2.3.24   Sweep (RF)

With a sweep the change in frequency takes place in selectable steps and not continuously.

A sweep is possible across the complete frequency range from 100 kHz to 2000 MHz in minimum steps of 1 Hz.

A linear or logarithmic sweep (see "Sweep (RF), Logarithmic") can be selected.

The following sweep modes are available:

Automatic (AUTO)   Sweep from the start frequency to the stop frequency with an automatic restart at the start frequency.

Single   (SINGLE) Single sweep from the start frequency to the stop frequency.

Manual   (MAN)   Rotary knob variation within the sweep limits at the selected step size f_{STEP}.

Reset   (RESET)   Return frequency to start frequency f_{START}.

2.3.25   Sweep (RF), Parameter Entry

The adjustable parameters are:

f_{START}, f_{STOP} Start frequency, stop frequency
f_{STEP} Step size (Δf/STEP)
TIME/STEP   Time per step (Δt/STEP)

Table 2-1   Ranges of adjustment of the sweep parameters

Sweep parameter	Range of adjustment	Resolution
f_{START}, f_{STOP}	100 kHz to 2000 MHz [1]	1 Hz
f_{STEP}	1 Hz to 1999.9 MHz [2]	1 Hz
TIME/STEP	10 ms to 10 s [3]	1 ms

[1] 10 kHz to 2080 MHz can be set
[2] 1 Hz to 2079.999 Mz can be set
[3] The minimum step time is 150 ms if one of the special functions "Pulse modulation (code 19)", "Pulse modulation (code 29)" or "Level control without function" (code 23) is switched on. The stored value for TIME/STEP is maintained.

The sweep parameters f_{START}, f_{STOP}, f_{STEP}, TIME/STEP are SHIFT parameters. They are set by first pressing the SHIFT key and then the parameter key. The SHIFT parameters remain set as the sweep parameters only for one numerical entry. They must therefore be set again with each new entry. The sweep parameters cannot be varied using the rotary knob or the STEP ↑↓ keys.

The sweep parameters can also be entered whilst a sweep is in progress.

MAN

Manual sweep within the limits f_{START}, f_{STOP} using the rotary knob.

.Pressing the MAN key

+ does not change the set frequency if it is within the sweep range.

+ sets the frequency to f_{START} if the set frequency is outside the sweep range.

+ interrupts a sweep at the frequency reached.

RESET

Pressing the SHIFT and RESET keys

+ sets the frequency to f_{START}.

OFF

Pressing the OFF key

+ switches the sweep off at the frequency reached.

The sweep is also switched off at the frequency reached by pressing the RF key in the parameter keypad.

2.3.27   Sweep (RF), Display

Table 2-2 Display of sweep

Mode	LED	FREQUENCY display
AUTO	AUTO LED on	____ 5-digit ____ __ 4-digit __ Current frequency Stop frequency STOP
SINGLE During sweep	SINGLE LED on	____ 5-digit ____ __ 4-digit __ Current frequency Stop frequency STOP
After sweep	SINGLE LED on	_____ up to 10-digit _____ - - - - Stop frequency - - - - - -
MAN	MAN LED on	_____ up to 10-digit _____ - - - - Current frequency- - - -
RESET		____ 5-digit ____ _ 4-digit __ Start frequency Stop frequency START STOP

2.3.28   Sweep (RF), Logarithmic

With the logarithmic sweep the step size f_{STEP} (Δf/STEP) is equal to a constant fraction of the current frequency.

The sweep is logarithmic if the special function "Logarithmic sweep" is switched on. This special function is switched on with code 07 and off with code 08.

The sweep parameters f_{START}, f_{STOP}, TIME/STEP are identical for linear and logarithmic sweeps and are only stored once. The sweep parameter f_{STEP} is stored twice, however, once in % for the logarithmic sweep and once in Hz for the linear sweep.

Switching on and off of the sweep modes, the display of the sweep and the entry of the sweep parameters (except f_{STEP}) remain the same (see "Sweep (RF), Parameter Entry", "Sweep (RF), Operating Modes", "Sweep (RF), Display").

f_{STEP} is entered in % referred to the respective frequency. The entry of f_{STEP} in % is only possible if the special function "Logarithmic sweep" is switched on.

Range of adjustment of f_{STEP}: 0.01% to 50%
Resolution of f_{STEP}:   0.01%

Examples	a) Switching on the special func. "Log. sweep" b) Switching off the special func. "Log. sweep" c) Setting a step size of 10%

	PARAMETER	__ DATA __	ENTER/UNITS
a)	SHIFT [ ] [ ] SPECIAL	[0] [7]	[ ]
b)	SHIFT [ ] [ ] SPECIAL	[0] [8]	[ ]
c)	SHIFT [ ] f_{STEP} [ ]	[1] [0]	% [ ]

IEC-bus codes	
a)	SWP:MODE:$\frac{RF}{AF}$:LOG
b)	SWP:MODE:$\frac{RF}{AF}$:LIN
c)	RF:LOG_STEP 10%

Associated instructions: Sweep (RF); Sweep (RF), parameter entry
Sweep (RF), operating modes; sweep (RF), display
Sweep (AF); special functions

2.3.29   Sweep (AF)

AF sweep is possible if the instrument is fitted with the option
AF Synthesizer SMG-B2.

RF and AF sweeps cannot function simultaneously.

The special function "Sweep AF" enables the instrument to carry
out an AF sweep. The special function is switched on using code
09 and off using code 10.

The sweep is switched on or off and the sweep mode is selected
using the keys in the SWEEP keypad.

The amplitude of the AF signal at output AF INT (usually
1 V_{rms}) can be set using the special function "AF Amplitude".

The AF sweep can also be used to sweep the modulation frequency
with internal modulation. The internal modulation and the AF
sweep must then be switched on simultaneously. The modulation
frequency ranges for AM, FM and ΦM must not be exceeded.

Associated   AF amplitude
instructions: Special functions

2.3.30   Sweep (AF), Parameter Entry

The sweep parameter inputs (f_{START}, f_{STOP}, f_{STEP}, TIME/
STEP) apply to the AF sweep if the special function "Sweep AF" is
switched on (see section "Sweep (RF), Parameter Entry").

The sweep parameters are stored separately for the AF sweep and
the RF sweep.

Table 2-3 Ranges of adjustment of the AF sweep parameters

Sweep parameter	Range of adjustment	Resolution
f_{START}, f_{STOP}	10 Hz to 100 kHz	1 Hz up to 10 kHz 10 Hz above 10 kHz
f_{STEP}	1 Hz to 99.99 kHz	1 Hz
TIME/STEP	10 ms to 10 s	1 ms

	a) Switching on the special function "Sweep AF" b) Switching off the special function "Sweep AF" c) Setting a start frequency of 10 kHz
Examples	

<table>
<tr><td></td><td colspan="2">PARAMETER</td><td>— DATA —</td><td>ENTER/UNITS</td></tr>
<tr><td>a)</td><td>SHIFT
☐</td><td>☐ SPECIAL</td><td>9</td><td>☐</td></tr>
<tr><td>b)</td><td>SHIFT
☐</td><td>☐ SPECIAL</td><td>1 0</td><td>☐</td></tr>
<tr><td>c)</td><td>SHIFT
☐</td><td>f START ☐</td><td>1 0</td><td>kHz
☐</td></tr>
</table>

IEC-bus codes	
a)	SWP:MODE:AF: LIN / LOG
b)	SWP:MODE:RF: LIN / LOG
c)	AF:START 10KHZ

Display: After pressing the SHIFT key, the parameter is output in the right-hand section of the modulation display as long as the parameter key is pressed.

The digits of the new value are displayed progressively during the numerical input (DATA keys).

2.3.31   Sweep (AF), Operating Modes

If the special function "Sweep AF" is switched on, the key operations in the SWEEP keypad automatically apply to the AF sweep.

The functions of the keys in the SWEEP keypad are the same as with RF sweep (see section "Sweep (RF), Operating Modes").

Notes: By pressing the AF key in the parameter keypad, the AF sweep is switched off at the current frequency.

With the AF sweep switched on, the RF can be changed by a numerical entry or by a rotary knob or step variation.

2.3.32   Sweep (AF), Display

The AF sweep mode is indicated just like the RF sweep by one of the LEDs in the SWEEP keypad (see section "Sweep (RF), Display"). Depending on the operating mode and status, the frequency is displayed successively or fixed in the right-hand section of the modulation display.


2.3.33   Sweep (AF), Logarithmic

The AF sweep is logarithmic if the special function "Logarithmic Sweep" is switched on. See section "Sweep (RF), Logarithmic" for operating the logarithmic sweep.

2.3.34   Sweep (RF, AF) X Output and Z Output

The option SMG-B3 supplies the signals required for controlling and triggering oscilloscopes or XY recorders at the outputs X-Axis and Z-Axis. These signals are available both with RF and AF sweep.

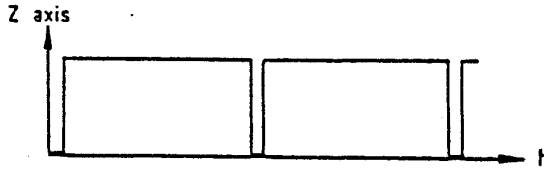**Auto sweep**   **Single sweep**
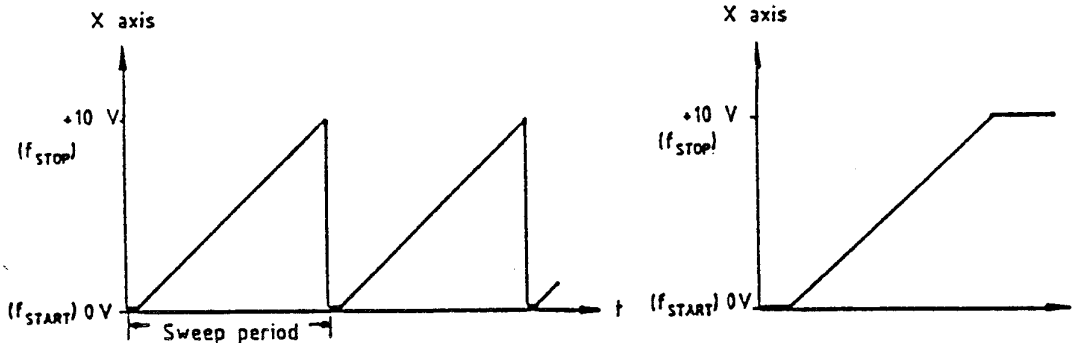
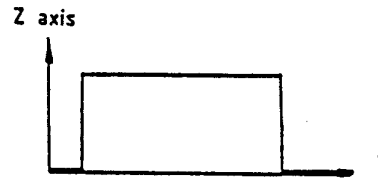using special function "X-voltage decreasing if fSTART > fSTOP":
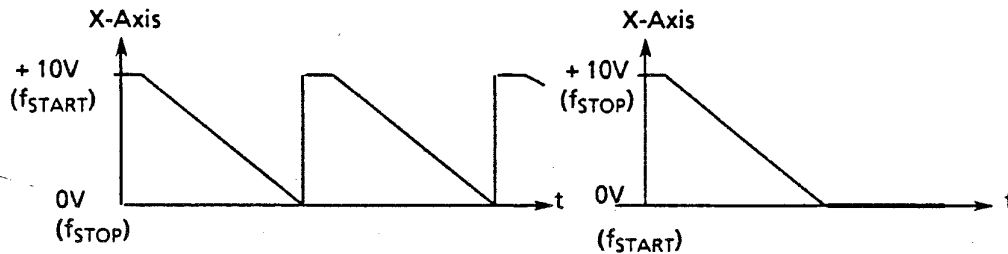
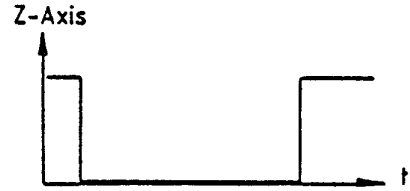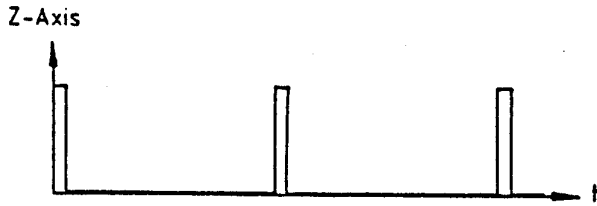The special function "X-voltage decreasing if fSTART > fSTOP" is switched on using code 41 and off using code 42.

Auto sweep

Z axis

Single sweep

Z axis

using special function "Z-axis inverted":

Z-Axis

Z-Axis

The special function "Z axis inverted" is switched on using code 27 and switched off using code 28.

**Associated
instructions:** Special functions