R&S®SMCVB-KS19
Extended HDTV Streams
User Manual

1179273102
Version 04

ROHDE&SCHWARZ
Make ideas real

This document describes the following software options:

- R&S®SMCVB-KS19 Extended HDTV Streams (1434.5257.xx)

The software contained in this product makes use of valuable open-source software packages. For information, see the document `LIB-K58 K70 K71 K72 K73 OpenSourceAcknowledgement.pdf` on the "Vector Signal Generator Customer Web" at the global Rohde & Schwarz information system (GLORIS). Rohde & Schwarz would like to thank the open-source community for their valuable contribution to embedded computing.

Muehldorfstr. 15, 81671 Muenchen, Germany
Phone: +49 89 41 29 - 0
Email: info@rohde-schwarz.com
Internet: www.rohde-schwarz.com

1179.2731.02 | Version 04 | R&S®SMCVB-KS19

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

Contents

1 Welcome to the R&S SMCVB-KS19 option

The R&S SMCVB-KS19 is a stream library that provides stream files for testing high-definition television (HDTV) of the systems DVB, ATSC and ISDB-T. The files are additional to the HDTV stream files provided in the Basic Streams library R&S SMCVB-KS17.

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-KS19 stream library consists of the same video content signal to provide a comprehensive functional testing on the receivers:

- Moving video scenes signal

Transport streams with moving scenes

Moving picture scenes can be used for a basic functional test of decoders, multiplexers and terminals. For example, use moving picture scenes for testing set-top boxes (STBs) in final production. Due to the movement of the picture scenes, any interruption or transmission error in the data stream or any processing error in the decoder is immediately recognizable. Due to digital processing, the last frame that was received is always output in the decoder, even if there are transmission errors. The limitations imply that images are less useful in functional testing.

1.2 Installation

Required options

The equipment layout for processing files of waveform libraries includes:

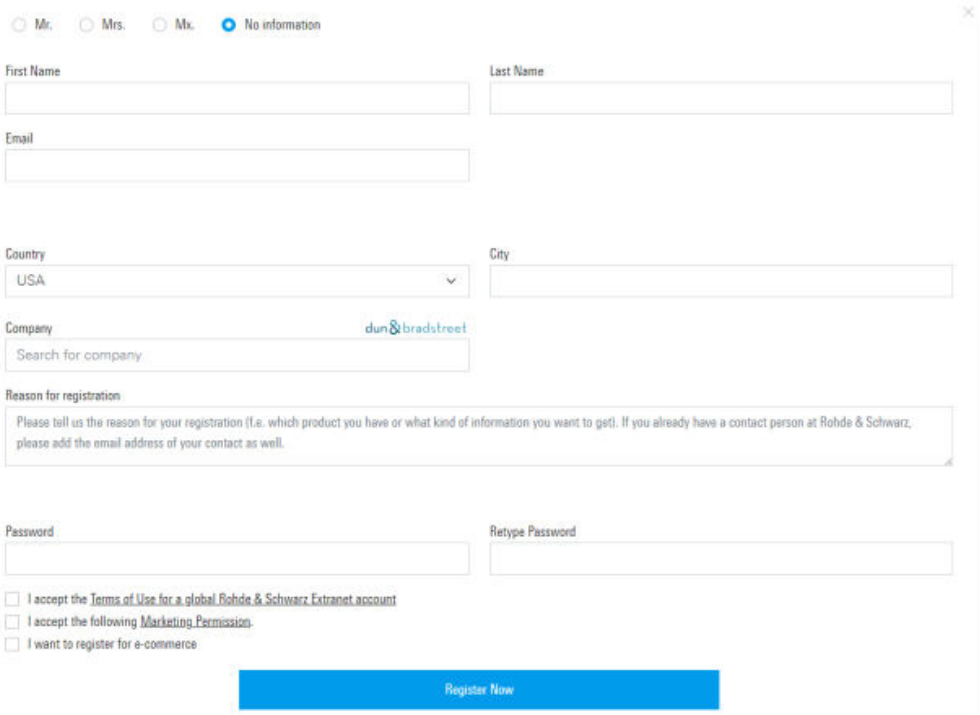
- R&S SMCV100B base unit (64 MSample ARB memory, 60 MHz RF bandwidth)
- Broadcast standard option for the "TS Player" application (R&S SMCVB-Kxxx)
- Enable Broadcast Standards option (R&S SMCVB-K519)
- Stream library option (R&S SMCVB-KSxx)

For more information on stream options, see chapter "TS Player section "Required options" in the broadcast standard option user manual of the R&S SMCV100B.

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).

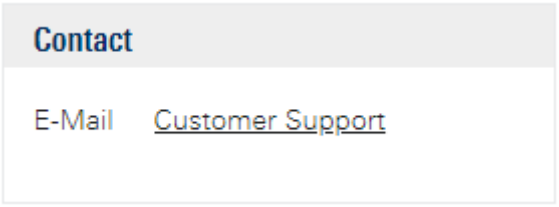
1. For access, register at https://gloris.rohde-schwarz.com:
   In the section "How to register", follow the instructions provided in the introduction video "How to register for GLORIS".
2. Register to GLORIS with the creation of a personal account.



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.

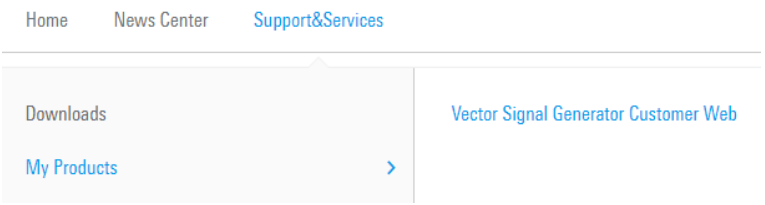
   a) When using a new GLORIS account, fill the information in the "Reason for registration" field.

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



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".

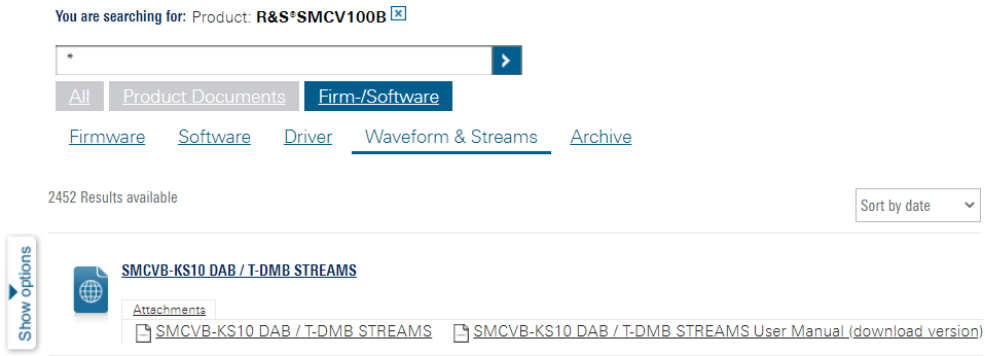
A webpage opens and displays search results for products related to the R&S SMCV100B.

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.

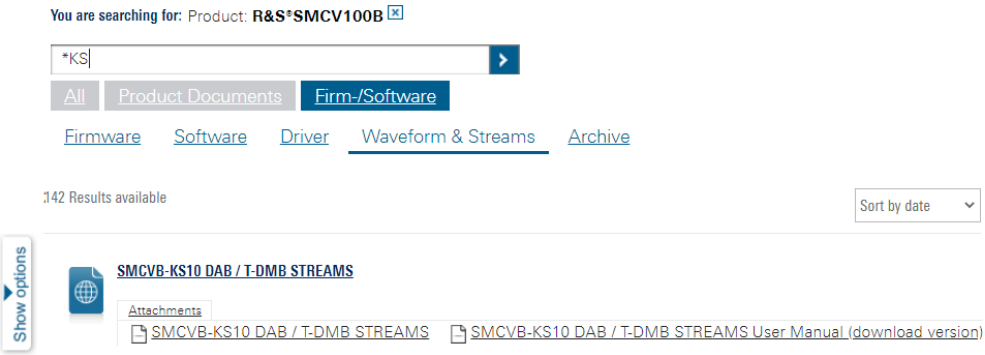
1. Access the "Product Related Documents" webpage as described in "To access "Product Related Documents"" on page 9.
2. In the search navigation bar, select "Firm-/Software" > "Waveform & Streams".

   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.".

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.

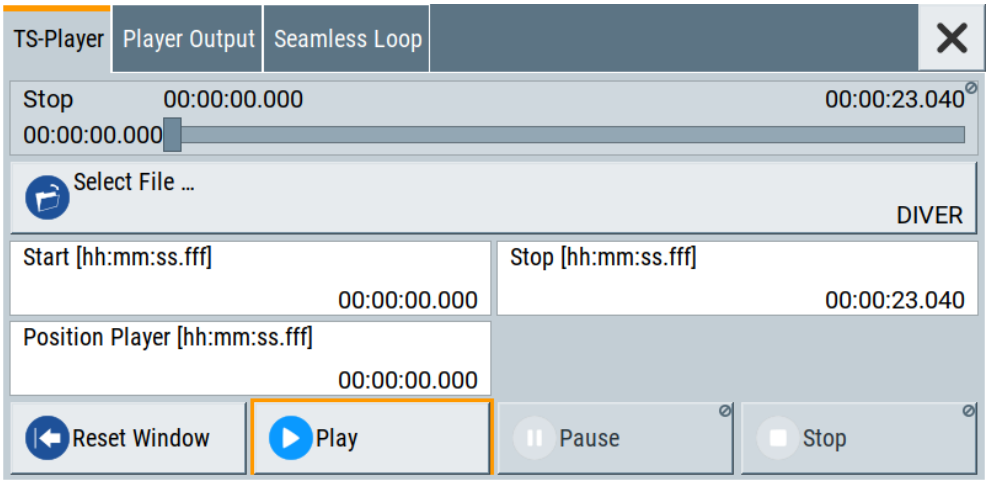
To save a library file

► 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 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. Loading the library file at the R&S SMCV100B requires installation of the corresponding library option. See "Required options" on page 7.
2. To load the file at the R&S SMCV100B, open the "TS Player" application in digital broadcast standard ("<Broadcast_Standard>") dialogs:
   a) Select "Baseband" > "<Broadcast_Standard>" > "Input Signal".
   b) Select "Source" > "TS Player".
   c) Select "TS Player" button.
   d) Select "Select File".
3. To select the file, navigate to the storage location (1).
4. Select "TS-Player" > "Play".



The R&S SMCV100B processes the stream file.

5. Select "<Broadcast_Standard>" > "State" > "On", to activate the baseband signal.
6. In the block diagram, select "RF" > "On".

   The stream file is modulated onto the RF carrier and output at the "RF 50 Ω" connector.

For more information on loading stream files, see chapter "How to generate an internal TS sinal" in the broadcast standard option user manual of the R&S SMCV100B.

1.3 What's new

Compared to the previous version the documentation provides updated installation instructions to access, download and play stream library files, see Chapter 1.2, "Installation", on page 7.

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 Video test patterns and audio test sequences

In this chapter, moving video sequences that are used in the HDTV transport streams are described in detail.

2.1 Video

The video scenes are recorded and provided by

TestVid

4 Cheyne Road

Bristol BS9 2DH

United Kingdom

www.testvid.com/

2.1.1 Moving video scenes

The moving video scenes used in the HDTV transport streams library are made up of five different moving video sequences:

- "The Strip" (see Figure 2-1)
- "Monorail" (see Figure 2-2)
- "Fountain" (see Figure 2-3)
- "Golden Gate" (see Figure 2-4)
- "The Matthew" (see Figure 2-5)

These video sequences are combined together to form a complete video content.

Example of use: General function test for vision and sound, demonstration of picture quality as a function of data rate.

Figure 2-1: Video scene for "The Strip"

Figure 2-2: Video scene for “Monorail”

Figure 2-3: Video scene for “Fountain”

Figure 2-4: Video scene for “Golden Gate”

Figure 2-5: Video scene for "The Matthew"

2.2 Audio

2.2.1 Background musical audio

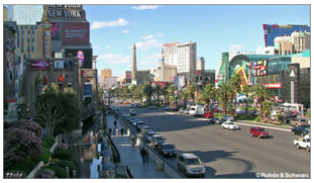
Background musical audio was selected for the entire HDTV transport streams library.

3 DVB transport streams

3.1 Overview

Each of the DVB transport streams consists of one video elementary streams (MPEG2 or AVC) and two audio elementary streams (MPEG1-L2 and MPEG4 HE-AACv1 LOAS or AAC-LC LOAS).

The file name gives information about the video information (scene or pattern) and format (MPEG2 or AVC) of the coded video picture.

Video source	DVB test stream & video elementary stream	
Locations 16:9 1080 lines (23 Hz, 24Hz) Progressive 2880 frames 	**DVB_24Hz**	**DVB_23Hz**
	24.000 frames per second 120.000 seconds **HDTV_MPEG_LOCATIONS** MPEG-2 (H.262) mp@hl 16.012 Mbps **HDTV_AVC_LOCATIONS** AVC (H.264) hp@L4.0 14.566 Mbps	23.976 frames per second 120.120 seconds **HDTV_MPEG_LOCATIONS** MPEG-2 (H.262) mp@hl 16.012 Mbps H **DTV_AVC_LOCATIONS** AVC (H.264) hp@L4.0 15.540 Mbps
Locations 16:9 1080i lines (25Hz, 29Hz) Interlaced 2880 frames 	**DVB_25Hz**	**DVB_29Hz**
	25.000 frames per second 115.200 seconds H **DTV_MPEG_LOCATIONS** MPEG-2 (H.262) mp@hl 16.013 Mbps H **DTV_AVC_LOCATIONS** AVC (H.264) hp@L4.0 13.956 Mbps	29.970 frames per second 96.096 seconds H **DTV_MPEG_LOCATIONS** MPEG-2 (H.262) mp@hl 16.021 Mbps H **DTV_AVC_LOCATIONS** AVC (H.264) hp@L4.0 17.860 Mbps
Locations 16:9 720p lines (50 Hz, 59Hz) 5760 frames 	**DVB_50Hz**	**DVB_59Hz**
	50.000 frames per second 115.200 seconds H **DTV_MPEG_LOCATIONS** MPEG-2 (H.262) mp@hl 15.998 Mbps H **DTV_AVC_LOCATIONS** AVC (H.264) hp@L4.0 14.858 Mbps	59.940 frames per second 96.096 seconds H **DTV_MPEG_LOCATIONS** MPEG-2 (H.262) mp@hl 15.998 Mbps H **DTV_AVC_LOCATIONS** AVC (H.264) hp@L4.0 17.811 Mbps

Locations 16:9 1080p lines (50 Hz, 59Hz) 5760 frames 	DVB_50Hz	DVB_59Hz
	50.000 frames per second 115.200 seconds F **ULL_HDTV_AVC_LOCATIONS** AVC (H.264) hp@L4.2 14.935 Mbps	59.940 frames per second 96.096 seconds F **ULL_HDTV_AVC_LOCATIONS** AVC (H.264) hp@L4.2 17.904 Mbps

3.2 HDTV_MPEG_LOCATIONS (23 Hz)

TS ID: 2011 (0x07DB)

Length: 4 times 2880 video frames (480.480 s)

Tables: DVB-T (terrestrial)

Program

Service_name: R&S CH 1

3.2.1 Video

Moving video scene.

MPEG2 (H.262) main profile @ high level

- 23.976 frames/s
- 1920 pixels/line
- 1080 lines/picture
- 16.012 Mbit/s
- Moving picture

3.2.2 Audio

Background musical audio.

MPEG-1 Layer 2

- 48 ksample/s
- 384 kbit/s
- Stereo

Background musical audio.

MPEG4 (AAC-LC LOAS)

- 48 ksample/s

- 256 kbit/s
- Stereo

3.3 HDTV_AVC_LOCATIONS (23 Hz)

TS ID: 2011 (0x07DB)

Length: 4 times 2880 video frames (480.480 s)

Tables: DVB-T (terrestrial)

Program

Service_name: R&S CH 1

3.3.1 Video

Moving video scene.

MPEG4 AVC HP@L4.0

- 23.976 frames/s
- 1920 pixels/line
- 1080 lines/picture
- 15.540 Mbit/s
- Moving picture

3.3.2 Audio

Background musical audio.

MPEG-1 Layer 2

- 48 ksample/s
- 384 kbit/s
- Stereo

Background musical audio.

MPEG4 (AAC-LC LOAS)

- 48 ksample/s
- 256 kbit/s
- Stereo

3.4 HDTV_MPEG_LOCATIONS (24 Hz)

TS ID: 2011 (0x07DB)

Length: 4 times 2880 video frames (480.000 s)

Tables: DVB-T (terrestrial)

Program

Service_name: R&S CH 1

3.4.1 Video

Moving video scene.

MPEG2 (H.262) main profile @ high level

- 24 frames/s
- 1920 pixels/line
- 1080 lines/picture
- 16.012 Mbit/s
- Moving picture

3.4.2 Audio

Background musical audio.

MPEG1 layer 2

- 48 ksample/s
- 384 kbit/s
- Stereo

Background musical audio.

MPEG4 (HE-AACv1 LOAS)

- 48 ksample/s
- 128 kbit/s
- Stereo

3.5 HDTV_AVC_LOCATIONS (24 Hz)

TS ID: 2011 (0x07DB)

Length: 4 times 2880 video frames (480.00 s)

Tables: DVB-T (terrestrial)

Program

Service_name: R&S CH 1

3.5.1 Video

Moving video scene.

MPEG4 AVC (H.264) HP@L4.0

- 24 frames/s
- 1920 pixels/line
- 1080 lines/picture
- 15.555 Mbit/s
- Moving picture

3.5.2 Audio

Background musical audio.

MPEG1 layer 2

- 48 ksample/s
- 384 kbit/s
- Stereo

Background musical audio.

MPEG4 (HE-AACv1 LOAS)

- 48 ksample/s
- 128 kbit/s
- Stereo

3.6 HDTV_MPEG_LOCATIONS (25 Hz)

TS ID: 2011 (0x07DB)

Length: 4 times 2880 video frames (460.800 s)

Tables: DVB-T (terrestrial)

Program

Service_name: R&S CH 1

3.6.1 Video

Moving video scene.

MPEG2 (H.262) main profile @ high level

- 25 frames/s
- 1920 pixels/line
- 1080 lines/picture
- 16.013 Mbit/s
- Moving picture

3.6.2 Audio

Background musical audio.

MPEG1 layer 2

- 48 ksample/s
- 384 kbit/s
- Stereo

Background musical audio.

MPEG4 (HE-AACv1 LOAS)

- 48 ksample/s
- 128 kbit/s
- Stereo

3.7 HDTV_AVC_LOCATIONS (25 Hz)

TS ID: 2011 (0x07DB)

Length: 4 times 2880 video frames (460.800 s)

Tables: DVB-T (terrestrial)

Program

Service_name: R&S CH 1

3.7.1 Video

Moving video scene.

MPEG4 AVC (H.264) high profile @ level 4.0

- 25 frames/s

- 1920 pixels/line
- 1080 lines/picture
- 14.898 Mbit/s
- Moving picture

3.7.2 Audio

Background musical audio.

MPEG1 layer 2

- 48 ksample/s
- 384 kbit/s
- Stereo

Background musical audio.

MPEG4 (HE-AACv1 LOAS)

- 48 ksample/s
- 128 kbit/s
- Stereo

3.8 HDTV_MPEG_LOCATIONS (29 Hz)

TS ID: 2011 (0x07DB)

Length: 4 times 2880 video frames (384.384 s)

Tables: DVB-T (terrestrial)

Program

Service_name: R&S CH 1

3.8.1 Video

Moving video scene.

MPEG2 (H.262) main profile @ high level

- 29.970 frames/s
- 1920 pixels/line
- 1080 lines/picture
- 16.021 Mbit/s
- Moving picture

3.8.2 Audio

Background musical audio.

MPEG1 layer 2

- 48 ksample/s
- 384 kbit/s
- Stereo

Background musical audio.

MPEG4 (HE-AACv1 LOAS)

- 48 ksample/s
- 128 kbit/s
- Stereo

3.9 HDTV_AVC_LOCATIONS (29 Hz)

TS ID: 2011 (0x07DB)

Length: 4 times 2880 video frames (384.384 s)

Tables: DVB-T (terrestrial)

Program

Service_name: R&S CH 1

3.9.1 Video

Moving video scene.

MPEG4 AVC (H.264) high profile @ level 4.0

- 29.970 frames/s
- 1920 pixels/line
- 1080 lines/picture
- 17.860 Mbit/s
- Moving picture

3.9.2 Audio

Background musical audio.

MPEG1 layer 2

- 48 ksample/s

- 384 kbit/s
- Stereo

Background musical audio.

MPEG4 (HE-AACv1 LOAS)

- 48 ksample/s
- 128 kbit/s
- Stereo

3.10 HDTV_MPEG_LOCATIONS (50 Hz)

TS ID: 2011 (0x07DB)

Length: 4 times 5760 video frames (460.800 s)

Tables: DVB-T (terrestrial)

Program

Service_name: R&S CH 1

3.10.1 Video

Moving video scene.

MPEG2 (H.262) main profile @ high level

- 50 frames/s
- 1280 pixels/line
- 720 lines/picture
- 15.998 Mbit/s
- Moving picture

3.10.2 Audio

Background musical audio.

MPEG1 layer 2

- 48 ksample/s
- 384 kbit/s
- Stereo

Background musical audio.

MPEG4 (HE-AACv1 LOAS)

- 48 ksample/s

- 128 kbit/s
- Stereo

3.11 HDTV_AVC_LOCATIONS (50 Hz)

TS ID: 2011 (0x07DB)

Length: 4 times 5760 video frames (460.800 s)

Tables: DVB-T (terrestrial)

Program

Service_name: R&S CH 1

3.11.1 Video

Moving video scene.

MPEG4 AVC (H.264) high profile @ level 4.0

- 50 frames/s
- 1280 pixels/line
- 720 lines/picture
- 14.858Mbit/s
- Moving picture

3.11.2 Audio

Background musical audio.

MPEG1 layer 2

- 48 ksample/s
- 384 kbit/s
- Stereo

Background musical audio.

MPEG4 (HE-AACv1 LOAS)

- 48 ksample/s
- 128 kbit/s
- Stereo

3.12 HDTV_MPEG_LOCATIONS (59 Hz)

TS ID: 2011 (0x07DB)

Length: 4 times 5760 video frames (384.384 s)

Tables: DVB-T (terrestrial)

Program

Service_name: R&S CH 1

3.12.1 Video

Moving video scene.

MPEG2 (H.262) main profile @ high level

- 59.940 frames/s
- 1280 pixels/line
- 720 lines/picture
- 15.998 Mbit/s
- Moving picture

3.12.2 Audio

Background musical audio.

MPEG1 layer 2

- 48 ksample/s
- 384 kbit/s
- Stereo

Background musical audio.

MPEG4 (HE-AACv1 LOAS)

- 48 ksample/s
- 128 kbit/s
- Stereo

3.13 HDTV_AVC_LOCATIONS (59 Hz)

TS ID: 2011 (0x07DB)

Length: 4 times 5760 video frames (384.384 s)

Tables: DVB-T (terrestrial)

Program

Service_name: R&S CH 1

3.13.1 Video

Moving video scene.

MPEG4 AVC (H.264) high profile @ level 4.0

- 59.940 frames/s
- 1280 pixels/line
- 720 lines/picture
- 17.811 Mbit/s
- Moving picture

3.13.2 Audio

Background musical audio.

MPEG1 layer 2

- 48 ksample/s
- 384 kbit/s
- Stereo

Background musical audio.

MPEG4 (HE-AACv1 LOAS)

- 48 ksample/s
- 128 kbit/s
- Stereo

3.14 FULL_HDTV_AVC_LOCATIONS (50 Hz)

TS ID: 2011 (0x07DB)

Length: 4 times 5760 video frames (460.800 s)

Tables: DVB-T (terrestrial)

Program

Service_name: R&S CH 1

3.14.1 Video

Moving video scene.

MPEG4 AVC (H.264) high profile @ level 4.2

- 50 frames/s
- 1920 pixels/line
- 1080 lines/picture
- 14.935 Mbit/s
- Moving picture

3.14.2 Audio

Background musical audio.

MPEG1 layer 2

- 48 ksample/s
- 384 kbit/s
- Stereo

Background musical audio.

MPEG4 (HE-AACv1 LOAS)

- 48 ksample/s
- 128 kbit/s
- Stereo

3.15 FULL_HDTV_AVC_LOCATIONS (59 Hz)

TS ID: 2011 (0x07DB)

Length: 4 times 5760 video frames (384.384 s)

Tables: DVB-T (terrestrial)

Program

Service_name: R&S CH 1

3.15.1 Video

Moving video scene.

MPEG4 AVC (H.264) high profile @ level 4.2

- 59.940 frames/s

- 1920 pixels/line
- 1080 lines/picture
- 17.904 Mbit/s
- Moving picture

3.15.2 Audio

Background musical audio.

MPEG1 layer 2

- 48 ksample/s
- 384 kbit/s
- Stereo

Background musical audio.

MPEG4 (HE-AACv1 LOAS)

- 48 ksample/s
- 128 kbit/s
- Stereo

4 ATSC transport streams

4.1 Overview

Each of the ATSC transport streams consists of one video-elementary stream (MPEG2) and an AC3 audio elementary stream with respective number of video streams.

The file name gives information about the video information (scene or pattern) and the coded video picture.

Video source	ATSC test stream & video elementary stream
Locations 16:9 1080p lines (23 Hz) 2880 frames progressive 	**ATSC_23Hz** 23.976 frames per second 120.120 seconds **HDTV_MPEG_LOCATIONS** MPEG-2 (H.262) mp@hl 16.012 Mbps
Locations 16:9 1080i lines (29 Hz) 2880 frames interlaced 	**ATSC_29Hz** 29.970 frames per second 96.096 seconds **HDTV_MPEG_LOCATIONS** MPEG-2 (H.262) mp@hl 16.012 Mbps

Locations 16:9 720p lines (59 Hz) 5760 frames progressive 	**ATSC_59Hz** 59.940 frames per second 96.096 seconds H**DTV_MPEG_LOCATIONS** MPEG-2 (H.262) mp@hl 15.998 Mbps

4.2 HDTV_MPEG_LOCATIONS (23 Hz)

TS ID: 2011 (0x07BD)

Length: 4 times 2880 video frames (480.480 s)

Tables: ATSC terrestrial (TVCT)

Program

Major_channel_number: 1

Program 1: minor_channel_number 1

Short_name: CH1

4.2.1 Video

Moving video scene.

MPEG2 (H.262) main profile @ high level

- 23.976 frames/s
- 1920 pixels/line
- 1080 lines/picture
- 16.012 Mbit/s
- Moving picture
- ATSC identifier

4.2.2 Audio

Background musical audio.

AC-3

- 48 ksample/s
- 384 kbit/s

- 2/0 (L,R)

4.3 HDTV_MPEG_LOCATIONS (29 Hz)

TS ID: 2011 (0x07DB)

Length: 4 times 2880 video frames (384.384 seconds)

Tables: ATSC terrestrial (TVCT)

Program

Major_channel_number: 1

Program 1: minor_channel_number 1

Short_name: CH1

4.3.1 Video

Moving video scene.

MPEG2 (H.262) main profile @ high level

- 29.970 frames/s
- 1920 pixels/line
- 1080 lines/picture
- 16.021 Mbit/s
- Moving picture
- ATSC identifier

4.3.2 Audio

Background musical audio.

AC-3

- 48 ksample/s
- 384 kbit/s
- 2/0 (L,R)

4.4 HDTV_MPEG_LOCATIONS (59 Hz)

TS ID: 2011 (0x07BD)

Length: 4 times 5760 video frames (384.384 seconds)

Tables: ATSC terrestrial (TVCT)

Program

Major_channel_number: 1

Program 1: minor_channel_number 1

Short_name: CH1

4.4.1 Video

Moving video scene.

MPEG2 (H.262) main profile @ high level

- 59.940frames/s
- 1280 lines/picture
- 720 pixels/line
- 15.998 Mbit/s
- Moving picture
- ATSC identifier

4.4.2 Audio

Background musical audioAC-3.

- 48 ksample/s
- 384 kbit/s
- 2/0 (L,R)

5 ISDB-T transport streams

5.1 Overview

Each of the ISDB-T transport streams consists of a video elementary stream (MPEG2) and an AAC-LC ADTS audio elementary stream.

The file name gives information about the video information (scene or pattern) of the coded picture.

Video source	ISDB-T test stream & video elementary stream
Locations 16:9 1080i lines (29 Hz) 2880 frames interlaced 	**ISDBT_29Hz** 29.970 frames per second 96.096 seconds **HDTV_MPEG_LOCATIONS** MPEG-2 (H.262) mp@hl 16.021 Mbps
Locations 16:9 720p lines (59Hz) 5760 frames progressive 	**ISDBT_59Hz** 59.940 frames per second 96.096 seconds **HDTV_MPEG_LOCATIONS** MPEG-2 (H.262) mp@hl 15.998 Mbps

5.2 HDTV_MPEG_LOCATIONS (29 Hz)

TSID: 32736 (0x7FE0)

SID: 1024 (0x0400)

Length: 4 times 2880 video frames (384.384 s)

Tables: ISDB-T

Program

Program number: 1024

Service name: CH 1

5.2.1 Video

Moving video scene.

MPEG2 (H.262) main profile @ high level

- 29.970 frames/s
- 1920 pixels/line
- 1080 lines/picture
- 16.021 Mbit/s
- Moving picture

5.2.2 Audio

Background musical audio.

MPEG4 (AAC-LC ADTS)

- 48 ksample/s
- 144 kbit/s
- Stereo

5.3 HDTV_MPEG_LOCATIONS (59 Hz)

TSID: 32736 (0x7FE0)

SID: 1024 (0x0400)

Length: 4 times 5760 video frames (384.384 s)

Tables: ISDB-T

Program

Program number: 1024

Service name: CH 1

5.3.1 Video

Moving video scene.

MPEG2 (H.262) main profile @ high level

- 59.940 frames/s

- 720 lines/picture
- 1280 pixels/line
- 15.998 Mbit/s
- Moving picture

5.3.2 Audio

Background musical audio.

MPEG4 (AAC-LC ADTS)

- 48 ksample/s
- 144 kbit/s
- Stereo

Index