

Signal Generator SMX

0.1 to 1000 MHz

Cost-effective,
system-compatible
universal signal source



Uses, characteristics

Signal Generator SMX is a cost-effective, fully system-compatible synthesizer with excellent signal characteristics and comprehensive basic configuration. It is an economical solution for universal use in laboratory and production. Its spectral purity allows for instance in-channel and blocking measurements on AM, FM and SSB receivers.

Main features

- Overload protection up to 30 W
- Nonvolatile memory for 40 complete instrument setups
- Modulation generator with four fixed frequencies
- Precise output level from -137 to $+13$ dBm
- Oven-controlled reference oscillator for extremely high frequency accuracy (option SMX-B1)
- AF synthesizer as an internal modulation source; can be used as an AF signal source for external applications (option SMX-B2)

Frequency

The wide frequency range is produced without a doubler. Underranging is possible down to a lower limit of 10 kHz, overranging upto 1005 MHz.

Level

The low total level error of less than ± 1.5 dB ensures accurate and reproducible sensitivity measurements. There are no transients upon level changes. The SMX features non-interrupting level setting over a range of 10 dB.

Spectral purity

Low residual FM, low SSB phase noise and excellent suppression of nonharmonic spurious signals are the outstanding features of the SMX in this class of equipment and price range.

Modulation

The modulation capabilities of the SMX include AM, FM and pulse modulation (separate, combined, internal or external). For two-tone modulation, the internal and external sources can be switched on simultaneously.

Frequency modulation is possible up to high modulation frequencies and even with maximum deviation; frequency response is flat. The Low Rate FM Modification Kit (SCM-U1) ensures extremely low sag for digital modulations thanks to the very small low-end limit frequency. With simultaneous AM and FM, modulation depth and deviation can be set separately;

different modulation sources can be selected. AM and FM ensure high accuracy and low distortion.

With pulse modulation full level accuracy is preserved. The RF envelope shows rise/fall times of 2 μ s, the on/off ratio is 40 dB. The standard modulation generator with four fixed frequencies or the optional AF synthesizer are available as modulation sources. The AF synthesizer is also used as an AF signal source for external applications with an output level of 1 V and phase-continuous frequency change in less than 10 ms.

Operation

Carrier frequency, modulation and output levels with selectable units as well as supplementary information can be simultaneously indicated on the illuminated LCD displays. The step keys allow each parameter to be varied in any preset step size. Up to 40 complete instrument setups can be stored in a nonvolatile memory.

The RF level can be switched off while the 50- Ω source impedance remains effective. By setting a frequency offset, the converted frequency can be directly entered and indicated on the SMX in LO applications.

INT, EXT, INT + EXT

Frequency modulation Modes	INT, EXT, INT + EXT						
f<	31.25	62.5	125	250	500	1000	MHz
Max. deviation	100	50	100	200	400	800	kHz
Setting error (at f _{mod} = 1 kHz)	<7% of set value						
FM distortion at 1 kHz and 50% of maximum deviation	<0.5% (typ. 0.1 %)						
Modulation frequency							
FM EXT	20 Hz to 500 kHz						
FM INT	0.4/1/3/15 kHz						
FM INT with option SMX-B2	20 Hz to 100 kHz						
Modulation frequency response from 100 Hz to 100 kHz	<1 dB						
Incidental AM at f _{mod} = 1 kHz, 40 kHz deviation	<0.1 %						
Modulation input	100 k Ω , link-selectable to 600 Ω						
Low Rate FM (Modification Kit SCM-U1)							
Mode	EXT						
3-dB bandwidth	<3 Hz to >500 kHz						
Sag	typ. 30% with 12 Hz squarewave						
Maximum deviation	same as with normal FM						
Pulse modulation							
Mode	external						
Pulse on/off ratio	40 dB						
Rise/fall time 10% to 90%	2 μ s						
Max. repetition frequency	50 kHz						
Min. pulse width	50 μ s						
Modulation input	100 k Ω , link-selectable to 600 Ω						
AF Synthesizer (Option SMX-B2)							
Frequency	10 Hz to 100 kHz						
Readout	3-digit						
Frequency error	<4 $\times 10^{-5}$						
Level error at 1 kHz	< $\pm 3\%$ (typ. 1 %)						
Distortion	<0.1 % (typ. 0.03%)						
Phase-stochastic frequency change, response time between setting command and frequency change	<10 ms						
Remote control							
System	IEC625-1 (IEEE488)						
Connector	24-contact Amphenol						
Remote-controlled functions	all manual settings except power switch and spinwheel (not SMX)						
Interface functions	listener and talker, SH1, AH1, T6, L4, SR1, RL1, PPO, DC1, DTO, CO						
Overload protection							
Protects the instrument against externally applied (50- Ω source) RF power and DC voltage							
Max. permissible RF power	30 W						
Max. permissible DC voltage	35 V						
Max. pulse loading capacity (pulse width <10 μ s)	1 mWs or 150 V _p						
General data							
Power supply	100/120/220/240 V $\pm 10\%$, 47 to 440 Hz, max. 90 VA						
Dimensions (W x H x D)	435 mm x 147 mm x 460 mm						
Weight	12.5 kg						
Ordering information							
Signal Generator	SMX						0826.4517.52
Options							
Reference Oscillator	SMX-B1						0826.9519.02
AF Synthesizer	SMX-B2						0826.9619.02
Low Rate FM Modification Kit	SCM-U1						0804.1615.02
Extras							
Rear-panel connectors for RF, AF	SMX-Z10						0827.0250.02
Service Kit	SMX-Z2						0827.0150.02

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