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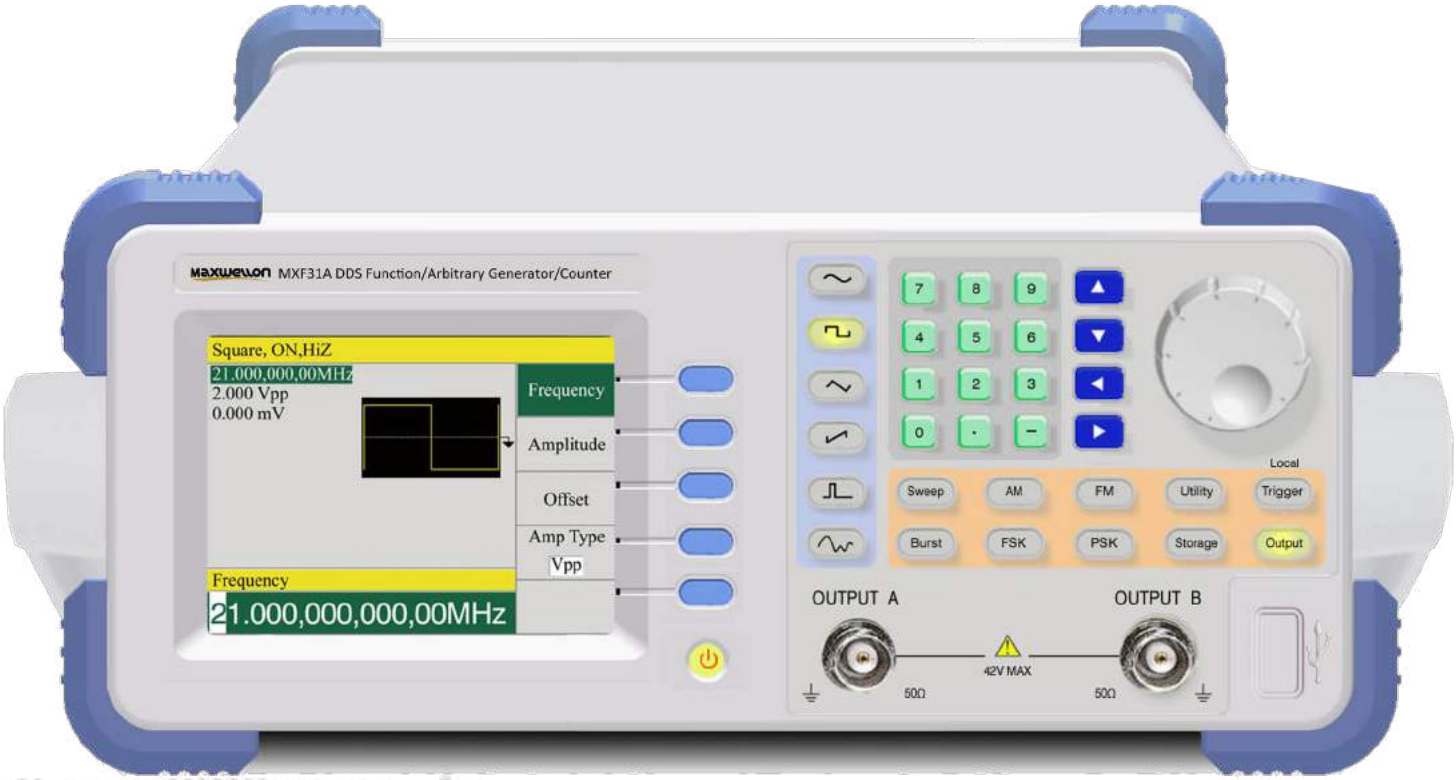

MAXWELLON MXF31A

1μHz ~ 6/ 11/ 21/ 31MHz

DDS Function/Arbitrary Generator/Counter

2023

Maxwellon

This instrument is a precision testing instrument that has the functions of outputting function signals, FM, AM, FSK, PSK, burst, frequency scanning, and other signals. In addition, this instrument also has the functions of frequency measurement and counting. This instrument is an ideal testing equipment for electronic engineers, electronic laboratories, production lines, teaching, and scientific research..

Key Feature

- Adopting Direct Digital Synthesis (DDS) technology
- Small signal output amplitude can reach 1mV
- Pulse wave duty cycle resolution up to 0.001
- Digital frequency modulation and amplitude modulation with high resolution and accuracy
- Burst mode with continuous phase adjustment function
- Frequency scanning output can be arbitrarily set for starting and ending frequencies
- Phase adjustment resolution up to 0.1 degrees
- The amplitude modulation system can be set arbitrarily from 1% to 100%
- More than 30 types of output waveforms
- Equipped with frequency measurement and counting functions
- With a second output, it can control the phase difference with the first signal
- Large screen TFT LCD display, user-friendly and intuitive interface

Specification

Channel A Function Generator		
1. Waveform Characteristics		
Main Waveform	Type	Sine wave, square wave
	Waveform amplitude resolution	12 bits
	Sampling rate	200Msa/s
	Sine wave harmonic distortion	≤ -50dBc (frequency ≤ 5MHz)
		≤ -45dBc (frequency ≤ 10MHz)
		≤ -40dBc (frequency >10MHz)
	Sine wave distortion	≤ 0.2% (frequency: 20Hz~100kHz)
	Square wave rise and fall time	≤25ns(MXF06A ≤ 28ns)
	Note: Test conditions for sine wave harmonic distortion, sine wave distortion, and square wave rise and fall time: output amplitude 2Vp-p (high resistance), ambient temperature 25 ℃ ± 5 ℃	
Store Waveform	Type	26 types of waveforms, including sine wave, square wave, pulse wave, triangular wave, serrated wave, stepped wave, etc. TTL waveform (MXF21A/MXF31A only)
	Waveform length	4096 points
	Waveform amplitude resolution	12 bits
	pulse duty factor	0.1% ~ 99.9% (frequency≤10kHz)
		1% ~ 90% (10kHz ~ 100kHz)
	Pulse wave rise and fall time	≤1uS
	DC output error	≤±10%+10mV (output voltage range 10mV~10V)

Channel A Function Generator		
2. Frequency characteristics		
Frequency range	Main waveform	Sine wave 1μHz~6MHz; Square wave, TTL wave 10Hz~6MHz (MXF06A)
		Sine wave 1μHz~11MHz; Square wave, TTL wave 10Hz~11MHz (MXF11A)
		Sine wave 1μHz~21MHz; Square wave, TTL wave 10Hz~21MHz MX(F21A)
		Sine wave 1μHz~31MHz; Square wave, TTL wave 10Hz~21MHz (MXF31A)
	Store Waveform	1μHz ~ 100kHz
Resolution		1μHz
Frequency error		≤±5×10^{-4}
Frequency stability		±5×10^{-5}
3. Amplitude characteristic		
Amplitude range		1mV ~ 20Vp-p (High resistance)
		0.5mV ~ 10Vp-p (50Ω)
Max Resolution		2μVp-p (High resistance)
		1μVp-p (50Ω)
Amplitude error		≤±2%+1mV (frequency 1kHz sine wave)
Amplitude stability		± 1%/3 hours
Flatness		± 5% (frequency ≤ 5MHz, sine wave); ± 10% (frequency>5MHz, sine wave)
		± 5% (frequency ≤ 50 kHz, other waveforms); ± 20% (frequency>50 kHz, other waveforms)
Output Impedance		50Ω
Amplitude unit		Vp-p, mVp-p, Vrms, mVrms, dBm
4.Offset characteristics		
DC offset (High resistance)		±(10V-Vpk ac)
Max Resolution		2μV (High resistance)
		1μV (50Ω)
Offset error		≤±10% +20mV (high resistance)
5. AM characteristic		
Carrier Signal		The waveform is a sine wave, with the same frequency range as the main waveform
Modulation Mode		Internal or External
Modulation Signal		Internal 5 waveforms (sine, square, triangular, ascending sawtooth, descending sawtooth) or external input signals
Modulated Signal Frequency		1Hz~20kHz (internal)
		100Hz~10kHz (external)
Distortion		≤1% (Modulation signal frequency 1kHz sine wave)
Modulation Depth		1% ~ 100%
Relative Modulation Error		≤±5% +0.5 (Modulation signal frequency 1kHz sine wave)
External Input Signal Amplitude		3Vp-p(-1.5V~ +1.5V)
6. FM characteristics		
Carrier Signal		The waveform is a sine wave, with the same frequency range as the main waveform
Modulation Mode		Internal or External
Modulation Signal		Internal 5 waveforms (sine, square, triangular, ascending sawtooth, descending sawtooth) or external input signals
Modulated Signal Frequency		1Hz~10kHz (internal)
		100Hz~10kHz (external)
Frequency Offset		The Max. frequency offset of frequency modulation is 50% of the carrier frequency, and (the frequency offset + the carrier frequency) < (the Max. operating frequency+100 kHz)
Distortion		≤1% (Modulation signal frequency 1kHz sine wave)
Relative modulation error		≤ ± 5% set value ± 50Hz (modulation signal frequency 1kHz sine wave)
External Input Signal Amplitude		3Vp-p(-1.5V~ +1.5V)
FSK		Frequency 1 and frequency 2 can be set arbitrarily

Channel A Function Generator	
Control Mode	Internal or external (external control: TTL level, low level F1; high level F2)
External trigger signal frequency	≤10kHz
Alternating Rate	0.1ms ~ 800s
7. PM characteristics	
Basic signal	The waveform is a sine wave, with the same frequency range as the main waveform
PSK	Phase 1 (P1) and Phase 2 (P2); Range: 0.1~360.0 °
Resolution	0.1 °
Alternating time interval	0.1ms~800s
Control method	internal or external (external control TTL level, low level P2, high level P1)
External trigger signal frequency	≤10kHz
8. Burst	
Basic signal	The waveform is a sine wave, with the same frequency range as the main waveform
Burst count	1 ~ 30000 cycles, The minimum burst count for frequencies of 50kHz and below is 1, and for frequencies ranging from 50kHz to 100kHz (including 100kHz), the minimum burst count is 2. Similarly, for each increase in 50kHz, the minimum burst count is increased by 1.
Burst signal alternating time interval	0.1ms~800s
Control mode	internal (automatic)/external (single manual button triggering, external input TTL pulse rising edge triggering)
External trigger signal frequency	≤10kHz
9. Frequency Sweep characteristics	
Signal waveform	Sine wave
Sweep Range	The frequency range of the scanning starting point is the same as the main waveform
	Scan termination point frequency range is the same as the main waveform
Sweep Time	1ms~800s (linear)
	100ms~800s (logarithmic)
Sweep step time	1ms~800s (step sweep)
Sweep interval	0ms~800s (step sweep)
Sweep Mode	Linear sweep, logarithmic sweep, and step sweep
External trigger signal frequency	≤ 1kHz (linear)
	≤ 10Hz (logarithmic)
Control Mode	Internal (automatic)/External (single manual button trigger, external input TTL pulse rising edge trigger)
10. Modulated signal output	
Output Frequency	1Hz ~ 20kHz
Output Waveform	Sine wave, square wave, triangular wave, ascending sawtooth, descending sawtooth
Output Amplitude	5Vp-p±5% (Sine wave, frequency ≤ 10kHz)
Output Impedance	600 Ω
11.External standard frequency input	
Signal amplitude	3Vp-p
Signal frequency	10MHz
12. Storage characteristics	
Storage parameters	The frequency value, amplitude value, waveform, DC offset value, and functional status of the signal
Storage capacity	10 signals
Reproduction mode	Call up all stored signals with corresponding serial numbers
Storage time	Ten years
13. Computational characteristics	
When inputting and displaying data, both frequency and period values can be used, as well as amplitude RMS and amplitude peak to peak and dBm values.	
14.Operational Characteristics	
In addition to the direct input of the digital health, the data can be continuously adjusted using the adjustment knob for flexible operation.	

Channel B Function Generator	
1.Output Frequency	
Frequency range	1Hz-20kHz
Minimum frequency resolution	100 μHz
Frequency stability	$\pm 1\times10^{-4}$
2.Output Amplitude (output waveform is sine wave)	
Amplitude range	100mVp-p~5Vp-p
Minimum resolution	± 2mVp-p
Amplitude error	≤ 5% ± 5mVp-p
Distortion	≤ 1% (output amplitude 2Vp-p, f=1kHz)
3.Output Impedance	
600Ω±5%	
4.Output waveform	
Sine wave, square wave, triangular wave, negative sawtooth wave, positive sawtooth wave (AM)	
5.Front and back edges of square waves	
Square wave front and rear edges<10 μS	
6.Phase difference of A/B sine signal	
A/B sine signal phase difference range: 0.0°~360.0° degrees Phase error of A/B sine signal: -0.5° ~ +0.5° (frequency<2kHz)	
Channel B Power Amplifier Module	
1.OUTPUT FREQUENCY	
Frequency range	1Hz-20kHz
Minimum frequency resolution	100 μHz
Frequency stability	$\pm 1\times10^{-4}$
2.Output amplitude (output waveform is sine wave)	
Amplitude range	300mVp-p~15Vp-p
Minimum resolution	± 6mVp-p
Amplitude error	≤ 5% ± 5mVp-p
Output power	≥ 3W (sine wave, frequency range 100Hz~10kHz, load resistance ≥ 4 Ω)
3.Output impedance	
Output impedance ≤ 0.5 Ω	
4.Output waveform	
Sine wave, square wave, triangular wave, sawtooth wave	
5.Phase difference of A/B sine signal	
A/B sine signal phase difference range: 0.0°~360.0° degrees Phase error of A/B sine signal: -0.5° ~ +0.5° (frequency<2kHz)	

Counter

Frequency measurement range			Frequency measurement: 10Hz~100MHz; Count: ≤ 10MHz
Input characteristics	Min. Input Voltage	ATT on	50mVrms (frequency: 100Hz ~ 50MHz)
			100mVrms (frequency: 10Hz ~ 100MHz)
		ATT closed	0.5Vrms (frequency: 100Hz ~ 50MHz)
			1Vrms (frequency: 10Hz ~ 100MHz)
	Max. Allowable Input Voltage		100Vp-p (frequency ≤ 100kHz)
			20Vp-p (frequency ≤ 100MHz)
	Impedance		R>500kΩ
			C<30PF
	Coupling mode		AC
	Waveform		Sine wave, square wave
	Low Pass Filter	The cutoff frequency	100kHz
		In band attenuation	≤ -3 dB
		Out of band attenuation	≥ -30 dB (frequency>1MHz)
Measurement time			10ms ~ 10s continuously adjustable
Display digit			8 (gate time>5s)
Counting capacity			≤1.37×10^{11}
Counting control mode			manual control
Measurement error			time base error ± trigger error (if the signal-to-noise ratio of the measured signal is better than 40dB, the trigger error is ≤ 0.3)
Time Base	Category		Small temperature compensated crystal oscillator
	Nominal frequency		10MHz
	Stability		better than ± 1×10^{-6} (22°C ± 5°C)

Others

1.Conditions

Power supply voltage: 198~242V
Frequency: 47~53Hz
Power consumption:<35W
Environmental temperature: 0~40 ° C

2.Physical Property

Chassis size: 240 × three hundred and seventy-seven × 105 (mm)
Weight: 4kg
Using surface mount technology and large-scale integrated circuits, it has high reliability, small size, and light weight.
Color LCD display.

3.Program Control

This machine is equipped with an RS232C serial interface, which can form an automatic testing system with other instruments under the control of a computer.

4.Option

a) This machine can be purchased with a USB interface or RS485 interface, which can form an automatic testing system with other instruments under the control of a computer.
b) High stability time base, this machine can choose to purchase high stability time base crystal oscillators and small temperature compensated crystal oscillators, making the output signal more accurate and stable.
c) Power amplifier module ≥ 3W
d) B-channel output module

Ordering Information

Model

Model	Name	Description
MXF06A	DDS Function/Arbitrary Generator/Counter	1μHz ~ 6MHz
MXF11A	DDS Function/Arbitrary Generator/Counter	1μHz ~ 11MHz
MXF21A	DDS Function/Arbitrary Generator/Counter	1μHz ~ 21MHz
MXF31A	DDS Function/Arbitrary Generator/Counter	1μHz ~ 31MHz

Standard

No.	Name	Qty.
1	BNC - Double clip cable	1 pc
2	BNC test cable	1 pc
3	RS232 connection cable	1 pc
4	RS232 testing software CD	1 pc
5	Power cord	1 pc
6	Product User Manual	1 pc
7	Product qualification certificate	1 pc
8	0.5A/2220V fuse (installed in the socket)	2 pc

Option

No.	Name	Qty.
1	USB interface	1 pc
2	RS-485 interface	1 pc
3	High stability time base	1 pc
4	Power amplifier module	1 pc
5	B-channel output module	1 pc

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