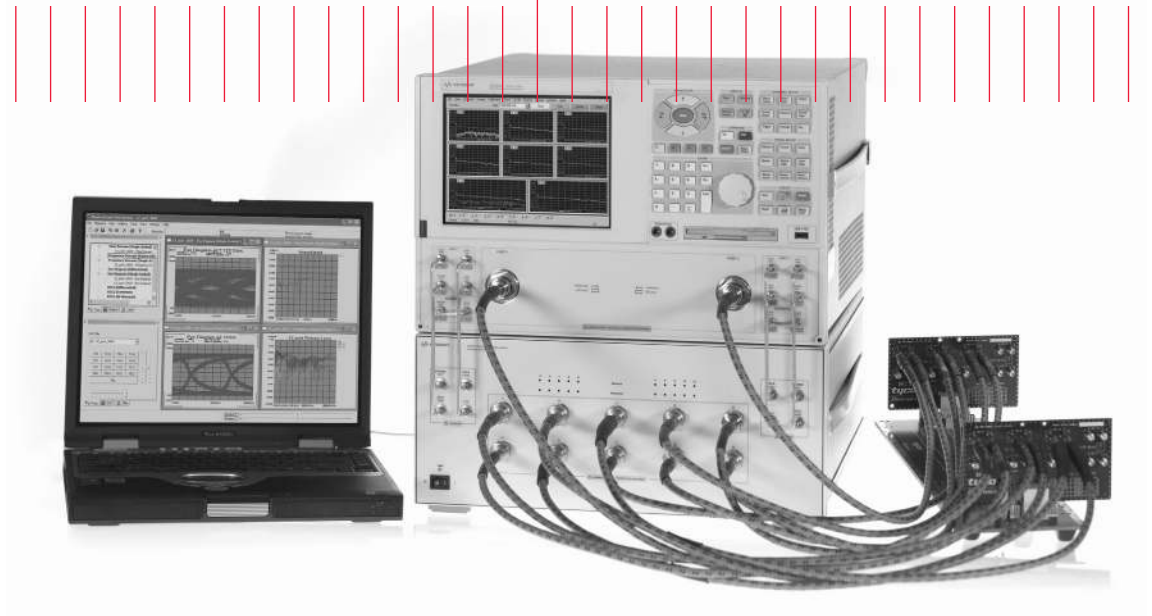


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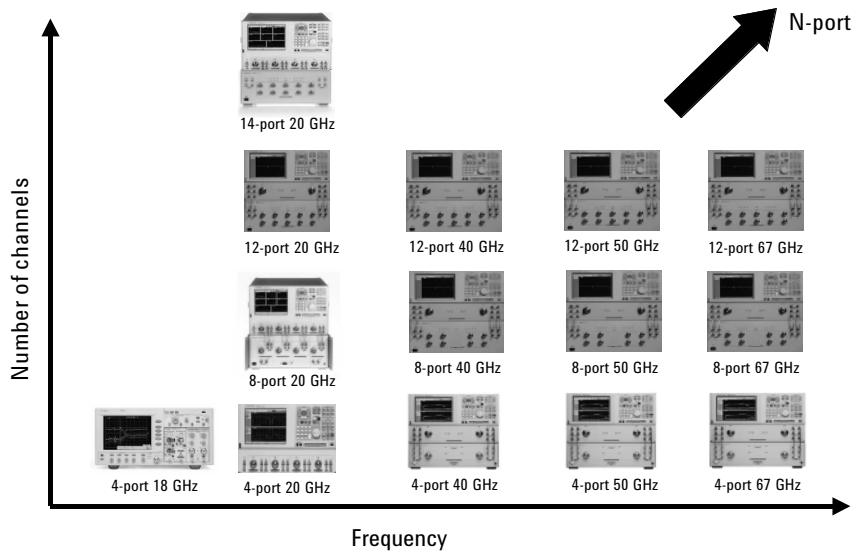
Physical Layer Test System (PLTS Version 5.2)

Vector Network Analyzer-based
Physical Layer Test Systems (PLTS)

Configuration Guide



PLTS signal integrity solutions portfolio



Keysight Technologies, Inc. is a leader in multiport Vector Network Analyzer (VNA) test systems. It is important to have many flexible system configurations to adapt to each customer's specific application requirements. Most high speed digital design engineers require multiples of 4-ports in order to characterize differential transmission lines (i.e., 4-port, 8-port, 12-port or 16-port). This can be accomplished with either a 2-port VNA or a 4-port VNA.

The following multiport configurations are meant to show the most popular configurations that signal integrity laboratories use today. In each case, the PLTS software license was defaulted to the fixed node license option. As can be seen near the end of this document under, "PLTS Software Ordering Information," there are a variety of PLTS licenses that may be substituted in this configuration guide.

For more information, please refer to the PLTS website at www.keysight.com/find/plts.

PLTS multiport configuration (4-port 67 GHz system)

Qty	Default options	Available options	Description
1	E8361C		10 MHz to 67 GHz vector network analyzer; 2 port; 4 receiver
1	E8361C-014		Configurable test set deck
1	E8361C-550		4-port measurement application
1	N4421BH67		2-port 67 GHz test set
4		N4421B-K67	Test port cables, 3 ft., 1.85 mm (m-f), quantity 1
1	N1930B-1TP		PLTS base analysis transportable (USB Key) license
1	N1930B-3TP		PLTS measurement and cal transportable (USB Key) license
1	PS-S20-01		Productivity assistance
1		85058E	1.85 mm mechanical cal kit

PLTS multiport configuration (12-port 50 GHz system)

Qty	Default options	Available options	Description
1	E8364C		10 MHz to 50 GHz vector network analyzer; 2 port; 4 receiver
1	E8364C-551		PNA multiport firmware
	E8364C-014		Configurable test set deck
1	U3025AE10		10-port 50 GHz S-parameter test set
12		N4421AK20	Test port cables, 3 ft., 2.4 mm (m-f), quantity 1
1	N1930B-1TP		PLTS base analysis transportable (USB Key) license
1	N1930B-3TP		PLTS measurement and cal transportable (USB Key) license
1	N1930B-7TP		PLTS n-port measurement and cal transportable (USB Key) license
1	PS-S20-01		Productivity assistance

PLTS multiport configuration (8-port 50 GHz system)

Qty	Default options	Available options	Description
1	E8364C		10 MHz to 50 GHz vector network analyzer; 2 port; 4 receiver
1	E8364C-014		Configurable test set deck
1	E8364C-551		PNA multiport firmware
1	U3025AE06		6-port 50 GHz S-parameter test set
8		N4421AK20	Test port cables, 3 ft., 2.4 mm (m-f), quantity 1
1	N1930B-1TP		PLTS base analysis transportable (USB Key) license
1	N1930B-3TP		PLTS measurement and cal transportable (USB Key) license
1	N1930B-7TP		PLTS n-port measurement and cal transportable (USB Key) license
1	PS-S20-01		Productivity assistance
1		N4693A-00F	2.4 mm ECal kit

PLTS ordering information (4-port 50 GHz bundled system)

Qty	Default options	Available options	Description
			Physical layer test system, 15 ps, 50 GHz
1	E8364C		10 MHz to 50 GHz vector network analyzer; 2 port; 4 receiver
1	E8364C-014		Configurable test set deck
1	E8364C-550		4-port measurement application
1	N4421B		10 MHz to 50 GHz S-parameter test set
4		N4421AK20	Test port cables, 3 ft., 2.4 mm (m-f), quantity 1
1	N1930B-1TP		PLTS base analysis transportable (USB Key) license
1	N1930B-3TP		PLTS measurement and cal transportable (USB Key) license
1	PS-S20-01		Productivity assistance
1		N4693A-00F	2.4 mm ECal kit

PLTS multiport configuration (12-port 40 GHz system)

Qty	Default options	Available options	Description
1	E8363C		10 MHz to 40 GHz vector network analyzer; 2 port; 4 receiver
1	E8363C-014		Configurable test set deck
1	E8363C-551		PNA multiport firmware
1	U3024AE10		10-port 40 GHz S-parameter test set
12		N4421AK20	Test port cables, 3 ft., 2.4 mm (m-f), quantity 1
1	N1930B-1TP		PLTS base analysis transportable (USB Key) license
1	N1930B-3TP		PLTS measurement and cal transportable (USB Key) license
1	N1930B-7TP		PLTS n-port measurement and cal transportable (USB Key) license
1	PS-S20-01		Productivity assistance
1		N4693A-00F	2.4 mm ECal kit

PLTS multiport configuration (8-port 40 GHz system)

Qty	Default options	Available options	Description
1	E8363C		10 MHz to 40 GHz vector network analyzer; 2 port; 4 receiver
1	E8364C-014		Configurable test set deck
1	E8363C-551		PNA multiport firmware
1	U3024AE06		6-port 40 GHz S-parameter test set
8		N4421AK20	Test port cables, 3 ft., 2.4 mm (m-f), quantity 1
1	N1930B-1TP		PLTS base analysis transportable (USB Key) license
1	N1930B-3TP		PLTS measurement and cal transportable (USB Key) license
1	N1930B-7TP		PLTS n-port measurement and cal transportable (USB Key) license
1	PS-S20-01		Productivity assistance
1		N4693A-00F	2.4 mm ECal kit

PLTS ordering information (4-port 40 GHz system)

Qty	Default options	Available options	Description
1	E8363C		10 MHz to 40 GHz vector network analyzer, 2 port, 4 receiver
1	E8363C-014		Configurable Test Set Deck
1	E8363C-550		PNA multiport firmware
1	N4420B		10 MHz to 40 GHz S-parameter test set
4		N4421AK20	Test port cables, 3 ft., 2.4 mm (m-f), quantity 1
1	N1930B-1TP		PLTS base analysis transportable (USB Key) license
1	N1930B-3TP		PLTS measurement and cal transportable (USB Key) license
1	PS-S20-01		Productivity assistance
1		N4693A-00F	2.4 mm ECal kit

PLTS multiport configuration (14-port 20 GHz system)

Qty	Default options	Available options	Description
1	N5230C-245		4-port PNA-L network analyzer
1	N5231AU-551		PNA multiport firmware
14		N4419AK20	Test port cables, 3 ft., 3.5 mm (m-f), quantity 1
1	U3022AE10		10-port 20 GHz Test Set
1	N1930B-1TP		PLTS base analysis transportable (USB Key) license
1	N1930B-3TP		PLTS measurement and cal transportable (USB Key) license
1	N1930B-7TP		PLTS n-port measurement and cal transportable (USB Key) license
1	PS-S20-01		Bundled Productivity Assistance
1		N4433A-010	3.5 mm ECal kit

PLTS multiport configuration (12-port 20 GHz system)

Qty	Default options	Available options	Description
1	E8362C		10 MHz to 20 GHz Vector network analyzer
1	E8362C-014		Configurable test set deck
1	E8362C-551		PNA multiport firmware
1	U3022AE10		10-port 20 GHz test set
12		N4419AK20	Test port cables, 3 ft., 3.5 mm (m-f), quantity 1
1	N1930B-1TP		PLTS base analysis transportable (USB Key) license
1	N1930B-3TP		PLTS measurement and cal transportable (USB Key) license
1	N1930B-7TP		PLTS n-port measurement and analysis transportable (USB Key) license
1	PS-S20-01		Productivity assistance (1 Day Start-up Assistance)
1		N4433A-010	3.5 mm ECal kit

PLTS multiport configuration (8-port 20 GHz system)

Qty	Default options	Available options	Description
1	N5230C-245		4-port PNA-L network analyzer
1	N5231AU-551		PNA multiport firmware
8		N4419AK20	Test port cables, 3 ft., 3.5 mm (m-f), quantity 1
1	Z5623AK44		4-port 20 GHz Test Set
	N1930B-1TP		PLTS base analysis transportable (USB Key) license
1	N1930B-3TP		PLTS measurement and cal transportable (USB Key) license
1	N1930B-7TP		PLTS n-port measurement and cal transportable (USB Key) license
1	PS-S20-01		Bundled Productivity Assistance
1		N4433A-010	3.5 mm ECal kit

PLTS multiport configuration (4-port 20 GHz system)

Qty	Default options	Available options	Description
			Physical layer test system, 35 ps, 20 GHz
1	N5230C-245		4-port PNA-L network analyzer
4		N4419AK20	Test port cables, 3 ft., 3.5 mm (m-f), quantity 1
1	N1930B-1TP		PLTS base analysis transportable (USB Key) license
1	N1930B-3TP		PLTS measurement and cal transportable (USB Key) license
1	PS-S20-01		Bundled Productivity Assistance
1		N4433A-010	3.5 mm ECal kit

PLTS Multiport Test Set Ordering Information

Test sets for use with 2-port network analyzers (E836X Family)

Model	Freq	Switch	# Test set ports	Options		# Total system ports
U3024AE06	40 GHz	Mechanical	6 port	700	STD (with amp)	8
U3024AE06	40 GHz	Mechanical	6 port	001	BiasT	8
U3024AE10	40 GHz	Mechanical	10 port	700	STD (with amp)	12
U3024AE10	40 GHz	Mechanical	10 port	001	BiasT	12
U3025AE06	50 GHz	Mechanical	6 port	700	STD (with amp)	8
U3025AE06	50 GHz	Mechanical	6 port	001	BiasT	8
U3025AE10	50 GHz	Mechanical	10 port	700	STD (with amp)	12
U3025AE10	50 GHz	Mechanical	10 port	001	BiasT	12

Test sets for use with 4-port network analyzers (N5230A/C Family)

Model	Freq	Switch	# Test set ports	Options		# Total system ports
U3042A E08	20 GHz	Solid state	8 port	700	STD	12
U3042A E08	20 GHz	Solid state	8 port	001	Amp	12
U3042A E08	20 GHz	Solid state	8 port	002	BiasT/amp	12
U3042A E12	20 GHz	Solid state	12 port	700	STD	16
U3042A E12	20 GHz	Solid state	12 port	001	Amp	16
U3042A E12	20 GHz	Solid state	12 port	002	BiasT/amp	16
U3044A Exx	40 GHz		x Port	Future test sets		
U3045A Exx	50 GHz		x Port	Future test sets		
Z5623AK44	20 GHz	Solid state	4 port	STD	STD	8
Z5623AK44	20 GHz	Solid state	4 port	001	Amp	8
Z5623AK44	20 GHz	Solid state	4 port	002	BiasT/amp	8

Test sets for use with 2-port (E836X Family) or 4-port (N5230A/C Family) analyzers

Model	Freq	Switch	# Test set ports	Options		# Total system ports
U3022AE10	20 GHz	Mechanical	10 port	STD	STD	12 or 14
U3022AE10	20 GHz	Mechanical	10 port	001	BiasT/amp	12 or 14

Note: The highest port count available to date is 24-ports. This is achieved by using the following configuration.

N5230C-245 (4-port VNA)

U3042AE10 (10-port test set)

U3042AE 10 (10-port test set)

PLTS Software Ordering Information

Model	Description
N1930B-1NP	Base analysis networkable license; 1-year update subscription
N1930B-1FP	Base analysis fixed license; 1-year update subscription
N1930B-1TP	Base analysis transportable license (USB Key); 1-year update subscription
N1930B-3NP	Measurement & cal networkable license; 1-year update subscription
N1930B-3FP	Measurement & cal fixed license; 1-year update subscription
N1930B-3TP	Measurement & cal transportable license (USB Key); 1-year update subscription
N1930B-5NP	Advanced calibration networkable license; 1-year update subscription
N1930B-5FP	Advanced calibration fixed license; 1-year update subscription
N1930B-5TP	Advanced calibration transportable license (USB Key); 1-year update subscription
N1930B-7NP	N-port measurement & analysis networkable license; 1-year update subscription
N1930B-7FP	N-port measurement & analysis fixed license; 1-year update subscription
N1930B-7TP	N-port measurement & analysis transportable license (USB Key); 1-year update subscription

Important notes regarding PLTS software configuration

1. If PLTS Studio is used (PLTS options 1NP, 1FP or 1TP), this will allow data analysis of files up to and including 4 ports (*.s4p Touchstone files). However, if data is to be analyzed from files containing more than 4 ports (for example, 12-port data from a *.s12p Touchstone file), the appropriate PLTS multiport option must be purchased (PLTS options 7NP, 7FP or 7TP).
2. As noted in the sample configurations on pages 3-6 of this configuration guide, the VNA firmware Options 550 or 551 must be ordered in conjunction with PLTS to work properly as a calibration and measurement system. Option 550 is for applications of 4 ports or less, while option 551 is for applications greater than 4 ports.
3. PLTS option 1xP is required for either 3xP, 5xP, or 7xP options.
4. PLTS as an annual update called "SUS" that stands for "Software Update Service". Each new PLTS license comes with 12 months of SUS. Twelve months after initial purchase, a 1 or 2 year SUS extension must be purchased to receive technical support and new PLTS software updates. If any SUS lapses, then a 2 year SUS must be purchased to re-activate the support and updates.
5. Option 3xP is required for instrument control portions of option 5xP. As noted in 3 above, option 1xP is required for either 3xP, 5xP, or 7xP options.

PLTS application software uses new licensing capabilities

Besides fixed license and networkable FLEXlm licensing on a shared server, there is also a transportable USB key. The summary of the three licensing options are as follows:

Option xFP Fixed License (default)

Fixed licenses are locked to a single PC through its host ID (e.g., the MAC address) with or without connected system hardware. Fixed licenses do not require any networking or license server processes. A fixed license is also known as a node-locked license.

Option xNP Networkable License

Networkable licenses allow users to share a single license, or multiple licenses, over a network. The application software may be installed on an unlimited number of PCs with or without connected system hardware. The number of available licenses determines the number of concurrent users. Networkable licenses require a license server and a TCP/IP (or IPX/SPX) connection between clients and server(s). A networkable license is also known as a floating license.

Option xTP Transportable License

Transportable licenses are locked to a USB key that can be shared among different PCs.

Important licensing notes:

1. File import, file export, calibrations, and measurements greater than 4 ports requires one of the following PLTS options: 7NP, 7FP, or 7TP.
2. For 4-port calibrations option 550 is required on the PNA firmware. For greater than 4-port calibrations option 551 is required on the PNA firmware.
3. See configuration guide information contained in this Technical Overview for further details.

Web Resources

Visit our Web sites for additional product and literature information.

Physical Layer Test Systems
www.keysight.com/find/plts

Network Analyzers
www.keysight.com/find/na

Electronic Calibration (ECal)
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