Quality&**Precise**

MAXWELLON 4025

9kHz~20GHz

Handheld Spectrum Analyzer

2023

Maxwellon

The 4025 Spectrum analyzer is a new generation of high-performance handheld Spectrum analyzer launched by Maxwellon. Its frequency measurement range covers 9kHz~20GHz. It is mainly used for the installation, commissioning, maintenance and interference troubleshooting of outdoor wireless communication equipment. It is small in size, light in weight, strong in environmental adaptability, flexible in power supply, and convenient in operation.

The Spectrum analyzer has multiple measurement function modes such as 40MHz Bandwidth Real-Time Spectrum Analysis, Interference Analysis, Channel Sweep, Field Strength Measurement, USB Continuous Wave And Peak Power Measurement, Analog Demodulation Analysis, Directional Analysis, and Channel Power, Occupied Bandwidth, Adjacent Channel Power, Spectrum Emission Template, Carrier Noise Ratio Intelligent Measurement functions such as Harmonic Distortion, Stray Emission Templates, Indoor And Outdoor Map Coverage, supporting interfaces such as LAN, USB, Micro SD card, WiFi wireless communication, etc.

Key Feature

Wide Frequency Range:

9kHz~20GHz, low frequency expandable to 5kHz, standard with full band preamplifier

Excellent Spectral Purity:

Display Average Noise Level: -165 dBm/Hz (2MHz~2 GHz, preamplifier on, Typ.)

SSB Phase Noise:-113dBc/Hz@100kHz Frequency offset@1GHz carrier (Typ.);-108dBc/Hz@100kHz Frequency offset@10GHz carrier (Typ.)

Third-Order Intermodulation Distortion: +16dBm@900MHz (Typ.)

Total Level Uncertainty:±1.0dB(Typ.)

Fast Sweep Speed:

Sweep time <33ms (sweep width 20 GHz, resolution bandwidth 3MHz)

Sweep time <4s (sweep width 1 GHz, resolution bandwidth 1 kHz, Fast FFT Sweep Mode)

Multiple Measurement Function Modes:

Spectrum Analysis, Interference Analysis (Waterfall, RSSI), Channel Sweep, Field Strength Measurement, USB Continuous Wave Power Measurement, USB Peak Power Measurement, Analog Demodulation Analysis (AM, FM, PM), Directional Analysis, 40MHz Bandwidth Real-Time Spectrum Analysis (Supporting Digital Afterglow Spectrum And Waterfall Display), etc

Multiple Intelligent Measurement Functions:

Channel Power, Occupied Bandwidth, Adjacent Channel Power, Spectrum Emission Template, Carrier to Noise Ratio, Harmonic Distortion, Spurious Emission Template, Indoor And Outdoor Map Coverage, Time Gate Measurement, etc. Support GPS/Beidou Positioning and Frequency Tame Calibration Function For Internal Crystal Oscillators. The Typical Frequency Reference Accuracy After GPS Lock Calibration Can Reach ±10ppb

Various Auxiliary Testing Interfaces and Digital Interfaces:

10MHz Reference Input/Output, GPS/Beidou Antenna, Zero Sweep Width Intermediate Frequency Output, WiFi Wireless Communication Interface, LAN, USB, Micro SD, etc

Convenient and Fast User Operation Experience:

10.1-inch LCD and capacitive touch screen with 6 independent markers, supporting tag dragging, frequency amplitude parameter dragging and scaling functions, supporting signal tracking and peak tracking, with 3 display traces and 6 detection methods (standard, positive peak, negative peak, sampling, mean, RMS)

Good Outdoor Usability:

Strong environmental adaptability, working temperature -20℃~55℃, storage temperature -50℃~70℃,Lightweight, with a total battery weight of approximately 3.5kg. It supports three display modes: default, outdoor, and night vision; Built in large capacity lithium-ion battery, typical battery life can reach 4.5 hours

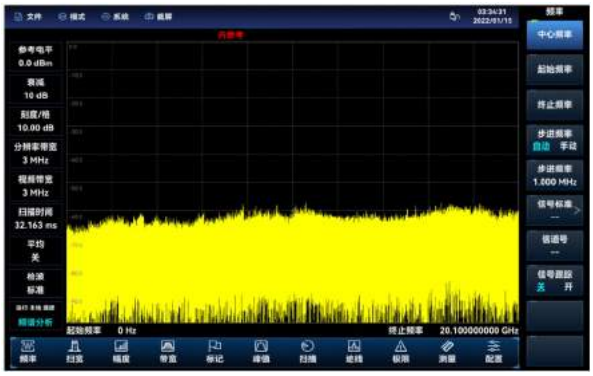
Multiple Field Testing Attachments Selection:

Usb Continuous Wave Power Probe, USB Peak Power Probe, Omnidirectional Antenna, Directional Antenna, Electronic Compass, Emi Near-Field Probe, Car Charger, Battery Charger, etc.

Abundant Measurement Function Modes And Options

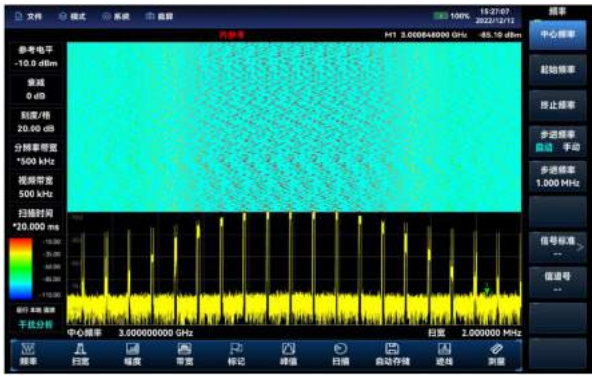
Spectrum Analysis

The spectrum analysis function of the 4025 Spectrum Analyzer is equipped with such test functions as Channel Power, Occupied Bandwidth, Adjacent Channel Power, Spectrum Transmission Template, Carrier Noise Ratio, Audio Demodulation, Harmonic Distortion, Spectrum Transmission Template, Multi Carrier Adjacent Channel Power, etc. It has the characteristics of high test sensitivity, fast sweep speed, large dynamic range, good phase noise index, etc. The 4025 Spectrum analyzer has a variety of built-in predefined signal standards, which can directly call and support the noise marker and frequency counter functions. It can display three traces at the same time, and has different detection methods such as standard, positive peak, negative peak, sampling, mean and RMS. It supports signal tracking and peak tracking functions.



Interference Analysis (Option)

The interference analysis option of the 4025 Spectrum Analyzer has Spectrum Measurement, Waterfall Chart and Rssi Measurement functions. The waterfall chart uses the three-dimensional display mode of frequency, amplitude and time to conveniently observe periodic or intermittent signals. The waterfall chart displays the strength of different response signal amplitudes in different colors. RSSI (received signal strength indication) is mainly used to measure the strength change of a point frequency signal within a time period, Both waterfall plot and RSSI measurement support automatic signal storage function.



Channel Sweep (Option)

The channel sweep measurement mode provides measurement of signal power for multiple channels. The signal power is displayed in the form of a Bar chart or a list, and the signal power of up to 20 channels can be measured. According to the method of setting channels, there are three measurement methods: channel sweep, frequency sweep, and list sweep. All three measurement methods can set the bandwidth and number of channels.

Analog Demodulation Analysis (Option)

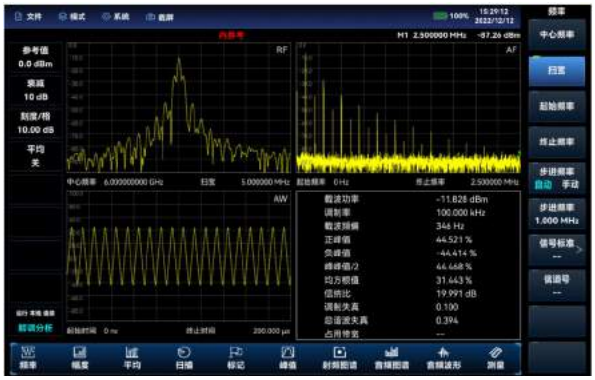
Demodulation analysis measurement mode provides display of AM, FM, and PM modulation signal spectra and analysis of related parameters. The main spectra and related parameter measurements are as follows:

RF Spectrum: Similar to spectrum analysis mode, it displays the spectrum of modulated signals and can be used for bandwidth measurement.

Audio Spectrum: Display the spectrum of the demodulated audio signal.

Audio Waveform: Display the waveform of the demodulated audio signal in the time domain.

Parameter Analysis: Measure and analyze the Carrier Power, Modulation Rate, Carrier Frequency Offset, Modulation Depth (AM), Modulation Frequency Offset (FM), Modulation Phase Offset (PM), SNR, Modulation Distortion, Total Harmonic Distortion and other parameters of the modulated signal.



USB Power Measurement (Option)

The USB power measurement function can measure continuous wave signal power up to 40GHz through the external USB power probe of the 87230/87231/84232/87233 series of the Maxwellon.

USB Peak Power Measurement (Option)

The 4025 spectrum analyzer is connected to the 87234 D/E/F/L USB peak power probe of Maxwellon via the USB interface, which can test radio frequency microwave signals up to 67GHz and achieve Pulsed power measurement in a large dynamic range.

Field Strength Measurement (Option)

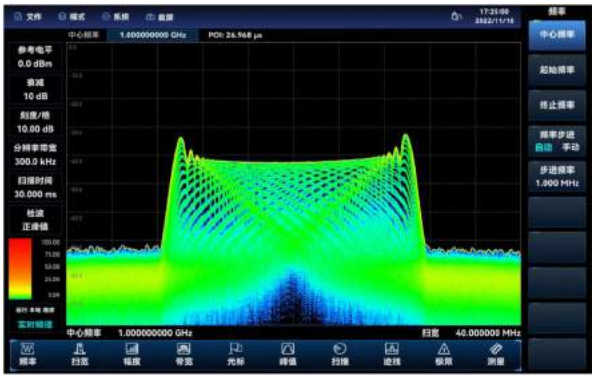
The 4025 Spectrum Analyzer can measure the field strength with a portable antenna, and is widely used in space electromagnetic environment monitoring and radio management. Users can directly call antenna files or customize antenna factors. Field strength measurement can be divided into three modes: Point Frequency Measurement, Frequency Sweep Measurement, and List Sweep Measurement. Point Frequency Measurement observes the frequency deviation, amplitude value, and field strength value of the current point by setting the point frequency; Frequency Sweep Measurement observes the amplitude and field strength changes within a frequency range by setting the starting frequency, step frequency, and number of sweep points; List Sweep Measurement observes the amplitude and field strength values of frequency points in the list by calling pre edited or saved lists.

Directional Analysis(Option)

The directional analysis option of the 4025 Spectrum Analyzer needs to be equipped with directional antenna, electronic compass, GPS Beidou and other options to realize the direct search of interference signal , horizontal sweep direction finding and map cross positioning functions. When selecting the ZE9080 series antenna and handheld handle, it does not need to be configured separately due to its built-in electronic compass.

40MHz Bandwidth Real-Time Spectrum Analysis (Option)

The real-time spectrum analysis function of 4025 is mainly used to capture and analyze transient time-varying signals and burst signals. The maximum real-time analysis bandwidth is 40MHz, which can realize the digital afterglow and waterfall map measurement function of transient signals.



Outdoor Map (Option)

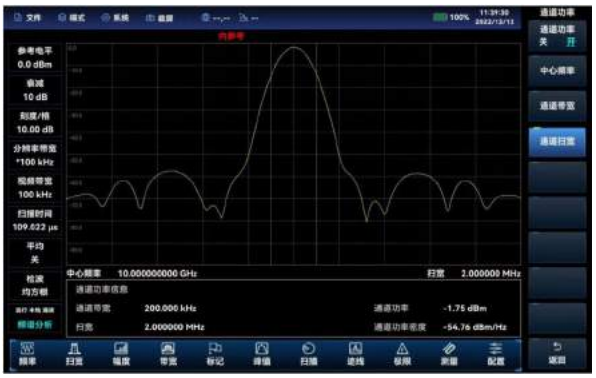
The outdoor map option is a measurement function in spectrum analysis mode, which can perform RSSI testing of interference signals and adjacent channel power ratio testing. The test results can be annotated on the map in real-time based on time or distance. The test results marked on the map can be saved to the instrument for future reference.

Indoor Map(Option)

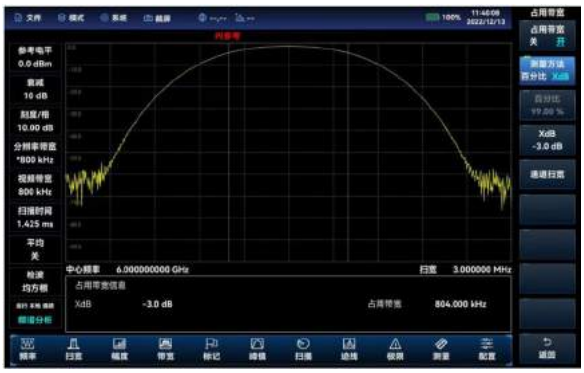
The indoor map option can be used for RSSI testing and adjacent channel power ratio testing. As GPS signals cannot be received indoors, users need to manually move the position and mark the test results on the map. The test results marked on the map can be saved to the instrument for future reference. Users can convert the floor plan in image format into a tile diagram and store it on the instrument through dedicated software (included with the option).

Comprehensive Intelligent Measurement Functions

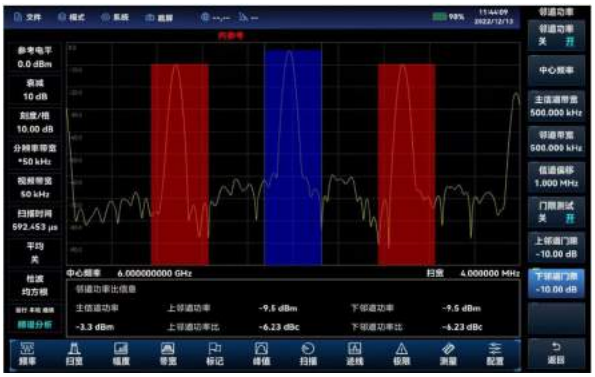
Channel Power



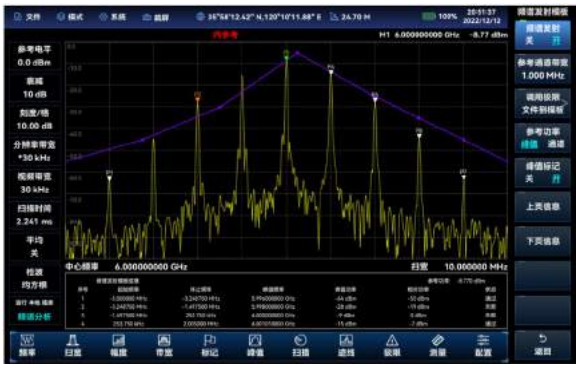
Occupied Bandwidth



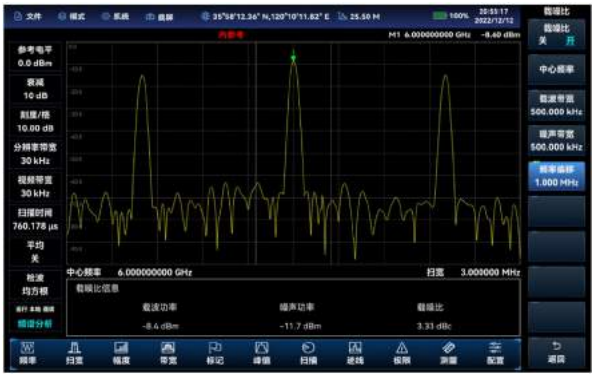
Adjacent Channel Power



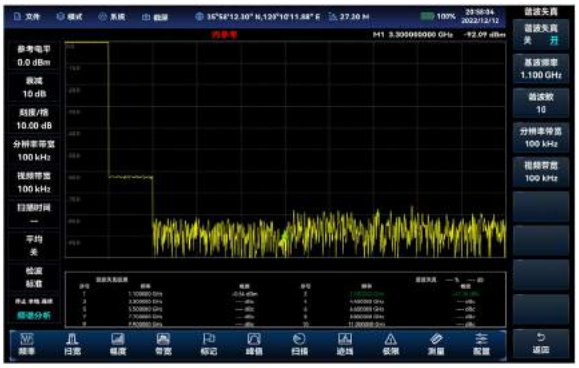
Spectrum Emission Template



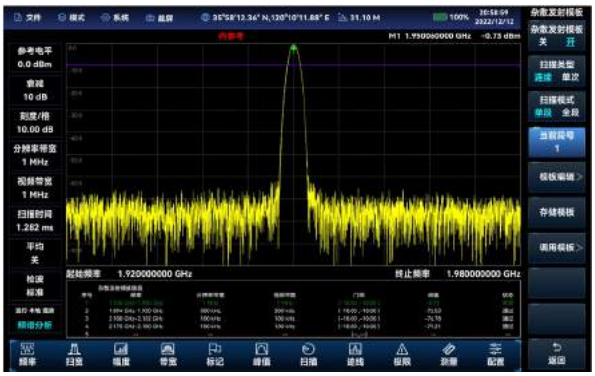
Carrier to Noise Ratio(CNR)



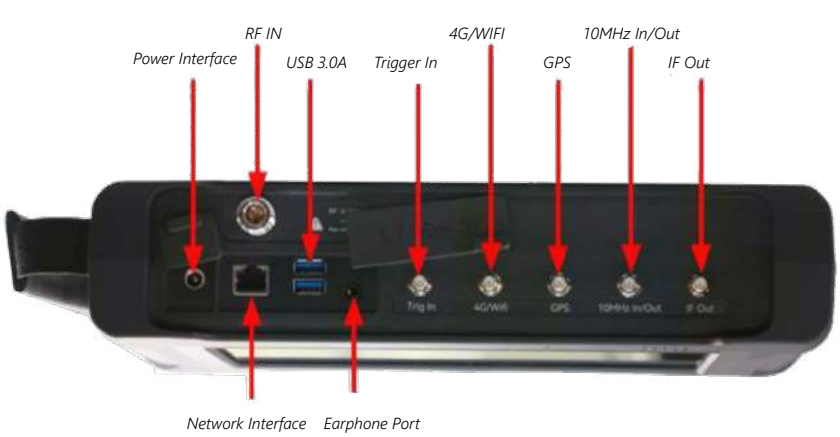
Harmonic Distortion



Spurious Emission Template



Multiple RF and Auxiliary Testing Interfaces



Typical Applications

Comprehensive Performance Evaluation Of Electronic Equipment

The 4025 Spectrum Analyzer product has multiple advantages, such as high performance index, fast sweep speed, multiple test functions, simple operation, etc. It uses a handheld structure, small size, light weight, strong environmental adaptability, battery power supply, and can be applied to the field installation, debugging and maintenance support of various electronic equipment, such as radar, communication, electronic countermeasures, electronic reconnaissance, precision guidance, etc.

Diagnosis Of Transmitters And Receivers

The 4025 Spectrum Analyzer product has a variety of measurement function modes such as spectrum analysis, real-time spectrum analysis, interference analysis, analog demodulation analysis, power measurement, channel sweep, field strength measurement, and a variety of intelligent measurement functions such as channel power, occupied bandwidth, adjacent channel power, carrier noise ratio, stray module board, harmonic distortion, etc, It can provide comprehensive spectrum analysis and diagnostic services for on-site testing of transmitters and receivers.

Broadband Spectrum Monitoring And Interference Identification

The 4025 Spectrum Analyzer can be used for electromagnetic environment detection, Radio jamming analysis, electromagnetic environment background assessment, spectrum monitoring and identification of illegal channel interference signals through external omnidirectional or directional antennas, and can be used for spectrum testing of complex signals such as Time-division multiple access signals and transient time varying signals through time gates and real-time spectrum analysis functions.

Specification

Frequency Range	9kHz~20GHz	
Frequency Reference	Nominal Frequency: 10MHz Aging Rate: $\pm5\times10^{-7}$/year Initial Frequency Accuracy:$\pm3\times10^{-7}$ Temperature Stability: $\pm1\times10^{-7}$(-20℃ +55℃) Frequency Reference Error=± (Until the last calibration date × Aging rate+temperature stability+calibration accuracy) ***Note:** The default calibration time until the last calibration is 1 year, and this indicator is guaranteed by the crystal oscillator manufacturer*	
Sweep Time	Range: 1μs~6000s(zero sweep width) Accuracy: ± 1.0% (zero sweep width)	
Frequency Reading Accuracy	±(Frequency Reading × Frequency Reference Error+1% × Sweep Width+10% × Resolution Bandwidth)	
Sweep Width	Range: 0Hz (zero sweep width), 10Hz~20GHz Accuracy: ± 1.0%	
Resolution Bandwidth	Bandwidth Range: 1Hz-20MHz(in steps of 1-2-3-5-8)	
Video Bandwidth	Bandwidth Range: 1Hz-20MHz(in steps of 1-2-3-5-8)	
SSB Phase Noise (Carrier 1GHz,+15℃ to+35℃)	≤-108dBc/Hz@10kHz ≤-110dBc/Hz@100kHz ≤-118dBc/Hz@1MHz ≤-129dBc/Hz@10MHz	
DANL (Input terminal connected to 50 Ω load, 0dB input attenuation, mean detection, resolution bandwidth normalized to 1Hz,+15℃ -+35℃)	Preamplifier On: ≤-161dBm(2MHz~2.4GHz) ≤-160dBm(2.4GHz~6GHz) ≤-159dBm(6GHz~9GHz) ≤-158dBm(9GHz~14GHz) ≤-156dBm(14GHz~20GHz)	Preamplifier Off: ≤-142dBm(2MHz~2.4GHz) ≤-141dBm(2.4GHz~6GHz) ≤-140dBm(6GHz~9GHz) ≤-138dBm(9GHz~14GHz) ≤-138dBm(14GHz~20GHz)
Second Harmonic Distortion (Attenuation 0dB, -30dBm input, preamplifier off)	≤-70dBc(50MHz~10GHz)	

Third-Order Intermodulation Distortion (-15dBm dual tone signal, 100kHz interval, 0dB attenuation, preamplifier off)	≥+13dBm(50MHz~20GHz)	
Mirror, Multiple, and Out of Band Response	<-65dBc(10MHz~7.5GHz) <-60dBc(7.5GHz~10.5GHz) <-65dBc(10.5GHz~20GHz)	
Residual Response (RF input terminal connected to 50 Ω load, 0dB input attenuation)	Preamplifier On: ≤-110dBm (10MHz~3GHz) ≤-105dBm(3GHz~9GHz) ≤-103dBm(9GHz~12GHz) ≤-100dBm(12GHz~20GHz)	Preamplifier Off: ≤-90dBm(10MHz~20GHz)
Total Level Uncertainty (Frequency 10MHz~20GHz, attenuation 10dB, 0dBm~-50dBm, preamplifier off, resolution bandwidth 1kHz, other parameters automatic)	±1.30dB(working temperature:+15℃ ~+35℃)	
Input Attenuator	Attenuation range 0-30dB, 2dB step	
Max. Safe Input Level	+27dBm continuous wave(input frequency ≥ 50MHz, ≥ 10dB attenuation, preamplifier off)	
Reference Level	Range: -150dBm~+30dBm, Min. 1dB step Conversion Error: ± 0.50dB (reference level 0dBm~-60dBm)	
Detection Mode	Standard, Positive Peak, Negative Peak, Sampling, Mean, Root Mean Square	
Dimensions (W×H×D)	316.5mm×236.5mm×75mm(excluding side straps, interface plugs, and rear bracket closure) 316.5mm×236.5mm×68mm(excluding side straps, interface plugs, and rear brackets)	
Weight	3.0kg(excluding built-in battery) 3.5kg(including built-in battery)	
Operation Temperature	-20℃ ~+55℃ (where the discharge of the battery is -20℃ ~+55℃ , and the charging of the battery is+10℃ ~+45℃)	
Storage Temperature	-50℃ ~+70℃ (where the storage temperature of the battery is -20℃ ~+50℃ , and the storage time is less than 1 month)	
EMC	Comply with the relevant requirements of item 3.9.1 of GJB 3947A-2009	
Power	AC power adapter: Input voltage 100 to 240VAC, 50/60Hz Output voltage 19VDC, 4.7A	Built-in lithium-ion battery: Nominal voltage 10.8V
Consumption	Typical values: 22W~28W (depending on operating mode)	
Battery Life	Typical values: 3.5h~4.5h (depending on operating mode)	
Test Port	RF input: N-type female connector	
Other Interfaces	10mhz Reference Input/Output: SMA Female External Trigger Input Interface: SMA Female GPS Antenna Interface: SMA Female (Optional) IF Output Interface: SMA Female (Optional) WiFi/4G Antenna Interface: SMA Female (optional, 4G antenna input interface is reserved and not currently supported)	
Communication And Auxiliary Interfaces	USB Interface: 2 USB 3.0 A-type interfaces, 1 USB 2.0 Type-C interface,1 USB 3.0 B-type interface (reserved). LAN Interface: Standard RJ-45 type. Headphone Interface: standard 3.5mm. Memory Card/SIM Card: slot for Micro SD card and SIM card (reserved for 4G option)	

Ordering Information

Model

Model	Name	Description
4025	Handheld Spectrum Analyzer	9 kHz~20 GHz

Standard

No.	Name	Description
1	Power Cord Components	Standard three core power cord Adapter input 100 240V 50/60Hz output 19 V 4.7 A Rechargeable lithium-ion batteries
2	Qualification Certificate	/

Options

Option Model	Name	Description
4025-01	English Version Options	Includes English signage, menus, and quick to use guides.
4025-02	Chinese Version Of User Manual	Chinese version of user manual.
4025-03	English Version Of User Manual	The English version of the user manual.
4025-04	Chinese Version Of Programming Manual	Chinese version of programming manual.
4025-05	Programming Manual In English	Programming manual in English.
4025-S01	USB Power Measurement	Provide power measurement function, which needs to be used in conjunction with an external USB continuous wave power probe 87230/87231/87232/87233.
4025-S02	USB Peak Power Measurement	Provide peak power measurement function, which needs to be used in conjunction with 87234D/E/F/L USB peak/average power meter.
4025-S03	Interference Analysis	Provide waterfall plots, RSSI measurements, and other functions.
4025-S04	Channel Scanning	Provide signal power measurement for multiple channels.
4025-S05	Field Strength Measurement	Measurement of electric field radiant intensity.
4025-S06	Outdoor Map	Under outdoor interference maps, RSSI testing and adjacent channel power ratio testing can be performed, and the test results can be annotated on the map in real-time based on time or distance, which needs to be used in conjunction with the 4025 H01 option.
4025-S07	Indoor Map	Under indoor maps, RSSI and adjacent channel power ratio tests can be conducted, and the test results can be annotated on the map through the correlation between signal strength and color.
4025-S08	Analog Demodulation Analysis	Analyzing and Measuring AM, FM, and PM modulated signals.
4025-S09	Zero Sweep Width If Output	Output analog IF signal at zero sweep width.
4025-S10	Time Gate Function	Used for time division interference signal testing.
4025-S11	Orientation Analysis	Used for locating external interference sources or unknown signals, it needs to be used in conjunction with the 4025-H01 option, USB electronic compass option, and directional antenna option.
4025-S12	40MHz bandwidth real-time spectrum analysis	40MHz bandwidth real-time spectrum analysis
4025-S13	List Sweep	Realize continuous scanning measurement of multiple frequency bands.
4025-H01	GPS/Beidou function	GPS or Beidou positioning functions can be achieved through external antennas.
4025-H02	WiFi wireless communication	Wireless data transmission communication with external devices is possible.
4025-H03	Pull rod aluminum alloy box	Pull rod aluminum alloy box.
4025-H04	Trolley transport box	Trolley transport box.
4025-H05	Portable backpack	Portable backpack.
AAL090KN029	AC adapter	Power adapter.
GSA3SA1	9900mAh rechargeable lithium-ion battery	Backup battery pack, nominal voltage 10.8V, battery capacity 9900mAh, not suitable for air transportation.
GS2040IM	9000mAh rechargeable lithium-ion battery	Backup battery pack, with a nominal voltage of 10.8V and a battery capacity of 9000mAh, suitable for air transportation.
GSCAR19V	Car power adapter	In the field of car chargers, the input voltage is 12-24V, and the output voltage is 19V, which can supply power to handheld measuring instruments.
GSCH4000B	Smart battery charging stand	Lithium ion battery charging stand.

MicroSD	Memory card	Mrico SD card with a capacity of 128G.
87230	87230 USB continuous wave function probe	Frequency range: 9kHz~6GHz, interface type N (m).
87231	87231 USB continuous wave function probe	Frequency range 10MHz~18GHz, interface type N (m).
87232	87232 USB continuous wave function probe	The frequency range is 50MHz~26.5GHz, and the interface type is 3.5mm (m).
87233	87233 USB continuous wave function probe	The frequency range is 50MHz~40GHz, and the interface type is 2.4mm (m).
87234D	87234D USB Peak/Average Power Meter	Frequency range 50MHz~18GHz, interface type N (m).
87234E	87234E USB Peak/Average Power Meter	The frequency range is 50MHz~26.5GHz, and the interface type is 3.5mm (m).
87234F	87234F USB Peak/Average Power Meter	The frequency range is 50MHz~40GHz, and the interface type is 2.4mm (m).
87234L	87234L USB Peak/Average Power Meter	Frequency range 500MHz~67GHz, interface type 1.85mm (m)
ZE9080 antenna module A	ZE9080 directional antenna A	Frequency range: 9kHz~20MHz, interface type N (f). (It is recommended to choose the ZE9080 handheld handle module option for use)
ZE9080 antenna module B	ZE9080 directional antenna B	Frequency range 20MHz~200MHz, interface type N (f). (It is recommended to choose the ZE9080 handheld handle module option for use)
ZE9080 antenna module C	ZE9080 directional antenna C	Frequency range 200MHz to 500MHz, interface type N (f). (It is recommended to choose the ZE9080 handheld handle module option for use)
ZE9080 antenna module D	ZE9080 directional antenna D	Frequency range: 500MHz~8GHz, interface type N (f). (It is recommended to choose ZE9080 handheld handle module for use)
ZE9080 handheld handle module	ZE9080 Antenna amplifier	Frequency range: 9kHz~8GHz, N (f), used in conjunction with ZE9080 antenna module A/B/C/D option, including amplifier and electronic compass.
ZE9080 Antenna New Trolley Box	ZE9080 antenna transport box	The ZE9080 antenna special transport box can accommodate ZE9080 antenna module A/B/C/D and ZE9080 handheld handle module options.
HyperLOG 7060X	700MHz~6GHz directional antenna	Active logarithmic periodic antenna, frequency 700MHz~6GHz, interface type SMA (f).
HyperLOG 60100X	680MHz~10GHz directional antenna	Active logarithmic periodic antenna, frequency 680MHz~10GHz, interface type SMA (f).
HyperLOG 60200X	680MHz~20GHz directional antenna	Active logarithmic periodic antenna, frequency 680MHz~20GHz, interface type SMA (f).
OmniLOG 70600	6GHz omnidirectional antenna	Portable omnidirectional antenna, frequency 680MHz~6GHz, interface type SMA (m).
OmniLOG 30800	8GHz omnidirectional antenna	Portable omnidirectional antenna, frequency 300MHz~8GHz, interface type SMA (m).
HyperLOG 7060	700MHz~6GHz passive directional antenna	Passive logarithmic periodic antenna, frequency 700MHz~6GHz, interface type SMA (f).
HyperLOG 60100	680MHz~10GHz passive directional antenna	Passive logarithmic periodic antenna, frequency 680MHz~10GHz, interface type SMA (f).
HyperLOG 60180	680MHz~18GHz passive directional antenna	Passive logarithmic periodic antenna, frequency 680MHz~18GHz, interface type SMA (f).
USB electronic compass	USB electronic compass	External USB electronic compass can be used in conjunction with HyperLOG 7060X, HyperLOG 60100X, HyperLOG 60200X, and 4025-S11 options.
UF2-SMAMNM-2.0M	N/SMA-JJ RF cable (2m)	N/SMA dual positive RF coaxial cable, DC~18GHz, 2m long.
PBS1	PBS1 near-field probe	The highest operating frequency is up to 9GHz, including one electric field probe and one 6mm, 12mm, 25mm, and 50mm magnetic field probe each, with an interface type of SMB (m).

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