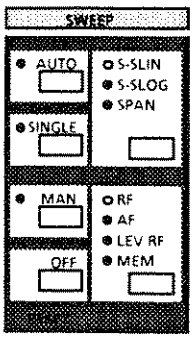
2.3.37 Sweep

The Signal Generator features digital, stepwise sweep for RF, AF, LEV RF and memory (MEM). This means that using the sweep function the change in frequency is effected in selectable steps rather than in a continuous analog manner.

The sweep parameters START, STOP, SPAN, STEP, TIME/STEP and MARKER are determined by numeric entries.



SWEEP keypad

The keys in the SWEEP keypad are used to select the currently required operating mode. The following operating modes are available:

- **AUTO** Sweep from a start end-point to a stop end-point with automatic restart at the end of each sweep.
- **SINGLE** Single sweep from the start end-point to the stop end-point.
- **MAN** Manual sweep using the rotary knob within the sweep limits.
- **S-S LIN** Linear start-stop sweep.
- **S-S LOG** Logarithmic start-stop sweep.
- **SPAN** Sweep centered round the center frequency (CF/RF) with freeely selectable sweep span (SPAN).
- **RF** RF sweep.
- **AF** AF sweep.
- **LEV RF** RF level sweep.
- **MEM** Memory sweep.

The outputs X-AXIS, Z-AXIS and MARKER located at the rear of the instrument are fitted for controlling and triggering oscilloscopes or XY recorders (see section "Sweep outputs").

2.3.38 Sweep, RF

The LED of the RF key in the SWEEP keypad is illuminated when the RF sweep is switched on. To select the sweep mode, its respective key is pressed.

Activating the sweep: by pressing one of the keys AUTO, SINGLE or MAN.

Deactivating the sweep: by pressing the OFF key in the SWEEP keypad.

Sweep performance is indicated by means of the LED of the AUTO, SINGLE or MAN mode currently used (LED illuminated). The LEDs indicating the selected sweep mode (e.g. S-S LIN and RF) are illuminated also if the sweep is switched off.

The following sweep modes are available:

- **S-S LIN** Linear start-stop sweep.
- **S-S LOG** Logarithmic start-stop sweep.
- **SPAN** Sweep centered round the center frequency (CF/RF) with freeely selectable sweep span (SPAN).

Setting ranges of RF sweep parameters:

Sweep parameter	Setting range	Resolution
Start, Stop	100 kHz to 4320 MHz	0.1 Hz
SPAN	0.2 Hz to 4319.9 MHz	0.1 Hz
STEP (lin)	0.1 Hz to 4319.9 MHz	0.1 Hz
STEP (log)	0.01% to 50%	0.01%
TIME / STEP	10 ms to 10 s	1 ms
MARKER	100 kHz to 4320 MHz	0.1 Hz

Display: The operating mode is indicated by the illuminated LEDs in the SWEEP keypad. The FREQUENCY-RF/CF display reads out the current sweep frequency.

Related instructions:
Sweep parameter entry
Sweep operating modes
Sweep, Start-Stop (LIN, LOG)
Sweep, Span
Sweep, Marker
Sweep outputs

2.3.39 Sweep, AF

The LED of the AF key in the SWEEP keypad is illuminated when the AF sweep is switched on. To select the sweep mode, its respective key is pressed.

AF sweep can be used also for sweeping the modulation frequency with internal modulation. In this case, internal modulation and AF sweep must be switched on simultaneously. Note the modulation frequency ranges with AM, FM and ΦM.

Activating the sweep: by pressing one of the keys AUTO, SINGLE or MAN.

Deactivating the sweep: by pressing the OFF key in the SWEEP keypad.

Sweep performance is indicated by means of the LED of the AUTO, SINGLE or MAN mode currently used (LED illuminated). The LEDs indicating the selected sweep mode (e.g. S-S LIN and AF) are illuminated also if the sweep is switched off.

The following sweep modes are available with AF sweep:

- **S-S LIN** Linear start-stop sweep.
- **S-S LOG** Logarithmic start-stop sweep.

Setting ranges of AF sweep parameters:

Sweep parameter	Setting range	Resolution
Start, Stop	1 Hz to 100 kHz	1 Hz
STEP (lin)	1 Hz to 99.99 kHz	1 Hz
STEP (log)	0.01% to 50%	0.01%
TIME / STEP	10 ms to 10 s	1 ms
MARKER	1 Hz to 100 kHz	1 Hz

Display: The operating mode is indicated by the illuminated LEDs in the SWEEP keypad. The AF display reads out the current sweep frequency.

Related instructions:
Sweep parameter entry
Sweep operating modes
Sweep, Start-Stop (LIN, LOG)
Sweep, Marker
Sweep outputs

2.3.40 Sweep, LEV RF

The LED of the LEV RF key in the SWEEP keypad is illuminated when level sweep is selected. To select the sweep mode, its respective key is pressed.

Activating the sweep: by pressing one of the keys AUTO, SINGLE or MAN.

Deactivating the sweep: by pressing the OFF key in the SWEEP keypad.

Sweep performance is indicated by means of the LED of the AUTO, SINGLE or MAN mode currently used (LED illuminated). The LEDs indicating the selected sweep mode (e.g. S-S LOG and LEV RF) are illuminated also if the sweep is switched off.

In LEV RF mode of the generator, only logarithmic start-stop sweep (S-S LOG) is available.

The level sweep may cover a maximal range of 20 dB. If this permissible range is exceeded, the over-range error code "11" is displayed.

Setting ranges of level sweep parameters:

Sweep parameter	Setting range	Resolution
Start, Stop	-140 dBm to 13 dBm	0.1 dB
STEP	0.1 dB to 20 dB	0.1 dB
TIME / STEP	10 ms to 10 s	1 ms
MARKER	-140 dBm to 13 dBm	0.1 dB

Display: The operating mode is indicated by the illuminated LEDs in the SWEEP keypad. The LEVEL display reads out the current sweep level.

Note: Level sweep cannot be set in combination with:
Pulse modulation
Special function "AGC off"

Related instructions:
Sweep parameter entry
Sweep operating modes
Sweep, Start-Stop
Sweep, Marker
Sweep outputs

2.3.41 Sweep, Memory (MEM)

In memory sweep mode, stored instrument settings can be recalled in upward or downward sequence. If MAN mode is used, the memory addresses are called up with the STEP ↑ ↓ keys in the VARIATION keypad instead of using the rotary knob.

The LED of the MEM key in the SWEEP keypad is illuminated when memory sweep is switched on. To select the sweep mode, its respective key is pressed.

Activating the sweep: by pressing one of the keys AUTO, SINGLE or MAN.

Deactivating the sweep: by pressing the OFF key in the SWEEP keypad.

Sweep performance is indicated by means of the LED of the AUTO, SINGLE or MAN mode currently used (LED illuminated). The LEDs indicating the selected sweep mode (e.g. MEM) are illuminated also if the sweep is switched off.

In MEM sweep mode of the generator, only linear start-stop sweep with step size 1 is possible. The MEM sweep cannot be stored.

No STEP or MARKER entries are possible with memory sweep mode. Selection of MEM mode does not affect the sweep outputs X-AXIS, Z-AXIS and MARKER.

Setting ranges of memory sweep parameters:

Sweep parameter	Setting range	Resolution
Start, Stop	Memory 1 to 50	
TIME / STEP	50 ms to 60 s	1 ms

Display: The operating mode is indicated by the illuminated LEDs in the SWEEP keypad. The address of the memory location is read out in the right corner of the LEVEL display. If another sweep (RF, AF or LEV RF) is stored in a stored setting, also the LEDs indicating the mode of this stored sweep (e.g. S-S LIN and RF) are illuminated in addition to the MEM sweep mode LEDs.

Note: ***Setting AUTO mode with short step times highly stresses the mechanical attenuator set.***

Related instructions: Sweep parameter entry
Sweep operating modes
Sweep, Start-Stop

2.3.42 Sweep, Fast Mode Memory

Special function "Memory Sweep Fast Mode" switches the memory sweep function to fast mode.

Special function "Memory Sweep Fast Mode":	Activating code	45
	Deactivating code	46

The number of memories available varies from 220 to 4801 depending on the respective model of the signal generator (see below).

If memory sweep fast mode is switched on, stored instrument settings can be recalled in upward or downward sequence, with the exception of the attenuation setting. The fast mode setting has no effect on the mechanical attenuator. The attenuation must already be set as required prior to starting the sweep run. If level variation is required in fast mode, this can be obtained in a 20-dB range using the special function "Transient-free Level Settings".

The following applies to SMHU58: The operating modes BB-FM, BB-AM, I/Q and DM cannot be changed in fast mode. Deviation only can be altered in the operating mode BB-FM. Before starting the sweep, the desired operating mode must be switched on.

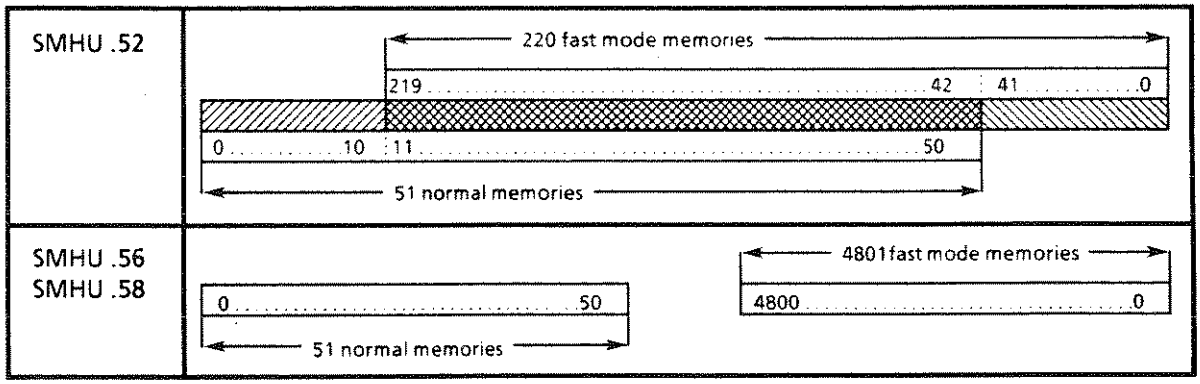
Activating the sweep: by pressing one of the keys AUTO, SINGLE or MAN.

Deactivating the sweep: by pressing any key except the STEP keys. When switched off, the valid setting prior to sweep start is reassumed in the instrument.

Memory selection in MAN mode by means of:

- positive edge at the TRIGGER input (rear)
- Group Execute Trigger of IEC-Bus
- STEP keys

The sweep parameters (START, STOP, TIME/STEP) are selected as with normal memory sweep mode. Separate sweep parameter data sets and memories are used for the fast mode. In some models fast mode memories and normal memories overlap (cf. table below). Therefore it is possible to overwrite the contents of normal memories although "Memory Sweep Fast Mode" is activated and vice versa. An error message is given out if destroyed memories are called up.

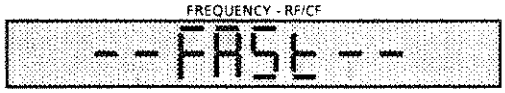


Key sequence STO ⎵ Data ⎵ ENTER is used to store instrument settings in fast mode memories. Fast mode memories cannot be recalled by key sequence RCL ⎵ Data ⎵ ENTER.

Setting ranges of fast memory sweep parameters:

Sweep Parameter	Setting Range	Resolution
Start, Stop	Memory 0 to 219 (Model .52) Memory 0 to 4800 (Model .56/.58)	
TIME / STEP	1 ms to 60 s	1 ms

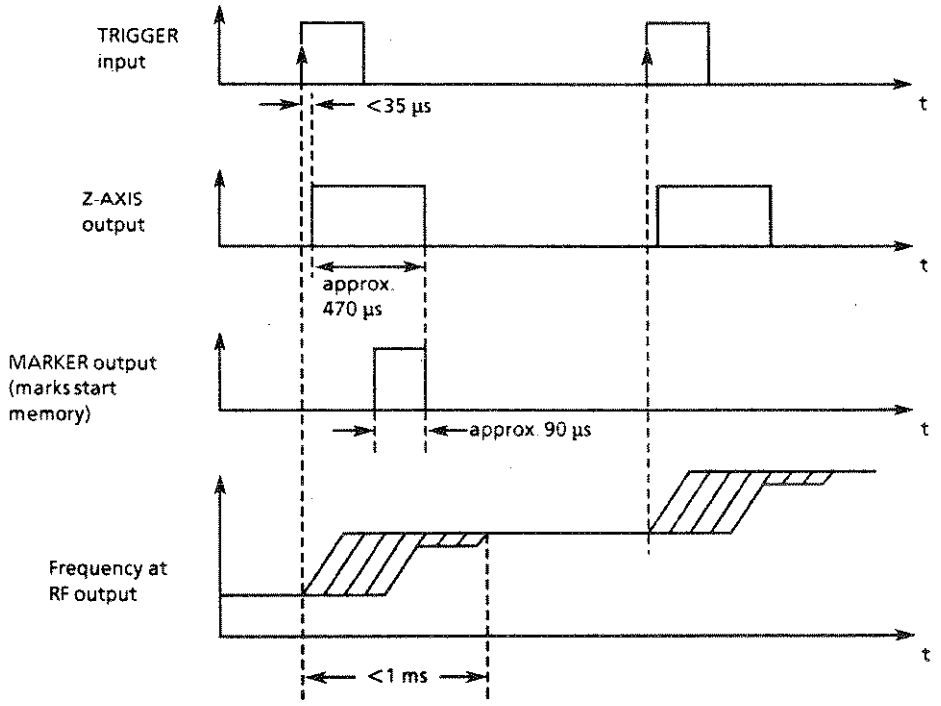
Display: If memory sweep fast mode (AUTO, SINGLE or MAN) is switched on, FREQUENCY display reads as follows:



The memory address is shown on the LEVEL display if an internal step time > 3 ms is set.

Note: Approx. 3 ms are required to have the memory address transferred to the LEVEL display. With a step time < 4 ms with external trigger, an internal step time ≤ 3 ms must be set to suppress the display readout.

Signals with memory sweep fast mode:

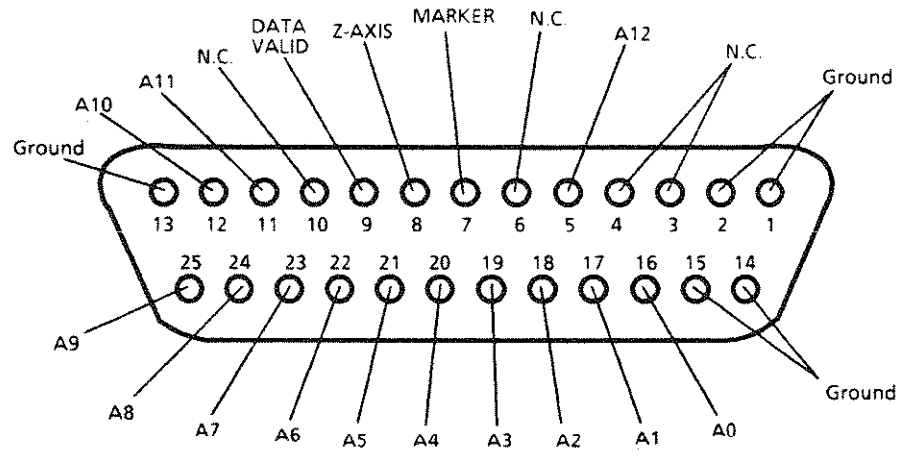


Pulse or AM-SQUARE modulation with the Z-AXIS signal can eliminate transient effects when changing the frequency. In this case pulse or AM-SQUARE modulation must already be activated prior to storing the settings in the fast mode memory.

Related instructions: Sweep, Memory
Sweep parameter entry
Sweep, operating modes
Sweep, Start-Stop
Special functions

2.3.43 Fast Hop Bus (SMHU .56/.58 only)

In this operating mode the addresses of the fast mode memories can be determined externally as desired within the range of 0 to 4800 (in binary code, 13 bits parallel) via the fast hop bus connection. This makes externally controlled frequency hopping possible. In addition all other signal parameters can be controlled externally (with the exception of the mechanical setting of the precision attenuator).



A0... A12	Fast mode memory addresses, in binary code (0 to 4800)
DATA VALID	Acceptance signal
Z-AXIS/ MARKER	Output signals as at BNC-Connectors marked with Z-AXIS or MARKER
N.C.	Not connected

Connector pin assignment of Fast Hop Bus

Operating instructions are similar to those of Memory sweep fast mode:

Special function "Fast Hop Bus" switches memory sweep to fast hop bus mode.

Special function "Fast Hop Bus" : Activating code 47
Deactivating code 48