

# R&S<sup>®</sup>SMCVB-KV18

## Cable Interferers Waveforms

### User Manual



1179283102  
Version 04

**ROHDE & SCHWARZ**  
Make ideas real



This document describes the following software options:

- R&S®SMCVB-KV18 Cable Interferers (1434.5586.xx)

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

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# 1 Welcome to the R&S SMCVB-KV18 option

The R&S SMCVB-KV18 is a waveform library that provides waveform files in accordance with various cable standards.

This user manual contains a reference description of the functionality that the waveform 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](http://www.rohde-schwarz.com/manual/SMCV100B)

## 1.1 Key features

The R&S SMCVB-KV18 features:

- Numerous waveform files in accordance with various cable standards
- Efficient use with dedicated waveforms as interferer signal

## 1.2 Installation

### Required options

The equipment layout for processing files of waveform libraries includes:

- R&S SMCV100B base unit, including arbitrary waveform generator (64 MSample ARB memory, 60 MHz RF bandwidth)
- Waveform library option (R&S SMCVB-KVxx)

For more information on ARB options, see chapter "Using the arbitrary waveform generator (ARB)" in the R&S SMCV100B user manual.

### 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.

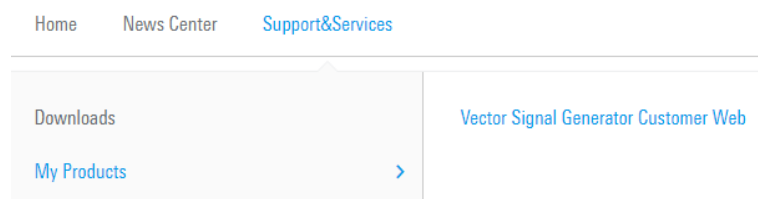
- b) When using an existing GLORIS account, click "Customer support" and fill in the information into an email.

**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



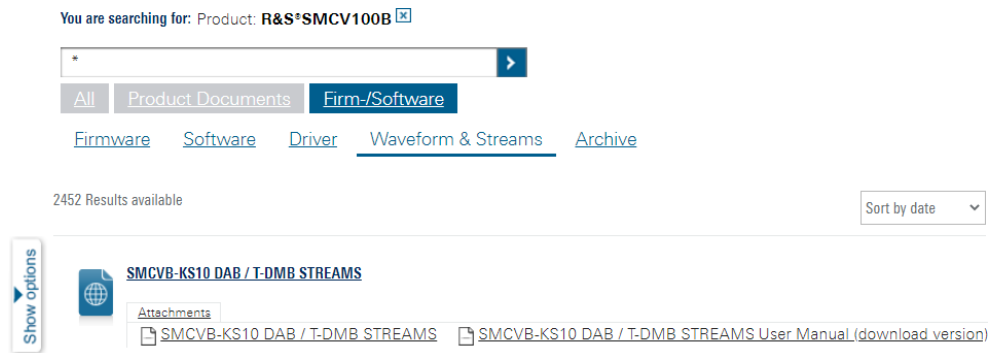
#### To download a library file

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:

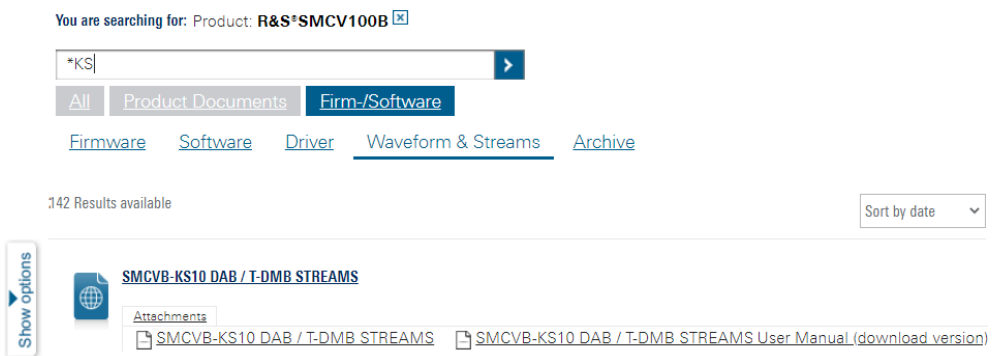
- R&S SMCVB-KSxx results relate to stream libraries.
- R&S SMCVB-KVxx results relate to waveform libraries.



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 waveform library file

1. Load the waveform 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 5.
2. To load the file at the R&S SMCV100B, select the file in the dialog "Baseband" > "ARB" > "Load Waveform".
3. To select the file, navigate to the storage location (1).
4. Select "ARB" > "State" > "On".  
The R&S SMCV100B processes the waveform file.
5. In the block diagram, select "RF" > "On"  
The waveform file is modulated onto the RF carrier and output at the RF 50 Ω connector.

For more information on loading waveform files, see chapter "How to create, generate and play waveform files" in the R&S SMCV100B user manual.

## 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](http://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](http://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](http://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](http://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 Available waveform files

This chapter contains the description of the available waveform files sorted as on the disk.

### 2.1 Single channel

#### **DVB\_C2\_GI64\_8MHz.wv**

RF = 489.991 MHz, 8 MHz channel, GI = 1/64, 1 PLP, 1 data slice, 256QAM, 5 C2 frames

#### **DVB\_C2\_GI128\_6MHz.wv**

RF = 490.018 MHz, 6 MHz channel, GI = 1/128, 1 PLP, 1 data slice, 256QAM, 4 C2 frames

#### **16QAM\_DVB-C\_NORDIG\_CH1.wv**

Modulation: 16QAM, symbol rate: 6.952 MSymb, Nyquist filter alpha = 15%

#### **64QAM\_DVB-C\_NORDIG\_CH1.wv**

Modulation: 64QAM, symbol rate: 6.952 MSymb, Nyquist filter alpha = 15%

#### **128QAM\_DVB-C\_NORDIG\_CH1.wv**

Modulation: 128QAM, symbol rate: 6.952 MSymb, Nyquist filter alpha = 15%

#### **256QAM\_DVB-C\_NORDIG\_CH1.wv**

Modulation: 256QAM, symbol rate: 6.952 MSymb, Nyquist filter alpha = 15%

#### **DVB\_C\_64QAM.wv**

Modulation: 64QAM, symbol rate: 6.9 MSymb, Nyquist filter alpha = 15%

#### **DVB\_C\_256QAM.wv**

Modulation: 256QAM, symbol rate: 6.9 MSymb, Nyquist filter alpha = 15%

#### **M\_UDCP\_NTSC.wv**

Modulation: Analog Std M, NTSC SMPTE colorbars 100%, modulation depth: 87.5%, 400 Hz FM mono sound carrier/vision level: -13 dB.

#### **QPSK\_FDC\_A.wv**

Modulation: QPSK, symbol rate: 0.772 MSymb, Nyquist filter alpha = 30%

#### **QPSK\_FDC\_B.wv**

Modulation: QPSK, symbol rate: 1.544 MSymb, Nyquist filter alpha = 30%

#### **SCTE\_64QAM.wv**

Modulation: 64QAM, symbol rate: 5.056941 MSymb, Nyquist filter alpha = 18%

#### **SCTE\_256QAM.wv**

Modulation: 256QAM, symbol rate: 5.360537 MSymb, Nyquist filter alpha = 12%

#### **SCTE\_NTSC.wv**

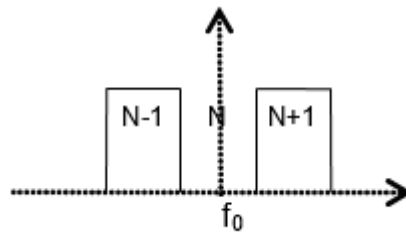
Modulation: Analog Std M, NTSC, modulation depth: 87.5%, 400 Hz FM mono sound carrier/vision level: -7 dB; spectrum centered, i.e. vision carrier 1.75 MHz below RF frequency ( $f_0$ )

#### **SCTE\_NTSC\_10dB.wv**

Modulation: Analog Std M, NTSC, modulation depth: 87.5%, 400 Hz FM mono sound carrier/vision level: -10 dB; spectrum centered, i.e. vision carrier 1.75 MHz below RF frequency ( $f_0$ )

## 2.2 Dual channel

Two signals are grouped around the RF frequency with a spacing of one channel (see [Figure 2-1](#)).



*Figure 2-1: Two channel signal*

#### **16QAM\_DVB-C\_NORDIG\_CH101.wv**

N-1 and N+1 interferer; modulation: 16QAM, symbol rate: 6.952 MSymb, Nyquist filter alpha = 15%

#### **64QAM\_DVB-C\_NORDIG\_CH101.wv**

N-1 and N+1 interferer; modulation: 64QAM, symbol rate: 6.952 MSymb, Nyquist filter alpha = 15%

#### **128QAM\_DVB-C\_NORDIG\_CH101.wv**

N-1 and N+1 interferer; modulation: 128QAM, symbol rate: 6.952 MSymb, Nyquist filter alpha = 15%

#### **256QAM\_DVB-C\_NORDIG\_CH101.wv**

N-1 and N+1 interferer; modulation: 256QAM, symbol rate: 6.952 MSymb, Nyquist filter alpha = 15%

#### **16QAM\_DVB-C\_NORDIG\_CH10001.wv**

N-2 and N+2 interferer; modulation: 16QAM, symbol rate: 6.952 MSymb, Nyquist filter alpha = 15%

#### **64QAM\_DVB-C\_NORDIG\_CH10001.wv**

N-2 and N+2 interferer; modulation: 64QAM, symbol rate: 6.952 MSymb, Nyquist filter alpha = 15%

**128QAM\_DVB-C\_NORDIG\_CH10001.wv**

N-2 and N+2 interferer; modulation: 128QAM, symbol rate: 6.952 MSymb, Nyquist filter alpha = 15%

**256QAM\_DVB-C\_NORDIG\_CH10001.wv**

N-2 and N+2 interferer; modulation: 256QAM, symbol rate: 6.952 MSymb, Nyquist filter alpha = 15%

**DVB\_C\_2CH\_64QAM\_8MHz.wv**

N-1 and N+1 interferer; modulation: 64QAM, symbol rate: 6.9 MSymb, Nyquist filter alpha = 15%

**DVB\_C\_2CH\_256QAM\_8MHz.wv**

N-1 and N+1 interferer; modulation: 256QAM, symbol rate: 6.9 MSymb, Nyquist filter alpha = 15%

**SCTE\_2CH\_64QAM.wv**

N-1 and N+1 interferer; modulation: 64QAM, symbol rate: 5.056941 MSymb, Nyquist filter alpha = 18%

**SCTE\_2CH\_256QAM.wv**

N-1 and N+1 interferer; modulation: 256QAM, symbol rate: 5.360537 MSymb, Nyquist filter alpha = 12%

**SCTE\_2CH\_NTSC.wv**

N-1 and N+1 interferer; modulation: Analog Std M, NTSC, modulation depth: 87.5%, 400 Hz FM mono sound carrier/vision level: -7 dB

**SCTE\_2CH\_NTSC\_10dB.wv**

N-1 and N+1 interferer; modulation: Analog Std M, NTSC, modulation depth: 87.5%, 400 Hz FM mono sound carrier/vision level: -10 dB

## 2.3 Multi channel

**MULTI\_13CH\_[index of empty channels \_MT]\_[modulation type].wv**

The directory contains 81 files. All files are named in the same fashion.

For example, the file name "MULTI\_13CH\_2\_3\_4MT\_64QAM.wv" reads as follows:

[index of empty channels \_MT]  
 MULTI\_13CH\_2\_3\_4MT\_64QAM.wv  
 [modulation type]

Each file supports a 13-channel signal.

Modulations:

- Analog Std M, NTSC, modulation depth: 87.5%, 400 Hz FM mono sound carrier/ vision level: -7 dB; spectrum centered, i.e. vision carrier 1.75 MHz below RF frequency (f0)
- 64QAM, symbol rate: 5.056941 MSymb, Nyquist filter alpha = 18%
- 256QAM, symbol rate: 5.360537 MSymb, Nyquist filter alpha = 12%

#### **16QAM\_DVB-C\_NORDIG\_CH11011.wv**

N-2, N+2 interferer at +5 dB relative to carrier level and N-1, N+1 interferer at +0 dB relative to carrier level; modulation: 16QAM, symbol rate: 6.952 MSymb, Nyquist filter alpha = 15%

#### **64QAM\_DVB-C\_NORDIG\_CH11011.wv**

N-2, N+2 interferer at +5 dB relative to carrier level and N-1, N+1 interferer at +0 dB relative to carrier level; modulation: 64QAM, symbol rate: 6.952 MSymb, Nyquist filter alpha = 15%

#### **128QAM\_DVB-C\_NORDIG\_CH11011.wv**

N-2, N+2 interferer at +5 dB relative to carrier level and N-1, N+1 interferer at +0 dB relative to carrier level; modulation: 128QAM, symbol rate: 6.952 MSymb, Nyquist filter alpha = 15%

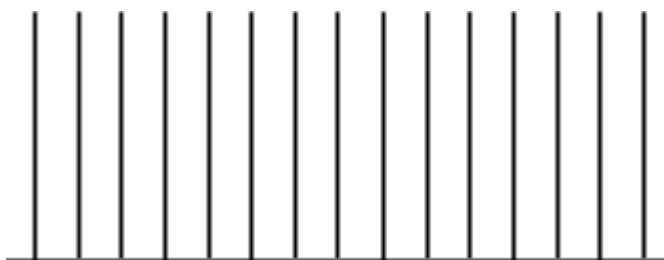
#### **256QAM\_DVB-C\_NORDIG\_CH11011.wv**

N-2, N+2 interferer at +5 dB relative to carrier level and N-1, N+1 interferer at +0 dB relative to carrier level; modulation: 256QAM, symbol rate: 6.952 MSymb, Nyquist filter alpha = 15%

## 2.4 CW

#### **FullCWLoad\_6MHz.wv**

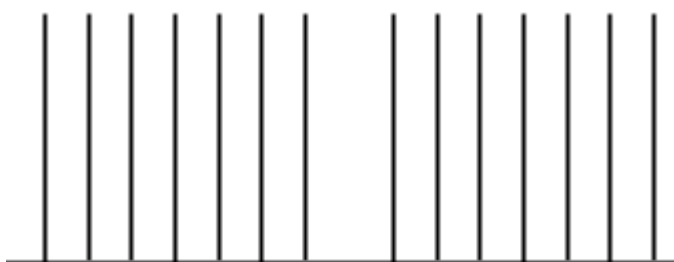
15 CW signals in 6 MHz spacing



*Figure 2-2: CW signals*

**FullCWLoad\_6\_MHz\_NoCenter.wv**

14 CW signals in 6 MHz spacing; center channel empty.



*Figure 2-3: CW signals, center empty*

**FullCWLoad\_7MHz.wv**

13 CW signals in 7 MHz spacing

**FullCWLoad\_7\_MHz\_NoCenter.wv**

12 CW signals in 7 MHz spacing; center channel empty.

**FullCWLoad\_8MHz.wv**

11 CW signals in 8 MHz spacing

**FullCWLoad\_8\_MHz\_NoCenter.wv**

10 CW signals in 8 MHz spacing; center channel empty.



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