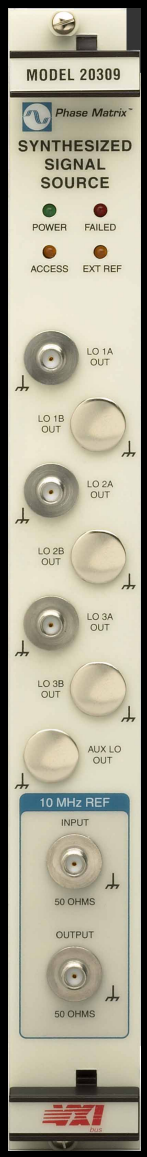
20309

Phase Matrix, Inc.™
Instruments You Can Count On



VXIbus Local Oscillator

High-Performance Microwave Local Oscillator Generation for VXIbus Systems

- 3 to 9 GHz Frequency Range
- Multi-Stage Downconversion Support
- +10 dBm Output Power
- 1 Hz Tuning Resolution
- < 100 dBc/Hz Phase Noise @ 10kHz Offset
- High Stability 10 MHz System Reference

Phase Matrix Model 20309
VXIBus Local Oscillator

High-Performance Microwave Local Oscillator Generation for VXIbus Systems

Model 20309 Specification Summary

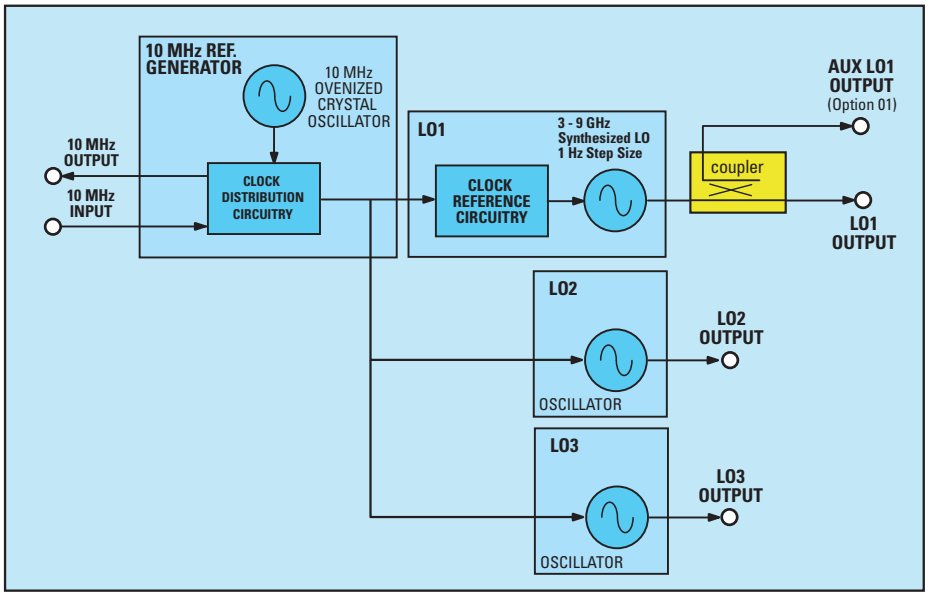
- *3 to 9 GHz Frequency Range*
- *1 Hz Frequency Resolution*
- *<-70 dBc Spurious*
- *<-100 dBc/Hz SSB Phase Noise (10 kHz offset from 3 GHz)*
- *+10 dBm Output Power*
- *Second Coherent Output Available*
- *VXIbus Revision 1.3/1.4*
- *C-Size, 1 Slot Wide*
- *Register Based Instrument*

20309 - Ideal Local Oscillator System for Downconverter Applications

The Phase Matrix Model 20309 VXIbus Local Oscillator (L.O.) is a combination of compact synthesized signal sources optimized for use in downconverter and synthetic instrumentation applications. Downconverters are essential front-end elements of any microwave signal analysis system. In only 1, C-Size, VXI slot the 20309 combines a 3-9 GHz main L.O. as well as additional lower frequency synthesized sources. The 20309 is a complete L.O. solution whether you are utilizing single or multiple stage downconversion. The 20309 is fully compliant with VXIbus specification 1.3/1.4 for register based instruments.

Superb Spectral Purity

Microwave performance is not compromised for VXIbus compliance. The 20309 utilizes full modular shielding and post regulation with double filtering to ensure outstanding performance, even when sharing a system with digital instruments. The 20309 does not sacrifice spurious and phase noise performance for small size. Based on fundamental YIG resonator technology, spurious signals are kept below -70dBc. Phase noise of better than –100dBc/Hz at a 10kHz offset make the 20309 the ideal L.O. for radar/EW testing, narrowband device characterization as well as communication system analysis.



Simplified Block diagram of the Phase Matrix Model 20309.

Phase Matrix Model 20309 VXIBus Local Oscillator

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The addition of multiple LO outputs adds flexibility for an optimum combination of sampling and digitizing bandwidths for any measurement combination.

Plenty of Power

The 20309 can provide up to +10 dBm of fixed output power. Sufficient power to drive most commonly utilized, industry standard, mixer architectures. Optional second channel outputs, for two channel phase coherent downconversion, are also available. In addition an optional AUX main L.O. output is available to drive external mm-wave mixers for frequency extension beyond the microwave range.

Programming

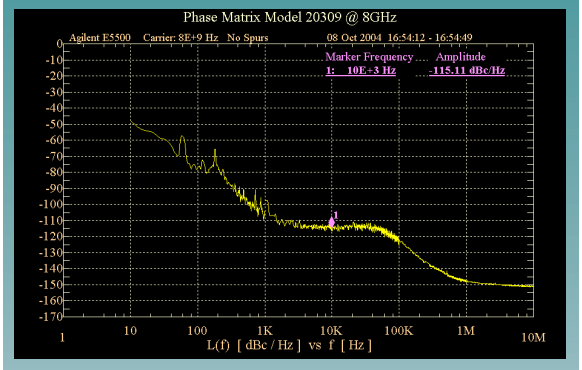
The 20309 is fully compliant with VXIbus Specification Revision 1.3/1.4. Register based communication through plug & play drivers allows for the fastest data transfer and control. Phase Matrix supports the 20309 with software drivers for most popular development environments.

Small Size and Light Weight

No other products combine small size and light weight with uncompromised high performance as effectively as the Phase Matrix VXI product family. Less than one-eighth the size of comparable "rack and stack" microwave products, the 20309 family is the perfect solution in portable communications, flight-line or signal analysis VXIbus automatic test systems or in any other application where small size, light weight, and high performance are important.

Accessory Modules Enhance the 20309's Capability

A host of accessory modules including pulse generators, downconverters, frequency counters, power meters, and power amplifiers, are readily available to complement the 20309 local oscillator. Phase Matrix, in partnership with other proven manufacturers of high quality, industry standard VXIbus equipment, can supply all of your automated microwave testing needs.



Phase Noise at 4 GHz and 8 GHz. Phase noise of better than –100dBc/Hz at a 10kHz offset make the 20309 the ideal L.O. for radar/EW testing.

20309 SPECIFICATIONS

Output Specifications

LO1 Frequency Output	3.0 to 9.0 GHz
LO2 Frequency Output	3.25 GHz (Factory set)
LO3 Frequency Output	228 MHz (Factory set)
LO1 Frequency Step Size	1Hz (true 1 Hz, binary type steps)
LO2 Frequency Step Size	N/A (Factory set)
LO3 Frequency Step Size	N/A (Factory set)
LO1 Frequency Switching Speed	25 mSec. max. (<15 mSec. typical)
Output Power (fixed)	
LO1	+10 dBm min. (> +11 dBm typical)
LO2	+1 dBm min.
LO3	+1 dBm min.
Output Impedance (LO1, LO2, LO3)	50 Ohm nom.

Spectral Purity

Harmonics (LO1, LO2, LO3)	15 dBc min.
Non Harmonically Related Spurious (LO1, LO2, LO3)	
0.1 - 100 kHz from Fo	70 dBc min.
> 100 kHz	75 dBc min.
Power Line Related Spurious (LO1, LO2, LO3)	40dBc min.
Residual Modulation (50 Hz to 15 kHz bandwidth) (LO1, LO2, LO3)	
FM	<200 Hz rms
AM	<0.1% peak
Phase Noise (SSB, Offset from Fo) (LO1, LO2, LO3)	
100 Hz	-75 dBc/Hz max.
1 kHz	-85 dBc/Hz max.
10 kHz	-100 dBc/Hz max.
100 kHz	-120 dBc/Hz max.
1 MHz	-145 dBc/Hz max.

Internal Time Base Output

Frequency	10 MHz
Aging Rate (after 72 hour warm-up)	$<1x10^{-9}$/day @ +25°C
Temperature Stability	$<1x10^{-7}$ over 0°C to 50°C
Output Level	0dBm ±3dB
Output Impedance	50 Ohm nom.
Connector	SMA F

External Time Base Input

Frequency (will automatically lock to ext. applied:)	1/2/5/10 MHz
Input Level	-3dBm min.
Input Impedance	50 Ohms nom.
Connector	SMA F

20309 SPECIFICATIONS

General Specifications

Temperature Range	
Operating	0 to +55°C
Non-Operating	-40° to +70°C
Relative Humidity	0 to 90%, Non Condensing
EMI	
Below 1 GHz	Complies with VXIbus Rev 1.3/1.4
Above 1 GHz	Complies with RE02 of Mil-Std-461C
Weight	5 lbs./2.6kg. max (all options installed)
Output Connectors (LO1, LO2, LO3)	SMA F

VXIbus Specification

Module Size:	1 C-Size slot
Device type:	Register-Based (A24)
Protocol:	Not Used
Local Bus:	Not Used
ECLTRG	Not Used
TTLTRG	Not Used
CLK10 Utilization	Not Used
Cooling:	1mm H_2O @ 5 liters / second for 15° C rise in temperature.
Warm-up Time:	15 Min. max. @ +25°C ambient temperature.
Power Dissipation:	50W max., 37W typ. (all options installed)

Power Requirements

	Power	I_{peak} (Amperes)						
		+5V	+12V	+24V	-2V	-5.2V	-12V	-24V
20309	<38 Watts	1.8	0.8	1.5	N/A	0.1	N/A	N/A

*Typical, means appromimately 2/3 of all units will meet these characteristics.
Specifications are subject to change without notice.

ORDERING INFORMATION

MODEL 20309	VXIbus Local Oscillator	
Options	M20309-OPT01	Aux LO1 Output Connector 0dBm minimum output power
	M20309-OPT02	2nd Channel Coherent LO1, LO2, LO3 Outputs
	(Requires ACC001, ACC002, ACC003, ACC005, ACC006, ACC007)	
Accessories	M20309-ACC001	Cable Assy, Coax, Semirigid, SMA, LO1A
	M20309-ACC002	Cable Assy, Coax, Semirigid, SMA, LO2A
	M20309-ACC003	Cable Assy, Coax, Semirigid, SMA, LO3A
	M20309-ACC004	Cable Assy, Coax, Flexible, LO1, LO2, LO3 (See Note 1)
	M20309-ACC005	Cable Assy, Coax, Semirigid, SMA, LO1B
	M20309-ACC006	Cable Assy, Coax, Semirigid, SMA, LO2B
	M20309-ACC007	Cable Assy, Coax, Semirigid, SMA, LO3B
	Note 1: ACC004 Cable can be used for LO1, LO2 or LO3	
Related Products	Model 1313B	1MHz to 26.5 GHz VXIbus Microwave Downconverter

Warranty

Phase Matrix, Inc. has a proven commitment to quality and reliability in instrumentation. This commitment is demonstrated in all VXIbus products with a full 1 year standard warranty. Parts, Labor, even shipping are all included at no cost to you.

During the life of electronic equipment, components may fail. When they do, you need the fastest, easiest, and least expensive repair possible. To meet this need, Phase Matrix offers a variety of services designed to minimize equipment downtime. Please contact Phase Matrix's Customer Service Department for details. Quality, reliability and support, all designed to minimize your cost of ownership.

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