SECTION 1 TECHNICAL SPECIFICATION

Input A

Frequency Range	10Hz to 100MHz
Sensitivity (rms)	20mV (to 80MHz) 30mV (at 100MHz)
Input Impedance	1MΩ/35pF
Maximum Input	260V (DC + AC rms) to 2kHz, decreasing to 10V rms at 50kHz and above
Filter	Low pass filter (50kHz)

Input B

Frequency Range	40MHz to 1.3GHz
Sensitivity	10mV (to 1GHz) 50mV (at 1.3GHz)
Input Impedance	50Ω nominal
VSWR	Typically 2 : 1 (to 1GHz)
Operating Range	10mV to 5V rms
Damage Overload	7V rms (protected by fuse)

Input C (Microwave Channel)

Frequency Range	500MHz to 20GHz
Sensitivity	-32dBm (to 12.4GHz) -27dBm (at 20GHz)
Operating Level	+7dBm
Damage Level	+25dBm peak (+33dBm with Option 11)
Input Connector	Precision type N female
VSWR	<2:1 (to 10GHz) <3:1 (to 20GHz)
AM Tolerance	Any modulation depth within sensitivity and max. input levels

FM Tolerance

Mode	Modulation Rate	FM Tolerance Max. Deviation
Automatic Normal Low FM Track	 1kHz to 10MHz 45Hz to 10MHz 300kHz to 10MHz	 20MHz pk-pk 20MHz pk-pk 20MHz pk-pk
Manual	1kHz to 10MHz	60MHz pk-pk*

* If set within ±1MHz

Acquisition Time

Mode	Acquisition Time
Automatic Normal Low FM Track	 <125msec <1.25sec <60msec
Manual	<20msec

Tracking Speed

Mode	Tracking Speed
Normal Low FM Track	1MHz/sec 80kHz/sec 1GHz/sec

Splitback	Typically -55dBm (-70dBm in Quiet Mode)
Amplitude Discrimination (Typical)	6dB for signals within 500MHz 20dB for signals at any frequency

IF Output

Available when measurements are made using Input C in Manual Mode. Available intermittently during gate time in Auto Mode.

Frequency Range	41MHz to 112MHz
Output Level	-10dBm nominal
Output Impedance	50Ω nominal
Reverse Damage Level	50V (DC + AC RMS) to 210kHz, decreasing to 3V RMS at 3.5MHz and above

Timebase Specifications

Internal Timebase (PX0)

Frequency	10MHz
Aging Rate	2×10^{-6} in the first year
Temp. Stability	1×10^{-5} over 0-50°C range

Frequency Standard Output

Frequency	10MHz
Amplitude	TTL levels giving approximately 1V pk-pk into 50Ω

External Standard Input

Frequency	10MHz (see also Option 10)
Signal Range	100mV rms to 10V rms
Damage Level	10V rms
Input Impedance	1kΩ nominal for signals <1V pk-pk
	500Ω nominal for signals ≥10V pk-pk
Coupling	AC coupled

General Specifications

Single Cycle (Hold)	Enables a single measurement to be initiated and held
Gate Times	Automatically determined depending on resolution selected
Range	1msec to 20sec (10sec maximum for channel C)
Sample Rate	Selectable display and data output rates
Display	13 digit high brightness 14mm LED display. Separate indicators for GHz, MHz, kHz and Hz

Power Requirements

Voltage	90–110V, 103–127V, 188–237V, 212–265V — externally selectable
Frequency	45 to 440Hz
Power Rating	40VA max
Operating Temp. Range	0 to 50°C 0 to 40°C (with batteries)
Storage Temp. Range	-40 to +70°C -40 to +60°C (with batteries)
EMC/RFI	Meets the requirements of MIL-STD-461 RE02 to 1.3GHz and CE03
Safety	Designed to meet the requirements of IEC348 and follow the guidelines of UL1244
Weight	Net 5.5kg excluding battery Net 8.4kg including battery
Normal Dimensions	101mm (H) x 212mm (W) x 420mm (D)
Shipping Dimensions	260mm (H) x 355mm (W) x 610mm (D)

Options

Option 01 Rear Panel Inputs

Connections to input channels A, B and C can be made at rear.

Option 04T Temperature Compensated Crystal Oscillator

Frequency	10MHz
Aging Rate	3×10^{-7} per month 1×10^{-6} in the first year
Temp. Stability	1×10^{-6} over the range 0°C to +40°C (Operable to +50°C)

Option 04A Ovened Oscillator

Frequency	10MHz
Aging Rate	3×10^{-9} per day averaged over 10 days after 3 months continuous operation
Temp. Stability	$\pm 3 \times 10^{-9}$ per °C averaged over the range 0°C to +45°C (operable to +50°C)

Option 04B High Stability Ovened Oscillator

Frequency	10MHz
Aging Rate	5×10^{-10} per day averaged over 10 days after 3 months continuous operation
Temp. Stability	$\pm 6 \times 10^{-10}$ per °C averaged over range 0°C to +45°C (operable to +50°C)

Option 04E Ultra High Stability Oscillator

Frequency	10MHz
Ageing Rate	$\leq 5 \times 10^{-10}$ per day after 2 days
Temp. Stability	$\pm 7 \times 10^{-9}$ over range 0-50°C (with respect to 25°C)
Warm Up	$\pm 5 \times 10^{-9}$ within 5 hours

Option 07 Rechargeable Battery Pack and External DC Operation

Battery Life	Up to 30 hours on battery save/ standby (typical 3 hours continuous at 25°C)
Battery Condition	Display indicates battery low
External DC	11 to 16V via socket on rear panel

Option 10 Reference Frequency Multiplier

Input Frequency	1,2,5 or 10MHz ($\pm 1 \times 10^{-5}$)

Option 11 Power Limiter

Fitted internally to increase Input C protection

Max. CW power	+36dBm to 18GHz decreasing to +33dBm at 20GHz
Sensitivity Loss	Typical 3 to 4dB depending on frequency

Note: further options/accessories listed on back page.

Definitions

Trigger Error rms

$$\text{Trigger Error} = \frac{[E_i^2 + E_n^2]^{1/2}}{\text{Slew rate at Trigger Point (V/sec)}}$$

E_i = Input amplifier rms noise (typically 150µV rms in 100MHz bandwidth)

E_n = Input signal rms noise in 100MHz bandwith

Residual Stability (channel C only)

Residual stability (rms) = 1 LSD for resolutions 0.1Hz to 1kHz, negligible above 1kHz

Software Ratio Measurements

Counter measures denominator first according to the number of digits selected. It then measures the numerator with the same value of LSD, subject to the maximum resolution possible.