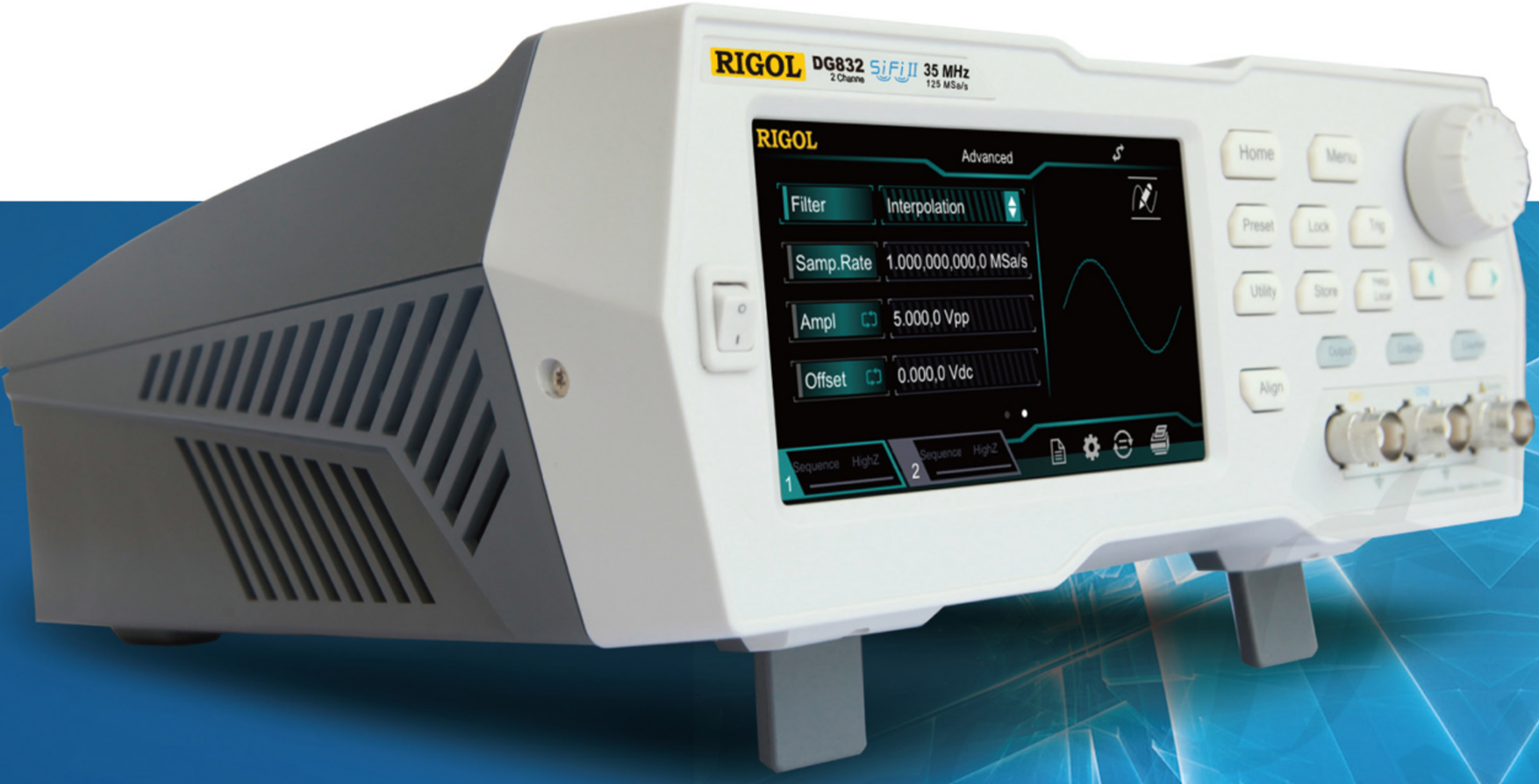
RIGOL
Innovation or nothing



DG800 시리즈
임의 파형/함수 발생기

- 독창적 SiFi II (신호 충실도 II) 기술 : 임의 파형을 포인트별 파형 발생, 왜곡 없는 신호 복구, 정확하고 가변 가능한 샘플링 속도, 모든 출력 파형 (사인파, 펄스파 포함)에 200 ps의 낮은 지터
- 2 Mpts 메모리 (표준) : 임의 파형에 대하여 채널당 8 Mpts 메모리 (옵션)
- 옵션 (1채널에서 2채널) : 두 채널이 동일한 성능 및 각각의 같은 독립적인 신호원
- 높은 주파수 안정도 : ±1 ppm, 낮은 위상 잡음 : -105 dBc/Hz
- 고조파 발생기 내장 (최대 8차 고조파)
- 7 디지트, 240 MHz 대역의 주파수 측정 기능 내장
- 임의 파형 최대 160여개 파형 내장
  (엔지니어링 응용, 의용 전자, 차량 전장, 연산 공정, 기타 다양한 분야의 공통 신호 포함)
- 최대 샘플링율 125 MSa/s, 수직 분해능 16 bits
- 임의 파형 시퀀스 편집 기능 및 PC 소프트웨어를 통하여 임의 파형 발생 가능
- 다양한 아날로그와 디지털 변조 기능 : AM, FM, PM, ASK, PSK, PWM
- 표준 파형은 기본 파형에 결합된 특정 파형을 출력할 수 있는 기능 제공
- 표준 채널 트레킹 기능이 활성화 시 양쪽 채널 모든 파라미터는 사용자 구성에 따라서 업데이트
- USB Host&Device 표준 지원 및 USB to GPIB 기능 지원
- 4.3인치 컬러 터치 화면
- RS232C, PRBS, 듀얼톤 출력 지원

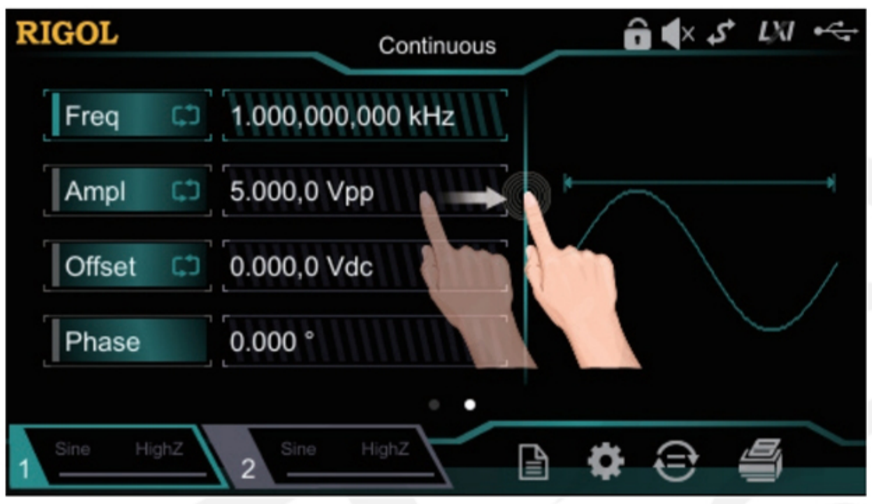
▶ 특징

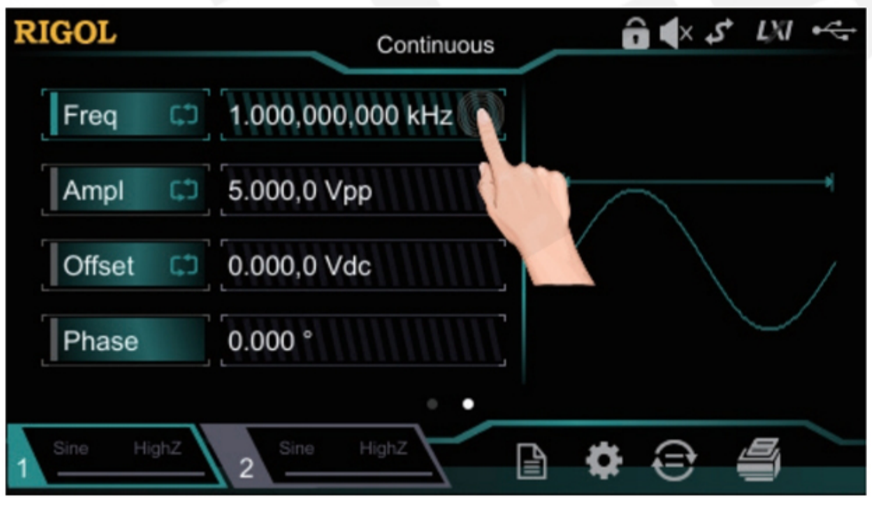
독창적 SiFi II 기술

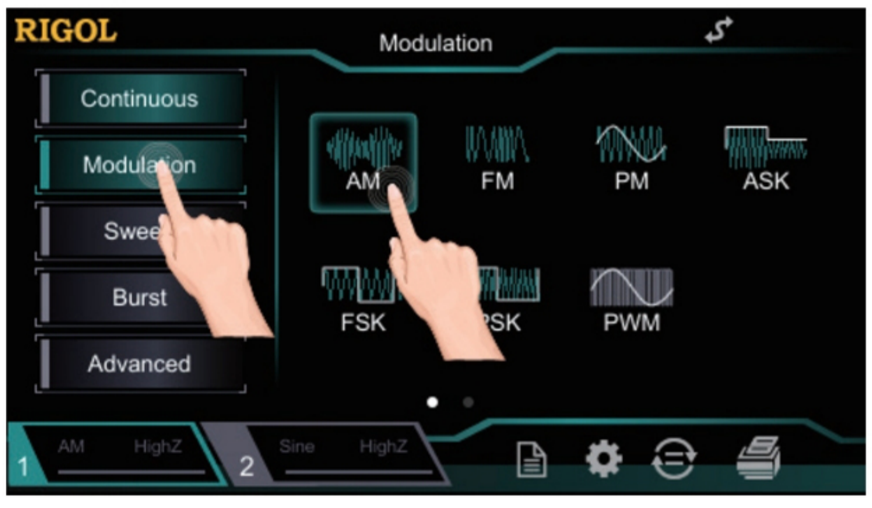
임의 파형을 신호 왜곡 없이 포인트별 발생 가능합니다. 이전의 SiFi 에 비하여 다양한 필터가 추가 되었으며 엣지 시간에 대한 다이나믹한 조정 기능을 추가하였습니다.

터치가 가능한 UI 디자인

탭과 드래그 동작 제스처를 지원하는 새로운 UI 작업 환경을 제공합니다. 키보드를 사용하여 파라미터 설정을 완료할 수 있습니다.



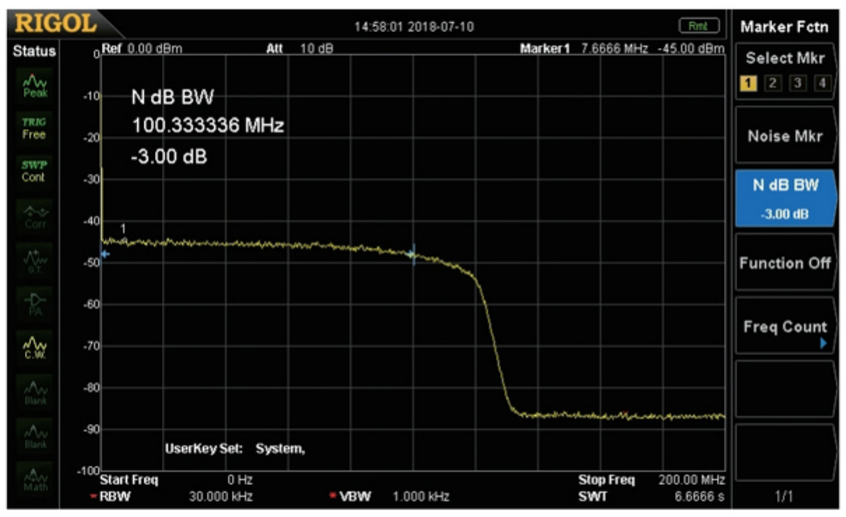




고급 기능 출력

PRBS와 RS232C 패턴 출력과 장비 내(로컬) 시퀀스 편집 가능합니다.

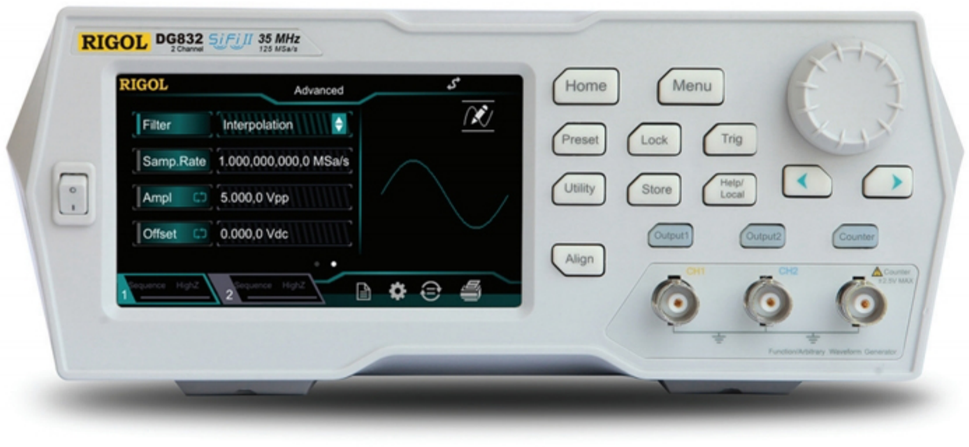
100MHz 대역의 화이트 가우시안 잡음



팬 없이 자연 열 소실(냉각)
0 dB 동작 잡음

새로운 열 분산 구조 설계는 복잡한 환경에서
기기의 동작이 안정적으로 이루어지도록 엄격한
열 시뮬레이션 시험을 거쳤습니다.

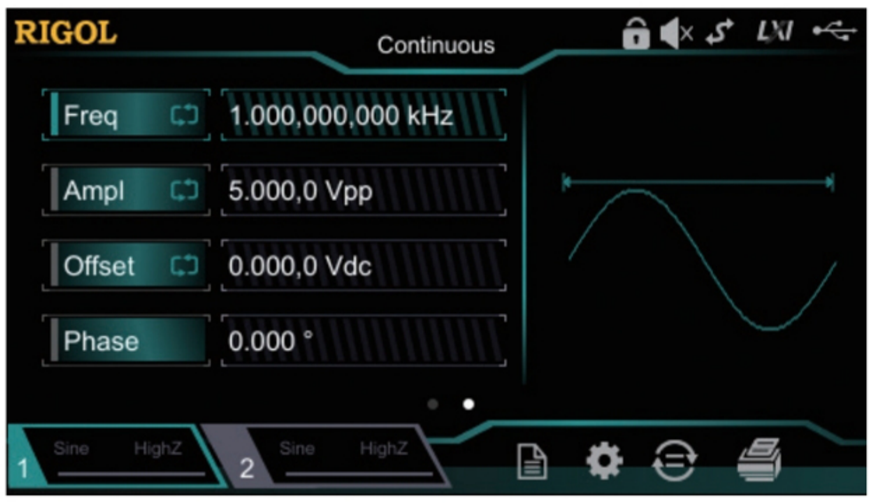
DG800 시리즈
임의 파형/함수 발생기

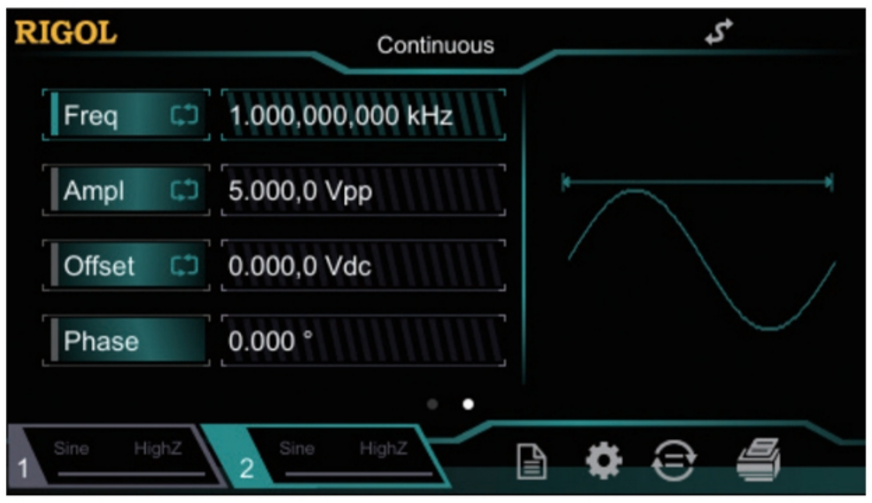


크기 : W×H×D = 237.4 mm × 97 mm × 268 mm, 장비 무게 : 약 1.75 kg

▶ 기능 인터페이스

같은 성능을 가진 듀얼 채널(옵션:1채널에서)



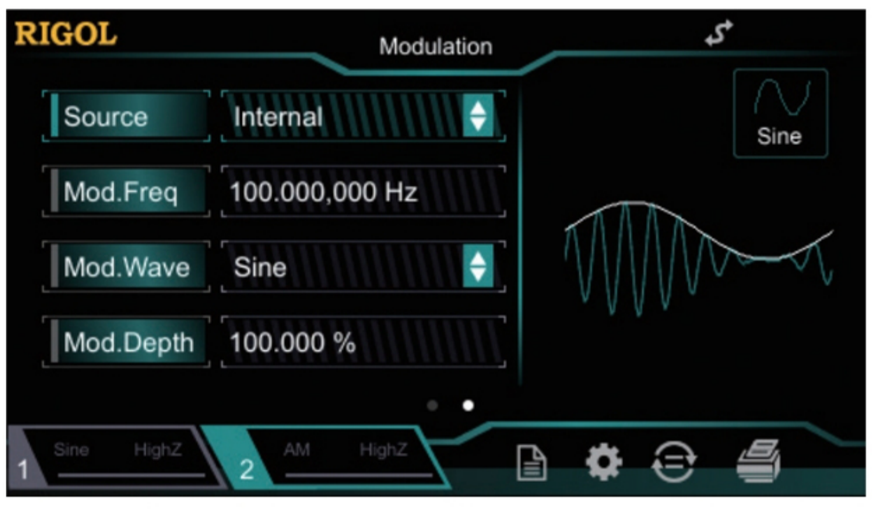


SiFi II 독창적인 SiFi II 기술의 임의 파형 기능

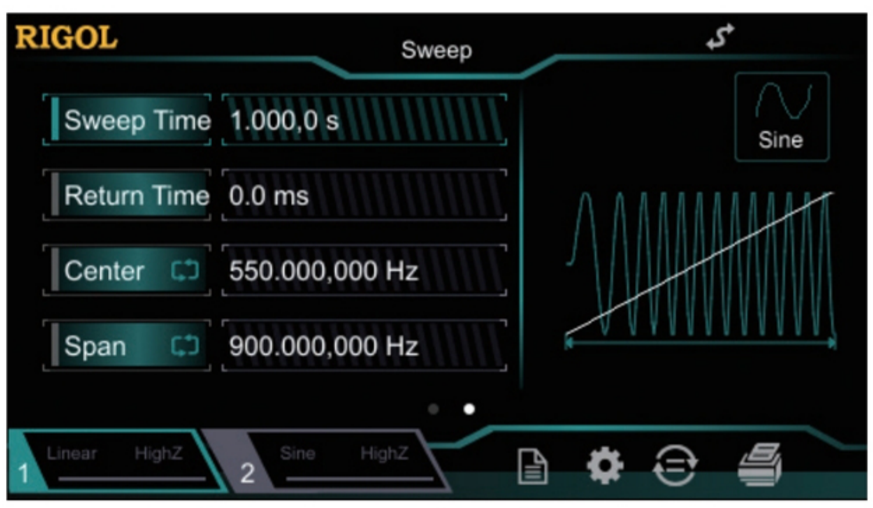
160여개의 내장된 파형

버스트(Burst) 기능

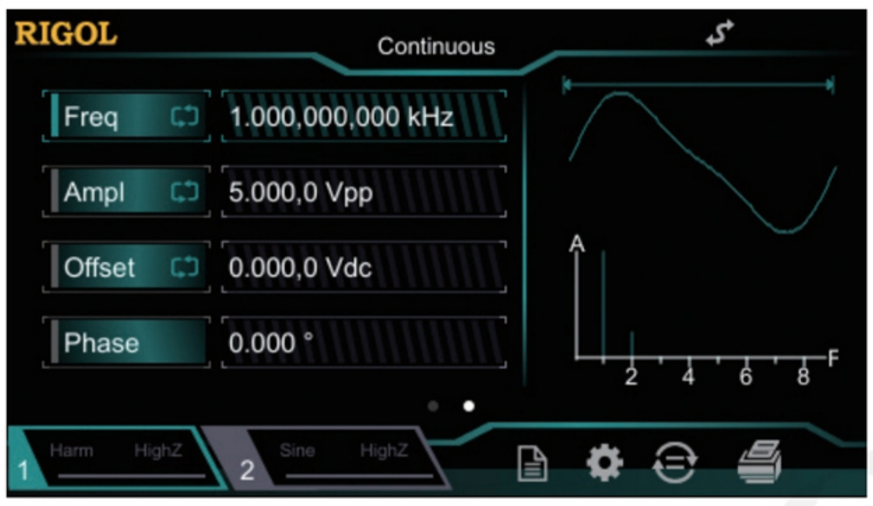
다양한 아날로그와 디지털 변조 기능



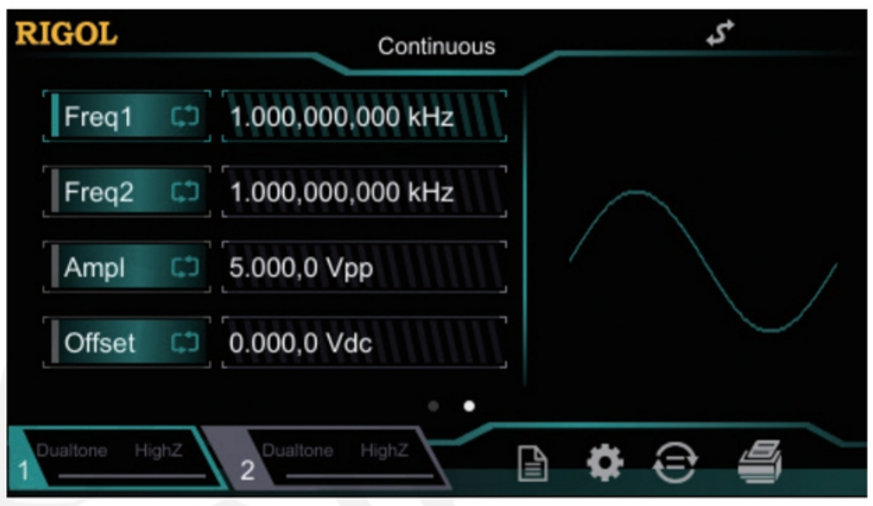
스윕(Sweep) 기능



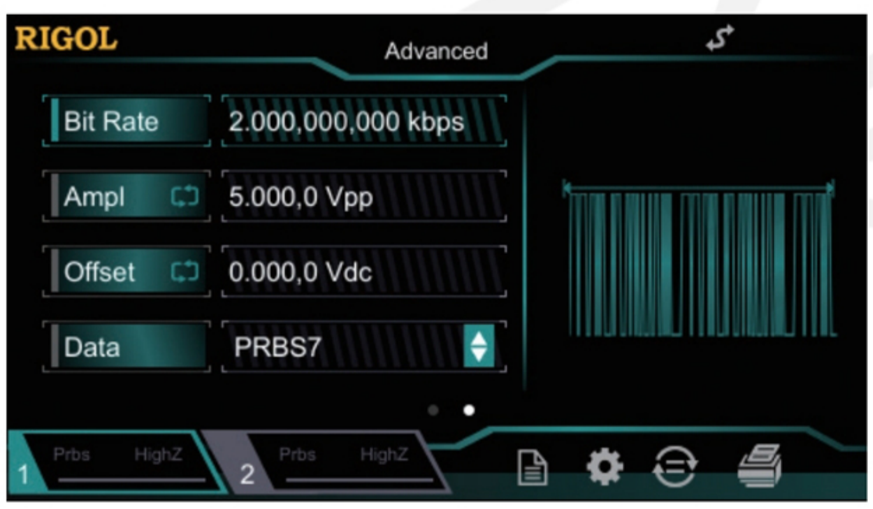
기본 고조파 발생 기능



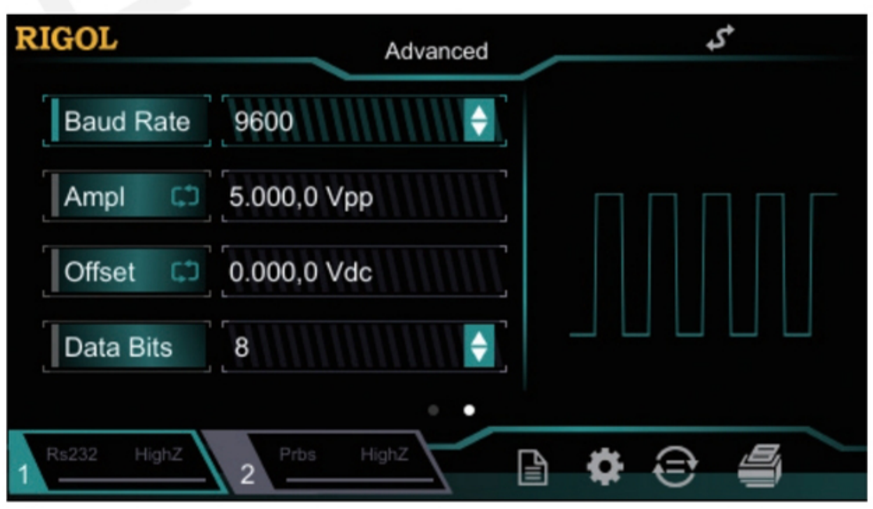
듀얼톤 기능



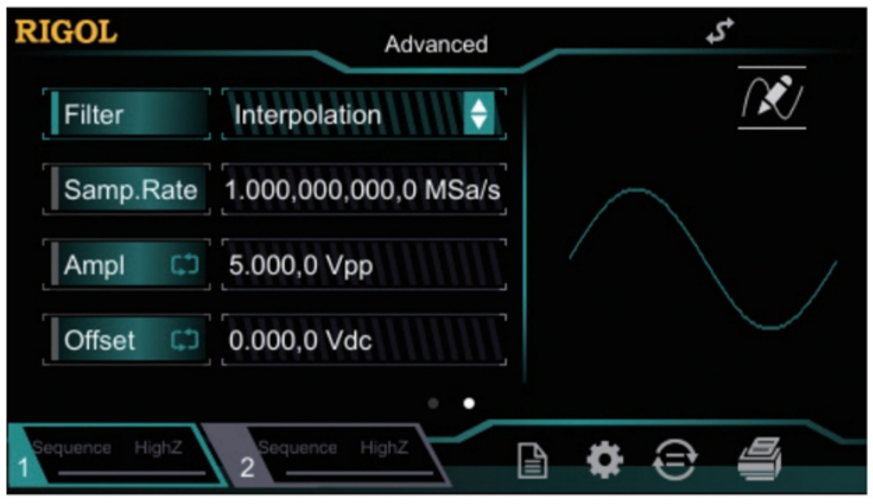
PRBS 기능



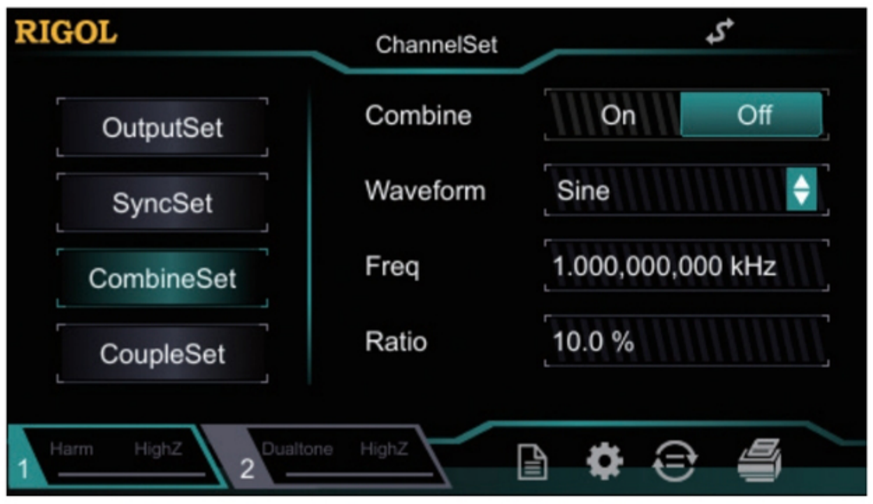
RS232 기능



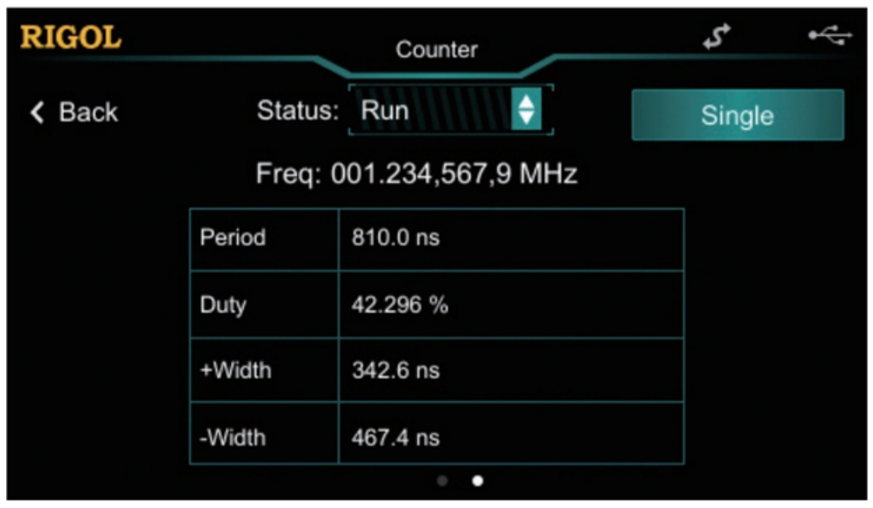
시퀀스 기능



파형 결합 기능



기본 7 digit, 240 MHz 대역의 주파수 측정기



채널과 시스템 설정

파일 관리 기능

▶ 사양

별도 명시되지 않는 한, 모든 사양은 다음의 두 조건이 충족시 보증됩니다.
· 함수 발생기가 교정 주기 내에 있을 것.
· 지정된 동작 온도(23℃±5℃)에서 30분 이상 지속적으로 작동되어야 함.
일반(Typical)이라고 표시된 것 제외하고 모든 사양이 보장됩니다.

DG800 series specifications

Model	DG812	DG811	DG822	DG821	DG832	DG831
Channel	2	1	2	1	2	1
Max. Frequency	10 MHz		25 MHz		35 MHz	
Sample Rate	125 MSa/s					

Waveform	
Basic Waveforms	Sine, Square, Ramp, Pulse, Noise, DC, Dual-tone
Advanced Waveforms	PRBS, RS232, Sequence
Built-in Arbitrary Waveforms	160 types of waveforms, including Sinc, Exponential Rise, Exponential Fall, ECG, Gauss, HaverSine, Lorentz, etc.

Frequency Characteristics			
Sine	1 μHz to 10 MHz	1 μHz to 25 MHz	1 μHz to 35 MHz
Square	1 μHz to 5 MHz	1 μHz to 10 MHz	1 μHz to 10 MHz
Ramp	1 μHz to 200 kHz	1 μHz to 500 kHz	1 μHz to 1 MHz
Pulse	1 μHz to 5 MHz	1 μHz to 10 MHz	1 μHz to 10 MHz
Harmonic	1 μHz to 5 MHz	1 μHz to 10 MHz	1 μHz to 15 MHz
PRBS	2 kbps to 10 Mbps	2 kbps to 20 Mbps	2 kbps to 30 Mbps
Dual-tone	1 μHz to 10 MHz	1 μHz to 20 MHz	1 μHz to 20 MHz
RS232	baud rate range: 9600, 14400, 19200, 38400, 57600, 115200, 128000, 230400		
Sequence	2 k to 30 MSa/s		
Noise (-3 dB)	100 MHz bandwidth		
Arbitrary Waveform	1 μHz to 5 MHz	1 μHz to 10 MHz	1 μHz to 10 MHz
Resolution	1 μHz		
Accuracy	±(1 ppm of the setting value + 10 pHz), 18℃ to 28℃		

Sine Wave Spectrum Purity	
Harmonic Distortion	Typical (0 dBm)[1] DC to 10 MHz (included): <-55 dBc 10 MHz to 20 MHz (included): <-50 dBc 20 MHz to 35 MHz (included): <-40 dBc
Total Harmonic Distortion[1]	<0.075% (10 Hz to 20 kHz)
Spurious (non-harmonic)	Typical[1] ≤10 MHz: <-60 dBc >10 MHz: <-60dBc + 6dB/octave
Phase Noise	Typical (0 dBm, 10 kHz offset) 10 MHz: <-105 dBc/Hz
Signal Characteristics	
Square	
Rise/Fall Time	Typical (1 Vpp, 1 kHz) ≤9 ns
Overshoot	Typical (100 kHz, 1 Vpp) ≤5%
Duty	0.01% to 99.99% (limited by the current frequency setting)
Non-symmetry	1% of the period + 4 ns
Jitter (rms)	Typical (1 Vpp) ≤5 MHz: 2 ppm of the period + 200 ps >5 MHz: 200 ps
Ramp	
Linearity	≤1% of peak output (typical, 1 kHz, 1 VPP, 100% symmetry)
Symmetry	0% to 100%
Pulse	

Pulse	16 ns to 1000 ks (limited by the current frequency setting)
Duty	0.001% to 99.999% (limited by the current frequency setting)
Rising/Falling Edge	≥8ns (limited by the current frequency setting and pulse width setting)
Overshoot	Typical (1 Vpp, 1 kHz) ≤5%
Jitter (rms)	Typical (1 Vpp) ≤5 MHz: 2 ppm of the period + 200 ps >5 MHz: 200 ps
Arbitrary Waveform Sequence	
Waveform Length	2 Mpts(optional 8 Mpts)
Vertical Resolution	16 bits
Sample Rate	Interpolation filter: 10 Sa/s to 30 MSa/s Step filter: 2k Sa/s to 30 MSa/s Smooth filter: 2k Sa/s to 30 MSa/s
Min Rise/Fall Time	Interpolation filter: ≥8 ns Step filter: 3.0/sample rate Smooth filter: 1.0/sample rate
Jitter (rms)	Typical (1 Vpp) Interpolation filter: 200 ps Step filter: <5 ps Smooth filter: <5 ps
Overshoot	Typical (1 Vpp) ≤5%
Harmonic Output	
Harmonic Order	≤8
Harmonic Type	Even Harmonic, Odd Harmonic, Order Harmonic, User
Harmonic Amplitude	The amplitude of each order of the harmonic can be set.
Harmonic Phase	The phase of each order of harmonic can be set.

Output Characteristics	
Amplitude (into 50 Ω)	
Range	≤10 MHz: 1.0 mVpp to 10 Vpp ≤30 MHz: 1.0 mVpp to 5.0 Vpp ≤35 MHz: 1.0 mVpp to 2.5 Vpp
Accuracy	Typical (1 kHz sine, 0 V offset, >10 mVpp, auto) ±(1% of the setting value) ± 5 mV
Flatness	Typical (Sine, 1 Vpp) ≤5 MHz: ±0.1 dB ≤15 MHz: ±0.2 dB ≤25 MHz: ±0.3 dB ≤35MHz: ±0.5 dB
Unit	Vpp, Vrms, dBm
Resolution	0.1 mVpp or 4 digits
Offset (into 50 Ω)	
Range(Peak ac+dc)	±5 Vpk ac+dc
Accuracy	±(1% of the setting value + 5 mV + 1% of the amplitude)
Waveform Output	
Output Impedance	50 Ω (typical)
Protection	Short-circuit protection, automatically disable the waveform output when overload occurs

Modulation Characteristics	
Modulation Type	AM, FM, PM, ASK, FSK, PSK, PWM
AM	
Carrier Waveform	Sine, Square, Ramp, Arb
Source	Internal/External
Modulating Waveform	Sine, Square, Ramp, Noise, Arb
Modulation Depth	0% to 120%
Modulation Frequency	2 mHz to 1 MHz
FM	
Carrier Waveform	Sine, Square, Ramp, Arb

Source	Internal/External
Modulating Waveform	Sine, Square, Ramp, Noise, Arb
Modulation Frequency	2 mHz to 1 MHz
PM	
Carrier Waveform	Sine, Square, Ramp, Arb
Source	Internal/External
Modulating Waveform	Sine, Square, Ramp, Noise, Arb
Phase Deviation	0° to 360°
Modulation Frequency	2 mHz to 1 MHz
ASK	
Carrier Waveform	Sine, Square, Ramp, Arb
Source	Internal/External
Modulating Waveform	Square with 50% duty cycle
Key Frequency	2 mHz to 1 MHz
FSK	
Carrier Waveform	Sine, Square, Ramp, Arb
Source	Internal/External
Modulating Waveform	Square with 50% duty cycle
Key Frequency	2 mHz to 1 MHz
PSK	
Carrier Waveform	Sine, Square, Ramp, Arb
Source	Internal/External
Modulating Waveform	Square with 50% duty cycle
Key Frequency	2 mHz to 1 MHz
PWM	
Carrier Waveform	Pulse
Source	Internal/External
Modulating Waveform	Sine, Square, Ramp, Noise, Arb
Width Deviation	0% to 100% of the pulse width
Modulation Frequency	2 mHz to 1 MHz
External Modulation Input	
Input Range	AM, PM, FM: 75 mVRMS to ±5 (Vac+dc) ASK, PSK, FSK: standard 5 V TTL
Input Bandwidth	50 kHz
Input Impedance	10 kΩ

Burst Characteristics			
Carrier Waveform	Sine, Square, Ramp, Pulse, Noise, Arb, PRBS, RS232, Sequence (except DC, dual-tone, and Harmonic)		
Carrier Frequency	2 mHz to 10 MHz	2 mHz to 25 MHz	2 mHz to 35 MHz
Burst Count	1 to 1,000,000 or Infinite		
Internal Period	1 µs to 500 s		
Gated Source	External Trigger		
Source	Internal, External, Manual		
Trigger Delay	0 ns to 100 s		
Sweep Characteristics			
Carrier Waveform	Sine, Square, Ramp, Arb		
Type	Linear, Log, and Step		
Orientation	Up/Down		
Start/Stop Frequency	Same as the upper/lower limit of the corresponding carrier frequency		
Sweep Time	1 ms to 500 s		
Hold/Return Time	0 ms to 500 s		
Source	Internal, External, Manual		
Marker	Falling edge of the sync signal (programmable)		

Frequency Counter	
Measurement Function	Frequency, Period, Positive/Negative Pulse Width, Duty Cycle
Frequency Resolution	7 digits/s (Gate Time = 1 s)
Frequency Range	1 µHz to 240 MHz

Period Measurement	Measurement Range	4 ns to 1,000 ks	
Voltage Range and Sensitivity (non-modulating signal)			
DC Coupling	DC Offset Range	±1.5 Vdc	
	1 µHz to 100 MHz	50 mVRMS to ±2.5 (Vac+dc)	
	100 MHz to 240 MHz	100 mVRMS to ±2.5 (Vac+dc)	
AC Coupling	1 µHz to 100 MHz	50 mVRMS to ±2.5 Vpp	
	100 MHz to 240 MHz	100 mVRMS to ±2.5 Vpp	
Pulse Width and Duty Cycle Measurement			
Frequency and Amplitude Ranges	1 µHz to 25 MHz	50 mVRMS to ±2.5 (Vac+dc)	DC Coupling
Pulse Width	Min. Pulse Width	≥20 ns	
	Pulse Width Resolution	5 ns	
Duty	Measurement Range (display)	0% to 100%	

Input Characteristics			
Input Signal Range	Breakdown Voltage	±7 (Vac+dc)	Input Impedance = 1 MΩ
Input Adjustment	Coupling Mode	AC	DC
	High Frequency Rejection	On: Input Bandwidth = 150 kHz; Off: Input Bandwidth = 240 MHz	
Input Trigger	Trigger Level Range	-2.5 V to +2.5 V	
	Trigger Sensitivity Range	High, Low	
GateTime	1 ms	1.048 ms	
	10 ms	8.389 ms	
	100 ms	134.218 ms	
	1 s	1.074 s	
	10 s	8.590 s	
	>10 s	>8.590 s	

Trigger Characteristics	
Trig Input	
Level	TTL-compatible
Slope	Rising or falling (selectable)
Pulse Width	>100 ns
Latency	Sweep: <100 ns (typical) Burst: <350 ns (typical)

Trigger Output	
Level	TTL-compatible
Pulse Width	>60 ns (typical)
Max. Frequency	1 MHz

Two-channel Characteristics - Phase Offset	
Range	0° to 360°
Waveform Phase Resolution	0.03°

Reference Clock	
External Reference Input	
Lock Range	10 MHz ± 50 Hz
Level	250 mVpp to 5 Vpp
Lock Time	<2 s
Input Impedance(Typical)	1 kΩ, AC coupling
Internal Reference Output	
Frequency	10 MHz ± 50 Hz
Level	3.3 Vpp
Output Impedance(Typical)	50 Ω, AC coupling

Synchronous Output	
Level	TTL-compatible
Impedance	50 Ω, nominal value

Overvoltage Protection
Occurred when: The instrument amplitude setting is greater than 3.2 Vpp or the output AC+DC is greater than $\|1.6V_{DC}\|$ and the input voltage is greater than ±12 × (1 ± 5%)V (<10 kHz).Disruptive discharge voltage: ±5(Vac + dc). The instrument amplitude setting is smaller than or equal to 3.2 Vpp or the output AC+DC is smaller than $\|1.6V_{DC}\|$ and the input voltage is greater than ±2.6 × (1 ± 5%)V (<10 kHz).Disruptive discharge voltage: ±18(Vac + dc).

Overcurrent Protection
Occurred when: the current is greater than ±240 mA.

Programming Time	
Configuration Changes	USB
Function Change	10 ms
Amplitude Change	5 ms
Frequency Change	5 ms

General Specifications		
Power Supply		
Power Voltage	100 V to 127 V (45 Hz to 440 Hz) 100 V to 240 V (45 Hz to 65Hz)	
Power Consumption	Lower than 30 W	
Display		
Type	4.3-inch TFT LCD touch screen	
Resolution	480 horizontal × RGB × 272 vertical resolution	
Color	16 M	
Environment		
Temperature Range	Operating: 0℃ to 45℃ Non-operating: -40℃ to 60℃	
Cooling Method	Fan cooled	
Humidity Range	Below 30℃: ≤95%RH 30℃ to 40℃: ≤75%RH 40℃ to 50℃: ≤45%RH	
Altitude	Operating: below 3,000 meters Non-operating: below 15,000 meters	
Mechanical Characteristics		
Dimensions (W×H×D)	238 mm × 97 mm × 266.6 mm	
Weight	Package excluded: 1.75 kg Package included: 2.85 kg	
Interface	USB Host, USB Device, and USB-GPIB	
IP Protection	IP2X	
Calibration Interval	1 year (recommended)	
Certification Information		
EMC	Compliant with EN61326-1:2006	
	IEC 61000-3-2:2000	±4.0 kV (Contact Discharge) ±4.0 kV (Air Discharge)
	IEC 61000-4-3:2002	3 V/m (80 MHz to 1 GHz); 3 V/m (1.4 GHz to 2 GHz); 1 V/m (2.0 GHz to 2.7 GHz)
	IEC 61000-4-4:2004	1kV power line
	IEC 61000-4-5:2001	0.5 kV (phase-to-neutral voltage); 0.5 kV (phase-to-earth voltage); 1 kV (neutral-to-earth voltage)
	IEC 61000-4-6:2003	3 V, 0.15 MHz to 80 MHz
	IEC 61000-4-11:2004	Voltage dip: 0% UT during half cycle 0% UT during 1 cycle 70% UT during 25 cycles Short interruption: 0% UT during 1 cycle
Electrical Safety	complies with USA: UL 61010-1:2012, Canada: CAN/CSA-C22.2 No. 61010-1-2012 EN 61010-1:2010,	

Note[1]: 0 dBm output, DC offset 0, impedance 50 Ω.

▶ Options and Accessories

	Description	Order No
Model	DG812 (10 MHz, Dual-channel)	DG812
	DG822 (25 MHz, Dual-channel)	DG822
	DG832 (35 MHz, Dual-channel)	DG832
	DG811 (10 MHz, Single-channel)	DG811
	DG821 (20 MHz, Single-channel)	DG821
	DG831 (30 MHz, Single-channel)	DG831
Standard Accessories	1 Power Cord conforming to the standard of the destination country	-
	1 BNC Cable (only provided by DG832/DG831/DG822/DG821)	CB-BNC-BNC-MM-100
	1 Quick Guide	-
	1 Product Warranty Card	-
Option	Single-dual CH Upgrade Option (only for DG831/DG821/DG811)	DG800-DCH
	Memory Depth Upgrade Option	DG800-ARB8M
Optional Accessories	40 dB Attenuator	RA5040K
	USB-GPIB Interface Converter	USB-GPIB-L