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Find the *Giga-tronics 52000A* at our website: *Click HERE*

Series 50000A VXIbus Microwave Synthesizer

AN EFFICIENT AND ECONOMICAL APPROACH

The Giga-tronics Series 50000A VXIbus Microwave Synthesizer gives you full-function microwave synthesizer performance in a two-slot VXIbus module.

This level of performance is possible from a two-slot module because of our unique one-slot synthesizer control module. The model 52000A control module provides the digital programming and analog time base signals required to operate up to eight synthesizer modules.

For multiple synthesizer systems, this unique approach can save you space and cost you less, compared to an integrated three-slot module.

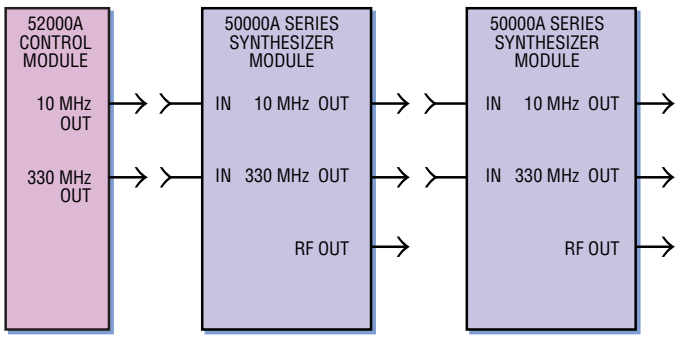
For example, you can put our of our synthesizers in nine slots — versus only three of our competitor's synthesizers in the same number of slots — and save yourself space and money. Plus we give you a choice of eleven synthesizer models with a frequency range as narrow as 2 to 8 GHz or as wide as 10 MHz to 20 GHz.

A FULL-FUNCTION SYNTHESIZER

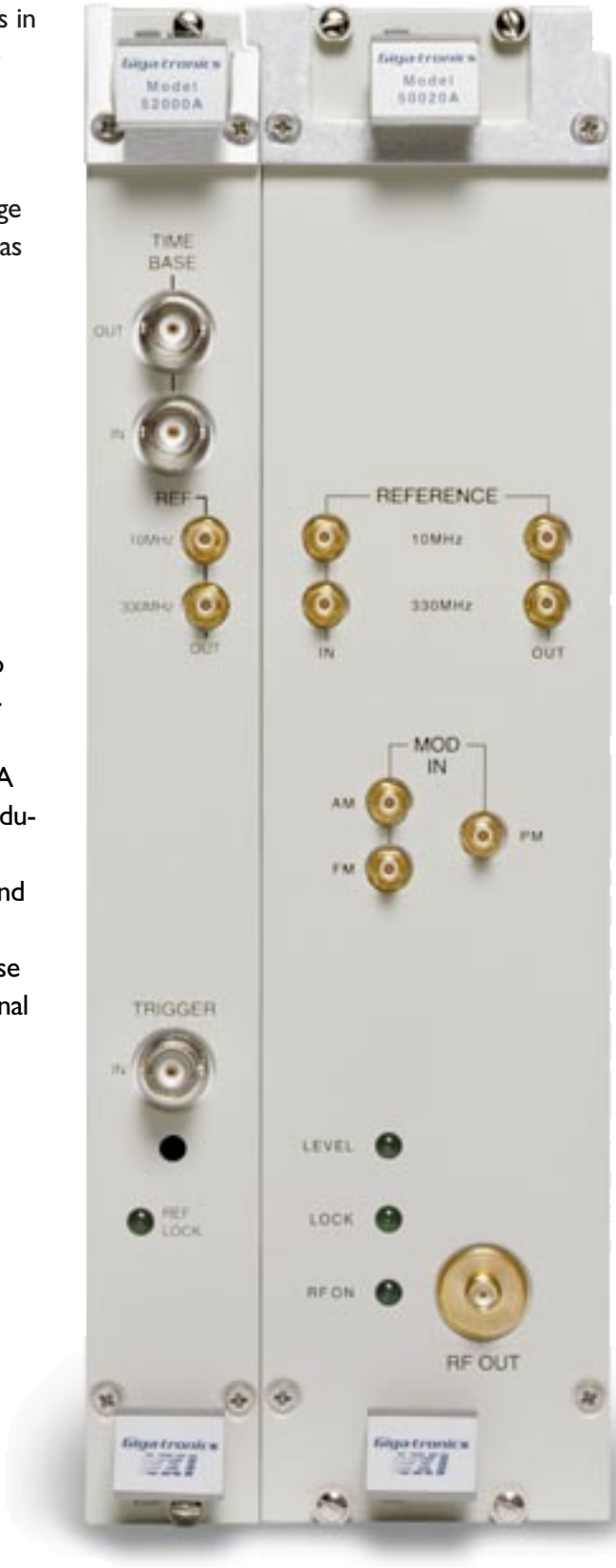
The Series 50000A packs all the circuitry needed to generate, modulate, level and attenuate RF output signal into a two-slot module.

You can accurately control the power level from -100 to +10 dBm with 0.1 dB resolution.

And because Series 50000A Synthesizers incorporate modulation circuitry, you can use externally supplied AM, FM and PM envelopes to control the amplitude, frequency and pulse modulation of the output signal — individually, alternately or simultaneously.



A Giga-tronics Model 52000A VXIbus Synthesizer Control Module provides the signals required to operate up to eight Series 50000A Microwave Synthesizers.



STABILITY, RESOLUTION AND SPECTRAL PURITY

Giga-tronics uses a two-loop indirect synthesis design — with a fundamental YIG-tuned output oscillator phase locked through a reference loop to a crystal controlled time base — to produce outstanding frequency accuracy and stability, frequency resolution and spectral purity.

The result is frequency stability better than 3 Hz per GHz per day, frequency resolution of 1 Hz, harmonics ≤-50 dBc from 2 to 20 GHz, and SSB phase noise from 2 to 20 GHz of -97 dBc or less at 100 kHz offset.

It all adds up to confidence that the measurements you make are from the system under test, and not due to your synthesizer.

Eleven Series 50000A Synthesizers are available to cover different frequency ranges.

Model 50208A	*2 to 8 GHz*
Model 50212A	*2 to 12 GHz*
Model 50218A	*2 to 18 GHz*
Model 50220A	*2 to 20 GHz*
Model 50612A	*5.4 to 12.5 GHz*
Model 50618A	*6 to 18 GHz*
Model 51218A	*12 to 18 GHz*
Model 50008A	*0.01 to 8 GHz*
Model 50012A	*0.01 to 12 GHz*
Model 50018A	*0.01 to 18 GHz*
Model 50020A	*0.01 to 20 GHz*

CHOOSE THE RANGE YOU NEED

Series 50000A Microwave Synthesizers are available in eleven models with a frequency range as narrow as 2 to 8 GHz or as broad as 10 MHz to 20 GHz.

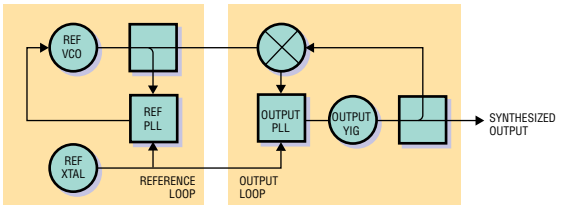
Choose the frequency range that meets your specific need. If you need a wide range, it's available. But if you don't, you won't have to pay for unnecessary range.

RELIABLE PERFORMANCE

Giga-tronics has a 16 year history of building test and measurement gear for the most demanding requirements.

We've shipped thousands of microwave test instruments to commercial and military customers for use in radar testing, electronic warfare, satellite and communications systems.

With a Series 50000A VXIbus Microwave Synthesizer, you're assured great performance and reliable operation, even in less than ideal situations.



Series 50000A Synthesizers use a two-loop, indirect synthesis technique for high resolution with optimum accuracy, stability and spectral purity.

LOCAL BUS CHARACTERISTICS (52000A)

Capability: Controls from 1 to 8 Series 50000A synthesizer modules.

Digital Output Signals (to synthesizer modules)**:** Output is to the right (as viewed from the front) on the 12 'local bus' lines on connector P2.

TIME BASE CHARACTERISTICS (52000A)

Internal: 10 MHz temperature compensated crystal oscillator; aging rate ±1 x 10^{-6}/year after 20 minutes of continuous operation.

External (automatically overrides internal time base)**:** 10 MHz ±1 x 10^{-6} or better; >1.5 Vpp.

Time Base Related Analog Output Signals (derived from internal or external time base)**:** 10 MHz, ECL levels; 330 MHz, –15 dBm, typical, into 50 Ω; 10 MHz 'Time Base Out', ≥2 Vpp into 50 Ω.

FRONT PANEL CONNECTORS (52000A)

10 MHz Output: Type SMB male.
330 MHz Output: Type SMB male.
Time Base Input: Type BNC female.
Time Base Output: Type BNC female.

INPUTS REQUIRED (50000A)

Local Bus Input Signals (from a compatible Giga-tronics VXIbus module)**:** Inputs from the left (as viewed from the front), on the 12 'local' bus lines on connector P2.

Time Base Related Analog Input Signals (from a compatible Giga-tronics VXIbus module): 10 MHz, ECL levels; 330 MHz, –15 dBm, typical.

OUTPUTS SUPPLIED (50000A)

RF Output: RF signal produced by the module; available at the RF OUT connector.

Digital Output Signals (replicates corresponding input signals to control other Giga-tronics VXIbus modules)**:** Output to the right (as viewed from the front), on the 12 'local' bus lines on connector P2.

Time Base Related Analog Output Signals (buffered from corresponding inputs; used to drive other Giga-tronics VXIbus modules)**:** 10 MHz, ECL levels; 330 MHz, –15 dBm, typical (at REFERENCE OUT connectors).

FRONT PANEL CONNECTORS (50000A)

10 MHz Input and Output: Type SMB male.
330 MHz Input and Output: Type SMB male.
AM In: Type SMB male.
FM In: Type SMB male.
PM In: Type SMB male.
RF Out: Type SMA female.

FRONT PANEL INDICATORS (50000A)

Lock: Green LED.
Level: Green LED.
RF On: Green LED.

FREQUENCY CHARACTERISTICS (50000A)

Range:

Model Number	Frequency Range
50208A	2 to 8 GHz
50212A	2 to 12 GHz
50218A	2 to 18 GHz
50220A	2 to 20 GHz
50612A	5.4 to 12.5 GHz
50618A	6 to 18 GHz
51218A	12 to 18 GHz
50008A	0.01 to 8 GHz
50012A	0.01 to 12 GHz
50018A	0.01 to 18 GHz
50020A	0.01 to 20 GHz

Resolution: 1 Hz throughout the frequency range.

Accuracy and Stability: Identical to, and determined by, the time base oscillator selected in the 52000A Control Module.

RF OUTPUT POWER PARAMETERS (50000A)

Maximum Leveled Output: ≥+8 dBm, 0.01 to 2 GHz; ≥+12 dBm, 2 to 12 GHz; ≥+9 dBm, 12 to 20 GHz.

Resolution: 0.1 dB

Minimum Leveled Output: –10 dBm (–15 dBm typical); –100 dBm with option 26.

RF Off: Typically attenuates a 0 dBm signal to –140 dBm at the output connector.

Output Accuracy (internally leveled)**:** ±2 dB

Flatness: Included in accuracy.

Output Impedance: 50 Ω, nominal.

Output SWR: <2:1

SPECTRAL PURITY (50000A)

Harmonics (up to maximum frequency of synthesizer)**:**
≤–50 dBc (measured at +5 dBm, 2 to 20 GHz);
≤–40 dBc (measured at +5 dBm, 0.1 to 2 GHz).

Subharmonics: None.

Nonharmonics (tested at 0 dBm)**:**

Offset Frequency	Level	Typical
<100 kHz	<–40 dBc	<–50 dBc
100 kHz to < 1MHz	<–50 dBc	<–60 dBc
>1MHz	<–60 dBc	<–70 dBc

SSB Phase Noise (dBc)**:**

Frequency (GHz)	Offset from Carrier 1 kHz	10 kHz	100 kHz
<2	≤ –70	≤ –75	≤ –97
2 to 8	≤ –75	≤ –77	≤ –97
8 to 12	≤ –70	≤ –75	≤ –97
12 to 16	≤ –65	≤ –72	≤ –97
16 to 18	≤ –60	≤ –72	≤ –97
18 to 20	≤ –60	≤ –70	≤ –97

Residual FM (50 Hz to 15 kHz bandwidth)**:** <200 Hz rms, below 8 GHz; <300 Hz rms, from 8 GHz to 16 GHz; <400 Hz rms, above 16 GHz.

AMPLITUDE MODULATION (AM) (50000A)

AM specifications apply for waveforms where envelope peak is at least 1 dB below maximum specified output power, with FM off and PM off. However, AM may be operated simultaneously with FM and/or PM.

AM Envelope Parameters (measured at 7 dB below max rated power).

Depth: 0 to ≥82%, 90% typical.

Bandwidth (50% depth; 3 dB points referenced to 1 kHz)**:** 10 Hz to 10 kHz, (50 kHz typical).

Harmonic Distortion (relative to externally supplied AM envelope)**:** <10% at 1 kHz rate and 50% depth, 5% typical.

Externally Supplied AM Envelope

Waveform: Any waveform compatible with bandwidth considerations.

Rate: See Bandwidth, above.

Sensitivity: 1 Vpp=50% modulation ±10% (i.e., 40 to 60%) at a 1 kHz rate, measured at 7 dB below max rated power.

Input Impedance: 600 Ω, nominal, ac coupled.

FREQUENCY MODULATION (FM) (50000A)

FM specifications apply with AM and PM off. However, FM may be operated simultaneously with AM and/or PM.

FM Envelope Parameters

Deviation: 10 kHz to 5 MHz, peak.

Bandwidth: ±3 dB, 10 Hz to 1 MHz.

Residual FM: ≤1.5 kHz rms, typical.

Distortion (relative to externally supplied FM envelope)**:** <5% at 500 kHz rate and 5 MHz, peak, deviation.

Externally Supplied FM Envelope

Waveform: Any waveform compatible with bandwidth considerations.

Rate: See Bandwidth, above.

Sensitivity: 2 Vpp is maximum (nominal) deviation.

Input Impedance: 50 Ω, nominal.

PULSE/SQUARE WAVE MODULATION (PM) (50000A)

PM specifications apply with AM and FM off. However, PM may be operated simultaneously with AM and/or FM.

PM Envelope Parameters

On/Off Ratio: >80 dB.

Rise/Fall Time: <25 ns.

Overshoot, Undershoot and Ringing: ±2 dB, typical.

Pulse Amplitude Accuracy: Same as RF output level accuracy.

Externally Supplied PM Envelope

Repetition Rate: dc to 1 MHz.

Pulse Delay (output envelope leading edge reference to input pulse leading edge)**:** 100 ns, typical.

Input Pulse Required: TTL level pulse, >50 ns wide (leveled output), positive level=RF 'on'.

GENERAL SPECIFICATIONS

VXIbus Characteristics

Device Type: Message based Instrument.

Compatibility: Fully compatible with VXIbus system specification, rev 1.4.

Protocol: Word serial.

Languages (52000A): Giga-tronics syntax subset, CIIL syntax subset, SCPI syntax subset, HP compatible syntax subset.

Programming (50000A): Local bus from the associated Giga-tronics VXIbus control module.

Temperature Range:
Operating: 0 to +50 °C (+32 to +122 °F).
Storage: –40 to +70 °C (–40 to +158 °F).

Cooling Requirements:

52000A: For 10° C temperature rise, air flow must be 2 L/s at 0.1 mm H_20.

50000A: For 10° C temperature rise, air flow must be 5 L/s at 0.2 mm H_20.

Relative Humidity: 0 to 95%, non-condensing

EMI: Below 1 GHz, complies with VXIbus specification Rev 1.4; above 1 GHz, complies with MIL-STD-461C RE02 (part 2).

Power Requirement:

Voltage (Vdc)	Max Current (52000A) (mA)	Max Current (50000A) (mA)
+ 24	175	2500
+ 12	100	1200
+ 5	2500	Not Used
+ 5 standby	Not Used	Not Used
– 2	Not Used	Not Used
– 5.2	Not Used	Not Used
– 12	700	1600
– 24	30	200

Power Rating:
52000A: 30 W maximum.
50000A: 100 W maximum.

Physical Characteristics:

52000A:
Dimensions: C-size, one-slot, VXI standard,
30 mm (1.2 in) wide,
234 mm (9.2 in) high,
340 mm (13.4 in) deep.
Weight: 2.27 kg (5.0 lbs).

50000A:
Dimensions: C-size, two-slot, VXI standard,
60 mm (2.4 in) wide,
234 mm (9.2 in) high,
340 mm (13.4 in) deep.
Weight: 5.45 kg (12.0 lbs).

OPTIONS (52000A)

Option 26: Provides a built-in 90 dB step attenuator in 10 dB steps (reduces maximum leveled power by 1 dB from 8 to 16 GHz and 2 dB above 16 GHz).

Giga-tronics

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