Sweep

The R&S SML /R&S SMV03 features digital, step-by-step sweep for the following parameters:

- RF frequency
- LF frequency
- RF level

A sweep is set in four basic steps, which are demonstrated by the following example, ie the setting of a frequency sweep:

1. Set sweep range (Start Freq and Stop Freq or Center Freq and Span).
2. Select linear or logarithmic sweep (Spacing).
3. Select step size (Step Lin or Step Log) and dwell time (Dwell).
4. Switch on sweep (Mode set to Auto, Single, Step, Ext Single or Ext Step).

Setting the Sweep Range (Start Freq, Stop Freq, Center Freq, Span)

The sweep range for RF sweeps can be entered in two ways. Either the Start Freq and Stop Freq are entered or Center Freq and Span. Please note that the two parameter sets mutually affect each other as follows:

Start Freq altered:	Stop Freq	=	unaltered
	Center Freq	=	(Start Freq + Stop Freq)/2
	Span	=	(Stop Freq – Start Freq)
Stop Freq altered:	Start Freq	=	unaltered
	Center Freq	=	(Start Freq + Stop Freq)/2
	Span	=	(Stop Freq – Start Freq)
Center Freq altered:	Span	=	unaltered
	Start Freq	=	(Center Freq – Span/2)
	Stop Freq	=	(Center Freq + Span/2)
Span altered:	Center Freq	=	unaltered
	Start Freq	=	(Center Freq – Span/2)
	Stop Freq	=	(Center Freq + Span/2)

Selecting Linear or Logarithmic Sweep (Spacing Lin, Log)

Linear or logarithmic sweep can be selected with Spacing. For RF and LF sweeps, both the linear and logarithmic modes are selectable. For level sweeps, only the logarithmic mode is possible.

With logarithmic sweeps, the step size (Step) is equal to a constant fraction of the current setting. The logarithmic step size for RF and LF sweeps is entered in % and for level sweeps in dB.

Operating Modes (Mode)

The following sweep modes are available:

Auto Sweep from start point to stop point with automatic restart at start point. If another sweep mode was active prior to selection of the auto mode, the sweep is continued from the setting active at that time.

IEC/IEEE bus commands

RF sweep:	LF sweep:	Level sweep:
`SOUR:FREQ:MODE SWE`	`SOUR2:FREQ:MODE SWE`	`SOUR:POW:MODE SWE`
`SOUR:SWE:MODE AUTO`	`SOUR2:SWE:MODE AUTO`	`SOUR:SWE:POW:MODE AUTO`
`TRIG:SOUR AUTO`	`TRIG2:SOUR AUTO`	`TRIG:SOUR AUTO`

Single Single sweep from start point to stop point. The selection of Single does not start a sweep run. The sweep run is started by means of the Execute Single Sweep function, which is displayed below the Mode line.

IEC/IEEE bus commands

RF sweep:	LF sweep:	Level sweep:
`SOUR:FREQ:MODE SWE`	`SOUR2:FREQ:MODE SWE`	`SOUR:POW:MODE SWE`
`SOUR:SWE:MODE AUTO`	`SOUR2:SWE:MODE AUTO`	`SOUR:SWE:POW:MODE AUTO`
`TRIG:SOUR SING`	`TRIG2:SOUR SING`	`TRIG:SOUR SING`

Step Step-by-step, manual run within the sweep limits. Activating Step stops a running sweep and the cursor moves to the value indicated for Current. The sweep can now be controlled upwards or downwards in discrete steps using the rotary knob or the numeric keys.

IEC/IEEE-bus commands:

RF sweep:	LF sweep:	Level sweep:
`SOUR:FREQ:MODE SWE`	`SOUR2:FREQ:MODE SWE`	`SOUR:POW:MODE SWE`
`SOUR:SWE:MODE STEP`	`SOUR2:SWE:MODE STEP`	`SOUR:SWE:POW:MODE STEP`
`TRIG:SOUR SING`	`TRIG2:SOUR SING`	`TRIG:SOUR SING`

Ext Single Single sweep from start point to stop point as with Single, but triggered by an external signal

IEC/IEEE-bus commands:

RF sweep:	LF sweep:	Level sweep:
`SOUR:FREQ:MODE SWE`	`SOUR2:FREQ:MODE SWE`	`SOUR:POW:MODE SWE`
`SOUR:SWE:MODE AUTO`	`SOUR2:SWE:MODE AUTO`	`SOUR:SWE:POW:MODE AUTO`
`TRIG:SOUR EXT`	`TRIG2:SOUR EXT`	`TRIG:SOUR EXT`

Ext Step Step-by-step run controlled by an external trigger signal. Each trigger event triggers a single step.

IEC/IEEE-bus commands:

RF sweep:	LF sweep:	Level sweep:
`SOUR:FREQ:MODE SWE`	`SOUR2:FREQ:MODE SWE`	`SOUR:POW:MODE SWE`
`SOUR:SWE:MODE STEP`	`SOUR2:SWE:MODE STEP`	`SOUR:SWE:POW:MODE STEP`
`TRIG:SOUR EXT`	`TRIG2:SOUR EXT`	`TRIG:SOUR EXT`

Off Switching-off sweep mode.

IEC/IEEE-bus commands:

RF sweep:	LF sweep:	Level sweep:
`SOUR:FREQ:MODE CW`	`SOUR2:FREQ:MODE CW`	`SOUR:POW:MODE CW`

Sweep Inputs

TRIGGER An external signal at the rear input triggers the sweep in the Ext Single and Ext Step modes or stops the sweep in all modes.

RUN

Queries whether a sweep is being performed.

IEC/IEEE bus commands:

RF sweep:	LF sweep:	Level sweep:
`SOUR:SWE:RUNN?`	`SOUR2:SWE:RUNN?`	`SOUR:SWE:POW:RUNN?`

Note: *This query may cause distortions in the course of the sweep, depending on the frequency of checkimng and dwell time.*

RF Sweep

Settings for RF sweeps can be made in the Sweep - Freq menu.

Menu selection: Sweep – Freq

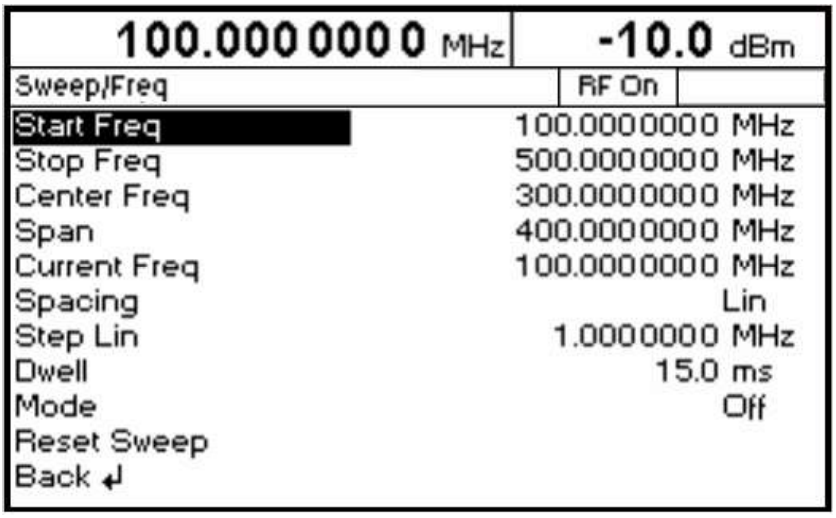

Fig. 4-19 Sweep - Freq menu

Start Freq
Input value of start frequency.
IEC/IEEE-bus command `:SOUR:FREQ:STAR 100MHz`

Stop Freq
Input value of stop frequency.
IEC/IEEE-bus command `:SOUR:FREQ:STOP 500MHz`

Center Freq
Input value of center frequency.
IEC/IEEE-bus command `:SOUR:FREQ:CENT 300MHz`

Span
Input value of span.
IEC/IEEE-bus command `:SOUR:FREQ:SPAN 400MHz`

Current Freq
Display of current frequency value.
In Step mode: input value of frequency.

Spacing
Selection of linear or logarithmic sweep.
IEC/IEEE-bus command `:SOUR:SWE:SPAC LIN`

Spacing Lin
Input value of step size. Depending on whether Spacing Lin or Log is selected, Step Lin or Step Log is displayed.
IEC/IEEE-bus command `:SOUR:SWE:STEP:LIN 1MHz`

Dwell
Input value of dwell time per step.
IEC/IEEE-bus command `:SOUR:SWE:DWEL 15ms`

Mode
Selection of sweep mode. See section "Operating Modes".
IEC/IEEE-bus commands
```
:SOUR:FREQ:MODE SWE;
:SOUR:SWE:MODE AUTO;
:TRIG:SOUR SING
```

Reset Sweep
Resets the start frequency.
IEC/IEEE-bus command `:ABOR`

Exec Single Sweep
Starts a single sweep. This function is displayed and is effective only if Single Mode is selected.
IEC/IEEE-bus command `:TRIG`

Level Sweep

Settings for level sweeps can be made in the Sweep - Level menu.

Menu selection: Sweep - Level

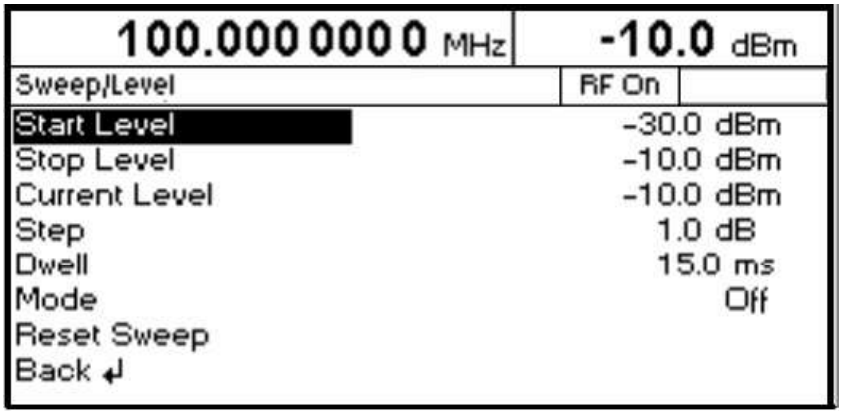

Fig. 4-20 Sweep - Level menu

Start Level
Input value of start level.
IEC/IEEE-bus command `:SOUR:POW:STAR -30dBm`

Stop Level
Input value of stop level.
IEC/IEEE-bus command `:SOUR:POW:STOP -10dBm`

Current Level
Display of current level.
In Step mode: Input value of level.

Step
Input value of step width.
IEC/IEEE-bus command `:SOUR:SWE:POW:STEP 1dB`

Dwell
Input value of dwell time per step.
IEC/IEEE-bus command `:SOUR:SWE:POW:DWEL 15ms`

Mode
Selection of sweep mode (see "Operating Modes").
IEC/IEEE-bus command
```
:SOUR:POW:MODE SWE;
:SOUR:SWE:POW:MODE AUTO;
:TRIG:SOUR SING
```

Reset Sweep
Sets the start level.
IEC/IEEE-bus command `:ABOR`

Exec Single Sweep
Starts a single sweep. This function is displayed and is effective only if Single Mode is selected.
IEC/IEEE-bus command `:TRIG`

LF Sweep

Settings for LF sweeps can be made in the Sweep - LFGen menu.

Menu selection: Sweep - LFGen

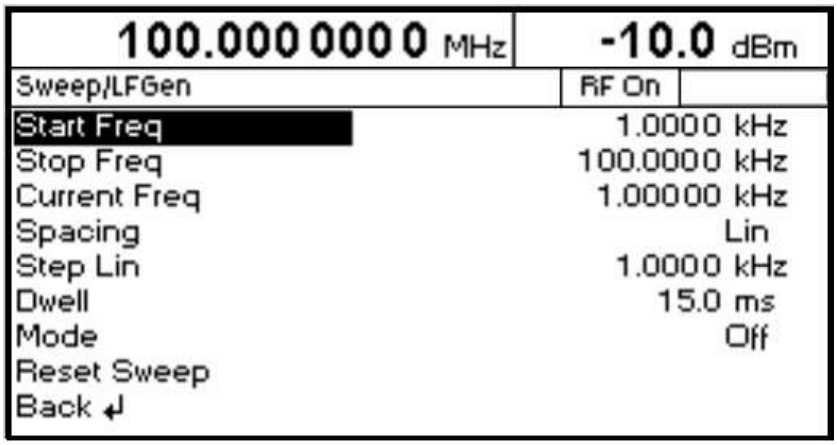

Fig. 4-21 Sweep - LFGen menu

Start Freq Input value of start frequency.
IEC/IEEE-bus command `:SOUR2:FREQ:STAR 1kHz`

Stop Freq Input value of stop frequency.
IEC/IEEE-bus command `:SOUR2:FREQ:STOP 100kHz`

Current Freq Display of current frequency value.
In Step mode: input value of frequency.

Spacing Selection of linear or logarithmic sweep.
IEC/IEEE-bus command `:SOUR2:SWE:SPAC LIN`

Step Lin Input value of step size.
IEC/IEEE-bus command `:SOUR2:SWE:STEP:LIN 1kHz`

Dwell Input value of dwell time per step.
IEC/IEEE-bus command `:SOUR2:SWE:DWEL 15ms`

Mode Selection of sweep mode (see "Operating Modes").
IEC/IEEE-bus command
```
:SOUR2:FREQ:MODE SWE;
:SOUR2:SWE:MODE AUTO;
:TRIG2:SOUR SING
```

Reset Sweep Sets the start frequency.
IEC/IEEE-bus command `:ABOR`

Exec Single Sweep Starts a single sweep. This function is displayed and is effective only if Single Mode is selected.
IEC/IEEE-bus command `:TRIG`