

UDG2000A Series Arbitrary Waveform Generators



● Introduction

UDG2000A series function / arbitrary waveform generator is designed by direct digital frequency synthesis (DDS) technology and can produce accurate, stable and low distortion output signals. The series of instruments 125 MS/s sampling rate, and 14-bit vertical resolution. It has equivalent dual channel independent output, Built-in 200 arbitrary waveforms, Meet the requirements of most applications in basic testing.

● Features

1. 25MHz sine waveform output, 1μHz full-band resolution
2. 125MSa/s sample rate, 14bit vertical resolution
3. 8k points arbitrary waveform storage, Built-in 48 arbitrary waveforms
4. non-volatile waveforms storage
5. Versatile modulation choices: AM, FM, PM, ASK, FSK, PSK, PWM
6. 5MHz pulse waveform, adjustable rise/fall time
7. 4.3 inch high resolution color TFT display
8. Standard Ports: USB Host, USB Device, LAN(Optional), Frequency Counter

Application features

| CH1 | Limit HighZ | CH2 | Limit HighZ | Wave |
|---|----------------|-----|-------------|-------|
| Freq | 25.000,000 MHz | | | Wave |
| Amp | 5.000 Vpp | | | Mod |
| Offset | 2.500 V | | | Sweep |
| Phase | 0.00 ° | | | Burst |
| <div style="display: flex; justify-content: space-around;"> Sine Square Ramp Pulse Arb Noise </div> | | | | |

25MHz sine waveform output, Double Channel Multiple Waveform Selection

| CH1 | Limit HighZ | AM | CH2 | Limit HighZ | Type |
|---|---------------|----|-----|-------------|------|
| Source | Internal | | | Type | |
| ModWave | Sine | | | Param | |
| ModFreq | 50.000,00 kHz | | | Carrier | |
| Depth | 88.00 % | | | | |
| <div style="display: flex; justify-content: space-around;"> AM FM PM ASK FSK PSK </div> | | | | | |

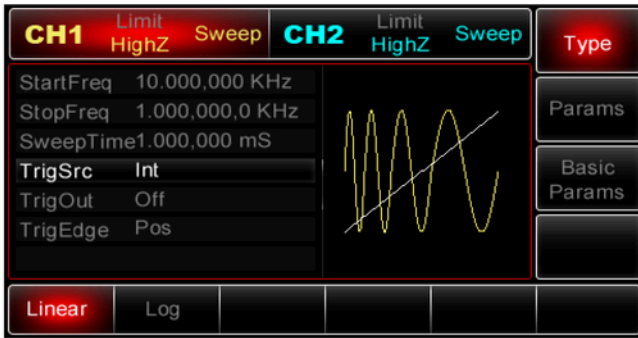
Multiple Analog and Digital Modulation

| CH1 | Limit HighZ | Infinite | CH2 | Limit HighZ | Infinite | Wave |
|---|-------------|----------|-----|-------------|----------|------|
| TrgSrc | Internal | | | Wave | | |
| TrigOut | Off | | | Mod | | |
| Phase | 0.00 ° | | | Sweep | | |
| | | | | Burst | | |
| <div style="display: flex; justify-content: space-around;"> NCyc Infinite Gated </div> | | | | | | |

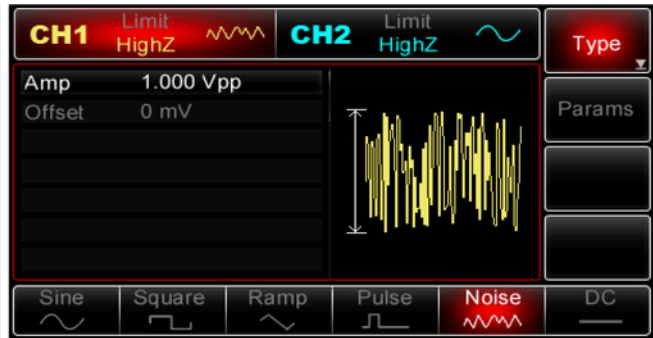
Three burst modes for your option

| CH1 | Limit HighZ | CH2 | Limit HighZ | Type |
|--|-----------------|-----|-------------|-------|
| Freq | 100.000,000 kHz | | | Type |
| Amp | 3.000 Vpp | | | Param |
| Offset | 0 mV | | | |
| Phase | 0.00 ° | | | |
| Duty | 50.000 % | | | |
| <div style="display: flex; justify-content: space-around;"> Freq Amp Offset Phase Duty </div> | | | | |

Square wave with 50% duty cycle



Sweep function and burst mode



Noise signal at 25MHz bandwidth

| Technical Specifications | | |
|------------------------------------|--|--------|
| Model | UDG2025A | |
| Channels | 2 | |
| Max. Frequency | 25MHz | |
| Sample Rate | 125MSa/s | |
| Waveforms | Sine, Square, Ramp, Pulse, Noise, DC, Arbitrary Waveforms | |
| Working Mode | Output Gate, Continuous, Modulate, Frequency Sweep, Burst | |
| Modulation Types | UTG2025A | |
| Waveform Specifications | | |
| Sine Wave | | |
| Frequency Range | 1μHz~25MHz | |
| | DC ~100kHz | -60dBc |
| | 100kHz~1MHz | -50dBc |
| | 1MHz~25MHz | -35dBc |
| Total Harmonic Distortion(typical) | DC~20kHz, 1Vpp < 0.2% | |
| Non-harmonic spurious(typical) | DC~1MHz < -70dBc | |
| | 1MHz~5MHz < -60dBc | |
| | 5MHz~25MHz < -50dBc | |
| | 1kHz offset: -105dBc/Hz | |
| Phase Noise(typical) | 10kHz offset: -115dBc/Hz | |
| | 100kHz offset: -125dBc/Hz | |
| Square Wave | | |
| Frequency Range | 1μHz~5MHz | |
| Rise/Fall Time | < 24ns(10%~90%) (Typical, 1kHz, 1Vpp) | |
| Overshoot(Typical) | < 2% | |
| Symmetry (below 50% duty cycle) | 1%+4ns of the period | |
| Jitter(typical) | 1ns+100ppm of the period | |
| Ramp Wave | | |
| Frequency Range | 1μHz~400kHz | |
| Nonlinearity | < 0.1% of peak output (Typical, 1kHz, 1Vpp, symmetrical 100%) | |
| Symmetry | 0.0%~100.0% | |
| Pulse Wave | | |
| Frequency Range | 500μHz~5MHz | |
| Pulse Width | 40ns~2000s | |
| Variable Edge Time | 10ns~2ms | |
| Overshoot (Typical) | < 2% | |
| Jitter | 1ns+100ppm of the period | |
| Gaussian Noise | | |
| Bandwidth | 25MHz bandwidth(-3dB), typical | |
| DC Offset | | |
| Range(Peak AC+DC) | ±5V(50Ω) | |
| | ±10V (High resistance) | |
| Offset Accuracy | ±(2% of Offset setting+ 0.5% of amplitude +5mV) | |
| Arbitrary Wave | | |
| Frequency Range | 1μHz~5MHz | |

| | |
|--|--|
| Waveform Length | 2~8k points |
| Vertical Resolution | 14bits(symbols included) |
| Sample Rate | 125MSa/s |
| Min Fall/Rise Time | 35ns, Typical |
| Jitter(RMS)(typical) | 15ns+100ppm |
| Nonvolatile Memory | 48 waveforms |
| Output Characteristics | |
| Amplitude Range | 1mVpp~10Vpp(50Ω) 2mVpp~20Vpp(high resistance) |
| Accuracy(1kHz sine) | ±(1% of setting value+2mVpp) |
| Amplitude Flatness | < 100kHz 0.1dB |
| (with reference to 1kHz sine wave, 5Vpp) | 100kHz~25MHz 0.2dB |
| Waveform Output | |
| Impedance | 50Ω, typical |
| Isolation | 42Vpk maximum to earth |
| Protection | Short-circuited protection |
| Modulation Characteristics | |
| AM | |
| Carrier Waveforms | Sine, Square, Ramp, Arbitrary |
| Source | Internal/External |
| Modulating Waveforms | Sine, Square, Ramp, Noise, Arbitrary |
| Modulating Frequency | 2mHz~50kHz |
| Modulation Depth | 0%~120% |
| FM | |
| Carrier Waveforms | Sine, Square, Ramp, Arbitrary |
| Source | Internal/External |
| Modulating Waveforms | Sine, Square, Ramp, Noise, Arbitrary |
| Modulating Frequency | 2mHz~50kHz |
| Frequency Deviation | 1μHz~12.5MHz |
| PM | |
| Carrier Waveforms | Sine, Square, Ramp, Arbitrary |
| Source | Internal/External |
| Modulating Waveforms | Sine, Square, Ramp, Noise, Arbitrary |
| Modulating Frequency | 2mHz~50kHz |
| Phase Deviation | 0°~360° |
| ASK | |
| Carrier Waveforms | Sine, Square, Ramp, Arbitrary |
| Source | Internal/External |
| Modulating Waveforms | Square waveforms with 50% duty cycle |
| Modulating Frequency | 2mHz~100kHz |
| FSK | |
| Carrier Waveforms | Sine, Square, Ramp, Arbitrary |
| Source | Internal/External |
| Modulating Waveforms | Square waveforms with 50% duty cycle |
| Modulating Frequency | 2mHz~100kHz |
| PSK | |
| Carrier Waveforms | Sine, Square, Ramp, Arbitrary |
| Source | Internal/External |
| Modulating Waveforms | Square waveforms with 50% duty cycle |
| Modulating Frequency | 2mHz~100kHz |
| PWM | |
| Carrier Waveforms | Pulse |
| Source | Internal/External |
| Modulating Waveforms | Sine, Square, Ramp, Noise, Arbitrary |
| Modulating Frequency | 2mHz~50kHz |
| Width Deviation | 0%~49.9% of pulse width |
| Sweep | |
| Carrier Waveforms | Sine, Square, Ramp, Arbitrary |
| Type | Linear, Logarithmic |
| Sweep Time | 1ms~500s±0.1% |

| | | |
|--------------------------------|--|----------|
| Trigger Source | Manual, External, Internal | |
| Burst | | |
| Waveforms | Sine, Square, Ramp, Pulse, Noise, Arbitrary | |
| Type | N-Cycle(1~50000cycle),Infinite, Gated | |
| Start/Stop Phase | -360°~ +360° | |
| Internal Cycle | 1μs~500s±1% | |
| Gate Source | External | |
| Trigger Source | Manual, External, Internal | |
| Connector on Back Panel | | |
| Modulation Input | | |
| External AM Modulation | ±5Vpk full-scale 20kΩ input impedance | |
| Lock Time | < 2s | |
| External Trigger | TTL Compatible | |
| 10MHz Input | | |
| Level | TTL Compatible, to 50Ω | |
| Input Frequency | 10MHz±500Hz | |
| Input Impedance | 10kΩ, Typical | |
| Coupling | DC | |
| 10MHz Output | | |
| Level | TTL Compatible, to 50Ω | |
| Input Frequency | 10MHz±500Hz | |
| Input Impedance | 50Ω, Typical | |
| Coupling | DC | |
| Frequency Counter | | |
| Level | TTL Compatible | |
| Input Frequency | 100mHz ~ 200MHz | |
| Accuracy | ±51ppm | |
| Frequency Resolution | 6 bit/s | |
| Coupling | AC, DC | |
| Trigger Input | | |
| Input Level | TTL Compatible | |
| Slope | Rise or Fall, selectable | |
| Pulse Width | > 100ns | |
| Input Impedance | > 10kΩ, DC-coupled | |
| Reaction Time | Sweep: < 500μs, Typical Burst: < 500ns, Typical | |
| Trigger Output | | |
| Level | TTL Compatible, to 50Ω | |
| Pulse Width | > 400ns, Typical | |
| Output Impedance | 50Ω, Typical | |
| Max. Frequency | 1MHz | |
| Waveform Specifications | | |
| Display Type | 4.3inch color TFT display, 480 Horizontal × 272Vertical (Display Resolution) | |
| Power Supply | 100 ~ 240 VAC, 50Hz/60Hz , Power Dissipation < 40W | |
| Fuse | 2A, T level, 250V | |
| Environment | | |
| Temperature Range | Operating: 10°C ~ +40°C Non-operating: -20°C ~ +60°C | |
| Cooling | Natural cooling | |
| Humidity | < +35°C: ≤90% RH +35°C~+40°C: ≤60% RH | |
| Altitude | Operating: < 3000m Sine, Square, Ramp, Arbitrary | |
| Ordering Information | | |
| UDG2000A Series | (25MHz, 125MSa/s, 8Kpts, 2-Channel) | UDG2025A |
| Standard Accessories | Power cord conforming to the standard of the destination country | / |
| | USB interface cable | / |
| | 2 BNC cables (1M) | / |