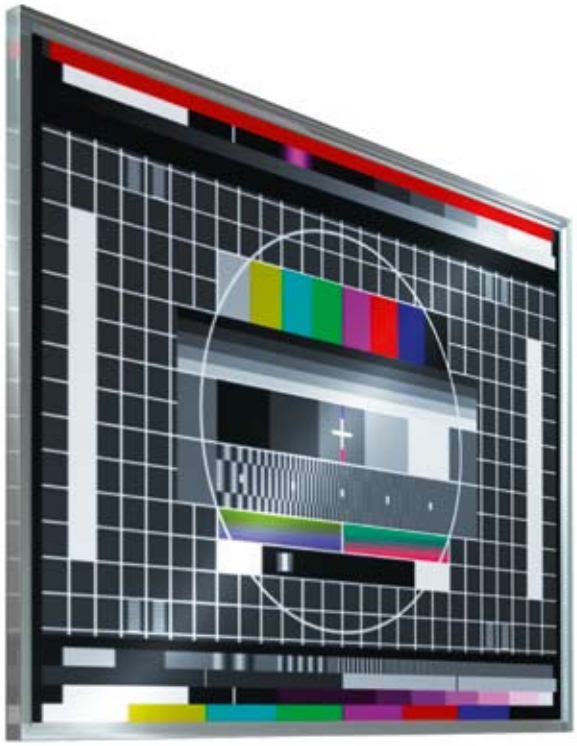
Stream Libraries
for broadcasting T&M equipment from Rohde&Schwarz



75 Years of Driving Innovation

ROHDE&SCHWARZ

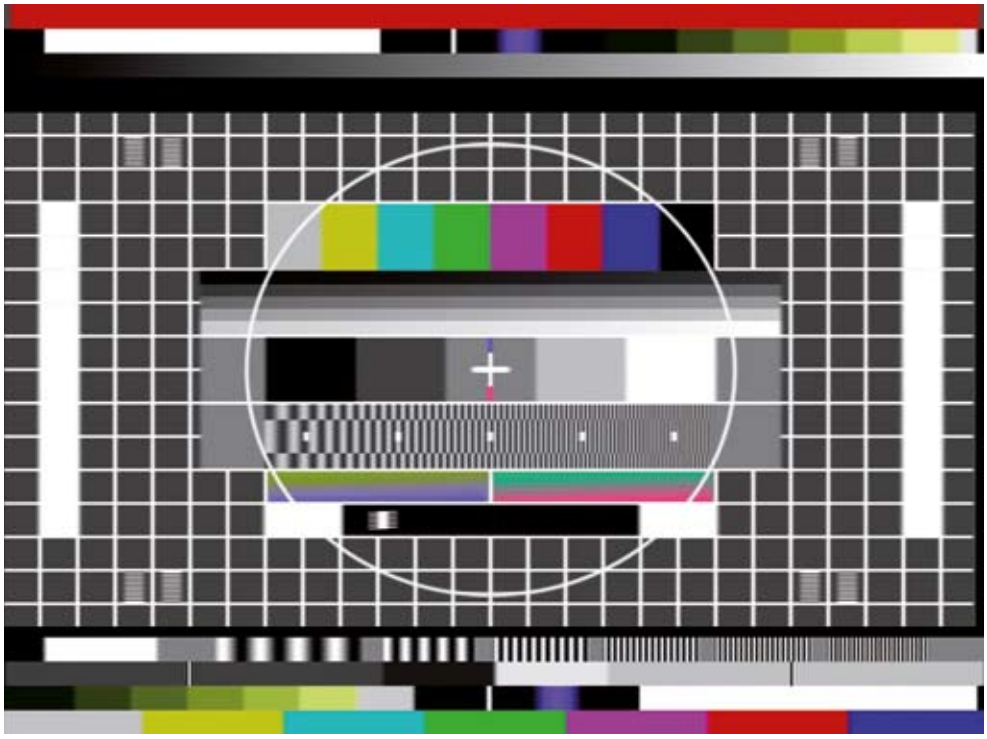
Stream Libraries
At a glance

Whenever the development, production and testing of TV components or devices is involved, suitable test signals are needed. To meet this need, Rohde&Schwarz offers not only the generators and modulators that are required but also an extensive collection of stream libraries.

The R&S®DV-ASC advanced stream combiner software complements the stream library collection. This software provides an easy way to generate customized MPEG-2 transport streams for DVB, ATSC and ISDB-T. Alternatively, Rohde&Schwarz offers the generation of customized test signals as a service.

Key facts

- Support of numerous transmission standards
- High-quality video contents
- High-quality audio contents
- Efficient use



Test signal: "Codec 4:3 and 16:9".

Stream Libraries
Benefits and key features

Large variety of applications
- Testing of TV sets, set-top boxes and mobile TV handsets
- EMC testing of TV sets
- Testing of decoders and encoders
- Testing of analog and digital TV networks and transmitters
- Testing of radio receivers

▷ page 4

Extensive collection of libraries
- SDTV stream library for DVB and ATSC
- HDTV stream library for DVB and ATSC
- H.264 stream library for DVB and ATSC
- TCM stream library for DVB and ATSC
- DVB-H stream library
- ISDB-T stream libraries for Japanese and Brazilian ISDB-T
- MediaFLO™ stream library
- CMMB stream library
- T-DMB and DAB stream library
- DAB+ stream library
- Analog video signal library

▷ page 6

Easy generation of transport streams by the user
- Generation of customer-specific transport streams with the R&S®DV-ASC advanced stream combiner software

▷ page 8

Rohde&Schwarz customizes baseband streams
- Rohde&Schwarz offers the generation of customer-specific transport streams or analog CCVS signals as a service

▷ page 9

Support of numerous transmission standards
- Digital TV
- Mobile TV
- Audio broadcasting
- Analog TV

High-quality video contents
- High-quality video sequences
- Precise test patterns
- Numerous resolutions, including full HD
- MPEG-2 and H.264 coding

High-quality audio contents
- Detailed audio signals
- Precise test tones
- Surround/multichannel sound
- Various coding methods, including MPEG-4 HE-AAC v2

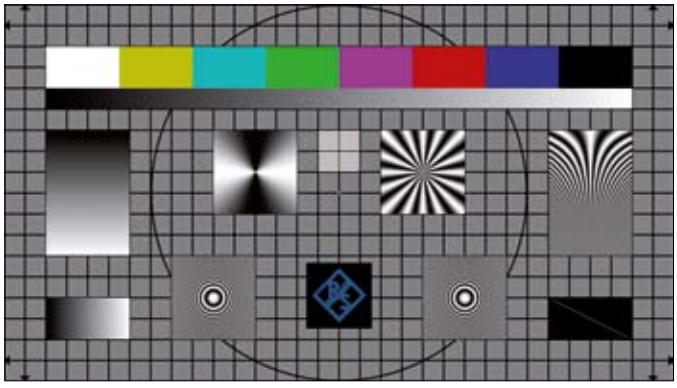
Efficient use
- Standard-compliant, reliable operation worldwide
- Available at the push of a button
- Clear and simple property rights
- Comprehensive documentation

Large variety of applications

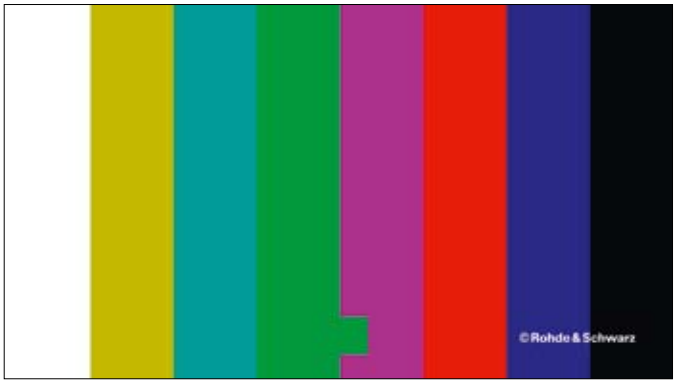
This section presents a variety of possible applications. Each one has its own – sometimes difficult – requirements. All of these applications can be handled with the stream libraries from Rohde&Schwarz.

Testing of TV sets, set-top boxes and mobile TV handsets

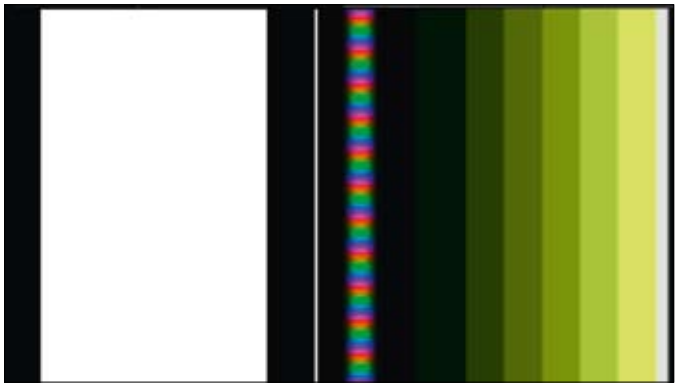
A large number of digital TV standards can be found worldwide. They often implement the widely used MPEG-2 transport stream format, but also special formats. HDTV transmission and state-of-the-art data compression methods such as H.264 are also increasingly being used. To test the corresponding receivers, users need the appropriate test signals with various video and audio contents – ranging from the complex stress test during the development phase up to the simple functional test during production.



Test signal: "HDTV test pattern".



Test signal: "Color bars".



Test signal: "NTC7 composite".



Test signal: "Test Card M".

EMC testing of TV sets

Verifying EMC is an essential step in obtaining the approval of TV receivers. To ensure reproducible test conditions, the relevant EMC standards specify standardized test patterns for the certification tests. These patterns are used not only by the officially authorized agencies, but also in preparatory tests during instrument development.

Testing of decoders and encoders

Video and audio data is transmitted in compressed form. Therefore, encoders are required on the transmit end and decoders on the receive end. Continued development in this area is yielding stronger digital compression techniques and the support of higher video resolutions and additional audio channels. Suitable test signals are required in order to accommodate these developments as well as the subsequent device test.

Testing of analog and digital TV networks and transmitters

During the setup and maintenance of TV networks and transmitter systems, signals with specific predefined contents may be required for a functional test.

Testing of radio receivers

Digital sound broadcasting systems such as DAB and DAB+ use audio streams. During the development and production of digital radio receivers, digital audio streams with special test signals are required in order to test both the sound quality and the additional data and services.



Live sequence: "Ice hockey."



Live sequence: "Park".



Live sequence: "Shark and other fish in the aquarium".



Live sequence: "Fireworks".

Extensive collection of libraries

SDTV stream library for DVB and ATSC

SDTV	SDTV stream library
Transport stream	MPEG-2, DVB and ATSC
Video	MPEG-2, SDTV
Audio	MPEG-1 layer II (DVB) Dolby AC-3 (ATSC)
Data	DVB teletext
Playback	endless; seamless at transport stream level and at video and audio level
Application	digital TV

HDTV stream library for DVB and ATSC

R&S®DV-HDTV	HDTV sequences
Transport stream	MPEG-2, DVB and ATSC
Video	MPEG-2, various HDTV formats
Audio	MPEG-1 layer II (DVB) Dolby AC-3 (DVB and ATSC)
Playback	endless; seamless at transport stream level and at video and audio level
Application	digital TV

H.264 stream library for DVB and ATSC

R&S®DV-H264	H.264 stream library
Transport stream	MPEG-2, DVB and ATSC
Video	H.264, various HDTV formats
Audio	MPEG-1 layer II (DVB) Dolby AC-3 (DVB and ATSC) MPEG-4 HE-AAC v1 (DVB)
Playback	endless; seamless at transport stream level and at video and audio level
Application	digital TV

TCM stream library for DVB and ATSC

R&S®DV-TCM	Test Card M sequences
Transport stream	MPEG-2, DVB and ATSC
Video	MPEG-2: SDTV format (with active format descriptor (AFD), DVB) SDTV and HDTV formats (ATSC)
Audio	MPEG-1 layer II (DVB) Dolby AC-3 (ATSC)
Data	DVB subtitling
Playback	endless; seamless at transport stream level and at video and audio level
Application	digital TV



Live sequence: "Flowers".

DVB-H stream library

R&S®DV-DVBH	DVB-H stream library
Transport stream	MPEG-2, DVB-T / DVB-H
Video	DVB-T: MPEG-2, SDTV DVB-H: H.264, CIF, QCIF and QVGA format
Audio	DVB-T: MPEG-1 layer II DVB-H: MPEG-4 HE-AAC v2 (LC+SBR+PS)
DVB-H ESG payload	DVB electronic service guide, DVB-IPDC
Time slicing	various burst sizes and timing settings support of MPE-FEC
Playback	endless; seamless at transport stream level, video (DVB-T) and audio level (DVB-T) as well as for time slicing
Application	mobile TV

ISDB-T stream libraries for Japanese and Brazilian ISDB-T

Japanese ISDB-T

R&S®DV-ISDBT	ISDB-T transport stream library
Transport stream	MPEG-2 ARIB-B10 and ARIB-B32
Video	MPEG-2: various SDTV and HDTV formats H.264: various mobile video formats
Audio	MPEG-1 layer II MPEG-4 AAC
Playback	endless; seamless at transport stream level and at video and audio level
Application	digital TV, mobile TV

Brazilian ISDB-T

R&S®SFU-K224	ISDB-T transport streams
Transport stream	MPEG-2 ARIB-B10 and ARIB-B32, layer A (1 segment) and layer B (12 segments)
Video	mobile HDTV H.264 high profile @L4.0 H.264 baseline profile @L1.3
Audio	MPEG-4 HE-AAC v1 MPEG-4 HE-AAC v2
Playback	transport stream endless, video and audio not seamless
Application	digital TV

MediaFLO™ stream library

R&S®SFU-K222	MediaFLO™ streams
Transport stream	Qualcomm proprietary format
Video	H.264 with Qualcomm proprietary extensions
Audio	Qualcomm proprietary
Playback	transport stream endless, video and audio not seamless
Application	mobile TV

CMMB stream library

R&S®SFU-K225	CMMB transport streams
Transport streams	MF and PMS streams
Video	H.264
Audio	MPEG-4 HE-AAC
Playback	transport stream endless, video and audio not seamless
Application	mobile TV

T-DMB and DAB stream library

R&S®SFU-K221	T-DMB/DAB streams
Transport stream	ETI NI G.703, DAB mode 1
Video	H.264 (T-DMB only)
Audio	DAB: MPEG-1 layer II T-DMB: MPEG-4 part 3 BSAC MPEG-4 HE-AAC v1 MPEG-4 HE-AAC v2
Playback	transport stream endless, video and audio not seamless
Application	audio broadcasting, mobile TV

DAB+ stream library

R&S®SFU-K223	DAB+ streams
Transport stream	ETI NI G.703
Video	–
Audio	MPEG-4 HE-AAC v1/v2
Playback	transport stream endless, video and audio not seamless
Application	audio broadcasting

Analog video signal library

R&S®ATV-Video	Analog TV test patterns
Signal format	CCVS
Video	NTSC 525 lines PAL 625 lines SECAM 625 lines
Audio	–
Playback	endless
Application	analog TV

Easy generation of transport streams by the user

Generation of customer-specific transport streams with the R&S®DV-ASC advanced stream combiner software

If signals that are not found in the libraries are needed, the R&S®DV-ASC advanced stream combiner software is the solution. This software enables the user to easily generate MPEG-2 transport streams for DVB (including time slicing for DVB-H), ATSC and ISDB-T. The user selects the video, audio and data contents wanted. The software supplements all additional data required in order to generate an error-free and standard-compliant MPEG-2 transport stream. All data added by the software can be modified if needed.

Customers can use their own video, audio and data contents. Alternatively, the elementary streams of the following stream libraries can be used: SDTV, R&S®DV-HDTV, R&S®DV-H264, R&S®DV-DVBH and R&S®DV-ISDBT. These libraries provide all video, audio and data contents of the transport streams as separate elementary streams.

To play back transport streams that contain elementary streams from the Rohde&Schwarz stream libraries, the corresponding stream libraries must be enabled on the generator.

All transport streams of the R&S®DV-HDTV, R&S®DV-H264, R&S®DV-DVBH and R&S®DV-ISDBT stream libraries can easily be modified by using the R&S®DV-ASC advanced stream combiner software since the libraries contain the configuration files in addition to the elementary streams.

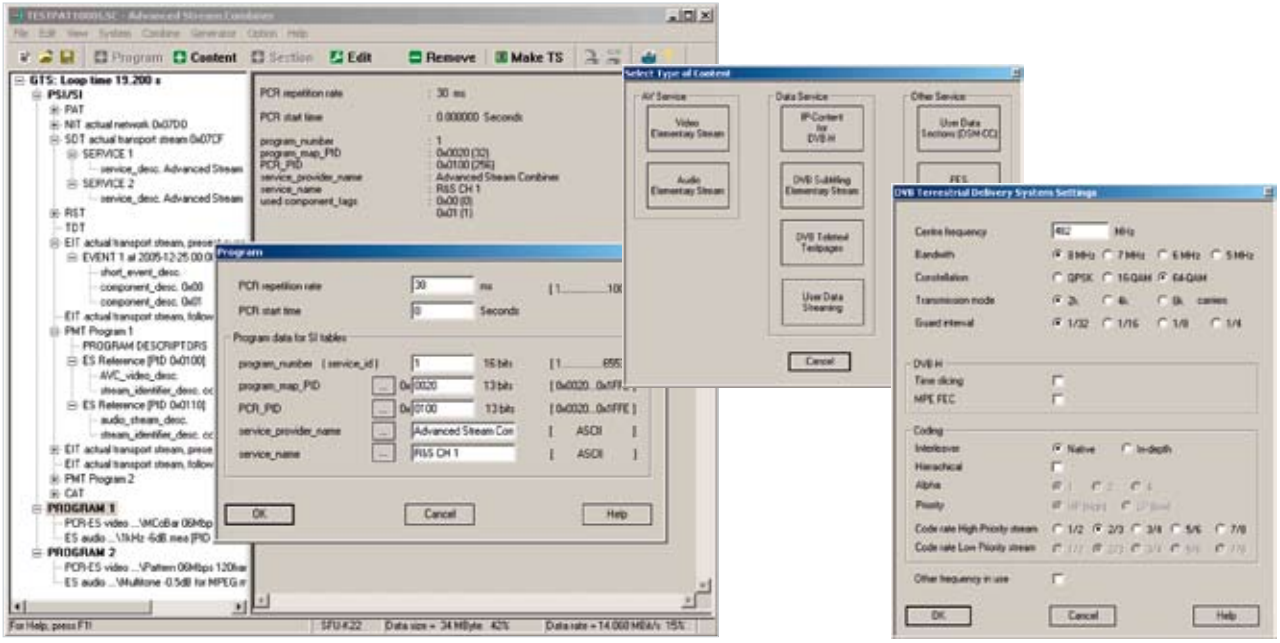
The Rohde&Schwarz website offers demo software for download that contains all functions of the original software. However, the transport stream file can only be generated with the original software.

Additional data delivered with the stream libraries

	SDTV	R&S®DV-HDTV	R&S®DV-H264	R&S®DV-DVBH	R&S®DV-ISDBT
Elementary streams (video audio)/IP data	– (delivered with R&S®DV-ASC)	●	●	●	●
Configuration files for R&S®DV-ASC	–	●	●	●	●

Note: If elementary streams or IP data is taken from one of the libraries, the transport streams composed by R&S®DV-ASC can only be played on Rohde&Schwarz generators that have the related stream option enabled.

Creation of customer-specific transport streams with R&S®DV-ASC



Rohde & Schwarz customizes baseband streams

R&S®ATV-SCA	Customized baseband streams (analog SDTV)
Signal format	CCVS
Video	NTSC 525 lines PAL 625 lines SECAM 625 lines
Audio	–
Playback	endless
Application	analog TV

R&S®DV-SCA	Customized baseband streams (MPEG-2 TS)
Transport stream	MPEG-2 DVB/ATSC/DTMB/ISDB
Video	MPEG-2: various SDTV and HDTV formats H.264: various SDTV and HDTV formats
Audio	MPEG-1/2 layer II MPEG-4 AAC MPEG-4 HE-AAC v1 MPEG-4 HE-AAC v2
Playback	endless; seamless at transport stream level and at video and audio level
Application	digital TV

Rohde&Schwarz offers the generation of customer-specific transport streams or analog CCVS signals as a service

Rohde&Schwarz offers not only an extensive collection of baseband libraries but also the generation of customer-specific transport streams or analog CCVS signals as a service. A separate Center of Competence (CoC) has been established specifically for this service.

The content of the streams is customer-chosen, and can be still images, video streams, and for transport streams in addition audio samples and sequences. The resulting transport streams can include system information for many different standards, including DVB, ATSC, ISDB and DTMB – most importantly it is the "customer transport stream".

The created baseband streams are delivered with documentation as well as option keys for the following instruments: R&S®SFU, R&S®SFE, R&S®SFE100, R&S®DVM400 and R&S®DVSG.



Rohde&Schwarz offers the generation of customer-specific transport streams or analog CCVS signals as a service.

Devices supporting the stream libraries

R&S®DVSG digital video signal generator

The R&S®DVSG is a universal platform for generating and playing compressed and uncompressed video and audio signals. It features transport stream (TS) interfaces as well as all common audio/video (AV) interfaces for the latest TV display technology.

R&S®DVM400 digital video measurement system

The R&S®DVM400 is a portable high-end transport stream analyzer with various RF receiver modules, Gigabit Ethernet interface, hardware decoder and in-depth analysis function for video, audio and additional data. It is ideal for R&D and maintenance.

R&S®ETL TV analyzer

The R&S®ETL TV analyzer platform has been mainly designed for the commissioning, installation, and servicing of TV transmitters and TV cable headends.



R&S®DVSG digital video signal generator.



R&S®DVM400 digital video measurement system.



R&S®ETL TV analyzer.

R&S®SFU broadcast test system

The R&S®SFU is a high-end multistandard broadcast test system for analog and digital TV and audio transmission standards – the multifunctional solution for all R&D applications including noise, fading and interference simulation.

R&S®SFE broadcast tester

The R&S®SFE is a general-purpose multistandard broadcast signal generator for analog and digital TV and audio transmission standards. It is a compact, low-weight and easy-to-use instrument for lab, quality assurance and manufacturing applications.

R&S®SFE100 test transmitter.

The R&S®SFE100 is a powerful single-standard test transmitter for digital and analog TV and audio transmission standards. It has been specially designed for use in manufacturing.



R&S®SFU broadcast test system.



R&S®SFE broadcast tester.



R&S®SFE100 test transmitter.

Availability of the various options for the Rohde&Schwarz generators

Standard	DVB, ATSC	DVB, ATSC	DVB, ATSC	DVB, ATSC	DVB-H	ISDB-T
Library	**SDTV**	**R&S®DV-HDTV**	**R&S®DV-H264**	**R&S®DV-TCM**	**R&S®DV-DVBH**	**R&S®DV-ISDBT**
File format	TS (GTS)	TS (GTS)	TS (GTS)	TS (GTS)	TS (GTS)	TS (GTS)
Instrument [1]						
R&S®DVG [2]	●	● [3]		● [3]		
R&S®DVRG [2]	●	●	●	●	●	
R&S®DVM400	●	●	●	●	●	●
R&S®DVSG	●	●	●	●	●	●
R&S®SFE	●	●	●	●	●	●
R&S®SFU	●	●	●	●	●	●
R&S®SFE100	●	●	●	●	●	●
R&S®ETL [5]	●	●	●	●	●	●

[1] In some cases, instrument-specific options are required in order to use the libraries. For further information, refer to the product brochures.
[2] The R&S®DVG and R&S®DVRG are no longer available. However, libraries for these instruments can still be obtained. The R&S®DVSG supports the functions of the R&S®DVG and R&S®DVRG and more.
[3] The use of R&S®DV-HDTV and R&S®DV-TCM on the R&S®DVG requires 32 Mbytes of memory. The memory of the R&S®DVG can be checked by pressing the ← → buttons simultaneously and stepping through the displays with the ESC button.
[4] Customer-defined signals; please contact Rohde&Schwarz for details.
[5] Function expansion for MPEG-2 transport stream generation planned for third quarter of 2009.

Required hard disk space for streams [1]						
Library	**SDTV**	**R&S®DV-HDTV**	**R&S®DV-H264**	**R&S®DV-TCM**	**R&S®DV-DVBH**	**R&S®DV-ISDBT**
Required hard disk space (approximately)	1 Gbyte	4 Gbyte (1 Gbyte, only R&S®DVG)	900 Mbyte	400 Mbyte	500 Mbyte	520 Mbyte

[1] Revised March 2009.

ISDB-T	MediaFLO™	CMMB	T-DMB, DAB	DAB+	Customer-specific	Analog TV	Customer-specific
R&S®SFU-K224	**R&S®SFU-K222**	**R&S®SFU-K225**	**R&S®SFU-K221**	**R&S®SFU-K223**	**R&S®DV-SCA [4)]**	**R&S®ATV-Video**	**R&S®ATV-SCA [4)]**
TS (TRP)	TS (TRP)	MFS, PMS	ETI	ETI	TS (GTS/TRP)	CCVS	CCVS
●	●				●		
●	●				●		
●	●	●	●	●	●	●	●
●	●	●	●	●	●	●	●
●	●	●	●	●	●	●	●
●					●		

R&S®SFU-K224	**R&S®SFU-K222**	**R&S®SFU-K225**	**R&S®SFU-K221**	**R&S®SFU-K223**	**R&S®DV-SCA**	**R&S®ATV-Video**	**R&S®ATV-SCA**
230 Mbyte	25.2 Gbyte	1 Gbyte	1.4 Gbyte	740 Gbyte	depends on length and number of videos	1.1 Gbyte	depends on length and number of videos

Details common to all libraries

Documentation on the libraries

Comprehensive documentation on each stream makes working with the stream libraries fast and effective. A description for each library is provided on CD or DVD.

Installation

All libraries are delivered on CD or DVD. All stream files can be copied to the hard disk of the instrument from the CD or DVD that is included in the stream library option. The required hard disk space is specified in the table on pages 12/13. If the stream library is ordered together with the base unit, the stream files will be installed at the factory before delivery.

Activation

The stream library options are activated via an instrument-specific key code, which is part of the delivery. The key code is valid for a specific instrument and bound to its serial number.

The SDTV library is part of every Rohde&Schwarz transport stream generator that supports GTS format. You do not need to order it as a separate option, and no extra key code is required.

Copyrights

The streams of the different libraries are protected by a Rohde&Schwarz license key. They can only be used with a Rohde&Schwarz transport stream generator if the related option is installed. Recording or copying these libraries for use with any other players is not allowed. Furthermore, customized transport streams with content taken from the libraries may only be played on Rohde&Schwarz generators that have the related option installed.

Comprehensive documentation – example pages from the "Quick Start Guide"









Ordering information

Designation	Type	Order No.
SDTV Stream Library	–	part of each Rohde&Schwarz MPEG-2 TS generator
HDTV Sequences	R&S®DV-HDTV	2085.7650.02
H.264 Stream Library	R&S®DV-H264	2085.9052.02
Test Card M Sequences	R&S®DV-TCM	2085.7708.02
DVB-H Stream Library	R&S®DV-DVBH	2085.8704.02
ISDB-T Transport Stream Library	R&S®DV-ISDBT	2085.9146.02
T-DMB/DAB Streams	R&S®SFU-K221	2110.4348.02
MediaFLO™ Streams	R&S®SFU-K222	2110.2968.02
DAB+ Streams	R&S®SFU-K223	2110.4760.02
ISDB-T Transport Streams	R&S®SFU-K224	2110.4777.02
CMMB Transport Streams	R&S®SFU-K225	2112.3649.02
Analog TV Test Patterns	R&S®ATV-Video	2110.4831.02
Customized Baseband Streams	R&S®DV-SCA	on request
Customized Baseband Streams	R&S®ATV-SCA	on request

Your local Rohde&Schwarz expert will help you determine the optimum solution for your requirements and will be glad to provide you with a customized quotation.

To find your nearest Rohde&Schwarz representative, visit www.sales.rohde-schwarz.com

Service you can rely on

- Worldwide
- Local and personalized
- Customized and flexible
- Uncompromising quality
- Long-term dependability

About Rohde&Schwarz

Rohde&Schwarz is an independent group of companies specializing in electronics. It is a leading supplier of solutions in the fields of test and measurement, broadcasting, radiomonitoring and radiolocation, as well as secure communications. Established 75 years ago, Rohde&Schwarz has a global presence and a dedicated service network in over 70 countries. Company headquarters are in Munich, Germany.

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Certified Quality System
ISO 9001
DQS REG. NO 1954 QM

Certified Environmental System
ISO 14001
DQS REG. NO 1954 UM

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Data without tolerance limits is not binding | Subject to change

*0.14 €/min within German wireline network; rates may vary in other networks (wireline and mobile) and countries.