



Phase Matrix, Inc.[®]
A National Instruments Company

PXI MICROWAVE PRESELECTOR MODULE

Model PXI-1410

The PXI-1410 Preselector Module is a PXI 3U, 3-slot module that provides the necessary input signal conditioning and routing to form a complete RF PXI downconverter. When integrated with complementary modules, it enables down conversion over the 100 kHz to 26.5 GHz frequency range. The PXI-1410 employs a 70 dB (10 dB/step) input step attenuator that enables a dynamic range of approximately +30 dBm to -160 dBm. The module uses broadband switches to distribute the incoming RF signal to other PXI modules for further processing with minimal signal degradation. In addition, the module contains an electronically tuneable, 4-stage, YIG-tuned filter (YTF) based RF-input pre-selector, allowing for greater than 80 dB input image rejection and greater than 40 MHz of instantaneous input bandwidth. These attributes provide enough performance to satisfy even the most demanding spectrum analysis applications. For additional bandwidth (up to 350 MHz), the PXI-1410 offers a bypass path that automatically routes signals around the band limited preselector.

The PXI-1410 Preselector Module is primarily intended to function as an analog front end in applications such as synthetic instrumentation, microwave receivers, signal intelligence, and anywhere a microwave signal needs to be down converted to a baseband frequency for data capture, analysis, and measurement. The PXI-1410 works in combination with Phase Matrix's family of PXI downconverter modules. The PXI-1410 can also operate alone in PXI signal conditioning applications to implement RF microwave attenuation or band-pass filtering in support of applications other than frequency down conversion.

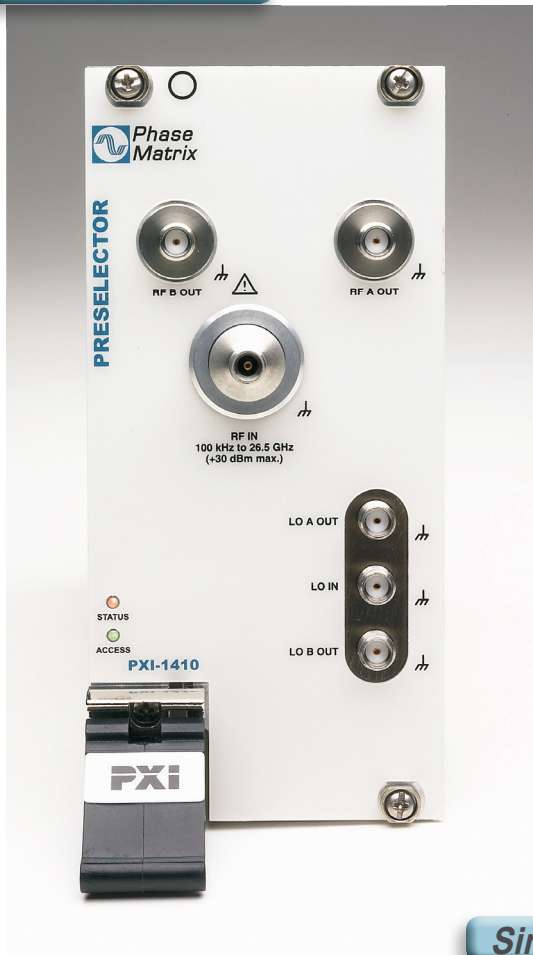


PXI
Systems Alliance

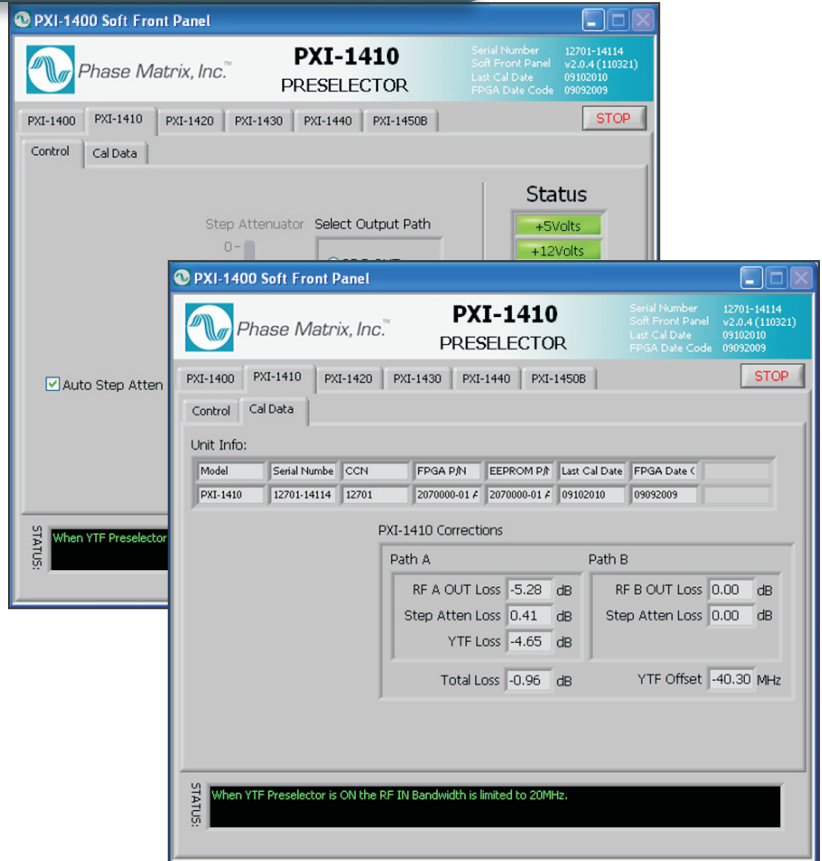
PXI MICROWAVE PRESELECTOR MODULE

Model PXI-1410

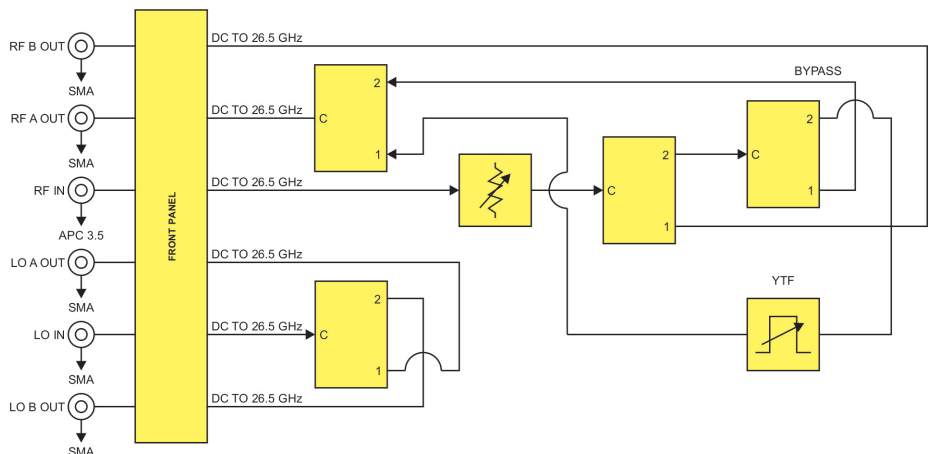
Front Panel



Software-user Interface



Simplified Block Diagram



PXI MICROWAVE

PRESELECTOR MODULE

Model PXI-1410

Specifications and ordering information subject to change without notice.

Specifications

RF INPUT

DESCRIPTION	SPECIFICATION
RF IN to RF A OUT or RF B OUT (<i>bypass path</i>)	DC to 26.5 GHz
RF IN to RF A OUT (<i>YTF path</i>)	2.75 to 26.5 GHz
LO IN to LO A OUT or LO B OUT	DC to 26.5 GHz
RF IN Level	+30 dBm max.
LO IN Level	+20 dBm max.

RF & LO OUTPUT INSERTION LOSS

DESCRIPTION	SPECIFICATION
RF IN to RF A OUT (<i>min. attenuator setting/bypass</i>)	7 dB max.
RF IN to RF A OUT (<i>min. attenuator setting/YTF path</i>)	12 dB max.
RF IN to RF B OUT (<i>min. attenuator setting</i>)	2 dB max. to 2.9 GHz/6 dB to 26.5 GHz
LO IN to LO A OUT or LO B OUT	2 dB max.

SWITCHING TIMES

DESCRIPTION	SPECIFICATION
Step Attenuator	20 ms. max.
Switches	20 ms. max.
Rated Switch/Attenuator Life	5 million cycles min.

CONTROLS

DESCRIPTION	SPECIFICATION
Attenuator	0 to 70 dB in 10 dB steps
Switches	SP2T mechanical type

PRESELECTOR YTF

DESCRIPTION	SPECIFICATION
YIG Preselector Frequency Range	2.75 to 26.5 GHz
3dB BW	40 MHz min., 120 MHz max.

PXI MICROWAVE

PRESELECTOR MODULE

Model PXI-1410

Specifications and ordering information subject to change without notice.

Specifications (continued)

PRESELECTOR YTF (CONTINUED)

DESCRIPTION	SPECIFICATION
Tuning Speed	< 5 ms @ 50 MHz step
Tuning Accuracy	± 35 MHz nom. (<i>with corrections applied</i>)
Topology	4 pole, nominal 24dB/oct

INPUT RETURN LOSS

DESCRIPTION	SPECIFICATION
RF IN (<i>DC TO 26.5 GHz</i>)	-10 dB max. (<i>output terminated into 50 Ω, attenuator set to 10 dB</i>)
LO IN (<i>DC TO 26.5 GHz</i>)	-12 dB max. (<i>output terminated into 50 Ω</i>)

GENERAL SPECIFICATIONS

DESCRIPTION	SPECIFICATION
Temperature Range	
Operating	0° to +55° C
Non-Operating	-40° to +70° C
Relative Humidity	10% TO 90% (<i>non-condensing</i>)
Certifications and Compliances	
CE Mark Compliance	Low Voltage Directive 2006/95/EC
Safety	EN/IEC 61010-1:2001
EMC	EN 55011:2007, IEC 61326-1:2006
Weight	3.5 lb./1.6 kg
Connectors	
RF IN	APC 3.5 (<i>Precision type</i>)
RF A OUT / RF B OUT	SMA (f) (<i>27 GHz type</i>)
LO IN / LO A OUT / LO B OUT	SMA (f)
Warranty	1 Year

PXI MICROWAVE PRESELECTOR MODULE

Model PXI-1410

Specifications and ordering information subject to change without notice.

Specifications (continued)

PXIbus SPECIFICATIONS

DESCRIPTION

SPECIFICATION

Module Type 3U/3-Slot

Warm-up Time 15 minutes max.

DC Power Dissipation	+3.3 V	+5 V	+12 V	-12 V	Total Power (3 slots)
	0.1 A	0.6 A	1.3 A	0.5 A	25 W max.

ORDERING INFORMATION

Model PXI-1410

Options None

Accessories ¹

MPXI-14XX-ACC01 Cable set

Related Products PXI Modules PXI-1420, PXI-1430B, PXI-1440B, PXI-1450B

Notes:

¹ Software, manuals, and quick-start guides are available online www.phasematrix.com

² "Typ." means approximately 2/3 of all units meet these characteristics at room temperature. Characteristics identified by typ. and nom. are by design and are not normally verified on every unit during production.

PXI MICROWAVE

PRESELECTOR MODULE

Model PXI-1410

Phase Matrix, Inc. designs and manufactures RF and microwave test-and-measurement (T&M) instruments, subsystems, and components and is a wholly owned subsidiary of National Instruments. Our array of instruments includes traditional benchtop frequency counters, modular (VXI) pulsed-frequency counters, modular (VXI and PXI) synthetic instruments, including downconverters, upconverters/synthesizers and local oscillators that are designed for both commercial and military applications. In addition, we produce instrument-grade, fast-switching synthesizer modules that can be used in various instruments or subsystems. We also manufacture a line of narrowband and broadband microwave components, ranging from VCOs to complex custom-built assemblies for military instrumentation and telecommunications applications.

Data sheet PN: DS_1410 Rev. C Sept. 2013

Copyright © 2013 Phase Matrix, Inc. All rights reserved.



Phase Matrix, Inc.[®]
A National Instruments Company

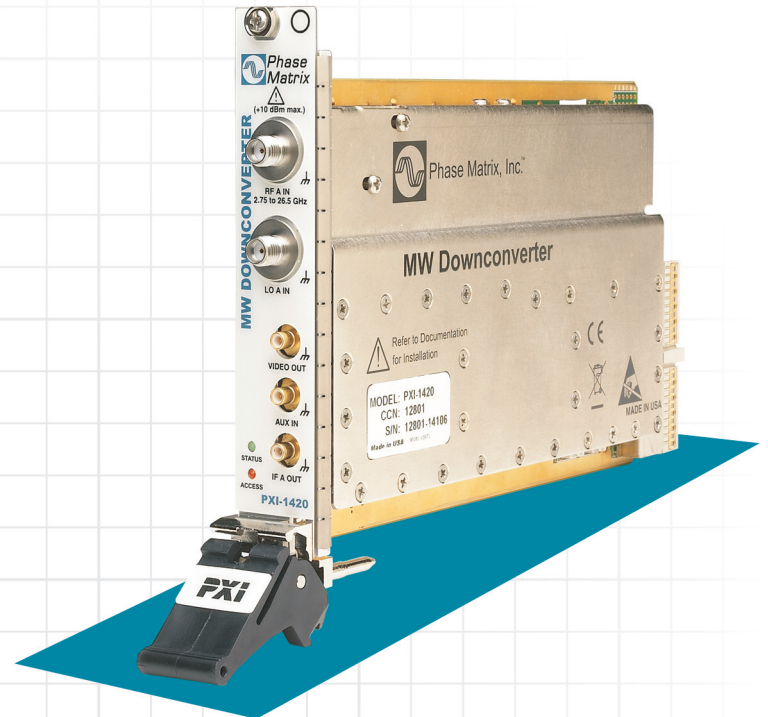
PXI MICROWAVE MW DOWNCONVERTER MODULE

Model PXI-1420

The PXI-1420 MW Downconverter

Module is a PXI 3U, 1-slot downconverter module that, in conjunction with Local Oscillator Module PXI-1450B, converts microwave signals within the 2.75 to 26.5 GHz frequency range into baseband intermediate frequency (IF) signals to drive today's newest generation of digitizers with over 350 MHz instantaneous information bandwidth.

The PXI-1420 MW Downconverter Module is intended for use in applications such as synthetic instrumentation, microwave receivers, signal intelligence, and anywhere a microwave signal needs to be down converted to a baseband frequency for data capture, analysis, and measurement. When combined with a companion high-speed digitizer (>1Gs/s) and user-provided software (e.g., LabVIEW[®]), the PXI-1420 provides a total measurement solution in support of microwave test and measurement applications.



PXI
Systems Alliance

PXI MICROWAVE

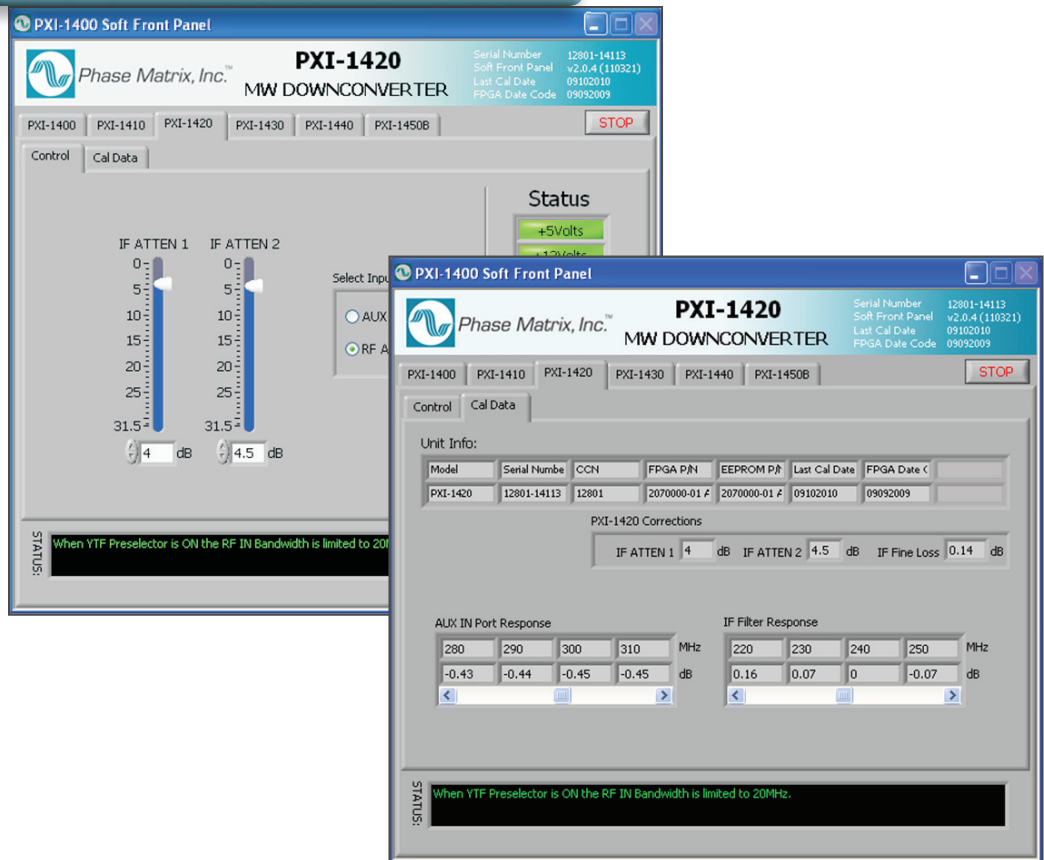
MW DOWNCONVERTER MODULE

Model PXI-1420

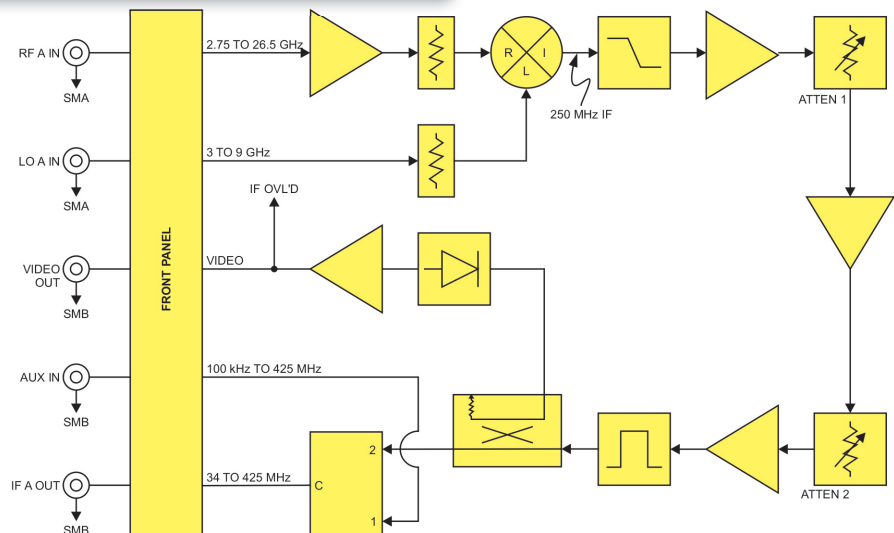
Front Panel



Software-User Interface



Simplified Block Diagram



PXI MICROWAVE

MW DOWNCONVERTER MODULE

Model PXI-1420

Specifications and ordering information subject to change without notice.

Specifications

RF INPUT SPECIFICATIONS

DESCRIPTION	SPECIFICATION
RF A IN Frequency Range	2.75 to 26.5 GHz
RF A IN Operating Level Range	-160 to -40 dBm/-30 dBm nom.
RF A IN Compression Point	-25 dBm min.
RF A IN Max. Level (<i>continuous without damage</i>)	+10 dBm max.
RF A IN Return Loss (50 Ω)	
2.75 to 10 GHz	-12 dB nom.
10 to 26.5 GHz	-10 dB max.
RF A IN Noise Figure	
< 8.75 GHz	12 dB max.
< 26.5 GHz	28 dB max.
RF A IN IP3	-10 dBm min. (<i>with two -40dBm RF-input tones spaced 1 MHz apart, the 3rd order intermodulation product measures with the IF (250 MHz) shall be > 60 dBc</i>)
LO Leakage @ RF A IN (3 to 9 GHz)	-60 dBm max. (<i>includes LO related leakage</i>)

IF OUTPUT SPECIFICATIONS

DESCRIPTION	SPECIFICATION
RF A to IF A Gain	38 dB nom.
IF A OUT Gain Control	37 to 68.5 dB in 0.5 dB/step
IF A OUT Level	-2 dBm (500 mVp-p) nom. (<i>User adjustable via IF Gain Control</i>)
IF A OUT Overload Warning	+3 dBm \pm 2 dB
IF A OUT Center Frequency	250 MHz nom. (<i>User adjustable via LOA IN Frequency</i>)
IF A OUT Bandwidth	300 MHz nom./1 dB
IF A OUT Second Harmonic Distortion	50 dBc min. (<i>@ -2 dBm IF OUT</i>)
LO A Leakage @ IF A OUT	-55 dBm max.
Spurious Single Tone Signals @ IF A OUT	-70 dBm (<i>residual spurs, input, terminated, measured with SA</i>)

PXI MICROWAVE

MW DOWNCONVERTER MODULE

Model PXI-1420

Specifications and ordering information subject to change without notice.

Specifications (continued)

IF VIDEO SPECIFICATIONS ①

DESCRIPTION	SPECIFICATION
Output Rise Time	15 ns max. @ 250 MHz IF Out
DC Output Level (w/ -2 dBm IF Out)	+1 V min. (<i>polarity positive</i>)
DC Level Error Over Temp.	±2 dB (0 to + 55° C)

LOCAL OSCILLATOR INPUT SPECIFICATIONS

DESCRIPTION	SPECIFICATION
LO A IN Frequency Range	3 to 9 GHz
LO A IN Power	+15 dBm ±2 dB
LO A IN Return Loss	-10 dB min.
LO A IN Impedance	50 Ω nom.

GENERAL SPECIFICATIONS

DESCRIPTION	SPECIFICATION
Temperature Range	
Operating	0° to +55° C
Non-Operating	-40° to +70° C
Relative Humidity	10% to 90% (<i>non-condensing</i>)
Certifications	
CE Compliance	Low Voltage Directive 2006/95/EC
Safety	EN/IEC 61010-1:2001
EMI/RFI	EN 55011:2007, IEC 61326-1:2006
Weight	
Shipping Weight	1 lb./0.5 kg
Connector	
RF A IN	SMA (f) (27 GHz type)
LO A IN	SMA (f) (27 GHz type)

PXI MICROWAVE

MW DOWNCONVERTER MODULE

Model PXI-1420

Specifications and ordering information subject to change without notice.

Specifications (continued)

GENERAL SPECIFICATIONS (continued)

DESCRIPTION	SPECIFICATION
Connectors (continued)	
VIDEO OUT	SMB (m)
IF A OUT	SMB (m)
AUX IN	SMB (m)
Warranty	1 Year

PXIbus SPECIFICATIONS

DESCRIPTION	SPECIFICATION				
Module Type	3U/1-Slot				
Warm-up Time	15 minutes max.				
DC Power Dissipation	+3.3 V	+5 V	+12 V	-12 V	Total Power
	70 mA	0.1 mA	850 mA	0.1 mA	10.5 W max.

ORDERING INFORMATION

Model	PXI-1420
Options	None
Accessories ②	
MPXI-14XX-ACC01	Cable set
Related Products	PXI Modules PXI-1410, PXI-1430B, PXI-1440B, PXI-1450B

Notes:

- ① IF video is not available in bypass mode.
- ② Software, operation manuals, and quick-start guides are available online www.phasematrix.com
- ③ "Typ." means approximately 2/3 of all units meet these characteristics at room temperature. Characteristics identified by typ. and nom. are by design and are not normally verified on every unit during production.

PXI MICROWAVE

MW DOWNCONVERTER MODULE

Model PXI-1420

Phase Matrix, Inc. designs and manufactures RF and microwave test-and-measurement (T&M) instruments, subsystems, and components and is a wholly owned subsidiary of National Instruments. Our array of instruments includes traditional benchtop frequency counters, modular (VXI) pulsed-frequency counters, modular (VXI and PXI) synthetic instruments, including downconverters, upconverters/synthesizers and local oscillators that are designed for both commercial and military applications. In addition, we produce instrument-grade, fast-switching synthesizer modules that can be used in various instruments or subsystems. We also manufacture a line of narrowband and broadband microwave components, ranging from VCOs to complex custom-built assemblies for military instrumentation and telecommunications applications.

Data sheet PN: DS_1420 Rev. D Sept. 2013

Copyright © 2013 Phase Matrix, Inc. All rights reserved.



Phase Matrix, Inc.[®]
A National Instruments Company

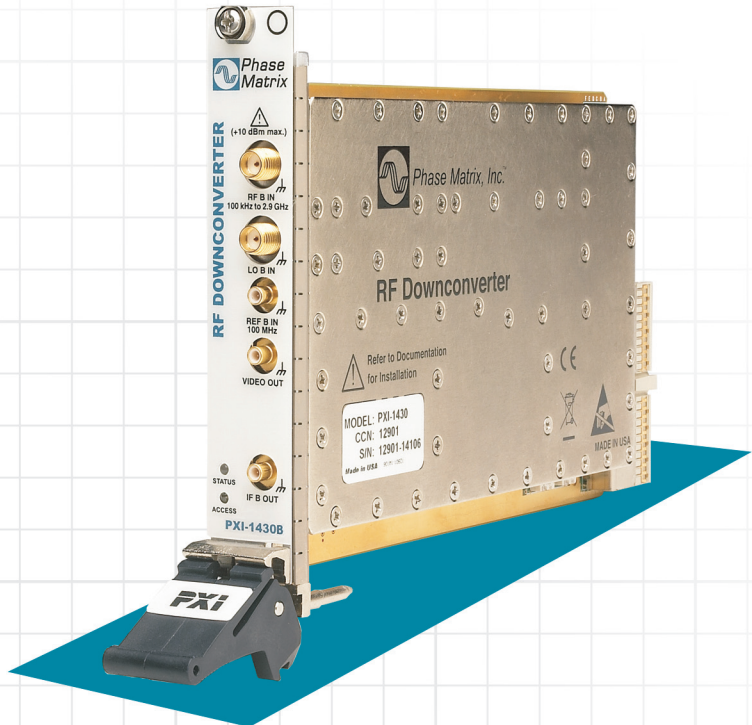
PXI MICROWAVE RF DOWNCONVERTER MODULE

Model PXI-1430B

The PXI-1430B RF Downconverter

Module is a PXI 3U, 1-slot downconverter module. It works in conjunction with the PXI-1450B Local Oscillator Module to convert microwave signals in the 100 kHz to 2.9 GHz frequency range into baseband intermediate frequency (IF) signals to drive today's newest generation of digitizers.

The PXI-1430B RF Downconverter Module is intended for use in applications such as synthetic instrumentation, microwave receivers, signal intelligence, and anywhere a microwave signal needs to be down converted to a baseband frequency for data capture, analysis, and measurement. When combined with a companion high-speed digitizer (> 1 Gs/s) and user-provided software (e.g., LabVIEW®), the PXI-1430B provides a total measurement solution in support of microwave test and measurement applications within the 100 kHz to 2.9 GHz frequency range.



PXI
Systems Alliance

PXI MICROWAVE

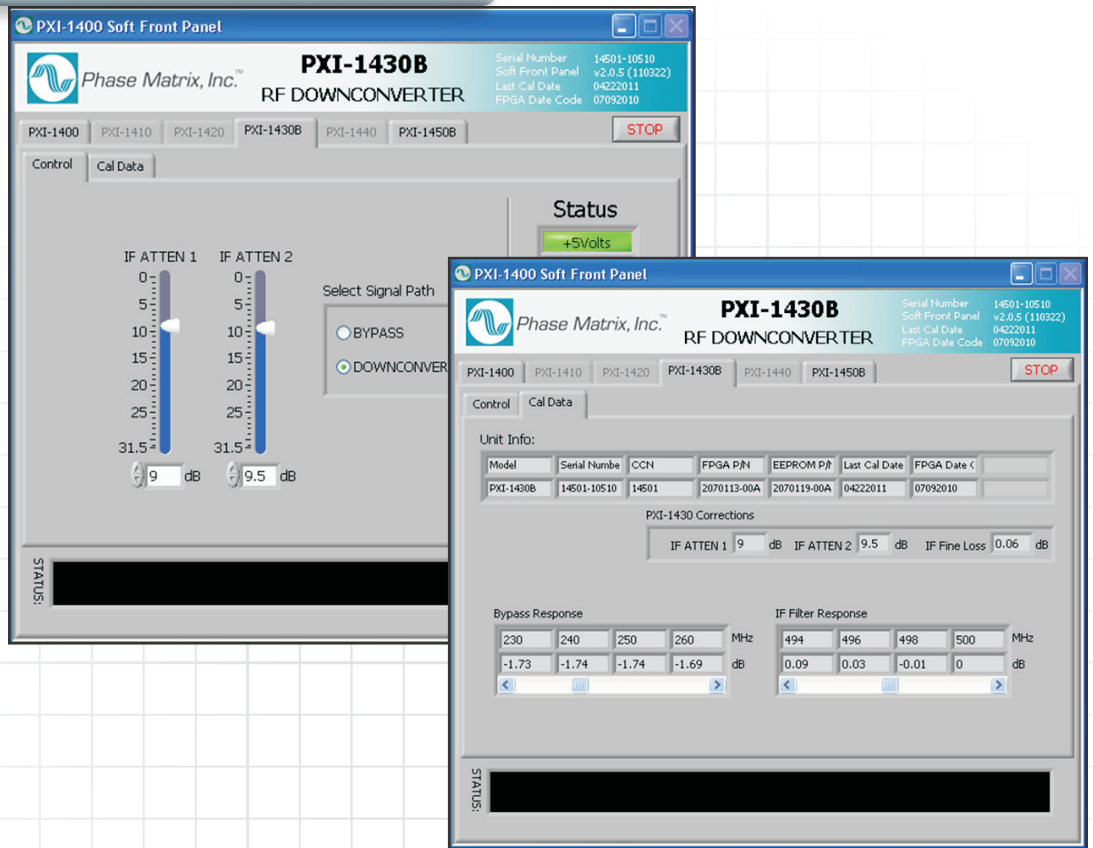
RF DOWNCONVERTER MODULE

Model PXI-1430B

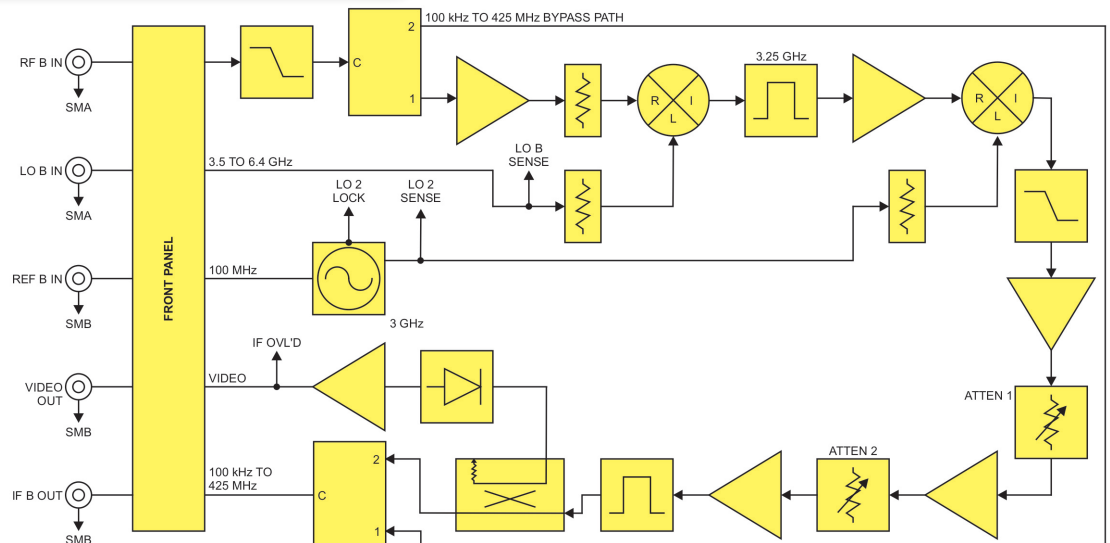
Front Panel



Software-User Interface



Simplified Block Diagram



PXI MICROWAVE

RF DOWNCONVERTER MODULE

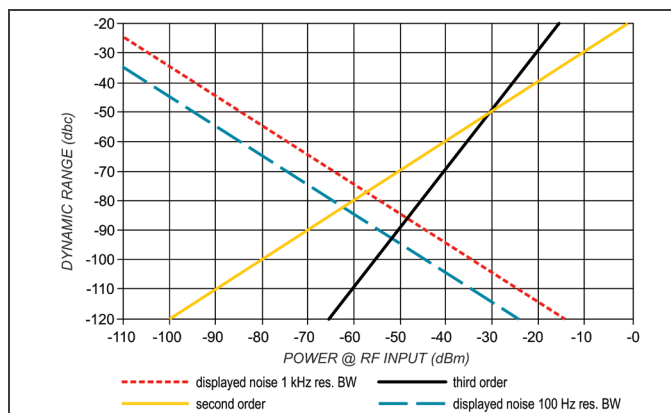
Model PXI-1430B

Specifications and ordering information subject to change without notice.

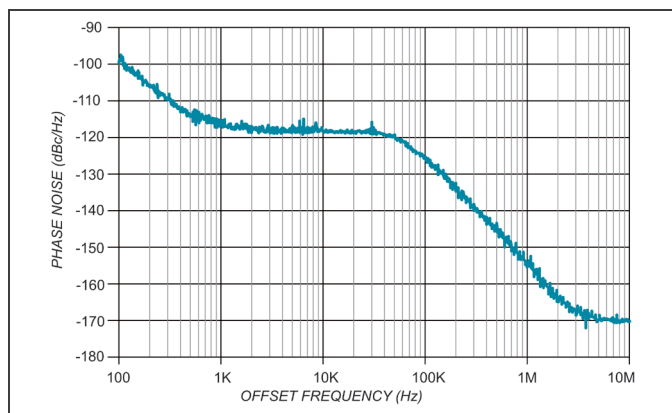
Specifications

RF INPUT SPECIFICATIONS

DESCRIPTION	SPECIFICATION
RF B IN Frequency Range ①	10 MHz to 2.9 GHz (<i>conversion mode</i>) 100 kHz to 425 MHz (<i>bypass mode</i>)
RF B IN Operating Level Range	-160 to -40 dBm/-30 dBm nom.
RF B IN Compression Point	-25 dBm min.
RF B IN Max. Level (<i>continuous without damage</i>)	+10 dBm max.
RF B IN Return Loss (50 Ω)	-10 dB nom.
RF B IN Noise Figure	12 dB max.
RF B IN IP3 (<i>tested with IF @ 250 MHz and two tones spaced 1 MHz apart</i>)	-10 dBm min. (<i>with two -40dBm RF-input tones spaced 1 MHz apart, the 3rd order intermodulation product measures with the IF [250 MHz] shall be > 60 dBc</i>)
LO Leakage @ RF Input (3.5 to 6.4 GHz)	-50 dBm max. (<i>includes LO related leakage</i>)



Dynamic Range at 3 GHz (typ.)



Residual Phase Noise, typ. (does not include LO B contribution)

IF OUTPUT SPECIFICATIONS

DESCRIPTION	SPECIFICATION
RF B to IF B Gain	38 dB nom.
IF B OUT Level	-2 dBm (500 mVp-p) nom. (<i>user adjustable via IF Gain Control</i>)
IF B OUT Overload Warning	+3 dBm \pm 2 dB
IF B OUT Center Frequency	250 MHz typ. (<i>user adjustable via LO A IN Frequency</i>)
IF B OUT BW	40 MHz min. (3 dB)

PXI MICROWAVE

RF DOWNCONVERTER MODULE

Model PXI-1430B

Specifications and ordering information subject to change without notice.

Specifications (continued)

IF OUTPUT SPECIFICATIONS (continued)

DESCRIPTION	SPECIFICATION
LO B Leakage @ IF B OUT ⁵	-60 dBm max.
IF OUT Gain Control	37 to 68.5 dB in 0.5 dB/step
Spurious Single Tone Signals @ IF B OUT	-75 dBm (<i>residual spurs, input, terminated, measured with SA</i>)
Bypass Mode Loss	-2.5 dB max. (100 kHz to 425 MHz)

IF VIDEO SPECIFICATIONS ²

DESCRIPTION	SPECIFICATION
Output Rise Time	15 ns max. @ 250 MHz IF Out
DC Output Level (<i>w/ -2 dBm IF Out</i>)	+1 V min. (<i>polarity positive</i>)
DC Level Error Over Temp.	±2 dB (0 to + 55° C)

LOCAL OSCILLATOR INPUT SPECIFICATIONS

DESCRIPTION	SPECIFICATION
LO B IN Frequency Range	3.5 to 6.4 GHz
LO B IN Power	+15 dBm ±2 dB
LO B IN Return Loss	-10 dB max.
LO B IN Impedance	50 Ω nom.

REFERENCE OSCILLATOR INPUT SPECIFICATIONS

DESCRIPTION	SPECIFICATION
REF B IN Input Frequency Range	100 MHz ±1 ppm
REF B IN Input Power	0 dBm ±3 dB
REF B IN Input Impedance	50 Ω nom.

GENERAL SPECIFICATIONS

DESCRIPTION	SPECIFICATION
Temperature Range	
Operating	0° to +55° C
Non-Operating	-40° to +70° C

PXI MICROWAVE

RF DOWNCONVERTER MODULE

Model PXI-1430B

Specifications and ordering information subject to change without notice.

Specifications (continued)

GENERAL SPECIFICATIONS

DESCRIPTION	SPECIFICATION
Certifications	
CE Compliance	Low Voltage Directive 2006/95/EC
Safety	EN/IEC 61010-1:2001
EMC	EN 55011:2007, IEC 61326-1:2006
Weight	1 lb./0.5 kg
Connectors	
RF B IN	SMA (f)
LO B IN	SMA (f)
VIDEO OUT	SMB (m)
Warranty	1 Year

PXIbus SPECIFICATIONS

DESCRIPTION	SPECIFICATION
Module Type	3U/1-Slot
Warm-up Time	15 minutes max.
DC Power Dissipation	+3.3 V
	+5 V
	+12 V
	-12 V
	Total Power
	0.1 A
	0.5 A
	1.1 A
	0.0 A
	16 W max.

ORDERING INFORMATION

Model	PXI-1430B
Options	None
Accessories ③	
MPXI-14XX-ACC01	Cable set
Related Products	PXI Modules PXI-1410, PXI-1420, PXI-1440B, PXI-1450B

Notes:

① When down converting low-frequency signals, it is important to have sufficient IF filtering to prevent overload.

② IF video is not available in bypass mode.

③ Software, manuals, and quick-start guides are available online www.phasematrix.com

④ "Typ." means approximately 2/3 of all units meet these characteristics at room temperature. Characteristics identified by typ. and nom. are by design and are not normally verified on every unit during production.

⑤ LO B leakage at the IF B OUT connector is +10 dBc max. (3.5 to 3.75 GHz)

PXI MICROWAVE

RF DOWNCONVERTER MODULE

Model PXI-1430B

Phase Matrix, Inc. designs and manufactures RF and microwave test-and-measurement (T&M) instruments, subsystems, and components and is a wholly owned subsidiary of National Instruments. Our array of instruments includes traditional benchtop frequency counters, modular (VXI) pulsed-frequency counters, modular (VXI and PXI) synthetic instruments, including downconverters, upconverters/synthesizers and local oscillators that are designed for both commercial and military applications. In addition, we produce instrument-grade, fast-switching synthesizer modules that can be used in various instruments or subsystems. We also manufacture a line of narrowband and broadband microwave components, ranging from VCOs to complex custom-built assemblies for military instrumentation and telecommunications applications.

Data sheet PN: DS_1430B Rev.C, Sept. 2013

Copyright © 2013 Phase Matrix, Inc. All rights reserved.



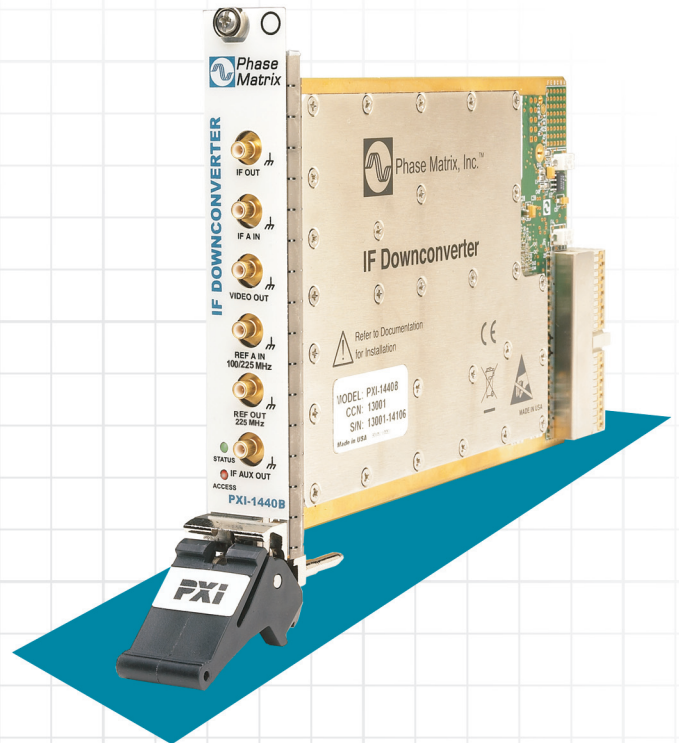
Phase Matrix, Inc.[®]
A National Instruments Company

PXI MICROWAVE IF DOWNCONVERTER MODULE

Model PXI-1440B

The PXI-1440B IF Downconverter Module is a PXI 3U, 1-slot module that facilitates additional frequency translations to lower intermediate frequencies (IF) when high-dynamic range digitization is required. The module can receive an IF input from a wideband downconverter. The IF-input signal can either be bypassed and sent out in wideband mode or filtered and further down converted and routed through an alias filter in the narrowband mode. The input source to this module is normally the IF signal from the RF Downconverter Module (PXI-1430B) or from the MW Downconverter Module (PXI-1420). Additionally, the PXI-1440B contains video-processing circuitry to enable video demodulation or IF video triggering implementation in a PXI downconverter system. Features and controls include: incoming signal routing, anti-alias filter routing, IF output routing, LO level indicator, and several signal-path options for testing.

The PXI-1440B IF Downconverter Module is intended for use in applications such as instrumentation, microwave receivers, signal intelligence, or anywhere a microwave signal needs to be down converted to a baseband frequency for data capture, analysis, and measurement.



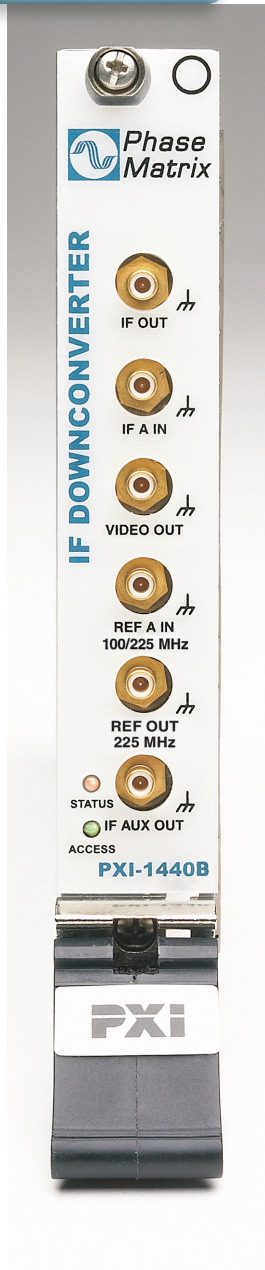
PXI
Systems Alliance

PXI MICROWAVE

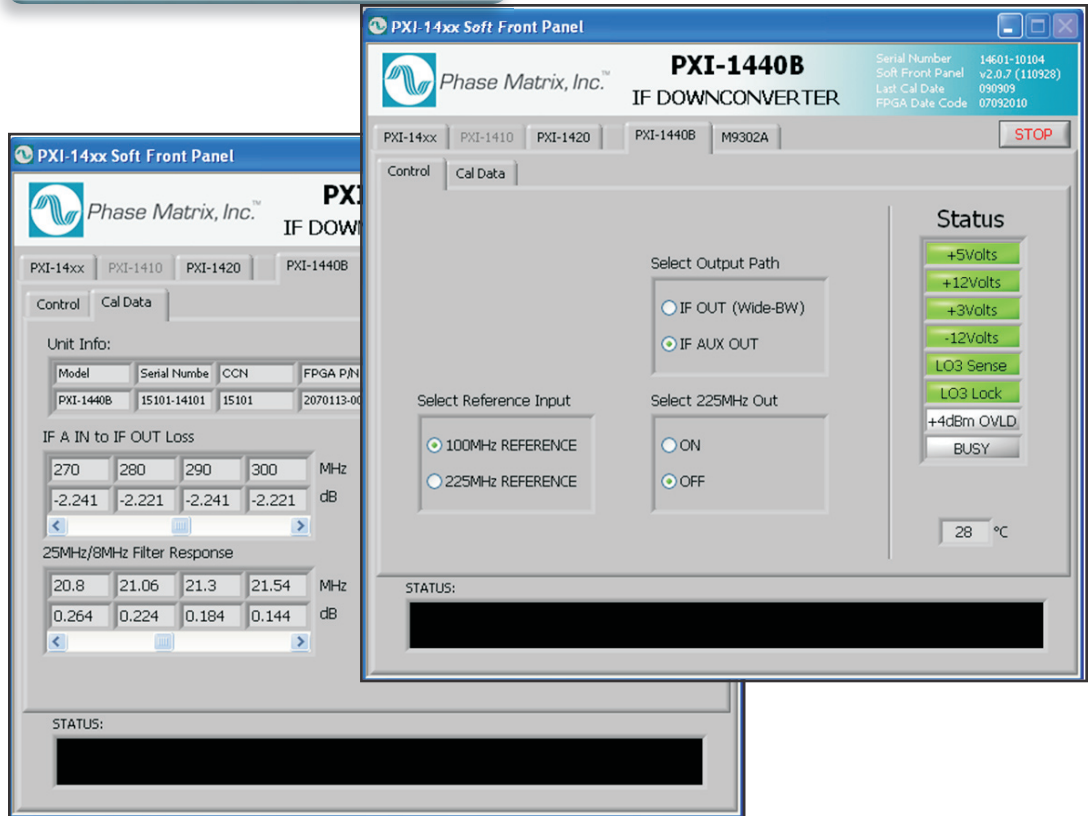
IF DOWNCONVERTER MODULE

Model PXI-1440B

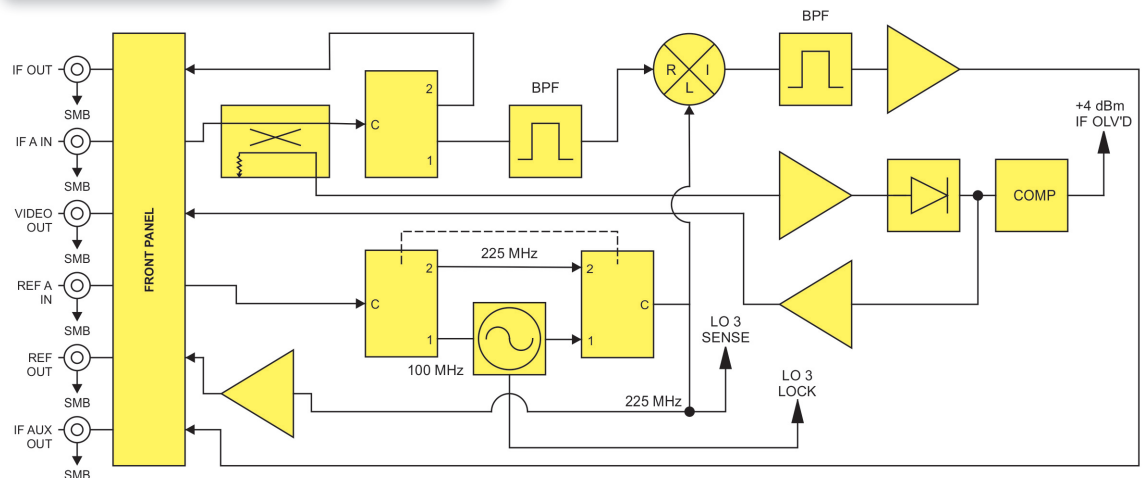
Front Panel



Software-User Interface



Simplified Block Diagram



PXI MICROWAVE

IF DOWNCONVERTER MODULE

Model PXI-1440B

Specifications and ordering information subject to change without notice.

Specifications

IF INPUT SPECIFICATIONS

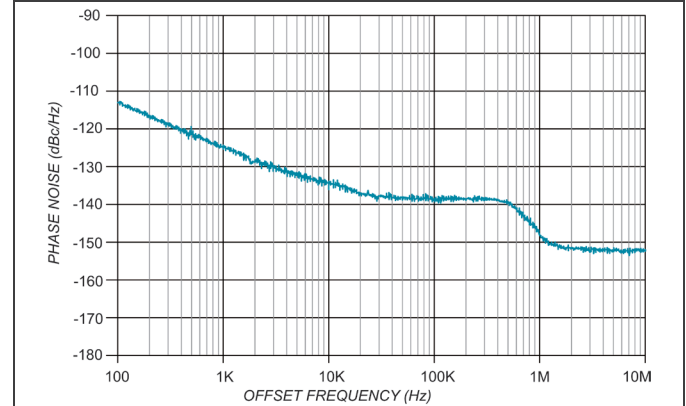
DESCRIPTION	SPECIFICATION
IF (A) IN Frequency Range	100 kHz to 425 MHz
IF (A) IN Operating Power Levels	-2 dBm nom.
IF (A) IN Return Loss	-10 dB max.
IF (A) IN to IF AUX OUT Noise Figure	25 dB max.
IF (A) IN Max. Level (<i>continuous without damage</i>)	+10 dB max.

IF OUTPUT SPECIFICATIONS

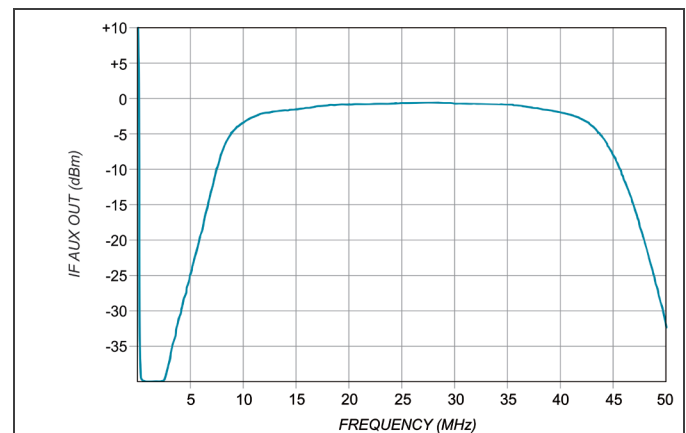
DESCRIPTION	SPECIFICATION
IF OUT (1 dB BW)	100 Hz to 425 MHz
IF AUX OUT (3 dB BW)	30 MHz min. (23 MHz 1 dB BW typ.)
IF AUX OUT Fc	25 MHz typ.
IF OUT/IF AUX OUT Insertion Loss	-2 dB max.
IF AUX OUT Maximum Level	+4 dBm (IF overload warning)
IF AUX OUT OIP3	+36 dBm min. (2 tones produce < 75 dBc intermods @ -2 dBm, 25 MHz IF OUT)
IF AUX OUT Second Harmonic Distortion	70 dBc min. (@ -2 dBm, 25 MHz IF OUT)
IF OUT OIP3	+36 dBm min. (2 tones produce < 75 dBc intermods @ -2 dBm, 25 MHz IF OUT)
IF AUX OUT 1 dB Compression Point	+15 dBm min.

IF VIDEO SPECIFICATIONS

DESCRIPTION	SPECIFICATION
Output Rise Time	20 ns max. @ 250 MHz IF Out
DC Output Level (w/ -2 dBm IF Out)	+1 V min. (<i>polarity positive</i>)
DC Level Error Over Temp.	±2 dB (0 to + 55° C)



Residual Phase Noise, typ. (does not include LO B contribution)



IF AUX OUT Flatness/Response, typ.

PXI MICROWAVE

IF DOWNCONVERTER MODULE

Model PXI-1440B

Specifications and ordering information subject to change without notice.

Specifications (continued)

REF OSCILLATOR INPUT SPECIFICATIONS

DESCRIPTION	SPECIFICATION
REF A IN Frequency	100 MHz \pm 1 ppm (<i>master mode</i>) / 225 MHz \pm 1 ppm (<i>slave mode</i>)
REF A IN Power	0 dBm \pm 3 dB
REF OUT Frequency	225 MHz nom (<i>REF OUT used for multi-module, phase-coherent operation</i>)
REF OUT Power	0 dBm \pm 3 dB
REF A IN Impedance	50 Ω nom.

GENERAL SPECIFICATIONS

DESCRIPTION	SPECIFICATION
Temperature Range	
Operating	0° to +55° C
Non-Operating	-40° to +70° C
Relative Humidity	0 to 90% (<i>non-condensing</i>)
Certifications	
CE Compliance	73/23/EEC; Low Voltage Directive (safety) 89/336/EEC; Electromagnetic Compatibility Directive (EMC)
Safety	IEC 61010-1
EMI/RFI	IEC 61326-1, MIL-STD 461E/RS102, MIL-STD 461E/RS103
Weight	
Shipping Weight	1 lb./0.5 kg
Connectors	
IF A/B IN	SMB (m)
IF OUT/IF AUX OUT	SMB (m)
VIDEO OUT	SMB (m)
REF A IN	SMB (m)
Warranty	1 Year

PXI MICROWAVE

IF DOWNCONVERTER MODULE

Model PXI-1440B

Specifications and ordering information subject to change without notice.

Specifications (continued)

PXIbus SPECIFICATIONS

DESCRIPTION

SPECIFICATION

Module Type 3U/1-Slot

Warm-up Time 15 minutes max.

DC Power Dissipation	+3.3 V	+5 V	+12 V	-12 V	Total Power
	0.1 A	0.1 A	0.5 A	0	7 W max.

ORDERING INFORMATION

Model PXI-1440B

Options None

Accessories

MPXI-14XX-ACC01 Cable set

Related Products PXI Modules PXI-1410, PXI-1420, PXI-1430B, PXI-1450B

Notes:

1. Software, operation manuals, and quick-start guides are available online www.phasematrix.com

PXI MICROWAVE

IF DOWNCONVERTER MODULE

Model PXI-1440B

Phase Matrix, Inc. designs and manufactures RF and microwave test-and-measurement (T&M) instruments, subsystems, and components and is a wholly owned subsidiary of National Instruments. Our array of instruments includes traditional benchtop frequency counters, modular (VXI) pulsed-frequency counters, modular (VXI and PXI) synthetic instruments, including downconverters, upconverters/synthesizers and local oscillators that are designed for both commercial and military applications. In addition, we produce instrument-grade, fast-switching synthesizer modules that can be used in various instruments or subsystems. We also manufacture a line of narrowband and broadband microwave components, ranging from VCOs to complex custom-built assemblies for military instrumentation and telecommunications applications.

Data sheet PN: DS_1440B Rev. A Oct. 2013

Copyright © 2013 Phase Matrix, Inc. All rights reserved.



Phase Matrix, Inc.[®]
A National Instruments Company

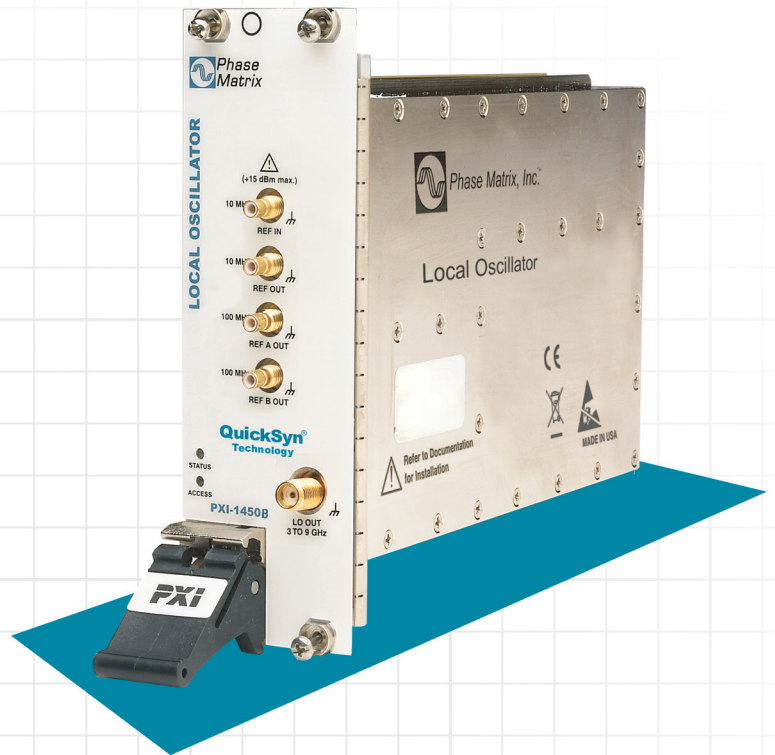
PXI MICROWAVE LOCAL OSCILLATOR MODULE

Model PXI-1450B

The PXI-1450B Local Oscillator Module is a PXI 3U, 2-slot synthesizer module intended for frequency down conversion applications. The PXI-1450B is a VCO-based, 3 to 9 GHz synthesizer that uses QuickSyn[®] technology, enabling a tuning resolution of less than 1 Hz and optimization for speedy (300 μ s typ.) settling time to allow for fast frequency down conversion applications that employ Phase Matrix models PXI-1420 MW Down-converter Module (2.7 to 26.5 GHz) and PXI-1430B RF Downconverter Module (100 kHz to 2.9 GHz).

The PXI-1450B contains all the circuitry necessary to lock the synthesizer and a 100 MHz ovenized crystal oscillator to an externally provided 10 MHz master reference oscillator. This capability enables the module to distribute its internal high-stability reference or the customer-provided external reference to other PXI modules within a PXI mainframe chassis.

The PXI-1450B is intended for use in applications such as synthetic instrumentation, microwave receivers, signal intelligence, or anywhere a microwave signal needs to be down converted to a baseband frequency for data capture, analysis, and measurement.



PXI
Systems Alliance

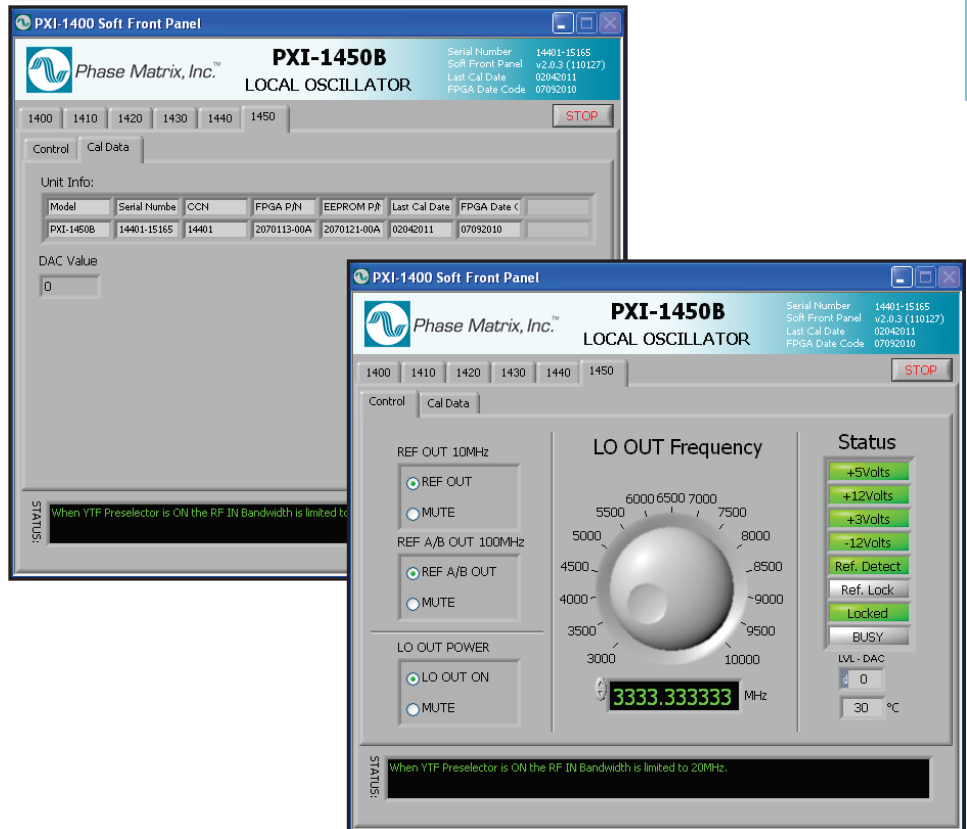
PXI MICROWAVE LOCAL OSCILLATOR MODULE

Model PXI-1450B

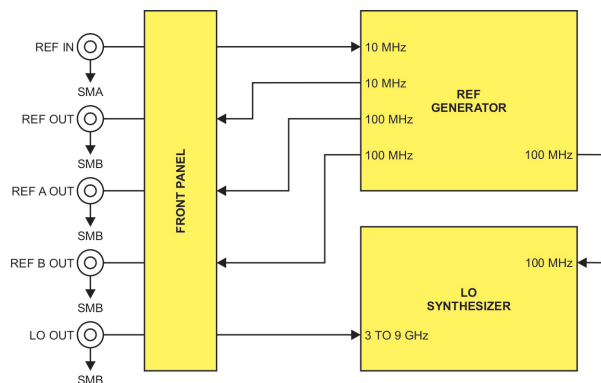
Front Panel



Software-User Interface



Simplified Block Diagram



PXI MICROWAVE

LOCAL OSCILLATOR MODULE

Model PXI-1450B

Specifications and ordering information subject to change without notice.

Specifications

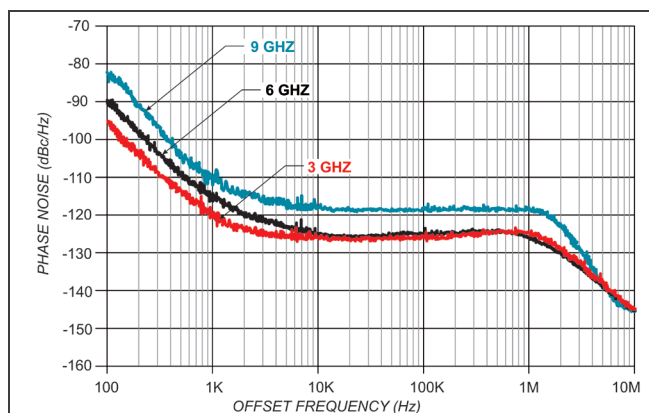
OUTPUT SPECIFICATIONS

DESCRIPTION	SPECIFICATION
Number of LO Outputs	1
Frequency Output Range	3 – 9 GHz (2.75 to 10 GHz typ.)
Frequency Output Step Size	0.1 Hz
Frequency Switching Speed	500 μ s (300 μ s typ.)
Output Power Accuracy	+16 dBm \pm 2 dB
Output Impedance	50 Ω nom.

SPECTRAL PURITY

DESCRIPTION

Harmonics	-12 dBc
Non-Harmonic Spurious	-60 dBc max. / -70 dBc nom.
Power Line Related Spurious	-40 dBc typ.
Phase Noise—measured at: <u>OFFSET</u>	<u>9 GHz</u>
100 Hz	-75 dBc/Hz
1 kHz	-103 dBc/Hz
10 kHz	-115 dBc/Hz
100 kHz	-115 dBc/Hz
1 MHz	-120 dBc/Hz
Floor	-145 dBc/Hz



Phase Noise (typ.)

PXI MICROWAVE

LOCAL OSCILLATOR MODULE

Model PXI-1450B

Specifications and ordering information subject to change without notice.

Specifications (continued)

REFERENCE FREQUENCY

DESCRIPTION	SPECIFICATION
Frequency Output	
REF OUT	10 MHz nom.
REF A OUT	100 MHz nom.
REF B OUT	100 MHz nom.
REF OUT Amplitude	0 dBm \pm 3 dB
Aging (<i>after 30 days of operation</i>)	\pm 1.0 ppm/year
Frequency Temp. Stability	\pm 0.5 ppm (<i>over 0° to 50° C</i>)
REF OUT Impedance	50 Ω nom.
REF IN Frequency ❶	10 MHz
REF IN Lock Frequency Range	10 MHz \pm 2 ppm
REF IN Level Range	0 \pm 4 dBm
REF IN Impedance	50 Ω nom

PXIbus SPECIFICATIONS

DESCRIPTION	SPECIFICATION
Module Type	3U/2-Slot
Warm-up Time	15 minutes max.

DC Power Dissipation	+3.3 V	+5 V	+12 V	-12 V	Total Power
	0.5A	0.5 A	0.75 A	0.1 A	16 W max.

PXI MICROWAVE

LOCAL OSCILLATOR MODULE

Model PXI-1450B

Specifications and ordering information subject to change without notice.

Specifications (continued)

GENERAL SPECIFICATIONS

DESCRIPTION	SPECIFICATION
Temperature Range	
Operating	0° to +55° C
Non-Operating	-40° to +70° C
Certifications	
CE Compliance	Low Voltage Directive 2006/95/EC
Safety	EN/IEC 61010-1:2001
EMC	EN 55011:2007, IEC 61326-1:2006
Weight	2 lb. / 0.91 kg
Connectors	
RF OUT	SMA (f)
REF IN	SMB (f)
REF OUT	SMB (f)
REF A OUT	SMB (f)
REF B OUT	SMB (f)
Warranty	1 Year

ORDERING INFORMATION

Model	PXI-1450B
Options	None
Accessories ²	
MPXI-14XX-ACC01	Cable set
Related Products	PXI Modules PXI-1410, PXI-1420, PXI-1430B, PXI-1440

Notes:

- ¹ External reference frequency input to be within ± 2 ppm max. of actual internal reference frequency.
- ² Software, manuals, and quick-start guides are available online www.phasematrix.com
- ³ "Typ." means approximately 2/3 of all units meet these characteristics at room temperature. Characteristics identified by typ. and nom. are by design and are not normally verified on every unit during production.

PXI MICROWAVE

LOCAL OSCILLATOR MODULE

Model PXI-1450B

Phase Matrix, Inc. designs and manufactures RF and microwave test-and-measurement (T&M) instruments, subsystems, and components and is a wholly owned subsidiary of National Instruments. Our array of instruments includes traditional benchtop frequency counters, modular (VXI) pulsed-frequency counters, modular (VXI and PXI) synthetic instruments, including downconverters, upconverters/synthesizers and local oscillators that are designed for both commercial and military applications. In addition, we produce instrument-grade, fast-switching synthesizer modules that can be used in various instruments or subsystems. We also manufacture a line of narrowband and broadband microwave components, ranging from VCOs to complex custom-built assemblies for military instrumentation and telecommunications applications.

Data sheet PN: DS_1450B Rev. C, Sept. 2013

Copyright © 2013 Phase Matrix, Inc. All rights reserved.



Phase Matrix, Inc.[®]
A National Instruments Company

PRELIMINARY

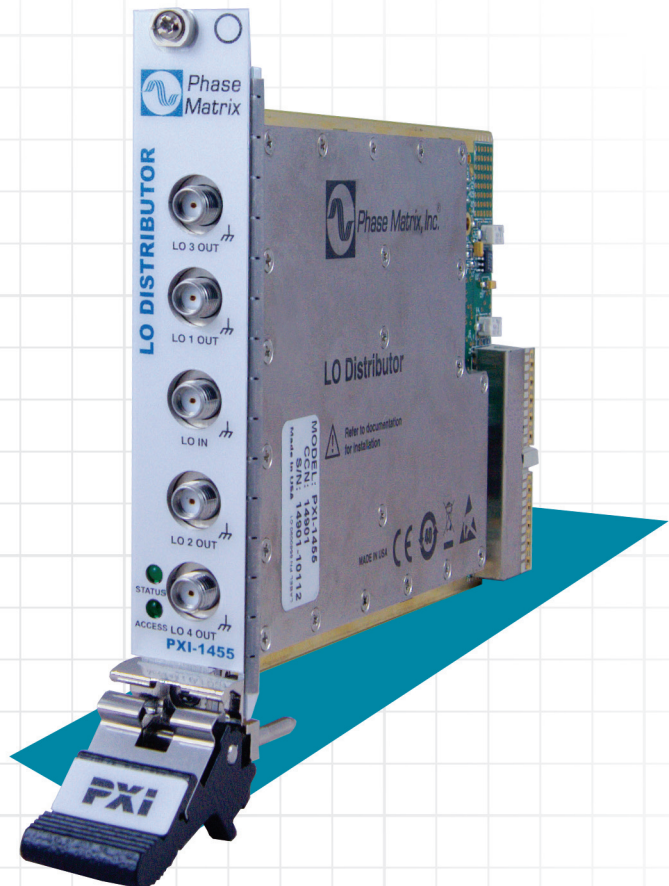
PXI MICROWAVE LO DISTRIBUTOR MODULE

Model PXI-1455

The **PXI-1455 LO Distributor** is a PXI 3U, 1-slot module that provides up to four, phase-coherent signals between 3 and 9 GHz. These local oscillator (LO) signals are simultaneously generated without loss between input and output.

The PXI-1455, combined with Phase Matrix's PXI-1450B Local Oscillator module and one or more other PXI downconverter modules, enables the application of measurement and analysis of 26.5 GHz signals among four channels. With this setup, the user can compare time, amplitude, phase, and frequency domains by simultaneous and synchronized measurement. The PXI-1455 is the solution for difficult-to-perform analysis of multiplexed, mixed, and interfered signals, which are common in applications requiring multipath analysis such as MIMO communications and EW characterization applications (e.g, radar, SIGINT, ELINT) as well as antenna characterization applications.

Furthermore, the compact PXI form factor is ideal for situations requiring a small footprint, and the LabVIEW™ device drivers and example code enable easy-to-customize ability for unique solutions.



PXI
Systems Alliance

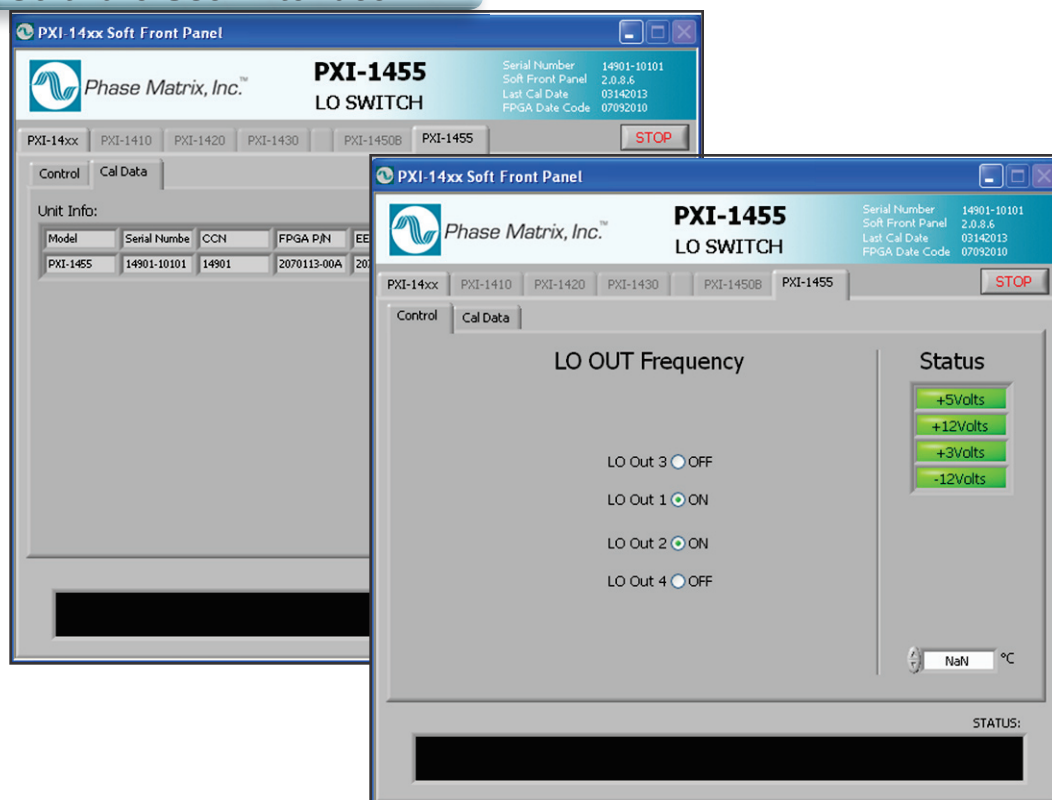
PXI MICROWAVE LO DISTRIBUTOR MODULE

Model PXI-1455

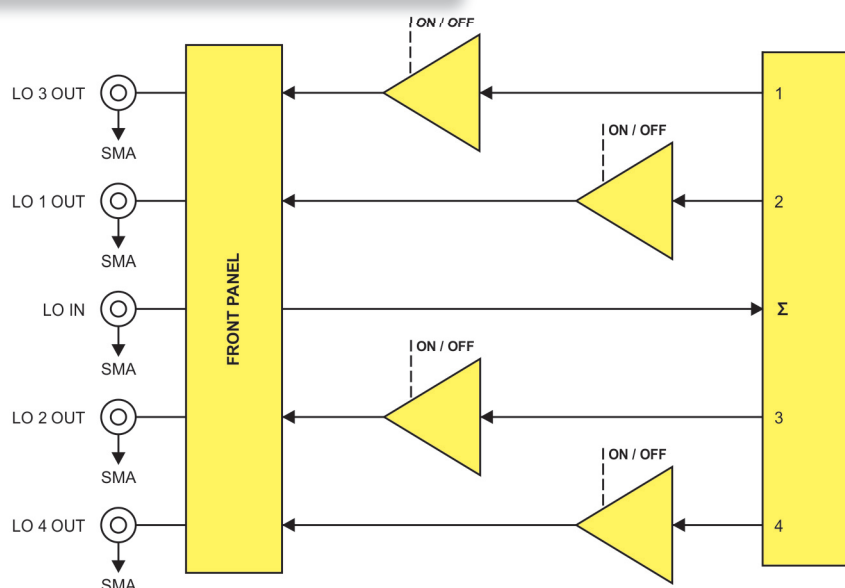
Front Panel



Software-User Interface



Simplified Block Diagram



PXI MICROWAVE LO DISTRIBUTOR MODULE

Model PXI-1455

Specifications and ordering information subject to change without notice.

Specifications

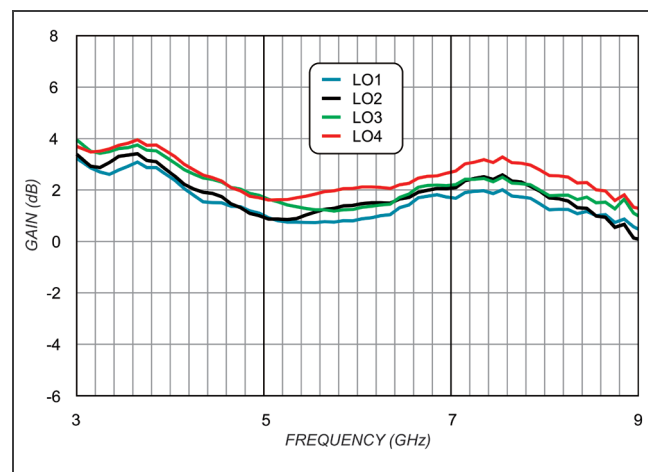
PERFORMANCE SPECIFICATIONS

DESCRIPTION	SPECIFICATION
Frequency Input	3 to 9 GHz
Power Input	+18 dBm max. (+27 dBm damage)
Gain / Flatness	2 ± 2 dB
Channel-to-Channel Isolation	> 60 dB (<i>LO IN terminated</i>)
Channel On / Off Ratio	> 60 dB

PXIbus SPECIFICATIONS

DESCRIPTION	SPECIFICATION
Module Type	U/1-Slot (<i>1:4 splitter</i>)
Warm-up Time	15 minutes max.

DC Power Dissipation	+3.3 V	+5 V	+12 V	-12 V	Total Power
	0.1 A	0.1 A	0.4 A	0	5.5 W max.



Gain / Flatness

GENERAL SPECIFICATIONS

DESCRIPTION	SPECIFICATION
Temperature Range	
Operating	0° to +55° C
Non-Operating	-40° to +70° C
Relative Humidity	0 to 90% (<i>non-condensing</i>)
Certifications	
CE Compliance	73/23/EEC; Low Voltage Directive (safety) 89/336/EEC; Electromagnetic Compatibility Directive (EMC)
Safety	IEC 61010-1
EMI/RFI	IEC 61326-1, MIL-STD 461E/RS102, MIL-STD 461E/RS103
Weight	
Shipping Weight	1 lb./0.5 kg
Connectors	SMA (f)
Warranty	1 Year

PXI MICROWAVE LO DISTRIBUTOR MODULE

Model PXI-1455

ORDERING INFORMATION

Model	PXI-1455
Options	None
Accessories	None
Related Products	PXI Modules PXI-1410, PXI-1420, PXI-1430B, PXI-1440B, PXI-1450B

Notes:

1. Software, operation manuals, and quick-start guides are available online www.phasematrix.com

Phase Matrix, Inc. designs and manufactures RF and microwave test-and-measurement (T&M) instruments, subsystems, and components and is a wholly owned subsidiary of National Instruments. Our array of instruments includes traditional benchtop frequency counters, modular (VXI) pulsed-frequency counters, modular (VXI and PXI) synthetic instruments, including downconverters, upconverters/synthesizers and local oscillators that are designed for both commercial and military applications. In addition, we produce instrument-grade, fast-switching synthesizer modules that can be used in various instruments or subsystems. We also manufacture a line of narrowband and broadband microwave components, ranging from VCOs to complex custom-built assemblies for military instrumentation and telecommunications applications.

Data sheet PN: DS_1455 Rev. 1

Copyright © 2013 Phase Matrix, Inc. All rights reserved.