Test Equipment Solutions Datasheet

Test Equipment Solutions Ltd specialise in the second user sale, rental and distribution of quality test & measurement (T&M) equipment. We stock all major equipment types such as spectrum analyzers, signal generators, oscilloscopes, power meters, logic analysers etc from all the major suppliers such as Agilent, Tektronix, Anritsu and Rohde & Schwarz.

We are focused at the professional end of the marketplace, primarily working with customers for whom high performance, quality and service are key, whilst realising the cost savings that second user equipment offers. As such, we fully test & refurbish equipment in our in-house, traceable Lab. Items are supplied with manuals, accessories and typically a full no-quibble 2 year warranty. Our staff have extensive backgrounds in T&M, totalling over 150 years of combined experience, which enables us to deliver industry-leading service and support. We endeavour to be customer focused in every way right down to the detail, such as offering free delivery on sales, covering the cost of warranty returns BOTH ways (plus supplying a loan unit, if available) and supplying a free business tool with every order.

As well as the headline benefit of cost saving, second user offers shorter lead times, higher reliability and multivendor solutions. Rental, of course, is ideal for shorter term needs and offers fast delivery, flexibility, try-before-you-buy, zero capital expenditure, lower risk and off balance sheet accounting. Both second user and rental improve the key business measure of Return On Capital Employed.

We are based near Heathrow Airport in the UK from where we supply test equipment worldwide. Our facility incorporates Sales, Support, Admin, Logistics and our own in-house Lab.

All products supplied by Test Equipment Solutions include:

- No-quibble parts & labour warranty (we provide transport for UK mainland addresses).
- Free loan equipment during warranty repair, if available.
- Full electrical, mechanical and safety refurbishment in our in-house Lab.
- Certificate of Conformance (calibration available on request).
- Manuals and accessories required for normal operation.
- Free insured delivery to your UK mainland address (sales).
- Support from our team of seasoned Test & Measurement engineers.
- ISO9001 quality assurance.

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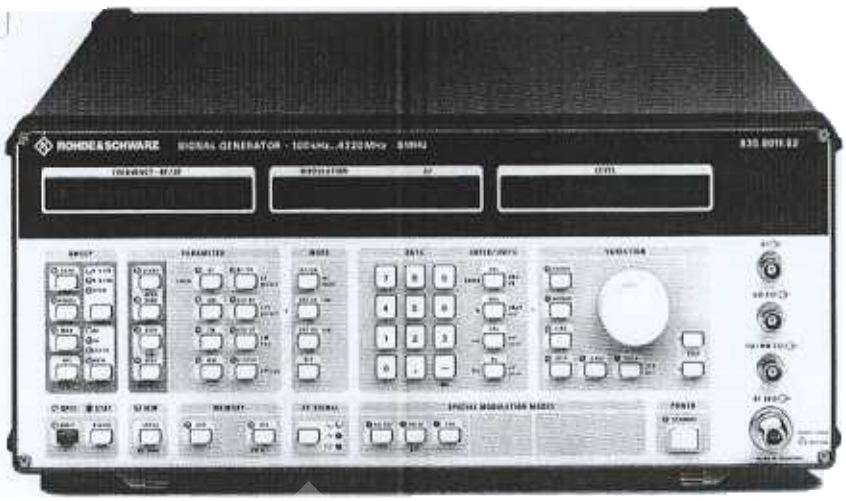
Signal Generators SMGU, SMHU

SMGU: 100 kHz to 2160 MHz
SMHU: 100 kHz to 4320 MHz
High-performance generators with excellent features over a wide frequency range



SMHU (photo 37926)

Brief description

SMGU and SMHU are ideal for applications which the majority of signal generators cannot handle. In addition to out-of-channel measurements, they are for instance able to determine the spurious rejection of radiotelephone equipment up to 4 GHz as laid down by CEPT.

Main features

- Extremely high spectral purity
- Frequency setting time <1 ms
- Frequency resolution 0.1 Hz
- RF, AF, level and memory sweeps
- Broadband FM from DC to 1 MHz
- Frequency-accurate and drift-free FM DC for FSK applications
- OCXO as a reference
- Pulse modulator

Characteristics

Frequency
The frequency can be set with a resolution of 0.1 Hz over the entire range, and this is sufficient even for measurements on extremely narrowband DUTs. Both instruments supply frequencies down to 1 kHz.

The frequency setting time is below 10 ms. In the fast mode up to 200 user-defined frequencies can be handled by means of a trigger signal or by memory sweep in less than 1 ms per setting.

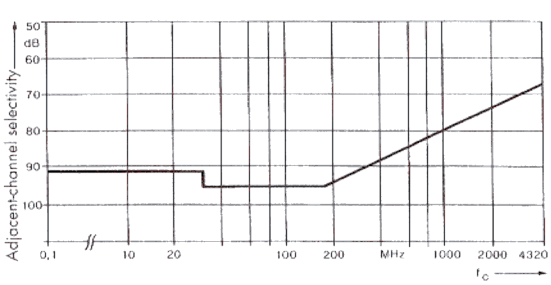
Spectral purity
SMGU/SMHU fulfill requirements for selectivity measurements on top-class receivers. Signals of extremely high spectral purity afford critical adjacent-channel, in-channel and out-of-channel measurements with a wide tolerance margin.

Phase noise remains low right up to the carrier. SMGU and SMHU are therefore ideal for LO applications or as a low-noise reference in noise measurement systems.

Frequency modulation
The FM modulation frequency range extends from DC to 1 MHz. In FM DC mode a high carrier-frequency accuracy is attained. The frequency offset occurring with FM DC selected is extremely small.

Amplitude modulation
The whole of the modulation frequency range can be used down to carrier frequencies of less than 100 kHz. The minimal phase shift at 30 Hz (AM DC) and a flat frequency response make for the precision amplitude modulation that is required for testing VOR/ILS navigation receivers.

Pulse modulation
Rise/fall times of 20 ns (typ. <10 ns for frequencies >200 MHz) and an on/off ratio of 80 dB open up a wide range of possibilities for testing telemetry, microwave link, radar and satellite communications systems.



Dynamic adjacent-channel selectivity can be measured with an uncertainty of <1 dB (modulation for RT applications, channel spacing 20 Hz, AF bandwidth 3 kHz)

Digital and analog sweep
In addition to the digital, step-by-step sweep with presettable start and stop frequency, span, step width and step time, an analog frequency and level sweep is also provided.

Phase offset
The phase of the RF output signal can be varied in steps of 1° using keyboard entry or the spinwheel. This makes it easier to adjust for phase quadrature during noise measurements and to investigate phase-critical components.

Specifications in brief

Frequency

Range	
SMGU	100 kHz to 2160 MHz
SMHU	100 kHz to 4320 MHz
Underrange without guarantee of specs	down to 1 kHz
Resolution	0.1 Hz
Stability	same as reference frequency
Setting time	<10 ms, <1 ms in fast mode
Reference frequency, aging	<1 x 10^{-9}/day after 30 days of operation
Temperature effect	<2 x 10^{-9}/°C
Reference frequency input/output	5 or 10 MHz, selectable

Level

Range	–140 to +13 dBm
Overrange without guarantee of specs	up to 16 dBm (SMGU) up to 19 dBm (SMHU)
Frequency response at 0 dBm	
f ≤2160 MHz	1 dB
Characteristic impedance	50 Ω
VSWR	<1.5 for levels ≤0 dBm (SMGU) <1.8 for f ≤3000 MHz (SMHU)
Setting time	<25 ms (<10 ms with non-interrupting level setting)
Non-interrupting level setting	0 to –20 dB
Overload protection (maximum permissible RF power)	50 W (SMGU)/30 W (SMHU)

Spectral purity

Spurious signals	
Harmonics	<–30 dBc
Subharmonics	
f <2160 MHz	none
f >2160 MHz	<–60 dBc
Nonharmonic spurious signals at >10 kHz from carrier	see line a in table below
Residual FM, rms, 0.3 to 3 kHz (CCITT)	see line b in table below
SSB phase noise at 20 kHz from carrier, 1 Hz bandwidth (FM/φM deviation <2% of max. deviation), typical	see line c in table below

f <	15.6	125	250	500	1000	2000	4000	MHz
			–100	–100	–94			
			0.5	0.5	1			
			–145	–137	–134			

Amplitude modulation

Modes	INT, EXT AC, EXT DC, two-tone
Modulation depth	0 to 100%
AM distortion at 1 kHz and m = 60%	<2%
Modulation frequency (3 dB bandwidth)	
AM EXT AC (DC)	10 Hz (DC) to 50 kHz
AM INT	1 Hz to 50 kHz

AM square (AM-SQU)

Dynamic range	typ. 30 dB
Rise/fall time	typ. 2 µs
Modulation signal (AM EXT)	logic signal

Frequency modulation

Modes	INT, EXT AC, EXT DC, two-tone, preemphasis

Max. deviation (without preemphasis)

f<	15.625	31.25	62.5	125	250	500	1000	2160	4320	MHz
	200	25	50/800*	100	200	400	800	1600	3200	kHz

*) With special function "heterodyne band 0.1 to 125 MHz"

FM distortion at 1 kHz and 50% of max. deviation	<0.2% (<1% with preemphasis)
Modulation frequency	
FM INT	10 Hz to 100 kHz
FM EXT AC (DC)	10 Hz (DC) to 100 kHz, 10 Hz (DC) to 1 MHz (with deviation <10% of max. deviation)
Preemphasis	50 µs, 75 µs

FSK modulation

Rise/fall time	10 µs
Modulation signal (FM/φM EXT)	logic signal

Phase modulation

Modes	INT, EXT AC, two-tone

Maximum deviation

f<	15.625	31.25	62.5	125	250	500	1000	2160	4320	MHz
	20	2.5	5/80*	10	20	40	80	160	320	rad

*) With special function "heterodyne band 125 MHz"

φM distortion at f = 1 kHz and 50% of max. deviation	<0.5%
Modulation frequency	10 Hz to 10 kHz
Pulse modulation	external
On/off ratio	>80 dB
Rise/fall time	<20 ns (f >125 MHz)

Sweep

Modes: automatic, single-shot or manual

	RF sweep	AF sweep	RF level sweep	Memory sweep
Sweep range	user-selectable	user-selectable	0.1 to20 dB	user-selectable
Step size (lin)	user-selectable	user-selectable		1
Step time	10 ms to 1s	10 ms to 1s	10 ms to 1s	50 ms to 60 s 1 ms to 60 s*)

*) In fast mode

General data

Remote control	IEC625-1 (IEEE488)
Power supply	100/120/220/240 V ±10%, 47 to 63 Hz, max. 270 VA
Dimensions (W x H x D)	435 mm x 192 mm x 460 mm
Weight	26 kg for fully equipped unit

Ordering information

Signal Generator	SMGU	0819.0010.52
	SMHU	0835.0011.52