

## TW4402 Series Radio Communications Test Set



Order Code **TW4402**

### Features:

- Multiple RF testing function
- Analog standard communication testing
- Auto signal testing and auto signal software
- Build-in attenuator with high power
- Optional frequency-hopping testing
- Optional dual-channel oscilloscope
- Optional digital standard communication testing

**Maxwellon TW4402 series radio communications tester** is a multifunctional and portable model based on software radio architecture, integrates plentiful functions, like frequency-hopping signal generation and analysis, vector signal generation and demodulation analysis, analog modulation signal generation and demodulation analysis, audio signal generation and analysis, audio oscilloscope, automatic testing and so on. The tester is capable of major performance tests on transmit and receiving of radio communication equipment, measurement and analysis on feature parameters of RF, modulation, audio, and digit etc.

Wide applications of the tester cover R&D, production, verification, maintenance and repair, and testing on radio communication equipment, including short-wave/ultra short-wave radio stations, data link systems, communication and surveillance satellites, radio relay equipment. Military mobile carriers with radio communication terminals like communication vehicles, surveillance vehicles, vessels and ships, as well as external field tests can use this tester conveniently.

### Specifications

RF Signal Generation	
Frequency Range	TW4402B: 1 MHz to 1.05 GHz, TW4402C: 1 MHz to 3 GHz
Frequency Resolution	1 Hz
Output Level Range	<ul style="list-style-type: none"> <li>• GEN: -120dBm to +5dBm(max. modulation 0dBm)</li> <li>• T/R interface: -130dBm to -35dBm</li> </ul>
Level Resolution	0.1 dB
Level Accuracy	±1.5dB(>-110dBm), ±2.0dB(<-110dBm)
SSB Phase Noise	<ul style="list-style-type: none"> <li>• <math>f \leq 1.05\text{GHz}</math>: -93dBc/Hz @20kHz</li> <li>• <math>f &gt; 1.05\text{GHz}</math>: -90dBc/Hz @20kHz</li> </ul>
Harmonic	Better than -25dBc (>1MHz, <0dBm)
Non-harmonic	
Internal Analog Modulation Source	Sine, square wave, triangle, saw-tooth, dual-tone (analog pilot)
Broadband Power Measurement	

Frequency Range	TW4402B: 400 kHz to 1.05 GHz, TW4402C: 400 kHz to 3 GHz
Measurement Range	<ul style="list-style-type: none"> <li>• ANT interface: 0.1mW – 100mW</li> <li>• T/R interface: 100mW – 150W</li> </ul>
Measurement Accuracy	15% ( $\leq 120W$ , CW or frequency modulation)
<b>Narrow Band Power Measurement</b>	
Frequency Range	TW4402B: 300 kHz to 1.05 GHz (low frequency depends on small IF bandwidth) TW4402C: 300 kHz to 3 GHz (low frequency depends on small IF bandwidth)
Measurement Accuracy	$\pm 2dB$
Receiving Bandwidth	6.25, 8.33, 10, 12.5, 25, 30, 100, 300kHz
<b>Frequency Error Meter</b>	
Frequency Range	TW4402B: 300 kHz to 1.05 GHz (low frequency depends on small IF bandwidth) TW4402C: 300 kHz to 3 GHz (low frequency depends on small IF bandwidth)
Accuracy	Frequency standards $\pm 1Hz$
<b>Audio Signal Generation</b>	
Waveform	Sine, square wave, triangle, saw-tooth
Signal Type	Single-tone, dual-tone
Frequency	<ul style="list-style-type: none"> <li>• 20Hz – 20kHz (sine),</li> <li>• 20Hz – 4kHz (square wave, triangle, saw-tooth)</li> </ul>
Frequency Resolution	0.1Hz
Level Range	1mV – 7Vrms (10k $\Omega$ load)
Level Accuracy	$\pm 5%$ (10k $\Omega$ load $\geq 10mVrms$ )
<b>Audio Signal Analysis</b>	
Input Impedance	150 $\Omega$ , 600 $\Omega$ , high impedance
Max. input Level	30Vrms (high impedance)
Audio Filter	<ul style="list-style-type: none"> <li>• Low-pass: 300Hz, 5kHz, 15kHz, 20kHz</li> <li>• Band-pass: 0.3-3.4kHz, 0.3-5kHz, 0.3-15kHz, 0.3-20kHz</li> </ul>
<b>Sweep Spectrum Analyzer</b>	
Frequency Range	TW4402B: 100 kHz to 1.05 GHz TW4402C: 100 kHz to 3 GHz
Sweep Width	0Hz – whole frequency bands
Level Precision	$\pm 1.5dB$
Min. DANL	<ul style="list-style-type: none"> <li>• ANT interface: better than -125dBm</li> <li>• T/R interface: better than -75dBm</li> </ul>
Resolution Bandwidth	30Hz – 3MHz (1-3 stepping)
<b>Demodulation And Analysis of Analog Modulation Signals</b>	
Frequency Range	TW4402B: 300 kHz to 1.05 GHz (low frequency depends on small IF bandwidth)

	TW4402C: 300 kHz to 3 GHz (low frequency depends on small IF bandwidth)
Signal Format	FM, AM, SSB
Demodulation	6.25, 8.33, 10, 12.5, 25, 30, 100, 300kHz
Demodulation Audio Filter	<ul style="list-style-type: none"> <li>• Low-pass: 300Hz, 5kHz, 15kHz, 20kHz</li> <li>• Band-pass: 0.3-3.4kHz, 0.3-5kHz, 0.3-15kHz, 0.3-20kHz</li> </ul>
Frequency Range of Demodulation Counter	20Hz – 20kHz
Demodulation Counter Resolution	0.1 Hz
Sensitivity	< -100dBm (10dB SINAD, ANT interface)
<b>Demodulation And Analysis of Vector Signals (Option)</b>	
Frequency Range	TW4402B: 300 kHz to 1.05 GHz (low frequency depends on small IF bandwidth) TW4402C: 300 kHz to 3 GHz (low frequency depends on small IF bandwidth)
Signal Format	GMSK, BPSK, QPSK, 8PSK, 16QAM
Demodulation Bandwidth	10kHz – 10MHz
Max. Symbol Rate	5 MHz
<b>Frequency-hopping Signal Analysis (option)</b>	
Filter	RC, RRC, GAUSS
Transient Bandwidth	60MHz, 30MHz, 15MHz, 7.5MHz, 3.75MHz, 1.875MHz
Capture Storage Depth	8 GB
Analysis Domain	Time-frequency (modulation domain), time-amplitude, time-spectrum (waterfall chart), spectrum at random time
Min. Time Resolution	10 ns
<b>Dual-channel Oscilloscope</b>	
Frequency Range	DC to 4 MHz
Vertical Scale	10mV – 10V/mark (1, 2, 5 stepping)
Horizontal Scale	1us – 1s/mark (1, 2, 5 stepping)
Coupling Type	DC, AC
Input Impedance	1 MΩ
<b>Digital Sequence Generation And Bit Error Rate Measurement (option)</b>	
Digital Format	PN3, PN5, PN9, PN11
Baud Rate	300bps – 1Mbps (BPSK, GMSK, 2FSK, 2ASK)
Bit Error Rate Measurement Range	0.1 – 0.000001
Internal Time-base	<ul style="list-style-type: none"> <li>• Frequency: 10MHz;</li> <li>• Aging rate: 1×10<sup>-7</sup>/year;</li> <li>• Temperature stability: ±0.05ppm (0 – 50°C)</li> </ul>
<b>General Specifications</b>	

Interface	<ul style="list-style-type: none"> <li>• RF: GEN interface(TNC), T/R interface(type N), ANT interface(TNC)</li> <li>• BNC: audio input, audio output, oscilloscope input etc</li> <li>• Others: network port (support remote control), 26-core testing bus interface, USB-host interface etc.</li> </ul>
Power Supply	<ul style="list-style-type: none"> <li>• Internal AC: 220V±10%, frequency 50Hz±5%;</li> <li>• External DC: 24V±2V (16V is Acceptable);</li> <li>• Built-in and rechargeable battery: ≥11000mAh (option)</li> </ul>
Dimension	426 (H) × 222 (W) × 180 (D) mm (without handles and auxiliaries)
Weight	≤ 12kg

### Ordering Information

Part No.	Name	Description
TW4402B	Radio Communications Test Set	300 kHz to 1.05 GHz
TW4402C	Radio Communications Test Set	300 kHz to 3 GHz

### Options

Part No.	Name	Description
TW4402-H01	Built-in Lithium Battery	/
TW4402-S01	Vector Signal Generation and Bit Error Rate Measurement	Software
TW4402-S02	Vector Signal Demodulation and Analysis	Software
TW4402-S03	Frequency-hopping Signal Generation	Software
TW4402-S04	Frequency-hopping Signal Analysis	Software
TW4402-S05	Dual-channel Oscilloscope	Software

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