

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.

Test equipment Solutions Ltd
Unit 8 Elder Way
Waterside Drive
Langley
Berkshire
SL3 6EP

T: +44 (0)1753 596000
F: +44 (0)1753 596001

Email: info@TestEquipmentHQ.com
Web: www.TestEquipmentHQ.com



Signal Generator SMT

SMT02: 5 kHz to 1.5 GHz

SMT03: 5 kHz to 3 GHz

SMT06: 5 kHz to 6 GHz

For receiver and EMS measurements



Photo 42353

Brief description

Signal Generator SMT covers the complete range of conventional analog receiver measurements. It provides an exceptionally high signal quality for a generator in this price category, as well as outstanding level accuracy, a wide variety of modulation and signal generation modes, customized configuration, and great ease of operation. Features such as programmable RF, LF and level sweeps as well as the correction of external frequency response make the SMT an ideal source for EMS measurements.

Main features

- Ideal EMS signal source with specified frequency range from 5 kHz
- AM, FM, ϕ M, pulse modulation
- FM DC with high carrier frequency accuracy
- Broadband FM from DC to 8 MHz, broadband ϕ M from DC to 2 MHz

- Convenient RF/LF/level sweep
- Programmable level correction (compensation of external frequency response)
- VOR/ILS generator (option SM-B6)
 - phase resolution 0.01°
 - DDM resolution 0.0001
- Stereo generator (option SM-B6) for measurements on FM sound broadcast transmitters and receivers
- Large, backlit LCD for clear display of all relevant settings
- Minimum RF leakage due to special shielding measures
- Calibration interval of three years

Overview of options

Designation, functions	Option
Reference Oscillator OCXO: aging $<1 \times 10^{-9}$ /day	SM-B1
LF Generator: supplies sinewave, noise 0.1 Hz to 500 kHz, triangular, squarewave 0.1 Hz to 50 kHz signals	SM-B2
Pulse Modulator: on/off ratio >80 dB, rise/fall time <10 ns	SMT02: SM-B3 SMT03: SM-B8 SMT06: SM-B9
Pulse Generator: only in conjunction with SM-B3/SM-B8/SM-B9; provides single, delayed and double pulses	SM-B4
Multifunction Generator: produces stereo multiplex and VOR/ILS signals as well as sinewave, noise 0.1 Hz to 1 MHz, triangular, sawtooth, squarewave 0.1 Hz to 50 kHz signals	SM-B6
Rear Connectors for RF and LF: to replace front-panel connectors	SMT-B19

Specifications in brief

Frequency Range	SMT02: 5 kHz to 1.5 GHz SMT03: 5 kHz to 3 GHz SMT06: 5 kHz to 6 GHz	Reference frequency	standard	option SM-B1
Resolution	0.1 Hz	Aging (after 30 days of operation)	1×10^{-6} /year	$<1 \times 10^{-9}$ /day
Phase offset	adjustable in 1° steps	Temperature effect (0 to 55°C)	2×10^{-6}	$<5 \times 10^{-8}$

Signal Generator SMT

Spectral purity

Spurious signals	
Harmonics	<-30 dBc, with SM-B8/B9: <-26 dBc
Nonharmonics	
f < 1.5 GHz	<-80 dBc
f > 1.5 GHz	<-74 dBc
f > 3 GHz	<-68 dBc
SSB phase noise at 20 kHz from carrier, 1 Hz bandwidth	
< 67.5 MHz	<-120 dBc
125 MHz	<-134 dBc
250 MHz	<-128 dBc
500 MHz	<-122 dBc
1000 MHz	<-116 dBc
2000 MHz	<-110 dBc
3000 MHz	<-109 dBc
6000 MHz	<-103 dBc
Residual FM, rms (f = 1 GHz)	
0.3 to 3 kHz (CCITT)	<8 Hz
0.03 to 20 kHz	<20 Hz

Level	-144 to +13 dBm
Resolution	0.1 dB
Accuracy for levels >-127dBm	
f < 1.5 GHz	±1 dB
f > 1.5 GHz	±1.5 dB
f > 3 GHz	±2 dB
Level frequency response at 0 dBm	1 dB, typ. 0.3 dB

Overload protection

protects the unit from externally applied RF power (50 Ω source) and DC voltages, SMT02 and 03: ≤50 W/35 V, SMT06: ≤1 W/0 V

Simultaneous modulation

any combination of AM, FM (φM) and pulse modulation

Amplitude modulation

Modulation depth/resolution	0 to 100%/0.1%
Setting error at 1 kHz (m < 80%)	<4% of reading ±1%
AM distortion at 1 kHz	
m = 30%	<1%
m = 80%	<2%
Modulation frequency range	DC to 100 kHz

Frequency modulation

	internal, external AC/DC, two-tone with two separate channels FM1 and FM2
Maximum deviation	depending on carrier frequency: 5 MHz (at f _c < 130 MHz) to 40 MHz (at f _c 6 GHz)
Setting error at AF = 1 kHz (FM AC)	<(3% of reading + 20 Hz)
FM distortion at AF = 1 kHz and 50% of max. deviation	<0.2%, typ. 0.1%
Modulation frequency response	
FM1/2: 20 Hz (DC) to 100 kHz	0.5 dB
FM2: 20 Hz (DC) to 8 MHz	3 dB
Stereo modulation	
Crosstalk attenuation	>50 dB
Unweighted S/N ratio	>76 dB
Carrier frequency offset (FM DC)	<0.1% of deviation

Phase modulation

	internal, external AC/DC, two-tone with two separate channels broadband φM or narrowband φM (broadband φM only possible with φM2)
Maximum deviation	depending on carrier frequency
φM range 1: DC to 100 kHz	12.5 to 400 rad
φM range 2: DC to 2 MHz	0.625 to 20 rad

Pulse modulation

Operating modes	external; internal with optional Pulse Generator SM-B4
On/off ratio	>80 dB
Rise/fall time (10/90%)	<10 ns

Internal modulation generator

Level (EMF) at LF socket	0.4/1/3/15 kHz ±3% 1 V ±1% (R _{out} = 10 Ω, R _L > 200 Ω)
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LF generator

Sinewave, noise	
Triangular, squarewave	
Distortion (20 Hz to 100 kHz)	<0.1% (level >0.5 V)
Level (EMF) at LF socket	1 mV to 4 V (R _{out} = 10 Ω, R _L > 200 Ω)

Multifunction generator

Modulation signals	
Sinewave, noise	
Triangular, sawtooth, squarewave	
Distortion (20 Hz to 100 kHz)	<0.1% (level >0.5 V)
Level (EMF) at LF socket	1 mV to 4 V (R _{out} = 10 Ω, R _L > 200 Ω)

Stereo multiplex signal

Stereo operating modes	
Frequency range of L, R signal	0.1 Hz to 15 kHz
Preemphasis	50 μs, 75 μs
Pilot-tone frequency	19 kHz ±1 Hz
Pilot phase/resolution	0 to 360°/0.1°

VOR modulation signal

Settings	with option SM-B6 30 Hz (VAR, REF)/ 9.96 kHz FM carrier, FM deviation, COM/ID tone 0 to 360°/0.01°
Phase/phase resolution	
Bearing error (RF output, 108 to 118 MHz)	<0.05°

ILS modulation signal

Settings	with option SM-B6 90 Hz, 150 Hz tone, COM/ID tone, marker beacon 0 to ±0.8/0.0001
DDM setting range/resolution	
DDM error (RF output)	
Localizer (108 to 112 MHz)	<0.0004 + 1% of DDM reading
Glideslope (329 to 335 MHz)	<0.0008 + 1% of DDM reading

Pulse generator

Operating modes	option SM-B4 single, delayed and double pulse
Pulse repetition period	100 ns to 85 s
Pulse width	20 ns to 1 s
Pulse delay	40 ns to 1 s
Double pulse	60 ns to 1 s

Sweep

digital sweep in discrete steps for RF, level and LF
LF sweep with option SM-B2 or SM-B6

Remote control

Command set	IEC 625 (IEEE 488) SCPI 1993.0
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General data

Power supply	90 to 132/180 to 265 V, 47 to 440 Hz (300 VA)
Dimensions (W x H x D)	435 mm x 192 mm x 350 mm
Weight	20 kg for fully equipped unit

Ordering information

Signal Generator	SMT02	1039.2000.02
	SMT03	1039.2000.03
	SMT06	1039.2000.06

Options

Reference Oscillator OCOXO	SM-B1	1036.7599.02
LF Generator	SM-B2	1036.7947.02
Pulse Modulator		
for SMT02	SM-B3	1036.6340.02
for SMT03	SM-B8	1036.6805.02
for SMT06	SM-B9	1039.5100.02
Pulse Generator (only in combination with SM-B3, SM-B8 or SM-B9)	SM-B4	1036.9310.02
Multifunction Generator	SM-B6	1036.7760.02
Rear Connectors for RF and LF	SMT-B19	1039.4003.02