

R&S® SMW200A VECTOR SIGNAL GENERATOR

Configuration guide

How to configure the R&S® SMW200A vector signal generator

Configuration guide
Version 05.00

ROHDE & SCHWARZ

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1 GENERAL INFORMATION

1.1 Minimum configuration

Each R&S®SMW200A must be equipped with at least a frequency option for RF path A and a signal routing and baseband main module. This means that one of the following frequency options must be installed in RF path A.

R&S®SMW-B1003	100 kHz to 3 GHz
R&S®SMW-B1006	100 kHz to 6 GHz
R&S®SMW-B1007	100 kHz to 7.5 GHz
R&S®SMW-B1012	100 kHz to 12.75 GHz
R&S®SMW-B1020	100 kHz to 20 GHz
R&S®SMW-B1031	100 kHz to 31.8 GHz
R&S®SMW-B1040	100 kHz to 40 GHz
R&S®SMW-B1040N	100 kHz to 40 GHz, I/Q bandwidth and minimum pulse width limited
R&S®SMW-B1044	100 kHz to 44 GHz
R&S®SMW-B1044N	100 kHz to 44 GHz, I/Q bandwidth and minimum pulse width limited

In addition, one of the following signal routing and baseband main modules must be installed:

R&S®SMW-B13	one I/Q path to RF section
R&S®SMW-B13T	two I/Q paths to RF section
R&S®SMW-B13XT	wideband, two I/Q paths to RF section

If RF path B is to be equipped with an R&S®SMW-B20xx frequency option, an R&S®SMW-B13T or R&S®SMW-B13XT must be installed as the baseband main module.

1.2 Frequency options and RF path configurations

The R&S®SMW200A can be equipped with a second RF path (RF path B).

The table below shows the possible RF path combinations (● = possible, – = not possible).

Cells with grey background: These RF path combinations require the R&S®SMW-B94L option (deeper chassis).

Note that R&S®SMW-B94L is only possible with these RF path combinations.

Cells with white background: These RF path combinations (if possible) come with the standard chassis (included in the base unit).

		Path B							
		(path B not equipped)	3 GHz	6 GHz	7.5 GHz	12.75 GHz	20 GHz	31.8 GHz	44 GHz
Path A		R&S®SMW-B2003	R&S®SMW-B2006	R&S®SMW-B2007	R&S®SMW-B2012	R&S®SMW-B2020	R&S®SMW-B2031	R&S®SMW-B2044(N)	
3 GHz	R&S®SMW-B1003	●	●	–	–	–	–	–	–
6 GHz	R&S®SMW-B1006	●	–	●	–	–	●	–	–
7.5 GHz	R&S®SMW-B1007	●	–	–	●	–	–	–	–
12.75 GHz	R&S®SMW-B1012	●	–	●	–	●	–	–	–
20 GHz	R&S®SMW-B1020	●	–	●	–	–	●	–	–
31.8 GHz	R&S®SMW-B1031	●	–	–	–	–	–	●	–
40 GHz	R&S®SMW-B1040(N)	●	–	–	–	–	–	–	–
44 GHz	R&S®SMW-B1044(N)	●	–	–	–	–	–	–	● ¹

1.3 Low phase noise options

The R&S®SMW200A can be equipped with different types of low phase noise options, providing different levels of phase noise performance.

As a general rule, all installed RF paths must have the same phase noise performance level. For example, if RF path A is equipped with an ultra low phase noise option, and a second RF path (B) shall be installed, the second RF path must also be equipped with an ultra low phase noise option.

The following table shows the possible option combinations for instruments with two RF paths.

Phase noise performance level	Required options for RF path A	Required options for RF path B
Standard performance	R&S®SMW-B10xx frequency option	R&S®SMW-B20xx frequency option
Low phase noise	R&S®SMW-B10xx frequency option and R&S®SMW-B709	R&S®SMW-B20xx frequency option and R&S®SMW-B719
Improved close-in phase noise performance	R&S®SMW-B10xx frequency option and R&S®SMW-B710	R&S®SMW-B20xx frequency option and R&S®SMW-B720
Ultra low phase noise	R&S®SMW-B10xx frequency option and R&S®SMW-B711	R&S®SMW-B20xx frequency option and R&S®SMW-B721

¹ R&S®SMW-B1044 can only be combined with R&S®SMW-B2044 and R&S®SMW-B1044N can only be combined with R&S®SMW-B2044N.

1.4 Baseband hardware overview

To select one of two different baseband sections, simply choose the appropriate baseband main module.

To select the standard baseband section, choose the R&S®SMW-B13 or R&S®SMW-B13T option as the baseband main module. The standard baseband section enables RF modulation bandwidths up to 160 MHz and allows further options for fading and MIMO to be installed. The following additional hardware options are available:

R&S®SMW-B10	Standard baseband generator
R&S®SMW-B10F	Baseband generator for GNSS with high dynamics
R&S®SMW-B14	Fading simulator

To select the wideband baseband section, choose the R&S®SMW-B13XT option as the baseband main module.

The wideband baseband section enables RF modulation bandwidths up to 2 GHz and allows further options for fading and MIMO to be installed. The following additional hardware options are available:

R&S®SMW-B9	Wideband baseband generator
R&S®SMW-B9F	Wideband baseband generator for GNSS with high dynamics
R&S®SMW-B15	Fading simulator and signal processor

For the standard baseband section, select R&S®SMW-B13 or R&S®SMW-B13T in step 2 of Chapter 2. Then use step 8 for choosing baseband hardware and performance enhancements, and skip step 9.

For the wideband baseband section, select R&S®SMW-B13XT in step 2 of Chapter 2. Skip step 8 and use step 9 to choose baseband hardware and performance enhancements.

1.5 General remarks on installation and retrofitting

Option types: A "B" after the hyphen denotes a hardware option, a "K" a software/keycode option, i.e.:

R&S®SMW-Bxxxx = hardware option

R&S®SMW-Kxxx = software/keycode option

Retrofitting

Retrofitting conditions for hardware options are described in the related sections in the step-by-step configuration chapter.

All software options can be retrofitted by the user via keycode.

Path-specific software options

Some software options can be installed once or twice in two-path instruments. For most of these options a "floating license" concept applies. This means if the features of the option shall be used in both paths simultaneously, the option must be installed twice. If the option is installed only once, it can be used only either in path A or B. However, the option is not tied to a specific path. This is further outlined in the step-by-step configuration chapter (at the steps where it applies).

2 STEP-BY-STEP CONFIGURATION

2.1 Mandatory steps

Each R&S®SMW200A must be equipped with at least a frequency option for RF path A and a signal routing and baseband main module.

Step 1: Choose frequency range for RF path A – mandatory

Choose one of the following options:

Type	Designation	Requires	Remarks
R&S®SMW-B1003	100 kHz to 3 GHz		
R&S®SMW-B1006	100 kHz to 6 GHz		
R&S®SMW-B1007	100 kHz to 7.5 GHz		
R&S®SMW-B1012	100 kHz to 12.75 GHz		
R&S®SMW-B1020	100 kHz to 20 GHz		
R&S®SMW-B1031	100 kHz to 31.8 GHz		
R&S®SMW-B1040	100 kHz to 40 GHz		
R&S®SMW-B1040N	100 kHz to 40 GHz, I/Q bandwidth and minimum pulse width limited		
R&S®SMW-B1044	100 kHz to 44 GHz		
R&S®SMW-B1044N	100 kHz to 44 GHz, I/Q bandwidth and minimum pulse width limited		

Retrofitting notes: The options in this step cannot be retrofitted.

Step 2: Choose signal routing and baseband main module – mandatory

Type	Designation	Requires	Remarks
R&S®SMW-B13	Signal routing and baseband main module, one I/Q path to RF section		
R&S®SMW-B13T	Signal routing and baseband main module, two I/Q paths to RF section		R&S®SMW-B13T or R&S®SMW-B13XT required if a second RF path is to be installed
R&S®SMW-B13XT	Wideband signal routing and baseband main module, two I/Q paths to RF section		R&S®SMW-B13T or R&S®SMW-B13XT required if a second RF path is to be installed

Retrofitting notes: The options in this step can be retrofitted in factory. Retrofitting of R&S®SMW-B13XT is only possible for instruments with serial number 102700 or higher.

2.2 Optional steps

Step 3: Choose phase noise performance for RF path A

Type	Designation	Requires	Remarks
–	standard performance		no additional option required; standard performance comes with the frequency option
R&S®SMW-B709	Low phase noise	frequency option (see step 1)	not compatible with R&S®SMW-B710/-B711
R&S®SMW-B710	Improved close-in phase noise performance	frequency option (see step 1)	not compatible with R&S®SMW-B709/-B711
R&S®SMW-B711	Ultra low phase noise	frequency option (see step 1)	not compatible with R&S®SMW-B709/-B710

Retrofitting notes: The options in this step cannot be retrofitted.

Step 4: Choose additional enhancements for RF path A

Type	Designation	Requires	Remarks
R&S®SMW-B90	Phase coherence	R&S®SMW-B1003/-B1006/ -B1007/-B1012/-B1020/ -B1031/-B1040/-B1040N/ -B1044/-B1044N	can be installed once and can be used with all installed RF paths
R&S®SMW-K22	Pulse modulator	R&S®SMW-B1003/-B1006/ -B1007/-B1012/-B1020/ -B1031/-B1040/-B1040N/ -B1044/-B1044N	
R&S®SMW-K23	Pulse generator	R&S®SMW-B13/-B13T/ -B13XT	
R&S®SMW-K24	Multifunction generator	R&S®SMW-B13/-B13T/ -B13XT	
R&S®SMW-K553	External frontend control	R&S®SMW-B1006/ -B1007/-B1012/-B1020/ -B1031/-B1040/-B1040N/ -B1044/-B1044N	requires frequency option with 6 GHz or higher
R&S®SMW-K703	100 MHz, 1 GHz ultra low noise reference input/output	R&S®SMW-B1003/-B1006/ -B1007/-B1012/-B1020/ -B1031/-B1040/-B1040N/ -B1044/-B1044N	can be installed once and can be used with all installed RF paths
R&S®SMW-K704	Flexible reference input (1 MHz to 100 MHz)	R&S®SMW-B1003/-B1006/ -B1007/-B1012/-B1020/ -B1031/-B1040/-B1040N/ -B1044/-B1044N	can be installed once and can be used with all installed RF paths
R&S®SMW-K720	AM/FM/φM	R&S®SMW-B1003/-B1006/ -B1007/-B1012/-B1020/ -B1031/-B1040/-B1040N/ -B1044/-B1044N; R&S®SMW-B13T/-B13XT	
R&S®SMW-K739	Differential analog I/Q inputs	R&S®SMW-B1003/-B1006/ -B1007/ -B1012/-B1020/ -B1031/-B1040/-B1040N/ -B1044/-B1044N	

Retrofitting notes: R&S®SMW-B90 can be retrofitted at any Rohde & Schwarz service center with R&S®UCS universal calibration system.

Step 5: Choose frequency range for RF path B

Type	Designation	Requires	Remarks
R&S®SMW-B2003	100 kHz to 3 GHz, RF path B	R&S®SMW-B13T or R&S®SMW-B13XT	see section 1.2 for possible RF path configurations
R&S®SMW-B2006	100 kHz to 6 GHz, RF path B	R&S®SMW-B13T or R&S®SMW-B13XT	see section 1.2 for possible RF path configurations
R&S®SMW-B2007	100 kHz to 7.5 GHz, RF path B	R&S®SMW-B13T or R&S®SMW-B13XT	see section 1.2 for possible RF path configurations
R&S®SMW-B2012	100 kHz to 12.75 GHz, RF path B	R&S®SMW-B13T or R&S®SMW-B13XT; R&S®SMW-B94L	see section 1.2 for possible RF path configurations
R&S®SMW-B2020	100 kHz to 20 GHz, RF path B	R&S®SMW-B13T or R&S®SMW-B13XT	see section 1.2 for possible RF path configurations
R&S®SMW-B2031	100 kHz to 31.8 GHz, RF path B	R&S®SMW-B13T or R&S®SMW-B13XT; R&S®SMW-B94L	see section 1.2 for possible RF path configurations
R&S®SMW-B2044	100 kHz to 44 GHz, RF path B	R&S®SMW-B13T or R&S®SMW-B13XT; R&S®SMW-B94L	see section 1.2 for possible RF path configurations
R&S®SMW-B2044N	100 kHz to 44 GHz, I/Q bandwidth and minimum pulse width limited. RF path B	R&S®SMW-B13T or R&S®SMW-B13XT; R&S®SMW-B94L	see section 1.2 for possible RF path configurations

Platform option for two-path instruments

Type	Designation	Requires	Remarks
R&S®SMW-B94L	deeper chassis	mandatory for specific combinations of RF paths	is only possible for RF path combinations where it is required, see section 1.2

Retrofitting notes: The options in this step cannot be retrofitted.

Step 6: Choose phase noise performance for RF path B

Type	Designation	Requires	Remarks
–	Standard performance	frequency options in RF paths A and B	no additional option required; standard performance comes with the frequency option not compatible with R&S®SMW-B709/-B710/-B711 in RF path A
R&S®SMW-B719	Low phase noise	frequency options in RF paths A and B, R&S®SMW-B709 in RF path A	not compatible with R&S®SMW-B720/-B721
R&S®SMW-B720	Improved close-in phase noise performance	frequency options in RF paths A and B, R&S®SMW-B710 in RF path A	not compatible with R&S®SMW-B719/-B721
R&S®SMW-B721	Ultra low phase noise	frequency options in RF paths A and B, R&S®SMW-B711 in RF path A	not compatible with R&S®SMW-B719/-B720

Retrofitting notes: The options in this step cannot be retrofitted.

Step 7: Choose additional enhancements for RF path B

Type	Designation	Requires	Remarks
R&S®SMW-K22	Pulse modulator	R&S®SMW-B2003/-B2006/ -B2007/-B2012/-B2020/ -B2031/-B2044/-B2044N	floating license concept ²
R&S®SMW-K23	Pulse generator	R&S®SMW-B13T or R&S®SMW-B13XT	floating license concept ²
R&S®SMW-K24	Multifunction generator	R&S®SMW-B13T or R&S®SMW-B13XT	floating license concept ²
R&S®SMW-K553	External frontend control	R&S®SMW-B2006/ -B2007/-B2012/-B2020/ -B2031/-B2044/-B2044N	requires frequency option with 6 GHz or higher
R&S®SMW-K720	AM/FM/φM	R&S®SMW-B2003/-B2006/ -B2007/-B2012/-B2020, R&S®SMW-B13T/-B13XT	floating license concept ² , not compatible with R&S®SMW-B2031/-B2044/ -B2044N

Step 8: Choose standard baseband hardware and performance enhancements

For step 8, the instrument must be equipped with an R&S®SMW-B13 or R&S®SMW-B13T baseband main module. If you have selected the R&S®SMW-B13XT in step 2, skip step 8 and continue with step 9.

Note that standard and wideband baseband hardware cannot be mixed.

After completing step 8, continue with step 10.

Type	Designation	Requires	Remarks
R&S®SMW-B10	Baseband generator with ARB (64 Msample) and digital modulation (real-time), 120 MHz RF bandwidth	R&S®SMW-B13 or R&S®SMW-B13T	can be installed once or twice
R&S®SMW-B10F ³	Baseband generator for GNSS with high dynamics, with ARB (64 Msample) and digital modulation (real-time), 120 MHz RF bandwidth	R&S®SMW-B13 or R&S®SMW-B13T	can be installed once or twice ⁴
R&S®SMW-K16	Differential analog I/Q outputs	R&S®SMW-B13 or R&S®SMW-B13T	can be installed twice if R&S®SMW-B13T is installed
R&S®SMW-K18	Digital baseband output	R&S®SMW-B13 or R&S®SMW-B13T	can be installed twice if R&S®SMW-B13T is installed
R&S®SMW-K501	Extended sequencing	R&S®SMW-B10	can be installed twice if two R&S®SMW-B10 are installed
R&S®SMW-K511	ARB memory extension to 512 Msample	R&S®SMW-B10	can be installed twice if two R&S®SMW-B10 are installed
R&S®SMW-K512	ARB memory extension to 1 Gsample	R&S®SMW-K511	can be installed twice if two R&S®SMW-K511 are installed
R&S®SMW-K522	Baseband extension to 160 MHz RF bandwidth	R&S®SMW-B10	can be installed twice if two R&S®SMW-B10 are installed

Retrofitting notes: R&S®SMW-B10 and R&S®SMW-B10F can be retrofitted at any Rohde & Schwarz service center.

² If an R&S®SMW-B2xx or an R&S®SMW-B13T/B13XT is installed and a pulse modulator or a high-performance pulse generator is to be used in both paths, the corresponding software option must be installed twice. If only one R&S®SMW-K22 or R&S®SMW-K23 option is installed, it can be activated either in path A or path B. However, a software option is not tied to a specific path.

³ Note that enhancements for the R&S®SMW-B10 option and software options that run on the R&S®SMW-B10 also work with the R&S®SMW-B10F option.

⁴ Note that the R&S®SMW-B10F and R&S®SMW-B10 cannot be mixed, i.e. only the following configurations are possible:
1 x R&S®SMW-B10, 2 x R&S®SMW-B10, 1 x R&S®SMW-B10F, 2 x R&S®SMW-B10F.

Step 9: Choose wideband baseband hardware and performance enhancements

For step 9, the instrument must be equipped with an R&S®SMW-B13XT baseband main module. If you have selected the R&S®SMW-B13 or R&S®SMW-B13T in step 2, perform step 8 instead.

Note that standard and wideband baseband hardware cannot be mixed.

Type	Designation	Requires	Remarks
R&S®SMW-B9	Wideband baseband generator with ARB (256 Msample), 500 MHz RF bandwidth	R&S®SMW-B13XT	can be installed once or twice
R&S®SMW-B9F ⁵	Wideband baseband generator for GNSS, with high dynamics with ARB (256 Msample), 500 MHz RF bandwidth	R&S®SMW-B13XT	can be installed once or twice ⁶
R&S®SMW-K17	Wideband differential analog I/Q outputs	R&S®SMW-B13XT	can be installed once
R&S®SMW-K19	Digital baseband output for R&S®SMW200A wideband baseband	R&S®SMW-B13XT	can be installed once or twice
R&S®SMW-K502	Wideband extended sequencing	R&S®SMW-B9	can be installed twice if two R&S®SMW-B9 are installed
R&S®SMW-K503	Real-time control interface	R&S®SMW-K502	can be installed twice if two R&S®SMW-K502 are installed
R&S®SMW-K504	Real-time control interface with enhanced PDW rate and control PDWs	R&S®SMW-K503	can be installed twice if two R&S®SMW-K503 are installed
R&S®SMW-K515	ARB memory extension to 2 Gsample	R&S®SMW-B9	can be installed twice if two R&S®SMW-B9 are installed
R&S®SMW-K525	Baseband extension to 1 GHz RF bandwidth	R&S®SMW-B9	can be installed twice if two R&S®SMW-B9 are installed
R&S®SMW-K527	Baseband extension to 2 GHz RF bandwidth	R&S®SMW-K525	can be installed twice if two R&S®SMW-K525 are installed

Retrofitting notes: R&S®SMW-B9 and R&S®SMW-B9F can be retrofitted at any Rohde & Schwarz service center.

⁵ Note that enhancements for the R&S®SMW-B9 option and software options that run on the R&S®SMW-B9 also work with the R&S®SMW-B9F option.

⁶ Note that the R&S®SMW-B9F and R&S®SMW-B9 cannot be mixed, i.e. only the following configurations are possible:
1 x R&S®SMW-B9, 2 x R&S®SMW-B9, 1 x R&S®SMW-B9F, 2 x R&S®SMW-B9F.

Step 10: Choose baseband enhancements

Type	Designation	Requires	Remarks
R&S®SMW-K62	Additive white Gaussian noise (AWGN)	R&S®SMW-B13/-B13T/ -B13XT	can be installed twice if R&S®SMW-B13T or R&S®SMW-B13XT is installed
R&S®SMW-K80	Bit error rate tester	R&S®SMW-B10 or R&S®SMW-B9	can be installed once
R&S®SMW-K540	Envelope tracking	R&S®SMW-B13/-B13T and R&S®SMW-K16 or R&S®SMW-B13XT and R&S®SMW-K17	can be installed twice if R&S®SMW-B13T and two R&S®SMW-K16 are installed
R&S®SMW-K541	AM/AM, AM/φM predistortion	R&S®SMW-B9/-B10	can be installed twice if two R&S®SMW-B9/-B10, two RF paths and R&S®SMW-B13T/-B13XT are installed
R&S®SMW-K544	User-defined frequency response correction	R&S®SMW-B13/-B13T/ -B13XT	can be installed twice if R&S®SMW-B13T or R&S®SMW-B13XT is installed
R&S®SMW-K545	RF port alignment	R&S®SMW-B90, and for each installed RF path: R&S®SMW-B9/-B10, R&S®SMW-K61, R&S®SMW-K544	can be installed once
R&S®SMW-K546	Digital Doherty	two R&S®SMW-K541, two R&S®SMW-B9/-B10, two RF paths and R&S®SMW-B13T/-B13XT	can be installed once
R&S®SMW-K548	Crest factor reduction	R&S®SMW-B9/-B10	can be installed twice if two R&S®SMW-B9/-B10 are installed
R&S®SMW-K551	Slow I/Q	R&S®SMW-B10, R&S®SMW-K18 or R&S®SMW-B9, R&S®SMW-K19	
R&S®SMW-K810	Enhanced noise generation	R&S®SMW-K62	can be installed twice if two R&S®SMW-K62 are installed
R&S®SMW-K811	Notched signals	R&S®SMW-B9/-B10	can be installed twice if two R&S®SMW-B9/-B10 are installed

Step 11: Choose internal digital modulation systems

At least one standard baseband generator (R&S®SMW-B10 option) or wideband baseband generator (R&S®SMW-B9 option) must be installed. If two baseband generators are installed and two signals of the same standard (e.g. 3GPP FDD) are to be output simultaneously, the corresponding software option must be installed twice (e.g. two R&S®SMW-K42 for 3GPP FDD). If only one software option for a specific standard is installed and the standard is selected in one baseband generator, the other baseband generator is disabled for that standard. However, a software option is not tied to a specific baseband generator.

Note:

- Enhancements for the R&S®SMW-B10 option and software options that run on the R&S®SMW-B10 also work with the R&S®SMW-B10F option
- Enhancements for the R&S®SMW-B9 option and software options that run on the R&S®SMW-B9 also work with the R&S®SMW-B9F option

Type	Designation	Requires	Remarks
Cellular standards			
R&S®SMW-K40	GSM/EDGE	R&S®SMW-B9/-B10	can be installed twice if two R&S®SMW-B9/-B10 are installed
R&S®SMW-K41	EDGE Evolution	R&S®SMW-K40	can be installed twice if two R&S®SMW-K40 are installed
R&S®SMW-K42	3GPP FDD	R&S®SMW-B9/-B10	can be installed twice if two R&S®SMW-B9/-B10 are installed
R&S®SMW-K46	CDMA2000 ⁷	R&S®SMW-B9/-B10	can be installed twice if two R&S®SMW-B9/-B10 are installed
R&S®SMW-K47	1xEV-DO	R&S®SMW-B9/-B10	can be installed twice if two R&S®SMW-B9/-B10 are installed
R&S®SMW-K50	TD-SCDMA	R&S®SMW-B9/-B10	can be installed twice if two R&S®SMW-B9/-B10 are installed
R&S®SMW-K51	TD-SCDMA enhanced BS/MS tests	R&S®SMW-K50	can be installed twice if two R&S®SMW-K50 are installed
R&S®SMW-K55	LTE Release 8	R&S®SMW-B9/-B10	can be installed twice if two R&S®SMW-B9/-B10 are installed
R&S®SMW-K68	TETRA Release 2	R&S®SMW-B9/-B10	can be installed twice if two R&S®SMW-B9/-B10 are installed
R&S®SMW-K69	LTE closed-loop BS test	R&S®SMW-K55/-K115	can be installed twice if two R&S®SMW-K55/-K115 are installed
R&S®SMW-K81	Log file generation	R&S®SMW-K55, R&S®SMW-K115 or R&S®SMW-K144	can be installed twice if two R&S®SMW-K55/-K115/-K144 are installed
R&S®SMW-K83	3GPP FDD HSPA/HSPA+, enhanced BS/MS tests	R&S®SMW-K42	can be installed twice if two R&S®SMW-K42 are installed
R&S®SMW-K84	LTE Release 9	R&S®SMW-K55	can be installed twice if two R&S®SMW-K55 are installed
R&S®SMW-K85	LTE Release 10 (LTE-Advanced)	R&S®SMW-K55	can be installed twice if two R&S®SMW-K55 are installed
R&S®SMW-K87	1xEV-DO Rev. B	R&S®SMW-K47	can be installed twice if two R&S®SMW-K47 are installed
R&S®SMW-K112	LTE Release 11	R&S®SMW-K55	can be installed twice if two R&S®SMW-K55 are installed
R&S®SMW-K113	LTE Release 12	R&S®SMW-K55	can be installed twice if two R&S®SMW-K55 are installed
R&S®SMW-K115	Cellular IoT	R&S®SMW-B9/-B10	can be installed twice if two R&S®SMW-B9/-B10 are installed
R&S®SMW-K118	Verizon 5GTF signals	R&S®SMW-B9/-B10	can be installed twice if two R&S®SMW-B9/-B10 are installed
R&S®SMW-K119	LTE Release 13/14/15	R&S®SMW-K55	can be installed twice if two R&S®SMW-K55 are installed

⁷ CDMA2000[®] is a registered trademark of the Telecommunications Industry Association (TIA-USA).

Type	Designation	Requires	Remarks
R&S®SMW-K130	OneWeb user-defined signal generation	R&S®SMW-B9/-B10	can be installed twice if two R&S®SMW-B9/-B10 are installed
R&S®SMW-K143	Cellular IoT Release 14	R&S®SMW-B9/-B10	can be installed twice if two R&S®SMW-B9/-B10 are installed
R&S®SMW-K144	5G New Radio	R&S®SMW-B9/-B10	can be installed twice if two R&S®SMW-B9/-B10 are installed
R&S®SMW-K145	5G NR closed-loop BS test	R&S®SMW-K144	can be installed twice if two R&S®SMW-K144 are installed
R&S®SMW-K146	Cellular IoT Release 15	R&S®SMW-K143	can be installed twice if two R&S®SMW-K143 are installed
R&S®SMW-K148	5G NR Release 16	R&S®SMW-K144	can be installed twice if two R&S®SMW-K144 are installed
R&S®SMW-K175	U-plane generation	R&S®SMW-K55 or R&S®SMW-K144	can be installed twice if two R&S®SMW-K55/-K144 are installed
R&S®SMW-K355	OneWeb reference signals	R&S®SMW-B9/-B10	can be installed twice if two R&S®SMW-B9/-B10 are installed
Wireless connectivity standards			
R&S®SMW-K54	IEEE 802.11 (a/b/g/n/j/p)	R&S®SMW-B9/-B10	can be installed twice if two R&S®SMW-B9/-B10 are installed
R&S®SMW-K60	Bluetooth® 8 EDR	R&S®SMW-B9/-B10	can be installed twice if two R&S®SMW-B9/-B10 are installed
R&S®SMW-K86	IEEE 802.11ac	R&S®SMW-K54	can be installed twice if two R&S®SMW-K54 are installed
R&S®SMW-K117	Bluetooth® 5.x	R&S®SMW-K60	can be installed twice if two R&S®SMW-K60 are installed
R&S®SMW-K131	LoRa®	R&S®SMW-B9/-B10	can be installed twice if two R&S®SMW-B9/-B10 are installed
R&S®SMW-K141	IEEE 802.11ad	R&S®SMW-B9, R&S®SMW-K525, R&S®SMW-K527	can be installed twice if two R&S®SMW-K527 are installed; runs on R&S®SMW-B9 only (requires R&S®SMW-K525 and R&S®SMW-K527)
R&S®SMW-K142	IEEE 802.11ax	R&S®SMW-K54	can be installed twice if two R&S®SMW-K54 are installed
R&S®SMW-K147	IEEE 802.11be	R&S®SMW-K54	can be installed twice if two R&S®SMW-K54 are installed
R&S®SMW-K149	HRP UWB	R&S®SMW-B9	can be installed twice if two R&S®SMW-B9 are installed
Navigation standards			
R&S®SMW-K44	GPS	R&S®SMW-B9/-B10	can be installed twice if two R&S®SMW-B9/-B10 are installed
R&S®SMW-K66	Galileo	R&S®SMW-B9/-B10	can be installed twice if two R&S®SMW-B9/-B10 are installed
R&S®SMW-K94	GLONASS	R&S®SMW-B9/-B10	can be installed twice if two R&S®SMW-B9/-B10 are installed
R&S®SMW-K97	IRNSS	R&S®SMW-B9/-B10	can be installed twice if two R&S®SMW-B9/-B10 are installed
R&S®SMW-K98	Modernized GPS	R&S®SMW-B9/-B10	can be installed twice if two R&S®SMW-B9/-B10 are installed
R&S®SMW-K106	SBAS/QZSS	R&S®SMW-K44	can be installed twice if two R&S®SMW-K44 are installed
R&S®SMW-K107	BeiDou	R&S®SMW-B9/-B10	can be installed twice if two R&S®SMW-B9/-B10 are installed;

⁸ The Bluetooth® word mark and logos are registered trademarks owned by Bluetooth SIG, Inc. and any use of such marks by Rohde & Schwarz is under license.

Type	Designation	Requires	Remarks
R&S®SMW-K108	Real-world scenarios	R&S®SMW-K44/-K66/-K94/ -K98/-K107	can be installed twice if two R&S®SMW-B9/-B10 and at least two GNSS standards are installed;
R&S®SMW-K109	GNSS real-time interfaces (RT remote control)	R&S®SMW-K44/-K66/-K94/ -K98/-K107	can be installed twice if two R&S®SMW-B9/-B10 and at least two GNSS standards are installed;
R&S®SMW-K132	Modernized BeiDou	R&S®SMW-B9/-B10	can be installed twice if two R&S®SMW-B9/-B10 are installed
R&S®SMW-K134	Upgrade to dual-frequency GNSS	R&S®SMW-B9 and at least one GNSS standard (R&S®SMW-K44/-K66/-K94/-K98/-K107/-K132)	can be installed twice if two R&S®SMW-B9 and at least two GNSS standards are installed
R&S®SMW-K135	Upgrade to triple-frequency GNSS	R&S®SMW-K134	can be installed twice if two R&S®SMW-K134 are installed
R&S®SMW-K136	Add 6 GNSS channels	R&S®SMW-B9 and at least one GNSS standard (R&S®SMW-K44/-K66/-K94/-K98/-K107/-K132)	can be installed several times ⁹
R&S®SMW-K137	Add 12 GNSS channels	R&S®SMW-B9 and at least one GNSS standard (R&S®SMW-K44/-K66/-K94/-K98/-K107/-K132)	can be installed several times ⁹
R&S®SMW-K138	Add 24 GNSS channels	R&S®SMW-B9 and at least one GNSS standard (R&S®SMW-K44/-K66/-K94/-K98/-K107/-K132)	can be installed several times ⁹
R&S®SMW-K139	Add 24 GNSS channels	R&S®SMW-B9 and at least one GNSS standard (R&S®SMW-K44/-K66/-K94/-K98/-K107/-K132)	can be installed several times ⁹
R&S®SMW-K360	ERA-GLONASS test suite	R&S®SMW-K44 and R&S®SMW-K94	can be installed once
R&S®SMW-K361	eCall test suite	R&S®SMW-K44, R&S®SMW-K66 and R&S®SMW-K106	can be installed once
Broadcast standards			
R&S®SMW-K52	DVB-H/DVB-T	R&S®SMW-B9/-B10	can be installed twice if two R&S®SMW-B9/-B10 are installed
R&S®SMW-K116	DVB-S2/S2X	R&S®SMW-B9/-B10	can be installed twice if two R&S®SMW-B9/-B10 are installed
Other standards and modulation systems			
R&S®SMW-K61	Multicarrier CW signal generation	R&S®SMW-B9/-B10	can be installed twice if two R&S®SMW-B9/-B10 are installed
R&S®SMW-K89	NFC A/B/F	R&S®SMW-B9/-B10	can be installed twice if two R&S®SMW-B9/-B10 are installed
R&S®SMW-K114	OFDM signal generation	R&S®SMW-B9/-B10	can be installed twice if two R&S®SMW-B9/-B10 are installed
R&S®SMW-K542	Baseband power sweep	R&S®SMW-B9/-B10	can be installed twice if two R&S®SMW-B9/-B10 are installed

⁹ The maximum number of GNSS channels depends on the installed baseband hardware; see GNSS and avionics simulation for signal generators data sheet (PD 3607.6896.22) for details.

Step 12: Choose R&S®WinIQSIM2 digital modulation systems

At least one standard baseband generator (R&S®SMW-B10 option) or wideband baseband generator (R&S®SMW-B9 option) must be installed. If two baseband generators are installed and two waveforms of the same standard (e.g. GSM/EDGE) are to be output simultaneously, the corresponding software option must be installed twice (e.g. two R&S®SMW-K240 for GSM/EDGE). If only one software option for a specific standard is installed and the associated waveform is played on one baseband generator, the other baseband generator is disabled for that waveform. However, a software option is not tied to a specific baseband generator.

R&S®WinIQSIM2 requires an external PC.

Type	Designation	Requires	Remarks
Cellular standards			
R&S®SMW-K240	GSM/EDGE	R&S®SMW-B9/-B10	can be installed twice if two R&S®SMW-B9/-B10 are installed
R&S®SMW-K241	EDGE Evolution	R&S®SMW-K240	can be installed twice if two R&S®SMW-K240 are installed
R&S®SMW-K242	3GPP FDD	R&S®SMW-B9/-B10	can be installed twice if two R&S®SMW-B9/-B10 are installed
R&S®SMW-K246	CDMA2000®	R&S®SMW-B9/-B10	can be installed twice if two R&S®SMW-B9/-B10 are installed
R&S®SMW-K247	1xEV-DO	R&S®SMW-B9/-B10	can be installed twice if two R&S®SMW-B9/-B10 are installed
R&S®SMW-K250	TD-SCDMA	R&S®SMW-B9/-B10	can be installed twice if two R&S®SMW-B9/-B10 are installed
R&S®SMW-K251	TD-SCDMA enhanced BS/MS tests	R&S®SMW-K250	can be installed twice if two R&S®SMW-K250 are installed
R&S®SMW-K255	LTE Release 8	R&S®SMW-B9/-B10	can be installed twice if two R&S®SMW-B9/-B10 are installed
R&S®SMW-K268	TETRA Release 2	R&S®SMW-B9/-B10	can be installed twice if two R&S®SMW-B9/-B10 are installed
R&S®SMW-K283	3GPP FDD HSPA/HSPA+, enhanced BS/MS tests	R&S®SMW-K242	can be installed twice if two R&S®SMW-K242 are installed
R&S®SMW-K284	LTE Release 9	R&S®SMW-K255	can be installed twice if two R&S®SMW-K255 are installed
R&S®SMW-K285	LTE Release 10 (LTE-Advanced)	R&S®SMW-K255	can be installed twice if two R&S®SMW-K255 are installed
R&S®SMW-K287	1xEV-DO Rev. B	R&S®SMW-K247	can be installed twice if two R&S®SMW-K247 are installed
R&S®SMW-K412	LTE Release 11 and enhanced features	R&S®SMW-K255	can be installed twice if two R&S®SMW-K255 are installed
R&S®SMW-K413	LTE Release 12	R&S®SMW-K255	can be installed twice if two R&S®SMW-K255 are installed
R&S®SMW-K415	Cellular IoT	R&S®SMW-B9/-B10	can be installed twice if two R&S®SMW-B9/-B10 are installed
R&S®SMW-K418	Verizon 5GTF signals	R&S®SMW-B9/-B10	can be installed twice if two R&S®SMW-B9/-B10 are installed
R&S®SMW-K419	LTE Release 13/14/15	R&S®SMW-K255	can be installed twice if two R&S®SMW-K255 are installed
R&S®SMW-K430	OneWeb user-defined signal generation	R&S®SMW-B9/-B10	can be installed twice if two R&S®SMW-B9/-B10 are installed
R&S®SMW-K443	Cellular IoT Release 14	R&S®SMW-K415	can be installed twice if two R&S®SMW-K415 are installed
R&S®SMW-K444	5G New Radio	R&S®SMW-B9/-B10	can be installed twice if two R&S®SMW-B9/-B10 are installed
Wireless connectivity standards			
R&S®SMW-K254	IEEE 802.11 (a/b/g/n/j/p)	R&S®SMW-B9/-B10	can be installed twice if two R&S®SMW-B9/-B10 are installed
R&S®SMW-K260	Bluetooth® EDR	R&S®SMW-B9/-B10	can be installed twice if two R&S®SMW-B9/-B10 are installed
R&S®SMW-K286	IEEE 802.11ac	R&S®SMW-K254	can be installed twice if two R&S®SMW-K254 are installed

Type	Designation	Requires	Remarks
R&S®SMW-K417	Bluetooth® 5.x	R&S®SMW-K260	can be installed twice if two R&S®SMW-K260 are installed
R&S®SMW-K431	LoRa®	R&S®SMW-B9/-B10	can be installed twice if two R&S®SMW-B9/-B10 are installed
R&S®SMW-K441	IEEE 802.11ad	R&S®SMW-B9, R&S®SMW-K525, R&S®SMW-K527	can be installed twice if two R&S®SMW-K527 are installed; runs on R&S®SMW-B9 (requires R&S®SMW-K525 and R&S®SMW-K527)
R&S®SMW-K442	IEEE 802.11ax	R&S®SMW-K254	can be installed twice if two R&S®SMW-K254 are installed
R&S®SMW-K447	IEEE 802.11be	R&S®SMW-K254	can be installed twice if two R&S®SMW-K254 are installed
Navigation standards			
R&S®SMW-K244	GPS 1 satellite	R&S®SMW-B9/-B10	can be installed twice if two R&S®SMW-B9/-B10 are installed
R&S®SMW-K266	Galileo 1 satellite	R&S®SMW-B9/-B10	can be installed twice if two R&S®SMW-B9/-B10 are installed
R&S®SMW-K294	GLONASS 1 satellite	R&S®SMW-B9/-B10	can be installed twice if two R&S®SMW-B9/-B10 are installed
R&S®SMW-K298	Modernized GPS 1 satellite	R&S®SMW-B9/-B10	can be installed twice if two R&S®SMW-B9/-B10 are installed
R&S®SMW-K407	BeiDou 1 satellite	R&S®SMW-B9/-B10	can be installed twice if two R&S®SMW-B9/-B10 are installed
R&S®SMW-K432	Modernized BeiDou 1 SV	R&S®SMW-B9/-B10	can be installed twice if two R&S®SMW-B9/-B10 are installed
Broadcast standards			
R&S®SMW-K252	DVB-H/DVB-T	R&S®SMW-B9/-B10	can be installed twice if two R&S®SMW-B9/-B10 are installed
R&S®SMW-K253	DAB/T-DMB	R&S®SMW-B9/-B10	can be installed twice if two R&S®SMW-B9/-B10 are installed
R&S®SMW-K416	DVB-S2/S2X	R&S®SMW-B9/-B10	can be installed twice if two R&S®SMW-B9/-B10 are installed
Other standards and modulation systems			
R&S®SMW-K261	Multicarrier CW signal generation	R&S®SMW-B9/-B10	can be installed twice if two R&S®SMW-B9/-B10 are installed
R&S®SMW-K262	Additive white Gaussian noise (AWGN)	R&S®SMW-B9/-B10	can be installed twice if two R&S®SMW-B9/-B10 are installed
R&S®SMW-K289	NFC A/B/F	R&S®SMW-B9/-B10	can be installed twice if two R&S®SMW-B9/-B10 are installed
R&S®SMW-K414	OFDM signal generation	R&S®SMW-B9/-B10	can be installed twice if two R&S®SMW-B9/-B10 are installed
Waveform packages for signals from R&S®WinIQSIM2			
R&S®SMW-K200	1 waveform	R&S®SMW-B9/-B10	a maximum of 250 waveforms per instrument can be registered
R&S®SMW-K200	5 waveforms	R&S®SMW-B9/-B10	a maximum of 250 waveforms per instrument can be registered
R&S®SMW-K200	50 waveforms	R&S®SMW-B9/-B10	a maximum of 250 waveforms per instrument can be registered

Step 13: Choose options with R&S® Pulse Sequencer software

At least one standard baseband generator (R&S®SMW-B10 option) or wideband baseband generator (R&S®SMW-B9 option) must be installed. If two baseband generators are installed and two waveforms of the same standard (e.g. DFS) are to be output simultaneously, the corresponding software option must be installed twice (e.g. two R&S®SMW-K350 for DFS). If only one software option for a specific standard is installed and the associated waveform is played on one baseband generator, the other baseband generator is disabled for that waveform. However, a software option is not tied to a specific baseband generator.

Type	Designation	Requires	Remarks
R&S®SMW-K300	Pulse sequencing	R&S®SMW-B9/-B10	can be installed twice if two R&S®SMW-B9/-B10 are installed
R&S®SMW-K301	Enhanced pulse sequencing	R&S®SMW-K300	can be installed twice if two R&S®SMW-K300 are installed
R&S®SMW-K302	Radar platforms	R&S®SMW-K301	can be installed twice if two R&S®SMW-K301 are installed
R&S®SMW-K304	Moving emitters and receiver	R&S®SMW-B9, R&S®SMW-K502, R&S®SMW-K301	can be installed twice if two R&S®SMW-B9, two R&S®SMW-K502 and two R&S®SMW-K301 are installed
R&S®SMW-K306	Multiple emitters (interleaved)	R&S®SMW-B9, R&S®SMW-K502, R&S®SMW-K301	can be installed twice if two R&S®SMW-B9, two R&S®SMW-K502 and two R&S®SMW-K301 are installed
R&S®SMW-K307	Multiple emitters extension (interleaved)	R&S®SMW-K306	can be installed twice if two R&S®SMW-K306 are installed
R&S®SMW-K308	Direction finding	R&S®SMW-K301	can be installed twice if two R&S®SMW-K301 are installed
R&S®SMW-K309	Import of 2D maps	R&S®SMW-K301	can be installed twice if two R&S®SMW-K301 are installed
R&S®SMW-K315	Pulse-on-pulse simulation	two R&S®SMW-B9, two R&S®SMW-K502, two or four R&S®SMW-B15 and either two R&S®SMW-K503 or two R&S®SMW-K301	
R&S®SMW-K350	DFS signal generation	R&S®SMW-B9/-B10	can be installed twice if two R&S®SMW-B9/-B10 are installed

Step 14: Choose multichannel, MIMO and fading options

For the software options that can be installed twice (e.g. R&S®SMW-K62, R&S®SMW-K71, R&S®SMW-K72), a floating license concept similar to that used for digital modulation systems applies. For the R&S®SMW-K71 option, for example, this means the following: At least one R&S®SMW-B14 fading simulator must be installed. If more than one R&S®SMW-B14 is installed (signal paths A and B) but only one R&S®SMW-K71, dynamic fading can be used either on signal path A or B. For dynamic fading and enhanced resolution to be used on signal paths A and B simultaneously, two R&S®SMW-K71 must be installed.

Type	Designation	Requires	Remarks
R&S®SMW-B14	Fading simulator	R&S®SMW-B13/-B13T and at least one R&S®SMW-B10	can be installed once, twice, or four times
R&S®SMW-B15	Fading simulator and signal processor	R&S®SMW-B13XT and at least one R&S®SMW-B9	can be installed twice or four times if two R&S®SMW-B9 are installed
R&S®SMW-K71	Dynamic fading	R&S®SMW-B14 or R&S®SMW-B15	can be installed twice if two or four R&S®SMW-B14, or two or four R&S®SMW-B15 are installed
R&S®SMW-K72	Enhanced fading models	R&S®SMW-B14 or R&S®SMW-B15	can be installed twice if two or four R&S®SMW-B14, or two or four R&S®SMW-B15 are installed
R&S®SMW-K73	OTA-MIMO fading enhancements	two or four R&S®SMW-B14 or two or four R&S®SMW-B15, R&S®SMW-K74, two R&S®SMW-K72	
R&S®SMW-K74	MIMO fading/routing	R&S®SMW-B13T, two R&S®SMW-B10, two or four R&S®SMW-B14 or R&S®SMW-B13XT, two R&S®SMW-B9, two or four R&S®SMW-B15	
R&S®SMW-K75	Higher-order MIMO	R&S®SMW-B13T, two R&S®SMW-B10, two or four R&S®SMW-B14 or R&S®SMW-B13XT, two R&S®SMW-B9, two or four R&S®SMW-B15 R&S®SMW-K74	
R&S®SMW-K76	Multiple entities	R&S®SMW-B13T and two R&S®SMW-B10 or R&S®SMW-B13XT and two R&S®SMW-B9	
R&S®SMW-K78	Radar echo generation	R&S®SMW-B14	can be installed twice if two or four R&S®SMW-B14 are installed
R&S®SMW-K550	Stream extender	two R&S®SMW-B10, R&S®SMW-K76	
R&S®SMW-K820	Customized dynamic fading	R&S®SMW-K71	can be installed twice if two R&S®SMW-K71 are installed
R&S®SMW-K821	MIMO subsets for higher-order MIMO	R&S®SMW-K75	
R&S®SMW-K822	Fading bandwidth extension to 400 MHz	R&S®SMW-B15	can be installed twice if two or four R&S®SMW-B15 are installed
R&S®SMW-K823	Fading bandwidth extension to 800 MHz	R&S®SMW-K822	can be installed twice if two R&S®SMW-K822 are installed

Retrofitting notes: R&S®SMW-B14 can be retrofitted at any Rohde & Schwarz service center. For R&S®SMW-B15 it depends on the instrument configuration whether this option can be retrofitted. Please contact your local Rohde & Schwarz service center.

Step 15: Choose other options

Type	Designation	Requires	Remarks
R&S [®] SMW-B81	Rear panel connectors for RF path A (3/6 GHz) and I/Q	R&S [®] SMW-B1003 or R&S [®] SMW-B1006	only for 3 GHz and 6 GHz RF paths A
R&S [®] SMW-B82	Rear panel connectors for RF path B (3/6 GHz)	R&S [®] SMW-B2003 or R&S [®] SMW-B2006, R&S [®] SMW-B81	only for 3 GHz and 6 GHz RF paths B
R&S [®] SMW-B83	Rear panel connectors for RF path A (20/31.8/40 GHz) and I/Q	R&S [®] SMW-B1020/-B1031/-B1040	only for 20/31.8/40 GHz RF paths A
R&S [®] SMW-B84	Rear panel connectors for RF path B (20 GHz)	R&S [®] SMW-B2020, R&S [®] SMW-B83	only for 20 GHz RF paths B
R&S [®] SMW-B93	Solid-state drive		

Retrofitting notes: R&S[®]SMW-B81/-B82/-B83/-B84 can be retrofitted at any Rohde & Schwarz service center with R&S[®]UCS universal calibration system. R&S[®]SMW-B93 can be retrofitted at any Rohde & Schwarz service center.

3 ORDERING INFORMATION

R&S®SMW-Bxxx = hardware option

R&S®SMW-Kxxx = software/key code option

Designation	Type	Order No.
Vector signal generator ¹⁰ including power cable and quick start guide	R&S®SMW200A	1412.0000.02
Options		
Frequency options, RF path A		
100 kHz to 3 GHz	R&S®SMW-B1003	1428.4700.02
100 kHz to 6 GHz	R&S®SMW-B1006	1428.4800.02
100 kHz to 7.5 GHz	R&S®SMW-B1007	1428.7700.02
100 kHz to 12.75 GHz	R&S®SMW-B1012	1428.4900.02
100 kHz to 20 GHz	R&S®SMW-B1020	1428.5107.02
100 kHz to 31.8 GHz	R&S®SMW-B1031	1428.5307.02
100 kHz to 40 GHz	R&S®SMW-B1040	1428.8506.02
100 kHz to 40 GHz, I/Q modulation bandwidth and minimum pulse width limited	R&S®SMW-B1040N	1428.8606.02
100 kHz to 44 GHz	R&S®SMW-B1044	1428.5507.02
100 kHz to 44 GHz, I/Q modulation bandwidth and minimum pulse width limited	R&S®SMW-B1044N	1428.5407.02
Baseband main modules		
Signal routing and baseband main module, one I/Q path to RF	R&S®SMW-B13	1413.2807.02
Signal routing and baseband main module, two I/Q paths to RF	R&S®SMW-B13T	1413.3003.02
Wideband baseband main module, two I/Q paths to RF	R&S®SMW-B13XT	1413.8005.02
Phase noise performance options, RF path A		
Low phase noise for RF path A	R&S®SMW-B709	1428.7300.02
Improved close-in phase noise performance for RF path A	R&S®SMW-B710	1428.6503.02
Ultra low phase noise for RF path A	R&S®SMW-B711	1428.6703.02
Platform options		
Deeper chassis ¹¹	R&S®SMW-B94L	1438.8150.02
Frequency options, RF path B		
100 kHz to 3 GHz	R&S®SMW-B2003	1428.5707.02
100 kHz to 6 GHz	R&S®SMW-B2006	1428.5807.02
100 kHz to 7.5 GHz	R&S®SMW-B2007	1428.7900.02
100 kHz to 12.75 GHz	R&S®SMW-B2012	1438.8950.02
100 kHz to 20 GHz	R&S®SMW-B2020	1428.6103.02
100 kHz to 31.8 GHz	R&S®SMW-B2031	1438.8750.02
100 kHz to 44 GHz	R&S®SMW-B2044	1438.8350.02
100 kHz to 44 GHz, I/Q modulation bandwidth and minimum pulse width limited	R&S®SMW-B2044N	1438.8550.02
Phase noise performance options, RF path B		
Low phase noise for RF path B	R&S®SMW-B719	1428.7500.02
Improved close-in phase noise performance for RF path B	R&S®SMW-B720	1428.6903.02
Ultra low phase noise for RF path B	R&S®SMW-B721	1428.7100.02
Other RF options		
Phase coherence	R&S®SMW-B90	1413.5841.02
Pulse modulator	R&S®SMW-K22	1413.3249.02
Pulse generator	R&S®SMW-K23	1413.3284.02
Multifunction generator	R&S®SMW-K24	1413.3332.02
External frontend control	R&S®SMW-K553	1414.6758.02
100 MHz, 1 GHz ultra low noise reference input/output	R&S®SMW-K703	1413.7380.02
Flexible reference input (1 MHz to 100 MHz)	R&S®SMW-K704	1414.6541.02
AM/FM/PM	R&S®SMW-K720	1413.7438.02
Differential analog I/Q inputs	R&S®SMW-K739	1413.7167.02

¹⁰ The base unit can only be ordered with an R&S®SMW-B10xx frequency option and an R&S®SMW-B13 or R&S®SMW-B13T or R&S®SMW-B13XT signal routing and baseband main module.

¹¹ This option is required (and only possible) for the following RF path combinations: 2 × 12.75 GHz, 2 × 31.8 GHz and 2 × 44 GHz; see section "Frequency options and RF path combinations".

Designation	Type	Order No.
Standard baseband		
Standard baseband generator with ARB (64 Msample) and digital modulation (real-time), 120 MHz RF bandwidth	R&S®SMW-B10	1413.1200.02
Standard baseband generator for GNSS with high dynamics, with ARB (64 Msample) and digital modulation (real-time), 120 MHz RF bandwidth	R&S®SMW-B10F	1414.4303.02
Differential analog I/Q outputs	R&S®SMW-K16	1413.3384.02
Digital baseband output	R&S®SMW-K18	1413.3432.02
Extended sequencing	R&S®SMW-K501	1413.9218.02
ARB memory extension to 512 Msample	R&S®SMW-K511	1413.6860.02
ARB memory extension to 1 Gsample	R&S®SMW-K512	1413.6919.02
Baseband extension to 160 MHz RF bandwidth	R&S®SMW-K522	1413.6960.02
Slow I/Q	R&S®SMW-K551	1413.9724.02
Wideband baseband		
Wideband baseband generator with ARB (256 Msample), 500 MHz RF bandwidth	R&S®SMW-B9	1413.7350.02
Wideband baseband generator for GNSS, with high dynamics with ARB (256 Msample), 500 MHz RF bandwidth	R&S®SMW-B9F	1434.7808.02
Wideband differential analog I/Q outputs	R&S®SMW-K17	1414.2346.02
Digital baseband output for R&S®SMW200A wideband baseband	R&S®SMW-K19	1414.3865.02
Wideband extended sequencing	R&S®SMW-K502	1413.9260.02
Real-time control interface	R&S®SMW-K503	1414.3620.02
Real-time control interface with enhanced PDW rate and control PDWs	R&S®SMW-K504	1414.3665.02
ARB memory extension to 2 Gsample	R&S®SMW-K515	1413.9360.02
Baseband extension to 1 GHz RF bandwidth	R&S®SMW-K525	1414.6129.02
Baseband extension to 2 GHz RF bandwidth	R&S®SMW-K527	1414.6158.02
Baseband enhancements		
Additive white gaussian noise (AWGN)	R&S®SMW-K62	1413.3484.02
Bit error rate tester	R&S®SMW-K80	1414.6187.02
Envelope tracking	R&S®SMW-K540	1413.7215.02
AM/AM, AM/PM predistortion	R&S®SMW-K541	1413.7267.02
User-defined frequency response correction	R&S®SMW-K544	1414.3707.02
RF port alignment	R&S®SMW-K545	1414.6429.02
Digital Doherty	R&S®SMW-K546	1414.6487.02
Crest factor reduction	R&S®SMW-K548	1414.6641.02
Enhanced noise generation	R&S®SMW-K810	1414.6341.02
Notched signals	R&S®SMW-K811	1414.6364.02
Multichannel, MIMO and fading		
Fading simulator	R&S®SMW-B14	1413.1500.02
Fading simulator and signal processor	R&S®SMW-B15	1414.4710.02
Dynamic fading	R&S®SMW-K71	1413.3532.02
Enhanced fading models	R&S®SMW-K72	1413.3584.02
OTA-MIMO fading enhancements	R&S®SMW-K73	1414.2300.02
MIMO fading/routing	R&S®SMW-K74	1413.3632.02
Higher-order MIMO	R&S®SMW-K75	1413.9576.02
Multiple entities	R&S®SMW-K76	1413.9624.02
Radar echo generation	R&S®SMW-K78	1414.1833.02
Stream extender	R&S®SMW-K550	1413.7315.02
Customized dynamic fading	R&S®SMW-K820	1414.2581.02
MIMO subsets for higher-order MIMO	R&S®SMW-K821	1414.4403.02
Fading bandwidth extension to 400 MHz	R&S®SMW-K822	1414.6712.02
Fading bandwidth extension to 800 MHz	R&S®SMW-K823	1414.6735.02
Digital standards		
GSM/EDGE	R&S®SMW-K40	1413.3684.02
EDGE Evolution	R&S®SMW-K41	1413.3732.02
3GPP FDD	R&S®SMW-K42	1413.3784.02
GPS	R&S®SMW-K44	1413.3832.02
CDMA2000®	R&S®SMW-K46	1413.3884.02
1xEV-DO	R&S®SMW-K47	1413.3932.02
IEEE 802.16	R&S®SMW-K49	1413.3984.02
TD-SCDMA	R&S®SMW-K50	1413.4039.02
TD-SCDMA enhanced BS/MS tests	R&S®SMW-K51	1413.4080.02
DVB-H/DVB-T	R&S®SMW-K52	1413.6090.02
IEEE 802.11 (a/b/g/n)	R&S®SMW-K54	1413.4139.02
LTE Release 8	R&S®SMW-K55	1413.4180.02
Bluetooth® EDR	R&S®SMW-K60	1413.4239.02

Designation	Type	Order No.
Multicarrier CW signal generation	R&S®SMW-K61	1413.4280.02
Galileo	R&S®SMW-K66	1413.4380.02
TETRA Release 2	R&S®SMW-K68	1413.4439.02
LTE closed-loop BS test	R&S®SMW-K69	1413.4480.02
Log file generation	R&S®SMW-K81	1413.4539.02
3GPP FDD HSPA/HSPA+, enhanced BS/MS tests	R&S®SMW-K83	1413.4580.02
LTE Release 9	R&S®SMW-K84	1413.5435.02
LTE Release 10 (LTE-Advanced)	R&S®SMW-K85	1413.5487.02
IEEE 802.11ac	R&S®SMW-K86	1413.5635.02
1xEV-DO Rev. B	R&S®SMW-K87	1413.6519.02
NFC A/B/F	R&S®SMW-K89	1413.6619.02
GLONASS	R&S®SMW-K94	1414.1485.02
NavIC/IRNSS	R&S®SMW-K97	1414.6258.02
Modernized GPS	R&S®SMW-K98	1414.1533.02
SBAS/QZSS	R&S®SMW-K106	1414.2923.02
BeiDou	R&S®SMW-K107	1414.1585.02
Real-world scenarios	R&S®SMW-K108	1414.2975.02
GNSS real-time interfaces (RT remote control)	R&S®SMW-K109	1414.3013.02
LTE Release 11	R&S®SMW-K112	1413.8505.02
LTE Release 12	R&S®SMW-K113	1414.1933.02
OFDM signal generation	R&S®SMW-K114	1414.1985.02
Cellular IoT Release 13	R&S®SMW-K115	1414.2723.02
DVB-S2/DVB-S2X	R&S®SMW-K116	1414.2630.02
Bluetooth® 5.x	R&S®SMW-K117	1414.3336.02
Verizon 5GTF signals	R&S®SMW-K118	1414.3465.02
LTE Release 13/14/15	R&S®SMW-K119	1414.3542.02
OneWeb user-defined signal generation	R&S®SMW-K130	1414.3788.02
LoRa®	R&S®SMW-K131	1414.6464.02
Modernized BeiDou	R&S®SMW-K132	1414.6606.02
Upgrade to dual-frequency GNSS	R&S®SMW-K134	1414.6770.02
Upgrade to triple-frequency GNSS	R&S®SMW-K135	1414.6793.02
6 additional GNSS channels	R&S®SMW-K136	1414.6812.02
12 additional GNSS channels	R&S®SMW-K137	1414.6835.02
24 additional GNSS channels	R&S®SMW-K138	1414.6858.02
48 additional GNSS channels	R&S®SMW-K139	1414.6935.02
IEEE 802.11ad	R&S®SMW-K141	1414.1333.02
IEEE 802.11ax	R&S®SMW-K142	1414.3259.02
Cellular IoT Release 14	R&S®SMW-K143	1414.6064.02
5G New Radio	R&S®SMW-K144	1414.4990.02
5G New Radio closed-loop BS test	R&S®SMW-K145	1414.6506.02
Cellular IoT Release 15	R&S®SMW-K146	1414.6564.02
IEEE 802.11be	R&S®SMW-K147	1413.6677.02
5G New Radio Release 16	R&S®SMW-K148	1414.6664.02
HRP UWB	R&S®SMW-K149	1414.6912.02
U-plane generation	R&S®SMW-K175	1413.3261.02
OneWeb reference signals	R&S®SMW-K355	1414.3742.02
ERA-GLONASS test suite	R&S®SMW-K360	1414.2800.02
eCall test suite	R&S®SMW-K361	1414.2846.02
Baseband power sweep	R&S®SMW-K542	1413.9876.02
Digital standards using R&S®WinIQSIM2 ¹²		
GSM/EDGE	R&S®SMW-K240	1413.4739.02
EDGE Evolution	R&S®SMW-K241	1413.4780.02
3GPP FDD	R&S®SMW-K242	1413.4839.02
GPS 1 satellite	R&S®SMW-K244	1413.4880.02
CDMA2000®	R&S®SMW-K246	1413.4939.02
1xEV-DO	R&S®SMW-K247	1413.4980.02
IEEE 802.16	R&S®SMW-K249	1413.5035.02
TD-SCDMA	R&S®SMW-K250	1413.5087.02
TD-SCDMA enhanced BS/MS tests	R&S®SMW-K251	1413.5135.02
DVB-H/DVB-T	R&S®SMW-K252	1413.6190.02
DAB/T-DMB	R&S®SMW-K253	1413.6248.02
IEEE 802.11n	R&S®SMW-K254	1413.5187.02
LTE Release 8	R&S®SMW-K255	1413.5235.02
Bluetooth® EDR	R&S®SMW-K260	1413.5287.02
Multicarrier CW signal generation	R&S®SMW-K261	1413.5335.02
Additive white gaussian noise (AWGN)	R&S®SMW-K262	1413.6460.02
Galileo 1 satellite	R&S®SMW-K266	1413.7015.02
TETRA Release 2	R&S®SMW-K268	1413.5387.02
3GPP FDD HSPA/HSPA+, enhanced BS/MS tests	R&S®SMW-K283	1413.6290.02

¹² R&S®WinIQSIM2 requires an external PC.

Designation	Type	Order No.
LTE Release 9	R&S®SMW-K284	1413.5535.02
LTE Release 10 (LTE-Advanced)	R&S®SMW-K285	1413.5587.02
IEEE 802.11ac	R&S®SMW-K286	1413.5687.02
1xEV-DO Rev. B	R&S®SMW-K287	1413.6560.02
NFC A/B/F	R&S®SMW-K289	1413.6654.02
GLONASS 1 satellite	R&S®SMW-K294	1413.7067.02
Modernized GPS 1 satellite	R&S®SMW-K298	1414.3171.02
BeiDou 1 satellite	R&S®SMW-K407	1413.7115.02
LTE Release 11 and enhanced features	R&S®SMW-K412	1413.8557.02
LTE Release 12	R&S®SMW-K413	1414.2030.02
OFDM signal generation	R&S®SMW-K414	3636.0434.02
Cellular IoT Release 13	R&S®SMW-K415	1414.2769.02
DVB-S2/DVB-S2X	R&S®SMW-K416	1414.2681.02
Bluetooth® 5.x	R&S®SMW-K417	1414.3371.02
Verizon 5GTF signals	R&S®SMW-K418	1414.3507.02
LTE Release 13/14/15	R&S®SMW-K419	1414.3588.02
OneWeb user-defined signal generation	R&S®SMW-K430	1414.3820.02
LoRa®	R&S®SMW-K431	1414.6441.02
IEEE 802.11ad	R&S®SMW-K441	1414.1385.02
IEEE 802.11ax	R&S®SMW-K442	1414.3294.02
Cellular IoT Release 14	R&S®SMW-K443	1414.6093.02
5G New Radio	R&S®SMW-K444	1414.5022.02
Cellular IoT Release 15	R&S®SMW-K446	1414.6587.02
Options with external R&S®Pulse Sequencer software or R&S®Pulse Sequencer (DFS) software		
Pulse sequencing	R&S®SMW-K300	1413.8805.02
Enhanced pulse sequencing	R&S®SMW-K301	1413.9776.02
Moving emitters and receiver	R&S®SMW-K304	1413.8957.02
Multiple emitters (interleaved)	R&S®SMW-K306	1413.9053.02
Multiple emitters extension (interleaved)	R&S®SMW-K307	1413.3510.02
Direction finding	R&S®SMW-K308	1414.1433.02
Pulse-on-pulse simulation	R&S®SMW-K315	1414.6529.02
DFS signal generation	R&S®SMW-K350	1413.9160.02
Waveform packages for signals from R&S®WinIQSIM2¹³		
1 waveform	R&S®SMW-K200	1414.6870.71
5 waveforms	R&S®SMW-K200	1414.6870.72
50 waveforms	R&S®SMW-K200	1414.6870.75
Other options		
Rear panel connectors for RF path A (3/6 GHz) and I/Q	R&S®SMW-B81	1413.5893.02
Rear panel connectors for RF path B (3/6 GHz)	R&S®SMW-B82	1413.5941.02
Rear panel connectors for RF path A (20/31.8/40 GHz) and I/Q	R&S®SMW-B83	1414.0937.02
Rear panel connectors for RF path B (20 GHz)	R&S®SMW-B84	1414.1033.02
Solid-state drive	R&S®SMW-B93	1414.1885.02
Recommended extras		
19" rack adapter	R&S®ZZA-KN4	1175.3033.00
Cable for connecting Rohde & Schwarz digital baseband interfaces	R&S®SMU-Z6	1415.0201.02
Cable for HS digital I/Q interface (optical cable, QSFP+ plug)	R&S®DIGIQ-HS	3641.2948.03
USB serial adapter for RS-232 remote control	R&S®TS-USB1	6124.2531.00
Adapters for instruments with an R&S®SMW-B1012/-B2012/-B1020/-B2020/-B1031/-B2031/-B1040/-B1040N frequency option		
Test port adapter, 2.92 mm female		1036.4790.00
Test port adapter, 2.92 mm male		1036.4802.00
Test port adapter, N female		1036.4777.00
Test port adapter, N male		1036.4783.00
Adapters for instruments with an R&S®SMW-B1044/-B2044/-B1044N/-B2044N frequency option		
Coaxial adapter 1.85 mm (f) – 1.85 mm (f)		3588.9654.00
Coaxial adapter 1.85 mm (f) – 2.92 mm (f)		3628.4728.02
Documentation		
Documentation of calibration values	R&S®DCV-2	0240.2193.18
R&S®SMW200A accredited calibration, up to 6 GHz	R&S®ACASMW200A	3596.7005.03
R&S®SMW200A accredited calibration, 7.5 GHz	R&S®ACASMW200A	3598.3507.03
R&S®SMW200A accredited calibration, 12.75 GHz to 44 GHz	R&S®ACASMW200A	3596.7011.03

¹³ A maximum of 250 waveforms per instrument can be registered.

Designation	Type	Order No.
Warranty		
Base unit		3 years
All other items ¹⁴		1 year
Service options		
Extended warranty, one year	R&S®WE1	Please contact your local Rohde & Schwarz sales office.
Extended warranty, two years	R&S®WE2	
Extended warranty with calibration coverage, one year	R&S®CW1	
Extended warranty with calibration coverage, two years	R&S®CW2	
Extended warranty with accredited calibration coverage, one year	R&S®AW1	
Extended warranty with accredited calibration coverage, two years	R&S®AW2	

Extended warranty with a term of one and two years (WE1 and WE2)

Repairs carried out during the contract term are free of charge ¹⁵. Necessary calibration and adjustments carried out during repairs are also covered.

Extended warranty with calibration coverage (CW1 and CW2)

Enhance your extended warranty by adding calibration coverage at a package price. This package ensures that your Rohde & Schwarz product is regularly calibrated, inspected and maintained during the term of the contract. It includes all repairs ¹⁵ and calibration at the recommended intervals as well as any calibration carried out during repairs or option upgrades.

Extended warranty with accredited calibration (AW1 and AW2)

Enhance your extended warranty by adding accredited calibration coverage at a package price. This package ensures that your Rohde & Schwarz product is regularly calibrated (with accreditation), inspected and maintained during the term of the contract. It includes all repairs ¹⁵ and accredited calibration at the recommended intervals as well as any accredited calibration carried out during repairs or option upgrades.

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¹⁴ For options that are installed, the remaining base unit warranty applies if longer than 1 year. Exception: all batteries have a 1 year warranty.

¹⁵ Excluding defects caused by incorrect operation or handling and force majeure. Wear-and-tear parts are not included.

Rohde & Schwarz

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- ▶ Environmental compatibility and eco-footprint
- ▶ Energy efficiency and low emissions
- ▶ Longevity and optimized total cost of ownership



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