

3.25GHz SPECTRUM ANALYZER

GSP-9330




- CE
- USB
- LXI
- DVI Output
- RS-232
- GPIB
- PC Software

TESTS MUST BE FAST!


GSP-9330, a high test speed spectrum analyzer with 3.25 GHz, provides the fastest 204 μ s 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 204 μ s 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 μ s. Users, via high speed sweep time, can easily capture transient signals such as frequency/amplitude modulation signals, Blue tooth 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 200/9k/120k/1MHz 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.



MAIN FEATURES

- Frequency Range : 9 kHz ~ 3.25 GHz
- Fastest sweep speed up to 204 μ s
- 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)
- Speed 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

RELATED PRODUCTS INFORMATION :

GKT-008 Near Field Probe



GLA-5040A LISN



GIT-5060 Isolation Transformer



GPL-5010 Transient Limiter



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

SPECIFICATIONS

| FREQUENCY | | |
|--------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| FREQUENCY | | |
| Range | 9 kHz ~ 3.25 GHz | |
| Resolution | 1 Hz | |
| FREQUENCY REFERENCE | | |
| Accuracy | $\pm(\text{period since last adjustment} \times \text{aging rate}) + \text{stability over temperature} + \text{supply voltage stability}$ | |
| Aging Rate | $\pm 1 \text{ ppm max.}$ | 1 year after last adjustment |
| Frequency Stability Over Temperature | $\pm 0.025 \text{ ppm}$ | 0 ~ 50 °C |
| Supply Voltage Stability | $\pm 0.02 \text{ ppm}$ | |
| FREQUENCY READOUT ACCURACY | | |
| Start, Stop, Center, Marker | $\pm(\text{marker frequency indication} \times \text{frequency reference accuracy} + 10\% \times \text{RBW} + \text{frequency resolution})$ | |
| Trace Points | Max. 601 points, Min. 6 points | |
| MARKER FREQUENCY COUNTER | | |
| Resolution | 1 Hz, 10 Hz, 100 Hz, 1 kHz | |
| Accuracy | $\pm(\text{marker frequency indication} \times \text{frequency reference accuracy} + \text{counter resolution})$ | RBW/Span ≥ 0.02 ; Mkr level to DNL > 30 dB |
| FREQUENCY SPAN | | |
| Range | 0 Hz (zero span), 100 Hz ~ 3.25 GHz | |
| Resolution | 1 Hz | |
| Accuracy | $\pm \text{frequency resolution}$ | RBW : Auto |
| PHASE NOISE | | |
| Offset from Carrier | | $F_c = 1 \text{ GHz}; \text{RBW} = 1 \text{ kHz}; \text{VBW} = 10 \text{ Hz}; \text{Average} \geq 40$ |
| 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 ~ 1 MHz in 1-3-10 sequence 200 Hz, 9 kHz, 120 kHz, 1 MHz | -3dB bandwidth -6dB bandwidth |
| Accuracy | $\pm 8\%$, RBW = 1 MHz; $\pm 5\%$, RBW < 1 MHz | Nominal |
| Shape Factor | < 4.5 : 1 | Normal Bandwidth ratio: -60dB:-3dB |
| VIDEO BANDWIDTH (VBW) FILTER | | |
| Filter Bandwidth | 1 Hz ~ 1 MHz in 1-3-10 sequence | -3dB bandwidth |
| AMPLITUDE | | |
| AMPLITUDE RANGE | | |
| Measurement Range | 100 kHz ~ 1 MHz 1 MHz ~ 10 MHz 10 MHz ~ 3.25 GHz | Displayed Average Noise Level (DANL) to 18 dBm DANL to 21 dBm DANL to 30 dBm |
| ATTENUATOR | | |
| Input Attenuator Range | 0 ~ 50 dB, in 1 dB steps | Auto or manual setup |
| MAXIMUM SAFE INPUT LEVEL | | |
| Average Total Power | $\leq +33 \text{ dBm}$ | Input attenuator $\geq 10 \text{ dB}$ |
| DC Voltage | $\pm 50 \text{ V}$ | |
| 1 dB GAIN COMPRESSION | | |
| Total Power at 1st Mixer | > 0 dBm | Typical; $F_c \geq 50 \text{ MHz}$; preamp. off |
| Total Power at the Preamp | > -22 dBm | Typical; $F_c \geq 50 \text{ MHz}$; 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 = -60 dBm; trace average ≥ 40 | |
| 9 kHz~100 kHz | < -93 dBm | Nominal |
| 100 kHz~1 MHz | < -90 dBm - 3 x (f/100 kHz) dB | Nominal |
| 1 MHz~10 MHz | < -122 dBm | Nominal |
| 2.7 ~ 3.25 GHz | < -116 dBm | Nominal |
| Preamp on | 0 dB attenuation; RF Input is terminated with a 50Ω load. RBW 10 Hz; VBW 10 Hz; span 500 Hz; reference level = -60 dBm; trace average ≥ 40 | |
| 100 kHz~1 MHz | < -108 dBm - 3 x (f/100 kHz) dB | Nominal |
| 1 MHz~10 MHz | < -142 dBm | Nominal |
| 10 MHz~3.25 GHz | < -142 dBm + 3 x (f/1 GHz) dB | Nominal |
| LEVEL DISPLAY RANGE | | |
| Scales | Log, Linear | |
| Units | dBm, dBmV, dBuV, V, W | |
| Marker Level Readout | 0.01 dB 0.01 % of reference level | Log scale 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), Quasi-Peak (EMI), Average (EMI), Clear & Write, Max/Min Hold, View, Blank, Average | |
| Trace Functions | | |
| 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 | $\pm 0.3 \text{ dB}$ | Ref level 0 dBm; 10 dB RF attenuation |
| Preamp On | $\pm 0.4 \text{ dB}$ | Ref level 0 dBm; -30 dB RF attenuation |
| FREQUENCY RESPONSE | | |
| Preamp Off | Attenuation : 10 dB; Reference: 160 MHz; 20 ~ 30°C | |
| 100 kHz ~ 2.0 GHz | $\pm 0.5 \text{ dB}$ | |
| 2 GHz ~ 3.25 GHz | $\pm 0.7 \text{ dB}$ | |
| Preamp On | Attenuation: 0 dB; Reference: 160 MHz; 20 ~ 30°C | |
| 1 MHz ~ 2 GHz | $\pm 0.6 \text{ dB}$ | |
| 2 GHz ~ 3.25 GHz | $\pm 0.8 \text{ dB}$ | |
| ATTENUATION SWITCHING UNCERTAINTY | | |
| Attenuator Setting | 0 ~ 50 dB in 1 dB step | |
| Uncertainty | $\pm 0.25 \text{ dB}$ | Reference : 160 MHz, 10dB attenuation |
| RBW FILTER SWITCHING UNCERTAINTY | | |
| 1 Hz ~ 1 MHz | $\pm 0.25 \text{ dB}$ | Reference : 10 kHz RBW |
| LEVEL MEASUREMENT UNCERTAINTY | | |
| | $\pm 1.5 \text{ dB}$ | 20 ~ 30°C; frequency > 1 MHz; Signal input 0 ~ -50 dBm; Reference level 0 ~ -50 dBm; Input attenuation 10 dB; RBW 1 kHz; VBW 1 kHz; after cal; Preamp Off |
| Overall Amplitude Accuracy | $\pm 0.5 \text{ dB}$ | Typical |
| SPURIOUS RESPONSE | | |
| Second Harmonic Intercept | +35 dBm +60 dBm | Preamp off; signal input -30dBm; 0 dB attenuation Typical; 10 MHz < f_c < 775 MHz Typical; 775 MHz $\leq f_c$ < 1.625 GHz |
| Third-order Intercept | | Preamp off; signal input -30dBm; 0 dB attenuation 300 MHz ~ 3.25 GHz |
| Input Related Spurious | > 1dBm | Input signal level -30 dBm, Att. Mode, Att=0dB; 20-30°C |
| Residual Response (Inherent) | < -60 dBc < -90 dBm | Input terminated; 0 dB attenuation; Preamp off |

| SPECIFICATIONS | | |
|----------------------------------------|----------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|
| SWEEP | | |
| SWEEP TIME | | |
| Range | 204 μ s ~ 1000 s 50 μ s ~ 1000 s | Span > 0 Hz Span = 0 Hz; Min resolution=10 μ s |
| Sweep Mode | Continuous; Single | |
| Trigger Source | Free run; Video; External | |
| Trigger Slope | Positive or negative edge | |
| RF PREAMPLIFIER | | |
| Frequency Range | 1 MHz ~ 3.25 GHz | |
| Gain | 18 dB | Nominal (installed as standard) |
| FRONT PANEL INPUT/OUTPUT | | |
| RF INPUT | | |
| Connector Type | N-type female | |
| Impedance | 50 Ω | Nominal |
| VSWR | <1.6 :1 | 300 kHz ~ 3.25 GHz ; Input attenuator \geq 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 | Support Full/High/Low speed |
| MICRO SD SOCKET | | |
| Protocol | SD 1.1 | |
| Support Cards | Micro SD, Micro SDHC | 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 Ω | |
| REFERENCE INPUT | | |
| Connector Type | BNC female | |
| Input Reference Frequency | 10 MHz | |
| Input Amplitude | -5 dBm ~ +10 dBm | |
| Frequency Lock Range | Within \pm 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 | |
| Protocol | Version 2.0 | For remote control only; supports USB TMC Supports Full/High/Low speed |
| IF OUTPUT | | |
| Connector Type | SMA female | |
| Impedance | 50 Ω | 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 | |
| RS-232C 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 ~ 240 V, 50/60 Hz | Auto range selection |
| BATTERY PACK (OPTIONAL) | | |
| Battery Pack | 6 cells, Li-Ion rechargeable, 3S2P | |
| Voltage | DC 10.8 V | With UN38.3 Certification |
| Capacity | 5200 mAh/56Wh | |
| GENERAL | | |
| Internal Data Storage | 16 MB nominal | |
| Power Consumption | < 65 W | |
| Warm-up Time | < 30 minutes | |
| Temperature Range | +5 $^{\circ}$ C ~ + 45 $^{\circ}$ C -20 $^{\circ}$ C ~ + 70 $^{\circ}$ C | Operating Storage |
| Dimensions & Weight | 350(W) x 210(H) x 100(D) mm, Approx. 4.5kg 13.8(W) x 8.3(H) x 3.9(D) inch, Approx. 9.9lb | Inc. all options (Basic + TG + GPIB + Battery) |
| TRACKING GENERATOR (OPTIONAL) | | |
| Frequency Range | 100 kHz ~ 3.25 GHz | |
| Output Power | -50 dBm ~ 0 dBm in 0.5 dB steps | |
| Connector Type | N-type female | 50 Ω Nominal |
| Output VSWR | < 1.6 : 1 | 300 kHz ~ 3 GHz, source attenuation \geq 12 dB |

Note : The specifications apply when the GSP-9330 is powered on for at least 30 minutes to warm-up to a temperature of 20 $^{\circ}$ C to 30 $^{\circ}$ C, unless specified otherwise.

Specifications subject to change without notice. GSP-9330GD1DH

| 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 Isolation transformer GPL-5010 Transient Limiter |
| ACCESSORIES : | |
| Power Cord, Certificate of Calibration, CD-ROM (with Quick Start Guide, User Manual, Programming Manual, SpectrumShot Software, SpectrumShot Guide & IVI Driver) | |

| OPTIONS | |
|----------------------------------------------------------------------------------|------------------------------|
| Opt.01 Tracking Generator | Opt.03 GPIB Interface |
| Opt.02 Battery Pack | |
| 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) | |