

# R&S® SMW-K542

## Baseband power sweep

### User Manual



1176981202  
Version 17

**ROHDE & SCHWARZ**  
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This document describes the following software option:

- R&S®SMW-K542 Baseband power sweep (1413.9876.xx)

This manual describes firmware version FW 5.30.047.xx and later of the R&S®SMW200A.

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The following abbreviations are used throughout this manual: R&S®SMW200A is abbreviated as R&S SMW; the license types 02/03/07/11/13/16/12 are abbreviated as xx.

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# 1 Welcome to the baseband power sweep

The R&S SMW-K542 is a firmware application that enables you to generate a linear slope ramp waveform with the baseband generator.

The R&S SMW-K542 features:

- High degree of amplitude linearity
- Fast varying values
- High accuracy
- Dynamic range of 40 dB to 50 dB at the RF output.

This user manual contains a description of the functionality that the application provides, including remote control operation.

All functions not discussed in this manual are the same as in the base unit and are described in the R&S SMW user manual. The latest version is available at:

[www.rohde-schwarz.com/manual/SMW200A](http://www.rohde-schwarz.com/manual/SMW200A)

## Installation

You can find detailed installation instructions in the delivery of the option or in the R&S SMW service manual.

## Installation

You can find detailed installation instructions in the delivery of the option or in the R&S SMW Service Manual.

## 1.1 Accessing the baseband power sweep dialog

Access:

- ▶ Select "Baseband > Misc > Power Sweep...".

A dialog box opens that displays the provided general settings.

The signal generation is not started immediately. To start signal generation with the default settings, select "State > On".

## 1.2 What's new

This manual describes firmware version FW 5.30.047.xx and later of the R&S®SMW200A.

Compared to the previous version, it provides the new features listed below:

- Time-based triggering, see "[Time Based Trigger](#)" on page 22 and "[Trigger Time](#)" on page 22.
- Editorial changes

## 1.3 Documentation overview

This section provides an overview of the R&S SMW user documentation. Unless specified otherwise, you find the documents at:

[www.rohde-schwarz.com/manual/smw200a](http://www.rohde-schwarz.com/manual/smw200a)

### 1.3.1 Getting started manual

Introduces the R&S SMW and describes how to set up and start working with the product. Includes basic operations, typical measurement examples, and general information, e.g. safety instructions, etc. A printed version is delivered with the instrument.

### 1.3.2 User manuals and help

Separate manuals for the base unit and the software options are provided for download:

- Base unit manual  
Contains the description of all instrument modes and functions. It also provides an introduction to remote control, a complete description of the remote control commands with programming examples, and information on maintenance, instrument interfaces and error messages. Includes the contents of the getting started manual.
- Software option manual  
Contains the description of the specific functions of an option. Basic information on operating the R&S SMW is not included.

The contents of the user manuals are available as help in the R&S SMW. The help offers quick, context-sensitive access to the complete information for the base unit and the software options.

All user manuals are also available for download or for immediate display on the Internet.

### 1.3.3 Tutorials

The R&S SMW provides interactive examples and demonstrations on operating the instrument in form of tutorials. A set of tutorials is available directly on the instrument.

### 1.3.4 Service manual

Describes the performance test for checking compliance with rated specifications, firmware update, troubleshooting, adjustments, installing options and maintenance.

The service manual is available for registered users on the global Rohde & Schwarz information system (GLORIS):

<https://gloris.rohde-schwarz.com>

### 1.3.5 Instrument security procedures

Deals with security issues when working with the R&S SMW in secure areas. It is available for download on the internet.

### 1.3.6 Printed safety instructions

Provides safety information in many languages. The printed document is delivered with the product.

### 1.3.7 Data sheets and brochures

The data sheet contains the technical specifications of the R&S SMW. It also lists the options and their order numbers and optional accessories.

The brochure provides an overview of the instrument and deals with the specific characteristics.

See [www.rohde-schwarz.com/brochure-datasheet/smw200a](http://www.rohde-schwarz.com/brochure-datasheet/smw200a)

### 1.3.8 Release notes and open source acknowledgment (OSA)

The release notes list new features, improvements and known issues of the current firmware version, and describe the firmware installation.

The software makes use of several valuable open source software packages. An open source acknowledgment document provides verbatim license texts of the used open source software.

See [www.rohde-schwarz.com/firmware/smw200a](http://www.rohde-schwarz.com/firmware/smw200a)

### 1.3.9 Application notes, application cards, white papers, etc.

These documents deal with special applications or background information on particular topics.

See [www.rohde-schwarz.com/application/smw200a](http://www.rohde-schwarz.com/application/smw200a) and [www.rohde-schwarz.com/manual/smw200a](http://www.rohde-schwarz.com/manual/smw200a)

### 1.3.10 Videos

Find various videos on Rohde & Schwarz products and test and measurement topics on YouTube: <https://www.youtube.com/@RohdeundSchwarz>



On the menu bar, search for your product to find related videos.



Figure 1-1: Product search on YouTube

## 1.4 Scope



Tasks (in manual or remote operation) that are also performed in the base unit in the same way are not described here.

In particular, it includes:

- Managing settings and data lists, like saving and loading settings, creating and accessing data lists, or accessing files in a particular directory.
- Information on regular trigger, marker and clock signals and filter settings, if appropriate.
- General instrument configuration, such as checking the system configuration, configuring networks and remote operation
- Using the common status registers

For a description of such tasks, see the R&S SMW user manual.

## 1.5 Notes on screenshots

When describing the functions of the product, we use sample screenshots. These screenshots are meant to illustrate as many as possible of the provided functions and possible interdependencies between parameters. The shown values may not represent realistic usage scenarios.

The screenshots usually show a fully equipped product, that is: with all options installed. Thus, some functions shown in the screenshots may not be available in your particular product configuration.



## 2 About the baseband power sweep

The instrument generates a digital I/Q signal which varies the power values cyclically between the start and end values. The values change according to a predefined signal shape.

An upstream pre-sweep and RF off time allows the signal to achieve a steady state before sweep signal generation starts, and remains steady throughout the sweep cycle. The RF signal is adjusted once at signal start and requires no further control by the RF level hardware control systems.

The main application fields of signals generated with baseband power sweep are amplifier tests.

### 2.1 Required options

The equipment layout for processing of digital power sweep includes:

- Option Standard or Wideband Baseband Generator (R&S SMW-B10/-B9) per signal path
- Option Baseband main module, one/two I/Q paths to RF (R&S SMW-B13/-B13T) or Option Wideband baseband main module two I/Q paths to RF (R&S SMW-B13XT)
- Option Baseband Power Sweep (R&S SMW-K542) per signal path

### 2.2 Correlating parameters

This section describes the characteristic parameters of the baseband power sweep, explained by means of a stair-step sweep signal. In addition, the function calculates the constant power value of the sweep signal relative to the set RF level, and you can display the results in the graph, see "[Constant mode](#)" on page 12.

The characteristic parameters at a glance

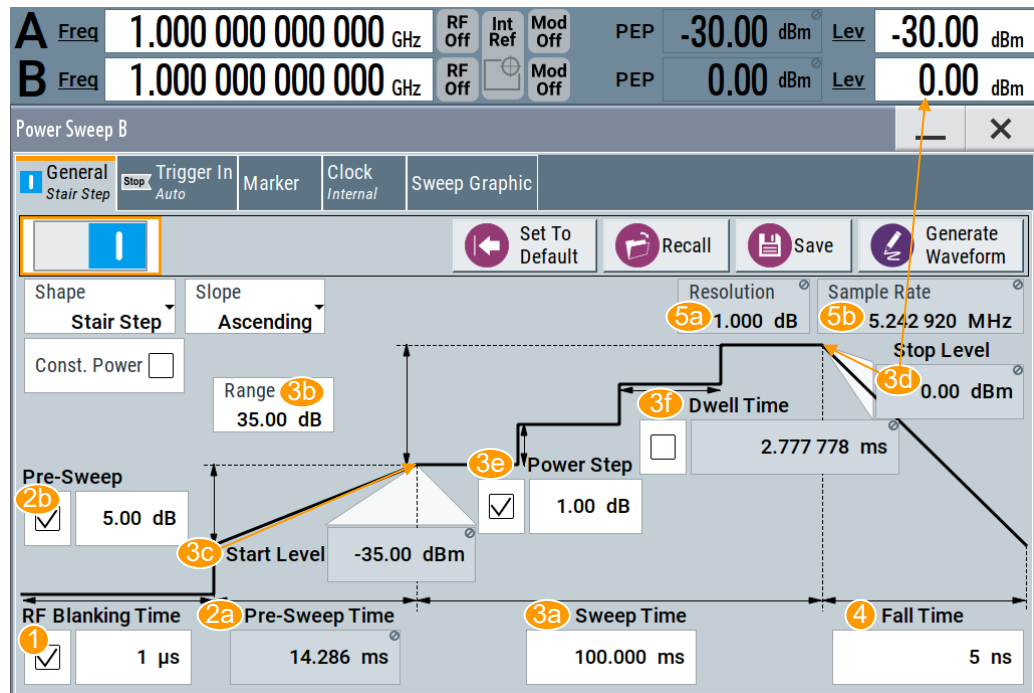


Figure 2-1: Characteristic parameters defining the power sweep

- 1 = RF Blanking
- 2a, 2b = Pre-Sweep
- 3a, 3b, 3c, 3d, 3e, 3f = active power sweep
- 4 = Rise / Fall time
- 5a, 5b = additional signal characteristics

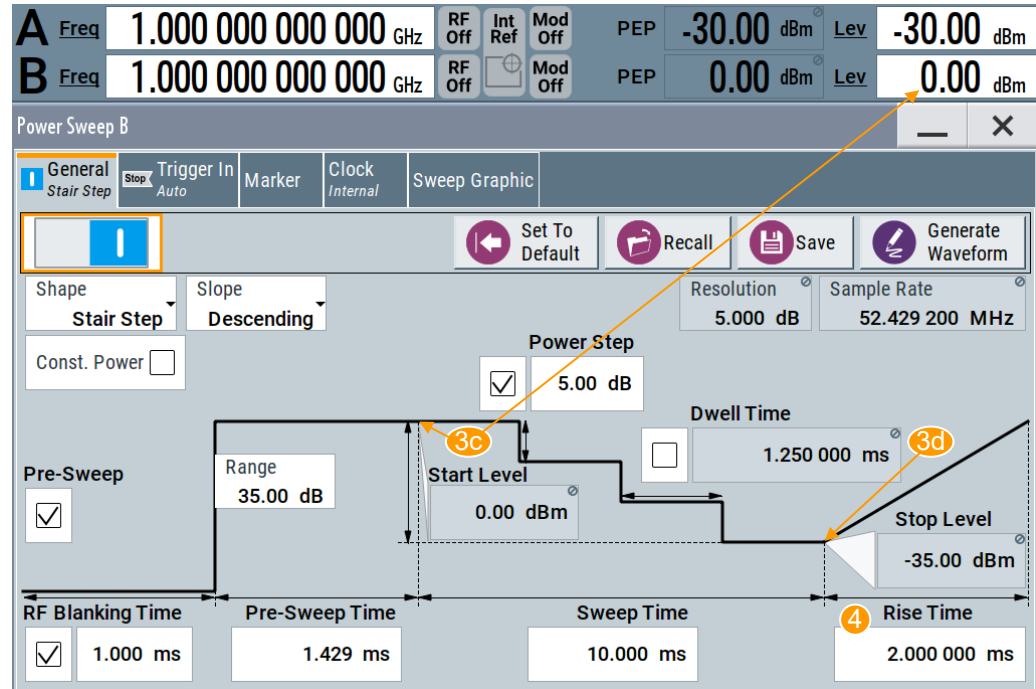
Table 2-1: Correlating parameters of the baseband power sweep

Functions	Description
RF Blanking	"RF Blanking Time (1)" Lead time before pre-sweep
Pre-Sweep	Start of sweep signal generation <ul style="list-style-type: none"> <li>• Provides settling of the signal before the actual measurement</li> <li>• the power value "Pre-Sweep (2b)" defines the starting point</li> <li>• "Pre-sweep (2b)" level, "Start Level (3a)" and the internal dwell time determine the indicated "Pre-sweep Time (2a)"</li> </ul>
Power sweep	<ul style="list-style-type: none"> <li>• "Sweep Time (3a)", the time of active measurement</li> <li>• "Range (3b)"                             <ul style="list-style-type: none"> <li>– The sweep range the measurement is performed</li> <li>– RF Blanking and Pre-Sweep are not considered</li> <li>– The upper level value always corresponds to the set RF level (3d), the corresponding lower level is derived from the upper level and the range</li> <li>– With ascending slope, the "Stop Level (3d) = RF level", and the "Start Level (3c)" is derived</li> <li>– Vice versa for a falling slope, the power sweep starts at the RF level, see <a href="#">Example"Baseband Power Sweep with descending slope"</a> on page 12.</li> <li>– "Power Step (3e)" and "Dwell Time (3f)" define either the power step size, or the sweep step length for "Stair Step" sweeps. One of the two parameters can be optionally set, the other is calculated and displayed accordingly.</li> </ul> </li> </ul>

Functions	Description
Fall / Rise Time (Post-sweep time)	"Fall Time (4)" <ul style="list-style-type: none"> <li>The time span the signal requires to return from the "Stop Level" to the initial level at sweep start</li> <li>With ascending slope, the graph shows the fall time at the end of the sweep The "Rise Time" appears, when you generate the signal with descending slope, see <a href="#">Example"Baseband Power Sweep with descending slope"</a> on page 12.</li> </ul>
Sweep range	Defined level value range
"Sweep Time"	Defined duration of a sweep cycle
Additional signal characteristics	Indicated relevant key parameters: <ul style="list-style-type: none"> <li>"Resolution (5a)" Resolution of the instrument hardware, which determines the current increment of the configured sweep signal</li> <li>"Sample Rate (5b)" Number of samples, resulting from the resolution</li> </ul>
"Slope"	Direction (rising or falling) of the power sweep signal

**Example: Baseband Power Sweep with descending slope**

The following figure shows the example from above with the same settings, but with descending slope.



**Figure 2-2: Example of a stair step power sweep with descending slope**

3c, 3d = changed upper and lower level (start & stop)

4 = Rise instead of Fall time (post-sweep time)

The sweep starts at the upper power value ("Start Level (3c)", the RF level, and stops at the low value ("Stop Level (3d)"). The "Rise Time (4)" is the time span the signal requires to return to the start level (post-sweep time).

**Constant mode**

You can define an attenuation value in constant mode. Based on the RF level, the function calculates the constant sweep power over the sweep range. The following figure shows the corresponding parameters on the example of a "Stair Step" sweep.

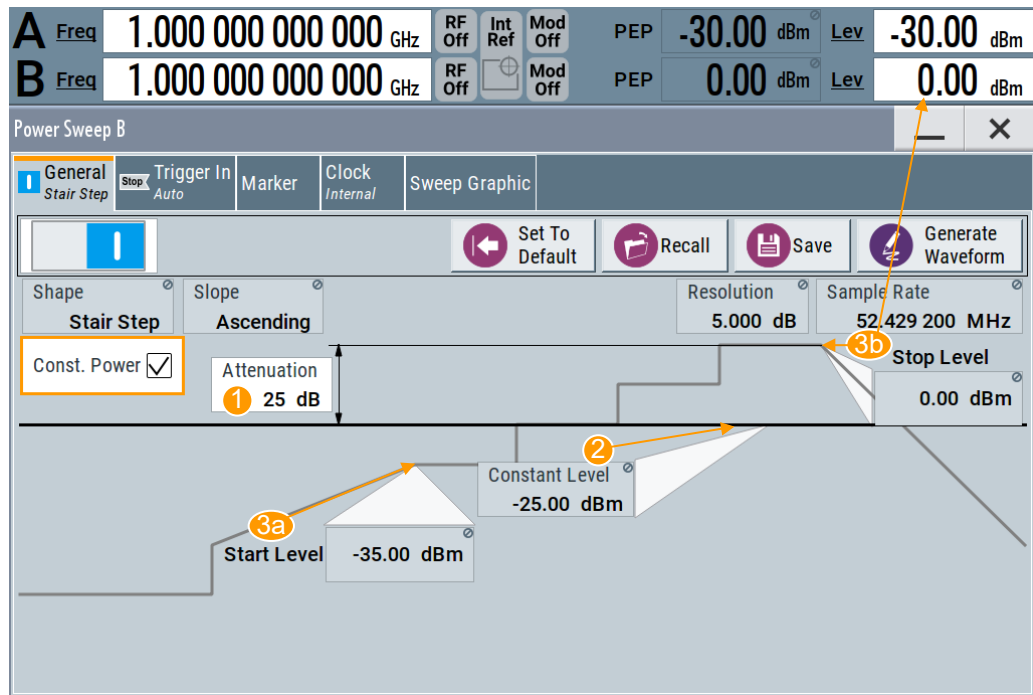


Figure 2-3: Characteristic parameters defining the power sweep

- 1 = constant power attenuation
- 2 = constant sweep power
- 3a, 3b = range

Apart from the parameters mentioned under [Chapter 2.2, "Correlating parameters"](#), on page 9, the following distinctive features apply to constant mode.

Table 2-2: Correlating parameters of constant power sweep

Functions	Description
Attenuation	"Attenuation (1)" <ul style="list-style-type: none"> <li>• Adjustable constant attenuation related to the RF level</li> <li>• Both parameters determine the resulting constant sweep power "(2)"</li> <li>• Relates to the active sweep range, that means from "Start Level (3a)" to "Stop Level (3b)"</li> <li>• RF Blanking and Pre-Sweep are not considered</li> </ul>
Constant Sweep Power	"Constant sweep power (2)" <ul style="list-style-type: none"> <li>• Derived from the RF level and the attenuation</li> <li>• Relates to the sweep range, i.e. the active measurement</li> <li>• RF Blanking and Pre-Sweep are not considered</li> </ul>

## 3 Baseband power sweep configuration and settings

Access:

- ▶ Select "Baseband > Misc > Power Sweep".

The remote commands required to define these settings are described in [Chapter 5, "Remote-control commands"](#), on page 33.

Settings:

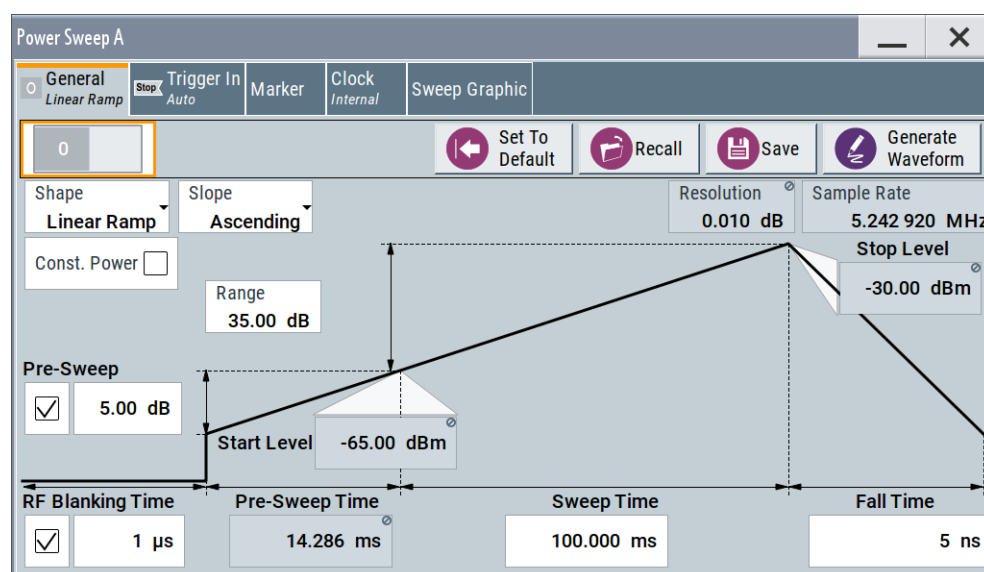
- [General settings](#)..... 14
- [Power sweep settings](#)..... 16
- [Trigger settings](#)..... 20
- [Marker settings](#)..... 25
- [Clock settings](#)..... 27
- [Local and global connectors settings](#)..... 28
- [Sweep graphic](#)..... 28

### 3.1 General settings

Access:

- ▶ Select "Baseband" > "Misc" > "Power Sweep".

This tab provides access to the default and the "Save/Recall" settings, and the settings for configuring the I/Q power sweep of the digital baseband signal.



The remote commands required to define these settings are described in [Chapter 5.2, "General commands"](#), on page 38.

### Settings:

<a href="#">State</a> .....	15
<a href="#">Set to Default</a> .....	15
<a href="#">Save/Recall</a> .....	15
<a href="#">Generate Waveform File</a> .....	15

### State

Activates the power sweep.

Switching on this option, turns off all the other sweeps in the corresponding signal path.

Remote command:

[\[:SOURce<hw>\]:BB:PRAMp:STATe](#) on page 40

### Set to Default

Sets the default settings, see [Chapter A.1, "Baseband power sweep default values"](#), on page 55.

Remote command:

[\[:SOURce<hw>\]:BB:PRAMp:PRESet](#) on page 38

### Save/Recall

Accesses the "Save/Recall" dialog, that is the standard instrument function for saving and recalling the complete dialog-related settings in a file. The provided navigation possibilities in the dialog are self-explanatory.

The settings are saved in a file with predefined extension. You can define the filename and the directory, in that you want to save the file.

See also, chapter "File and Data Management" in the R&S SMW user manual.

The power sweep settings are stored as files with the predefined file extension `*.pwr_ramp`.

Remote command:

[\[:SOURce<hw>\]:BB:PRAMp:SETTing:CATalog?](#) on page 39

[\[:SOURce<hw>\]:BB:PRAMp:SETTing:LOAD](#) on page 39

[\[:SOURce<hw>\]:BB:PRAMp:SETTing:STORe](#) on page 39

[\[:SOURce<hw>\]:BB:PRAMp:SETTing:DELeTe](#) on page 39

### Generate Waveform File

With enabled signal generation, triggers the instrument to save the current settings of an arbitrary waveform signal in a waveform file with predefined extension `*.wv`. You can define the filename and the directory, in that you want to save the file.

Using the ARB modulation source, you can play back waveform files and/or process the file to generate multi-carrier or multi-segment signals.

Remote command:

[\[:SOURce<hw>\]:BB:PRAMp:WAVEform:CREate](#) on page 40

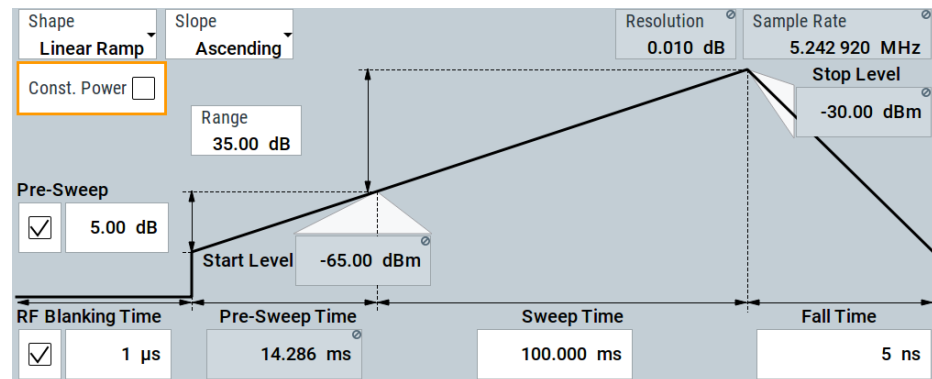
### 3.2 Power sweep settings

Access:

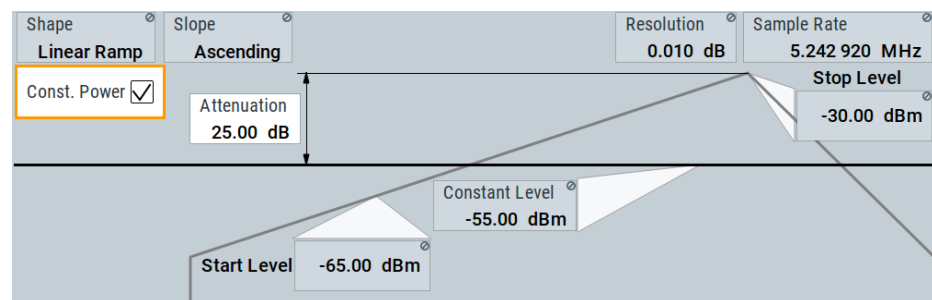
- ▶ Select "Baseband" > "Misc" > "Power Sweep" > "General".

Table 3-1: Power sweep settings and the correlating constant level indication

#### Linear Ramp



#### Constant value of linear ramp



The center of the "General" tab shows the sweep signal graphically according to the selected [Shape](#). You can perform the settings directly in the diagram. Impacts or interactions between the parameters are adjusted immediately (see also [Chapter 2.2, "Correlating parameters"](#), on page 9). For the graphical representation of all available power sweep shapes, see [Representation of the power sweep shapes in the settings dialog](#).

The remote commands required to define these settings are described in [Chapter 5.3, "Power sweep commands"](#), on page 40.

#### Settings:

<a href="#">Shape</a> .....	17
<a href="#">Slope</a> .....	17
<a href="#">Resolution</a> .....	17
<a href="#">Sample Rate</a> .....	17
<a href="#">Const. Power</a> .....	18



L Attenuation.....	18
L Constant Level.....	18
Range.....	18
Start Level / Stop Level.....	18
Pre-Sweep.....	18
RF Blanking Time.....	18
Power Step.....	19
Dwell Time.....	19
Sweep Time.....	19
Fall Time / Rise Time / Post-Sweep Time.....	19

### Shape

Selects the form of the sweep curve.

- "Linear Ramp" The sweep sequence resembles a sawtooth.  
A sweep runs from the initial level to stop level and returns to the initial level in the specified fall time.
- "Stair Step" The sweep sequence proceeds step by step.  
A sweep runs from the initial level and switches automatically to the next step when the **Dwell Time** has elapsed. When the top level is reached the signal returns to the initial level in the specified fall time.
- "Triangle" The sweep sequence resembles a triangle with the ascending and descending sides of equal length.  
A sweep runs from the initial level to top level and back.

Remote command:

[ :SOURce<hw> ] :BB:PRAMp:RAMP:SHAPE on page 44

### Slope

Defines the direction (rising or falling) of the power sweep signal.

- "Ascending" The waveform is rising, that means, the sweep starts from the bottom up (positive slope).
- "Descending" The waveform is falling. The sweep starts from the top down (negative slope).

Remote command:

[ :SOURce<hw> ] :BB:PRAMp:RAMP:SLOPe on page 45

### Resolution

Displays how the instrument resolves the power step size for the currently set power sweep.

Remote command:

[ :SOURce<hw> ] :BB:PRAMp:RAMP:RESolution? on page 44

### Sample Rate

Displays the internally derived sample rate.

Remote command:

[ :SOURce<hw> ] :BB:PRAMp:RAMP:SAMPlerate? on page 44

**Const. Power**

Selects the display of constant power (see "Constant mode" on page 12).

Remote command:

[ :SOURce<hw> ] :BB:PRAMp:RAMP:CONStmode on page 42

**Attenuation ← Const. Power**

Sets a constant attenuation for the power sweep. This value refers to the RF level set in the instrument.

Remote command:

[ :SOURce<hw> ] :BB:PRAMp:RAMP:ATTenuation on page 41

**Constant Level ← Const. Power**

Displays the constant power of the power sweep. The value is derived from the RF signal level of the instrument and the attenuation over the sweep range (see also "Constant mode" on page 12).

Remote command:

[ :SOURce<hw> ] :BB:PRAMp:RAMP:LEVel? on page 42

**Range**

Determines the sweep range.

The upper and lower sweep power values are calculated relative to the signal level set in the instrument.

Remote command:

[ :SOURce<hw> ] :BB:PRAMp:RAMP:RANGe on page 43

**Start Level / Stop Level**

Indicates the power values at the beginning and the end of the measurement.

Remote command:

[ :SOURce<hw> ] :BB:PRAMp:RAMP:StARtlevel? on page 46

[ :SOURce<hw> ] :BB:PRAMp:RAMP:StOPlevel? on page 46

**Pre-Sweep**

Activates the pre-sweep and displays the input field to specify the start level value for the pre-sweep.

The pre-sweep level value, expressed in dB, is added to the start level. Thus the signal generation starts before the actual measurement, and the signal has therefore a certain ramp-up time to achieve a steady state, see also [Sweep graphic](#).

The instrument indicates the internally derived ramp-up time on the time axis.

Remote command:

[ :SOURce<hw> ] :BB:PRAMp:RAMP:PREsweep:StATe on page 43

[ :SOURce<hw> ] :BB:PRAMp:RAMP:PREsweep [ :LEVel ] on page 43

[ :SOURce<hw> ] :BB:PRAMp:RAMP:PREsweep:TIME on page 43

**RF Blanking Time**

Activates RF output blanking, and then indicates the input field to specify the duration for RF blanking.

Blanking switches off the RF signal temporarily, until the signal has settled to a steady state, see [Sweep graphic](#).

Using this function, you can protect a sensitive DUT as you feed a stable signal at the start of the measurement.

Remote command:

[ :SOURce<hw> ] :BB:PRAMp:RAMP:BLANk [ :STATe ] on page 41

[ :SOURce<hw> ] :BB:PRAMp:RAMP:BLANk:TIME on page 41

### Power Step

Activates the "Power Step" for stair step shapes, and thus the edit mode for the level input field to specify the increment of a power step (step size).

**Note:** The instrument calculates either the power step, or the [Dwell Time](#) based on the sweep time and level sweep range. It depends on the parameter that you want to specify, enabled by the checkbox.

You can determine only one of the two values.

Remote command:

[ :SOURce<hw> ] :BB:PRAMp:RAMP:STAIr:STEP [ :STATe ] on page 46

[ :SOURce<hw> ] :BB:PRAMp:RAMP:STAIr:STEP:LEVeL on page 46

### Dwell Time

Activates the "Dwell Time" for stair step shapes, and thus the edit mode for the input field to specify the duration of a sweep step.

**Note:** The instrument calculates either the dwell time, or the [Power Step](#) based on the sweep time and level sweep range. It depends on the parameter that you want to specify, enabled by the checkbox. Therefore, you can determine only one of the two values.

Remote command:

[ :SOURce<hw> ] :BB:PRAMp:RAMP:STAIr:DWELl [ :STATe ] on page 45

[ :SOURce<hw> ] :BB:PRAMp:RAMP:STAIr:DWELl:TIME on page 45

### Sweep Time

Determines the measurement duration of a sweep cycle.

Remote command:

[ :SOURce<hw> ] :BB:PRAMp:RAMP:SWEep:TIME on page 47

### Fall Time / Rise Time / Post-Sweep Time

Specifies the time that the signal needs to return from the "Stop Level" to the initial level.

The initial level is the "Pre-Sweep Level", if set, or the "Start Level".

**Note:** Triangle sweep signals without pre-sweep generally return to the "Start Level". The next sweep starts when the "Pre-Sweep Time" has elapsed. The R&S SMW displays the "Pre-Sweep Time" instead of "Fall or Rise Time" (see [Chapter A.2, "Representation of the power sweep shapes in the settings dialog"](#), on page 56).

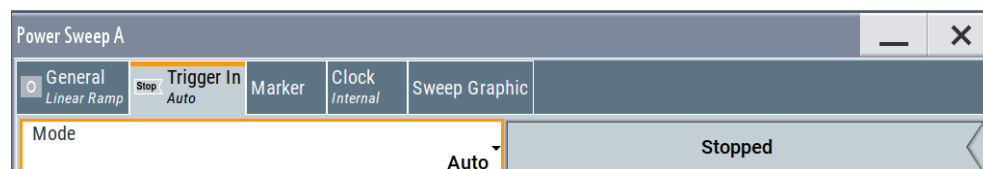
Remote command:

[ :SOURce<hw> ] :BB:PRAMp:RAMP:FALL:TIME on page 42

### 3.3 Trigger settings

Access:

- ▶ Select "Baseband" > "Misc" > "Power Sweep" > "Trigger In".



This tab provides settings to select and configure the trigger, like trigger source, trigger mode and trigger delays, and to arm or trigger an internal trigger manually. The header of the tab displays the status of the trigger signal and trigger mode. As in the tabs "Marker" and "Clock", this tab provides also access to the settings of the related connectors.

#### Routing and activating a trigger signal

1. Define the effect of a trigger event and the trigger signal source.
  - a) Select "Trigger In" > "Mode".
  - b) Select "Trigger In" > "Source".
2. For external trigger signals, define the connector for signal input. See [Chapter 3.6, "Local and global connectors settings"](#), on page 28.  
You can map trigger signals to one or more USER x or T/M connectors.  
Local and global connectors settings allow you to configure the signal mapping, the polarity, the trigger threshold and the input impedance of the input connectors.
3. Activate baseband signal generation. In the block diagram, set "Baseband" > "On".  
The R&S SMW starts baseband signal generation after the configured trigger event.

#### About baseband trigger signals

This section focuses on the available settings.

For information on how these settings affect the signal, refer to section "Basics on ..." in the R&S SMW user manual.

The remote commands required to define these settings are described in [Chapter 5.4, "Trigger commands"](#), on page 47.


#### Settings:

<a href="#">Trigger settings common to all basebands</a> .....	21
<a href="#">Mode</a> .....	21
<a href="#">Signal Duration Unit</a> .....	22
<a href="#">Signal Duration</a> .....	22
<a href="#">Running/Stopped</a> .....	22

Time Based Trigger.....	22
Trigger Time.....	22
Arm.....	23
Execute Trigger.....	23
Source.....	23
Sync. Output to External Trigger/Sync. Output to Trigger.....	23
External Inhibit/Trigger Inhibit.....	24
External Delay/Trigger Delay.....	24

### Trigger settings common to all basebands

To enable simultaneous signal generation in all basebands, the R&S SMW couples the trigger settings in the available basebands in any instrument's configuration involving signal routing with signal addition. For example, in MIMO configuration, routing and summing of basebands or of streams.

The icon  indicates that common trigger settings are applied.

You can access and configure the common trigger source and trigger mode settings in any of the basebands. An arm or a restart trigger event applies to all basebands, too. You can still apply different delay to each of the triggers individually.

### Mode

Selects trigger mode, i.e. determines the effect of a trigger event on the signal generation.

For more information, refer to chapter "Basics" in the R&S SMW user manual.

- "Auto"  
The signal is generated continuously.
- "Retrigger"  
The signal is generated continuously. A trigger event (internal or external) causes a restart.
- "Armed Auto"  
The signal is generated only when a trigger event occurs. Then the signal is generated continuously.  
An "Arm" stops the signal generation. A subsequent trigger event (internal or external) causes a restart.
- "Armed Retrigger"  
The signal is generated only when a trigger event occurs. Then the signal is generated continuously. Every subsequent trigger event causes a restart.  
An "Arm" stops signal generation. A subsequent trigger event (internal or external) causes a restart.
- "Single"  
The signal is generated only when a trigger event occurs. Then the signal is generated once to the length specified at "Signal Duration".  
Every subsequent trigger event (internal or external) causes a restart.

**Note:** You can specify the number of repetitions of the power sweep (1 to N):  
Select "Single" mode, and set the parameter "Signal Duration". The R&S SMW repeats the sweep cycle continuously according to the set signal duration.

Remote command:

[ :SOURce<hw> ] :BB:PRAMP [ :TRIGger ] :SEQUence on page 47

**Signal Duration Unit**

Defines the unit for describing the length of the signal sequence to be output in the "Single" trigger mode.

Remote command:

[\[:SOURce<hw>\]:BB:PRAMp:TRIGger:SLUNit](#) on page 50

**Signal Duration**

Requires trigger "Mode" > "Single".

Enters the length of the trigger signal sequence.

Use this parameter, for example, for the following applications:

- To output the trigger signal partly.
- To output a predefined sequence of the trigger signal.

Remote command:

[\[:SOURce<hw>\]:BB:PRAMp:TRIGger:SLENgth](#) on page 49

**Running/Stopped**

With enabled modulation, displays the status of signal generation for all trigger modes.

- "Running"  
The signal is generated; a trigger was (internally or externally) initiated in triggered mode.
- "Stopped"  
The signal is not generated and the instrument waits for a trigger event.

Remote command:

[\[:SOURce<hw>\]:BB:PRAMp:TRIGger:RMODe?](#) on page 49

**Time Based Trigger**

Requires trigger "Mode" > "Armed Auto"/"Single".

Activates time-based triggering with a fixed time reference.

The R&S SMW triggers signal generation when its operating system time ("Current Time") matches a specified time trigger ("Trigger Time"). As trigger source, you can use an internal trigger or an external global trigger.

How to: Chapter "Time-based triggering" in the R&S SMW user manual.

Remote command:

[\[:SOURce<hw>\]:BB:PRAMp:TRIGger:TIME\[:STATe\]](#) on page 52

**Trigger Time**

Requires trigger "Mode" > "Armed Auto"/"Single".

Sets date and time for a time-based trigger signal.

Set a trigger time that is later than the "Current Time". The current time is the operating system time of the R&S SMW. If you set an earlier trigger time than the current time, time-based triggering is not possible.

How to: Chapter "Time-based triggering" in the R&S SMW user manual.

"Date" Sets the date of the time-based trigger in format YYYY-MM-DD.

Remote command:

[\[:SOURce<hw>\]:BB:PRAMp:TRIGger:TIME:DATE](#) on page 51

"Time" Sets the time of the time-based trigger in format hh:mm:ss.  
 Remote command:  
[\[:SOURce<hw>\]:BB:PRAMp:TRIGger:TIME:TIME](#) on page 52

### Arm

Stops the signal generation until subsequent trigger event occurs.

Remote command:  
[\[:SOURce<hw>\]:BB:PRAMp:TRIGger:ARM:EXECute](#) on page 48

### Execute Trigger

For internal trigger source, executes trigger manually.

Remote command:  
[\[:SOURce<hw>\]:BB:PRAMp:TRIGger:EXECute](#) on page 48

### Source

Selects the trigger source.

The following sources of the trigger signal are available:

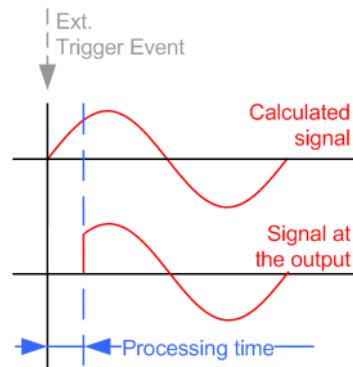
- "Internal"  
The trigger event is executed manually by the "Execute Trigger".
- "Internal (Baseband A/B)"  
The trigger event is provided by the trigger signal from the other basebands. If common trigger settings are applied, this trigger source is disabled.
- "External Global Trigger"  
The trigger event is the active edge of an external trigger signal provided and configured at the USER x connectors.
- "External Local Trigger"  
The trigger event is the active edge of an external trigger signal provided and configured at the local T/M/C connector.  
With coupled trigger settings, the signal has to be provided at the T/M/C1/2/3 connectors.
- "External Local Clock"  
The trigger event is the active edge of an external local clock signal provided and configured at the local T/M/C connector.  
With coupled trigger settings, the signal has to be provided at the T/M/C1 connector.

Remote command:  
[\[:SOURce<hw>\]:BB:PRAMp:TRIGger:SOURce](#) on page 50

### Sync. Output to External Trigger/Sync. Output to Trigger

Enables signal output synchronous to the trigger event.

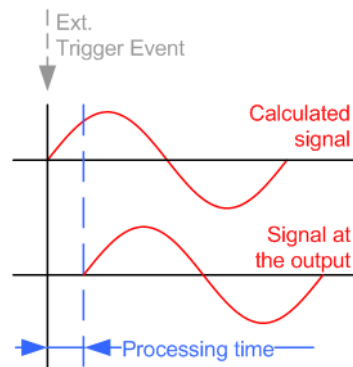
- "On"  
Corresponds to the default state of this parameter.  
The signal calculation starts simultaneously with the trigger event. Because of the processing time of the instrument, the first samples are cut off and no signal is output. After elapsing of the internal processing time, the output signal is synchronous to the trigger event.



- "Off"

The signal output begins after elapsing of the processing time. Signal output starts with sample 0. The complete signal is output.

This mode is recommended for triggering of short signal sequences. Short sequences are sequences with signal duration comparable with the processing time of the instrument.



Remote command:

`[ :SOURce<hw> ] :BB:PRAMp:TRIGger:EXTernal:SYNChronize:OUTPut`

on page 48

### External Inhibit/Trigger Inhibit

Applies for external trigger signal or trigger signal from the other path.

Sets the duration with that any following trigger event is suppressed. In "Retrigger" mode, for example, a new trigger event does not cause a restart of the signal generation until the specified inhibit duration does not expire.

For more information, see chapter "Basics" in the R&S SMW user manual.

Remote command:

`[ :SOURce<hw> ] :BB:PRAMp:TRIGger[:EXTernal<ch>]:INHibit` on page 51

`[ :SOURce<hw> ] :BB:PRAMp:TRIGger:OBASeband:INHibit` on page 49

### External Delay/Trigger Delay

Delays the trigger event of the signal from:

- The external trigger source
- The other path
- The other basebands (internal trigger), if common trigger settings are used.



Use this setting to:

- Synchronize the instrument with the device under test (DUT) or other external devices
- Postpone the signal generation start in the basebands compared to each other

For more information, see chapter "Basics on ..." in the R&S SMW user manual.

Remote command:

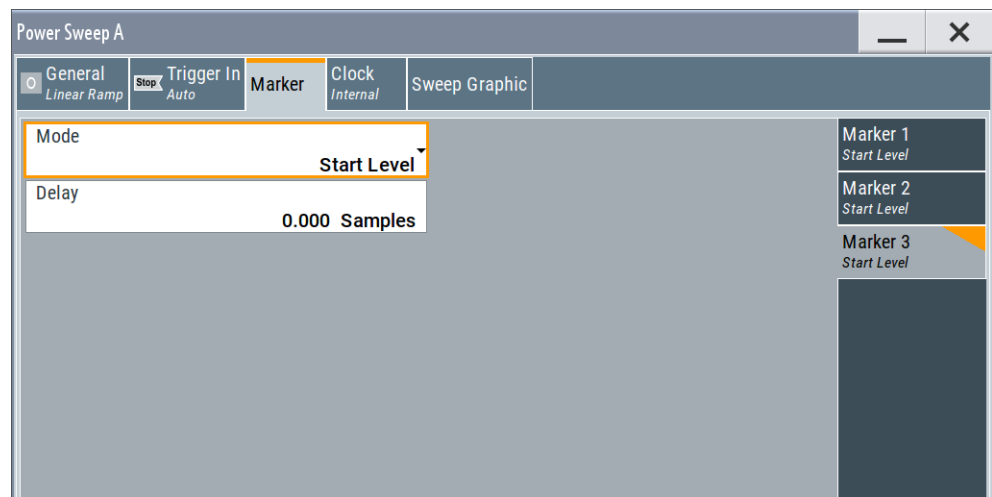
[ :SOURce<hw> ] :BB:PRAMP:TRIGger [ :EXTernal<ch> ] :DELay on page 51

[ :SOURce<hw> ] :BB:PRAMP:TRIGger:OBASeband:DELay on page 48

## 3.4 Marker settings

Access:

- ▶ Select "Baseband" > "Misc" > "Power Sweep" > "Marker".



This tab provides settings to select and configure the marker output signal including marker mode and marker delay.

### Routing and activating a marker signal

1. To define the signal shape of an individual marker signal "x", select "Marker" > "Marker x" > "Mode".
2. Optionally, define the connector for signal output. See [Chapter 3.6, "Local and global connectors settings"](#), on page 28.  
You can map marker signals to one or more USER x or T/M connectors.
3. Activate baseband signal generation. In the block diagram, set "Baseband" > "On".  
The R&S SMW adds the marker signal to the baseband signal. Also, R&S SMW outputs this signal at the configured USER x connector.

### About marker output signals

This section focuses on the available settings.

For information on how these settings affect the signal, refer to section "Basics on ..." in the R&S SMW user manual.

The remote commands required to define these settings are described in [Chapter 5.5, "Marker commands"](#), on page 53.

### Settings:

<a href="#">Mode</a> .....	26
<a href="#">Delay</a> .....	26

### Mode

Marker configuration for up to 3 markers. The settings are used to select the marker mode defining the shape and periodicity of the markers. The contents of the dialog change with the selected marker mode.

How to: ["Routing and activating a marker signal"](#) on page 25

"Unchanged"	The marker signal remains unchanged.
"RF Blanking"	Generates a marker signal when RF blanking starts.
"Pre-Sweep Level"	Generates a marker signal when the sweep signal passes the pre-sweep power value.
"Start level"	Generates a marker signal when the sweep signal passes the set start power.
"Stop Level"	Generates a marker signal when the sweep signal reaches the defined stop power.

Remote command:

[\[:SOURce<hw>\]:BB:PRAMp:TRIGger:OUTPut<ch>:MODE](#) on page 53

### Delay

Delays the marker signal at the marker output relative to the signal generation start.

Variation of the parameter "Marker x" > "Delay" causes signal recalculation.

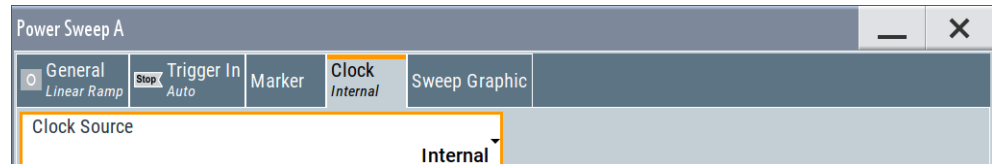
Remote command:

[\[:SOURce<hw>\]:BB:PRAMp:TRIGger:OUTPut<ch>:DELay](#) on page 53

## 3.5 Clock settings

Access:

- ▶ Select "Baseband" > "Misc" > "Power Sweep" > "Clock".



This tab provides settings to select and configure the clock signal, like the clock source and clock mode.

### Defining the clock

1. Select "Clock" > "Source" to define the source of clock signal.
2. For external clock signals, define the connector for signal input. See [Chapter 3.6, "Local and global connectors settings"](#), on page 28.  
You can map clock signals to one or more USER x or T/M connectors.  
Local and global connectors settings allow you to configure the signal mapping, the polarity, the trigger threshold and the input impedance of the input connectors.
3. Activate baseband signal generation. In the block diagram, set "Baseband" > "On".  
The R&S SMW starts baseband signal generation with a symbol rate that equals the clock rate.

### About clock signals

This section focuses on the available settings.

For information on how these settings affect the signal, refer to section "Basics on ..." in the R&S SMW user manual.

The remote commands required to define these settings are described in [Chapter 5.6, "Clock commands"](#), on page 54.

### Settings:

<a href="#">Clock Source</a> .....	27
<a href="#">Clock Mode</a> .....	28
<a href="#">Measured External Clock</a> .....	28

### Clock Source

Selects the clock source.

- "Internal"  
The instrument uses its internal clock reference.
- "External Local Clock"  
Option: R&S SMW-B10

The instrument expects an external clock reference at the local T/M/C connector.

How to: ["Defining the clock"](#) on page 27

Remote command:

[ :SOURce<hw> ] :BB:PRAMp:CLOCK:SOURce on page 54

#### **Clock Mode**

Sets the type of externally supplied clock.

Remote command:

[ :SOURce<hw> ] :BB:PRAMp:CLOCK:MODE on page 54

#### **Measured External Clock**

Provided for permanent monitoring of the enabled and externally supplied clock signal.

Remote command:

CLOCK:INPut:FREQuency?

## 3.6 Local and global connectors settings

Accesses a dialog to configure local connectors or global connectors.

The button is available in the following dialogs or tabs:

- "Trigger / Marker / Clock" dialog that is accessible via the "TMC" block in the block diagram.
- "Trigger In", "Marker" and "Clock" tabs that are accessible via the "Baseband" block in the block diagram.



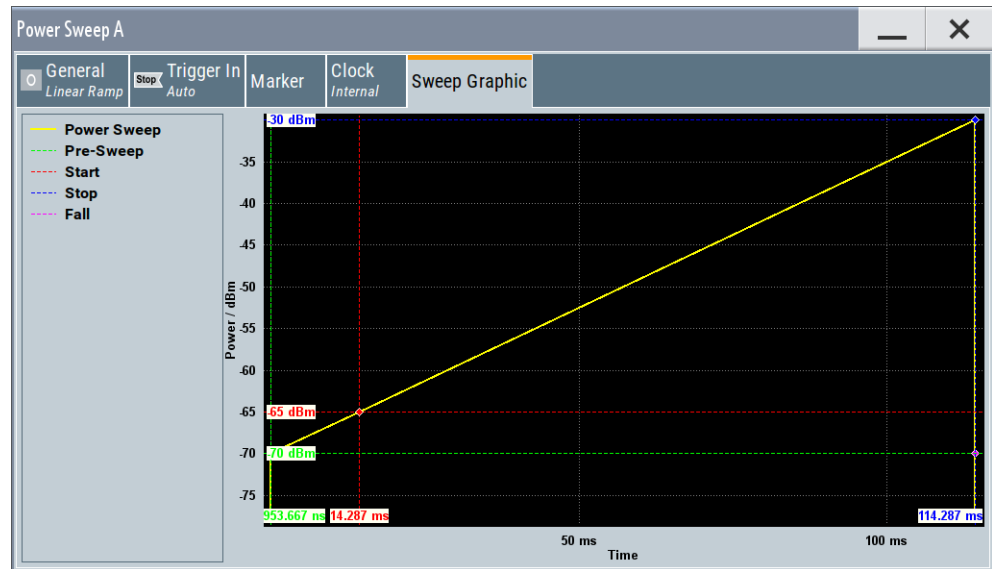
See also chapter "Local and global connectors settings" in the user manual.

## 3.7 Sweep graphic

Access:

- ▶ Select "Baseband" > "Misc" > "Power Sweep" > "General".

This tab graphically displays the currently configured signal.



This representation enables you to verify the configured power sweep signal quickly.

**Example:**

The example shows the resulting power and time parameters of the sweep with a staircase shape, see [Graphical representation of the configuration example](#).



The settings deviating from default are denoted by a different color, performed with the function "Mark all parameters changed from Preset".

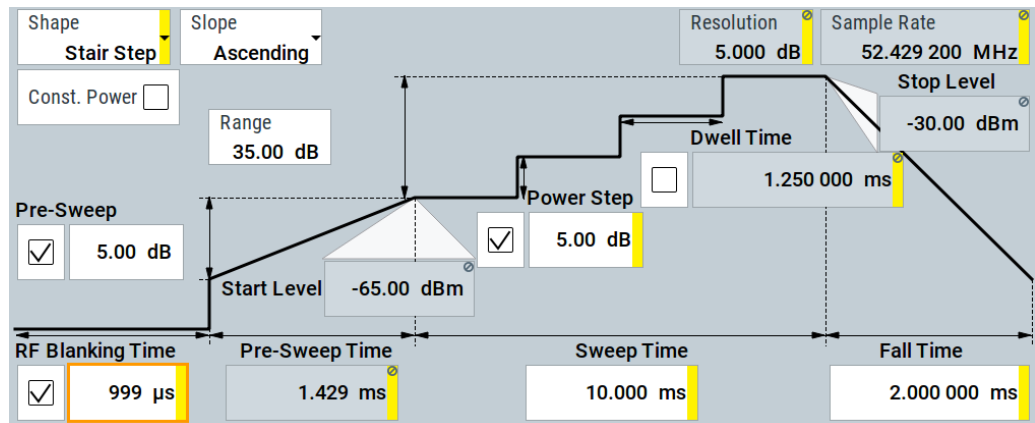
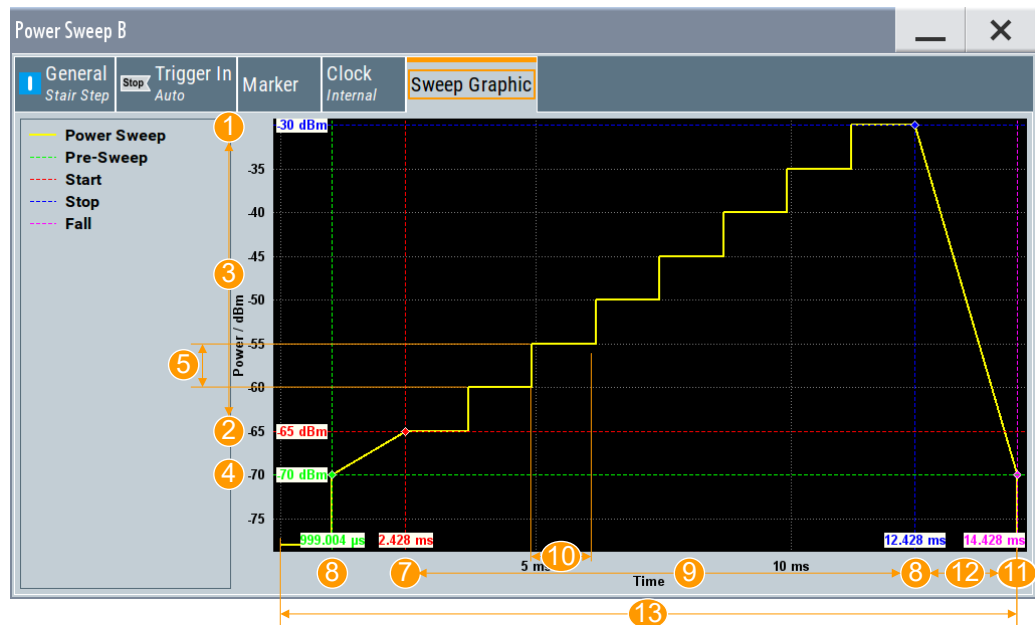


Figure 3-1: Configuration example for a power sweep

The R&S SMW immediately adjusts the settings display in the "Sweep Graphic" tab.



**Figure 3-2: Graphical representation of the configuration example**

- 1, 2 = Stop / Start level
- 3 = Range
- 4 = Pre-sweep level
- 5 = Power step
- 6 = RF Blanking time
- 7 = Sweep start time (Pre-sweep time)
- 8 = Sweep stop time
- 9 = Sweep time
- 10 = Dwell time
- 11 = Sweep restart (end of sweep cycle)
- 12 = Fall time
- 13 = Sweep cycle

Let us now have a look at the settings, to verify quickly the signal with the values shown in the graph:

- (1) *Stop level = RF level = -30 dB* (upper level = "RF Lev")
- (2) *Start level = Stop level - Range = -30 dBm - 35 dB = -65 dBm*
- (4) *Pre-sweep level = Start level - Pre-Sweep = -65 dBm - 5 dBm = -70 dBm*
- (5) RF blanking time = 1 ms (setting)
- (6) Pre-sweep time = 1,429 (internally derived)
- (7) *Sweep start time = Pre-Sweep time + RF Blanking time = 1 ms + 1,429 ms = 2,429 ms*
- (9) *Sweep stop time = Sweep start time + Sweep time = 2,429 ms + 10 ms = 12,429 ms*
- (11) *Sweep restart = Sweep stop time + Fall time = 12,429 + 2 ms = 14,429 ms*
- (12) *Fall time = Sweep restart time - Sweep stop time = 2 ms*
- (13) Complete sweep interval = RF Blanking time + Pre-Sweep time + Sweep Time + Fall time

## 4 Application example

The main application fields of signals generated with baseband power sweep are amplifier tests, e.g. to determine the 1 dB compression point of an amplifier.

An ideal device amplifies the signal from the input to the output in strict proportion. But above a certain input level, a real amplifier achieves saturation, resulting in non-linearity. To determine this maximum input level, the intercept point determination is used.

The 1dB compression point is obtained graphically by tracing the output power versus the input power in logarithmic scale [dBm]. This representation shows the linearity by means of 1 dB nominal gain. When the maximum input level is exceeded, the output power decreases, and the amplifier behaves non-linear. The point where the curve intersects is the intercept point.

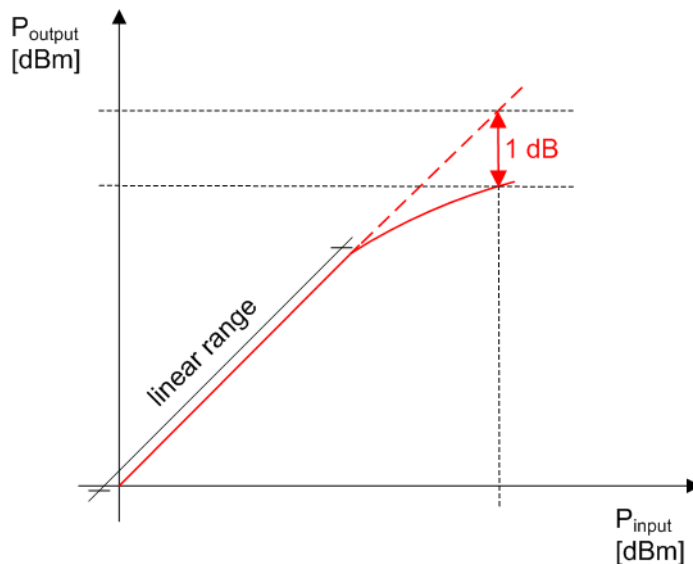
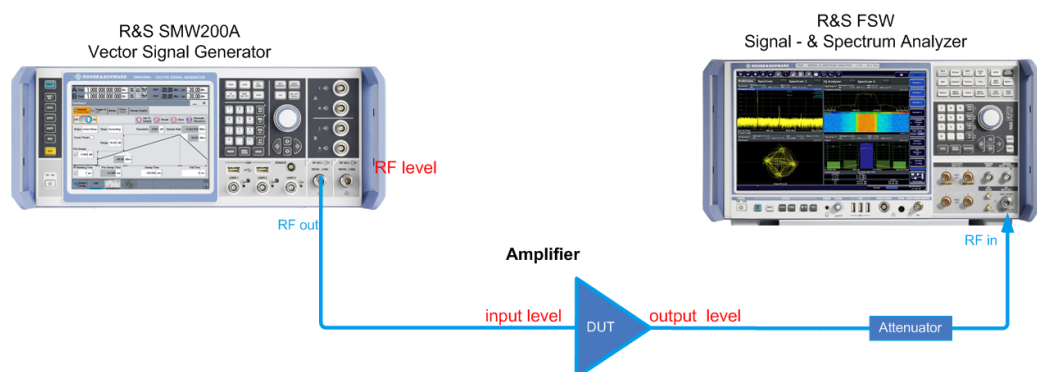


Figure 4-1: Correlation between the input power and output power of an amplifier with the 1 dB compression point

### Determining the 1dB compression point of an amplifier

The following example briefly explains the main steps to be taken for setting up a measurement in order to determine the 1 dB compression point of an amplifier.



The test setup consists of the R&S SMW, a signal analyzer, for example the R&S FSW, and the amplifier as the device under test (DUT). The signal generator creates a base-band power ramp signal with varying signal level. The frequency remains constant. The signal analyzer measures the amplifier's output signal.



The example below focuses on the power sweep settings to provide the test signal. It is assumed that ...

- The test setup has been established, including the connections for marker signals.
- The maximum input power of the analyzer is considered accordingly, e.g. protected by the attenuator
- The test setup has been calibrated.

For details, see the application note "Measuring with Modern Spectrum Analyzers" (1MA201\_08e) for a detailed description on setting up the measurement.

### To configure power sweep signal...

As a typical application example, configure the signal as follows:

1. In the status bar, select "Freq > 2 GHz" and "Lev > 0 dBm".
2. In the block diagram, select "RF > Off".
3. Select "Baseband > Misc > Power Sweep...".  
The "Power Sweep" dialog opens.
4. In the "General" tab, select "Set To default" to start from an initial state.
5. Select "RF Blanking Time > 1 ms".
6. Select "Sweep Time > 1 s".
7. In the context sensitive menu, select "Mark all parameters changed from Preset" to indicate the modified settings.  
All modified settings and parameters are colored.
8. In the "Marker" tab, select "Marker 1 > Pre-sweep level", "Marker 2 > Start Level" and "Marker 3 > Stop Level".  
Using the marker signals, you can see when the sweep signal passes the significant thresholds, and thus supports you when evaluating the signal response of the amplifier (see also [Chapter 3.4, "Marker settings"](#), on page 25).
9. Via the "Local or Global connector settings", assign the marker signals to the corresponding outputs.
10. Select "State > On".
11. In the block diagram, select "RF State > On".



## 5 Remote-control commands

The following commands are required to generate signals with the R&S SMW-K542 option in a remote environment. It is assumed that, the R&S SMW is connected to a network for remote control, as described in the R&S SMW documentation. Basic knowledge of the remote control and the SCPI command syntax is required.



### Conventions used in SCPI command descriptions

For a description of the conventions used in the remote command descriptions, see section "Remote-Control Commands" in the R&S SMW user manual.

### Common suffixes

The following common suffixes are used in remote commands:

Suffix	Value range	Description
ENTity<ch>	1 .. 4	Entity in a multiple entity configuration ENTity3 4 require option R&S SMW-K76
SOURce<hw>	[1] to 4	Available baseband signals
OUTPut<ch>	1 to 3	Available markers



### Using SCPI command aliases for advanced mode with multiple entities

You can address multiple entities configurations by using the SCPI commands starting with the keyword `SOURce` or the alias commands starting with the keyword `ENTity`.

Note that the meaning of the keyword `SOURce<hw>` changes in the second case.

For details, see section "SCPI Command Aliases for Advanced Mode with Multiple Entities" in the R&S SMW user manual.

The following commands specific to the R&S SMW-K542 are described here:

- [Programming examples](#)..... 33
- [General commands](#)..... 38
- [Power sweep commands](#)..... 40
- [Trigger commands](#)..... 47
- [Marker commands](#)..... 53
- [Clock commands](#)..... 54

### 5.1 Programming examples

The corresponding sections of the same title provide simple programming examples for the R&S SMW. The purpose of the examples is to present **all** commands for a given task. In real applications, one would rather reduce the examples to an appropriate subset of commands.

The programming examples have been tested with a software tool which provides an environment for the development and execution of remote tests. To keep the examples as simple as possible, only the "clean" SCPI syntax elements are reported. Non-executable command lines (e.g. comments) start with two // characters.

At the beginning of the most remote control programs, it is recommended that you perform an instrument reset to set the R&S SMW to a defined state. The commands \*RST and SYSTem:PRESet are equivalent for this purpose. \*CLS also resets the status registers and clears the output buffer.

In the examples, it is assumed that:

- A remote PC is connected to the instrument
- The remote PC and the instrument are switched on
- The connection between them is established
- The security setting "System Config > Setup > Security > SCPI over LAN" is enabled

### Example: Save/Recall Files with user settings

This example shows how to query and load settings files, stored with the save/recall function.

```
// *****
// Reset instrument first
// *****
*RST; *CLS

MMEM:CDIR '/var/user/'
SOURcel:BB:PRAMP:SETTING:CATalog?
// Response: pramp_lin_settings,pramp_trian_settings, pramp_stairstep_settings
SOURcel:BB:PRAMP:SETTING:STORE 'pramp_stairstep_settings_new'
SOURcel:BB:PRAMP:SETTING:LOAD 'pramp_stairstep_settings_new'
SOURcel:BB:PRAMP:SETTING:DELeTe 'pramp_stairstep_settings'
SOURcel:BB:PRAMP:SETTING:CATalog?
// Response: ramp_lin_settings,pramp_trian_settings,
//           pramp_stairstep_settings_new

// Generate and store a waveform file in the current directory
SOURcel:BB:PRAMP:WAVeform:CREate "wv_pramp_stairstep"
```

**Example: Configure a power sweep**

This example shows how to configure a power sweep resembling a stair step shape.

```
// *****
// Set the instrument to a predefined state.
// *****
SOURCE1:BB:PRAMP:PRESet

// *****
// Select the sweep shape, the sweep range,
// and define the sweep step power size.
// *****
SOURCE1:BB:PRAMP:RAMP:SHAPE STAirstep
// SOURCE1:BB:PRAMP:RAMP:SHAPE LINear
// SOURCE1:BB:PRAMP:RAMP:SHAPE TRIangle
SOURCE1:BB:PRAMP:RAMP:SLOPe ASCending
// SOURCE1:BB:PRAMP:RAMP:SLOPe DESCending
SOURCE1:BB:PRAMP:RAMP:RANGE 30
SOURCE1:BB:PRAMP:RAMP:START:LEVel?
// Response: -60
// SOURCE1:BB:PRAMP:RAMP:STOP:LEVel?
// Response: -30
SOURCE1:BB:PRAMP:RAMP:STAIR:DWell:STATe 1
SOURCE1:BB:PRAMP:RAMP:STAIR:DWell:TIME 0.001
// SOURCE1:BB:PRAMP:RAMP:STAIR:STEP:STATe 1
// SOURCE1:BB:PRAMP:RAMP:STAIR:STEP:LEVel 0.01
// SOURCE1:BB:PRAMP:RAMP:SAMPLerate?

// *****
// Activate pre-sweep and RF blanking,
// and set the parameters.
// *****
SOURCE1:BB:PRAMP:RAMP:PREsweep:STATe 1
SOURCE1:BB:PRAMP:RAMP:PREsweep:LEVel 4
SOURCE1:BB:PRAMP:RAMP:PREsweep:TIME?
// Response: 13.333
SOURCE1:BB:PRAMP:RAMP:BLANK:STATe 1
SOURCE1:BB:PRAMP:RAMP:BLANK:TIME 0.000002
SOURCE1:BB:PRAMP:RAMP:PREsweep:TIME?
// 14.285

// *****
// Switch to constant mode, set the attenuation.
// Query the resulting constant power, the
// resolution and the start/stop level values
// of the active measurement.
// *****
SOURCE1:BB:PRAMP:RAMP:CONStmode 1
BB:PRAMP:RAMP:ATTenuation -20
SOURCE1:BB:PRAMP:RAMP:LEVel?
```

```
// Response: -50
SOURCE1:BB:PRAMP:RAMP:START:LEVEL?
// Response: -65
SOURCE1:BB:PRAMP:RAMP:STOP:LEVEL?
// Response: -30
SOURCE1:BB:PRAMP:RAMP:RESOLUTION?
// Response: 0.02
```

**Example: Adjusting clock, marker and trigger settings**

The following examples present the available commands:

```
// *****
// Clock settings
// *****
SOURCE1:BB:PRAMP:CLOCK:SOURCE INTERNAL
// SOURCE1:BB:PRAMP:CLOCK:SOURCE ELCL
SOURCE1:BB:PRAMP:CLOCK:MODE SAMPLE
SOURCE1:BB:PRAMP:CLOCK:MODE?
// SAMP

// *****
// Marker settings
// *****
SOURCE1:BB:PRAMP:TRIGGER:OUTPUT1:MODE START
// SOURCE1:BB:PRAMP:RAMP:START:LEVEL?
// -35
SOURCE1:BB:PRAMP:TRIGGER:OUTPUT2:MODE PRESWEEP
// SOURCE1:BB:PRAMP:RAMP:PRESWEEP:STATE 1
// SOURCE1:BB:PRAMP:RAMP:PRESWEEP?
// 5
SOURCE1:BB:PRAMP:TRIGGER:OUTPUT3:MODE RFBANKING
// SOURCE1:BB:PRAMP:RAMP:BLANK:STATE 1
// SOURCE1:BB:PRAMP:RAMP:BLANK:TIME?
// 0.000001
SOURCE1:BB:PRAMP:TRIGGER:OUTPUT1:MODE UNCHANGED
SOURCE1:BB:PRAMP:TRIGGER:OUTPUT2:MODE STOP
// SOURCE1:BB:PRAMP:RAMP:STOP:LEVEL?
// 0
SOURCE1:BB:PRAMP:TRIGGER:OUTPUT2:DELAY 16
// delays the marker signal output

// *****
// Trigger settings
// *****
SOURCE1:BB:PRAMP:TRIGGER:SEQUENCE SINGLE
SOURCE1:BB:PRAMP:TRIGGER:SLUNIT SEQ
SOURCE1:BB:PRAMP:TRIGGER:SLLENGTH 200
// the first 200 samples will be output after the next trigger event

SOURCE1:BB:PRAMP:TRIGGER:SEQUENCE RETRIGGER
SOURCE1:BB:PRAMP:TRIGGER:SOURCE EGT1
// external trigger signal must be provided at the connector
// configured for the External Global Trigger 1 signal
// SOURCE1:BB:PRAMP:TRIGGER:SOURCE EXTERNAL
// SOURCE1:BB:PRAMP:TRIGGER:EXTERNAL:SYNCHRONIZE:OUTPUT ON
// SOURCE1:BB:PRAMP:TRIGGER:EXTERNAL:DELAY 200
// SOURCE1:BB:PRAMP:TRIGGER:EXTERNAL:INHIBIT 100
```

```

SOURCE1:BB:PRAMP:TRIGGER:SOURCE INTB
// the internal trigger signal from the other path must be used
// SOURCE1:BB:PRAMP:TRIGGER:OBASband:DELay 25
// SOURCE1:BB:PRAMP:TRIGGER:OBASband:INHibit 10

SOURCE1:BB:PRAMP:TRIGGER:SOURCE INTernal
SOURCE1:BB:PRAMP:TRIGGER:SEQUence ARETrigger
SOURCE1:BB:PRAMP:TRIGGER:EXEcute
// executes a trigger, signal generation starts
SOURCE1:BB:PRAMP:TRIGGER:ARM:EXEcute
// signal generation stops
SOURCE1:BB:PRAMP:TRIGGER:EXEcute
// executes a trigger, signal generation starts again

SOURCE1:BB:PRAMP:TRIGGER:SEQUence AAUTO
SOURCE1:BB:PRAMP:TRIGGER:EXEC
SOURCE1:BB:PRAMP:TRIGGER:RMODE?
// RUN

```

**Example: Enable signal generation**

The following example configures automatic triggering and activates signal generation:

```

SOURCE1:BB:PRAMP:TRIGGER:SEQUence AUTO
SOURCE1:BB:PRAMP:TRIGGER:SOURCE INTernal
SOURCE1:BB:PRAMP:STAT ON

```

## 5.2 General commands

This section contains the commands for the general settings of the baseband power sweep, e.g. preset, or file handling commands for save/recall settings files.

**Commands:**

<a href="#">[:SOURCE&lt;hw&gt;]:BB:PRAMP:PRESet</a> .....	38
<a href="#">[:SOURCE&lt;hw&gt;]:BB:PRAMP:SETTing:CATalog?</a> .....	39
<a href="#">[:SOURCE&lt;hw&gt;]:BB:PRAMP:SETTing:DELete</a> .....	39
<a href="#">[:SOURCE&lt;hw&gt;]:BB:PRAMP:SETTing:LOAD</a> .....	39
<a href="#">[:SOURCE&lt;hw&gt;]:BB:PRAMP:SETTing:STORE</a> .....	39
<a href="#">[:SOURCE&lt;hw&gt;]:BB:PRAMP:STATe</a> .....	40
<a href="#">[:SOURCE&lt;hw&gt;]:BB:PRAMP:WAVEform:CREate</a> .....	40

**[\[:SOURCE<hw>\]:BB:PRAMP:PRESet](#)**

Sets the parameters of the power sweep to their default values (\*RST values specified for the commands).

Not affected is the state set with the command [\[:SOURCE<hw>\]:BB:PRAMP:STATe](#).

**Example:** See [Example "Configure a power sweep"](#) on page 35.

**Usage:** Event  
**Manual operation:** See ["Set to Default"](#) on page 15

#### **[:SOURce<hw>]:BB:PRAMp:SETTING:CATalog?**

Queries the files with settings in the default directory. Listed are files with the file extension \*.pwr\_ramp.

**Return values:**  
 <Catalog> string  
 Returns a string of file names separated by commas.

**Example:** See [Example"Save/Recall Files with user settings"](#) on page 34

**Usage:** Query only

**Manual operation:** See ["Save/Recall"](#) on page 15

#### **[:SOURce<hw>]:BB:PRAMp:SETTING:DELeTe <Filename>**

Deletes the selected file from the default or specified directory. Deleted are files with the file extension \*.pwr\_ramp.

**Setting parameters:**  
 <Filename> string  
 File name or complete file path

**Example:** See [Example"Save/Recall Files with user settings"](#) on page 34

**Usage:** Setting only

**Manual operation:** See ["Save/Recall"](#) on page 15

#### **[:SOURce<hw>]:BB:PRAMp:SETTING:LOAD <Filename>**

Loads the selected file from the default or the specified directory. Loaded are files with extension \*.pwr\_ramp.

**Setting parameters:**  
 <Filename> string  
 File name or complete file path; file extension can be omitted

**Example:** See [Example"Save/Recall Files with user settings"](#) on page 34

**Usage:** Setting only

**Manual operation:** See ["Save/Recall"](#) on page 15

#### **[:SOURce<hw>]:BB:PRAMp:SETTING:STORe <Filename>**

Stores the current settings into the selected file; the file extension (\*.pwr\_ramp) is assigned automatically.

**Setting parameters:**

<Filename> string  
File name or complete file path

**Example:** See [Example"Save/Recall Files with user settings"](#) on page 34

**Usage:** Setting only

**Manual operation:** See ["Save/Recall"](#) on page 15

**[:SOURce<hw>]:BB:PRAMp:STATe <State>**

Activates power sweep signal generation, and deactivates all digital standards, digital modulation modes and other sweeps in the corresponding path.

**Parameters:**

<State> 1 | ON | 0 | OFF  
\*RST: 0

**Example:** See [Example"Enable signal generation"](#) on page 38.

**Manual operation:** See ["State"](#) on page 15

**[:SOURce<hw>]:BB:PRAMp:WAVEform:CREate <Filename>**

Stores the current settings as an ARB signal in a waveform file (\* .wv).

**Setting parameters:**

<Filename> string  
file name or complete file path; file extension is assigned automatically

**Example:** See [Example"Save/Recall Files with user settings"](#) on page 34

**Usage:** Setting only

**Manual operation:** See ["Generate Waveform File"](#) on page 15

## 5.3 Power sweep commands

This section lists the remote-control commands, necessary to configure the power sweep signal.

**Commands:**

<a href="#">[:SOURce&lt;hw&gt;]:BB:PRAMp:RAMP:ATTenuation</a> .....	41
<a href="#">[:SOURce&lt;hw&gt;]:BB:PRAMp:RAMP:BLANK:TIME</a> .....	41
<a href="#">[:SOURce&lt;hw&gt;]:BB:PRAMp:RAMP:BLANK[:STATe]</a> .....	41
<a href="#">[:SOURce&lt;hw&gt;]:BB:PRAMp:RAMP:CONStmode</a> .....	42
<a href="#">[:SOURce&lt;hw&gt;]:BB:PRAMp:RAMP:FALL:TIME</a> .....	42
<a href="#">[:SOURce&lt;hw&gt;]:BB:PRAMp:RAMP:LEVel?</a> .....	42
<a href="#">[:SOURce&lt;hw&gt;]:BB:PRAMp:RAMP:PRESwEEP:STATe</a> .....	43



<code>[ :SOURce&lt;hw&gt;]:BB:PRAMp:RAMP:PREsweep:TIME</code> .....	43
<code>[ :SOURce&lt;hw&gt;]:BB:PRAMp:RAMP:PREsweep[:LEVel]</code> .....	43
<code>[ :SOURce&lt;hw&gt;]:BB:PRAMp:RAMP:RANGe</code> .....	43
<code>[ :SOURce&lt;hw&gt;]:BB:PRAMp:RAMP:RESolution?</code> .....	44
<code>[ :SOURce&lt;hw&gt;]:BB:PRAMp:RAMP:SAMPlerate?</code> .....	44
<code>[ :SOURce&lt;hw&gt;]:BB:PRAMp:RAMP:SHAPE</code> .....	44
<code>[ :SOURce&lt;hw&gt;]:BB:PRAMp:RAMP:SLOPe</code> .....	45
<code>[ :SOURce&lt;hw&gt;]:BB:PRAMp:RAMP:STAir:DWELI:TIME</code> .....	45
<code>[ :SOURce&lt;hw&gt;]:BB:PRAMp:RAMP:STAir:DWELI[:STATe]</code> .....	45
<code>[ :SOURce&lt;hw&gt;]:BB:PRAMp:RAMP:STAir:STEP:LEVel</code> .....	46
<code>[ :SOURce&lt;hw&gt;]:BB:PRAMp:RAMP:STAir:STEP[:STATe]</code> .....	46
<code>[ :SOURce&lt;hw&gt;]:BB:PRAMp:RAMP:STARtlevel?</code> .....	46
<code>[ :SOURce&lt;hw&gt;]:BB:PRAMp:RAMP:STOPlevel?</code> .....	46
<code>[ :SOURce&lt;hw&gt;]:BB:PRAMp:RAMP:SWEep:TIME</code> .....	47

---

### `[ :SOURce<hw>]:BB:PRAMp:RAMP:ATTenuation <ConstAtten>`

Sets the attenuation in constant power sweep mode.

#### Parameters:

<code>&lt;ConstAtten&gt;</code>	float
	Range: 0.01 to 60
	Increment: 0.01
	*RST: 25

**Example:** See [Example "Configure a power sweep"](#) on page 35.

**Manual operation:** See ["Attenuation"](#) on page 18

---

### `[ :SOURce<hw>]:BB:PRAMp:RAMP:BLANK:TIME <RfBlanking>`

Sets the RF blanking time.

To activate RF blanking, use command `[ :SOURce<hw>]:BB:PRAMp:RAMP:BLANK[:STATe]`.

#### Parameters:

<code>&lt;RfBlanking&gt;</code>	float
	Range: 5E-9 to 1E-3
	Increment: 5E-9
	*RST: 1E-6
	Default unit: s

**Example:** See [Example "Configure a power sweep"](#) on page 35.

**Manual operation:** See ["RF Blanking Time"](#) on page 18

---

### `[ :SOURce<hw>]:BB:PRAMp:RAMP:BLANK[:STATe] <EnableRfBlank>`

Activates the RF blanking.

To determine the blanking interval, use command `[ :SOURce<hw> ] :BB:PRAMP:RAMP:BLANK [ :STATe ]`.

**Parameters:**

<EnableRfBlank> 1 | ON | 0 | OFF  
\*RST: 1

**Example:** See [Example"Configure a power sweep"](#) on page 35.

**Manual operation:** See ["RF Blanking Time"](#) on page 18

`[ :SOURce<hw> ] :BB:PRAMP:RAMP:CONStmode <ConstMode>`

Enables power constant mode.

**Parameters:**

<ConstMode> 1 | ON | 0 | OFF  
\*RST: 0

**Example:** See [Example"Configure a power sweep"](#) on page 35.

**Manual operation:** See ["Const. Power"](#) on page 18

`[ :SOURce<hw> ] :BB:PRAMP:RAMP:FALL:TIME <Falltime>`

Sets the fall time of the power sweep signal.

**Parameters:**

<Falltime> float  
Range: 5E-9 to 1  
Increment: 5E-9  
\*RST: 5E-9

**Example:** See [Example"Configure a power sweep"](#) on page 35.

**Manual operation:** See ["Fall Time / Rise Time / Post-Sweep Time"](#) on page 19

`[ :SOURce<hw> ] :BB:PRAMP:RAMP:LEVel?`

Queries the resulting constant power value of the power sweep.

**Return values:**

<ConstLevel> float  
Range: -145 to 30  
Increment: 0.01  
\*RST: 0

**Example:** See [Example"Configure a power sweep"](#) on page 35.

**Usage:** Query only

**Manual operation:** See ["Constant Level"](#) on page 18

---

**[ :SOURce<hw>]:BB:PRAMP:RAMP:PREsweep:STATe <EnablePreSweep>**

Activates the pre-sweep.

To determine the pre-sweep power, use command `[ :SOURce<hw> ] :BB:PRAMP:RAMP:PREsweep [ :LEVel ]`.

**Parameters:**

<EnablePreSweep> 1 | ON | 0 | OFF  
\*RST: 1

**Example:** See [Example"Configure a power sweep"](#) on page 35.

**Manual operation:** See ["Pre-Sweep"](#) on page 18

---

**[ :SOURce<hw>]:BB:PRAMP:RAMP:PREsweep:TIME <PreSweepTime>**

Queries the calculated pre-sweep time.

**Parameters:**

<PreSweepTime> float  
Range: 0 to 20  
Increment: 5E-9  
\*RST: 0

**Example:** See [Example"Configure a power sweep"](#) on page 35.

**Manual operation:** See ["Pre-Sweep"](#) on page 18

---

**[ :SOURce<hw>]:BB:PRAMP:RAMP:PREsweep[:LEVel] <PresweepLevel>**

Sets the pre-sweep power.

To activate pre-sweep, use command `[ :SOURce<hw> ] :BB:PRAMP:RAMP:PREsweep:STATe`.

**Parameters:**

<PresweepLevel> float  
Range: 0 to 20  
Increment: 0.01  
\*RST: 5  
Default unit: dB

**Example:** See [Example"Configure a power sweep"](#) on page 35.

**Manual operation:** See ["Pre-Sweep"](#) on page 18

---

**[ :SOURce<hw>]:BB:PRAMP:RAMP:RANGe <Range>**

Sets the power sweep range.

**Parameters:**

<Range> float  
 Range: 0.01 to 50  
 Increment: 0.01  
 \*RST: 35  
 Default unit: dB

**Example:** See [Example "Configure a power sweep"](#) on page 35.

**Manual operation:** See ["Range"](#) on page 18

**[ :SOURce<hw> ]:BB:PRAMP:RAMP:RESolution?**

Queries the resolution of the power steps.

**Return values:**

<PowerResolution> float  
 Range: 0 to 60  
 Increment: 1E-3  
 \*RST: 0.01

**Example:** See [Example "Configure a power sweep"](#) on page 35.

**Usage:** Query only

**Manual operation:** See ["Resolution"](#) on page 17

**[ :SOURce<hw> ]:BB:PRAMP:RAMP:SAMPlerate?**

Queries the calculated sample rate.

**Return values:**

<SampleRate> float  
 Range: 0 to 20  
 Increment: 5E-9  
 \*RST: 1310730

**Example:** See [Example "Configure a power sweep"](#) on page 35.

**Usage:** Query only

**Manual operation:** See ["Sample Rate"](#) on page 17

**[ :SOURce<hw> ]:BB:PRAMP:RAMP:SHAPE <Shape>**

Selects the power sweep shape.

**Parameters:**

<Shape> LINear | STAir | TRlangle  
**LINear**  
 The sweep curve resembles a sawtooth.

**STAir**

The sweep curve resembles a stair step with definable "Dwell time" or "Power step", see `[ :SOURce<hw> ] :BB:PRAMP:RAMP:STAir:DWELl:TIME` and `[ :SOURce<hw> ] :BB:PRAMP:RAMP:STAir:STEP:LEVel`.

**TRiangle**

The sweep curve resembles a triangle.

\*RST: LINear

**Example:** See [Example"Configure a power sweep"](#) on page 35.

**Manual operation:** See ["Shape"](#) on page 17

`[ :SOURce<hw> ] :BB:PRAMP:RAMP:SLOPe <Slope>`

Sets the slope direction (increasing or decreasing).

**Parameters:**

<Slope> ASCending | DESCending  
\*RST: ASCending

**Example:** See [Example"Configure a power sweep"](#) on page 35.

**Manual operation:** See ["Slope"](#) on page 17

`[ :SOURce<hw> ] :BB:PRAMP:RAMP:STAir:DWELl:TIME <Dwelltime>`

Sets the dwell time for a power step.

To activate the dwell time, use command `[ :SOURce<hw> ] :BB:PRAMP:RAMP:STAir:DWELl [ :STATe ]`.

**Parameters:**

<Dwelltime> float  
Range: 5E-9 to 20  
Increment: 5E-9  
\*RST: 0.000057110  
Default unit: s

**Example:** See [Example"Configure a power sweep"](#) on page 35.

**Manual operation:** See ["Dwell Time"](#) on page 19

`[ :SOURce<hw> ] :BB:PRAMP:RAMP:STAir:DWELl [ :STATe ] <EnableDwell>`

Activates the edit mode to set the dwell time.

To determine the dwell time, use command `[ :SOURce<hw> ] :BB:PRAMP:RAMP:STAir:DWELl:TIME`.

**Parameters:**

<EnableDwell> 1 | ON | 0 | OFF  
 \*RST: 0

**Example:** See [Example"Configure a power sweep"](#) on page 35.

**Manual operation:** See ["Dwell Time"](#) on page 19

**[ :SOURce<hw>]:BB:PRAMP:RAMP:STAIR:STEP:LEVEL <Step>**

Sets the power step size.

**Parameters:**

<Step> float  
 Range: 0.01 to 10  
 Increment: 0.01  
 \*RST: 1  
 Default unit: dB

**Example:** See [Example"Configure a power sweep"](#) on page 35.

**Manual operation:** See ["Power Step"](#) on page 19

**[ :SOURce<hw>]:BB:PRAMP:RAMP:STAIR:STEP[:STATe] <EnablePowerStep>**

Activates the edit mode to set the power step.

To determine the power step size, use command [\[ :SOURce<hw>\]:BB:PRAMP:RAMP:STAIR:STEP:LEVEL](#) on page 46.

**Parameters:**

<EnablePowerStep> 1 | ON | 0 | OFF  
 \*RST: 1

**Manual operation:** See ["Power Step"](#) on page 19

**[ :SOURce<hw>]:BB:PRAMP:RAMP:STARTlevel?**

**[ :SOURce<hw>]:BB:PRAMP:RAMP:STOPlevel?**

Queries the start or end power values of the active measurement.

**Return values:**

<StopLevel> float  
 Range: -145 to 30  
 Increment: 0.01  
 \*RST: 0

**Example:** See [Example"Configure a power sweep"](#) on page 35.

**Usage:** Query only

**Manual operation:** See ["Start Level / Stop Level"](#) on page 18

---

**[:SOURce<hw>]:BB:PRAMp:RAMP:SWEep:TIME <SweepTime>**

Sets the time of one sweep cycle.

**Parameters:**

<SweepTime>	float
Range:	1E-6 to 20
Increment:	1E-6
*RST:	0.1

**Example:** See [Example "Configure a power sweep"](#) on page 35.

**Manual operation:** See ["Sweep Time"](#) on page 19

## 5.4 Trigger commands

This section lists the remote-control commands, necessary to configure the trigger.

**Commands:**

<a href="#">[:SOURce&lt;hw&gt;]:BB:PRAMp[:TRIGger]:SEQuence</a> .....	47
<a href="#">[:SOURce&lt;hw&gt;]:BB:PRAMp:TRIGger:ARM:EXECute</a> .....	48
<a href="#">[:SOURce&lt;hw&gt;]:BB:PRAMp:TRIGger:EXECute</a> .....	48
<a href="#">[:SOURce&lt;hw&gt;]:BB:PRAMp:TRIGger:EXTernal:SYNChronize:OUTPut</a> .....	48
<a href="#">[:SOURce&lt;hw&gt;]:BB:PRAMp:TRIGger:OBASeband:DELay</a> .....	48
<a href="#">[:SOURce&lt;hw&gt;]:BB:PRAMp:TRIGger:OBASeband:INHibit</a> .....	49
<a href="#">[:SOURce&lt;hw&gt;]:BB:PRAMp:TRIGger:RMODE?</a> .....	49
<a href="#">[:SOURce&lt;hw&gt;]:BB:PRAMp:TRIGger:SLENgth</a> .....	49
<a href="#">[:SOURce&lt;hw&gt;]:BB:PRAMp:TRIGger:SLUNit</a> .....	50
<a href="#">[:SOURce&lt;hw&gt;]:BB:PRAMp:TRIGger:SOURce</a> .....	50
<a href="#">[:SOURce&lt;hw&gt;]:BB:PRAMp:TRIGger[:EXTernal&lt;ch&gt;]:DELay</a> .....	51
<a href="#">[:SOURce&lt;hw&gt;]:BB:PRAMp:TRIGger[:EXTernal&lt;ch&gt;]:INHibit</a> .....	51
<a href="#">[:SOURce&lt;hw&gt;]:BB:PRAMp:TRIGger:TIME:DATE</a> .....	51
<a href="#">[:SOURce&lt;hw&gt;]:BB:PRAMp:TRIGger:TIME:TIME</a> .....	52
<a href="#">[:SOURce&lt;hw&gt;]:BB:PRAMp:TRIGger:TIME[:STATe]</a> .....	52

---

**[:SOURce<hw>]:BB:PRAMp[:TRIGger]:SEQuence <Sequence>**

Selects the trigger mode:

- AUTO = auto
- RETRigger = retrigger
- AAUTO = armed auto
- ARETrigger = armed retrigger
- SINGle = single

Selects the trigger mode.

**Parameters:**

<Sequence> AUTO | RETRigger | AAUTo | ARETrigger | SINGLE  
 \*RST: AUTO

**Example:**

See [Example"Adjusting clock, marker and trigger settings"](#) on page 37.

**Manual operation:** See ["Mode"](#) on page 21

**[:SOURce<hw>]:BB:PRAMp:TRIGger:ARM:EXECute**

Stops signal generation; a subsequent internal or external trigger event restarts signal generation.

**Example:**

See [Example"Adjusting clock, marker and trigger settings"](#) on page 37.

**Usage:**

Event

**Manual operation:** See ["Arm"](#) on page 23

**[:SOURce<hw>]:BB:PRAMp:TRIGger:EXECute**

Executes a trigger.

**Example:**

See [Example"Adjusting clock, marker and trigger settings"](#) on page 37.

**Usage:**

Event

**Manual operation:** See ["Execute Trigger"](#) on page 23

**[:SOURce<hw>]:BB:PRAMp:TRIGger:EXtErnal:SYNChronize:OUTPut <Output>**

Enables signal output synchronous to the trigger event.

**Parameters:**

<Output> 1 | ON | 0 | OFF  
 \*RST: 1

**Example:**

See [Example"Adjusting clock, marker and trigger settings"](#) on page 37.

**Manual operation:** See ["Sync. Output to External Trigger/Sync. Output to Trigger"](#) on page 23

**[:SOURce<hw>]:BB:PRAMp:TRIGger:OBASeband:DELay <Delay>**

Sets the trigger delay for triggering by the trigger signal from the second path.



**Parameters:**

<Delay> float  
 Range: 0 to 2147483647  
 Increment: 0.01  
 \*RST: 0

**Example:** See [Example"Adjusting clock, marker and trigger settings"](#) on page 37.

**Manual operation:** See ["External Delay/Trigger Delay"](#) on page 24

**[ :SOURce<hw>]:BB:PRAMp:TRIGger:OBASeband:INHibit <Inhibit>**

For triggering via the other path, specifies the number of samples by which a restart is to be inhibited following a trigger event.

**Parameters:**

<Inhibit> integer  
 Range: 0 to 67108863  
 \*RST: 0  
 Default unit: sample

**Example:** See [Example"Adjusting clock, marker and trigger settings"](#) on page 37.

**Manual operation:** See ["External Inhibit/Trigger Inhibit"](#) on page 24

**[ :SOURce<hw>]:BB:PRAMp:TRIGger:RMODE?**

Queries the status of signal generation.

**Return values:**

<RMode> STOP | RUN

**Example:** See [Example"Adjusting clock, marker and trigger settings"](#) on page 37.

**Usage:** Query only

**Manual operation:** See ["Running/Stopped"](#) on page 22

**[ :SOURce<hw>]:BB:PRAMp:TRIGger:SLEngth <SLength>**

Defines the length of the signal sequence to be output in the `SINGLE` trigger mode, see [\[ :SOURce<hw>\]:BB:PRAMp\[:TRIGger\]:SEquence](#).

**Parameters:**

<SLength> integer  
 Range: 1 to 7000  
 \*RST: 1  
 Default unit: symbol

**Example:** See [Example "Adjusting clock, marker and trigger settings"](#) on page 37.

**Manual operation:** See ["Signal Duration"](#) on page 22

**[ :SOURce<hw>]:BB:PRAMp:TRIGger:SLUNit <SLunit>**

Defines the unit for the entry of the length of the signal sequence to be output in the Single trigger mode, see [\[ :SOURce<hw>\]:BB:PRAMp\[ :TRIGger\]:SEQUence](#).

**Parameters:**

<SLunit> FRAME | SEQUENCE

**FRAME**

Unit Frame. A single frame is generated after a trigger event.

**SEQUENCE**

Unit Sequence Length. A single sequence is generated after a trigger event.

\*RST: SEQUENCE

**Manual operation:** See ["Signal Duration Unit"](#) on page 22

**[ :SOURce<hw>]:BB:PRAMp:TRIGger:SOURce <Source>**

Selects the trigger signal source and determines the way the triggering is executed. Provided are:

- Internal triggering by a command (INTernal)
- External trigger signal via one of the local or global connectors
  - EGT1 | EGT2: External global trigger
  - EGC1 | EGC2: External global clock
  - ELTRigger: External local trigger
  - ELCLock: External local clock
- Internal triggering by a signal from the other basebands (INTA | INTB)
- OBASeband | BEXTernal | EXTernal: Setting only  
 Provided only for backward compatibility with other Rohde & Schwarz signal generators.  
 The R&S SMW accepts these values and maps them automatically as follows:  
 EXTernal = EGT1, BEXTernal = EGT2, OBASeband = INTA or INTB  
 (depending on the current baseband)

**Parameters:**

<Source> INTernal | EGT1 | EXTernal | EGC1 | INTB | OBASeband | ELTRigger | EGT2 | EGC2 | INTA | ELCLock | BEXTernal

\*RST: INTernal

**Example:** See [Example "Adjusting clock, marker and trigger settings"](#) on page 37.

**Manual operation:** See ["Source"](#) on page 23

---

**[[:SOURce<hw>]:BB:PRAMp:TRIGger[:EXTernal<ch>]:DELay <Delay>**

Specifies the trigger delay.

**Parameters:**

<Delay> float  
 Range: 0 to 2147483647  
 Increment: 0.01  
 \*RST: 0  
 Default unit: samples

**Example:** See [Example "Adjusting clock, marker and trigger settings"](#) on page 37.

**Manual operation:** See ["External Delay/Trigger Delay"](#) on page 24

---

**[[:SOURce<hw>]:BB:PRAMp:TRIGger[:EXTernal<ch>]:INHibit <Inhibit>**

Specifies the duration by which a restart is inhibited.

Specifies the number of samples by which a restart is to be inhibited following an external trigger event.

**Parameters:**

<Inhibit> integer  
 Range: 0 to 196297143  
 \*RST: 0  
 Default unit: sample

**Example:** See [Example "Adjusting clock, marker and trigger settings"](#) on page 37.

**Manual operation:** See ["External Inhibit/Trigger Inhibit"](#) on page 24

---

**[[:SOURce<hw>]:BB:PRAMp:TRIGger:TIME:DATE <Year>, <Month>, <Day>**

Sets the date for a time-based trigger signal. For trigger modes single or armed auto, you can activate triggering at this date via the following command:

SOURce<hw>:BB:<DigStd>:TRIGger:TIME:STATe

<DigStd> is the mnemonic for the digital standard, for example, ARB. Time-based triggering behaves analogously for all digital standards that support this feature.

**Parameters:**

<Year> integer  
 Range: 1980 to 9999  
 <Month> integer  
 Range: 1 to 12  
 <Day> integer  
 Range: 1 to 31

**Example:** See example "Configure a time-based trigger signal" in the sub-chapter "Trigger Commands" of the chapter "SOURce:BB:ARB subsystem" in the R&S SMW user manual.

**Manual operation:** See ["Trigger Time"](#) on page 22

**[:SOURce<hw>]:BB:PRAMP:TRIGger:TIME:TIME <Hour>, <Minute>, <Second>**

Sets the time for a time-based trigger signal. For trigger modes single or armed auto, you can activate triggering at this time via the following command:

```
SOURce<hw>:BB:<DigStd>:TRIGger:TIME:STATE
```

<DigStd> is the mnemonic for the digital standard, for example, ARB. Time-based triggering behaves analogously for all digital standards that support this feature.

**Parameters:**

<Hour>	integer	
	Range:	0 to 23
<Minute>	integer	
	Range:	0 to 59
<Second>	integer	
	Range:	0 to 59

**Example:** See example "Configure a time-based trigger signal" in the sub-chapter "Trigger Commands" of the chapter "SOURce:BB:ARB subsystem" in the R&S SMW user manual.

**Manual operation:** See ["Trigger Time"](#) on page 22

**[:SOURce<hw>]:BB:PRAMP:TRIGger:TIME[:STATE] <State>**

Activates time-based triggering with a fixed time reference. If activated, the R&S SMW triggers signal generation when its operating system time matches a specified time.

Specify the trigger date and trigger time with the following commands:

```
SOURce<hw>:BB:<DigStd>:TRIGger:TIME:DATE
```

```
SOURce<hw>:BB:<DigStd>:TRIGger:TIME:TIME
```

<DigStd> is the mnemonic for the digital standard, for example, ARB. Time-based triggering behaves analogously for all digital standards that support this feature.

**Parameters:**

<State>	1   ON   0   OFF
*RST:	0

**Example:** See example "Configure a time-based trigger signal" in the sub-chapter "Trigger Commands" of the chapter "SOURce:BB:ARB subsystem" in the R&S SMW user manual.

**Manual operation:** See ["Time Based Trigger"](#) on page 22

## 5.5 Marker commands

This section lists the remote-control commands, necessary to configure the markers.

### Commands:

<a href="#">[:SOURce&lt;hw&gt;]:BB:PRAMp:TRIGger:OUTPut&lt;ch&gt;:DELay.....</a>	53
<a href="#">[:SOURce&lt;hw&gt;]:BB:PRAMp:TRIGger:OUTPut&lt;ch&gt;:MODE.....</a>	53

---

**[:SOURce<hw>]:BB:PRAMp:TRIGger:OUTPut<ch>:DELay <Delay>**

Delays the marker signal at the marker output relative to the signal generation start.

Variation of the parameter "Marker x" > "Delay" causes signal recalculation.

### Parameters:

<Delay>	float
	Range: 0 to 16777215
	Increment: 0.01
	*RST: 0
	Default unit: samples

**Example:** See [Example"Adjusting clock, marker and trigger settings"](#) on page 37.

**Manual operation:** See ["Delay"](#) on page 26

---

**[:SOURce<hw>]:BB:PRAMp:TRIGger:OUTPut<ch>:MODE <Mode>**

Defines the signal for the selected marker output.

### Parameters:

<Mode>	UNCHanged   RFBLanking   PRESweep   START   STOP
	<b>UNCHanged</b>
	Provides the standard marker signal.
	<b>RFBLanking</b>
	Returns the marker signal when the RF blanking is active.
	<b>PRESweep</b>
	Returns the marker signal when the power sweep reaches the pre-sweep level.
	<b>START</b>
	Returns the marker signal when the power sweep reaches the stop level.
	*RST: UNCHanged

**Example:** See [Example"Adjusting clock, marker and trigger settings"](#) on page 37.

**Manual operation:** See ["Mode"](#) on page 26

## 5.6 Clock commands

This section lists the remote-control commands, necessary to configure the clock.

### Commands:

<a href="#">[:SOURce&lt;hw&gt;]:BB:PRAMP:CLOCK:MODE.....</a>	54
<a href="#">[:SOURce&lt;hw&gt;]:BB:PRAMP:CLOCK:SOURce.....</a>	54

---

### **[:SOURce<hw>]:BB:PRAMP:CLOCK:MODE <Mode>**

Sets the type of externally supplied clock.

#### Parameters:

<Mode>                    SAMPLE  
                              \*RST:        SAMPLE

**Example:**                See [Example"Adjusting clock, marker and trigger settings"](#) on page 37.

**Options:**                 R&S SMW-B10

**Manual operation:**    See ["Clock Mode"](#) on page 28

---

### **[:SOURce<hw>]:BB:PRAMP:CLOCK:SOURce <Source>**

Selects the clock source:

- `INTernal`: Internal clock reference
- `ELCLock`: External local clock
- `EXTernal` = `ELCLock`: Setting only  
     Provided for backward compatibility with other Rohde & Schwarz signal generators

#### Parameters:

<Source>                    INTernal|ELCLock|EXTernal  
                              \*RST:        INTernal

**Example:**                See [Example"Adjusting clock, marker and trigger settings"](#) on page 37.

**Manual operation:**    See ["Clock Source"](#) on page 27

# Annex

## A References

This section includes an overview of the power sweep defaults, and the graphical representations of all sweep signal shapes in the setting dialog box and in the graphic.

- [Baseband power sweep default values](#).....55
- [Representation of the power sweep shapes in the settings dialog](#)..... 56
- [Representation of the power sweep graphics](#).....60

### A.1 Baseband power sweep default values

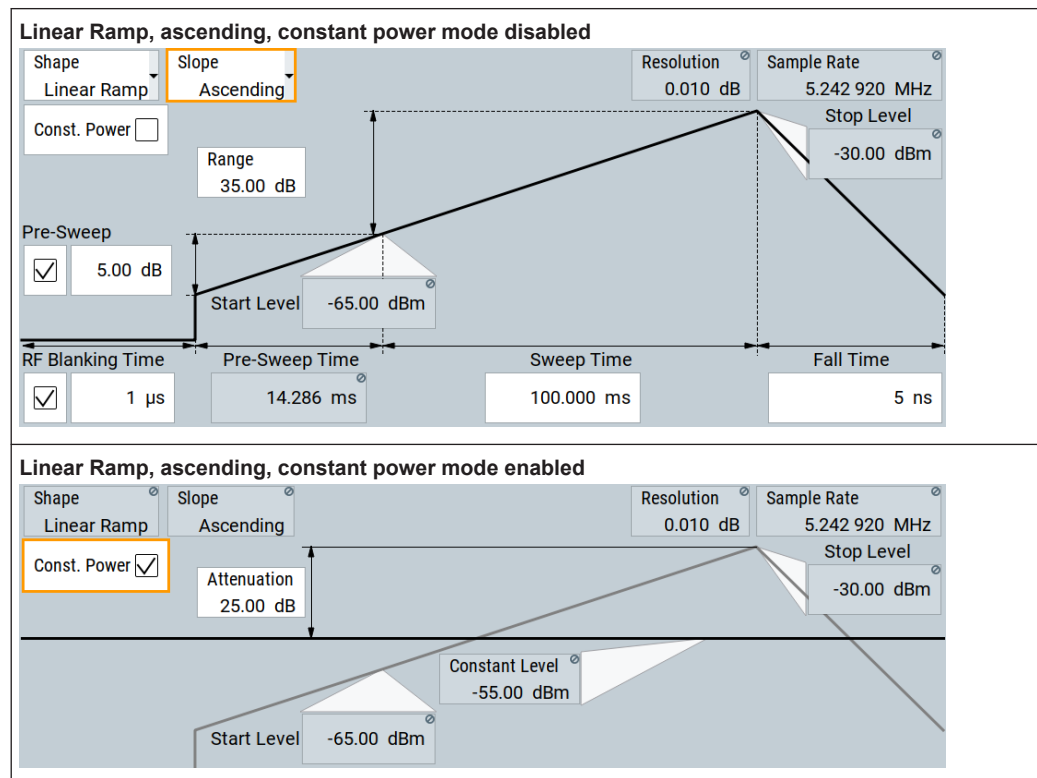
*Table A-1: Power Sweep default values*

Parameter	Value
State	Off
Shape	Linear ramp
Pre-Sweep	On
RF-Blanking	On
Const. Power	Off
Trigger	Auto, Internal
Marker	Start level
<b>Shape Settings</b>	
Slope	Ascending
Resolution	0.010 dB
Range	35 dB
Sample Rate	1.310730 MHz
Attenuation	25 dB
Pre-Sweep level	5 dB
RF Blanking Time	1 $\mu$ s
Pre-Sweep Time	14.285 s
Sweep Time	100 ms
Fall Time	5 ns
Stop Level	RF signal level

## A.2 Representation of the power sweep shapes in the settings dialog

The following tables provide an overview over the different power sweep shapes including their slope modes and characteristics with enabled and disabled constant power mode. The power sweep settings dialog are based on default values, except for the last example, that shows the "Post-Sweep Time" for "Triangle" shapes without "Pre-Sweep".

Table A-2: Linear Ramp





Representation of the power sweep shapes in the settings dialog

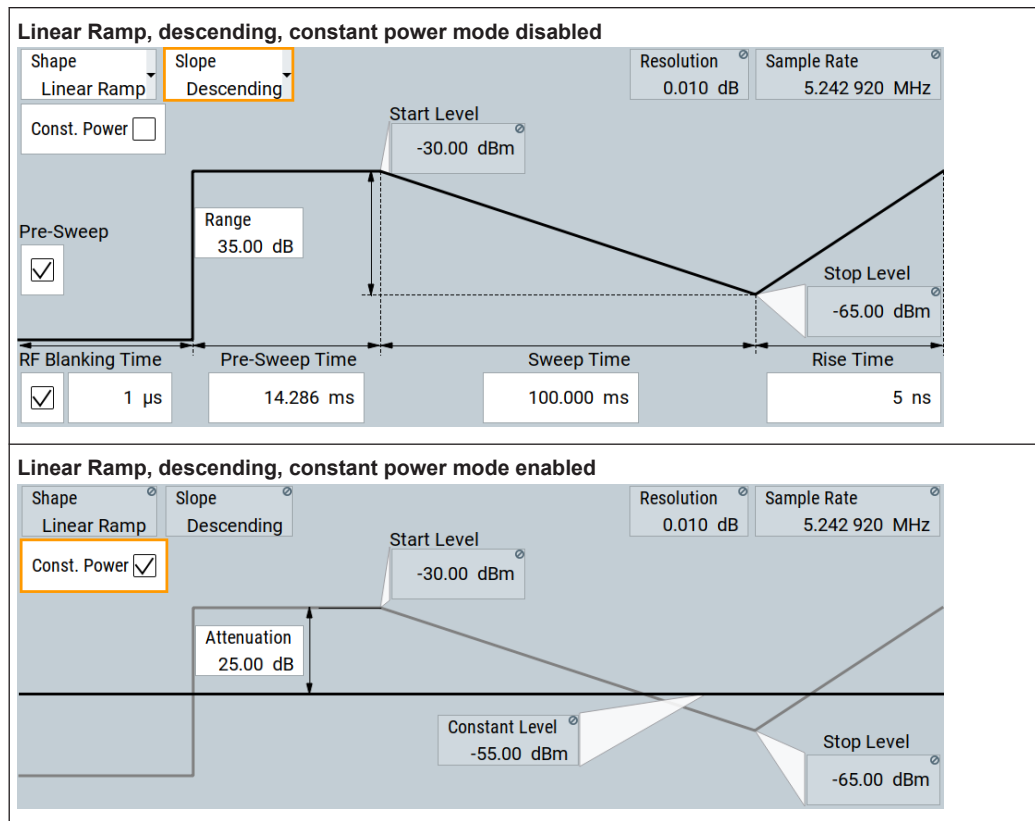
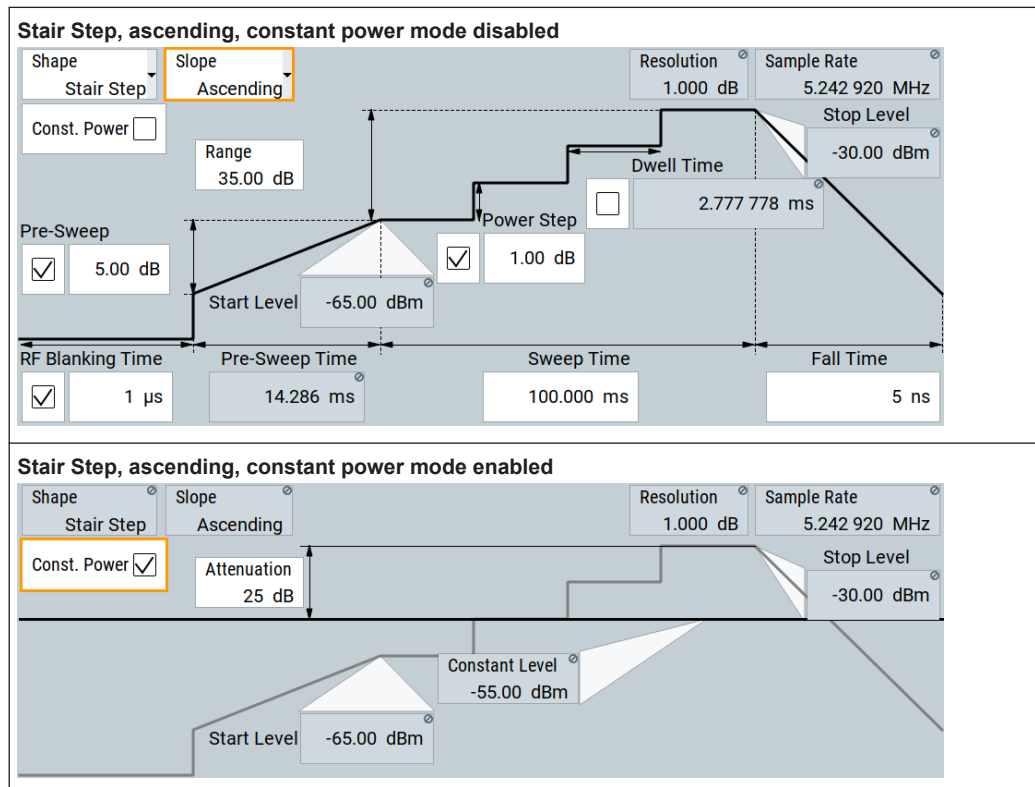
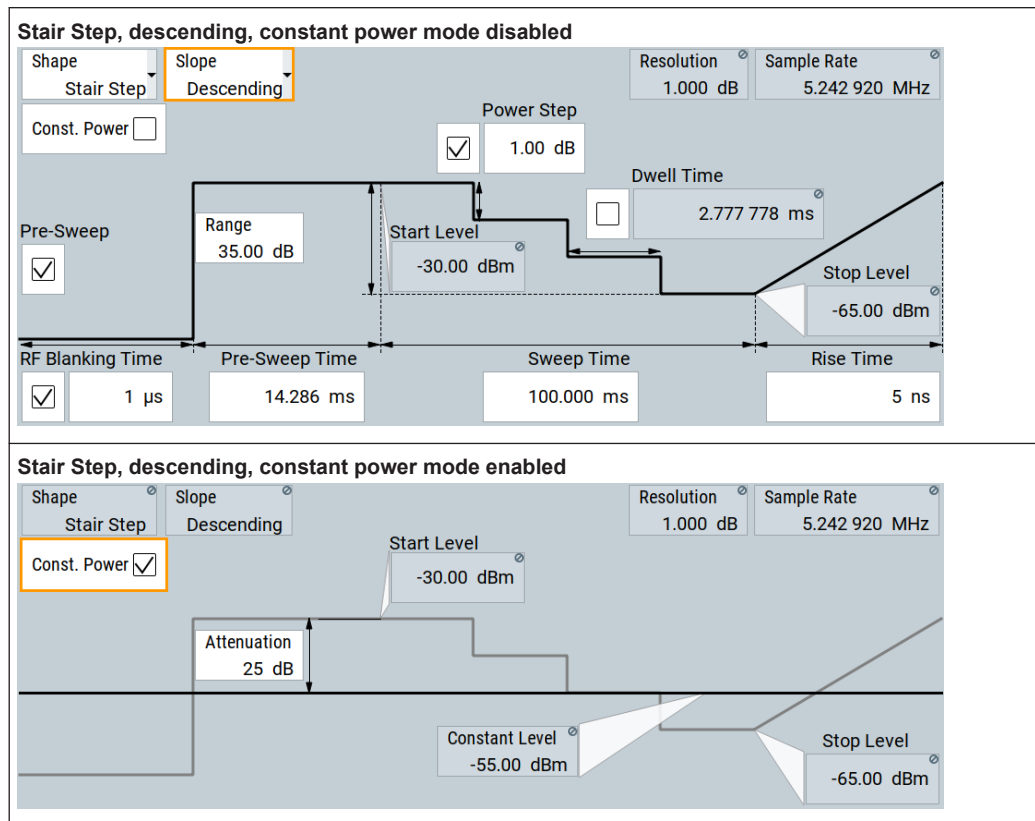


Table A-3: Stair Step

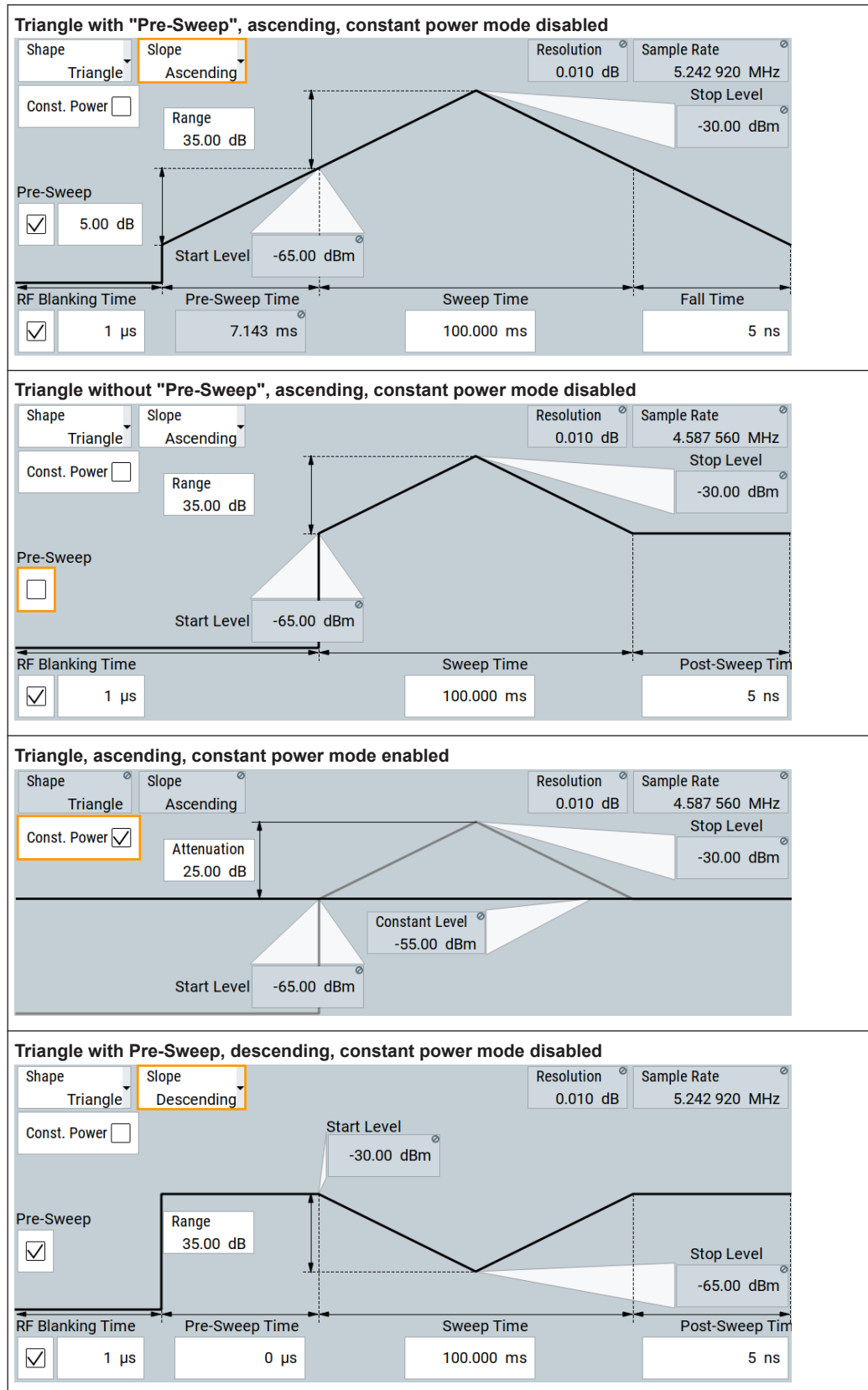


Representation of the power sweep shapes in the settings dialog

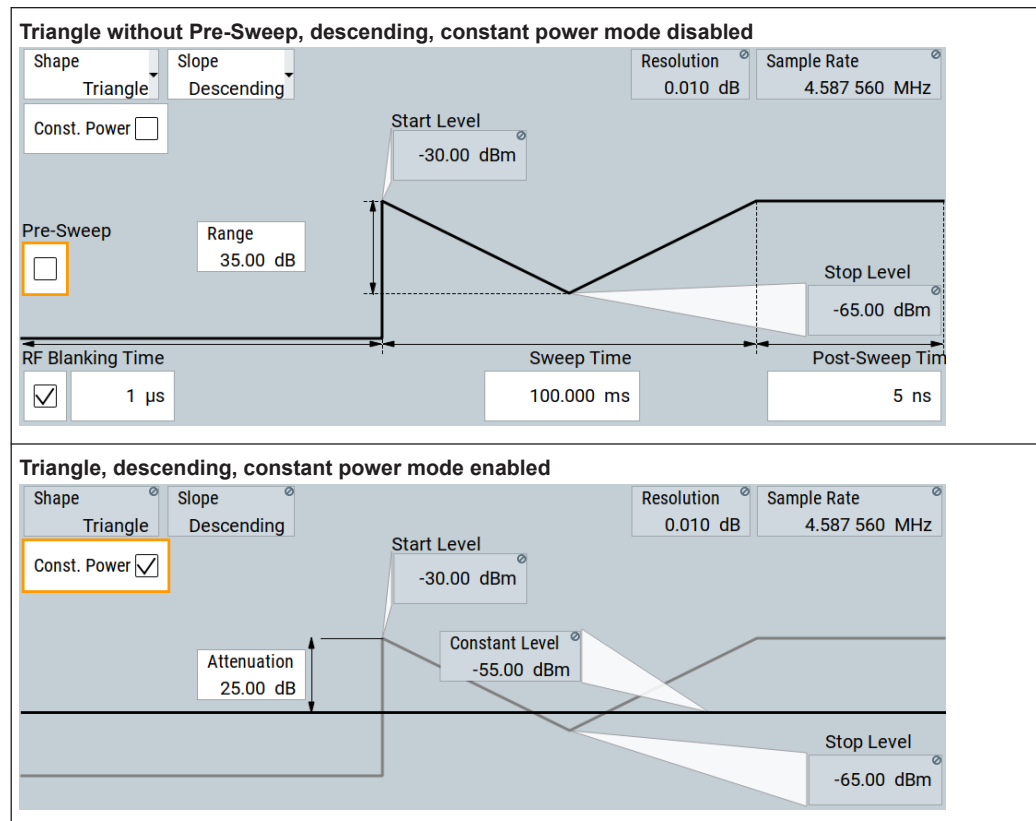


Representation of the power sweep shapes in the settings dialog

Table A-4: Triangle



## Representation of the power sweep graphics

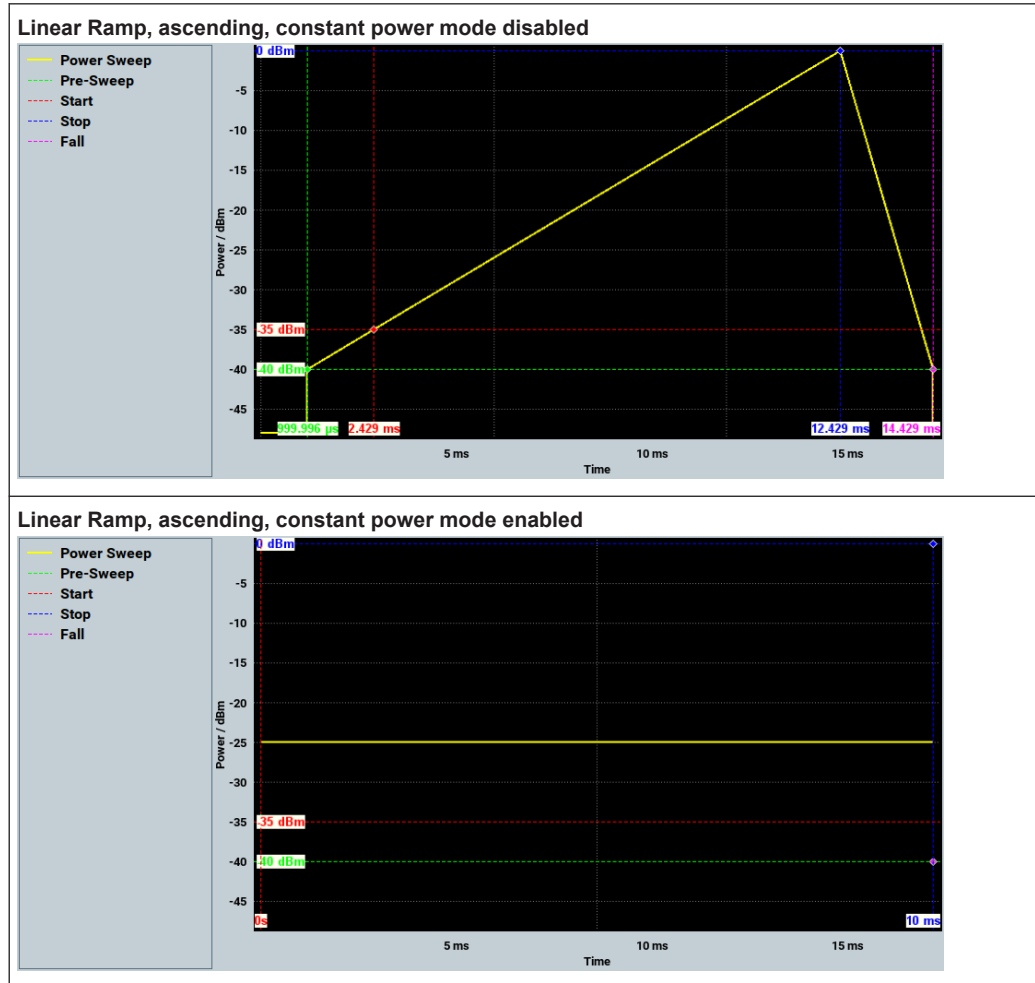


### A.3 Representation of the power sweep graphics

The following tables provide an overview over the different power sweep graphics including their slope modes and characteristics with enabled and disabled constant power mode. The power sweep graphics are not based on default settings. The settings are configured, especially to illustrate as many of the provided functions and interactions. The graphics represent therefore not necessarily realistic test signals.

Representation of the power sweep graphics

Table A-5: Linear Ramp



Representation of the power sweep graphics

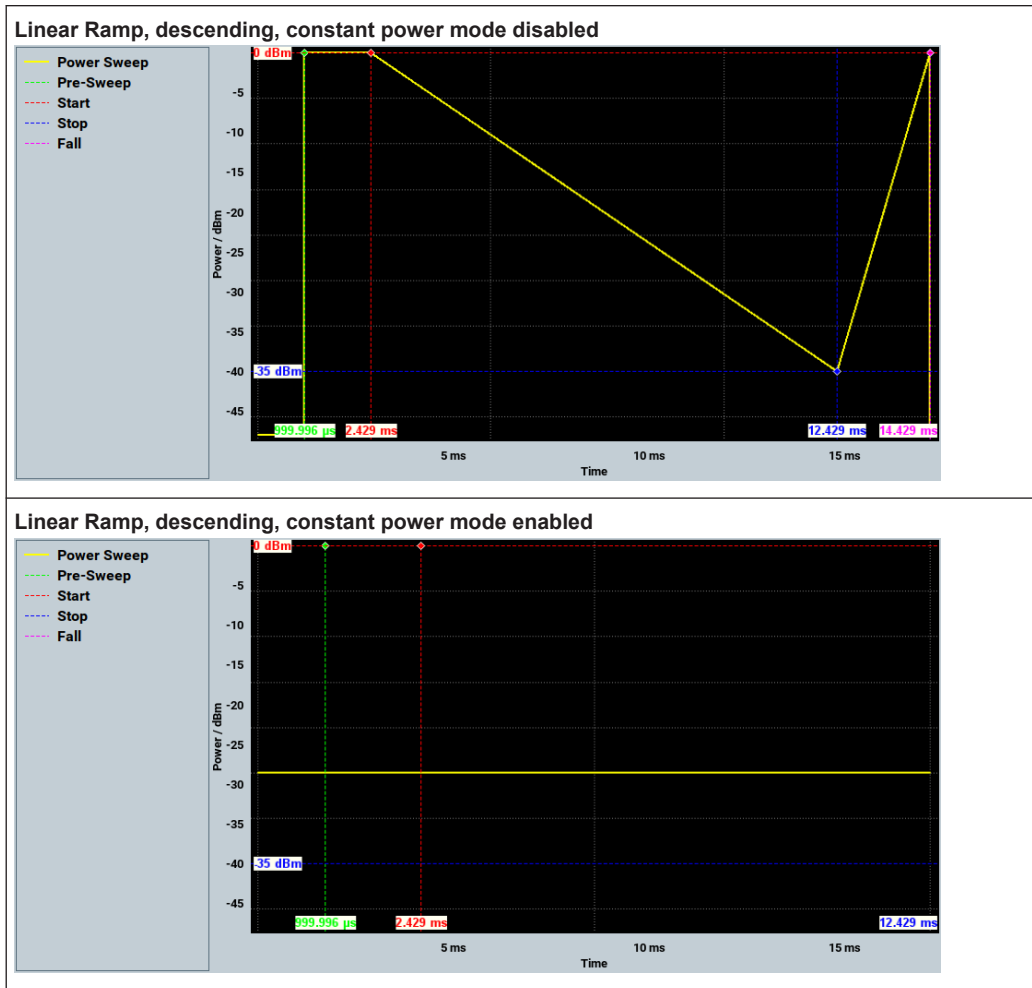
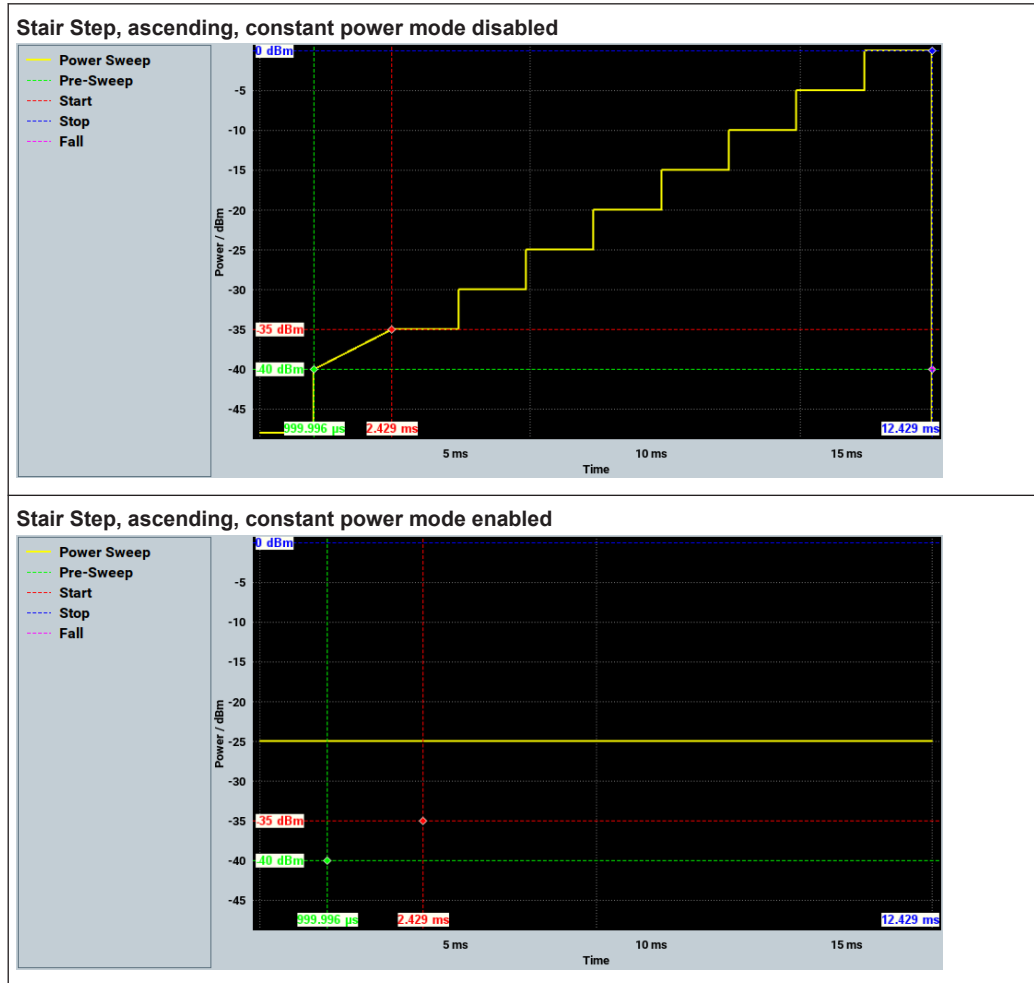
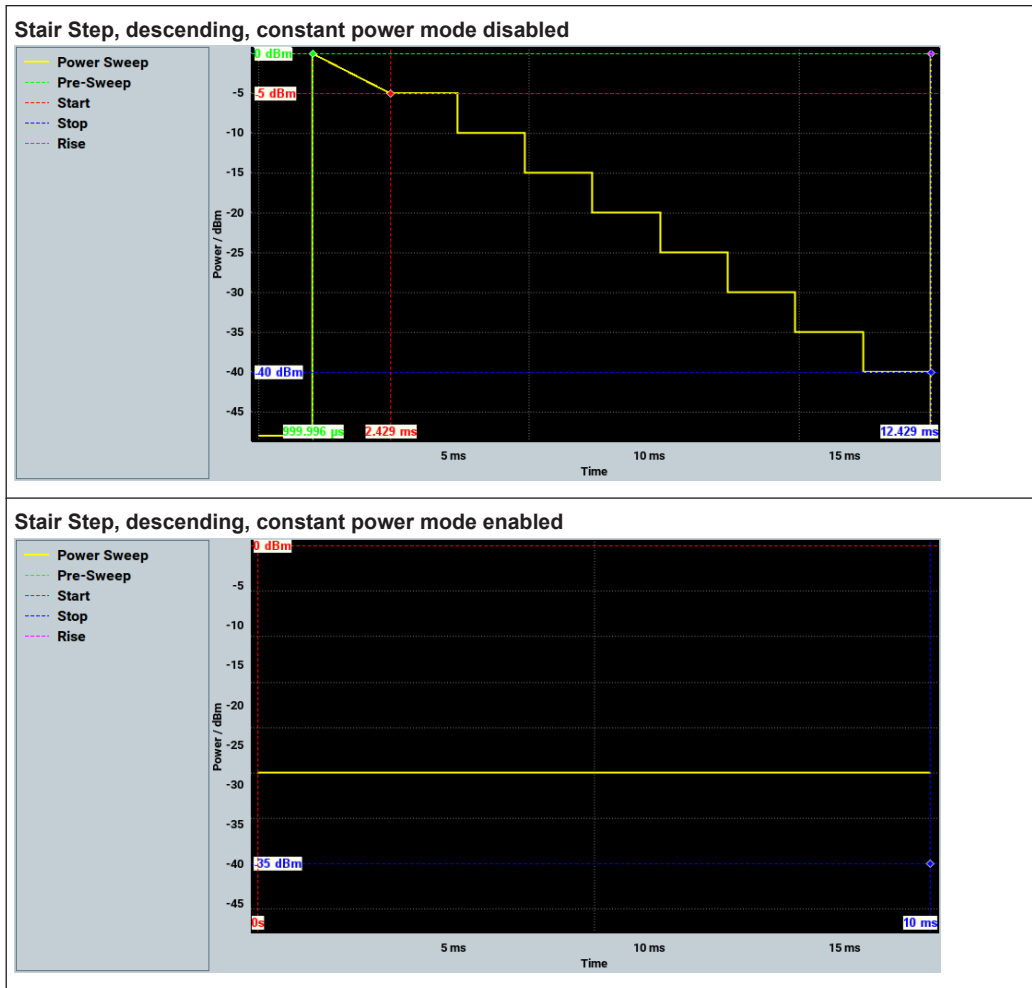


Table A-6: Stair Step



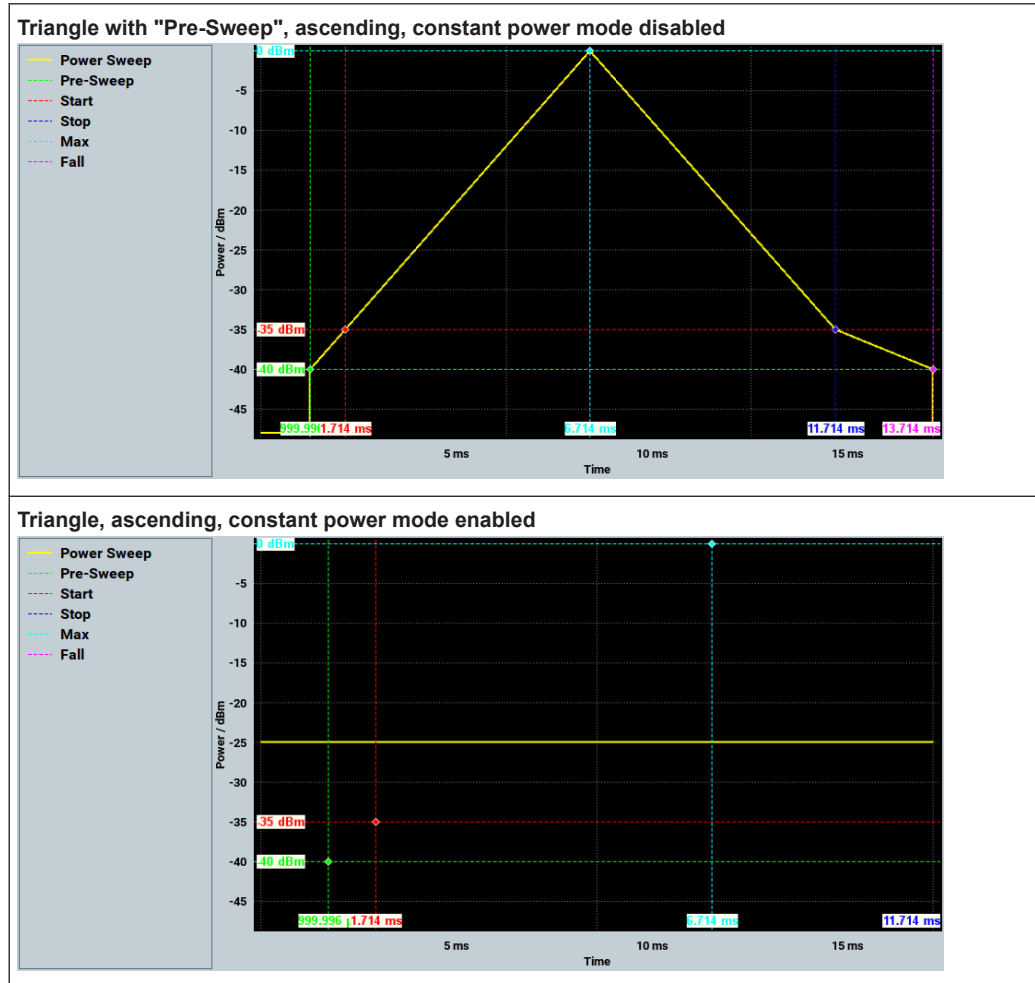
Representation of the power sweep graphics



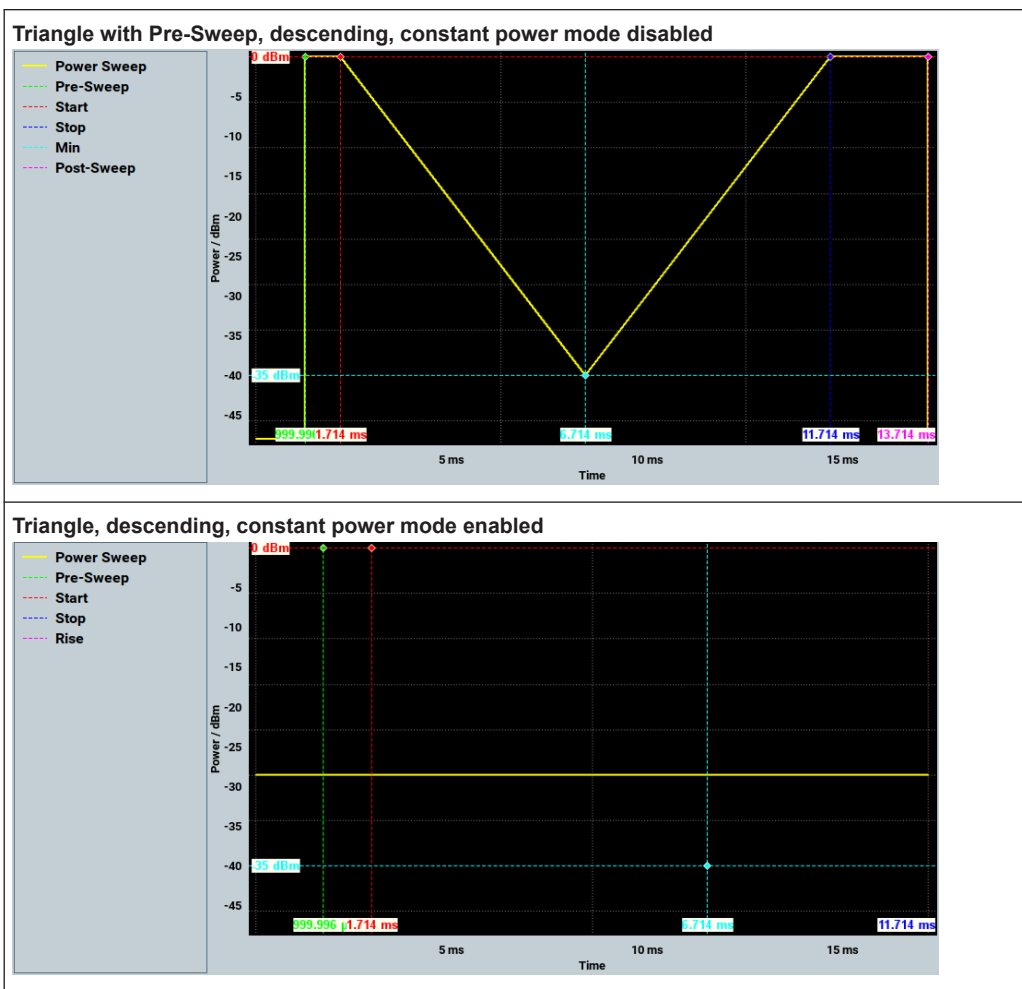


Representation of the power sweep graphics

Table A-7: Triangle



Representation of the power sweep graphics



## List of commands

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