



# 1441A/B

## Signal Generator

(9 kHz ~ 3 GHz / 6 GHz)



China Electronics Technology Instruments Co., Ltd.

## Product Overview:

1441 series signal generator is portable instrument products developed and produced by the 41<sup>st</sup> Institute of CETC, provided with portable case structure and featured by small size and convenient operation; with adjustable power output in wide dynamic range; available in complete amplitude modulation (AM), frequency modulation (FM) and pulse modulation functions by coming standards with internal modulation signal generator and internal pulse generator; using Chinese and English operation interface and large LED TFT LCD.

1441 series signal generator can be used for performance test and failure point location of the receiver in the radar, electronic warfare and communication equipment for convenient test, as well as used as a local oscillator to substitute those in the equipment under test, such as transmitter and receiver, etc., indirectly test for the normality of performance and index of local oscillator signal. In the civilian market, this signal generator can be applied to the R&D, manufacturing of consumer electronic products. As an economical RF signal generator, it is very suitable for teaching and experiment in universities. The portable design of cabinet makes it very suitable for outdoor operations.

## Main Features:

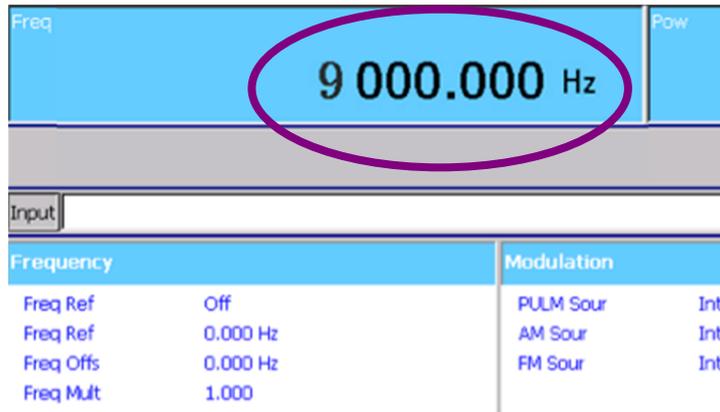
- Portable design of cabinet, lightweight, easy to carry
- Frequency range of 9kHz ~3GHz/6GHz
- High power output in -127~+10dBm large dynamic range
- Standard internal modulation signal generator and comprehensive AM, FM and pulse modulation functions
- Step sweep and list sweep
- Chinese/English operation interface, large LED TFT LCD
- Support wide range of AC power input
- With GPIB and LAN interfaces to enable operation under program control

### **Portable design of cabinet, lightweight, easy to carry**

1441 series signal generator adopts portable design of cabinet; the size is greatly reduced compared to the ordinary desktop cabinet. The integrated design reduces the weight, which will reduce the burden of outdoor detection and maintenance.

### **Frequency range of 9kHz~3GHz/6GHz**

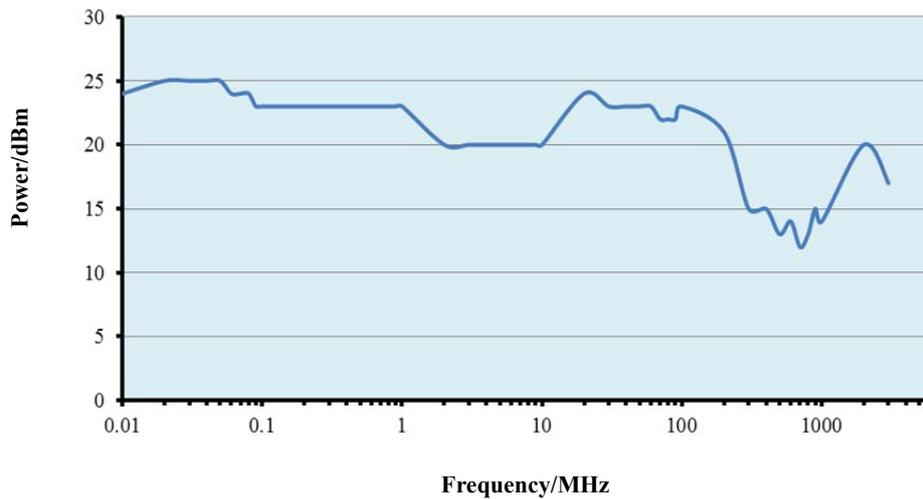
The frequency range of 1441 series signal generator is 9kHz~3GHz/6GHz, the lowest frequency of 9kHz can meet your demand for low frequency band.



**-127~+10 dBm large dynamic range of power output**

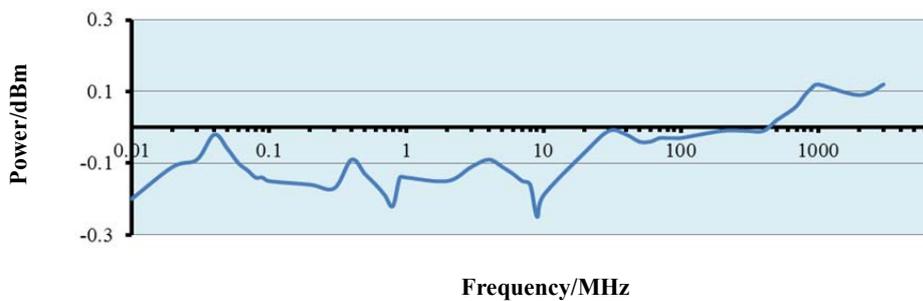
This signal generator is provided with a built-in programmable step attenuator. 1441 series signal generator could output -127dBm signal of min. power level with max output power >+10dBm.

**1441B 10kHz~6GHz Max ALC output power**



Tested value of maximum output power

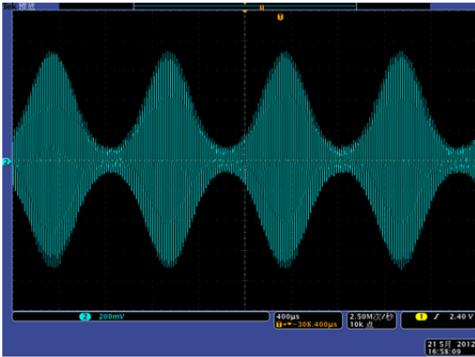
**1441B 10kHz~6GHz, output power of 0dBm**



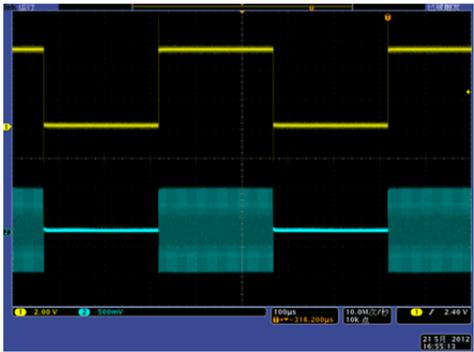
Tested value under 0 dBm output power

# Internal modulation signal generator and comprehensive AM, FM and pulse modulation functions

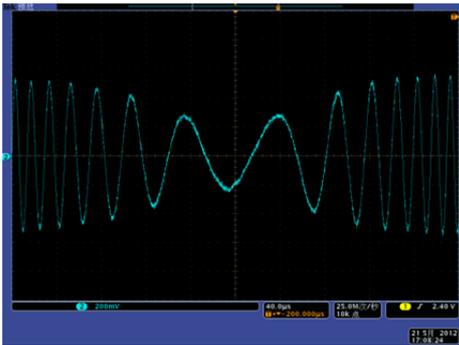
1441 series signal generator is configured with internal modulation signal generator, which adopts direct digital waveform synthesis technique to generate high-quality modulated signal with 20Hz-100 kHz frequency range and 1Hz resolution and can provide complete analog signals capability, the standard internal pulse generator can meet your test requirements for high-performance pulse source.



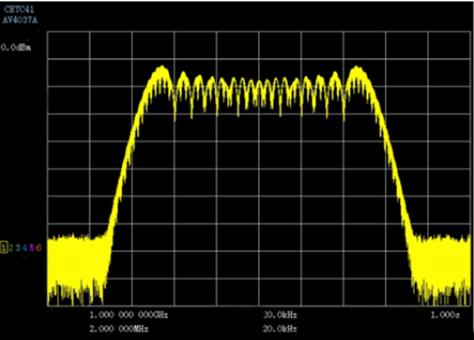
Amplitude modulation



pulse modulation and pulse modulation monitor output



Time domain waveform of frequency modulation



Spectrum of frequency modulation

## Large LED TFT LCD

1441 series signal generator uses large screen and Chinese/English operation interfaces and has a direct and panoramic view of the current state. The operation interface can be switched between English and Chinese for your convenience.

Freq <b>1 000 000 000.000 Hz</b>		POW <b>0.00 dBm</b>		Main Menu	
				Rf On	
Input				Frequency ▶	
Frequency		Modulation		Amplitude ▶	
Freq Ref	Off	PULM Sour	Int Auto	Sweep ▶	
Freq Ref	0.000 Hz	AM Sour	Int	Modulation ▶	
Freq Offs	0.000 Hz	FM Sour	Int	I/Q ▶	
Freq Mult	1.000			System ▶	
Power		Sweep			
Alc Stat	On	Swp Stat	Off		
Att	Auto	Swp Type	Step		
Man Att	0	Swp Ctrl	Cont		
Outp Blan	On	Swp Trig	Free Run		
ALC Bw	Auto/10kHz	Dot Trig	Free Run		
Pow Ref	0.000 dBm	Man Stat	Off		
Pow Offs	0.00 dB	Swp Dir	Normal		

### Step sweep and list sweep

1441 series signal generators supports step sweep and list sweep, which will make your test more flexible.

### Abundant Interfaces

1441 series signal generator provides RS232, GPIB and LAN interfaces for program control operation and network upgrading function.

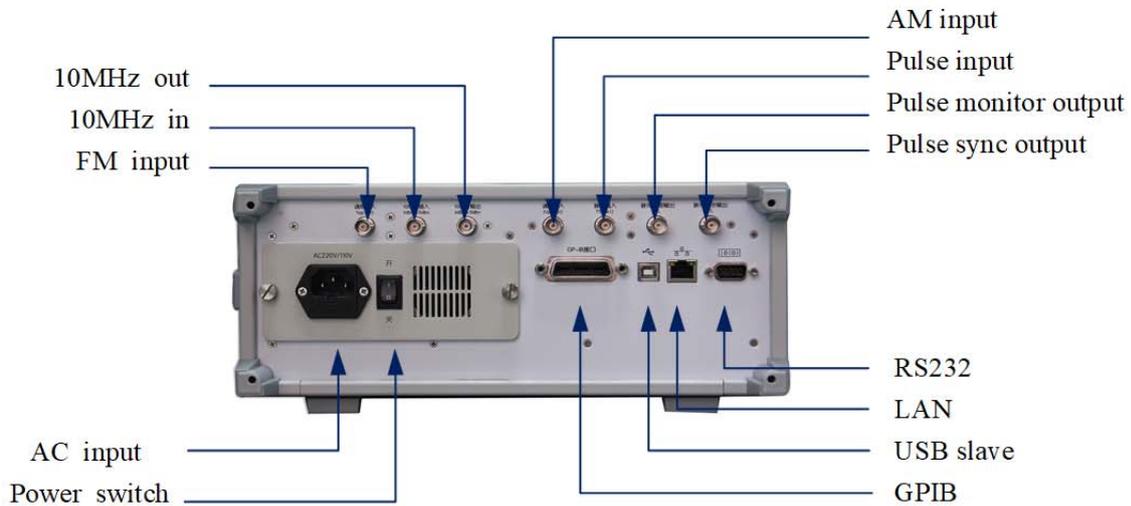
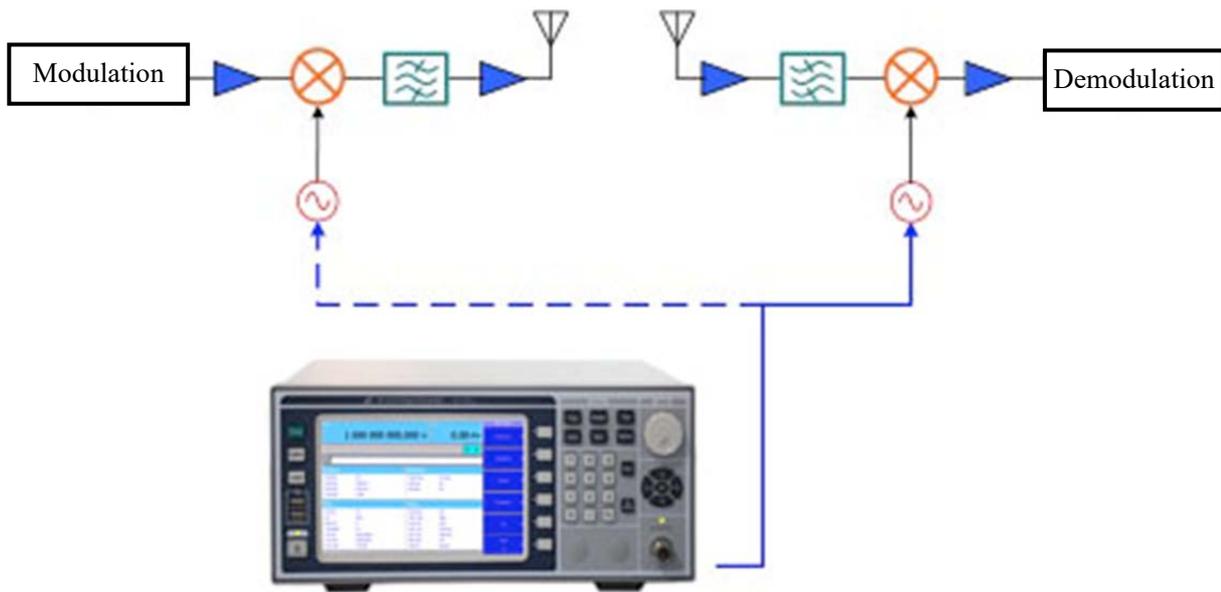


Diagram of multiple interfaces

## Typical Applications:

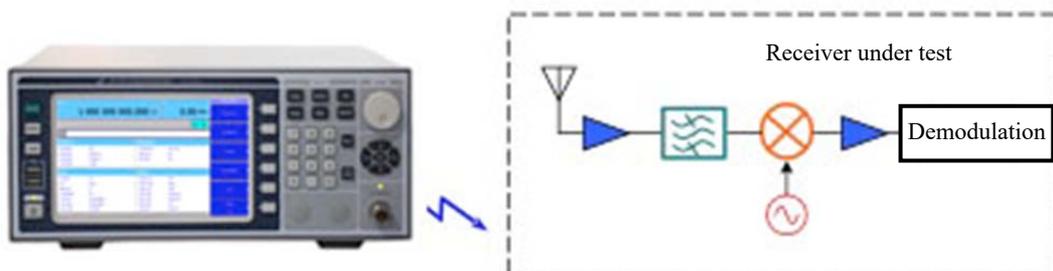
### Local oscillator substitution

With wide output frequency range, 1441 series signal generator can be used as local oscillator to substitute those in the equipment under test, such as transmitter and receiver, etc., and indirectly test the normality of performance and index of local oscillator signal.



### Receiver performance test

With more than 130dB output dynamic range and 0.01Hz frequency resolution, 1441 series signal generator can output amplitude modulation signal, frequency modulation signal and pulse modulation signal which are used for performance test and failure point location of the receiver in the radar, electronic warfare and communication equipment for convenient test.



## Technical Specifications:

Frequency range	1441A: 9kHz~3GHz		Frequency	N(internal YO f undamental wave frequency divisi on times
			$9\text{kHz} \leq f \leq 250\text{MHz}$	4
	1441B: 9kHz~6GHz		$250\text{MHz} < f \leq 400\text{MHz}$	16
			$400\text{MHz} < f \leq 800\text{MHz}$	8
			$800\text{MHz} < f \leq 1.6\text{GHz}$	4
			$1.6\text{GHz} < f \leq 3.2\text{GHz}$	2
			$3.2\text{GHz} < f \leq 6\text{GHz}$	1
Frequency resolution	0.01Hz			
Timebase aging rate(t ypical)	$< 1 \times 10^{-9}/\text{day}$ , $5 \times 10^{-7}/\text{year}$ (after 30 days of continuous power on)			
Sweep mode	Sweep way		Step sweep, list sweep	
	Sweep range		1441A: 9kHz~3GHz 1441B: 9kHz~6GHz	
	Sweep points		2~1601	
	Dwelling time		10ms~60s	
Harmonic	Output power less than +5dBm		$< -30\text{dBc}$	
Non-harmonic	Output power less than +5dBm, 30kHz offset from carrier		$< -60\text{dBc}$	
SSB phase noise	Freq. offset		20kHz	
	1441A	500MHz	$< -118\text{dBc}/\text{Hz}$	
		1GHz	$< -112\text{dBc}/\text{Hz}$	
		3GHz	$< -104\text{dBc}/\text{Hz}$	
	1441B	500MHz	$< -118\text{dBc}/\text{Hz}$	
		1GHz	$< -112\text{dBc}/\text{Hz}$	
		3GHz	$< -104\text{dBc}/\text{Hz}$	
6GHz		$< -98\text{dBc}/\text{Hz}$		
Max. ALC output power (25±10°C)	$> +10\text{dBm}$			
Power accuracy	$\pm 1.5\text{dB}$ ( $-50\text{dBm} \leq \text{output power} \leq +10\text{dBm}$ ) $\pm 2.0\text{dB}$ ( $-110\text{dBm} \leq \text{output power} < -50\text{dBm}$ ) $\pm 3.0\text{dB}$ ( $-120\text{dBm} \leq \text{output power} < -110\text{dBm}$ )			
Modulation performance	Pulse modulation	Pulse modulation on/off ratio	$9\text{kHz} \leq f \leq 3\text{GHz}$ : $> 80\text{dB}$ $3\text{GHz} < f \leq 6\text{GHz}$ : $> 60\text{dB}$	

		Pulse modulation rise/fall Time	<25ns, output frequency>250MHz <80ns, Output frequency≤250MHz
		Min. pulse width	ALC loop on: <2μs
	AM	Modulation mode: linear Max. modulation depth: 90% Modulation rate (3 dB bandwidth, 30% modulation depth): 20Hz~80kHz Accuracy (1kHz modulation rate, demodulation bandwidth 300Hz~3kHz) :±10%	
	FM	Max. Frequency modulation offset: >1.6MHz±N Modulation rate (3dB bandwidth) :20Hz~100kHz Accuracy ( 1kHz modulation rate, 2kHz<frequency offset≤1.6MHz±N, demodulation bandwidth300Hz~3kHz): ±10%	
RF output port	Type N port		
Display	7 inch LED		
Operation interface	Chinese/English		
Dimensions(W×H×D)	320mm×150mm ×390mm		
Max. Weight	9kg		
Operation temperature	0℃ ~+50℃		
Power input	85VAC~264VAC, 47~63Hz		
Power consumption	<90W		

## Ordering Information:

**Main unit:** 1441A signal generator 9kHz~3GHz  
1441B signal generator 9kHz~6GHz

### Standard configuration:

No.	Name	Description
1	Power cord	Standard 3-core power cord
2	User's guide	
3	Programming manual	
4	Certificate of conformity	

**Options:**

Model	Name	Description
1441-001	1441A English options	English label, English panel, English rubber keys, and English operation mode. You can only choose one from Chinese option and English options.
1441-002	1441B English options	English label, English panel, English rubber keys, and English operation mode. You can only choose one from Chinese option and English options
1441-003	Aluminum alloy transportation case	High strength, light aluminum alloy transportation case with handle. Easy for transportation.



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