GW Instek GSP-9330 Spectrum Analyzer

New Product Introduction

This document allows GW Instek's partners
to quickly grasp product's main features, FAB and ordering information.

GW INSTEK
Simply Reliable

TESTS MUST BE FAST!

The brand new GSP-9330, a high test speed spectrum analyzer with 3.25 GHz, provides the fastest 204 μs sweep speed. Users, via high speed sweep time, can easily handle and analyze modulation signals. The keys to handling modulated signals are fast sweep time and signal demodulation functions. In addition to the analog AM/FM demodulation and analysis function, GSP-9330 also provides digital signal ASK/FSK, and 2FSK demodulation and analysis capabilities. Nowadays, EMC issues are very crucial to product's design processes. Therefore, GSP-9330 has incorporated the EMC pretest solution to facilitate EMC tests. The simple and easy EMC pretest procedures from GSP-9330 can tremendously shorten users' product launch timeline.

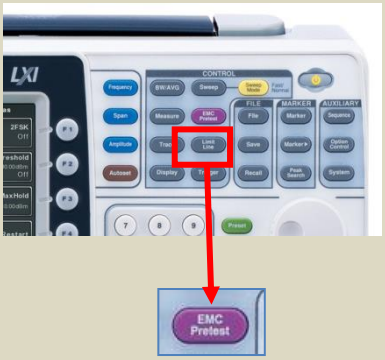
Fastest Sweep Speed Up to 204us

For measuring signals, speed is one of the specifications to be considered. Perhaps, it is the most important specification. GSP-9330 provides sweep speed up to 204 μs. Users, via high speed sweep time, can easily capture transient signals such as Tire-pressure monitoring system (TPMS), frequency/amplitude modulation signals, Bluetooth frequency hopping signals, tuned oscillator or other interfering signals under ISM Band.

Modulation Signal Analysis and Processing

The keys to handling modulated signals are fast sweep time and signal demodulation function. In addition to the analog AM/FM demodulation and analysis function, GSP-9330 also provides ASK/FSK digital signal demodulation capability. For the widely-utilized, low-cost and low power consumption 2FSK modulation signals, GSP-9330 also provides the complete test and analysis function to address the requirements.

EMC Pretest Solution



GSP-9330 can meet customers' EMC pretest requirements on the product development and verification stages. Users can detect and resolve problems at the early product development stage that can save time and money for product development and verification fee. As a result, users can expedite the process of products launch. GSP-9330 has the built-in EMI dedicated 200/9 k/120 k/1 MHz filter, 20 dB low noise amplifier and Quasi-Peak/Average detection mode to conduct radiation and conduction tests after collocating with the probe set.

GKT-008, the radiation test probe set, provides a complete near field test probe set to simplify the complex measurement procedures and to simulate 3m/10m far field tests from the labs. Using GKT-008 can greatly save engineers' debugging time and the money for going back and forth to the labs. GKT-008 can collocate with the Tracking Generator function of GSP-9330 to conduct EMS pretests.

For conduction tests, GKT-008 can collocate with LISN and Isolated Transformer to conduct electromagnetic conduction tests. If users concern EUT's large voltage variation or complexity, applying a Transient Limiter will make test equipment safer.

Features

Main features

- **Fastest sweep speed up to 204 µs.**
- **Support modulation signal analysis**
  - **2FSK digital signal** analysis
  - **ASK/FSK digital signals** demodulation and analysis.
  - **AM/FM analog signals** demodulation and analysis.
- **Complete EMC pretest solution**
  - EMI Detect mode: Quasi-Peak, Average
  - EMI Filter(-6dB): 200 Hz, 9 kHz, 120 kHz, 1MHz
  - Dedicated EMC function key

Applicable to tests and analysis for various signals

- Signal channel analysis provides Channel Power, OCBW, ACPR, N-dB bandwidth, SEM
- CATV parameter tests focus on CNR, CSO, and CTB parameters
- Signal source's stability characteristics can be tested via Phase Noise and Phase Jitter
- Component's or system's linearity test can be confirmed by TOI and P1dB functions
- Other measurement applications include Harmonic, Frequency Counter, Time Domain Power, and Gated Sweep

Graphic processing of signal monitor

- Spectrogram traces changes of frequency and power vs. time
- Topographic uses color shade to show the probability distribution of signal appearance
- Split-Window allows independent observation and settings for spectrum with different frequency bandwidths

Features for production line applications

- Frequency stability of 0.025 ppm allows GSP-9330 to be stable quickly after powered up
- Users can set up automatic wake-up time to save time from manually setting
- The sequence function exempts users from writing programs
- The limit line function determines whether the tested signal passes the test

User Friendly Design

- Built-in Definition Help
- Status Icons
- Support five languages (English, Simplified Chinese, Traditional Chinese, Japanese, and Russian)
- Quick save function

Various interface

- Support USB Host, RS-232, LXI C (LAN Base), GPIB (option)
- Support USB Device, MicroSD to save files
- Ideal for TV Output's DVI interface

Software and driver

- SpectrumShot PC Software - EMC / Remote Control Mode
- IVI Driver (It needs NI VISA)
- Android App – GSP-9330 Remote Control

Various augmenting options

- Tracking Generator analyzes scalar network analysis and P1dB point measurements
- Battery module and dedicated carrying case are ideal for Open Site operations
- GKT-008 near field probe set conducts EMI Pretest.
- GLN-5040A/GIT-5060 conducts EMI Conduction tests

Customers and Applications

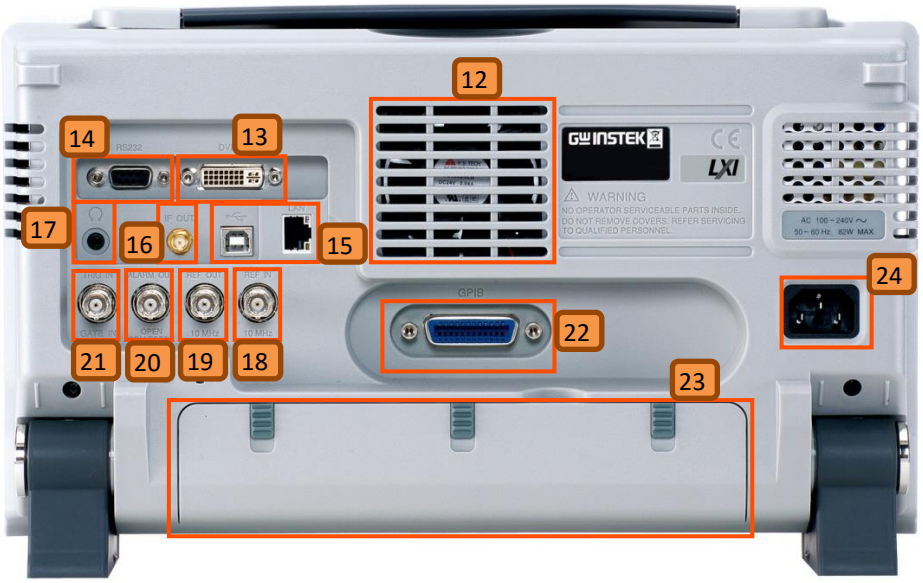
Customers

- Consumer Electronics
- Service and Maintenance
- Universities, Graduate Schools
- Military Industries
- Automotive Electronics
- Telecom and communications Industries
- Distributors for RF-Instruments
- Instrument leasing companies

Applications

- For the quick check and analysis of spectral characteristic
- EMI pre-compliance testing
- Analyze ASK, FSK, AM, FM signal characteristics
- Monitor Satellite uplink signals from Satellite Uplink Truck
- Test systems that require a very compact instrument
- Measure the frequency response of cable, attenuator, filter and amplifier

Panel Introduction



1. LCD Display	9. +7V DC Power Supply	17. 3.5mm Headphone Jack
2. F1~F6 Modifier keys	10. Tracking Generator Output	18. REF Input
3. Function Keys	11. USB-A, Micro SD Port	19. REF Output
4. Power Key	12. Fan	20. Alarm Output / Open Collector
5. Scroll Wheel, Arrow Keys	13. DVI-I Port	21. Trigger Input / Gate Input Port
6. Enter, BK SP, Preset & Quick Save Keys	14. RS-232 Port	22. GPIB Port (optional)
7. Numeric Keys	15. USB-B, LAN Port	23. Battery Cover / Optional Battery Pack
8. RF Input Terminal	16. IF Output	24. Power Socket

Important Information of Product Ordering

Key Dates for Product Announcement

1. Global Market Announcement (Aug 15, 2016)
2. Order Queue Open (Aug 10, 2016)

Service Policy

- **One (1) year warranty.** GSP-9330 Spectrum Analyzer carries a standard warranty for 1 year.
- **Service Support- GSP-9330 spectrum analyzer is a high-frequency and high-accuracy test and measurement instrument. To maintain the measurement accuracy, this product must be recalibrated after maintenance. Maintenance is only conducted by authorized distributors via PCB module swapping and calibration.**
- **The service manual clearly elaborates the required equipment, procedures, and maintenance instruction for certified maintenance units to carry out PCB swapping so as to assist distributors in providing customers with quick after-sales services and maintenance.**
- **Marcom Material and Service Manual download through Website**.
  Good Will Instrument continues to provide after sales support through its website. The most updated version of service manual and Marcom material of GSP-9330 spectrum analyzer will be posted on the distributor zone of GW Instek's website at http://www.gwinstek.com

Ordering Information

GSP-9330, 3.25 GHz Spectrum Analyzer

EMC Pretest Solution

GKT-008, **EMI Near Field Probe Set**
GLN-5040A, Line Impedance Stabilization Network
GIT-5060, Isolated transformer
GPL-5010, Transient Limiter

Standard Accessories

Power Cord, Certificate of Calibration,
CD-ROM (with Quick Start Guide, User Manual, Programming Manual, SpectrumShot Software, SpectrumShot Guide & IVI Driver)

Options

Option 01, Tracking Generator
Option 02, Battery Pack
Option 03, GPIB Interface

Optional Accessories

GSC-009, Soft Carrying Case
GRA-415, Rack Adapter Panel

Free Download

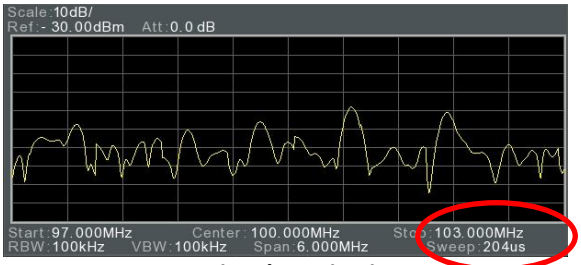
SpectrumShot PC Software for Windows System (available on GW Instek website)
IVI Driver Supports LabVIEW/LabWindows/CVI Programming (available on NI website)

Detailed Product Information

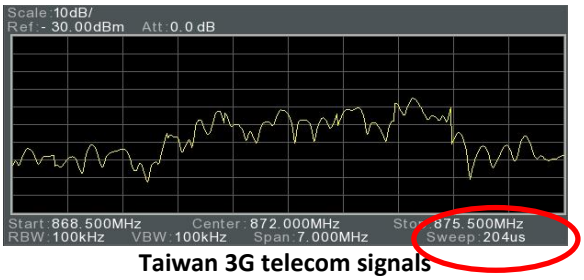
Detailed Descriptions for Features

Fast Signal Sweep

For spectrum analyzer, speed is the most important specification. GSP-9330 provides sweep speed up to 204 µs. Users, via high speed sweep time, can identify and analyze various fast or transient signals such as frequency/amplitude modulation signals, Bluetooth frequency hopping signals, tuned oscillator or other interfering signals under ISM Band.



FM signal monitoring



Taiwan 3G telecom signals

Modulated Signal Analysis

2FSK Signal Analysis

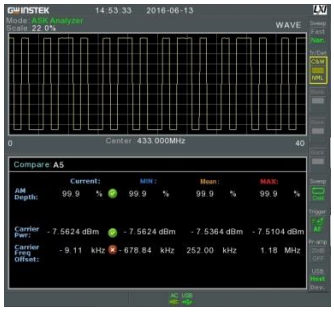
2FSK modulation, for its features of low design cost and low electricity consumption, is widely used by RF communications applications with low power and low data transmission speed characteristics. Nowadays, 2FSK modulation technology has been applied in various products and systems such as consumer electronics, automotive electronics, RFID, auto reading electricity meter, and industrial control devices, etc.

2FSK signal analysis measures parameters including carrier power, FSK frequency deviation, carrier frequency, and carrier frequency offset. Users can set the criterion in frequency deviation and carrier offset for fast test result determination.

ASK/FSK Signal Demodulation & Analysis

RFID and optical communications systems often use Amplitude Shift Keying (ASK). Applications such as wireless telephone, paging systems, and RFID, etc. utilize Frequency Shift Keying (FSK).

ASK/FSK demodulation and analysis measures parameters including AM depth, frequency deviation, carrier power, carrier frequency offset, symbol, and waveform. Users can set AM depth, frequency deviation, carrier power and carrier offset for Pass/Fail testing result. Data message is provided to determined preamble & sync function.



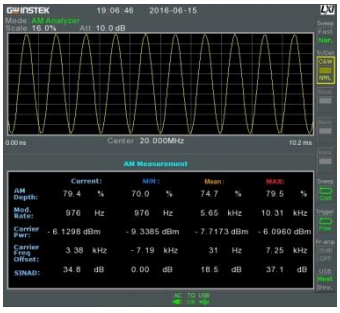
ASK

FSK

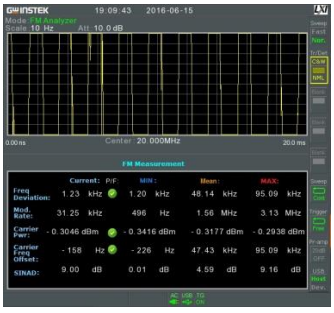
AM/FM Signal Demodulation & Analysis

AM/FM Signal Analysis measures parameters including AM depth, frequency deviation, modulation rate, carrier power, carrier frequency offset and SINAD. Users can set the criterion in AM depth, frequency deviation, carrier power and carrier offset for fast test result determination.

The GSP-9330 has a convenient AM/FM demodulation function to tune into AM or FM broadcast signals and listen to the demodulated signals.



AM



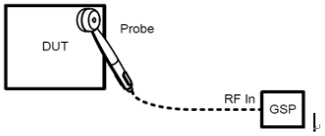
FM

EMC Pretest Solution

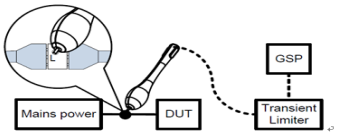
GSP-9330 has the built-in EMI dedicated 200/9k/120k/1MHz filter, 20dB low noise amplifier and Quasi-Peak/Average detection mode to conduct radiation and conduction tests after collocating with the probe set.

GKT-008, the radiation test probe set, provides a complete near field test probe set to simplify the complex measurement procedures and to simulate 3m/10m far field tests from the labs. Using GKT-008 can greatly save engineers' debugging time and the money for going back and forth to the labs. GKT-008 can collocate with the Tracking Generator function of GSP-9330 to conduct EMS tests.

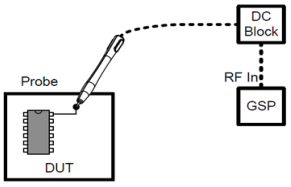
For conduction tests, GKT-008 can collocate with LISN and Isolated Transformer to conduct electromagnetic conduction tests. If users concern EUT's large voltage variation or complexity, applying a Transient Limiter will make test equipment safer.



ANT-04/ANT-05



PR-01



PR-02

EMC pretest instruments provided by GW Instek are as follows:

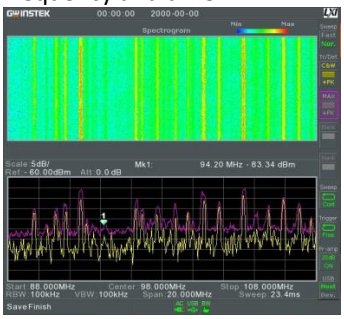
GSP-9330 **Spectrum Analyzer**	Built-in complete EMC pretest solution
GKT-008 **EMI Near Field Probe Set**	Provide probe set for near field signals, including • **ANT-04/ANT-05 field sensor** • **PR-01 AC voltage probe** • **PR-02 source contact probe**
GLN-5040A **LISN**	LISN required by EMI conduction tests and it meets CISPR16-1-2:2006 regulations.
GIT-5060 **Isolated Transformer**	Different mains have different current leakages that will cause systems to have short circuit. Isolation transformer prevents short circuit by isolating current loop.
GPL-5010 **Transient Limiter**	Transient Limiter will make test equipment safer if EUT has large voltage variation or complexity.

For more detailed information about EMC Pretest Solution, please visit "DETAILED EMC PRETEST SOULTION" documents.

Graphic Processing of Signal Monitoring

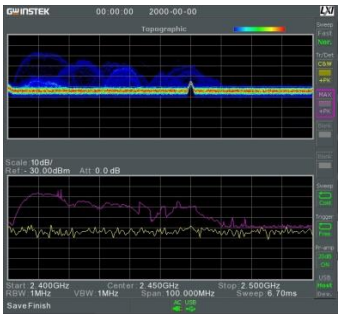
Spectrogram, Topographic, and Split-Window

Spectrogram can simultaneously display power, frequency, and time. Frequency and power variation according to time changes can also be tracked. Especially, the intermittently appeared signals can be identified. Users, by using Spectrogram, can analyze the stability of signal versus time or identify the intermittently appeared interference signals in the communications system. Users can use two markers to find out the relation of power to frequency and time.



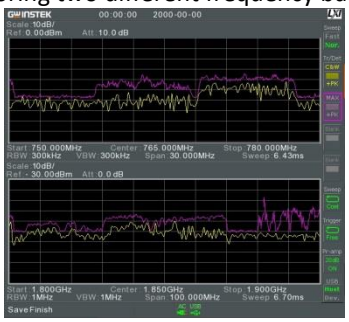
Observe FM signals by Spectrogram

Topographic uses color shade to show the probability distribution of signal appearance. This function allows users to directly understand the process of signal variation according to time changes that is beneficial to observe intermittent feeble signals or electromagnetic interference signals. Users can use two makers to find out the relation of power to frequency and percentage.



Observe WiFi signals by Topographic

Split-Window allows two independent observations that are very convenient for monitoring two different frequency bandwidths.



Observe 4G LTE signals by Split-Window display

Signal Verification, Test and Analysis

Channel Power Measurement - ACPR/OCBW

Telecommunications and broadcasting service carriers will encounter distorted signals caused by adjacent channels' inter-modulation while transmitting modulated signals using communications channels. If the distorted signals are too large the communications quality of adjacent channels will be affected. The ACPR measurement can examine the leakage status that is conducive to identifying interference source.

The OCBW measurement can simultaneously display OCBW, channel power and PSD. OCBW's unit is shown by percentage. A measurement area containing bandwidth will be shown when OCBW is in use.

OCBW

ACPR

Spectrum Emission Mask

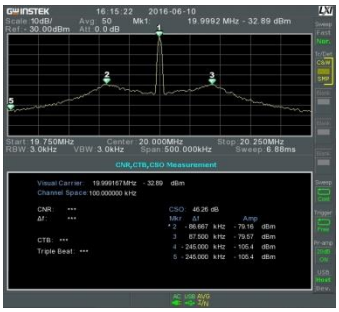
SEM measures out-of-channel emission which is defined by corresponding in-channel power. Users can set main channel's parameters, out-of-channel range, and limit line, etc.

GSP-9330 has the built-in SEM settings of 3GPP, WLAN 802.11b/g/n, Wimax 802.16 and self-defined communications system. SEM supports the Pass/Fail test function and lists frequency range for surpassing each out-of-channel limit. An alarm signal will be triggered if any measurement results that are not matched with SEM.

CATV System Parameter Tests - CNR/CSO/CTB

The built-in CNR/CSO/CTB functions of GSP-9330 are ideal for measuring performance of CATV amplifier and system.

Note: General CATV is 75 Ω. For GSP-9330, a 50 to 75 ohm adapter is needed.



Phase Jitter

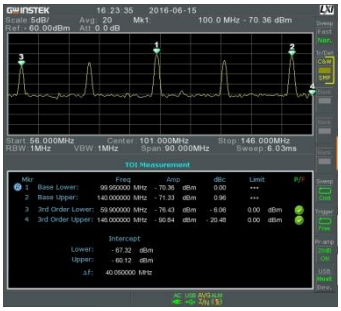
The Phase Jitter function can rapidly measure phase noise produced by RF signal source's and oscillator's carrier deviation. This function can directly convert signal jitter to phase (rad) and time (ns).

Marker Noise

The marker noise function calculates the average noise level over a bandwidth of 1Hz, referenced from the marker position.

TOI (Third Order Intercept)

Users can measure the linearity of non-linear systems and components such as receiver, low-noise amplifier and mixer by TOI which automatically tests effective carrier and measures inter-modulation sidebands.



Harmonic

Harmonic can easily measure the amplitude of fundamental frequency and as high as ten orders of harmonic frequency. This function can also measure amplitude (dBc) which is the ratio of harmonic and corresponding fundamental carrier. Total harmonic distortion (THD) can also be calculated by this function. The best harmonic information can be obtained by adjusting RBW.

Gated Sweep

Radar or TDMA communications systems, via intermittently turning on/off output power, control transmission signals. In order to monitor the power spectrum during the transmission process, the Gated Sweep function can initiate measurement only when signals appear. This function is ideal for measuring burst signals such as GSM or WLAN.

Frequency Counter

The frequency counter function is used to make accurate frequency measurements up to 1 Hz resolution.

Time Domain Power

Users can go to zero span setting and open marker to observe burst signals when measuring burst signal in time domain is required.

Production line applications

Shorten Warm-Up Time

GSP-9330 utilizes the patented design of high efficient heat dissipation and feedback temperature control. After the instrument is turned on, the internal instrument can rapidly maintain a stable temperature so as to provide accurate amplitude measurement and deliver the frequency measurement with 0.025 ppm frequency stability.

Wake-Up Clock

Users can set up automatic wake-up time for each day of the week. By so doing, the purpose of GSP-9330 pre wake-up can be achieved. Pre wake-up is ideal for the lower temperature environment to conduct tests in the preset time.

Sequence Function

The sequence function allows users to edit a sequence formulated by a series of steps directly from the instrument. Pause and delay can be inserted in the sequence to observe the test results. There are five sets of sequence for selection. Each sequence allows editing of 20 steps. Different sequence can be interactive and support each other. This function provides automatic editing without using the PC that is very convenient for assembly lines in which execute routine test procedures.

Limit Line Function

The limit line function, based upon the preset criteria of passing the test, can be used to directly determine whether the DUT passes the test. Test result not only can be shown on the LCD screen, but also an alarm signal output indication from the rear panel which is done by connecting a speaker or light device to show the test result.

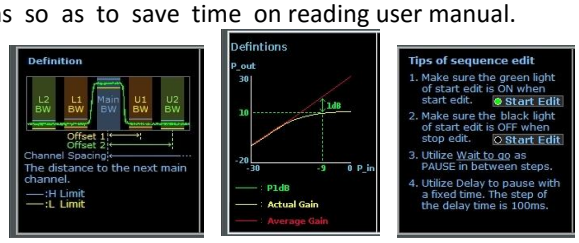
User Friendly Design

Status Icons

Status Icons show the interface status, power status, alarm status and etc of GSP-9330. Users can easily understand the setting status and test results of the instrument.

Definition Help

The built-in Definition Help function allows users to immediately understand the parameters of Channel Power, OCBW, ACPR, SEM, Phase Jitter, N-dB Bandwidth & P1dB items so as to save time on reading user manual.



Communications Interface

Various Interface

Provide USB Host, RS-232, LXI C(LAN), and GPIB(option) instrument control interface. Supported programs comply with IEEE488.2.

File Storage and Video Output

Provide USB Device, MicroSD interface for file storage. Quick Save function is also available for users to quickly retrieve display. Support DVI with 800*600 resolutions.

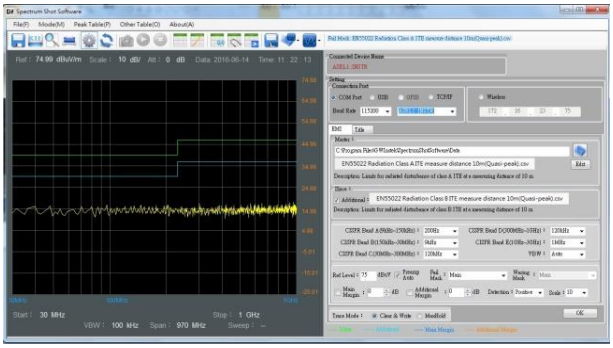
	
DVI Interface	**USB Device/MicroSD**

Software Support

PC Software - SpectrumShot

Users can use the external software SpectrumShot for EMI pretest report management and assessment, remote control and waveform data recording for long periods of time.

Under the EMI Pre-test Mode, users can select the required CISPR EMI regulation for conduction and radiation measurement.



Under Get Trace mode, users can record the waveform data for long periods of time. It can be applied to spectrum monitoring for detecting any abnormal radio signals. The software will send out e-mail to inform users if any abnormal situation occurs.

Under the Remote Control mode, users can monitor wireless interference signals or observe signals for long periods of time.

IVI Driver & LabVIEW Support

IVI Driver Supports LabView & LabWindows/CVI Programming. It is available on NI website.

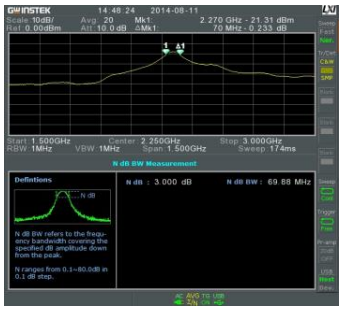
Various Augmenting Options

Tracking Generator

TG option provides 0 to -50 dBm synchronized sweep output, conducts scalar network analysis (S11. S21) function as well as P1dB.

Scalar Network Analysis

The built-in tracking generator can swiftly and easily measure frequency response of cable loss, filter bandwidth, amplifier gain, mixer conversion loss, etc. The N-dB Bandwidth function measures 3dB bandwidth of Bandpass filter. SWR bridge should be connected with tracking generator to measure the return loss of antenna or filter.



3dB frequency bandwidth

Reflection loss

P1dB Point Measurement

All active components have linear dynamic range for power output. Once output power reaches the maximum level, active component will enter the non-linear saturated area of P1dB point and cease amplifying signal intensity as well as produce harmonic distortion. It is very useful for P1dB point measurement in active components such as low noise amplifier, mixer and active filter.

Battery Pack & Soft Carrying Case

Compact and light-weighted (4 kg) GSP-9330 can be powered by battery making it suitable for outdoor operations. Optional GSP-9330 battery pack (opt.02) has a battery life of two hours.

Optional soft carrying case (GSC-009) provides convenience and protection to the instrument. GSP-9330 is equipped with 8.4 inches 800x600 pixels LCD display which yields clearer display results for outdoor operations.

Product Comparison

Compared with the previous generations - GSP-9330 vs. GSP-9300 vs. GSP-930

The following chart shows the comparison among the three products.

	GSP-9330	GSP-9300	GSP-930
Bandwidth	9 kHz ~ 3.25 GHz	9 kHz ~ 3 GHz	9 kHz ~ 3 GHz
Boot-Up Time	52 s	52 s	83 s
Sweep Time	204 µs to 1000 s	310 µs to 1000 s	22 ms to 1000 s
-3dB Bandwidth RBW Filter	1 Hz to 1 MHz in 1-3-10 sequence	1 Hz to 1 MHz in 1-3-10 sequence	10 Hz to 3 kHz in 1-3-10 sequence 10 kHz to 1 MHz, increment in 10% step
-6dB Bandwidth EMI Filter	200 Hz, 9 kHz, 120 kHz, 1 MHz	200 Hz, 9 kHz, 120 kHz, 1 MHz	200 Hz, 9 kHz, 120 kHz
EMI Trace Detect	Quasi-Peak, Average, Peak+	Peak+	Peak+
Measurement Function	2FSK Analysis, ASK/FSK demodulation & Analysis, EMC pretest, P1dB point	2FSK Analysis, ASK/FSK demodulation & Analysis, EMC pretest, P1dB point	Not support
Save Picture File Preview	Support	Support	Not support
Network Interface	LXI 1.4 HiSLIP / 3G modem	LXI 1.4 HiSLIP / 3G modem	LXI 1.3
ASK/FSK Demo Kit	Support	Support	Not support
GUI Language	English, Russian, Traditional Chinese, Simplified Chinese & Japanese	English, Russian, Traditional Chinese, Simplified Chinese & Japanese	English, Russian & Simplified Chinese

Product Comparison

Comparison with major competitors

	GW Instek GSP-9330	Keysight N9320B	R&S FSC
Frequency Range	9 kHz to 3.25 GHz	9 kHz to 3 GHz	9 kHz to 3 GHz
Freq Stability Aging Per Year	±1 ppm	±1 ppm	1 ppm
Over Temperature Freq Stability (0 to 50 °C)	**±0.025 ppm**	**±1 ppm**	**3 ppm**
RBW	1 Hz to 1 MHz in 1-3-10 sequence	10 Hz to 1 MHz in 1-3 steps	10 Hz to 3 MHz in 1-3-10 steps
Phase Noise	-88 dBc/Hz@1GHz, 10kHz offset	-90 dBc/Hz@1GHz, 10kHz offset	-95 dBc/Hz@500MHz, 30kHz offset
Displayed Average Noise Level (Attenuator 0 dB, RBW = 10 Hz, VBW = 10 Hz, Pre-amp OFF)	9 kHz to 100 kHz < -93 dBm, 100 kHz to 1 MHz < -90 dBm – 3 x (f/100 kHz) dB, 1 MHz to 10 MHz < -122 dBm, 10 MHz to 3 GHz < -122 dBm	9 to 100 kHz < -90 dBm, 100 kHz to 1 MHz < -90 dBm – 3 x (f/100 kHz) dB, 1 to 10 MHz < -124 dBm, 10 MHz to 3 GHz < -127 dBm	9 kHz to 100 kHz < –98 dBm, 100 kHz to 1 MHz < –105 dBm, 1 MHz to 10 MHz < –126 dBm, 10 MHz to 2 GHz < –131 dBm, 2 GHz to 3.0 GHz < –128 dBm,
Displayed Average Noise Level (Attenuator 0 dB, RBW = 10 Hz, VBW = 10 Hz, Pre-amp ON)	100 kHz to 1 MHz, < -108 dBm - 3 x (f/100 kHz) dB, 1 MHz to 10 MHz, < -142 dBm, 10 MHz to 3 GHz, < -142 dBm + 3 x (f/1GHz) dB	100 kHz to 1 MHz, < -108 dBm – 3 x (f/100 kHz) dB 1 to 10 MHz, < -142 dBm 10 MHz to 3 GHz, < -148 dBm + 3 x (f/1 GHz) dB	100 kHz to 1 MHz, < –123 dBm 1 MHz to 10 MHz, < –147 dBm 10 MHz to 1 GHz, < –151 dBm 1 GHz to 2 GHz, < –149 dBm 2 GHz to 3 GHz, < –145 dBm
Input Attenuator	0 to 50 dB, in 1 dB steps	0 to 70 dB, in 1 dB steps	0 to 40 dB, in 5 dB steps
Sweep Points	601	461	631
Sweep Time (Non-Zero Span)	204 µs to 1000 s	20 ms to 1000 s	10 ms to 1000 s
Gated Sweep	Support, standard	No support	Support
Frequency Counter	Min. resolution 1 Hz	Min. resolution 1 Hz	Min. resolution 0.1 Hz
Measurement Functions	SEM / ACPR / OCBW / Channel Power / Phase Jitter / AM,FM,ASK,FSK Demod Analyzer /TOI/Harmonic/ CNR/CSO/CTB/ N-dB Bandwidth /P1dB/Time domain Power	SEM/ACP/OCBW/Channel Power/ AM,FM,ASK,FSK Demod Analyzer (Option AMA, DMA)/ TOI	SEM/ACLR/ OCBW/ Channel Power/ TDMA Power /Harmonic/ AM modulation depth/
Trace	4 Traces	4 Traces	2 Traces
Display Modes	Spectrogram ,Topographic, Linear/ Log scale Spectrum	Only Spectrum mode	Only Spectrum mode
Display Screen	8.4 inch LCD , resolution (800 x 600)	6.4 inch LCD, resolution (640 x 480)	5.7 inch LCD resolution (640 x 480)
Interfaces	LXI, RS-232C, USB, DVI, MicroSD, GPIB(Opt)	LXI, USB, VGA, GPIB(Opt)	LXI, USB
Pre-amplifier	Built-in, standard	Option, Option PA3	R&S®FSC-B22 option
-6dB EMI Filter	Support, standard (200 Hz, 9 kHz, 120 kHz, 1 MHz)	Support, Option EMF (200 Hz, 9 kHz, 120 kHz,1 MHz)	No support
Power Meter	No support	Support, power sensor option	Support, power sensor option
Tracking Generator	Support, Option 01	Support, Option TG3	Support, Option
Spectrogram	Support, standard	No support	No support
Topographic	Support, standard	No support	No support
AM & FM Demodulation	Support, standard	Support, Option AMA	No support
ASK & FSK Demodulation	Support, standard	Support, Option DMA	No support
2FSK Analysis	Support, standard	Support, Option DMA	No support
Battery Operation	Option 02	No support	No support

Specifications

(The specifications apply when the GSP-9330 is powered on for at least 30 minutes to warm-up to a temperature of 20 ℃ to 30 ℃, unless specified otherwise.)

Frequency			
Frequency	Range	9 kHz to 3.25 GHz	
	Resolution	1 Hz	
Frequency Reference	Accuracy	±(period since last adjustment X aging rate) + stability over temperature + supply voltage stability	
	Aging Rate	±1 ppm max.	1 year after last adjustment
	Frequency Stability over Temperature	±0.025 ppm	0 to 50 °C
	Supply Voltage Stability	±0.02 ppm	
Frequency Readout Accuracy	Start, Stop, Center, Marker	±(marker frequency indication X frequency reference accuracy + 10% x RBW + frequency resolution)	
	Trace points	Max 601 points, min 6 points	
Marker Frequency Counter	Resolution	1 Hz, 10 Hz, 100 Hz, 1 kHz	
	Accuracy	±(marker frequency indication X frequency reference accuracy + counter resolution)	RBW/Span >=0.02 ; Mkr level to DNL>30 dB
Frequency Span	Range	0 Hz (zero span), 100 Hz to 3.25 GHz	
	Resolution	1 Hz	
	Accuracy	± frequency resolution1	RBW: Auto;
Phase Noise	Offset from Carrier		Fc =1 GHz; RBW = 1 kHz, VBW = 10 Hz; Average ≥ 40
	10 kHz	<-88 dBc/Hz	Typical
	100 kHz	<-95 dBc/Hz	Typical
	1 MHz	<-113 dBc/Hz	Typical
Resolution Bandwidth (RBW) Filter	Filter Bandwidth	1 Hz to 1 MHz in 1-3-10 sequence	-3dB bandwidth
		200 Hz, 9 kHz, 120 kHz, 1MHz	-6dB bandwidth
	Accuracy	± 8%, RBW = 1MHz	Nominal
		± 5%, RBW < 1MHz	Nominal
	Shape Factor	< 4.5:1	Normal Bandwidth ratio: -60dB:-3dB
Video Bandwidth (VBW) Filter	Filter Bandwidth	1 Hz to 1 MHz in 1-3-10 sequence	-3dB bandwidth
Amplitude			
Amplitude Range	Measurement Range	100 kHz to 1 MHz	Displayed Average Noise Level (DANL) to 18 dBm
		1 MHz to 10 MHz	DANL to 21 dBm
		10 MHz to 3.25 GHz	DANL to 30 dBm
Attenuator	Input Attenuator Range	0 to 50 dB, in 1 dB step	Auto or manual setup
Maximum Safe Input Level	Average Total Power	≤ +33 dBm	Input attenuator ≥10 dB
	DC Voltage	± 50 V	
1 dB Gain Compression	Total Power at 1st Mixer	> 0 dBm	Typical;Fc ≥ 50 MHz; preamp. off
	Total Power at the Preamp	> -22 dBm	Typical;Fc ≥ 50 MHz; preamp. on
		mixer power level (dBm)= input power (dBm)-attenuation (dB)	
Displayed Average Noise Level (DANL)	Preamp off	0 dB attenuation; RF Input is terminated with a 50Ω load. RBW 10 Hz; VBW 10 Hz; span 500 Hz; reference level = -60dBm; trace average ≥ 40	
	9 kHz to 100 kHz	< -93 dBm	Nominal
	100 kHz to 1 MHz	< -90 dBm - 3 x (f/100 kHz) dB	
	1 MHz to 2.7 GHz	< -122 dBm	
	2.7 GHz to 3.25 GHz	< -116 dBm	
	Preamp on	0 dB attenuation; RF Input is terminated with a 50Ω load ; RBW 10 Hz; VBW 10Hz; span 500 Hz; reference level = -60dBm; trace average ≥ 40	
	100 kHz to 1 MHz	< -108 dBm - 3 x (f/100 kHz) dB	Nominal
	1 MHz to 10 MHz	< -142 dBm	
	10 MHz to 3.25 GHz	< -142 dBm + 3 x (f/1 GHz) dB	
Level Display Range	Scales	Log, Linear	
	Units	dBm, dBmV, dBuV, V, W	
	Marker Level Readout	0.01 dB	Log scale
		0.01 % of reference level	Linear scale
	Level Display Modes	Trace, Topographic, Spectrogram	Single / split Windows
	Number of Traces	4	
	Detector	Positive-peak, negative-peak, sample, normal, RMS(not Video), Average(EMI), Quasi-Peak(EMI)	Can be setup for each trace separately
	Trace Functions	Clear & Write, Max/Min Hold, View, Blank, Average	

Absolute Amplitude Accuracy	Absolute Point	Center=160 MHz ; RBW 10 kHz; VBW 1 kHz; span 100 kHz; log scale; 1 dB/div; peak detector; 23°C±1°C; Signal at Reference Level	
	Preamp off	± 0.3 dB	Ref level 0 dBm; 10 dB RF attenuation
	Preamp on	± 0.4 dB	Ref level -30 dBm; 0 dB RF attenuation
Frequency Response	Preamp off	Attenuation: 10 dB; Reference: 160 MHz; 20 to 30°C	
	100 kHz to 2.0 GHz	± 0.5 dB	
	2GHz to 3.25 GHz	± 0.7 dB	
	Preamp on	Attenuation: 0 dB; Reference: 160 MHz; 20 to 30°C	
	1 MHz to 2 GHz	± 0.6 dB	
	2 GHz to 3.25 GHz	± 0.8 dB	
Attenuation Switching Uncertainty	Attenuator setting	0 to 50 dB in 1 dB step	
	Uncertainty	± 0.25 dB	reference: 160 MHz, 10dB attenuation
RBW Filter Switching Uncertainty	1 Hz to 1 MHz	± 0.25 dB	reference : 10 kHz RBW
Level Measurement Uncertainty	Overall Amplitude Accuracy	± 1.5 dB	20 to 30°C; frequency > 1 MHz; Signal input 0 to -50 dBm; Reference level 0 to -50 dBm; Input attenuation 10 dB; RBW 1 kHz; VBW 1 kHz; after cal; Preamp Off
		± 0.5 dB	Typical
Spurious Response	Second Harmonic Intercept		Preamp off; signal input -30dBm; 0 dB attenuation
		+35 dBm	Typical; 10 MHz < fc < 775 MHz
		+60 dBm	Typical; 775 MHz ≤ fc < 1.625 GHz
	Third-order Intercept		Preamp off; signal input -30dBm; 0 dB attenuation
		> 1dBm	300 MHz to 3.25 GHz
	Input Related Spurious	< -60 dBc	Input signal level -30 dBm, Att. Mode, Att=0dB; 20-30ºC
	Residual Response (inherent)	<-90 dBm	Input terminated; 0 dB attenuation; Preamp off
Sweep			
Sweep Time	Range	307 us to 1000 s	Span > 0 Hz
		50 us to 1000 s	Span = 0 Hz; Min Resolution = 10 us
	Sweep Mode	Continuous; Single	
	Trigger Source	Free run; Video; External	
	Trigger Slope	Positive or negative edge	
RF Preamplifier			
	Frequency Range	1 MHz to 3.25 GHz	
	Gain	18 dB	Nominal
			(installed as standard)
Front Panel Input/Output			
RF Input	Connector Type	N-type female	
	Impedance	50 ohm	Nominal
	VSWR	<1.6 :1	300 kHz to 3.25 GHz; Input attenuator ≥ 10 dB
Power for Option	Connector Type	SMB male	
	Voltage/Current	DC +7V / 500 mA max	With short-circuit protection
USB Host	Connector Type	A plug	
	Protocol	Version 2.0	Supports Full/High/Low speed
MicroSD Socket	Protocol	SD 1.1	
	Supported Cards	microSD, microSDHC	Up to 32GB capacity
Rear Panel Input/Output			
Reference Output	Connector Type	BNC female	
	Output Frequency	10 MHz	Nominal
	Output Amplitude	3.3V CMOS	
	Output Impedance	50 ohm	
Reference Input	Connector Type	BNC female	
	Input Reference Frequency	10 MHz	
	Input Amplitude	-5 dBm to +10 dBm	
	Frequency Lock Range	Within ± 5 ppm of the input reference frequency	
Alarm Output	Connector Type	BNC female	Open-collector
Trigger Input/ Gated Sweep Input	Connector Type	BNC female	
	Input Amplitude	3.3V CMOS	
	Switch	Auto selection by function	
LAN TCP/IP Interface	Connector Type	RJ-45	
	Base	10Base-T; 100Base-Tx; Auto-MDIX	

USB Device	Connector Type	B plug	For remote control only; supports USB TMC
	Protocol	Version 2.0	Supports Full/High/Low speed
IF Output	Connector Type	SMA female	
	Impedance	50 ohm	Nominal
	IF Frequency	886 MHz	Nominal
	Output level	-25 dBm	10 dB attenuation; RF input: 0 dBm @ 1 GHz
Earphone Output	Connector Type	3.5mm stereo jack, wired for mono operation	
Video Output	Connector Type	DVI-I (integrated analog and digital) , Single Link. Compatible with VGA or HDMI standard through adapter	
RS232 Interface	Connector Type	D-sub 9-pin female	Tx,Rx,RTS,CTS
GPIB Interface (Optional)	Connector Type	IEEE-488 bus connector	
AC Power Input	Power Source	AC 100 V to 240 V, 50 / 60 Hz Auto range selection	
Battery Pack (Optional)	Battery pack	6 cells, Li-Ion rechargeable, 3S2P	With UN38.3 Certification
	Voltage	DC 10.8 V	
	Capacity	5200 mAh / 56Wh	
General			
	Internal Data storage	16 MB nominal	
	Power Consumption	<65 W	
	Warm-up Time	< 30 minutes	
	Temperature Range	+5 °C to +45 °C	Operating
		-20 °C to + 70 °C	Storage
	Weight	4.5 kg (9.9 lb)	Inc. all options (Basic+TG+GPIB+Battery)
	Dimensions	210 x 350 x 100 (mm)	Approximately
		8.3 x 13.8 x 3.9 (in)	
Tracking Generator (Optional)			
	Frequency Range	100 kHz to 3.25 GHz	
	Output Power	-50 dBm to 0 dBm in 0.5 dB steps	
	Absolute Accuracy	± 0.5 dB	@160 MHz, -10 dBm, Source attenuation 10 dB, 20 to 30°C
	Output Flatness	Referenced to 160 MHz, -10 dBm	
		100 kHz to 2 GHz	± 1.5 dB
		2 GHz to 3.25 GHz	± 2 dB
	Output Level Switching Uncertainty	± 0.8 dB	Referenced to -10 dBm
	Harmonics	< -30 dBc	Typical, output level = -10 dBm
	Reverse Power	+30 dBm max.	
	Connector type	N-type female	
	Impedance	50 ohm	Nominal
	Output VSWR	< 1.6:1	300 kHz to 3.25 GHz, source attenuation ≥ 12 dB

Please do not hesitate to contact us if you have any queries on GSP-9330 spectrum analyzer announcement, or product information of the EMC pre-compliance testing solution.

Sincerely yours,

Overseas Sales Department

Good Will Instrument Co., Ltd

No. 7-1, Jhongsing Road, Tucheng Dist.,

New Taipei City 23678, Taiwan R.O.C

Email: marketing@goodwill.com.tw

www.gwinstek.com www.facebook.com/GWInstek