Quality&**Precise**

MAXWELLON MXF120

1μHz~5/10/20/40/80/120MHz

DDS Function/Arbitrary Generator/Counter

2023

Maxwellon

The 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, counting, and any wave generator. 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.
- The main waveform output frequency is 1 μ Hz~120MHz (MXF120).
- The small signal output amplitude can reach 0.2mV.
- The pulse duty cycle resolution is as high as one thousandth.
- Digital FM has high resolution and accuracy.
- The burst mode has a continuous phase adjustment function.
- The frequency scanning output can be arbitrarily set to the starting and ending frequencies.
- The phase adjustment resolution reaches 0.1 degrees.
- The amplitude modulation system can be set arbitrarily from 1% to 120%.
- There are over 30 types of output waveforms.
- It has the function of frequency measurement and counting.
- Equipped with any wave module, the function of any wave signal generator can be achieved.
- The chassis design is beautiful and generous, and the button operation is comfortable and flexible.

Specification

Function Signal Generator		
1. Waveform Characteristics		
Main Waveform	Type	Sine wave, square wave, TTL wave(Square wave,TTL wave Max. output frequency ≤ 40MHz)
	Waveform amplitude resolution	12 bits
	Sampling rate	200Msa/s (MXF80,MXF40,MXF20,MXF10,MXF05)
		300Msa/s (MXF120)
	Sine wave harmonic distortion	≤ -50dBc (frequency ≤ 5MHz)
		≤ -45dBc (frequency ≤ 10MHz)
		≤ -40dBc (frequency ≤ 20MHz)
		≤ -35dBc (frequency ≤ 40MHz)
		≤ -30dBc (frequency>40MHz)
	Sine wave distortion	≤ 0.1% (frequency: 20Hz~100kHz)
	Square wave rise and fall time	≤25ns(MXF05,MXF10)
		≤15ns(MXF20,MXF40,MXF80,MXF120)
	Note: Testing 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	27 waveforms including sine wave, square wave, pulse wave, triangular wave, serrated wave, stepped wave, etc
	Waveform length	4096 points
	Waveform amplitude resolution	10 bits
	pulse duty factor	0.1% ~ 99.9% (frequency≤10kHz)
		1% ~ 99% (10kHz ~ 100kHz)
	Pulse wave rise and fall time	≤100ns
	DC output error	≤ ± 5%+10mV (output voltage range 10mV~10V)

Function Signal Generator

2. Frequency characteristics

Frequency range	Main waveform		1μHz ~ 5MHz(MXF05)
			1μHz ~ 10MHz(MXF10)
			1μHz ~ 20MHz(MXF20)
			1μHz ~ 40MHz(MXF40)
			1μHz ~ 80MHz(MXF80)
			1μHz ~ 120MHz(MXF120)
	Note: The maximum output frequency of square wave and TTL wave for F80 and F120 is ≤ 40MHz		
	Store Waveform		1μHz ~ 100kHz
Resolution			1μHz
Frequency error			$\leq \pm 5\times10^{-6}$
Frequency stability			$\pm 1\times10^{-6}$

3. Amplitude characteristic

Amplitude range	MXF40, MXF20, MXF10, MXF05		2mV ~ 20Vp-p (High resistance)
			1mV ~ 10Vp-p (50Ω)
	MXF80	f≤40MHz	2mV ~ 20Vp-p (High resistance)
			1mV ~ 10Vp-p (50Ω)
		f>40MHz	2mV ~ 4Vp-p (High resistance)
			1mV ~ 2Vp-p (50Ω)
	MXF120	f≤40MHz	0.2mV ~ 20Vp-p (High resistance)
			0.1mV ~ 10Vp-p (50Ω)
		f>40MHz	-76dBm ~ +13.5 dBm(50Ω) or 0.1mV ~ 3Vp-p(50Ω)
Max Resolution			2μVp-p (High resistance)
			1μVp-p (50Ω)
Amplitude error			≤ ± 1%+0.2mV (frequency 1kHz sine wave)
Amplitude stability			± 0.5%/3 hours
Flatness	Amplitude ≤ 2Vp-p		±3%(f≤5MHz)
			±10%(f≤40MHz)
	Amplitude > 2Vp-p		±5%(f≤5MHz)
			±10%(f≤20MHz)
			±20%(f>20MHz)
	MXF120, MXF80		±1dBm(f>40MHz)
Output Impedance			50Ω
Amplitude unit			Vp-p, mVp-p, Vrms, mVrms, dBm

4.Offset characteristics

DC offset	High resistance, f ≤ 40MHz	±(10V-Vpk ac), (Offset absolute value ≤ 2 × Peak to peak amplitude)
	MXF80, High resistance, f > 40MHz	±(2V-Vpk ac), (Offset absolute value ≤ 2 × Peak to peak amplitude)
Max Resolution		2μV (High resistance)
		1μV (50Ω)
Offset error		≤ ± (5%+10mV), Signal amplitude ≤ 2Vp-p (high resistance)
		≤ ± (5%+200mV), Signal amplitude>2Vp-p (high resistance)

Function Signal Generator		
5. AM characteristic		
Carrier Signal		The waveform is a sine wave or square 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		100μHz ~ 20kHz
Distortion		≤2%
Modulation Depth		1%~120%
		1%~ 80% (frequency>40MHz, carrier amplitude>2Vp-p (high resistance))
Relative Modulation Error		≤ ± 10% of the set value+2%
External Input Signal Amplitude		3Vp-p(-1.5V~ +1.5V)
6. FM characteristics		
Carrier Signal		The waveform is a sine wave or square 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		100μHz ~ 10kHz
Frequency Offset	Internal frequency modulation	Frequency offset ΔF ≤ fc (carrier frequency)/2ΔF + fc≤ f_{MAX} + 100kHz
	External frequency modulation	Frequency offset ΔF ≤ 100kHz (carrier frequency ≥ 5MHz), input signal voltage 3Vp-p(-1.5V~+1.5V)
External frequency modulation		Carrier frequency accuracy ≤ 10^{-7}, frequency deviation error ≤ ± 20%
FSK		Frequency 1 and frequency 2 can be set arbitrarily
Control Mode		Internal or external (external control: TTL level, low level F1; high level F2)
Alternating Rate		0.1ms ~ 800s
7. PM characteristics		
Basic signal		The waveform is a sine wave or square wave, and the frequency range is the same as the main waveform
PSK		Phase 1 (P1) and Phase 2 (P2); Range: 0~360.0 °
Resolution		0.1 °
Alternating time interval		0.1ms~800s
Control method		internal or external (external control TTL level, low level P2, high level P1)
8. Burst		
Basic signal		The waveform is a sine wave or square wave, and the frequency range is the same as the main waveform
Burst count		1-10000 cycles and COUNT ≤ 800 * Freq (Hz)
Burst signal alternating time interval		0.1ms~800s
Control mode		internal (automatic)/external (single manual button triggering, external input TTL pulse rising edge triggering)
9. Frequency Sweep characteristics		
Signal waveform		Sine wave and square 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 Mode		Linear sweep and logarithmic 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)

Function Signal Generator

10. Modulated signal output			
Output Frequency			100 μ Hz~20kHz
Output Waveform			sine wave, square wave, triangle, rising sawtooth, falling sawtooth
Output Amplitude			5Vp-p ± 2%
Output Impedance			600 Ω
11. 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
12. Computational characteristics			
When entering and displaying data, you can use both frequency and period values, and you can use both amplitude RMS values and amplitude peak-to-peak and dBm values.			
13. 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.			

Counter

Frequency measurement range	Frequency Measurement		1Hz ~ 100MHz
	Counting Repetition Rate		≤50MHz
Input characteristics	Min. Input Voltage	ATT on	50mVrms (frequency: 10Hz~50MHz)
			100mVrms (frequency: 1Hz~100MHz)
		ATT closed	0.5Vrms (frequency: 10Hz~50MHz)
			1Vrms (frequency: 1Hz~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			≤4.29×10^{9}
Counting control mode			manual or external gate 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

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

Others
physical property
Chassis size: 255×370×100 (mm) Using surface mount technology and large-scale integrated circuits, it has high reliability, small size, and light weight. Adopting a 12 bit high brightness VFD display.
Program control
This machine is equipped with an RS232 serial interface, which can form an automatic testing system with other instruments under the control of a computer. This machine can be purchased with the IEEE-488 (GPIB) measurement instrument standard interface (option) or USB interface (option), which can form an automatic testing system with other instruments under the control of a computer.
High stability time base (option)
This machine can be purchased with a high stability time base crystal oscillator, which ensures higher output signal accuracy and better stability.
Arbitrary wave generation function (option)
This machine can purchase any wave module to achieve the generation and reproduction of any waveform, making it convenient for customers to use.
Function of dual signal generator (option)
This machine can choose to purchase a B-channel module to achieve dual output function, and the phase between the two signals (sine waves) can be adjusted arbitrarily.
Power amplification output module (option)
This machine can choose to purchase a power amplifier output module, which can be output at the B-port, and the output signal can drive large power loads.

Ordering Information

Model

Model	Name	Description
MXF05	DDS Function/Arbitrary Generator/Counter	1μHz ~ 5MHz
MXF10	DDS Function/Arbitrary Generator/Counter	1μHz ~ 10MHz
MXF20	DDS Function/Arbitrary Generator/Counter	1μHz ~ 20MHz
MXF40	DDS Function/Arbitrary Generator/Counter	1μHz ~ 40MHz
MXF80	DDS Function/Arbitrary Generator/Counter	1μHz ~ 80MHz
MXF120	DDS Function/Arbitrary Generator/Counter	1μHz ~ 120MHz

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	50 Ω impedance matcher	1 pc
2	Any wave plugin and accompanying software	1 pc
3	Dual plug-in	1 pc
4	Power plug-in	1 pc
5	USB interface	1 pc
6	RS-485 interface	1 pc
7	IEEE 488 interface	1 pc

Maxwellon Electronic Instruments Co.,LTD.

Factory: No.6 XiangJiang Road, Qingdao 266000, China
Tel: 0086 13816527810

Sales Office: NO.153 Zhuzhou Rd.,Laoshan District, Qingdao 266100, China.
Tel: 0086-532-80977508
Fax: 0086-532-80977508

Sales: Sales@Maxwellon.com
Web: www.maxwellon.com