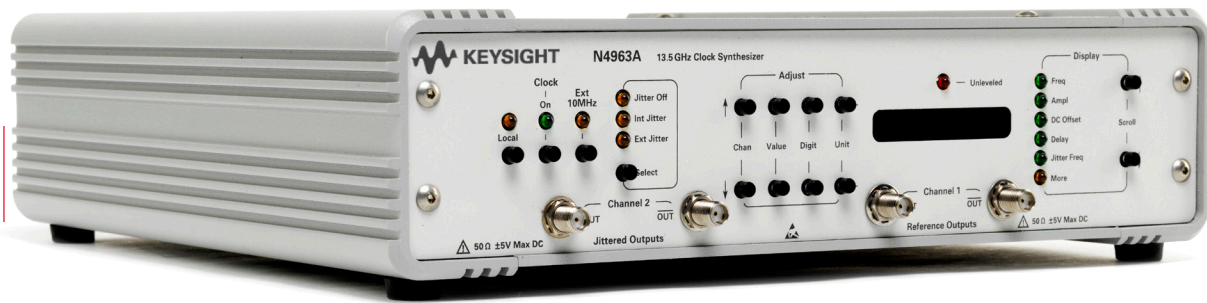


Keysight

# N4963A Clock Synthesizer 13.5 GHz

Data Sheet





## Introduction

### Applications

- Designed to extend the operation of the Keysight Technologies, Inc. N4962A serial BERT 12.5 Gb/s for continuous operation from 500 Mb/s to 12.5 Gb/s.
- XAUI BERT tester using four N4962A serial BERT 12.5 Gb/s and the N4963A clock synthesizer 13.5 GHz to enable a synchronous four lane BER tester at a fraction of the cost from competitors.
- Stand alone lab clock source for general purpose use.

### Features

- Small compact size
- Wide range 500 MHz to 13.5 GHz square wave generator
- Jitter injection capability from 1 Hz to 100 MHz
- Six pairs of differential outputs, 3 pairs jittered and 3 pairs unjittered
- One set of differential outputs offer independent delay adjustment relative to the other outputs
- Wide range of amplitude (600 to 2000 mV)
- DC offset adjustable for driving different logic types (-2.0 to 2.0 V)
- GPIB controllable for automated use
- Very low jitter typically < 1.5 ps rms

## Specifications

Specifications	
<b>All clock outputs</b>	
Frequency of operation	0.5 to 13.5 GHz
Frequency resolution	1 kHz when GPIB controlled 1 kHz at frequencies < 1GHz when front panel controlled 1 MHz at frequencies ≥ 1 GHz when front panel controlled
Frequency accuracy	+/- 5 ppm maximum
Rise/fall times (20 to 80%)	< 50 ps typ from 0.5 to 10 GHz < 25 ps typ from 10 to 13.5 GHz
Jitter	2.6 ps rms typ from 0.5 to 2.5 GHz 1.5 ps rms typ from 2.5 to 13.5 GHz
<b>Front panel outputs (channel 1 and channel 2)</b>	
Amplitude	0.6 to 2.0 V from 0.5 to 7.5 GHz 0.6 to 1.5 V from 7.5 to 13.5 GHz
Amplitude resolution	1 mV
Offset voltage	-2.0 to +2.0 V
Offset voltage resolution	10 mV
Phase adjust (channel 1 only)	-180 to +178 °
Phase adjust resolution (channel 1 only)	2 °
Interface	Differential. DC coupled, 50 Ω nominal, female SMA (May be operated single end without unused output terminated into 50 Ω)
<b>Rear panel outputs (channels 3A, 3B, 4A, 4B)</b>	
Amplitude	0.2 to 0.8 V from 0.5 to 7.5 GHz 0.2 to 0.6 V from 7.5 to 13.5 GHz
Amplitude resolution	1 mV
Interface	Differential. AC coupled, 50 Ω nominal, female SMA (May be operated single end without unused output terminated into 50 Ω)
<b>Jitter injection (Option 101)</b>	
Jitter injection source	Internal or external
Jittered outputs	Channel 2 (front panel) and channels 4A and 4B (rear panel)
Jitter injection frequency range	1 Hz to 100 MHz
Jitter injection frequency resolution (internal)	1 Hz from 1 Hz to 1 MHz injection frequency 1 kHz from 1 to 100 MHz injection frequency
Jitter injection range <sup>1</sup>	0 to 32 UI from 1 to 75 kHz 0 to 16 UI from > 75 to 150 kHz 0 to 8 UI from > 150 to 300 kHz 0 to 4 UI from > 300 to 600 kHz 0 to 2 UI from > 600 kHz to 1.2 MHz 0 to 1 UI from > 1.2 to 2.4 MHz 0 to 0.6 UI from > 2.4 to 100 MHz
Jitter injection resolution	0.01 UI
External jitter input voltage	1 V pp max
<b>External jitter injection interface</b>	<b>DC coupled, 50 Ω nominal, female SMA</b>

1. At 5 GHz

<b>Specifications</b>	
<b>Trigger output</b>	
Type	Divided clock trigger
Trigger divide range	Division ration 8 to 511 in steps of 1
Trigger frequency	Clock frequency/trigger division ratio
Amplitude	> 400 mV typ
Interface	AC coupled, 50 $\Omega$ nominal, female SMA
<b>Nominal timebase specifications</b>	
Reference frequency	10 MHz internal or external
10 MHz external input frequency	10 MHz $\pm$ 10 ppm
10 MHz external input amplitude range	0.5 to 2 Vpp
10 MHz reference output	500 mVpp
Interface	AC coupled, 50 $\Omega$ nominal, female BNC
<b>General and mechanical parameters</b>	
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Operating temperature	+10 $^{\circ}$ C to +40 $^{\circ}$ C
Storage temperature	-40 $^{\circ}$ C to +70 $^{\circ}$ C
Power requirements	42 W external AC adaptor (included) 100 to 240 V AC, 47 to 63 Hz
Weight	3.4 kg (7.5 lbs)
<b>Regulatory standards</b>	
EMC	
Complies with European EMC Directive 2004/108/EC	IEC/EN 61326-1 CISPR Pub 11 Group 1, class A AS/NZS CISPR 11 ICES/NMB-001
	This ISM device complies with Canadian ICES-001. Cet appareil ISM est conforme a la norme NMB-001 du Canada.

## Rear view of N4963A clock synthesizer 13.5 GHz

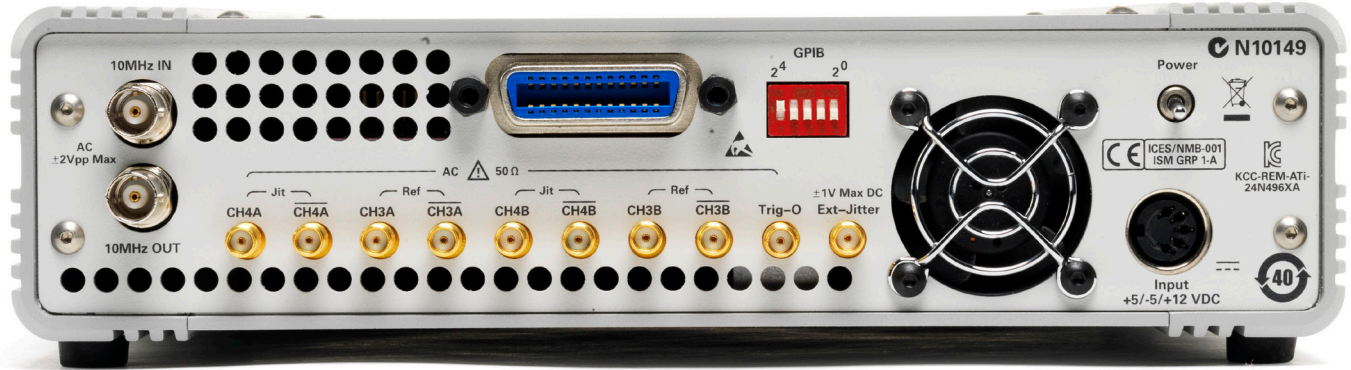


Figure 1. Rear view

## Block diagram

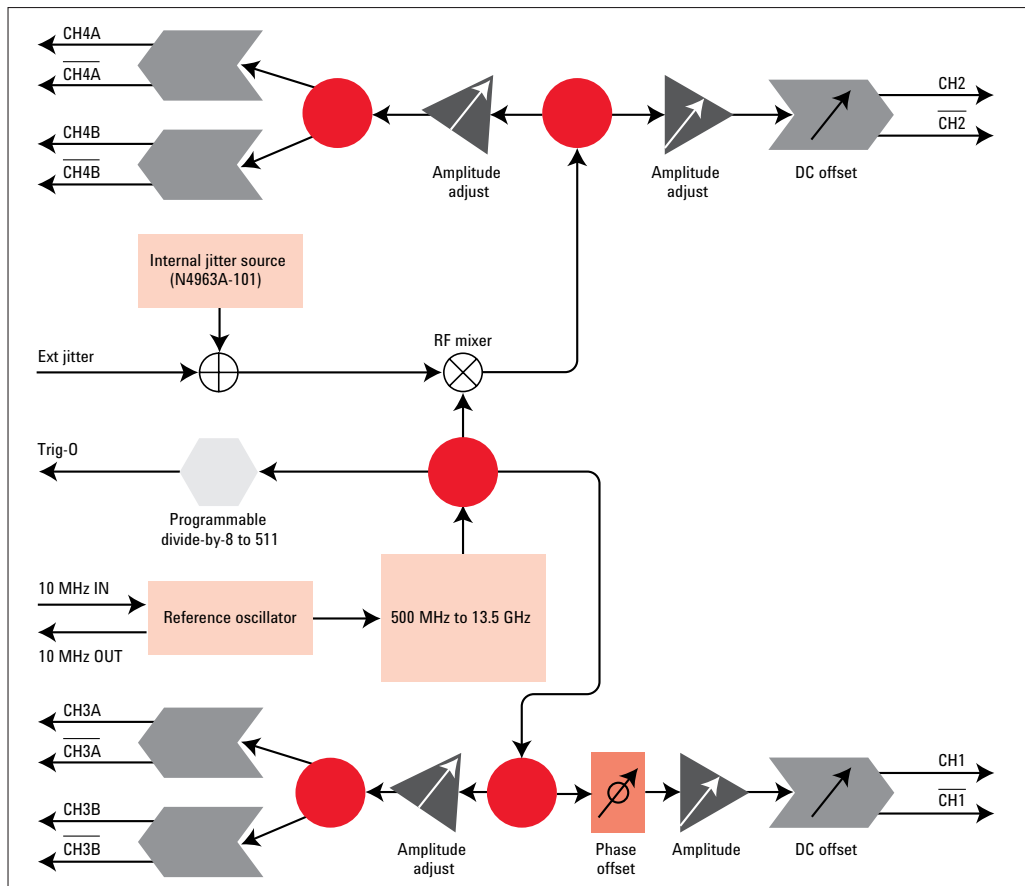


Figure 2. Block diagram

## Ordering information

N4963A clock synthesizer 13.5 GHz (500 MHz to 13.5 GHz), includes standard 3-year warranty

## Warranty and calibration service

For warranty and calibration service information, contact your local authorized Keysight distributor or Keysight sales department.

For more information on Keysight Technologies' products, applications or services, please contact your local Keysight office. The complete list is available at: [www.keysight.com/find/contactus](http://www.keysight.com/find/contactus)

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Hong Kong	800 938 693
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Japan	0120 (421) 345
Korea	080 769 0800
Malaysia	1 800 888 848
Singapore	1 800 375 8100
Taiwan	0800 047 866
Other AP Countries	(65) 6375 8100

### Europe & Middle East

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Belgium	0800 58580
Finland	0800 523252
France	0805 980333
Germany	0800 6270999
Ireland	1800 832700
Israel	1 809 343051
Italy	800 599100
Luxembourg	+32 800 58580
Netherlands	0800 0233200
Russia	8800 5009286
Spain	800 000154
Sweden	0200 882255
Switzerland	0800 805353
	Opt. 1 (DE)
	Opt. 2 (FR)
	Opt. 3 (IT)
United Kingdom	0800 0260637

For other unlisted countries:  
[www.keysight.com/find/contactus](http://www.keysight.com/find/contactus)  
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### Three-Year Warranty

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