



Configuration Guide

# IPA 510 Configuration Guide and Workbook



The IPA 510 Interconnect Parameter Analyzer System combines powerful hardware, software, and high-performance fixturing with a comprehensive methodology for the development and verification of interconnect models.

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## An Introduction to IPA 510 Configuration

### Using This Configuration Guide

This configuration guide provides a step-by-step checklist for configuring an IPA 510 Interconnect Parameter Analyzer system. A complete IPA 510 system consists of analysis software, a computer system, the measurement instrument, and fixturing. These items can be purchased as a fully-integrated turnkey solution, or as individual components to be integrated by the customer. Typical configurations for various applications are shown on page 7 in the System Configuration Table.

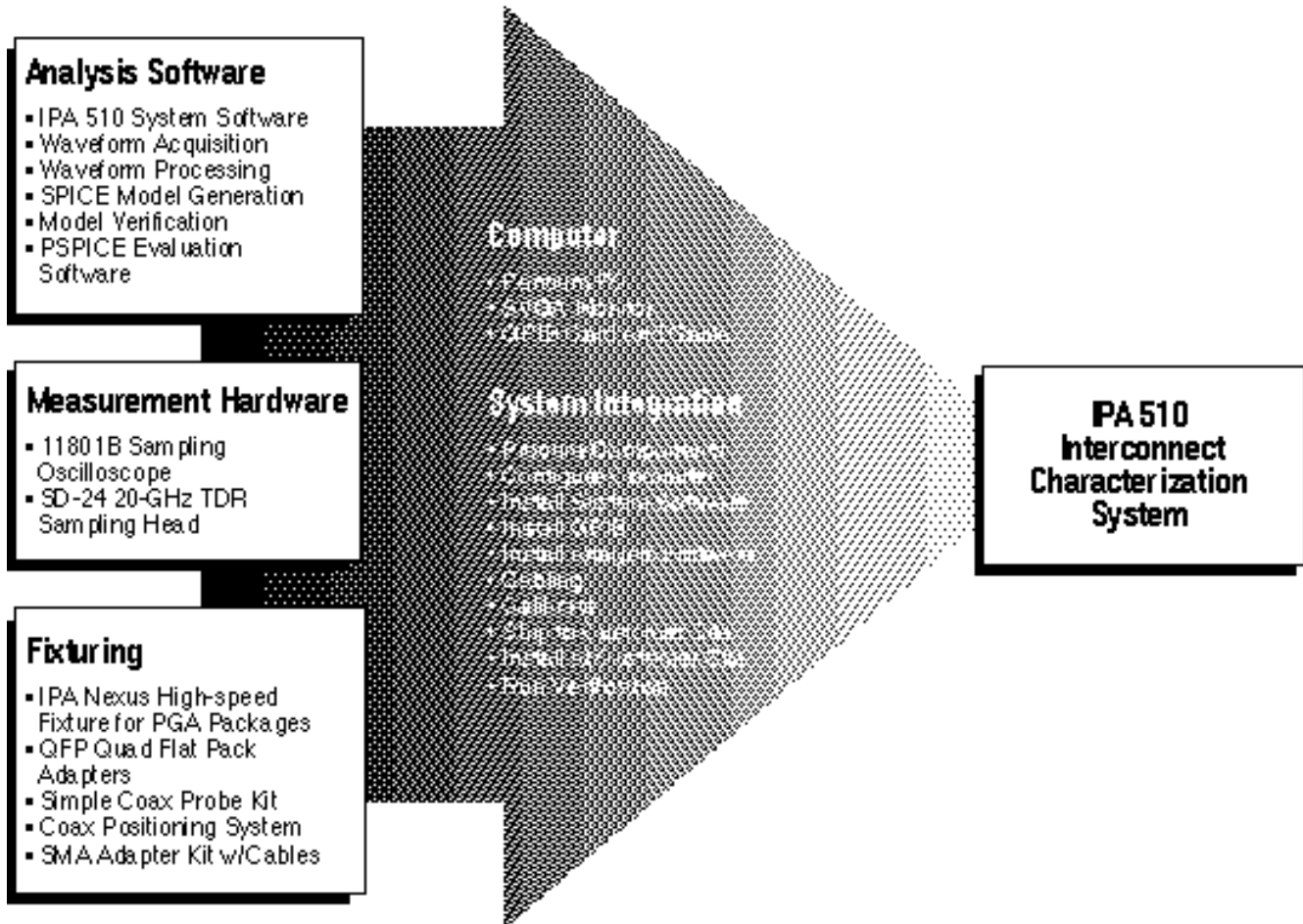
After completing this configuration guide, you will have defined a system for your specific needs. The checklist ensures that there are no omissions or redundancies. After marking the checklist, fill in the Contact Information on the last page. Your Tektronix Account Manager will use this Configuration Guide to quote your system.

### About System Integration

Not all computers, interfaces, firmware, operating systems, and cabling are created equal. The IPA 510 Interconnect Parameter Analyzer system relies on a compatible combination of instruments, software, and computer hardware to do its job as specified.

Tektronix offers expert integration services at a nominal cost to encourage customers to use the proven components included with a full system configuration. System integration at the Tektronix Integration Center guarantees a tested and ready-to-use system installed at your site. For the cost of a computer alone, you eliminate the risk of expensive delays in getting your IPA 510 system up and running.

# IPA 510 Interconnect Parameter Analyzer System Integration



## 1. Analysis Software

### q IPA 510 Interconnect Parameter Analyzer Software (base product – one each required per system)

Includes: Interconnect Parameter Analyzer Software, IPA Quick-Start Demo Board, Coax Adapter Kit, torque wrench, PSPICE Evaluation Software, evaluation copy of PSPICE Manuals, IPA User Manuals, Reference Book “High Speed Digital System Design – A Handbook of Black Magic”.

*NOTE: Evaluation copy of PSPICE allows the simulation of only simple interconnect models. If larger models are required, the purchase of a full version of Contec SPICE or PSPICE is required.*

Comes with data transfer capability from HP8510 Option 010 network analyzers.

*NOTE: The standard IPA 510 with Option 2S, 1U, or 2U provides improved time-domain acquisition capability over the HP8510 at a lower cost. HP8510 Option 010 time-domain data import capability is provided for those users who have already made the significant capital investment in the HP8510.*

Contec SPICE and RLGC (see Options on next page) are excellent tools to use with the IPA 510 to provide a complete interconnect modeling tool set. The IPA 510 operates transparently with Contec SPICE. Contec RLGC allows “what if” analysis of standard interconnect structures before initial prototype fabrication. Subcircuit model outputs from RLGC are smoothly imported into the IPA 510 composite model generation environment.

## 2. Analysis Software Options

- EA-TDR/TDT options provide increased accuracy TDR/TDT measurements by reducing aberrations, providing user-specified risetime (17 ps to 100 ns), and more accurate impedance measurements. Measurements made in this mode can be displayed in vector-network-analyzer formats from DC to 12.5 GHz.
- \* Select One
    - q Option 2S – Enhanced Accuracy TDR/TDT Software (EA-TDR/TDT) when Option 26 selected<sup>1</sup>
    - q Option 1U – Enhanced Accuracy TDR/TDT Software (EA-TDR/TDT) for owners of existing 11800 series mainframes<sup>1</sup>
    - q Option 2U – Enhanced Accuracy TDR/TDT Software (EA-TDR/TDT) for owners of existing CSA 803 mainframes<sup>1</sup>
  - \* Select One
    - q Option 2E – Enhanced Accuracy Coaxial Calibration Kit  
Option 2E Open-Short-Load (OSL) cal kit required with EA-TDR/TDT Software. Option 2E includes: Microwave standards, 1-ea. female open, female short, female 50 termination, male open, male short, male termination, female-to-female thru adapter, 7.5 cm 50 reference airline.
    - q Customer provided Open-Short-Load Cal Kit (in place of Option 2E)
  - \*
    - q Option 3S – Contec SPICE Simulator Software plus One Year Annual Support Fee (U.S.)
    - q Option 4S – Contec SPICE Simulator Software plus One Year Annual Support Fee (Europe)
    - q Option 5S – Contec SPICE Simulator Software plus One Year Annual Support Fee (Japan)
    - q Option 6S – Contec SPICE Simulator Software plus One Year Annual Support Fee (International)
    - q Option 1F – Contec RLGC Field Solver Software plus One Year Annual Support Fee (U.S.)
    - q Option 2F – Contec RLGC Field Solver Software plus One Year Annual Support Fee (Europe)
    - q Option 3F – Contec RLGC Field Solver Software plus One Year Annual Support Fee (Japan)
    - q Option 4F – Contec RLGC Field Solver Software plus One Year Annual Support Fee (International)

\* Select one.

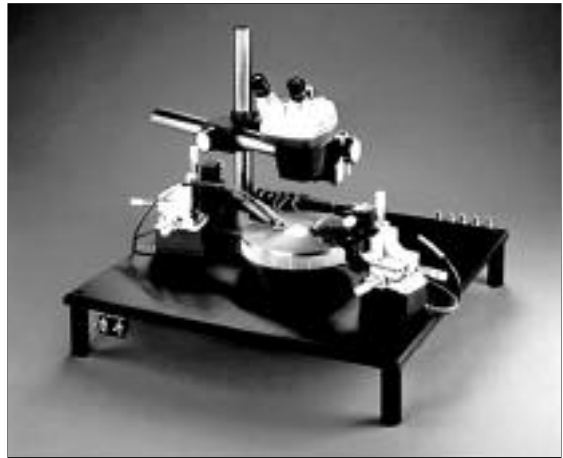
<sup>1</sup> If the IPA 510 is purchased without the EA-TDR/TDT software option, it can be upgraded later; contact your local Tektronix Service Center.

## 3. Measurement Hardware

- \* Select One
  - q Use existing 11801A or 11801B Sampling Oscilloscope  
Model \_\_\_\_\_ S/N \_\_\_\_\_
  - q Use existing CSA 803 or CSA 803A Communications Signal Analyzer  
Model \_\_\_\_\_ S/N \_\_\_\_\_
  - q Option 26 – Add 11801B Sampling Oscilloscope with Option 1T  
11801B Digital Sampling Oscilloscope. Wide range of on-board measurement and waveform processing capabilities, modular architecture, supports modular sampling heads with up to 50 GHz bandwidth, 7 ps risetime, expandable to 136 channels, 10 fs sampling interval, 1 ps timing measurement repeatability.  
*NOTE: The IPA 510 Interconnect Parameter Analyzer Software supports the 11801A, 11801B Option 1T, CSA 803, and CSA 803A. The user is responsible for ensuring calibration of the oscilloscope if Option 26 is not selected.*
  - q Option 27 – Add SD-24 Sampling Head (one each minimum required per system)  
SD-24 20-GHz two-channel TDR sampling head.
- q Option 1E – Additional Coax Adapter Kit  
Includes: 2-ea. high-performance SMA cables, 50 SMA terminations, SMA short-circuit terminations, 0.085 dia. coax probes, 0.141 dia. semi-rigid 0.5-ns SMA coax, wrenches, 1-ea. SMA TEE.  
*NOTE: One adapter kit is included with the IPA 510 Interconnect Parameter Analyzer Software; an additional kit is required for each SD-24 TDR Sampling Head.*
- q Option 1R – Rackmount Kit for 11801B
- q Option 1M – Multi-Channel Conversion  
Modifies 11801B to permit operation with up to 136 channels (four SM-11 Multi-Channel Units).
- q Option A1 – 220V, 50 Hz Power (Euro)
- q Option A2 – 240 V, 50 Hz Power (U.K.)
- q Option A3 – 240 V, 50 Hz Power (Australia)
- q Option A4 – 120 V, 60 Hz Power (North America)
- q Option A5 – 220 V, 50 Hz Power (Switzerland)

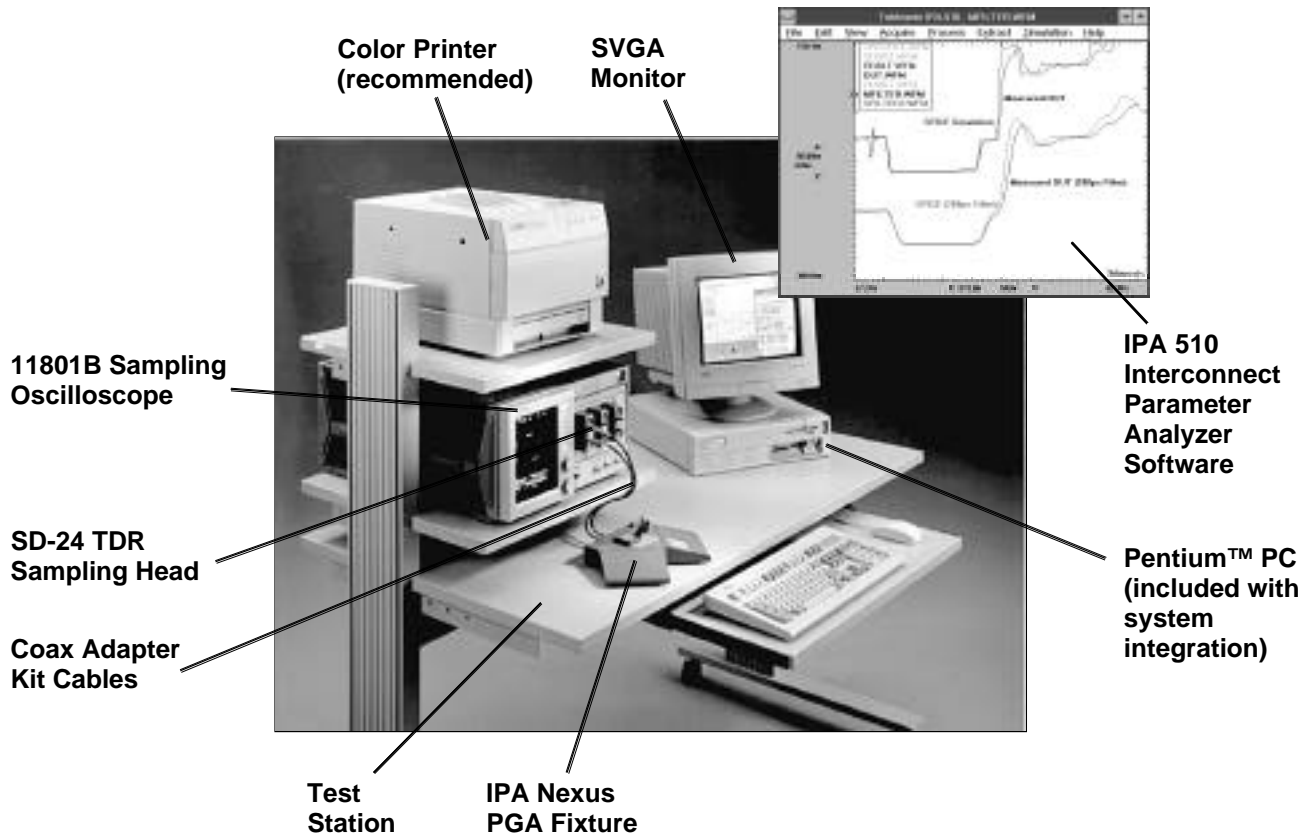
## 4. Fixturing

- q **Option 28 – IPA Nexus PGA Fixture**  
Precision multi-line interface fixture for 100-mil pitch PGA packages. Includes: Sample IC packages for system verification, fixture shorting device, copper tape.
- q **Option 29 – QFP2-25 Adapter for the IPA Nexus**  
Two-pin, 25-mil pitch adapter to interface IPA Nexus to QFP (Quad Flat Pack) packages.
- q **Option 30 – QFP4-25 Adapter for the IPA Nexus**  
Four-pin, 25-mil pitch adapter to interface IPA Nexus to QFP packages.
- q **Option 31 – QFP2-50 Adapter for the IPA Nexus**  
Two-pin, 50-mil pitch adapter to interface IPA Nexus to QFP packages.
- q **Option 32 – QFP4-50 Adapter for the IPA Nexus**  
Four-pin, 50-mil pitch adapter to interface IPA Nexus to QFP packages.
- q **Option 33 – QFP4-20 Adapter for the IPA Nexus**  
Four-pin, 20-mil pitch adapter to interface IPA Nexus to QFP packages.
- q **Option 34 – QFP4-15 Adapter for the IPA Nexus**  
Four-pin, 15-mil pitch adapter to interface IPA Nexus to QFP packages.
- q **Option 35 – Coax Positioning System**  
Highly flexible probe station with two probe holders for measuring IC packages, both large and small. Especially useful for making differential measurements on smaller ICs. Includes: 1-ea. left-hand probe holder, right-hand probe holder, 12" x 12" probing plate; 4-ea. 0.047" dia. coax probes.
- q **Option 36 – Simple Coax Probe Kit**  
Kit of 12 simple coax probes ( 950 ps long). These probes are especially useful in probing ECBs, ECB-mounted connectors, and hybrid circuits. They can be easily modified and soldered directly to circuits to meet specific measurement requirements. Includes: 4-ea. 0.141" dia. coax probes, 0.085" dia. coax probes, 0.047" dia. coax probes.
- q **Recommended Fixture – PPMS-100 High-Resolution Probing Station**  
Provides precision 50 capability when used with industry-standard microwave probes. Check current Tektronix Product Catalog for specific configuration and ordering information.



PPMS-100 High-Resolution Probing Station.

## Typical IPA 510 System



### Typical System Configuration for Characterization of IC Packages

A preconfigured IPA 510 system from Tektronix is a turnkey solution that eliminates:

- System development time
- System integration time
- Verification, calibration, and compatibility problems at the customer site

## 5. Integration

### q Option 1S – System Integration

Includes: System integration at the Tektronix Integration Center, Compaq Pentium-75 PC (or better), 720 Mbyte Hard Disk (or better), 3.5-in. 1.44 Mbyte Floppy Disk, 340/680 Mbyte Tape Backup, 16 Mbyte RAM, DOS Software (current version), Windows Software (current version), GPIB card, GPIB cable, On-site Installation, 90-Day On-Site System Warranty. **NOTE: Display not included.**

**NOTE: If you do not select Option 1S, minimum computer requirements are:**

- 486 DX33-Based PC
- 8 Mbyte RAM
- 80 Mbyte Hard Disk
- 3.5-in. 1.44 Mbyte Floppy Drive
- Windows™ 3.1
- SVGA Monitor (VGA useable)

Minimum GPIB requirements are (also available as Option 1G):

- AT-GPIB Card
- NI-4.88.2 Software for MS-DOS/Windows
- or
- AT-GPIB/TNT Card
- NI-4.88.2 Software for MS-DOS/Windows

### q Option 02 – 17-Inch Monitor

17-inch NEC SVGA Monitor.

### q Option 03 – 15-Inch Monitor

15-inch NEC SVGA Monitor.

### q Option 04 – 15-Inch Euro (240 V) Monitor

15-inch NEC SVGA Monitor (Europe only).

### q Option 1C – Test Station

Includes: Main desk top, two shelves, slide-out keyboard tray, cable management channel, manual holders. Shelf loading: 75 lbs. per shelf, 100 lbs. on main desktop.

### q Option 1G – GPIB Card

AT/GPIB/TNT Card with NI-4.88.2 software for MS-DOS/Windows, cable.

Not required if customer purchases Option 1S System Integration.

**NOTE: If the GPIB Interface is customer-supplied, the minimum requirements are:**

- AT-GPIB Card
- NI-4.88.2 Software for MS-DOS/Windows
- or
- AT-GPIB/TNT Card
- NI-4.88.2 Software for MS-DOS/Windows

**NOTE: Options 1S, 02, 03, and 04 are not available in Europe.**

## 6. Recommended Accessories

### q SD-14 Sampling Head

2.5 GHz high-impedance (100 k $\Omega$ /0.47 pf) dual-channel probe sampler.

### q SD-20 Sampling Head

20 GHz single-channel loop-through sampling head.

### q SD-22 Sampling Head

12.5 GHz dual-channel low-noise sampling head.

### q SD-26 Sampling Head

20 GHz dual-channel sampling head.

### q SD-30 Sampling Head

40 GHz single-channel sampling head.

### q SD-32 Sampling Head

50 GHz single-channel sampling head.

### q SIU 800 Static Isolation Unit

Input protection relay.

### q 012-1220-00 – 1-Meter Sampling Head Extender Cable

Useful for high-performance applications where sampling-head input cable length needs to be minimal.

### q 012-1221-00 – 2-Meter Sampling Head Extender Cable

Extends sampling head so it is closer to signal source for high-performance applications.

### q Color Printer

Tektronix Phaser™ 200- or 300-series color printer. Contact Tektronix Account Manager for name and location of local printer distributor.

# System Configuration Table

System Components / Options Available	Minimum System Configurations						Complete Device-Under-Test System Configurations			
	Existing 11800 Sampling Oscilloscope, Owner-Supplied 486 Analyzer, Owner-Supplied 486	Existing CSA 803 Communications Analyzer, Owner-Supplied 486	Existing 11800 Sampling Oscilloscope, Pentium-75 PC	Existing CSA 803 Communications Analyzer, Pentium-75 PC	New 11801B Sampling Oscilloscope Plus SD-24, Pentium-75 PC	IC Packages	Etched Circuit Boards	Multi-Chip Modules (MCMs)	Connectors	Cables
IPA 510 System Software	H	H	H	H	H	H	H	H	H	H
Opt. 1S – System Integration (includes Pentium PC)			H	H	H	H	H	H	H	H
Opt. 1G – GPIB Card/Drivers	H	H								
Opt. 2S – EA-TDR/TDT SW (w/Opt. 26)					I	H	H	H	H	H
Opt. 1U – EA-TDR/TDT SW (owner supplied 11800)	I		I							
Opt. 2U – EA-TDR/TDT SW (owner supplied CSA 803)		I		I						
Opt. 2E – Enhanced Accuracy Cal Kit	I	I	I	I	I	H	H	H	H	H
Opt. 02 – 17-in. Color Monitor			[H]	[H]	[H]	[H]	[H]	[H]	[H]	[H]
Opt. 03 – 15-in. Color Monitor			[H]	[H]	[H]	[H]	[H]	[H]	[H]	[H]
Opt. 04 – 15-in. Euro Color Monitor			[H]	[H]	[H]	[H]	[H]	[H]	[H]	[H]
Opt. 1C – Test Station Table	I	I	I	I	I	H	H	H	H	H
Opt. 3S – Contec SPICE (U.S.)	[H]	[H]	[H]	[H]	[H]	[H]	[H]	[H]	[H]	[H]
Opt. 4S – Contec SPICE (Europe)	[H]	[H]	[H]	[H]	[H]	[H]	[H]	[H]	[H]	[H]
Opt. 5S – Contec SPICE (Japan)	[H]	[H]	[H]	[H]	[H]	[H]	[H]	[H]	[H]	[H]
Opt. 6S – Contec SPICE (International)	[H]	[H]	[H]	[H]	[H]	[H]	[H]	[H]	[H]	[H]
Opt. 1F – Contec RLGC (U.S.)	[I]	[I]	[I]	[I]	[I]	[I]	[I]	[I]	[I]	[I]
Opt. 2F – Contec RLGC (Europe)	[I]	[I]	[I]	[I]	[I]	[I]	[I]	[I]	[I]	[I]
Opt. 3F – Contec RLGC (Japan)	[I]	[I]	[I]	[I]	[I]	[I]	[I]	[I]	[I]	[I]
Opt. 4F – Contec RLGC (International)	[I]	[I]	[I]	[I]	[I]	[I]	[I]	[I]	[I]	[I]
<b>SCOPE RELATED</b>										
Opt. 26 – 11801B with Opt. 1T					H	H	H	H	H	H
Opt. 27 – SD-24 20-GHz Sampling Head					H	H	H	H	H	H
Opt. 1M – SM-11 Compatibility					I	I	I	I	I	I
Opt. 1R – 11801B Rackmount					I	I	I	I	I	I
<b>FIXTURE RELATED</b>										
Opt. 28 – IPA Nexus PGA Fixture						H				
Opt. 29 – QFP2-25 Adapter						6				
Opt. 30 – QFP4-25 Adapter						6				
Opt. 31 – QFP2-50 Adapter						6				
Opt. 32 – QFP4-50 Adapter						6				
Opt. 33 – QFP4-20 Adapter						6				
Opt. 34 – QFP4-15 Adapter						6				
Opt. 35 – Coax Positioning System						H	I	H		
Opt. 36 – Simple Coax Probe Kit	H	H	H	H	H	H	H	H	H	H
Opt. 1E – Additional Coax Adapter Kit	I	I	I	I	I	I	I	I	I	I
PPMS-100 Probe Station (optional)						I	I	H		I

KEY: H Recommended      6 Recommended (select one or more)  
 I Optional      [ ] Select one from inside brackets

## 7. Shipment

For systems integrated by the Tektronix Integration Center (Option 1S), the system is shipped direct to the customer; the local Tektronix Service Center is notified and the IPA 510 System is installed and a complete

functional check is performed at the customer site by trained Tektronix Field Service Technicians. For systems not integrated by Tektronix, shipments are FOB Beaverton, unless otherwise specified by the customer.

## 6. Warranty and Support

Option 1S – System Integration is covered by a 90-day on-site system warranty. Software is covered under the standard Tektronix software warranty (90 days on media only). Individual product warranties apply for all Tektronix products. Non-Tektronix components,

such as the computer, are covered under the original vendor's warranty. Extended service or maintenance agreements are available by working with your Tektronix Account Manager to specify a custom service agreement.

## Contact Information

End User Name: \_\_\_\_\_

Company: \_\_\_\_\_

Division/Group: \_\_\_\_\_ Mail Stop: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

Phone: \_\_\_\_\_ Ext: \_\_\_\_\_

Account Manager: \_\_\_\_\_

### For further information, contact Tektronix:

World Wide Web: <http://www.tek.com>; ASEAN Countries (65) 356-3900; Australia & New Zealand 61 (2) 888-7066; Austria 43 (1) 70177-261; Belgium 32 (2) 725-96-10; Brazil and South America 55 (11) 3741 8360; Canada 1 (800) 661-5625; Denmark 45 (44) 53 54 55; Finland 358 (0) 4783 400; France & North Africa 33 (1) 69 86 81 81; Germany, Eastern Europe, & Middle East 49 (221) 94 77-0; Hong Kong (852) 2585-6688; India 91 (80) 2265470; Italy 39 (2) 250861; Japan (Sony/Tektronix Corporation) 81 (3) 3448-4611; Mexico, Central America, & Caribbean 52 (5) 666-6333; The Netherlands 31235695555; Norway 47 (22)070700; People's Republic of China (86) 10-235-1186; Republic of Korea 82 (2) 528-5299; Spain & Portugal 34 (1) 372 6000; Sweden 46 (8) 629 6500; Switzerland 41 (42) 219192; Taiwan 886 (2) 765-6362; United Kingdom & Eire 44 (1628) 403300; USA 1 (800)426-2200

From other areas, contact: Tektronix, Inc. Export Sales, P.O. Box 500, M/S 50-255, Beaverton, Oregon 97077-0001, USA (503)627-1916



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