### **R&S®SMBV100B VECTOR SIGNAL GENERATOR**



Perfect combination of performance and usability



Product Brochure Version 07.00



### **ROHDE&SCHWARZ**

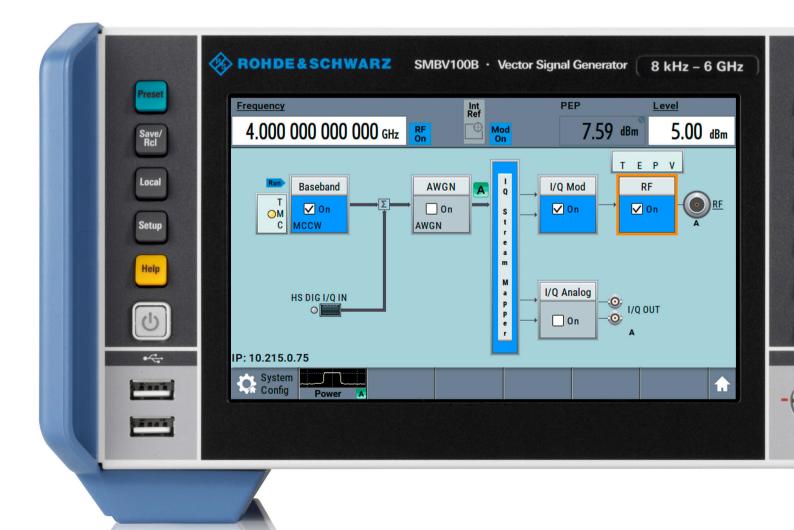
Make ideas real

## AT A GLANCE

The state-of-the-art R&S<sup>®</sup>SMBV100B vector signal generator sets new standards in its class. Ultra high output power, fully calibrated wideband signal generation and intuitive touchscreen operation make the R&S<sup>®</sup>SMBV100B ideal for all kinds of applications.

The R&S<sup>®</sup>SMBV100B vector signal generator combines superior performance characteristics such as high output power, wide modulation bandwidth and excellent signal quality. With a frequency range from 8 kHz to 6 GHz, the instrument covers all important RF bands for digital wireless communications. The wide RF modulation bandwidth of up to 500 MHz satisfies the challenging requirements of fourth and fifth generation communications standards. In A&D applications, the wide bandwidth allows the generation of complex pulsed signals. In many test setups, such as for RF component verification, it is important to provide signals at high power levels. The R&S<sup>®</sup>SMBV100B offers best-in-class signal quality up to very high power levels. No extra amplifier is needed, which simplifies the test setup.

The R&S<sup>®</sup>SMBV100B has an intuitive touchscreen GUI and is therefore very ergonomic and practical to use. The customizable instrument is also prepared to meet future requirements. Options can be added via software keycodes, making it easy to enhance the instrument with additional functionality, e.g. by extending frequency, bandwidth and output power.



#### **Key facts**

- ► Frequency range from 8 kHz to 3 GHz or 6 GHz
- ► Ultra high output power up to +33 dBm
- ► 500 MHz modulation bandwidth with perfect accuracy
- Excellent EVM and ACPR results up to high power levels
- Internal signal generation for all major digital communications standards, incl. 5G NR, LTE and WLAN
- ► Fully-fledged GNSS simulator for GPS, GLONASS, Galileo, BeiDou, IRNSS and QZSS/SBAS
- Convenient operation via 7" touchscreen



### **BENEFITS**

#### Perfect for signal quality

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#### Perfect for output power

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#### Perfect for use

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#### Perfect for upgrading

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#### Perfect for GNSS testing

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### **APPLICATIONS**

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## **PERFECT FOR SIGNAL QUALITY**

#### When developing electronic products, it is very important to choose the right test instruments.

For all key RF parameters, the R&S<sup>®</sup>SMBV100B offers outstanding specifications that clearly outperform the values of typical DUTs. This ensures that measurement results are not influenced by the signal generator. The instrument serves as a "golden reference", providing a dependable signal for all receiver tests.

Engineers can focus on core development tasks without having to worry about the performance of their signal generator.

### New real-time, user-defined frequency response correction to compensate for the effect of test fixtures

As with almost any other test instrument, the reference plane of the R&S<sup>®</sup>SMBV100B is at the RF connector. This means that the specifications for all parameters apply at this point. In most cases, however, there are also cables and other components (e.g. amplifiers) connected between the generator and the DUT. Especially when working with wide bandwidths, these test fixtures influence the modulated signal, degrading the amplitude and phase accuracy at the DUT input.

To take the influence of an external test fixture into account, the fixture can be characterized in terms of amplitude and phase, and the results can be saved to a Touchstone<sup>®</sup> .s2p file.

With the R&S<sup>®</sup>SMBVB-K544 option, this information can be used to precorrect the generator signal in real time to

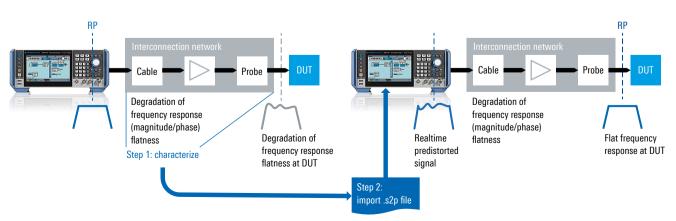
compensate for the influence of the external test fixture. This new method provides the user with a test solution that delivers an extremely precise measurement signal at the DUT input, unaffected by the test setup used between the generator and the DUT.

#### Very low single-sideband (SSB) phase noise

SSB phase noise is a key parameter when it comes to RF generator signal quality. This parameter is not only important in CW applications such as LO substitution, it also plays a significant role in the case of digitally modulated signals as it has a direct influence on the error vector magnitude (EVM).

The R&S<sup>®</sup>SMBV100B exhibits very low SSB phase noise of < -134 dBc (measured) at 1 GHz and 20 kHz offset. The close-in SSB phase noise can be reduced using the R&S<sup>®</sup>SMBVB-B1 OCXO option. The option reduces the phase noise from < -37 dBc (1 Hz) at 1 GHz and 1 Hz offset by 13 dB to < -50 dBc (1 Hz). Using the R&S<sup>®</sup>SMBVB-B1H high performance OCXO option, the close-in SSB phase noise can be further reduced by more than 20 dB compared with the standard instrument specifications, resulting in a value of < -65 dBc (1 Hz).

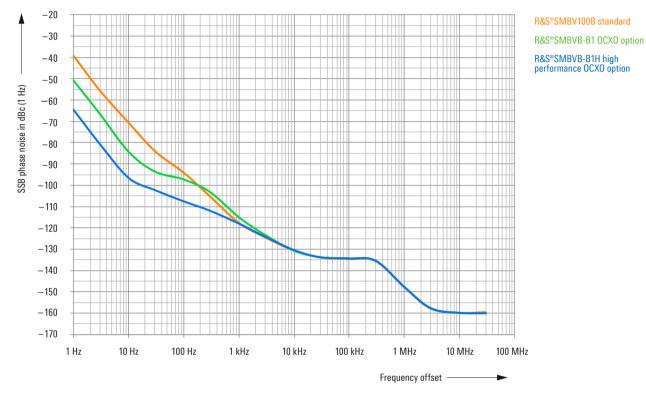
In addition, the R&S<sup>®</sup>SMBVB-B1 and R&S<sup>®</sup>SMBVB-B1H options significantly improve long-term stability for the reference frequency and mitigate the generator's frequency temperature drift.



#### Principle of user-defined frequency response correction with R&S®SMBVB-K544 option

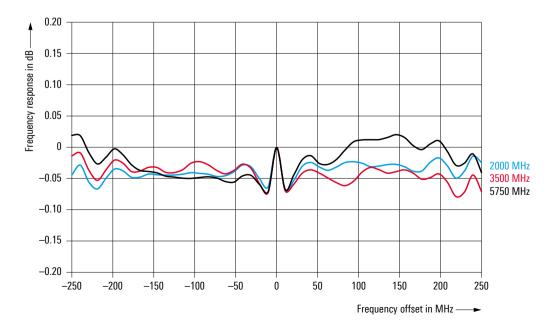
#### Wide modulation bandwidth with perfect accuracy

To satisfy the need for higher modulation bandwidths, the R&S<sup>®</sup>SMBV100B is equipped with a high performance baseband. Thanks to the generator's intelligent internal real-time frequency response correction, an extremely high amplitude flatness of < 0.3 dB (measured) is achieved across the entire bandwidth of 500 MHz.



#### Single-sideband phase noise (1 GHz, 1 Hz, measured)

Measured frequency response across maximum RF modulation bandwidth of 500 MHz at different carrier frequencies



Rohde & Schwarz R&S®SMBV100B Vector Signal Generator 5

#### Excellent EVM and ACPR up to high power levels

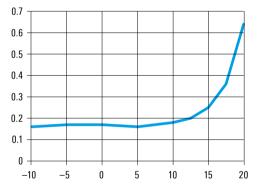
A receiver's data throughput is directly influenced by the input signal quality. As a result, a good EVM value for the test signal is an important prerequisite in order to reliably assess the performance of a DUT.

The R&S<sup>®</sup>SMBV100B combines large RF bandwidth and excellent signal quality and is therefore ideal for testing and characterizing wideband receivers and multicarrier amplifiers. With measured EVM values of less than 0.2% for LTE signals and less than 0.4% for 160 MHz IEEE802.11ac signals, the R&S<sup>®</sup>SMBV100B offers far better EVM performance than is required for measuring a DUT.

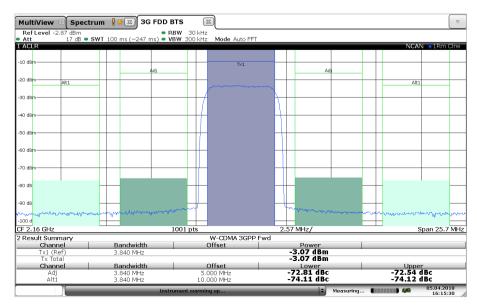
A feature unique to the R&S<sup>®</sup>SMBV100B is its excellent EVM performance even at high output power levels. An EVM value of less than 0.4% is achieved for an LTE signal with +18 dBm (RMS) output power. The R&S<sup>®</sup>SMBV100B thus outperforms conventional signal generators in terms of EVM, while at the same time simplifying the test setup since in most cases no extra amplifier is needed.

The R&S<sup>®</sup>SMBV100B was designed with a focus on delivering a practically distortion-free signal in addition to good EVM performance. This is a prerequisite for achieving a good adjacent channel power ratio (ACPR). The R&S<sup>®</sup>SMBV100B attains impressive values of < -72 dB ACPR (WCDMA test model 1, 64 DPCH, measured).

#### Measured EVM performance vs. RMS level (R&S<sup>®</sup>SMBV100B equipped with R&S<sup>®</sup>SMBVB-K31 and R&S<sup>®</sup>SMBVB-B32 options)



#### Signal: LTE E-TM 3.1 10 MHz, f = 2.14 GHz



Measured ACPR for WCDMA test model 1, 64 DPCH

## **PERFECT FOR OUTPUT POWER**

Many applications call for very high output powers. This means that in many cases an amplifier is required in addition to the signal generator. Here, the R&S<sup>®</sup>SMBV100B offers a better alternative. The ultra high output power option provides users with a calibrated test solution, saving space and money, all in a single box.

#### Ultra high output power

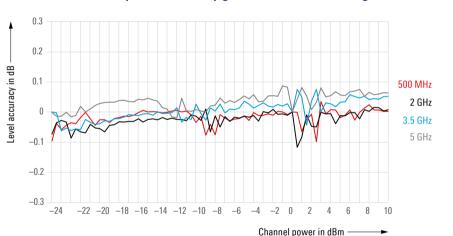
When equipped with the appropriate options, the R&S<sup>®</sup>SMBV100B can produce output power of up to +33 dBm at 1 GHz and up to +31 dBm at 6 GHz (measured values). In addition, the specified level increases to +25 dBm across almost the entire frequency range.

#### Excellent level accuracy for CW and modulated signals

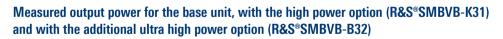
To describe the nonlinear characteristics of amplifier circuits (e.g. to determine the 1 dB compression point), the signal source must exhibit very high level accuracy. In many cases, the overall system is calibrated prior to the measurements to take into account the influence of test fixtures connected between the generator and the DUT. After calibration, it is critical that the generator sets the level values for each test sequence repeatedly and with high precision. Here, the R&S<sup>®</sup>SMBV100B delivers top performance with a measured level repeatability of < 0.09 dB.

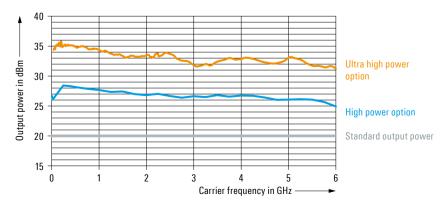
Another critical parameter is level linearity. It is crucial for the generator to keep deviation from nominal values extremely low across a wide amplitude range. With an accuracy of < 0.2 dB (measured), the R&S $^{\circ}$ SMBV100B excels also in this respect.

The generator's very high level accuracy simplifies the calibration procedure, enabling the generator to deliver extremely precise measurements.



#### Measured level linearity for an internally generated LTE downlink signal at various test frequencies





## **PERFECT FOR USE**

Its intuitive operating concept makes the R&S<sup>®</sup>SMBV100B very ergonomic and practical to use. The customizable instrument is also prepared to meet future requirements.

#### Convenient operation via 7" touchscreen

The R&S<sup>®</sup>SMBV100B has a clearly structured graphical user interface with a high-resolution 7" touchscreen for efficient, intuitive operation. The functional block diagram of the R&S<sup>®</sup>SMBV100B provides a clear overview at all times. The user can immediately see the signal flow and the status of all inputs and outputs. The built-in graphics function displays the generated signals in real time.

### Automation made easy with context-sensitive help system and SCPI recording

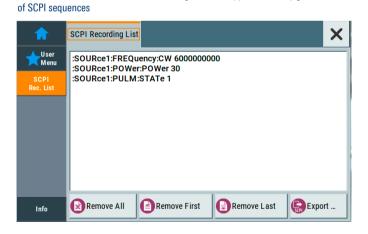
Context-sensitive online help offers comprehensive information. It describes each parameter and setup menu in detail, states the setting range and shows the associated remote control commands. Moreover, users can search for specific parameters in the user manual installed on the instrument. The R&S<sup>®</sup>SMBV100B helps users quickly and correctly create remote control programs. The instrument's built-in SCPI macro recorder with code generator can automatically record all manual settings and create an executable MATLAB<sup>®</sup> script. The R&S<sup>®</sup>SMBV100B therefore helps minimize the time required for test automation, saving development resources.

#### Internal real-time signal generation

The internal baseband of the R&S<sup>®</sup>SMBV100B offers impressive real-time capabilities. Users can generate signals for all major digital communications standards right on the instrument – no external signal generation software is needed. This simplifies operation of the instrument and helps to speed up measurement tasks.

#### **Protecting user data**

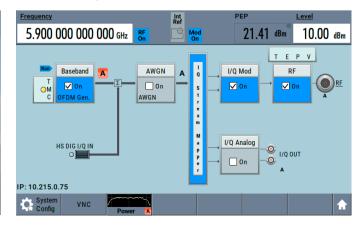
To meet requirements for secured areas, the R&S®SMBV100B can be configured to prevent user data from being saved to the instrument's nonvolatile memory. An easy-to-use erasure and sanitizing procedure is also available that removes user data from the instrument. Furthermore, the R&S®SMBV100B can be equipped with a removable solid-state drive (R&S®SMBVB-B80 option). A dedicated password can be used to disable the LAN and USB ports. The display can be disabled as well. These precautions ensure that no sensitive data will leave secured areas.



The built-in SCPI macro recorder and code generator support fast, easy generation

SCPI Recording Export X Code Template ... User Menu Format MATLAB Predefined Code Generator SCPI File .. Rec. List Export Reload test [status, InstrObject] = rs\_connect('visa', 'ni', 'TCPIP::10.215.1.79::INSTR' ) if(~status) disp(['Instrument connection failed: ' num2str(status)] ); return; end while(1) [status, result] = rs\_send\_query(InstrObject, ':SOURce1:FREQuency:CW Info

#### Functional block diagram of the R&S®SMBV100B



### **PERFECT FOR UPGRADING**

The R&S®SMBV100B is a flexible platform that can be custom-tailored to specific needs at any time.

### Easy upgrading of instrument at user premises via software keycodes

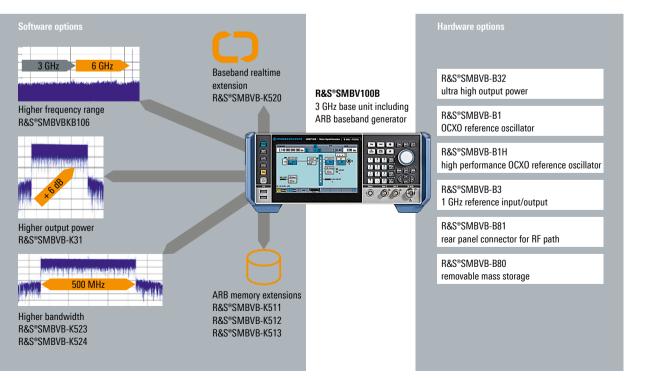
As to the instrument's hardware configuration, only a few decisions need to be made. Six hardware options are available. Software options can be added at the user premises via keycodes. The instrument is fully calibrated at the factory. There is no downtime for servicing the instrument after an upgrade, e.g. after an extension of the frequency range, bandwidth or output power. This flexibility minimizes investment risks, saves time and maximizes system uptime.

### Time-limited licenses and waveform package for software options

If specific functions are not permanently needed, users can acquire licenses for R&S®SMBV100B software options for a limited period of time (e.g. 1 month or 6 months). This alternative is offered for all of the R&S®SMBV100B software options. It allows users to configure their R&S®SMBV100B platform as needed for the project at hand.

Characterizing DUTs often requires using test signals from a number of different standards. The waveform package is the ideal solution when it comes to inexpensively providing a signal for each standard. A waveform package for five signals, for example, can license one WCDMA and LTE signal and three different 5G NR signals.

#### Overview of important software and hardware options



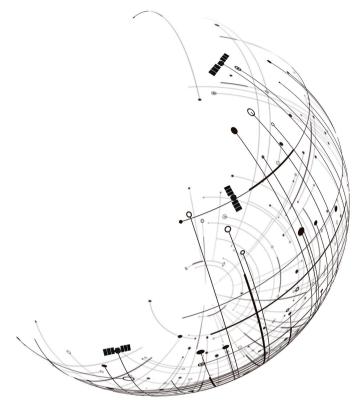
## **PERFECT FOR GNSS TESTING**

The R&S<sup>®</sup>SMBV100B can be equipped with a multitude of GNSS options, turning the instrument into a full-featured GNSS constellation simulator.

#### Take control over your GNSS scenarios

Using signal generators for GNSS testing has some major advantages over using a live GNSS signal. When using live signals, test conditions are expected to change permanently and unpredictably, so that it is very unlikely that two successive test runs can be performed under identical conditions. Repeatable testing – maybe the most critical test requirement – is impossible when using live GNSS signals.

With the R&S<sup>®</sup>SMBV100B, GNSS simulations can be performed under well-defined, controlled and realistic conditions. It offers fully customizable and repeatable scenarios, so that one and the same test scenario can be replayed as often as needed and produce the same signals with the same characteristics.



#### Application fields/modes of operation

#### **Constellation simulation**

In this mode, the R&S<sup>®</sup>SMBV100B simulates a realistic constellation of GNSS satellites with correct Doppler shifts and ICD-compliant signals. This includes realistic modeling of GNSS orbits, signal propagation effects and system errors like orbit and clock errors.

#### **Receiver prototyping and production testing**

Instead of being used as a GNSS constellation simulator, the R&S<sup>®</sup>SMBV100B can also be operated in a mode that is based on static (nonmoving) satellites. The signals generated this way do not exhibit any signal dynamics. Alternatively, constant Doppler shifts or customizable Doppler profiles can be applied to the signals.

#### Hardware in the loop (HIL) operation

Externally generated trajectory data can be streamed in real time to the R&S<sup>®</sup>SMBV100B. By using a special set of SCPI commands, vehicle position, velocity, acceleration and vehicle attitude data can be fed to the instrument. This makes it possible to operate the R&S<sup>®</sup>SMBV100B in a hardware in the loop environment with high update rates and low latencies.

#### **Automated GNSS testing**

Together with the test sequencer software R&S<sup>®</sup>CMWrun, the R&S<sup>®</sup>SMBV100B can be turned into a fully automated test system for verifying the positioning performance of eCall and ERA-GLONASS modules against the test cases defined in the standards EU2017/79/Annex VI (eCall) and GOST 33471 (ERA-GLONASS).

#### **Signals and systems**

The R&S<sup>®</sup>SMBV100B supports signal generation for all global satellite navigation systems as well as for satellitebased augmentation systems. Key capabilities are:

- Support of GPS, GLONASS, BeiDou, Galileo, SBAS and QZSS, including GPS P-Code
- Simultaneous signal generation in the GNSS frequency bands L1, L2 and L5 with up to 102 GNSS channels

#### Scenario configuration made easy

The R&S<sup>®</sup>SMBV100B comes with an integrated GNSS simulation software, which allows user-friendly simulation configuration, monitoring and interactive control using the instrument's large touch screen. No external PC is required for scenario configuration. Scenario generation can be fully automated making use of the extensive remote control capabilities of the R&S<sup>®</sup>SMBV100B.

#### **Realistic GNSS scenarios**

All GNSS signals are generated in real-time taking into account signal propagation, user environment and system characteristics like:

- Orbit errors, clock errors, atmospheric effects
- Signal obscuration and multipath
- Antenna gain and phase patterns
- ► Vehicle motion and vehicle attitude
- Pseudorange steps/ramps for RAIM testing

#### **GNSS** plus interferer in one box

The R&S<sup>®</sup>SMBV100B can be equipped with an internal noise generator adding well-defined noise or a CW interferer to the GNSS signals. This allows to test the receiver's resilience against unwanted interference or jamming attacks.



### R&S<sup>®</sup>LegacyPro: REFRESH YOUR T&M EQUIPMENT

#### **Replace your legacy signal generators**

For older test systems, obsolescence is a common topic. When individual pieces of equipment become obsolete before the entire ATE system does, regular calibration and repair of obsolete equipment is an expensive, timeconsuming and challenging task. Replacing obsolete test equipment with equivalent, state-of-the-art instruments should be straightforward and require minimal hardware and software changes.

The R&S<sup>®</sup>SMBV100B with R&S<sup>®</sup>LegacyPro code emulation fulfills these requirements, reducing the workload and eliminating risks. R&S<sup>®</sup>LegacyPro enables the R&S<sup>®</sup>SMBV100B to reliably emulate a wide range of legacy generators from vendors such as Keysight, Agilent, HP, Aeroflex, Anritsu and Rohde&Schwarz. As a result, the R&S<sup>®</sup>SMBV100B can be deployed in legacy ATE systems without major software changes, effectively increasing uptime, lowering the cost of ownership and extending the test system's useful life.

Enjoy plug&play replacement of your legacy signal generators with R&S<sup>®</sup>LegacyPro and the R&S<sup>®</sup>SMBV100B.

R&S<sup>®</sup>Legacy<sub>Pro</sub>

#### Emulation of legacy generators from Rohde & Schwarz and other vendors

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### SIMPLIFY YOUR ENVELOPE TRACKING SYSTEM

An increasing number of power amplifiers support envelope tracking (ET) in order to reduce power consumption and improve efficiency, for example in smartphones and tactical radios. Typical test setups for measuring power amplifiers comprise at least one signal generator and one spectrum analyzer. Envelope tracking requires an additional generator to deliver the envelope signal for the DC modulator.

#### RF and envelope signal out of one box

Equipped with the R&S®SMBVB-K540 envelope tracking option, the R&S<sup>®</sup>SMBV100B generates both the RF signal and the corresponding envelope signal. The envelope signal is generated from the baseband signal in real time. This means that any user-specific I/Q signals and any supported wireless communications signals, such as LTE or wireless LAN, can be used.

Generating the RF signal and the envelope signal in a single instrument makes it possible to precisely adjust the delay between the two signals.

The R&S®SMBV100B adjusts the delay in picosecond steps in real time, meeting tight requirements, for example accuracy better than 1 ns for a 20 MHz LTE signal.

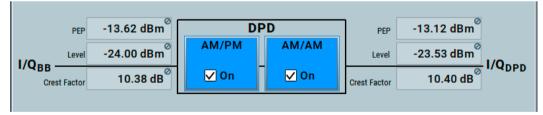
The envelope signal is shaped to optimize the power amplifier for efficiency or linearity. The R&S®SMBV100B offers various shaping methods, such as look-up table

and polynomial, which are applied in real time. For power sweeps, the R&S<sup>®</sup>SMBV100B automatically calculates the amplitude of the envelope signal, eliminating time-consuming manual calculations. It is also possible to adjust additional parameters, such as the gain and impedance of the DC modulator.

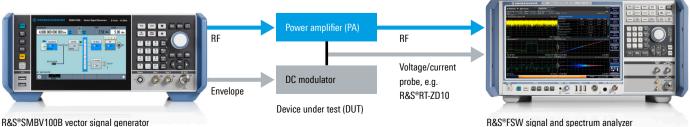
#### **Real-time digital predistortion**

With envelope tracking, the amplifier is operated close to or even in saturation, causing distortion at the amplifier output. To compensate for this effect, envelope tracking is often used in combination with digital predistortion (DPD). Equipped with the R&S<sup>®</sup>SMBVB-K541 digital predistortion option, the R&S®SMBV100B can apply real-time amplitude and phase correction to each complex I/Q sample using the values in the DPD tables. As a result, users can guickly verify the effect of predistortion, even for different power levels, without having to manually calculate the original waveform.

#### Digital predistortion user interface with the R&S®SMBVB-K541 option



#### Compact Rohde & Schwarz setup for power amplifier tests including envelope tracking



R&S®SMBV100B vector signal generator

### **GNSS TESTING**

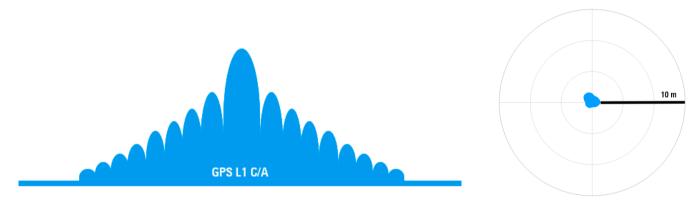
### The extensive GNSS simulation capabilities of the R&S<sup>®</sup>SMBV100B make it possible to cover a multitude of single- and multi-frequency GNSS applications.

Typical GNSS tests include the determination of the receiver's time to first fix, acquisition and tracking sensitivity, reacquisition time or its ability to provide an accurate positioning solution for both static and moving receivers. In addition to these standard tests, it is often required to test the receiver's performance under special

conditions such as interference or in the presence of multipath. Other applications include RAIM (receiver autonomous integrity monitoring) testing, ionospheric monitoring or atmospheric sounding.

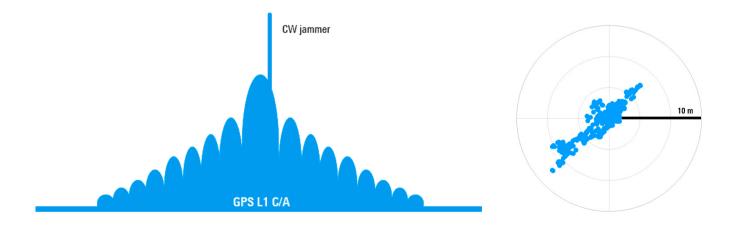
#### **Positioning accuracy**

Determination of the receiver's ability to provide an accurate navigation solution for both static and moving receivers under ideal conditions.



#### Positioning accuracy in the presence of a jammer

Determination of the receiver's ability to provide a navigation solution in the presence of a jammer.



#### Positioning accuracy in the presence of multipath

Determination of the receiver's positioning performance when multipath is present.

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Simulation of multipath propagation for SV 1 with the R&S®SMBV100B. In addition to the line of sight, three reflections with different relative delays, relative amplitudes and relative Doppler shifts are present

#### **RAIM testing**

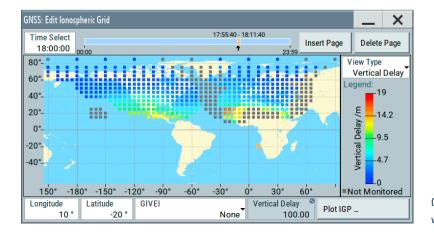
Receiver autonomous integrity monitoring is a special feature that allows a GNSS receiver to check whether the computed position is influenced by unusually high ranging errors. The objective of such tests is to verify that a DUT is able to identify affected observations and exclude them from the position solution.



Simulation of a pseudorange ramp for SV 3 with the R&S®SMBV100B for testing the RAIM capabilities of a GNSS receiver

#### **lonospheric monitoring**

Monitoring ionospheric conditions like total electron content (TEC) or anomalies caused by scintillation based on multi-frequency GNSS observations.

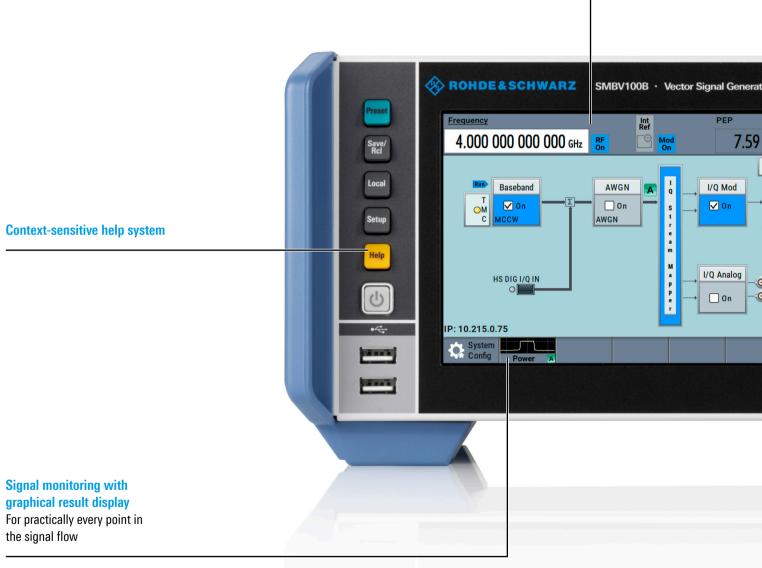


Configuration and simulation of ionospheric path delays with the R&S<sup>®</sup>SMBV100B

## **STATE-OF-THE-ART USER INTERFACE**

High-resolution touchscreen

With easy-to-use graphical user interface and block diagram



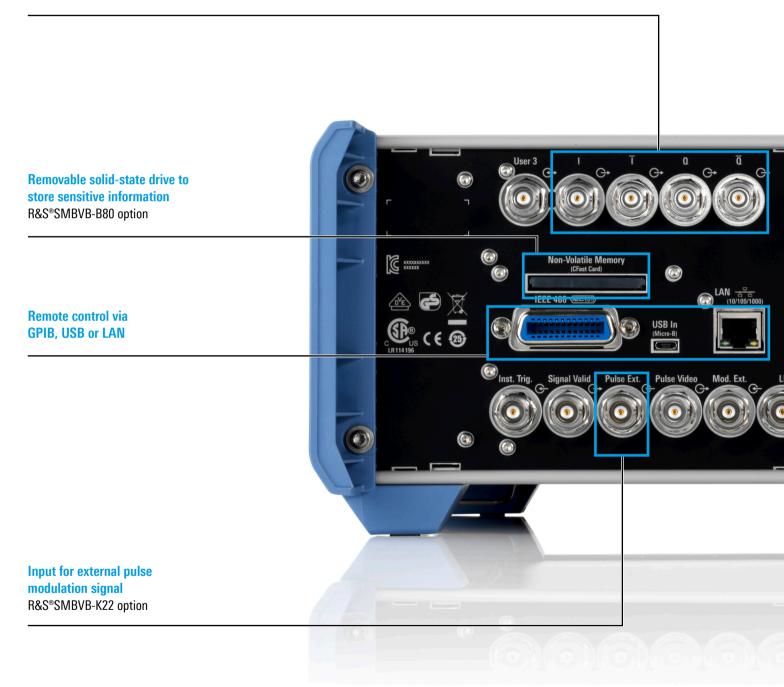
#### Favorite key

For simplified and fast operation via customizable user menu



# **REAR PANEL CONNECTIONS**

Single-ended and differential analog I/Q outputs R&S®SMBVB-K17 option



#### Standard and high-speed digital I/Q interfaces (I/Q in/out) R&S®SMBVB-K19 option



## **SPECIFICATIONS IN BRIEF**

Specifications in brief		
Frequency range	R&S <sup>®</sup> SMBVB-B103	
	CW mode	8 kHz to 3 GHz
	I/Q mode	1 MHz to 3 GHz
	R&S <sup>®</sup> SMBVB-B103 and R&S <sup>®</sup> SMBVBKB106	
	CW mode	8 kHz to 6 GHz
	I/Q mode	1 MHz to 6 GHz
Level range	peak envelope power (PEP)	
R&S <sup>®</sup> SMBVB-B103/KB106	standard	
	1 MHz < f ≤ 6 GHz	–127 dBm to +18 dBm
	with R&S <sup>®</sup> SMBVB-K31 option	
	1 MHz < f ≤ 4 GHz	–127 dBm to +21 dBm
	$4 \text{ GHz} < f \le 6 \text{ GHz}$	-127 dBm to +20 dBm
	with R&S <sup>®</sup> SMBVB-K31 and R&S <sup>®</sup> SMBVB-B32 opti	ons
	$10 \text{ MHz} < f \le 6 \text{ GHz}$	-127 dBm to +25 dBm
Spectral purity		
SSB phase noise	f = 1 GHz, 20 kHz offset, 1 Hz measurement bandwidth	< -126 dBc, -132 dBc (typ.)
Harmonics	1 MHz < f $\leq$ 6 GHz, level $\leq$ 13 dBm	< -30 dBc
Nonharmonics	f = 1 GHz, level > +10 dBm, offset > 10 kHz	< -76 dBc
Analog modulation	supported analog modulation modes	
	with R&S <sup>®</sup> SMBVB-K720 option	ΑΜ, FM, φΜ
	with R&S <sup>®</sup> SMBVB-K22 option	pulse modulation
I/Q modulation		
RF modulation bandwidth	with internal baseband I/Q, I/Q wideband on	
	1 MHz < f ≤ 1000 MHz	±25% of carrier frequency
	f > 1000 MHz	±250 MHz
	with external I/Q inputs, I/Q wideband on	
	$1 \text{ MHz} \le f \le 4 \text{ GHz}$	±25% of carrier frequency
	f > 4 GHz	±1 GHz
Modulation frequency response in specified RF modulation bandwidth	with internal baseband I/Q, I/Q wideband on, optimization mode: high quality	< 1.0 dB, < 0.3 dB (meas.)
I/Q baseband generator		
Signal bandwidth	standard	120 MHz
	with R&S <sup>®</sup> SMBVB-K523 option	240 MHz
	with R&S <sup>®</sup> SMBVB-K523 and R&S <sup>®</sup> SMBVB-K524 options	500 MHz
ARB memory depth	standard	64 Msample
	with R&S <sup>®</sup> SMBVB-K511 option	512 Msample
	with R&S <sup>®</sup> SMBVB-K511 and R&S <sup>®</sup> SMBVB-K512 options	1 Gsample
	with R&S <sup>®</sup> SMBVB-K511, R&S <sup>®</sup> SMBVB-K512 and R&S <sup>®</sup> SMBVB-K513 options	2 Gsample
Digital standards	the options are described in the Digital Standards data sheet (PD 5213.9434.22)	5G NR, cellular IoT, LTE Release 8 to 15, 3GPP FDD HSPA/HSPA+, GSM, WLAN IEEE 802.11a/b/g/n/j/p/ac/ax, AWGN and more
External R&S <sup>®</sup> Pulse Sequencer software or R&S <sup>®</sup> Pulse Sequencer (DFS) software	the options are described in the Pulse Sequencer options data sheet (PD 3607.1388.22)	pulse sequencing, enhanced pulse sequencing, direction finding, DFS signal generation
GNSS and avionics	the options are described in the GNSS and Avionics data sheet (PD 3607.6896.22)	GPS, Galileo, GLONASS, BeiDou, GBAS, ILS, VOR, DME

#### Always up to date

The firmware can be updated using a USB storage device or the LAN port. Free firmware updates are available for download from the Internet at www.rohde-schwarz.com.

## **ORDERING INFORMATION**

Designation	Туре	Order No.
Base unit		
Vector signal generator <sup>1)</sup> , including baseband generator with ARB (64 Msample, 120 MHz RF bandwidth), power cable and quick start guide	R&S <sup>®</sup> SMBV100B	1423.1003.02
Options		
R&S <sup>®</sup> SMBVB-Bxxx = hardware option,		
R&S <sup>®</sup> SMBVB-Kxxx/KBxxx = software/keycode option		
Frequency options		1423.6270.02
8 kHz to 3 GHz (mandatory)	R&S <sup>®</sup> SMBVB-B103 R&S <sup>®</sup> SMBVBKB106	
Frequency extension to 6 GHz	NAS SIVID V DKD 100	1423.6370.02
RF options OCXO reference oscillator	R&S <sup>®</sup> SMBVB-B1	1423.6470.02
High performance OCXO reference oscillator	R&S®SMBVB-B1	1423.6570.02
1 GHz reference input/output	R&S®SMBVB-B1	1423.7260.02
Flexible reference input from 1 MHz to 100 MHz	R&S®SMBVB-K704	1423.7618.02
High output power	R&S®SMBVB-K31	1423.6670.02
Ultra high output power	R&S®SMBVB-B32	1423.6711.02
Phase coherence	R&S®SMBVB-K90	1423.7076.02
Pulse modulator	R&S®SMBVB-K90	1423.7560.02
	R&S®SMBVB-K23	1423.7576.02
Pulse generator Multifunction generator	R&S®SMBVB-K24	1423.75782.02
AM/FM/φM	R&S®SMBVB-K720	1423.7599.02
Baseband	TAS SIVID VD-K720	1423.7399.02
Differential analog I/Q outputs	R&S <sup>®</sup> SMBVB-K17	1423.7624.02
	R&S®SMBVB-K19	1423.7630.02
Digital baseband output ARB memory extension to 512 Msample	R&S®SMBVB-K19	1423.7653.02
	R&S®SMBVB-K512	1423.7660.02
ARB memory extension to 1 Gsample	R&S <sup>®</sup> SMBVB-K513	1423.8589.02
ARB memory extension to 2 Gsample Baseband real-time extension		1423.7676.02
Baseband real-time extension Baseband extension to 240 MHz RF bandwidth	R&S®SMBVB-K520 R&S®SMBVB-K523	1423.7682.02
Baseband extension to 500 MHz RF bandwidth	R&S <sup>®</sup> SMBVB-K524	1423.7699.02
Baseband extension to 500 Minz nr bandwidth	NA3 3IVID V D-N324	1423.7099.02
Additive white Gaussian noise (AWGN)	R&S <sup>®</sup> SMBVB-K62	1423.7876.02
Bit error rate tester	R&S®SMBVB-K80	1423.7647.02
	R&S <sup>®</sup> SMBVB-K540	1423.7701.02
Envelope tracking AM/AM, AM/φM predistortion	R&S®SMBVB-K541	1423.7718.02
User-defined frequency response correction	R&S <sup>®</sup> SMBVB-K544	1423.8150.02
Crest factor reduction	R&S <sup>®</sup> SMBVB-K548	1423.8820.02
	N&3 3IVID V D-N340	1423.0020.02
Digital standards		1400 7704 00
GSM/EDGE EDGE evolution	R&S®SMBVB-K40	1423.7724.02
	R&S®SMBVB-K41	1423.7730.02
3GPP FDD	R&S®SMBVB-K42	1423.7747.02
CDMA2000®	R&S®SMBVB-K46	1423.7760.02
1xEV-DO	R&S®SMBVB-K47	1423.7776.02
TD-SCDMA	R&S®SMBVB-K50	1423.7782.02
TD-SCDMA enhanced BS/MS tests	R&S®SMBVB-K51	1423.7799.02
IEEE802.11 (a/b/g/n/j/p)	R&S®SMBVB-K54	1423.7824.02
LTE Release 8	R&S®SMBVB-K55	1423.7830.02
Bluetooth® EDR	R&S®SMBVB-K60	1423.7853.02
Multicarrier CW signal generation	R&S®SMBVB-K61	1423.7860.02
3GPP FDD HSPA/HSPA+, enhanced BS/MS tests	R&S®SMBVB-K83	1423.7899.02
LTE Release 9	R&S®SMBVB-K84	1423.7901.02
LTE Release 10	R&S®SMBVB-K85	1423.7918.02

Designation	Туре	Order No.
IEEE 802.11ac	R&S <sup>®</sup> SMBVB-K86	1423.7924.02
1xEV-DO Rev. B	R&S <sup>®</sup> SMBVB-K87	1423.7930.02
NFC A/B/F	R&S <sup>®</sup> SMBVB-K89	1423.7947.02
LTE Release 11	R&S <sup>®</sup> SMBVB-K112	1423.8037.02
LTE Release 12	R&S <sup>®</sup> SMBVB-K113	1423.8043.02
OFDM signal generation	R&S <sup>®</sup> SMBVB-K114	1423.8050.02
Cellular IoT Release 13	R&S <sup>®</sup> SMBVB-K115	1423.8066.02
Bluetooth <sup>®</sup> 5.x	R&S <sup>®</sup> SMBVB-K117	1423.8089.02
LTE Release 13/14/15	R&S <sup>®</sup> SMBVB-K119	1423.8108.02
LoRa®	R&S <sup>®</sup> SMBVB-K131	1423.8720.02
IEEE 802.11ax	R&S <sup>®</sup> SMBVB-K142	1423.8114.02
Cellular IoT Release 14	R&S <sup>®</sup> SMBVB-K143	1423.8637.02
5G NR Release 15	R&S <sup>®</sup> SMBVB-K144	1423.8608.02
Cellular IoT Release 15	R&S <sup>®</sup> SMBVB-K146	1423.8808.02
5G NR Release 16	R&S <sup>®</sup> SMBVB-K148	1423.8843.02
UWB HRP	R&S <sup>®</sup> SMBVB-K149	1423.8889.02
Digital standards using R&S <sup>®</sup> WinIQSIM2 <sup>2)</sup>		
GSM/EDGE	R&S <sup>®</sup> SMBVB-K240	1423.8166.02
EDGE evolution	R&S <sup>®</sup> SMBVB-K241	1423.8172.02
3GPP FDD	R&S <sup>®</sup> SMBVB-K242	1423.8189.02
GPS	R&S <sup>®</sup> SMBVB-K244	1423.8195.02
CDMA2000°	R&S <sup>®</sup> SMBVB-K246	1423.8208.02
1xEV-DO Rev. A	R&S <sup>®</sup> SMBVB-K247	1423.8214.02
TD-SCDMA	R&S <sup>®</sup> SMBVB-K250	1423.8220.02
TD-SCDMA enhanced BS/MS tests	R&S <sup>®</sup> SMBVB-K251	1423.8237.02
DVB-H	R&S <sup>®</sup> SMBVB-K252	1423.8243.02
DAB/T-DMB	R&S <sup>®</sup> SMBVB-K253	1423.8250.02
IEEE802.11a/b/g/n	R&S <sup>®</sup> SMBVB-K254	1423.8266.02
LTE Release 8	R&S <sup>®</sup> SMBVB-K255	1423.8272.02
Bluetooth® EDR	R&S <sup>®</sup> SMBVB-K260	1423.8295.02
Multicarrier CW signal generation	R&S <sup>®</sup> SMBVB-K261	1423.8308.02
Additive white Gaussian noise (AWGN)	R&S <sup>®</sup> SMBVB-K262	1423.8314.02
Galileo	R&S <sup>®</sup> SMBVB-K266	1423.8320.02
3GPP FDD HSPA/HSPA+, enhanced BS/MS tests	R&S®SMBVB-K283	1423.8337.02
LTE Release 9	R&S <sup>®</sup> SMBVB-K284	1423.8343.02
LTE Release 10	R&S®SMBVB-K285	1423.8350.02
IEEE802.11ac	R&S <sup>®</sup> SMBVB-K286	1423.8366.02
1xEV-DO Rev. B	R&S®SMBVB-K287	1423.8372.02
NFC A/B/F	R&S <sup>®</sup> SMBVB-K289	1423.8389.02
GLONASS 1 satellite	R&S <sup>®</sup> SMBVB-K294	1423.8395.02
NavIC/IRNSS 1 satellite	R&S® SMBVB-K297	1423.8695.02
Modernized GPS	R&S <sup>®</sup> SMBVB-K298	1423.8408.02
Beidou	R&S <sup>®</sup> SMBVB-K407	1423.8489.02
LTE Release 11	R&S <sup>®</sup> SMBVB-K412	1423.8495.02
LTE Release 12	R&S®SMBVB-K413	1423.8508.02
OFDM signal generation	R&S <sup>®</sup> SMBVB-K414	1423.8595.02
Cellular IoT Release 13	R&S <sup>®</sup> SMBVB-K415	1423.8514.02
DVB-S2/DVB-S2X	R&S <sup>®</sup> SMBVB-K416	1423.8520.02
Bluetooth® 5.x	R&S <sup>®</sup> SMBVB-K417	1423.8537.02
Verizon 5GTF signals	R&S <sup>®</sup> SMBVB-K418	1423.8543.02
LTE Release 13/14/15	R&S <sup>®</sup> SMBVB-K419	1423.8550.02
LoRa®	R&S®SMBVB-K431	1423.8737.02
Modernized BeiDou	R&S®SMBVB-K432	1423.8837.02
IEEE802.11ax	R&S <sup>®</sup> SMBVB-K442	1423.8114.02

Calutar IoT Release 14         423.845.02           BG NR Rolazo 15         RASTSMUYD K444         1423.861.02           GO NR Rolazo 15         RASTSMUYD K446         1423.861.02           Calutar IoT Rolazo 15         RASTSMUYD K446         1423.885.02           WW BHP         RASTSMUYD K446         1423.885.02           WW BHP         RASTSMUYD K446         1423.885.02           WW BHP         RASTSMUYD K446         1423.885.02           Wwetorm package for signals from RASTWINIOSIM2, RASTPUSE Sequencer, RASTMVR-K000         1423.871.72           Swawdorms         RASTSMUYD-K000         1423.871.72           Swawdorms         RASTSMUYD-K000         1423.871.72           Solveotorms         RASTSMUYD-K000         1423.871.02           Differencing         RASTSMUYD-K000         1423.870.02           DF         RASTSMUYD-K000         1423.775.02           DF         RASTSMUYD-K104         1423.775.02           Caliao         RASTSMUYD-K104         1423.786.02	Designation	Туре	Order No.
SG NR Ruleane 15         RSS*SMUPUS K444         1423.8614.02           Calidar 10 Ruleane 15         RSS*SMUPU-K448         1423.8810.02           CMB Ruleane 15         RSS*SMUPU-K449         1423.8850.02           UWB IRP         RSS*SMUPU-K449         1423.8850.02           Wardorm package for signals from RSS*WinLOSIM2, RSS*Plase Sequencer (DFS) software         1423.8714.72           Swardorms         RSS*SMUPU-K200         1423.8714.72           Swardorms         RSS*SMUPU-K200         1423.8714.72           Swardorms         RSS*SMUPU-K200         1423.8714.72           Swardorms         RSS*SMUPU-K200         1423.8714.72           Dytes sequencing         RSS*SMUPU-K200         1423.8714.72           Dytes sequencing         RSS*SMUPU-K200         1423.8710.72           Dytes sequencing         RSS*SMUPU-K200         1423.8470.02           DF         Indiana devines         1423.8470.02           CSS         RSS*SMUPU-K308         1423.755.02           Galabo         RSS*SMUPU-K44         1423.755.02           Galabo         RSS*SMUPU-K44         1423.755.02           Galabo         RSS*SMUPU-K44         1423.785.02           GASS and words         RSS*SMUPU-K44         1423.785.02           CMSS and words			
BG NR Ralease 16         RSS*SMEVB-K448         1423.8850.02           UWN HRP         RSS*SMEVB-K449         1423.8850.02           Waveform package for signals from RSS*WinUSUM2, RSS*Pulse Sequencer (DFS) softwars*         1423.871.471           Swaveforms         RSS*SMEVB-K200         1423.871.471           Swaveforms         RSS*SMEVB-K200         1423.871.472           Downseforms         RSS*SMEVB-K200         1423.871.472           Downseforms         RSS*SMEVB-K200         1423.871.472           Downseforms         RSS*SMEVB-K200         1423.847.02           DFIS         RSS*SMEVB-K300         1423.847.02           DFS signal generation         RSS*SMEVB-K300         1423.847.02           DFS signal generation         RSS*SMEVB-K300         1423.847.02           DFS signal generation         RSS*SMEVB-K300         1423.847.02           GUNASS         RSS*SMEVB-K300         1423.755.02           Gallion         RSS*SMEVB-K300         1423.785.02           GUNASS         RSS*SMEVB-K300         1423.785.02           GUNASS         RSS*SMEVB-K100         1423.785.02           GUNASS         RSS*SMEVB-K100         1423.785.02           GUNASS         RSS*SMEVB-K100         1423.785.02           GUNASS         <	5G NR Release 15	R&S <sup>®</sup> SMBVB-K444	1423.8614.02
UWB HRPR85'SMBVB-K4491423.885.02Waveform package for signals from R85'Win10SIM2, R85'Pulse Sequencer, R85'SMBVB-K2001423.8714.72Is waveformsR85'SMBVB-K2001423.8714.72S waveformsR85'SMBVB-K2001423.8714.72Do waveformsR85'SMBVB-K2001423.8714.72Do waveformsR85'SMBVB-K2001423.8714.72Do waveformsR85'SMBVB-K3001423.8714.72De waveformsR85'SMBVB-K3001423.842.02De kander and R85'Pulse Sequencer of R85'SMBVB-K3001423.842.02DFR85'SMBVB-K3001423.843.02DFR85'SMBVB-K3001423.843.02DFR85'SMBVB-K3001423.843.02DFR85'SMBVB-K3001423.783.02CBR85'SMBVB-K3001423.783.02CBR85'SMBVB-K3001423.783.02CBR85'SMBVB-K4401423.7783.02CBR85'SMBVB-K4401423.7783.02CBR85'SMBVB-K4401423.7783.02CBR85'SMBVB-K4901423.8780.02SBR85'SMBVB-K4901423.8780.02SBR85'SMBVB-K4901423.8780.02SBR85'SMBVB-K4901423.8780.02CBR85'SMBVB-K4901423.8780.02CBR85'SMBVB-K4901423.8780.02CBR85'SMBVB-K1901423.8780.02CBR85'SMBVB-K1901423.8780.02CBR85'SMBVB-K1901423.8780.02CBR85'SMBVB-K1901423.8780.02CBR85'SMBVB-K1901423.8780.02CBR85'SMBVB-K190	Cellular IoT Release 15	R&S <sup>®</sup> SMBVB-K446	1423.8814.02
Waveform package for signals from R&S''WinUSIM2, R&S''Pulse Sequencer, R&S''Pulse Sequencer (DFS) software <sup>3</sup> 1423 8714.71           1 waveform         R&S''SMMVB-R2000         1423 8714.72           50 waveforms         R&S''SMNVB-R2000         1423 8714.75           50 waveforms         R&S''SMNVB-R2000         1423 8714.75           50 waveforms         R&S''SMNVB-R2000         1423 8714.75           50 waveforms         R&S''SMNVB-R2001         1423 8420.02           51 manned pulse sequencing         R&S''SMNVB-R308         1423 8420.02           51 Signal generation         R&S''SMNVB-R308         1423 8430.02           51 Signal generation         R&S''SMNVB-R308         1423 8430.02           51 Signal generation         R&S''SMNVB-R308         1423 8430.02           61 Signal generation         R&S''SMNVB-R308         1423 8430.02           61 Signal generation         R&S''SMNVB-R408         1423 7753.02           62 Signal generation         R&S''SMNVB-R408         1423 7753.02           63 Signal works         R&S''SMNVB-R408         1423 7753.02           64 Signal Signa	5G NR Release 16	R&S <sup>®</sup> SMBVB-K448	1423.8850.02
1 waveformB&S*SMBVB-R2001423.8714.715 waveformsB&S*SMBVB-R2001423.8714.725 waveformsB&S*SMBVB-R2001423.8714.72Diversion of B&S*SMBVB-R2001423.841.02Diversion of B&S*SMBVB-R3001423.841.02Diversion of B&S*SMBVB-R3011423.841.02Diversion of B&S*SMBVB-R3081423.843.02DF signal generationB&S*SMBVB-R3081423.843.02DF signal generationB&S*SMBVB-R4081423.785.02OKS and avinesUSS and avinesAS*SMSVB-R441423.786.02Advine avinesAS*SMSVB-R441423.786.02Advine avines1423.876.02Advine avines1423.876.02NAVICINRSB&S*SMSVB-R4101423.876.02Advine avines1423.876.02Advine avines1423.876.02Advine avines1423.876.02Advine avines1423.876.02Advine avine avines1423.876.02Advine avine avines1423.876.0	UWB HRP	R&S <sup>®</sup> SMBVB-K449	1423.8850.02
1 waveformB&S*SMBVB-R2001423.8714.715 waveformsB&S*SMBVB-R2001423.8714.725 waveformsB&S*SMBVB-R2001423.8714.72Diversion of B&S*SMBVB-R2001423.841.02Diversion of B&S*SMBVB-R3001423.841.02Diversion of B&S*SMBVB-R3011423.841.02Diversion of B&S*SMBVB-R3081423.843.02DF signal generationB&S*SMBVB-R3081423.843.02DF signal generationB&S*SMBVB-R4081423.785.02OKS and avinesUSS and avinesAS*SMSVB-R441423.786.02Advine avinesAS*SMSVB-R441423.786.02Advine avines1423.876.02Advine avines1423.876.02NAVICINRSB&S*SMSVB-R4101423.876.02Advine avines1423.876.02Advine avines1423.876.02Advine avines1423.876.02Advine avines1423.876.02Advine avine avines1423.876.02Advine avine avines1423.876.0	Waveform package for signals from R&S®WinIQSIM2, R&S®Pulse Seque	ncer, R&S <sup>®</sup> Pulse Sequencer (DFS) software <sup>3)</sup>	
90 waveforms         98.8°S/MBVB-K200         1423.8714.75           Options with external R8SPUse Sequencing         88.5°S/MBVB-K300         1423.8414.02           Pulse sequencing         R8.5°S/MBVB-K301         1423.8442.02           DFS signal genaration         R8.5°S/MBVB-K301         1423.8443.02           DFS signal genaration         R8.5°S/MBVB-K301         1423.8443.02           ORSS and avinics         T         T           GPS         R8.5°S/MBVB-K44         1423.7783.02           Galleo         R8.5°S/MBVB-K44         1423.7783.02           Galleo         R8.5°S/MBVB-K44         1423.7983.02           CIDNASS         R8.5°S/MBVB-K40         1423.7983.02           NAVC/IRNSS         R8.5°S/MBVB-K40         1423.7983.02           RAS/SMSVB-K98         1423.3798.02         200           Ballou         R8.5°S/MBVB-K107         1423.879.02           GMACTIRNSS         R8.5°S/MBVB-K108         1423.3798.02           GAS/SMSVB-K109         1423.3798.02         200           GNS real-world simulation         R8.5°S/MBVB-K108         1423.8798.02           GNS real-world simulation         R8.5°S/MBVB-K108         1423.879.02           GNS real-world simulation         R8.5°S/MBVB-K131         1423.879.02		• • •	1423.8714.71
Dptions with external R&S*Pulse Sequencer (DFS) software         Number Name           Pulse sequencing         R&S*SMBVB K300         1423.8414.02           Enhanced pulse sequencing         R&S*SMBVB K300         1423.8420.02           DF         R&S*SMBVB-K308         1423.8420.02           DFS signal generation         R&S*SMBVB-K308         1423.8423.02           GBIS         R&S*SMBVB-K486         1423.7753.02           Galleo         R&S*SMBVB-K44         1423.7753.02           Galleo         R&S*SMBVB-K49         1423.8708.02           GLONASS         R&S*SMBVB-K49         1423.7950.02           MAUC/IRNSS         R&S*SMBVB-K98         1423.7950.02           Modernized GPS         R&S*SMBVB-K98         1423.8708.02           BeiDou         R&S*SMBVB-K198         1423.7950.02           GNS real-time interface         R&S*SMBVB-K198         1423.8708.02           GNS real-time interface         R&S*SMBVB-K108         1423.8008.02           GNS real-time interface         R&S*SMBVB-K118         1423.8008.02           GNS real-time interface         R&S*SMBVB-K113         1423.8008.02           GNS real-time interface         R&S*SMBVB-K131         1423.8008.02           GNS real-time interface         R&S*SMBVB-K131         1423.8008.02	5 waveforms	R&S <sup>®</sup> SMBVB-K200	1423.8714.72
Puise sequencing         R8S*SMBVB-K300         1423.8414.02           Enhanced puise sequencing         R8S*SMBVB-K308         1423.8420.02           DF         Signal generation         R8S*SMBVB-K308         1423.8420.02           DF signal generation         R8S*SMBVB-K308         1423.8437.02           CMSS and avionics	50 waveforms	R&S <sup>®</sup> SMBVB-K200	1423.8714.75
Enhanced pulse sequencing         R&S*SMBVB-K301         1423.8420.02           DF         R&S*SMBVB-K308         1423.8437.02           DFS signal generation         R&S*SMBVB-K308         1423.8437.02           GNSS and avionics	Options with external R&S®Pulse Sequencer software or R&S®Puls	uencer (DFS) software	
DF         R&S*SMBVB-K308         1423.8437.02           DFS signal generation         R&S*SMBVB-K300         1423.8443.02           GNSS and avionics         S         S           GPS         R&S*SMBVB-K44         1423.7753.02           Galieo         R&S*SMBVB-K46         1423.7853.02           GLONASS         R&S*SMBVB-K96         1423.7850.02           MAVC/IRNSS         R&S*SMBVB-K97         1423.6700.02           Modernized GPS         R&S*SMBVB-K98         1423.7960.02           SAS/COSS         R&S*SMBVB-K106         1423.7960.02           BelDou         R&S*SMBVB-K106         1423.7960.02           GNS real vorid simulation         R&S*SMBVB-K106         1423.7960.02           GNSS real-time interface         R&S*SMBVB-K106         1423.7960.02           GNS real-time interface         R&S*SMBVB-K106         1423.7960.02           GNS real-time interface         R&S*SMBVB-K106         1423.890.02           GNS real-time interface         R&S*SMBVB-K108         1423.890.02           GNS real-time interface         R&S*SMBVB-K108         1423.874.02           GNS real-time interface         R&S*SMBVB-K131         1423.874.02           GNS real-time interface         R&S*SMBVB-K133         1423.874.02	Pulse sequencing	R&S <sup>®</sup> SMBVB-K300	1423.8414.02
DFS signal generation         R&S*SMBVB-K350         1423.8443.02           GNS         and viocines	Enhanced pulse sequencing	R&S <sup>®</sup> SMBVB-K301	1423.8420.02
Series         Control           GPS         R85*SM8VB-K44         1423.7753.02           Galleo         R85*SM8VB-K44         1423.7852.02           GLDNASS         R85*SM8VB-K94         1423.7862.02           Modemized GPS         R85*SM8VB-K98         1423.7960.02           SMAJC/IRINSS         R85*SM8VB-K98         1423.7960.02           Modemized GPS         R85*SM8VB-K106         1423.7960.02           SMAJCZSS         R85*SM8VB-K106         1423.090.02           GNS real-time interface         R85*SM8VB-K106         1423.090.02           GNS real-time interface         R85*SM8VB-K108         1423.090.02           GNS real-time interface         R85*SM8VB-K108         1423.890.02           GNS real-time interface         R85*SM8VB-K108         1423.890.02           Gugade to viriple-frequency GNSS         R85*SM8VB-K111         1423.890.02           Upgrade to tail-frequency GNSS         R85*SM8VB-K136         1423.870.02           Upgrade to tail-frequency GNSS         R85*SM8VB-K136         1423.870.02           Upgrade to triple-frequency GNSS         R85*SM8VB-K136         1423.870.02           R4d 12 GNSS channels         R423.870.02         R45*SM8VB-K136         1423.870.02           Upgrade to triple-frequency GNSS         R85*SM8VB	DF	R&S <sup>®</sup> SMBVB-K308	1423.8437.02
GPS         R&S*SMBVB-K44         1423.7763.02           Galileo         R&S*SMBVB-K66         1423.7882.02           GLONASS         R&S*SMBVB-K97         1423.8780.02           Modernized GPS         R&S*SMBVB-K97         1423.7980.02           SBAS/0ZSS         R&S*SMBVB-K97         1423.7980.02           BeiDou         R&S*SMBVB-K107         1423.7980.02           GNS real-time interface         R&S*SMBVB-K106         1423.7980.02           GNS real-time interface         R&S*SMBVB-K107         1423.8908.02           GNS real-time interface         R&S*SMBVB-K109         1423.8908.02           GBAS         R&S*SMBVB-K109         1423.8908.02           GBAS         R&S*SMBVB-K103         1423.8743.02           Upgrade to fulle-frequency GNSS         R&S*SMBVB-K132         1423.8743.02           Upgrade to dual-frequency GNSS         R&S*SMBVB-K134         1423.8743.02           Upgrade to dual-frequency GNSS         R&S*SMBVB-K134         1423.8743.02           Upgrade to dual-frequency GNSS         R&S*SMBVB-K134         1423.8743.02           Upgrade to dual-frequency GNSS         R&S*SMBVB-K136         1423.8743.02           Upgrade to dual-frequency GNSS         R&S*SMBVB-K136         1423.8766.02           Add 12 GNSS channels         R&S	DFS signal generation	R&S <sup>®</sup> SMBVB-K350	1423.8443.02
Gallieo         R&S*SMBVB-K66         1423.7882.02           GLONASS         R&S*SMBVB-K94         1423.7963.02           NAVC/IRINSS         R&S*SMBVB-K97         1423.8706.02           Modernized GPS         R&S*SMBVB-K98         1423.7962.02           Bas/SDZSS         R&S*SMBVB-K106         1423.7982.02           BeiDou         R&S*SMBVB-K106         1423.7982.02           GNSS real-viorid simulation         R&S*SMBVB-K106         1423.8000.02           GNS real-time interface         R&S*SMBVB-K108         1423.8002.02           GNS real-time interface         R&S*SMBVB-K108         1423.8002.02           GNS real-time interface         R&S*SMBVB-K108         1423.802.02           GNS real-time interface         R&S*SMBVB-K132         1423.802.02           GNS real-time interface         R&S*SMBVB-K132         1423.870.02           GNS real-time interface         R&S*SMBVB-K132         1423.875.02           Upgrade to dual-frequency GNSS         R&S*SMBVB-K136         1423.875.02           Upgrade to triple-frequency GNSS         R&S*SMBVB-K136         1423.875.02           LQA d12 GNSS channels         R&S*SMBVB-K136         1423.875.02           LQS         R&S*SMBVB-K136         1423.817.02           VOR         R&S*SMBVB-K136			
GLONASS         R&S*SMBVB-K94         1423.7953.02           NAVIC/IRNSS         R&S*SMBVB-K97         1423.8708.02           Modernized GPS         R&S*SMBVB-K98         1423.7960.02           SBAS/0ZSS         R&S*SMBVB-K196         1423.7990.02           BeiDou         R&S*SMBVB-K107         1423.8708.02           GNSS real-time interface         R&S*SMBVB-K107         1423.8990.02           GNSS real-time interface         R&S*SMBVB-K108         1423.8008.02           GNSS real-time interface         R&S*SMBVB-K109         1423.8008.02           GBAS         RAS*SMBVB-K109         1423.8008.02           GBAS         RAS*SMBVB-K102         1423.8008.02           GBAS real-time interface         R&S*SMBVB-K102         1423.8020.02           GBAS         RAS*SMBVB-K132         1423.8760.02           Upgrade to dual-frequency GNSS         R&S*SMBVB-K133         1423.8750.02           Upgrade to thiple-frequency GNSS         R&S*SMBVB-K136         1423.8750.02           Upgrade to thiple-frequency GNSS         R&S*SMBVB-K137         1423.8760.02           Upgrade to thiple-frequency GNSS         R&S*SMBVB-K136         1423.876.02           Upgrade to fulpe-frequency GNSS         R&S*SMBVB-K137         1423.876.02           Upgrade to fulpe-frequency GNSS </td <td>GPS</td> <td>R&amp;S<sup>®</sup>SMBVB-K44</td> <td>1423.7753.02</td>	GPS	R&S <sup>®</sup> SMBVB-K44	1423.7753.02
NAVIC/IRNSSRASSMBVB-K971423.8708.02Modernized GPSRASSMBVB-K1081423.796.02SBAS/QZSSRASSMBVB-K1061423.796.02BeiDouRASSMBVB-K1061423.799.02BeiDouRASSMBVB-K1081423.809.02GNSS real-time interfaceRASSMBVB-K1091423.801.02GBASRASSMBVB-K1091423.802.02GMSS real-time interfaceRASSMBVB-K1111423.802.02GBASRASSMBVB-K1121423.802.02Modernized BeiDouRASSMBVB-K1211423.802.02Single satellite GNSSRASSMBVB-K1321423.875.02Upgrade to dual-frequency GNSSRASSMBVB-K1321423.875.02Upgrade to triple-frequency GNSSRASSMBVB-K1341423.875.02Add 6 GNSS channelsRASSMBVB-K1361423.875.02Add 12 GNSS channelsRASSMBVB-K1371423.875.02LISRASSMBVB-K1371423.875.02Upgrade to triple-frequency GNSSRASSMBVB-K1361423.875.02LISRASSMBVB-K1371423.875.02LISRASSMBVB-K1371423.875.02LISRASSMBVB-K1311423.875.02LISRASSMBVB-K1311423.875.02DMERASSMBVB-K1321423.875.02LISRASSMBVB-K1331423.876.02CORRASSMBVB-K1331423.876.02CORRASSMBVB-K1341423.870.02CORRASSMBVB-K1341423.870.02CORRASSMBVB-K1341423.870.02CORRASSMBVB-K1341423.870.02CORRASSMBVB-K1341423.87	Galileo	R&S <sup>®</sup> SMBVB-K66	1423.7882.02
Modernized GPS         R8S*SMBVB-K98         1423.7960.02           SBAS/0ZSS         R8S*SMBVB-K106         1423.7982.02           BeiDou         R8S*SMBVB-K107         1423.7999.02           GNSS real-time interface         R8S*SMBVB-K107         1423.8098.02           GNSS real-time interface         R8S*SMBVB-K108         1423.8008.02           GNSS real-time interface         R8S*SMBVB-K109         1423.8008.02           GMAGEnized BeiDou         R8S*SMBVB-K111         1423.8002.02           Modernized BeiDou         R8S*SMBVB-K132         1423.878.02           Single satellite GNSS         R8S*SMBVB-K133         1423.876.02           Upgrade to dual-frequency GNSS         R8S*SMBVB-K133         1423.876.02           Upgrade to fiple-frequency GNSS         R8S*SMBVB-K136         1423.876.02           Add 6 GNSS channels         R8S*SMBVB-K136         1423.876.02           Add 12 GNSS Channels         R8S*SMBVB-K136         1423.876.02           ILS         R8S*SMBVB-K137         1423.876.02           VOR         R8S*SMBVB-K136         1423.876.02           DME         R8S*SMBVB-K136         1423.876.02           GNSS test suite         R8S*SMBVB-K361         1423.866.02           GNSS test suite         R8S*SMBVB-K362         1423.8	GLONASS	R&S <sup>®</sup> SMBVB-K94	1423.7953.02
SBAS/0ZSS         R&S*SMBVB-K106         1423.7982.02           BeiDou         R&S*SMBVB-K107         1423.799.02           GNSS real-time interface         R&S*SMBVB-K108         1423.8008.02           GNSS real-time interface         R&S*SMBVB-K109         1423.8014.02           GBAS         R&S*SMBVB-K110         1423.8020.02           Modernizad BeiDou         R&S*SMBVB-K132         1423.8020.02           Single satellite GNSS         R&S*SMBVB-K132         1423.8740.02           Upgrade to dual-frequency GNSS         R&S*SMBVB-K133         1423.8750.02           Upgrade to triple-frequency GNSS         R&S*SMBVB-K136         1423.8750.02           Upgrade to triple-frequency GNSS         R&S*SMBVB-K136         1423.8750.02           Upgrade to triple-frequency GNSS         R&S*SMBVB-K136         1423.876.02           Add 12 GNSS channels         R&S*SMBVB-K136         1423.876.02           LS         R&S*SMBVB-K136         1423.8120.02           VOR         R&S*SMBVB-K151         1423.8120.02           VOR         R&S*SMBVB-K152         1423.8120.02           VOR         R&S*SMBVB-K153         1423.8120.02           VOR         R&S*SMBVB-K153         1423.8120.02           VOR         R&S*SMBVB-K361         1423.8160.02 <td>NAVIC/IRNSS</td> <td>R&amp;S<sup>®</sup>SMBVB-K97</td> <td>1423.8708.02</td>	NAVIC/IRNSS	R&S <sup>®</sup> SMBVB-K97	1423.8708.02
BeiDouR&S*SMBVB-K1071423.799.02GNSS real vorld simulationR&S*SMBVB-K1081423.8008.02GNSS real-time interfaceR&S*SMBVB-K1091423.8014.02GBASR&S*SMBVB-K1111423.8020.02Modenized BeiDouR&S*SMBVB-K1321423.8783.02Single satellite GNSSR&S*SMBVB-K1321423.8763.02Upgrade to dual-frequency GNSSR&S*SMBVB-K1331423.8760.02Upgrade to triple-frequency GNSSR&S*SMBVB-K1361423.8760.02Add 6 GNSS channelsR&S*SMBVB-K1361423.8750.02LSR&S*SMBVB-K1361423.8750.02VORR&S*SMBVB-K1511423.8750.02UPR&S*SMBVB-K1521423.8750.02LSR&S*SMBVB-K1521423.8750.02VORR&S*SMBVB-K1521423.8750.02DMER&S*SMBVB-K1521423.8130.02ERA-GLONASS test suiteR&S*SMBVB-K1531423.8650.02eCall test suiteR&S*SMBVB-K3601423.8650.02GNSS test suiteR&S*SMBVB-K3611423.8660.02GNSS test suiteR&S*SMBVB-K3611423.8660.02GNSS test suiteR&S*SMBVB-K3611423.871.00.02DRERS*SMBVB-K3611423.37160.02Rear panel connector for RF pathRSRS*SMBVB-E31Spare CFAST cardR&S*SMBVB-Z10639.991.0219' rack dapterIS*S-224-KNA331177.8090.00USB serial adapter for RS-232 remote controlRS*ST-USB16124.2531.00Documentation of calibration valuesRS*CV-2240.2193.18	Modernized GPS	R&S <sup>®</sup> SMBVB-K98	1423.7960.02
GNSS real-world simulation         R&S*SMBVB-K108         1423.8008.02           GNSS real-time interface         R&S*SMBVB-K109         1423.8014.02           GBAS         R&S*SMBVB-K111         1423.8020.02           Modernized BeiDou         R&S*SMBVB-K132         1423.8780.02           Single satellite GNSS         R&S*SMBVB-K132         1423.8780.02           Upgrade to dual-frequency GNSS         R&S*SMBVB-K133         1423.8760.02           Add 6 GNSS channels         R&S*SMBVB-K136         1423.8770.02           Add 12 GNSS channels         R&S*SMBVB-K136         1423.8770.02           LS         R&S*SMBVB-K151         1423.8790.02           VOR         R&S*SMBVB-K152         1423.8790.02           DME         RS*SMBVB-K152         1423.870.02           CRA-GLONASS test suite         R&S*SMBVB-K152         1423.870.02           CRA-GLONASS test suite         R&S*SMBVB-K153         1423.810.02           CRA-GLONASS test suite         R&S*SMBVB-K153         1423.810.02           CRA-GLONASS test suite         R&S*SMBVB-K153         1423.8160.02           CRA-GLONASS test suite         R&S*SMBVB-K163         1423.860.02           CRA-GLONASS test suite         R&S*SMBVB-K163         1423.8160.02           CRA-GLONASS test suite         R&S*S	SBAS/OZSS	R&S <sup>®</sup> SMBVB-K106	1423.7982.02
GNSS real-time interface         R&S*SMBVB-K109         1423.8014.02           GBAS         R&S*SMBVB-K111         1423.8020.02           Modernized BeiDou         R&S*SMBVB-K132         1423.8780.02           Single satellite GNSS         R&S*SMBVB-K133         1423.8743.02           Upgrade to dual-frequency GNSS         R&S*SMBVB-K134         1423.8760.02           Upgrade to triple-frequency GNSS         R&S*SMBVB-K134         1423.8760.02           Add 6 GNSS channels         R&S*SMBVB-K135         1423.8760.02           Add 12 GNSS channels         R&S*SMBVB-K136         1423.8770.02           Add 12 GNSS channels         R&S*SMBVB-K136         1423.8770.02           LS         R&S*SMBVB-K136         1423.8770.02           VOR         R&S*SMBVB-K151         1423.8760.02           DME         R&S*SMBVB-K152         1423.8170.02           ERA-GLONASS test suite         R&S*SMBVB-K153         1423.8143.02           eCall test suite         R&S*SMBVB-K150         1423.8160.02           GNS test suite         R&S*SMBVB-K150         1423.8160.02           GNS test suite         R&S*SMBVB-K361         1423.8160.02           GNS test suite         R&S*SMBVB-BK361         1423.8160.02           GNS test suite         R&S*SMBVB-BK361 <td< td=""><td>BeiDou</td><td>R&amp;S<sup>®</sup>SMBVB-K107</td><td>1423.7999.02</td></td<>	BeiDou	R&S <sup>®</sup> SMBVB-K107	1423.7999.02
GBAS         R4S*SMBVB-K111         1423.802.0.2           Modernized BeiDou         R6S*SMBVB-K132         1423.8789.02           Single satellite GNSS         R6S*SMBVB-K133         1423.8743.02           Upgrade to dual-frequency GNSS         R6S*SMBVB-K134         1423.8750.02           Upgrade to triple-frequency GNSS         R6S*SMBVB-K135         1423.8760.02           Add 6 GNSS channels         R6S*SMBVB-K136         1423.8772.02           Add 12 GNSS channels         R8S*SMBVB-K137         1423.8795.02           LS         R6S*SMBVB-K151         1423.8795.02           VOR         R6S*SMBVB-K152         1423.872.02           DME         R6S*SMBVB-K152         1423.8137.02           CMA         R6S*SMBVB-K152         1423.813.02           GNSS test suite         R6S*SMBVB-K153         1423.8143.02           ERA-GLONASS test suite         R6S*SMBVB-K361         1423.866.02           CME         R8S*SMBVB-K361         1423.866.02           GNSS test suite         R6S*SMBVB-K362         1423.866.02	GNSS real world simulation	R&S <sup>®</sup> SMBVB-K108	1423.8008.02
Modernized BeiDouR&S*SMBVB-K1321423.878.02Single satellite GNSSR&S*SMBVB-K1331423.874.02Upgrade to dual-frequency GNSSR&S*SMBVB-K1341423.875.02Upgrade to triple-frequency GNSSR&S*SMBVB-K1351423.876.02Add 6 GNSS channelsR&S*SMBVB-K1361423.8772.02Add 12 GNSS channelsR&S*SMBVB-K1371423.8795.02LSR&S*SMBVB-K1511423.8795.02VORR&S*SMBVB-K1521423.813.02DMER&S*SMBVB-K1521423.813.02EFA-GLONASS test suiteR&S*SMBVB-K1531423.866.02eCall test suiteR&S*SMBVB-K3611423.866.02GNSS test suiteR&S*SMBVB-K3611423.866.02DHER&S*SMBVB-K3611423.866.02eCall test suiteR&S*SMBVB-K3611423.866.02GNSS test suiteR&S*SMBVB-K3611423.866.02GNSS test suiteR&S*SMBVB-K3611423.866.02DHERearpanel connector for RF pathR&S*SMBVB-K3611423.866.02Rearpanel connector for RF pathR&S*SMBVB-K3611423.716.0.2Recommended extrasSYMBVB-B801423.716.0.2Spare CFAST cardR&S*SMBVB-Z103639.991.0.219" rack adapter for RS-232 remote controlR&S*SL177.809.0.0USB serial adapter for RS-232 remote controlR&S*SL6124.2531.00Documentation of calibration valuesR&S*DCV-2240.2193.18	GNSS real-time interface	R&S <sup>®</sup> SMBVB-K109	1423.8014.02
Single satellite GNSS         1423.8743.02           Upgrade to dual-frequency GNSS         R&S*SMBVB-K133         1423.8750.02           Upgrade to triple-frequency GNSS         R&S*SMBVB-K135         1423.8760.02           Add 6 GNSS channels         R&S*SMBVB-K136         1423.8772.02           Add 12 GNSS channels         R&S*SMBVB-K136         1423.8795.02           ILS         R&S*SMBVB-K151         1423.870.02           VOR         R&S*SMBVB-K152         1423.8120.02           DME         R&S*SMBVB-K153         1423.8143.02           ERA-GLONASS test suite         R&S*SMBVB-K153         1423.8660.02           eCall test suite         R&S*SMBVB-K361         1423.8660.02           GNSS test suite         R&S*SMBVB-B80         1423.7160.02           Rear panel connector for RF path         R&S*SMBVB-B81         1423.7360.02           Rear panel connector for RF path         R&S*SMBVB-S181         1423.7360.02           Rear panel connector for RF path         R&S*SMBVB-S10         3639.991.02           J9* rack adapter         R&S*SMBVB-S10	GBAS	R&S <sup>®</sup> SMBVB-K111	1423.8020.02
D         R8S*SMBVB-K134         1423.8750.02           Upgrade to triple-frequency GNSS         R8S*SMBVB-K135         1423.8760.02           Add 6 GNSS channels         R8S*SMBVB-K136         1423.8772.02           Add 12 GNSS channels         R8S*SMBVB-K137         1423.8795.02           ILS         R8S*SMBVB-K151         1423.8120.02           VOR         R8S*SMBVB-K152         1423.8137.02           DME         R8S*SMBVB-K153         1423.8143.02           eCall test suite         R8S*SMBVB-K153         1423.8660.02           eCall test suite         R8S*SMBVB-K360         1423.8660.02           GNSS test suite         R8S*SMBVB-K361         1423.8660.02           GNSS test suite         R8S*SMBVB-K362         1423.8660.02           GNSS test suite         R8S*SMBVB-K362         1423.8660.02           GNSS test suite         R8S*SMBVB-K362         1423.8660.02           GNSS test suite         R8S*SMBVB-B80         1423.7160.02           Rear panel connector for RF path         R8S*SMBVB-B80         1423.7360.02           Recommended extras         Iter suite         1423.760.02         1423.760.02           Systes CAST card         R8S*SMBVB-Z10         3639.9910.02         1423.760.02           19" rack adapter for RS-232 remote c	Modernized BeiDou	R&S <sup>®</sup> SMBVB-K132	1423.8789.02
Upgrade to triple-frequency GNSS         R&S*SMBVB-K135         1423.8766.02           Add 6 GNSS channels         R&S*SMBVB-K136         1423.8772.02           Add 12 GNSS channels         R&S*SMBVB-K137         1423.8795.02           ILS         R&S*SMBVB-K151         1423.8120.02           VOR         R&S*SMBVB-K152         1423.8137.02           DME         R&S*SMBVB-K153         1423.8143.02           ERA-GLONASS test suite         R&S*SMBVB-K153         1423.866.02           eCall test suite         R&S*SMBVB-K361         1423.866.02           GNSS test suite         R&S*SMBVB-K361         1423.866.02           GNS         R&S*SMBVB-K361         1423.866.02           <	Single satellite GNSS	R&S <sup>®</sup> SMBVB-K133	1423.8743.02
Add 6 GNSS channels         R&S*SMBVB-K136         1423.8772.02           Add 12 GNSS channels         R&S*SMBVB-K137         1423.8795.02           ILS         R&S*SMBVB-K151         1423.8120.02           VOR         R&S*SMBVB-K152         1423.8137.02           DME         R&S*SMBVB-K153         1423.8137.02           ERA-GLONASS test suite         R&S*SMBVB-K153         1423.8143.02           eCall test suite         R&S*SMBVB-K360         1423.8660.02           GNSS test suite         R&S*SMBVB-K361         1423.8660.02           GNSS test suite         R&S*SMBVB-K362         1423.8672.02           DME         R&S*SMBVB-K362         1423.8672.02           GNSS test suite         R&S*SMBVB-K362         1423.8672.02           GNSS test suite         R&S*SMBVB-K362         1423.8672.02           DME         R&S*SMBVB-K362         1423.8672.02           GNSS test suite         R&S*SMBVB-K362         1423.8672.02           GNSS test suite         R&S*SMBVB-K362         1423.8672.02           Rear panel connector for RF path         R&S*SMBVB-B80         1423.7160.02           Rear panel connector for RF path         R&S*SMBVB-K152         1423.7360.02           Syster CFAST card         R&S*SMBVB-K152         3639.9910.02	Upgrade to dual-frequency GNSS	R&S <sup>®</sup> SMBVB-K134	1423.8750.02
Add 12 GNSS channels       R&S*SMBVB-K137       1423.8795.02         ILS       R&S*SMBVB-K151       1423.8120.02         VOR       R&S*SMBVB-K152       1423.8137.02         DME       R&S*SMBVB-K153       1423.8143.02         ERA-GLONASS test suite       R&S*SMBVB-K360       1423.866.02         eCall test suite       R&S*SMBVB-K361       1423.866.02         GNSS test suite       R&S*SMBVB-K362       1423.867.02         GNSS test suite       R&S*SMBVB-K362       1423.7160.02         GNE apanel connector for RF path       R&S*SMBVB-B80       1423.7360.02         Rear panel connector for RF path       R&S*SMBVB-Z10       3639.9910.02         Spare CFAST card       R&S*SMBVB-Z10       3639.9910.02         19" rack adapter       R&S*SZA-KNA33       1177.8090.00         USB serial adapter for RS-232 remote control       R&S*ST-USB1       6124.2531.00         Documentation of calibration values	Upgrade to triple-frequency GNSS	R&S <sup>®</sup> SMBVB-K135	1423.8766.02
ILSR&S*SMBVB-K1511423.8120.02VORR&S*SMBVB-K1521423.8137.02DMER&S*SMBVB-K1531423.8137.02ERA-GLONASS test suiteR&S*SMBVB-K1531423.8650.02eCall test suiteR&S*SMBVB-K3601423.8660.02GNSS test suiteR&S*SMBVB-K3611423.8660.02GNSS test suiteR&S*SMBVB-K3621423.8672.02Gher optionsIteration of the pathR&S*SMBVB-B801423.7160.02Rear panel connector for RF pathR&S*SMBVB-B811423.7360.02Bear panel connector for RF pathR&S*SMBVB-Z103639.9910.02Spare CFAST cardR&S*SMBVB-Z103639.9910.0219" rack adapterR&S*SMBVB-Z103639.9910.02USB serial adapter for RS-232 remote controlR&S*TS-USB16124.2531.00Documentation of calibration valuesR&S*DCV-20240.2193.18	Add 6 GNSS channels	R&S <sup>®</sup> SMBVB-K136	1423.8772.02
VOR         R&S*SMBVB-K152         1423.8137.02           DME         R&S*SMBVB-K153         1423.8137.02           ERA-GLONASS test suite         R&S*SMBVB-K153         1423.8143.02           eCall test suite         R&S*SMBVB-K360         1423.8660.02           eCall test suite         R&S*SMBVB-K361         1423.8660.02           GNSS test suite         R&S*SMBVB-K362         1423.8672.02           GNSS test suite         R&S*SMBVB-K362         1423.8672.02 <b>Other options</b> T         T           Rear panel connector for RF path         R&S*SMBVB-B80         1423.7160.02           Recommended extras         T         T           Spare CFAST card         R&S*SMBVB-B81         1423.7360.02           19" rack adapter for RS-232 remote control         R&S*SMBVB-Z10         3639.991.02           USB serial adapter for RS-232 remote control         R&S*TS-USB1         6124.2531.00           Documentation of calibration values         R&S*DV-2         0240.2193.18	Add 12 GNSS channels	R&S <sup>®</sup> SMBVB-K137	1423.8795.02
DMER&S*SMBVB-K1531423.8143.02ERA-GLONASS test suiteR&S*SMBVB-K3601423.8650.02eCall test suiteR&S*SMBVB-K3611423.8660.02GNSS test suiteR&S*SMBVB-K3621423.8672.02 <b>Other options</b> TTRear panel connector for RF pathR&S*SMBVB-B801423.7160.02Spare CFAST cardR&S*SMBVB-Z103639.9910.0219" rack adapter for RS-232 remote controlR&S*TS-USB16124.2531.00Documentation of calibration valuesR&S*DCV-20240.2193.18	ILS	R&S <sup>®</sup> SMBVB-K151	1423.8120.02
ERA-GLONASS test suite         R&S*SMBVB-K360         1423.8650.02           eCall test suite         R&S*SMBVB-K361         1423.8660.02           GNSS test suite         R&S*SMBVB-K362         1423.8672.02 <b>Other options</b> R&S*SMBVB-K362         1423.7160.02           Rear panel connector for RF path         R&S*SMBVB-B80         1423.7360.02 <b>Recommended extras</b> recommended extras         recommended extras           Spare CFAST card         R&S*SMBVB-Z10         3639.9910.02           19" rack adapter for RS-232 remote control         R&S*TS-USB1         6124.2531.00           Documentation of calibration values         R&S*DCV-2         0240.2193.18	VOR	R&S <sup>®</sup> SMBVB-K152	1423.8137.02
eCall test suiteR&S*SMBVB-K3611423.8666.02GNSS test suiteR&S*SMBVB-K3621423.8672.02Other optionsRemovable mass storageR&S*SMBVB-B801423.7160.02Rear panel connector for RF pathR&S*SMBVB-B811423.7360.02Spare CFAST cardR&S*SMBVB-Z103639.9910.0219" rack adapterR&S*ZZA-KNA331177.8090.00USB serial adapter for RS-232 remote controlR&S*TS-USB16124.2531.00Documentation of calibration valuesR&S*DCV-20240.2193.18	DME	R&S <sup>®</sup> SMBVB-K153	1423.8143.02
GNSS test suiteR&S*SMBVB-K3621423.8672.02Other optionsRemovable mass storageR&S*SMBVB-B801423.7160.02Rear panel connector for RF pathR&S*SMBVB-B811423.7360.02Recommended extras1423.7360.02Spare CFAST cardR&S*SMBVB-Z103639.9910.0219" rack adapterR&S*ZZA-KNA331177.8090.00USB serial adapter for RS-232 remote controlR&S*TS-USB16124.2531.00Documentation of calibration valuesR&S*DCV-20240.2193.18	ERA-GLONASS test suite	R&S <sup>®</sup> SMBVB-K360	1423.8650.02
Other optionsRemovable mass storageR&S*SMBVB-B801423.7160.02Rear panel connector for RF pathR&S*SMBVB-B811423.7360.02Recommended extras1423.7360.02Spare CFAST cardR&S*SMBVB-Z103639.9910.0219" rack adapterR&S*ZZA-KNA331177.8090.00USB serial adapter for RS-232 remote controlR&S*TS-USB16124.2531.00Documentation of calibration valuesR&S*DCV-20240.2193.18	eCall test suite	R&S <sup>®</sup> SMBVB-K361	1423.8666.02
Removable mass storage         R&S°SMBVB-B80         1423.7160.02           Rear panel connector for RF path         R&S°SMBVB-B81         1423.7360.02 <b>Recommended extras</b>	GNSS test suite	R&S <sup>®</sup> SMBVB-K362	1423.8672.02
Rear panel connector for RF path         R&S*SMBVB-B81         1423.7360.02           Recommended extras         State	Other options		
Recommended extras         Feasibility           Spare CFAST card         R&S°SMBVB-Z10         3639.9910.02           19" rack adapter         R&S°ZZA-KNA33         1177.8090.00           USB serial adapter for RS-232 remote control         R&S°TS-USB1         6124.2531.00           Documentation of calibration values         R&S°DCV-2         0240.2193.18	Removable mass storage	R&S <sup>®</sup> SMBVB-B80	1423.7160.02
Spare CFAST card         R&S*SMBVB-Z10         3639.9910.02           19" rack adapter         R&S*ZZA-KNA33         1177.8090.00           USB serial adapter for RS-232 remote control         R&S*TS-USB1         6124.2531.00           Documentation of calibration values         R&S*DCV-2         0240.2193.18	Rear panel connector for RF path	R&S <sup>®</sup> SMBVB-B81	1423.7360.02
19" rack adapter     R&S°ZZA-KNA33     1177.8090.00       USB serial adapter for RS-232 remote control     R&S°TS-USB1     6124.2531.00       Documentation of calibration values     R&S°DCV-2     0240.2193.18	Recommended extras		
USB serial adapter for RS-232 remote controlR&S®TS-USB16124.2531.00Documentation of calibration valuesR&S®DCV-20240.2193.18	Spare CFAST card	R&S <sup>®</sup> SMBVB-Z10	3639.9910.02
Documentation of calibration values R&S°DCV-2 0240.2193.18	19" rack adapter	R&S <sup>®</sup> ZZA-KNA33	1177.8090.00
	USB serial adapter for RS-232 remote control	R&S <sup>®</sup> TS-USB1	6124.2531.00
	Documentation of calibration values	R&S®DCV-2	0240.2193.18
R&S®SMBV100B accredited calibration (ISO 17025, ISO 9000) R&S® ACASMBV100 3598.1027.03	R&S®SMBV100B accredited calibration (ISO 17025, ISO 9000)	R&S <sup>®</sup> ACASMBV100	3598.1027.03

The base unit can only be ordered with an R&S<sup>®</sup>SMBVB-B103 frequency option.
 R&S<sup>®</sup>WinIQSIM2<sup>™</sup> requires an external PC.

<sup>3)</sup> Maximum 250 waveforms per instrument can be registered.

Warranty		
Base unit	3 years	
All other items <sup>1)</sup>	1 year	
Options		
Extended warranty, one year	R&S®WE1	
Extended warranty, two years	R&S®WE2	
Extended warranty with calibration coverage, one year	R&S®CW1	Please contact your local
Extended warranty with calibration coverage, two years	R&S®CW2	Rohde&Schwarz sales office.
Extended warranty with accredited calibration coverage, one year	R&S®AW1	
Extended warranty with accredited calibration coverage, two years	R&S®AW2	

<sup>1)</sup> For options that are installed, the remaining base unit warranty applies if longer than 1 year. Exception: all batteries have a 1 year warranty.

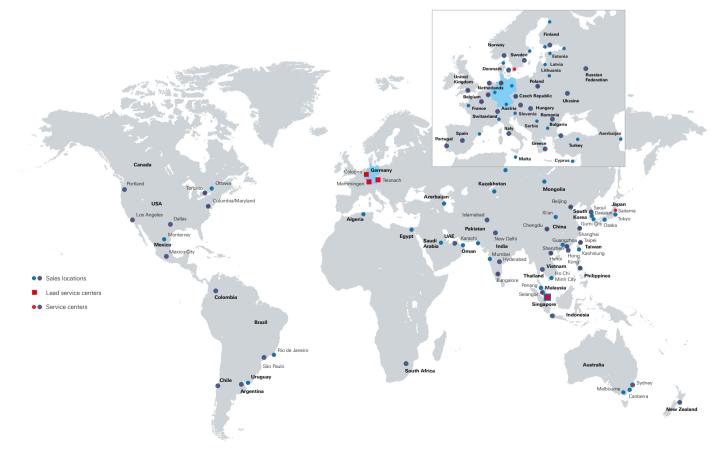
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