GSP-730 & GRF-1300

3GHz Spectrum Analyzer & RF and Communication Trainer

GSP-730 FEATURES

- Frequency Range : 150kHz ~ 3GHz
- Autoset Function
- Noise level : ≤ -100dBm
- RBW Range : 30kHz, 100kHz, 300kHz, 1MHz
- ACPR/CHPW/OCBW Measurement
- 3 Traces in Different Colors
- Split Window Function
- Limit Line Function
- Remote Control Software
- Presentation Material for Training Courses
- Support Interface : USB Device/Host, RS-232C
- 5.6" TFT LCD with VGA Output

GRF-1300 FEATURES

- Waveform Support :
    Sine Wave : 0.1 ~ 3MHz
    Square Wave : 0.1 ~ 3MHz
    Triangle Wave : 0.1 ~ 3MHz
- RF Frequency : 870 ~ 920MHz
- AM Modulation & FM Modulation
  5 On/Off Switches and 5 Test Points
  to Simulate 8 Failure Conditions for
  Learning Outcome Test
- USB Interface to Provide Remote
  Control

GW INSTEK

Simply Reliable

Turn-key Solution for RF and Communication Experiment Courses

GW Instek GSP-730 is a 3GHz Spectrum Analyzer mainly developed to fulfill the demands of RF Communication educations. Budget constraint and insufficient teaching tools are normally the two hurdles for schools to provide high-quality courses for RF communication experiments. GSP-730, featuring full functions, a moderate spectrum analyzer should provide, along with GRF-1300 RF communication trainer possesses a unique position in the field as an economic turn-key solution for 3GHz RF Communication Experiment courses.

## A TURN-KEY SOLUTION TO CLEAR AWAY TWO OBSTACLES

GSP-730, carrying 3GHz bandwidth and measurement functions including Autoset, Split Window, Limit Line, ACPR and OCBW etc., is regarded as the advanced educations of Mobile Communications (GSM, 3G, 4G/LTE...), Wi-Fi, Zigbee and RFID in the Electronic or the Communication classes. The USB ports, the RS-232 interface and the VGA video output facilitate the teaching efficiency. The combination of GSP-730 and GRF-1300 RF communication training is a turn-key system for both lecture and hands-on training purposes.

GRF-1300 RF communication trainer, as the counterpart of GSP-730 for the basic RF communication experiment system, is capable of generating a baseband signal and a RF carrier signal for the built-in AM and FM communication operations. The baseband signal output contains the selections of Sine, Triangle, and Square waveforms in the frequency range of 100kHz ~ 3MHz, whereas the RF signal output is a frequency-variable Sine wave in the range of 870 ~ 920 MHz. Connecting the baseband signal output with AM or FM inputs on the panel, GRF-1300 produces AM or FM signal output respectively by using the internal RF signal as the modulation carrier according to user's selected frequency.

An Experiment Textbook (student's book) is available as the standard accessory of GRF-1300 to provide experiment courses. The curriculum of the textbook includes the introduction of the frequency domain and the time domain concepts, the operation theories of a spectrum analyzer, and nine experiments to perform hands-on training for the learning of basic RF communication theories and the RF measurement techniques using a spectrum analyzer. A CD, containing power-point slides for course presentation and the remote-control software for experiment, is attainable with GRF-1300, allowing teacher to give lecture of experiment theories and perform experiment simultaneously.

Another Experiment Textbook (teacher's book) is accessible as an optional accessory of GRF-1300. In addition to the same contents in the student's book, this book provides the experiment results to the questions and as well as some advanced experiment theories. Thus, a section of test-for-learning outcomes can also be seen in the lecturers' material in order to guide the students from the faulty diagnosis to the correct one in a RF communication circuitry. On the GRF-1300 panel, there are five test points set at different joints of circuit blocks. Through turning on or off the corresponding relays of the five test points enables the teachers to simulate the faults and teach students diagnosis technique.

The economic solution of GSP-730 and GRF-1300 greatly lowers the budget barriers for providing fundamental RF Communication Educations and facilitate the establishment of RF communication experiment labs with more training stations in schools.

Test Points on GRF-1300 for Fault Diagnosis
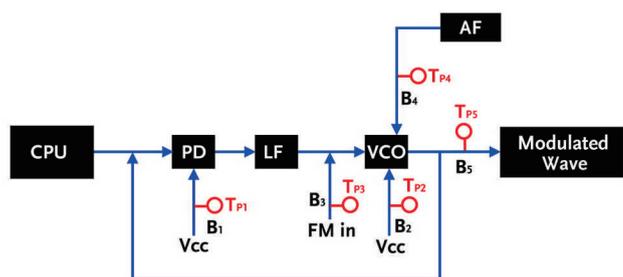
- **Introductions of Frequency Domain , Time Domain , and Spectrum Analyzer Basics.**

- **9 Experiments Include**
  Operations of Spectrum Analyzer
  Base band and RF signal measurements
  AM and FM signal measurements
  Communication system and product measurements

- **Learning Outcome Tests**

- **Auxiliary Tools**
  PPT files including all experiments contents
  Remote control software to control GRF-1300, GSP-730 simultaneously
  Experiment text books including the student version and the teacher(optional)

CURRICULUM CONTENTS

## A. AN ECONOMIC TURN-KEY SOLUTION
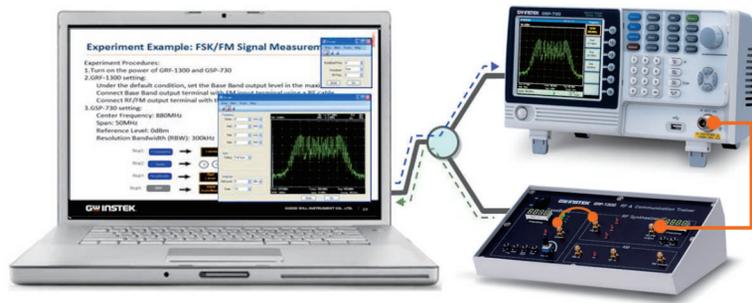
Fully-electronic RF Training System

In class, teacher can connect GSP-730 and GRF-1300 with PC via USB or RS-232 interface. First of all, all the contents of experiment has been converted into power-point slide and provided as the in-class materials. During lecturing the power-point slides, both GSP-730 and GRF-1300 can be remotely set by GRF Training System Control Software. Moreover, the signal shown on GSP-730 can be transferred to PC screen for further research. As a result, GSP-730 and GRF-1300 form an inclusive electronic-teaching-material

package which efficiently simplifies lecturers' tasks before classes and shortens the process of the material preparation, and meanwhile, enhances the quality of the lecture. If the PC can only offer one USB interface, an extra purchase of USB hub* may solve the problem of insufficient USB interfaces. With proper installation, PC can manage the conjunction of GSP-730 and GRF-1300.

* USB hub is excluded from the product standard accessories.

B. PC SOFTWARE FOR GSP-730 and GRF-1300 REMOTE CONTROL
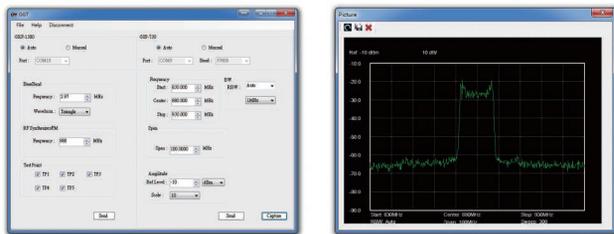
The dedicated PC software, Primary RF, is provided to support the remote control of GSP-730 and GRF-1300 simultaneously. The control includes base band signal waveform, frequency and RF signal frequency for GRF-1300 and Frequency, Span, Amplitude, RBW and spectrum transferring of GSP-730.

C. AUTOSET FUNCTION
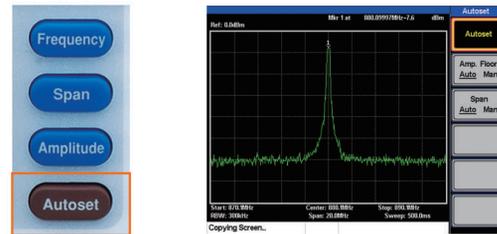
The Autoset function automatically captures the signal and configures an appropriate setting for the optimum spectrum display at just one press of the button. With the Autoset function, using a spectrum analyzer like GSP-730 is no longer an annoying and complicated task.

D. THREE-TRACE DISPLAY WITH THREE-COLOR IDENTITY
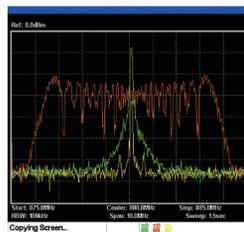
The GSP-730 can illustrate a signal with three colors simultaneously under various display modes, including Clear/Write, Max-Peak Hold, Min-Peak Hold, View, Blank and Average. Other useful trace functions such as trace math operations are also accomplishable.

E. MARKER FUNCTION
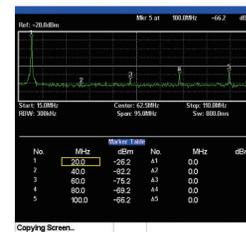
Five Markers can be used to obtain the measurement readings of specified points. Each marker has a counterpart △Marker, the amplitude difference can be measured and indicated by setting the frequency of marker and the interval frequency of △Marker between two signals. While several pairs of Markers are used for marking more than one pair of signals at the same time, the Marker Table can be turned on and it can process all the tests and demonstrate the reading figures.

## F. SETTING STATUS PRESENTED BY ICONS
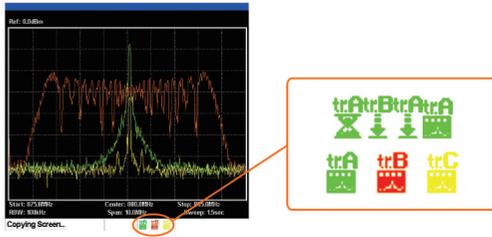
The intuitive icons help user grasp the current setting conditions all the time. As all status icons are clearly shown at the corner of the screen, there is no need to worry about the unknown settings, which may cause confusion and lead to measurement errors.

G. SPLIT-WINDOW DISPLAY IN LIVE MODE
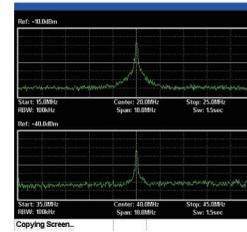
Under Split Window Display Mode, the monitor will display two independent screens, which can respectively have separated settings. For instance, if processing the test between fundamental and harmonic signals, the separated screens can respectively set at different frequencies at the same time in order to process the measurement.

H. PASS/FAIL JUDGMENTS

This function may run the "Pass" and "Fail" inspection with efficiency. Firstly, a limit line or upper and lower limit lines should be edited as the judgment criterion, then the LCD will display "Pass" or "Fail" according to whether the input signal meets the condition defined by the limit lines to indicate the examined outcome.

I. POWER MEASUREMENT FUNCTION
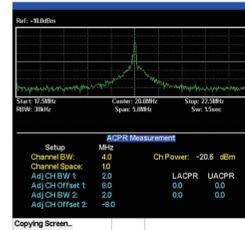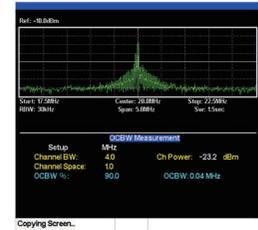
ACPR   **OCBW**

GSP-730 provides measurement functions such as ACPR, OCBW, and Channel Power. These items are regulated to be tested in recent communication systems, such as CDMA system. GSP-730 will illustrate channels by various colors so that the operation may become more precise and may minimize the errors.

J. FLEXIBLE INTERFACE
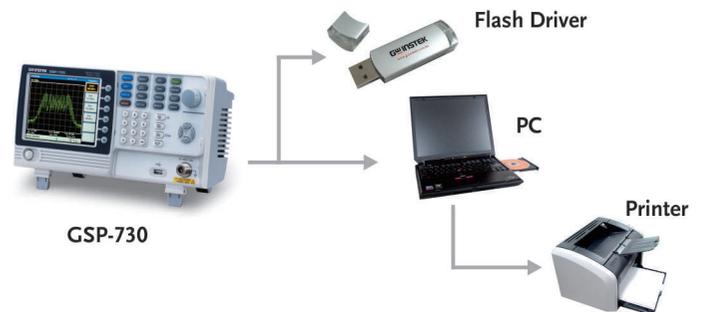
The USB host interface on GSP-730 front panel allows the measuring diagrams to be saved in the memory stick. The USB Device and RS232 interfaces on the rear panel are capable of connecting with PC for remote control. VGA output can transfer whatever demonstrated on the LCD display to other display device or projector, which will strengthen the impression while giving the lectures.

CE | USB | RS-232 | VGA Output | PC Software

GSP-730

3GHz Spectrum Analyzer

1. LCD Display
2. Function Keys
3. Menu Keys
4. Hardcopy Key
5. Scroll
6. Arrow Key
7. RF Input Terminal
8. USB Host Port
9. Keypad and Unit Keys
10. Power Key
11. USB Device Port
12. RS-232C Port
13. VGA Port
14. Fan
15. Power Socket

CE | USB | PC Software

GRF-1300

RF and Communication Trainer

1. Power Key
2. RF Synthesizer / FM Function Block
3. AM Function Block
4. Base Band Function Block

SPECIFICATIONS

GSP-730

FREQUENCY	Frequency Range	Setting Range	150kHz ~ 3GHz
	Center Frequency	Setting Resolution	0.1MHz
		Accuracy	within ±50kHz (frequency span : 0.3GHz ~ 2.6GHz, 20 ±5°C)
	Frequency Span	Setting range	1MHz ~ 3GHz
		Accuracy	within ±3% (frequency span : 0.3GHz ~ 2.6GHz, 20 ±5°C)
	Resolution Bandwidth	Setting Range	30KHz, 100KHz, 300KHz,1MHz
	SSB Phase Noise	-85dBc/Hz (typical, 500kHz offset, RBW : 30kHz, Sweep time : 1.5s, Span : 1MHz@1GHz)	
	Inherent Spurious Response	less than -45dBc@-40dBm Ref. Level (typical less than -50dBc)	
AMPLITUDE	Reference Level	Input Range	+20 ~ -40dBm
		Accuracy	Within ±2dB (1GHz) ; SPAN : 5MHz
		Unit	dBm, dBV, dBμV
	Average Noise Level	≤ -100dBm (typical, center frequency : 1GHz RBW : 30kHz)	
	Frequency Characteristic	within ±3.0dB@300MHz ~ 2.6GHz	
		within ±6.0dB@80 ~ 300MHz, 2.6 ~ 3GHz	
	Input	Input Impedance	50Ω
		Input VSWR	less than 2.0@input att≥10dB
		Input damage level	+30dBm (CW average power), 25VDC
		Input connector	N connector
SWEEP	Sweep Time	Setting Range	300ms ~ 8.4s, auto (not adjustable)
		Accuracy	within ±2% (frequency span : full span)
GENERAL	Display	640 x 480 RGB color LCD	
	Communication Interface	RS-232C	Sub-D female-D 9 pins
		USB Connector	USB Host/Device full speed supported
	VGA Output	Sub-D female 15 pins	
	Power Source	AC 100~240V, 50/60Hz	
OTHER	Operating Temperature	5 ~ 45°C (Guaranteed at 25 ±5°C, without soft carrying case)	
	Operating Humidity	Less than 45°C / 90%RH	
	Storage Temperature	-20 ~ 60°C, less than 60°C / 70%RH	
DIMENSIONS & WEIGHT		296(L) × 153(W) × 105(H) mm / 11.6(L) x 6(W) x 4.1(H) in Approx. 2.2kg / 4.9lb	

GRF-1300

BASE BAND	Waveforms	Sine, Square, Triangle
	Frequency Range	0.1 ~ 3MHz ; Step : 10kHz
	Amplitude	≥1.5Vpp
	Harmonics Distortion	≥ -30dBc
RF/FM GENERATOR	Frequency Accuracy	±0.15MHz
	Adjustable Range	≥45MHz (870M ~ 920MHz) ; Step: 1MHz
	Power Range	≥ -15dBm
FM	Max Frequency Deviation	>3MHz
AM	Peak Difference	≥ -18dBm
INTERFACE	USB	USB Device
DIMENSIONS & WEIGHT		165(W) x 155(H) x 90(D)mm / 6.5(W) x 6.1(H) x 3.5(D)im Approx. 1.2kg / 2.6lb

Specifications subject to change without notice.   SP-730GD1BH

ORDERING INFORMATION

GSP-730   3GHz Spectrum Analyzer
GRF-1300   RF and Communication System Trainer

ACCESSORIES

GSP-730 : Quick start manual x 1, User manual CD x 1, Power cord x1
GRF-1300 : Experiment text book of student version, Power point file and remote control software CD, RF cable x 3, Antenna x 1, N to SMA adaptor connector, Power cord x 1

OPTION

GBK-001   Experiment text book of teacher version

FREE DOWNLOAD

PC Software   Training syetem remote control software

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