



# Vector Signal Generator R&S® SMATE 200A

Configuration Guide

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# The variety of signal generation for production

This document guides you step-by-step through the configuration procedure for the Vector Signal Generator R&S SMATE200A. Each step indicates whether an option is mandatory or optional and also provides the following information:

Option	Name of the option
Description	Description of the option
Requires	Options required in order to install the selected option
Not compatible with	Options incompatible with the selected option
HW or SW	Identifies the option as a hardware or software option
Remarks	Special remarks such as “factory-installed”

Mandatory fields that list various selectable options apply only if the step that includes them is chosen (e.g. choosing a baseband source is mandatory only if the instrument is to be equipped with a baseband path).

The R&S SMATE200A can be equipped with up to two RF paths as well as two baseband paths (A and B), which effectively means two independent signal generators in one cabinet of only four height units. For easier configuration of the instrument to be used, this guide has been divided into two sections:

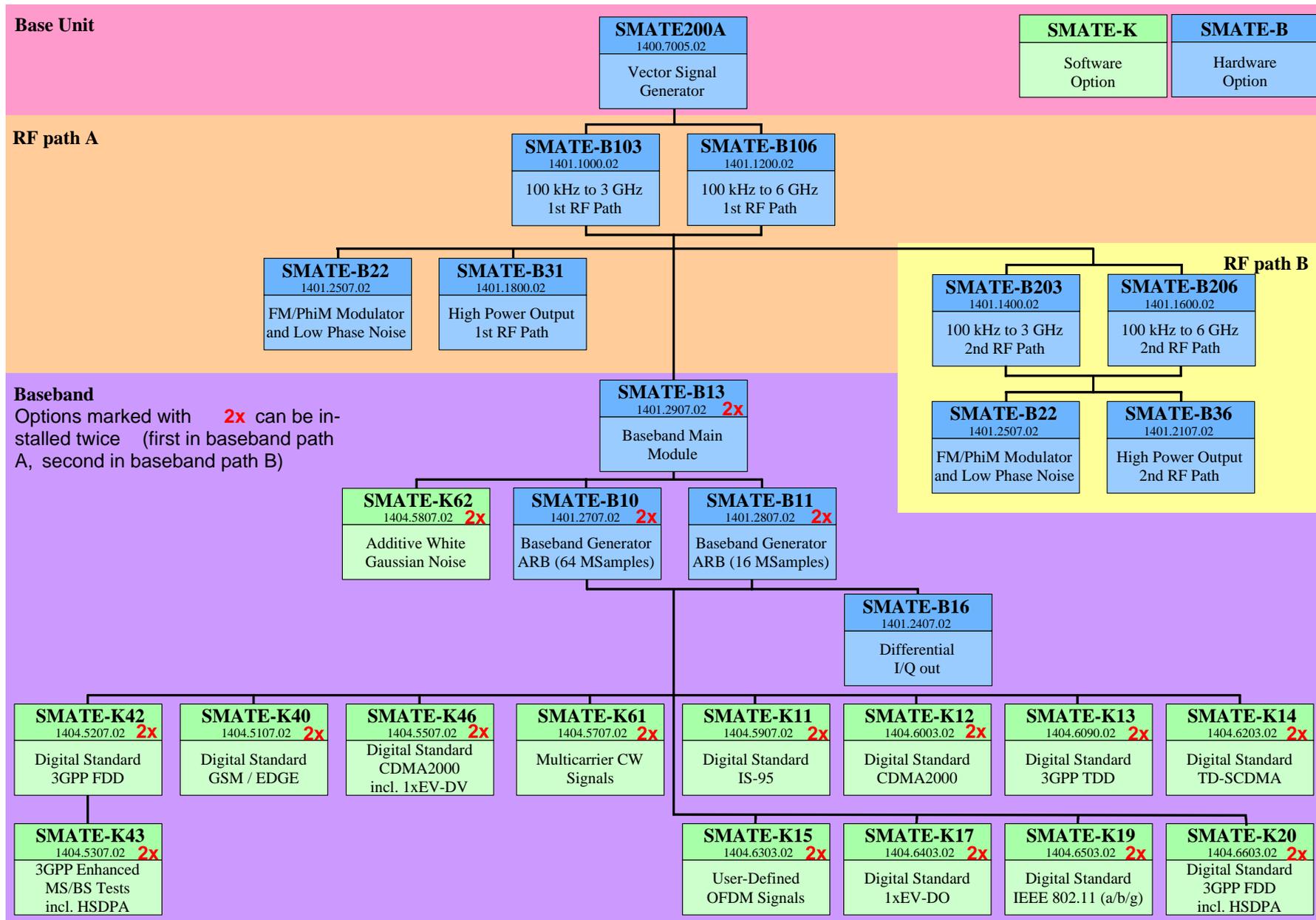
Single-path instrument – starting on page 3

Two-path instrument – starting on page 6

An overview of available options is provided on page 3. Configuration Examples are given on page 10.

Beside this paper version, you can also find an interactive product configurator online on the SMATE200A website under [www.smate.rohde-schwarz.com](http://www.smate.rohde-schwarz.com).

# Option overview



# Single-path instrument

Applies if the instrument is equipped with one RF path and no more than one baseband path.

## Step ① Configure RF path

**MANDATORY**

### Choose frequency range (only one choice possible)

**MANDATORY**

Option	Description	Requires	Not compatible with	HW or SW	Remarks
SMATEB103	100 kHz to 3 GHz	SMATE200A	SMATEB106	HW	Factory-installed
SMATEB106	100 kHz to 6 GHz	SMATE200A	SMATEB103	HW	Factory-installed

### Choose output configuration

**OPTIONAL**

Option	Description	Requires	Not compatible with	HW or SW	Remarks
SMATE-B22	Low Phase Noise and analog modulation FM and PhiM	SMATEB10x	-	HW	Factory-installed
SMATE-B31	High-Power Output	SMATEB10x	-	HW	Factory-installed

## Step ② Configure baseband path

**OPTIONAL**

### Choose baseband source

**MANDATORY**

Option	Description	Requires	Not compatible with	HW or SW	Remarks
SMATE-B13	Baseband Main Module	SMATEB10x	-	HW	Factory-installed.
SMATE-B10	Baseband Generator with ARB (64 MSamples) and Digital Modulation	SMATE-B13	SMATEB11	HW	Requires SMATEB10, SMATE-B11 or SMATEK62. Factory-installed
SMATE-B11	Baseband Generator with ARB (16 MSamples) and Digital Modulation	SMATE-B13	SMATEB10	HW	Factory-installed

### Choose baseband hardware

**OPTIONAL**

SMATE-B16	Differential I/Q Output	SMATE-B10 or B11	-	HW	Factory-installed
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### Choose digital modulation systems

**OPTIONAL**

Option	Description	Requires	Not compatible with	HW or SW	Remarks
SMATE-K40	Dig. Std. GSM/EDGE	SMATE-B10 or B11	-	SW	
SMATE-K42	Dig. Std. 3GPP FDD	SMATE-B10 or B11	-	SW	
SMATE-K43	3GPP enhanced MS/BS tests incl. HSDPA	SMATE-K42	-	SW	
SMATE-K46	Dig. Std. CDMA2000	SMATE-B10 or B11	-	SW	
SMATE-K61	Multicarrier CW Signal Generation	SMATE-B10 or B11	-	SW	

**Choose digital modulation systems with R&S WinIQSIM™<sup>1</sup>****OPTIONAL**

Option	Description	Requires	Not compatible with	HW or SW	Remarks
SMATE-K11	Dig. Std. IS-95	SMATE-B10 or B11	-	SW	With WinIQSIM™
SMATE-K12	Dig. Std. cdma2000	SMATE-B10 or B11	-	SW	With WinIQSIM™
SMATE-K13	Dig. Std. 3GPP TDD	SMATE-B10 or B11	-	SW	With WinIQSIM™
SMATE-K14	Dig. Std. TD-SCDMA	SMATE-B10 or B11	-	SW	With WinIQSIM™
SMATE-K15	User-Defined OFDM Signals	SMATE-B10 or B11	-	SW	With WinIQSIM™ and WinIQOFDM
SMATE-K17	Dig. Std. 1xEV-DO	SMATE-B10 or B11	-	SW	With WinIQSIM™
SMATE-K19	Dig. Std. IEEE 802.11 (a/b/g)	SMATE-B10 or B11	-	SW	With WinIQSIM™
SMATE-K20	Dig. Std. 3GPP incl. HSDPA	SMATE-B10 or B11	-	SW	With WinIQSIM™
SMATE-K5	Bluetooth	SMATE-B10 or B11	-	SW	With application software on an external PC

**Choose noise****OPTIONAL**

Option	Description	Requires	Not compatible with	HW or SW	Remarks
SMATE-K62	Additive White Gaussian Noise (AWGN)	SMATE-B13	-	SW	

<sup>1</sup> R&S WinIQSIM™ requires an external PC.

## Two-path instrument

Applies if the instrument is equipped with up to two RF paths and up to two baseband paths.

### Step ① Configure RF path A

**MANDATORY**

#### Choose frequency range (only one choice possible)

**MANDATORY**

Option	Description	Requires	Not compatible with	HW or SW	Remarks
SMATEB103	100 kHz to 3 GHz	SMATE200A	SMATEB106	HW	Factory-installed
SMATEB106	100 kHz to 6 GHz	SMATE200A	SMATEB103	HW	Factory-installed

#### Choose output configuration

**OPTIONAL**

Option	Description	Requires	Not compatible with	HW or SW	Remarks
SMATE-B22	Low Phase Noise and analog modulation FM and PhiM	SMATEB10x	-	HW	Factory-installed
SMATE-B31	High-Power Output	SMATEB10x	-	HW	Factory-installed

### Step ② Configure RF path B

**OPTIONAL**

#### Choose frequency range (only one choice possible)

**MANDATORY**

Option	Description	Requires	Not compatible with	HW or SW	Remarks
SMATEB203	100 kHz to 3 GHz	SMATEB10x	SMATEB206	HW	Factory-installed
SMATEB206	100 kHz to 6 GHz	SMATEB10x	SMATEB203	HW	Factory-installed

#### Choose output configuration

**OPTIONAL**

Option	Description	Requires	Not compatible with	HW or SW	Remarks
SMATE-B22	Low Phase Noise and analog modulation FM and PhiM	SMATEB10x	-	HW	Factory-installed Second option for path B. If only once installed it will be added to path A automatically.
SMATE-B36	High-Power Output	SMATEB20x	-	HW	Factory-installed

## Step ③ Configure baseband path A

**OPTIONAL**

### Choose baseband source

**MANDATORY**

Option	Description	Requires	Not compatible with	HW or SW	Remarks
SMATE-B13	Baseband Main Module	SMATEB10x	-	HW	Factory-installed. Requires SMATE-B10, SMATE-B11 or SMATE-K62.
SMATE-B10	Baseband Generator with ARB and Digital Modulation	SMATE-B13 (in baseband path A)	SMATE-B11 (in baseband path A)	HW	Factory-installed
SMATE-B11	Baseband Generator with ARB (16 MSamples) and Digital Modulation	SMATE-B13 (in baseband path A)	SMATE-B10 (in baseband path A)	HW	Factory-installed

### Choose baseband hardware

**OPTIONAL**

SMATE-B16	Differential I/Q Output	SMATE-B10 or B11 (in baseband path A)		HW	Can only be installed only once. Factory-installed
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### Choose digital modulation systems

**OPTIONAL**

Option	Description	Requires	Not compatible with	HW or SW	Remarks
SMATE-K40	Dig. Std. GSM/EDGE	SMATE-B10 or B11	-	SW	
SMATE-K42	Dig. Std. 3GPP FDD	SMATE-B10 or B11	-	SW	
SMATE-K43	3GPP enhanced MS/BS tests incl. HSDPA	SMATE-K42	-	SW	
SMATE-K46	Dig. Std. CDMA2000	SMATE-B10 or B11	-	SW	
SMATE-K61	Multicarrier CW Signal Generation	SMATE-B10 or B11	-	SW	

### Choose digital modulation systems with R&S WinIQSIM™<sup>1</sup>

**OPTIONAL**

Option	Description	Requires	Not compatible with	HW or SW	Remarks
SMATE-K11	Dig. Std. IS-95	SMATE-B10 or B11	-	SW	With WinIQSIM™
SMATE-K12	Dig. Std. cdma2000	SMATE-B10 or B11	-	SW	With WinIQSIM™
SMATE-K13	Dig. Std. 3GPP TDD	SMATE-B10 or B11	-	SW	With WinIQSIM™
SMATE-K14	Dig. Std. TD-SCDMA	SMATE-B10 or B11	-	SW	With WinIQSIM™
SMATE-K15	User-Defined OFDM Signals	SMATE-B10 or B11	-	SW	With WinIQSIM™ and WinIQOFDM
SMATE-K17	Dig. Std. 1xEV-DO	SMATE-B10 or B11	-	SW	With WinIQSIM™
SMATE-K19	Dig. Std. IEEE 802.11 (a/b/g)	SMATE-B10 or B11	-	SW	With WinIQSIM™
SMATE-K20	Dig. Std. 3GPP incl. HSDPA	SMATE-B10 or B11	-	SW	With WinIQSIM™
SMATE-K5	Bluetooth	SMATE-B10 or B11	-	SW	With application software on an external PC

<sup>1</sup> R&S WinIQSIM™ requires an external PC.

**Choose noise****OPTIONAL**

Option	Description	Requires	Not compatible with	HW or SW	Remarks
SMATE-K62	Additive White Gaussian Noise (AWGN)	SMATE-B13	-	SW	

**Step ④ Configure baseband path B****OPTIONAL****Choose baseband source****MANDATORY**

Option	Description	Requires	Not compatible with	HW or SW	Remarks
SMATE-B13	Baseband Main Module	SMATE-B13 (in baseband path A)	-	HW	Factory-installed. Requires SMATE-B10, SMATE-B11 (in baseband path A or B) or SMATE-K62.
SMATE-B10	Baseband Generator with ARB and Digital Modulation	SMATE-B13 (in baseband path A or B) and SMATE-B10 (in baseband path A)	SMATE-B11 in path A	HW	Factory-installed
SMATE-B11	Baseband Generator with ARB (16 MSamples) and Digital Modulation	SMATE-B13 (in baseband path A or B) and SMATE-B10 or SMATE-B11 (in baseband path A)	SMATE-B11 (in baseband path B) SMATE-B10 (in baseband path B)	HW	Factory-installed

**Choose digital modulation systems****OPTIONAL**

Option	Description	Requires	Not compatible with	HW or SW	Remarks
SMATE-K40	Dig. Std. GSM/EDGE	SMATE-B10 or B11	-	SW	
SMATE-K42	Dig. Std. 3GPP FDD	SMATE-B10 or B11	-	SW	
SMATE-K43	3GPP enhanced MS/BS tests incl. HSDPA	SMATE-K42	-	SW	
SMATE-K46	Dig. Std. CDMA2000	SMATE-B10 or B11	-	SW	
SMATE-K61	Multicarrier CW Signal Generation	SMATE-B10 or B11	-	SW	

**Choose digital modulation systems with R&S WinIQSIM™<sup>1</sup>****OPTIONAL**

Option	Description	Requires	Not compatible with	HW or SW	Remarks
SMATE-K11	Dig. Std. IS-95	SMATE-B10 or B11	-	SW	With WinIQSIM™
SMATE-K12	Dig. Std. CDMA2000	SMATE-B10 or B11	-	SW	With WinIQSIM™
SMATE-K13	Dig. Std. 3GPP TDD	SMATE-B10 or B11	-	SW	With WinIQSIM™
SMATE-K14	Dig. Std. TD-SCDMA	SMATE-B10 or B11	-	SW	With WinIQSIM™
SMATE-K15	User-Defined OFDM Signals	SMATE-B10 or B11	-	SW	With WinIQSIM™ and WinIQOFDM
SMATE-K17	Dig. Std. 1xEV-DO	SMATE-B10 or B11	-	SW	With WinIQSIM™
SMATE-K19	Dig. Std. IEEE 802.11 (a/b/g)	SMATE-B10 or B11	-	SW	With WinIQSIM™
SMATE-K20	Dig. Std. 3GPP incl. HSDPA	SMATE-B10 or B11	-	SW	With WinIQSIM™

**Choose noise****OPTIONAL**

Option	Description	Requires	Not compatible with	HW or SW	Remarks
SMATE-K62	Additive White Gaussian Noise (AWGN)	SMATE-B13	-	SW	

**Note:** Digital modulation systems and noise can be used either in baseband path A or baseband path B. The digital modulation systems or noise will be required twice only if the baseband paths are used simultaneously. (For example, an instrument is equipped with one R&S SMATE-K40 and two R&S SMATE-B10. In this configuration, R&S SMATE-K40 can be used either on baseband path A or baseband path B. For simultaneous use on both baseband paths, R&S SMATE-K40 would be required twice.)

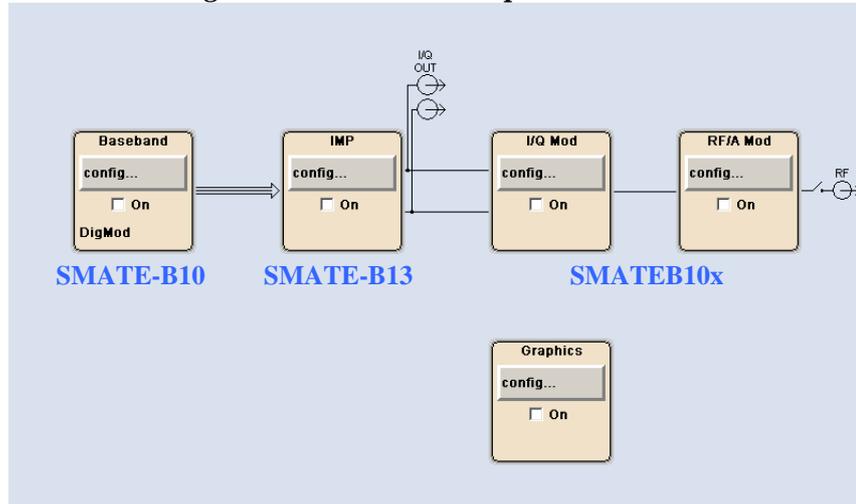
As only one set of Differential I/Q outputs SMATE-B16 can be installed, they can be switched to path A or B like the I/Q-outputs.

<sup>1</sup> R&S WinIQSIM™ requires an external PC.

# Configuration Examples

The modular design of the R&S SMATE200A allows the instrument to be equipped with up to two paths. This allows a multitude of applications to be performed for which several signal generators were previously required.

## One baseband generator and one RF path



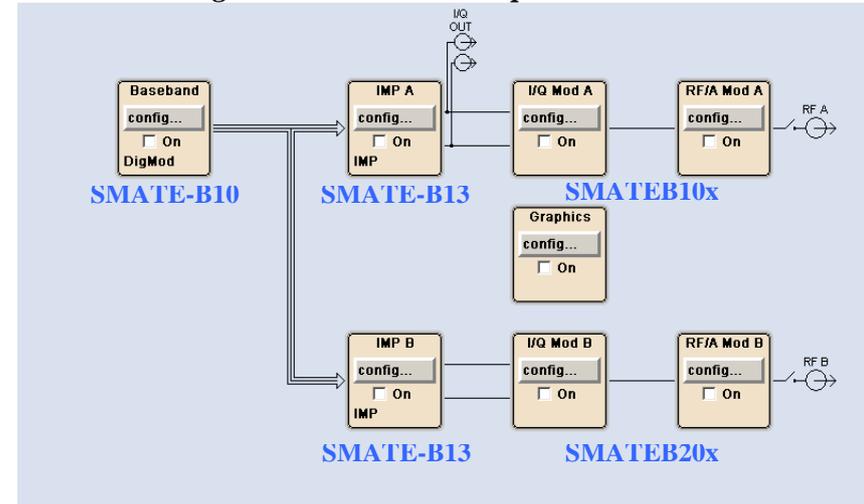
### Instrument configuration

Option	Installed	Description
SMATE200A	1x	Base unit
SMATEB10x	1x	Frequency option
SMATE-B13	1x	Baseband main module
SMATE-B10	1x	Baseband generator

### Application example

- Generation of digitally modulated signals

## One baseband generator and two RF paths



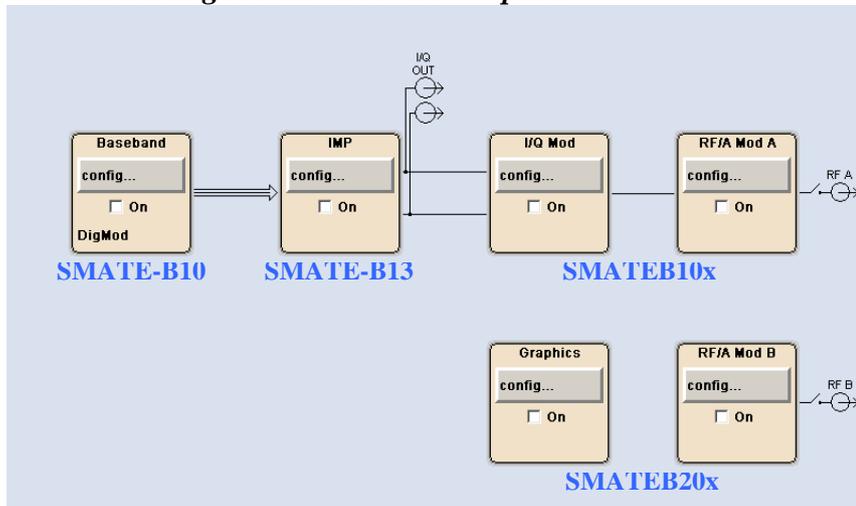
### Instrument configuration

Option	Installed	Description
SMATE200A	1x	Base unit
SMATEB10x	1x	Frequency option 1st RF path
SMATEB20x	1x	Frequency option 2nd RF path
SMATE-B13	2x	Baseband main module
SMATE-B10	1x	Baseband generator

### Application example

- Interference test with same digital signal
- Simulation of antenna diversity

### One baseband generator and two RF paths



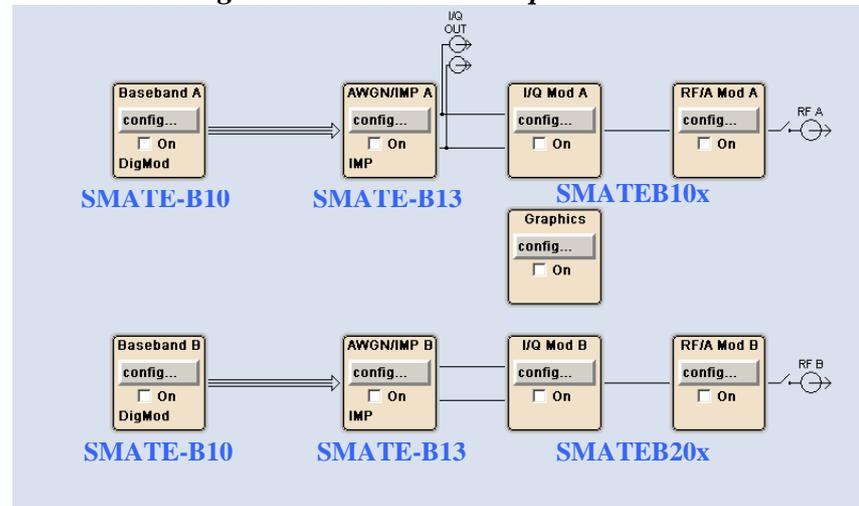
#### Instrument configuration

Option	Installed	Description
SMATE200A	1x	Base unit
SMATEB10x	1x	Frequency option 1st RF path
SMATEB20x	1x	Frequency option 2nd RF path
SMATE-B13	1x	Baseband main module
SMATE-B10	1x	Baseband generator

#### Application example

- Generation of a modulated signal on path A and a CW interferer on path B

### Two baseband generators and two RF paths



#### Instrument configuration

Option	Installed	Description
SMATE200A	1x	Base unit
SMATEB10x	1x	Frequency option 1st RF path
SMATEB20x	1x	Frequency option 2nd RF path
SMATE-B13	2x	Baseband main module
SMATE-B10	2x	Baseband generator

#### Application example

- Generation of a wanted signal and an interfering signal for receiver tests
- Generation of multicarrier signals with extremely wide bandwidth (>80 MHz)

# Ordering information

<b>Vector Signal Generator<sup>1</sup></b>	R&S SMATE200A	1400.7005.02
including power cable, Quick Start Guide and CD-ROM (with operating and service manual)		
<b>Options</b>		
RF path A		
100 kHz to 3 GHz	R&S SMATEB103	1401.1000.02
100 kHz to 6 GHz	R&S SMATEB106	1401.1200.02
Low Phase Noise and analog modulation FM / PhiM	R&S SMATE-B22	1401.2507.02
High-Power Output	R&S SMATE-B31	1401.1800.02
RF path B		
100 kHz to 3 GHz	R&S SMATEB203	1401.1400.02
100 kHz to 6 GHz	R&S SMATEB206	1401.1600.02
Low Phase Noise and analog modulation FM / PhiM	R&S SMATE-B22	1401.2507.02
High-Power Output	R&S SMATE-B36	1401.2107.02
Baseband		
Baseband Generator with ARB (64 Msamples) and Digital Modulation (realtime)	R&S SMATE-B10	1401.2707.02
Baseband Generator with ARB (16 Msamples) and Digital Modulation (realtime)	R&S SMATE-B11	1401.2807.02
Baseband Main Module	R&S SMATE-B13	1401.2907.02
Differential I/Q Output	R&S SMATE-B16	1401.2407.02
Digital modulation systems		
Digital Standard GSM/EDGE	R&S SMATE-K40	1404.5107.02
Digital Standard 3GPP FDD	R&S SMATE-K42	1404.5207.02
3GPP enhanced MS/BS tests incl. HSDPA	R&S SMATE-K43	1404.5307.02
Digital Standard CDMA2000 incl. 1xEV-DV	R&S SMATE-K46	1404.5507.02
Multicarrier CW Signal Generation	R&S SMATE-K61	1404.5707.02

<b>Digital modulation systems using R&amp;S WinIQSIM™ 2</b>			
Digital Standard IS-95	(with R&S WinIQSIM™)	R&S SMATE-K11	1404.5907.02
Digital Standard CDMA2000	(with R&S WinIQSIM™)	R&S SMATE-K12	1404.6003.02
Digital Standard 3GPP TDD	(with R&S WinIQSIM™)	R&S SMATE-K13	1404.6090.02
Digital Standard TD-SCDMA	(with R&S WinIQSIM™)	R&S SMATE-K14	1404.6203.02
User-Defined OFDM Signals	(with R&S WinIQSIM™ and R&S WinIQOFDM)	R&S SMATE-K15	1404.6303.02
Digital Standard 1xEV-DO	(with R&S WinIQSIM™)	R&S SMATE-K17	1404.6403.02
Digital Standard IEEE 802.11 (a/b/g)	(with R&S WinIQSIM™)	R&S SMATE-K19	1404.6503.02
Digital Standard 3GPP FDD incl. HSDPA	(with R&S WinIQSIM™)	R&S SMATE-K20	1404.6603.02
<b>Digital modulation systems using external PC software</b>			
Bluetooth (with external SW)		R&S SMATE-K5	1404.7000.02
<b>Noise</b>			
Additive White Gaussian Noise (AWGN)		R&S SMATE-K62	1404.5807.02
<b>Recommended extras</b>			
Hardcopy manuals (in English, USA)			1401.0940.39
19" Rack Adapter		R&S ZZA-411	1096.3283.00
Adapter for Telescopic Sliders		R&S ZZA-T45	1109.3774.00
BNC Adapter for AUX I/O connector		R&S SMATE-Z5	1160.4545.02
Keyboard with USB Interface (US assignment)		R&S PSL-Z2	1157.6870.03
Mouse with USB interface, optical		R&S PSL-Z10	1157.7060.02
External USB CD-RW Drive		R&S PSP-B6	1134.8201.12

<sup>1</sup> The base unit can only be ordered with an R&S SMATEB10x frequency option.

<sup>2</sup> R&S WinIQSIM™ requires an external PC.



**ROHDE & SCHWARZ**

[www.rohde-schwarz.com](http://www.rohde-schwarz.com)

Europe: Tel. +49 1805 12 4242, e-mail: [customersupport@rohde-schwarz.com](mailto:customersupport@rohde-schwarz.com) · North America: Tel. +1 410-910-7988, e-mail: [customer.support@rsa.rohde-schwarz.com](mailto:customer.support@rsa.rohde-schwarz.com)  
Asia: Tel. +65 68463710, e-mail: [customer-service@rsg.rohde-schwarz.com](mailto:customer-service@rsg.rohde-schwarz.com)