

Manual operation: See ["Audio Source - Stereo Modulation"](#) on page 218

[[:SOURce]:STEReo:STATe <State>

Activates/deactivates stereo modulation.

Parameters:

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

Example: STER:STAT ON
 activates generation of stereo signal.

Options: R&S SMB-B5

Manual operation: See ["State - Stereo Modulation "](#) on page 218

[[:SOURce]:STEReo[:DEViation] <Deviation>

Sets the MPX (Multiplex stereo signal) deviation.

Parameters:

<Deviation> integer
 Range: 0 to depends on instrument hardware
 *RST: 40 kHz

Example: STER 40kHz
 sets the stereo deviation according to standard.

Options: R&S SMB-B5

Manual operation: See ["FM Deviation - Stereo Modulation"](#) on page 218

6.13.16 SOURce:SWEep Subsystem

The SOURce: subsystem contains the commands for configuring RF sweep signals.



- The keyword [:FREQuency] can be omitted, then the commands are SCPI-compliant.
- To activate a RF sweep mode, use the following commands:
 - RF frequency sweep: SOURce:FREQuency:MODE SWEep (SOURce:FREQuency:MODE CW (off))
 - RF level sweep: SOURce:POWEr:MODE SWEep (SOURce:POWEr:MODE CW (off))
- All sweeps, including the LF sweep, can be set independently from each other.

This example shows how to set up a frequency sweep.

1. Set the sweep range.
 SOUR:FREQ:CENt 200 MHz

SOUR:FREQ:SPAN 300 MHz

2. Select linear or logarithmic spacing.

SOUR:SWE:FREQ:SPAC LIN

3. Set the step width and dwell time.

SOUR:SWE:FREQ:STEP:LIN 20 MHz

SOUR:SWE:FREQ:DWEL 12 ms

4. Select the trigger mode.

TRIG:FSW:SOUR SING

5. Select the sweep mode and activate the sweep.

SOUR:SWE:FREQ:MODE AUTO

SOUR:FREQ:MODE SWE

6. Trigger the sweep.

SOURce:SWE:FREQ:EXEC



It is recommended that you switch off the "Start/Stop Display Update" for optimum sweep performance, especially with short dwell times (SYST:DISP:UPD OFF).

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[SOURce<hw>]:SWEep[:FREQuency]:DWELI <Dwell>

Sets the time taken for each frequency step of the sweep.

The keyword `[:FREQuency]` can be omitted (see example). The command is then SCPI-compliant.

Tip: It is recommended to switch off the "Display Update" for optimum sweep performance especially with short dwell times (`SYSTem:DISPlay:UPDate OFF`).

Parameters:

`<Dwell>` float
 Range: 2E-3 to 100
 Increment: 100E-6
 *RST: 15E-3

Example: `SWE:DWEL 12 ms`
 sets a dwell time of 12 ms for a frequency sweep at the RF output.

Manual operation: See ["Dwell Time - Frequency Sweep"](#) on page 186

`[:SOURce<hw>]:SWEep[:FREQuency]:EXECute`

Starts an RF frequency sweep cycle manually.

The command is only effective in single mode.

Example: `TRIG:FSW:SOUR SING`
`SOUR:SWE:FREQ:MODE AUT`
`SWE:FREQ:EXEC`
 triggers a frequency sweep at the RF output.

Usage: Event

Manual operation: See ["Execute Single Sweep - Frequency Sweep"](#) on page 183

`[:SOURce<hw>]:SWEep[:FREQuency]:LFConnector <LfConnector>`

Activates the output of a sweep voltage ramp at the LF connector.

The voltage range is set with commands

`SOURce:SWEep:FREQuency:OVOLtage:STARt` and `...:STOP`

Parameters:

`<LfConnector>` 0 | 1 | OFF | ON
 *RST: 0

Example: `SWE:LFC ON`
 activates the output of a linear voltage ramp from sweep start to sweep stop at the LF connector.
`SWE:OVOL:STAR 0V`
`SWE:OVOL:STOP 3V`
 'the voltage at sweep start is 0 Volt and at sweep stop 3 V.

Manual operation: See ["Use LF connector to output sweep voltage - RF Frequency Sweep"](#) on page 186

[:SOURce<hw>]:SWEep[:FREQuency]:MODE <Mode>

Sets the sweep mode.

The keyword [:FREQuency] can be omitted (see example). The command is then SCPI-compliant.

Parameters:

<Mode>

AUTO | MANual | STEP

AUTO

Each trigger triggers exactly one complete sweep.

MANual

The trigger system is not active. Each frequency step of the sweep is triggered individually, either by varying the "Current Frequency" value using the rotary knob under manual control or by means of a `FREQ:MAN` command under remote control. With manual control, the frequency increases or decreases (depending on the direction of the rotary encoder) by the value specified under `FREQ:STEP:INCRement`. With remote control, the frequency is set directly with the command `:FREQ:MAN`.

STEP

Each trigger triggers one sweep step only (Mode Single Step).

The frequency increases by the value entered under

`SOUR:SWE:FREQ:STEP:LIN` (linear spacing)

or `...:STEP:LOG` (logarithmic spacing).

*RST: AUTO

Example:

`SWE:MODE AUTO`

selects **Mode Auto** for a frequency sweep at the RF output.

Manual operation: See "[Mode - RF Frequency Sweep](#)" on page 180

[:SOURce<hw>]:SWEep[:FREQuency]:OVOLTage:START <Start>

Sets the voltage at the sweep stop frequency. The linear voltage ramp from sweep start to stop is output at the LF connector.

Parameters:

<Start>

float

Range: -3 to 3

Increment: 1E-3

*RST: 0

Example:

`SWE:LFC ON`

activates the output of a linear voltage ramp from sweep start to sweep stop at the LF connector.

`SWE:OVOL:STAR 0V`

`SWE:OVOL:STOP 3V`

the voltage at the sweep start frequency is 0 V and at the stop frequency 3 V.

Manual operation: See ["Output Voltage Start Freq - RF Frequency Sweep"](#) on page 186

[:SOURce<hw>]:SWEep[:FREQuency]:OVOLTage:STOP <Stop>

Sets the voltage at the sweep stop frequency. The linear voltage ramp from sweep start to stop is output at the LF connector.

Parameters:

<Stop> float
 Range: -3 to 3
 Increment: 1E-3
 *RST: 3

Example:

SWE:LFC ON
 activates the output of a linear voltage ramp from sweep start to sweep stop at the LF connector.
 SWE:OVOL:STAR 0V
 SWE:OVOL:STOP 3V
 the voltage at the sweep start frequency is 0 V and at the stop frequency 3 V.

Manual operation: See ["Output Voltage Stop - RF Frequency Sweep"](#) on page 187

[:SOURce<hw>]:SWEep[:FREQuency]:POINTs <Points>

Determines the number of steps for the RF frequency sweep within the sweep range.

This parameter always applies to the currently set sweep spacing and correlates with the step size as follows:

- for linear sweeps

$$\text{freq_points} = (f_{\text{SPAN}} / \text{step_lin}) + 1$$
 To determine the step size, use the command [SWE:STEP\[:LIN\]](#).
- logarithmic sweeps and $f_{\text{START}} < f_{\text{STOP}}$

$$\text{freq_points} = ((\log f_{\text{STOP}} - \log f_{\text{START}}) / \log \text{step_log}) + 1$$
 To determine the logarithmic step size, use the command [SWE:STEP:LOG](#).

If you change the number of sweep points, the step size changes accordingly. The sweep range remains the same.

Parameters:

<Points> integer
 Range: 2..max

Example:

```
FREQ:STAR
sets the start frequency to 100 MHz.
FREQ:STOP
sets the stop frequency to 500 MHz.
SWE:SPAC LIN
sets linear sweep spacing.
SWE:POIN 401
sets 401 sweep steps for linear sweep spacing. The sweep step
width (STEP) is automatically set to 1 MHz.
```

[[:SOURce<hw>]:SWEep[:FREQuency]:RETRace <State>

Activates that the signal changes to the start frequency value while it is waiting for the next trigger event.

You can enable this feature, when you are working with sawtooth shapes in sweep mode "Single" or "External Single".

Parameters:

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

Example:

```
TRIG0:SWE:SOUR SING
FREQ:MODE SWE
SWE:SHAP SAWT
SWE:RETR ON
activates retrace function, i.e. the frequency changes to the
value at start frequency while waiting for the next trigger event.
```

Manual operation: See ["Retrace - RF Frequency Sweep"](#) on page 185

[[:SOURce<hw>]:SWEep[:FREQuency]:RUNNing?

Queries the current state of the frequency sweep mode.

Return values:

<State> 0 | 1 | OFF | ON

Example:

```
SWE:RUNN?
Response "1": signal generation in level sweep active.
```

Usage: Query only

[[:SOURce<hw>]:SWEep[:FREQuency]:SHAPE <Shape>

Sets the cycle mode for a sweep sequence (shape).

Parameters:

<Shape> SAWTooth | TRIangle

SAWTooth

One sweep runs from start to stop frequency. Each subsequent sweep starts at the start frequency, i.e. the shape of the sweep sequence resembles a sawtooth.

TRiangle

One sweep runs from start to stop frequency and back, i.e. the shape of the sweep resembles a triangle. Each subsequent sweep starts at the start frequency.

*RST: SAWTooth

Example:

SOUR:SWE:SHAP TRI

selects the sweep cycle with alternating ascending and descending sweep directions.

Manual operation: See ["Shape - RF Frequency Sweep"](#) on page 184

[:SOURce<hw>]:SWEep[:FREQuency]:SPACing <Spacing>

Selects the mode for the calculation of the frequency sweep intervals. The frequency increases or decreases by this value at each step.

The keyword [:FREQuency] can be omitted. Then the command is SCPI-compliant.

Parameters:

<Spacing>

LINear | LOGarithmic

LINear

With the linear sweep, the step width is a fixed frequency value which is added to the current frequency. The step width for linear sweep is entered in Hz (see [:SOURce<hw>]:SWEep[:FREQuency]:STEP[:LINear] on page 427).

LOGarithmic

With the logarithmic sweep, the step width is a constant fraction of the current frequency. This fraction is added to the current frequency. The logarithmic step width is entered in % (see [:SOURce<hw>]:SWEep[:FREQuency]:STEP:LOGarithmic on page 428).

*RST: LINear

Example:

SWE:SPAC LIN

selects linear sweep spacing for a frequency sweep at the RF output.

Manual operation: See ["Spacing - Frequency Sweep"](#) on page 184

[:SOURce<hw>]:SWEep[:FREQuency]:STEP[:LINear] <Linear>

Sets the step size for linear RF frequency sweep steps.

This parameter is related to the number of steps ([:SOURce<hw>]:SWEep[:FREQuency]:POINTS) within the sweep range as follows:

$$f_{\text{START}} < f_{\text{STOP}}$$

$$\text{freq_points} = (f_{\text{SPAN}} / \text{step_lin}) + 1$$

If you change the step size, the number of steps changes accordingly. The sweep range remains the same.

The keywords `[:FREQuency]` and `[:LINear]` can be omitted. The command is then SCPI-compliant.

Parameters:

<code><Linear></code>	float
	Range: full frequency range
	Increment: see the data sheet: RF characteristics > Resolution of setting

Example:

```
FREQ:STAR 1GHz
sets the start frequency to 1 GHz.
FREQ:STOP 5GHz
sets the stop frequency to 5 GHz.
SWE:SPAC LIN
sets linear sweep spacing.
SWE:STEP 2 MHz
sets the step width for linear sweep spacing to 2 MHz (RF
sweep) at the RF output. The number of sweep steps for linear
sweep spacing (POINTS) is automatically set to 2001.
```

Manual operation: See ["Step Lin/Log - Frequency Sweep"](#) on page 185

`[:SOURce<hw>]:SWEep[:FREQuency]:STEP:LOGarithmic <Logarithmic>`

Sets a logarithmically determined sweep step size for the RF frequency sweep. It is expressed in percent and you must enter the *value* and the unit *PCT* with the command.

The frequency is increased by a logarithmically calculated fraction of the current frequency according to:

$$\text{step_log}_{n+1} = f_n + \text{step_log}_n \times f_n$$

$$f_{n+1} = f_n + \text{step_log}_{n+1}$$

with $f_{\text{START}} < f_{\text{STOP}}$ and n = number of sweep steps

This parameter correlates with the number of steps `SWE:FREQ:POIN` within the sweep range as follows:

$$\text{freq_points} = ((\log f_{\text{STOP}} - \log f_{\text{START}}) / \log \text{step_log}) + 1$$

If you change the step size, the number of steps changes accordingly. The sweep range remains the same.

Parameters:

<Logarithmic> float
 Range: 0.01 to 100
 Increment: 1E-3
 *RST: 1

Example:

FREQ:STAR 1GHz
 sets the start frequency to 1 GHz.
 FREQ:STOP 5GHz
 sets the stop frequency to 5 GHz.
 SWE:SPAC LOG
 sets logarithmic sweep spacing.
 SWE:STEP:LOG 10PCT
 sets the step width for logarithmic sweep spacing to 10% of the previous frequency in each instance (for a frequency sweep).

Manual operation: See ["Step Lin/Log - Frequency Sweep"](#) on page 185

[[:SOURce<hw>]:SWEep:POWer:DWELI <Dwell>

Sets the time taken for each level step of the sweep.

Tip: It is recommended to switch off the "Display Update" for optimum sweep performance especially with short dwell times (`SYSTem:DISPlay:UPDate OFF`).

Parameters:

<Dwell> float
 Range: 1E-3 to 100
 Increment: 100E-6
 *RST: 15E-3

Example:

SWE:POW:DWEL 12 ms
 sets a dwell time of 12 ms for a level sweep at the RF output.

Manual operation: See ["Dwell Time - Level Sweep"](#) on page 192

[[:SOURce<hw>]:SWEep:POWer:EXECute

Triggers a sweep.

The command is only valid for sweep mode Single (`SOURce:SWEep:POWer:MODE SINGLE`). The command corresponds to the manual-control command "Execute Single Sweep".

Example:

SOURce:SWEep:POWer:MODE SINGLE
 sets the single cycle mode of the level sweep.
 SWE:POW:EXEC
 triggers a level sweep at the RF output.

Usage: Event

Manual operation: See ["Execute Single Sweep - Level Sweep"](#) on page 190

[[:SOURce<hw>]:SWEep:POWer:MODE <Mode>

Sets the cycle mode of the level sweep.

Parameters:

<Mode>

AUTO | MANual | STEP

AUTO

Each trigger triggers exactly one complete sweep.

MANual

The trigger system is not active. Each level step of the sweep is triggered individually, either by varying the "Current Level" value using the rotary knob under manual control or by means of a POW:MAN command under remote control.

With manual control, the level increases or decreases (depending on the direction of the rotary encoder) by the value specified under SOUR:SWE:POW:STEP. With remote control, the level increases by the value specified under SWEep:POW:STEP which each sent :POW:MAN command, irrespective the value entered there.

STEP

Each trigger triggers one sweep step only. The level increases by the value entered under :SWEep:POWer:STEP.

*RST: AUTO

Example:

SWE:POW:MODE AUTO

selects Mode Auto for a level sweep at RF output.

Manual operation: See ["Mode - Level Sweep"](#) on page 188

[[:SOURce<hw>]:SWEep:POWer:POINTs <Points>

Determines the number of steps for the RF level sweep within the sweep range.

This parameter always applies to the currently set sweep spacing and correlates with the step size as follows:

$$\text{pow_points} = (\text{f}_{\text{STOP}} - \text{f}_{\text{START}} / \text{step_log}) + 1$$

To determine the step size use the command [SWE:POW:STEP\[:LOG\]](#).

If you change the number of sweep points, the step size changes accordingly. The sweep range remains the same.

Parameters:

<Points>

integer

Range: 2...max

Example: `POW:STAR - 30 dBm`
 sets the start frequency to -30 dBm.
`POW:STOP - 10 dBm`
 sets the stop frequency to -10 dBm.
`SWE:POW:POIN 20`
 sets 20 sweep steps. The sweep step width (`STEP`) is automatically set to 1 dB.

[[:SOURce<hw>]:SWEep:POWer:RETRace <State>

Activates that the signal changes to the start level value while it is waiting for the next trigger event.

You can enable this feature, when you are working with sawtooth shapes in sweep mode "Single" or "External Single".

Parameters:

<State> 0 | 1 | OFF | ON

*RST: 0

Example:

`TRIG0:SWE:SOUR SING`

`POW:MODE SWE`

`SWE:POW:SHAP SAWT`

`SWE:POW:RETR ON`

activates retrace function, i.e. the level changes to the value at start level while waiting for the next trigger event.

Manual operation: See ["Retrace - RF Level Sweep"](#) on page 191

[[:SOURce<hw>]:SWEep:POWer:RUNNing?

Queries the current state of the level sweep mode.

Return values:

<State> 0 | 1 | OFF | ON

Example:

`SWE:POW:RUNN?`

Response "1": signal generation in level sweep active.

Usage:

Query only

[[:SOURce<hw>]:SWEep:POWer:SHAPE <Shape>

Sets the cycle mode for a sweep sequence (shape).

Parameters:

<Shape> SAWTooth | TRIangle

SAWTooth

One sweep runs from the start level to the stop level. The subsequent sweep starts at the start level again, i.e. the shape of sweep sequence resembles a sawtooth.

TRiangle

One sweep runs from start to stop level and back, i.e. the shape of the sweep resembles a triangle. Each subsequent sweep starts at the start level again.

*RST: SAWTooth

Example:

SOUR:SWE:POW:SHAP TRI

selects the sweep cycle with alternating ascending and descending sweep directions.

Manual operation: See ["Shape - RF Level Sweep"](#) on page 191

[SOURce<hw>]:SWEep:POWer:SPACing:MODE?

Queries the sweep spacing mode. The sweep spacing for level sweeps is always linear.

Return values:

<Mode> LINear

*RST: LINear

Example:

SWE:POW:SPAC:MODE?

queries the sweep spacing for a level sweep at RF output.

Result: LIN

linear spacing

Usage:

Query only

[SOURce<hw>]:SWEep:POWer:STEP[:LOGarithmic] <Logarithmic>

Sets a logarithmically determined sweep step size for the RF level sweep. It is expressed in decibels and you must enter the *value* and the unit *dB* with the command.

The level is increased by a logarithmically calculated fraction of the current level according to:

$$\text{step_size}_{n+1} = \text{Level}_n + \text{step_size}_n \times \text{Level}_n$$

$$\text{Level}_{n+1} = \text{Level}_n + \text{step_size}_{n+1}$$

with $\text{Level}_{\text{START}} < \text{level}_{\text{STOP}}$, $\text{step_size} = \text{SWE:POW:STEP[:LOG]}$ and n = number of sweep steps

This parameter correlates with the number of steps [SWE:POW:POIN](#) within the sweep range as follows:

$$\text{level_points} = ((\text{Level}_{\text{STOP}} - \text{Level}_{\text{START}}) / \text{step_size}) + 1$$

If you change the step size, the number of steps changes accordingly. The sweep range remains the same.