

Expandable, Affordable Logic Analyzers that Grow with You

- 16 to 64 Channels
- 100 MHz Asynchronous Sampling
- 100 MS/s Digitizing Oscilloscope Card
- 25 MHz Synchronous Sampling
- 2K Memory Depth Per Channel
- Disassembly for 8 and 16 bit Microprocessors
- 14-Level Triggering with Conditional Branching
- GPIB, RS-232C, Parallel Printer Options

FLEXIBLE

The 1230 and 1230B Logic Analyzers are modular, general-purpose logic analyzers that support hardware, microprocessor, and system integration applications.

EXPANDABLE TO PROTECT YOUR INVESTMENT

The 1230/1230B lets you buy the performance you need now and add channels, a digitizing oscilloscope card, communication interfaces, and disassembly probes as your testing needs grow.

The basic 1230/1230B provides 16 channels. Up to three 1230E1 16-channel expander cards may be added to increase the number of channels to 64. One 1230DSM 100 MS/s digitizing scope card may be added to the 1230/1230B. Refer to the Configuration Chart.

Broad Microprocessor Support

Optional disassembly probes let you work with a long list of specific microprocessors, such as the 68000, 68010, 68332, 68HC11, Z80, 8086, 8088, 80186, 80188, 80286, 80386SX, and others. Refer to the microprocessor guide on page 206 for a complete list.

NEW! DIGITIZING OSCILLOSCOPE

Now Tek combines multiple testing tools - a 100 MS/s digitizing scope and a logic analyzer - in the same affordable instrument. Use the scope and logic analyzer separately, or interactively as an efficient system debug/characterization tool. The 1230DSM digitizing oscilloscope card provides:

- 2 simultaneous channels
- 100 MS/s sampling rate
- 100 MHz bandwidth
- 8 bit vertical resolution
- 2048 samples per channel
- Repetitive sampling and signal averaging

POWERFUL

SYSTEM TEST APPLICATIONS

An advantage of the 1230/1230B is that each block of 16 channels can be set to sample at a different rate, independent of the other 16-channel blocks. This means that you can simultaneously collect data from different parts of your system under test to see how everything works together. For example, a 64-channel 1230/1230B can disassemble an 8-bit microprocessor plus acquire eight channels of 100 MHz timing data at the same time.

EXCELLENT TRIGGERING-A TEK STANDARD

Like all Tek logic analyzers, the 1230/1230B provides flexible, accurate triggering. Resources include 24 user-definable conditions, 14 triggering levels, two word recognizers per level, 5 ns glitch triggering, and more. All triggering resources are available for both timing and state analysis.

The 1230/1230B provides two trigger modes: Basic and Advanced. Having two modes to choose from lets you use the mode most suited to your application, without unnecessary complexity. Basic mode supports the most commonly used trigger setups. Advanced mode expands triggering capabilities with IF..THEN..ELSE instructions useful for creating two-way conditional branches and for qualifying data storage.

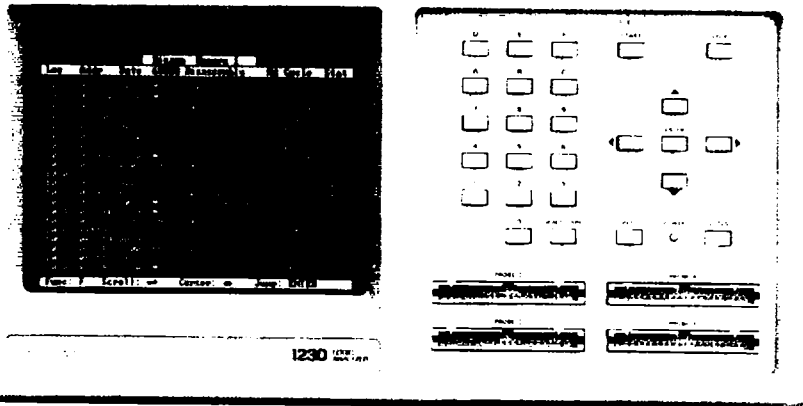
FOUR NONVOLATILE 2K-DEEP MEMORIES

Four different memories, each with 2K bits/channel, are available for acquisition or reference data. All four memories are nonvolatile. Nonvolatile storage means that valuable test data is not accidentally lost. The last-used setup and acquisition data are restored on power-up, letting you begin where you left off.

MEMORY COMPARISON FUNCTIONS

The 1230/1230B supports two comparison modes: Manual and Auto. Manual-compare provides a single comparison of acquisition memory to reference memory. This is useful for basic pass/fail tests.

Auto-compare makes data acquisitions and comparisons repetitively without an operator present. Auto-compare is valuable in "babysitting" applications such as isolating intermittent malfunctions, freeing you from monitoring the test until the fault is detected.



2K-deep memory can be displayed in State, Timing, or Disassembly formats. This 68000 disassembly display shows all bus cycles. Another disassembly display is also available that shows only instruction cycles and looks like an assembly listing.

Easy to Learn and Use

The 1230/1230B features a large display and fast, interactive, pop-up menus. To save you time, most menu selections are available with one or two keystrokes. Menus are never more than one level deep, so you can select parameters quickly, without bottlenecks. Prompts at the bottom of each menu describe what to do, and a NOTES key provides context-sensitive, on-screen explanation.

1230B Battery-Power

The 1230B is a model of the 1230 that operates from multiple power sources: a self-contained rechargeable battery, +12V dc, or ac. Battery and dc power let you use the 1230B in situations where ac power is unavailable, unreliable, or inconvenient.

1230/1230B CONFIGURATION CHART

	1230/1230B	With one 1230E1	With two 1230E1s	With three 1230E1s
Channels at 25 MHz sync, async	16	32	48	64
Channels at 50 MHz async	8	16	24	32
Channels at 100 MHz async	4	8	12	16
Glitch channels	8	16	24	32
Time bases	1	2	3	4
Nonvolatile memories	4	4	4	4
Nonvolatile setups	8	8	8	8
Memory depth/channel	2048	2048	2048	2048
Compatible with 1230DSM	Yes	Yes	Yes	No

In both compare modes, you can compare any two of the four memories. Differences are highlighted in the State Table.

AUTOMATION

By adding an optional RS232 or GPIB communications interface to the 1230/1230B, the analyzer can be controlled remotely from a computer keyboard or via a program written for the computer. This capability lets you turn the 1230/1230B into a low-cost automated test station.

The RS232 and GPIB interfaces also let you store unlimited memories and setups on your PC, and download them into the 1230/1230B at any time.

Included with the RS232 Interface is software package S43R101. This software runs on IBM PC, XT, ATs (or compatibles) and provides an easy, fast method for transferring 1230 setups and data over RS232. S43R101 also lets you create and run automatic, remote-controlled tests.

COMPLETE SOLUTION

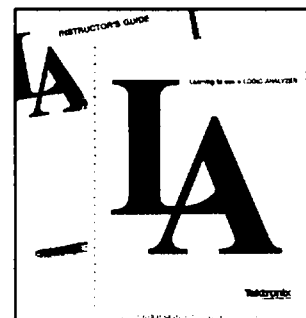
STANDARD ACCESSORIES

Everything you need to learn and use the 1230/1230B is provided standard. This includes the normal accessories you would expect: programmable-threshold acquisition probe, leadsets, grabber tips, Operator's Manual, and pocket-sized quick reference guide. In addition, the 1230/1230B also includes extensive instructional materials: training videotape, test circuit to practice on, and a workbook of application examples.

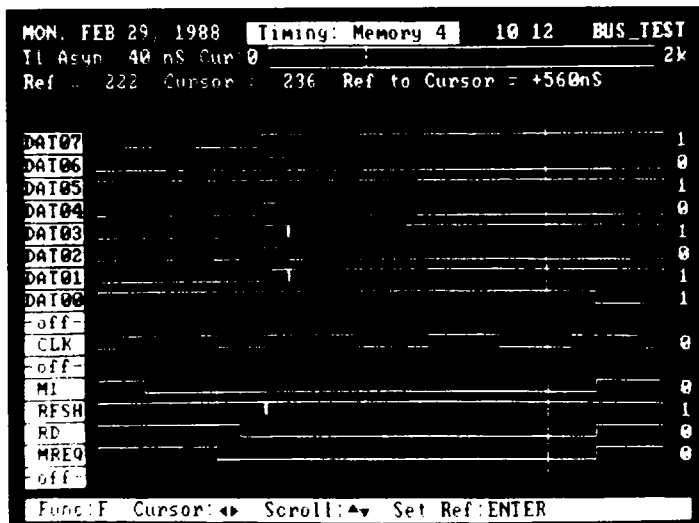
TEACHING MATERIALS

Tektronix developed the Basic Concepts of Logic Analysis self-study workbook (LABASIC) for those who need to learn or teach logic analysis theory and techniques. This optional workbook contains theory, exercises using the 1230/1230B, and student examinations.

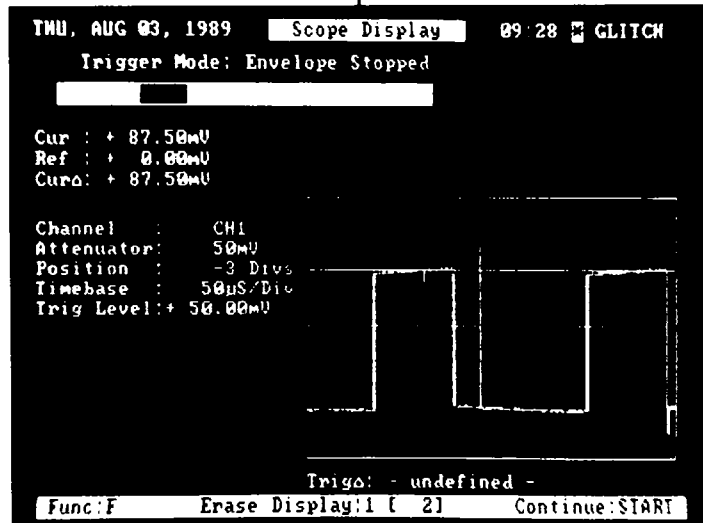
Another self-study workbook, LAMICRO, which focuses on debug techniques for microprocessor-based systems is also available. For realistic practice, a 68010-based test system, FasTrak, is available.



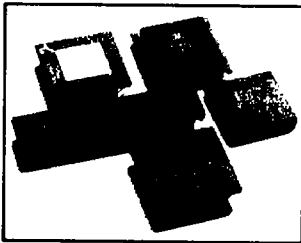
Self-paced training materials quickly build your skills. Workbooks for basic concepts and microprocessor system analysis are available.



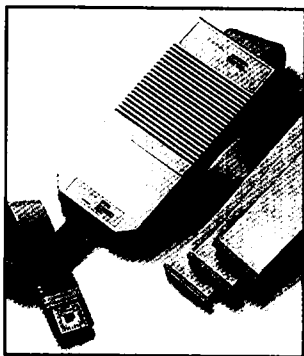
Timing diagram displays up to 16 traces at once. Intensified areas indicate glitches.



Digitizing oscilloscope displays are available for single or dual trace, full-screen trace, and mixed scope and timing diagram traces.



The 1230/1230B supports an extensive list of popular processors and controllers.



Disassembly probes are compact and easy to connect.

MICROPROCESSOR SUPPORT

QUICK AND CONVENIENT CONNECTIONS

These compact microprocessor probes attach to the 1230/1230B in place of the standard acquisition probes. Each probe is preconfigured for fast, efficient connections to the specific microprocessor package (e.g., DIP, PGA, PLCC, or PQFP).

Disassembly probes that begin with the letters DP require the 1230DPA, a universal preprocessor.

AUTOMATIC MENU SETUP

You can completely set up all pertinent menus for the target microprocessor by uploading setups from the disassembly probe. All it takes is one keystroke at power-up. If desired, setups can then be customized for your specific application.

FLEXIBLE VIEWING OF DATA

Acquired data can be viewed in either a state table, timing diagram, or disassembly format. When using disassembly format, two additional modes of display, Hardware and Software, are available.

Hardware mode shows all bus operations by displaying all machine cycles. Software mode shows only instruction cycles, much like an assembly listing.

EXTRA CAPABILITIES

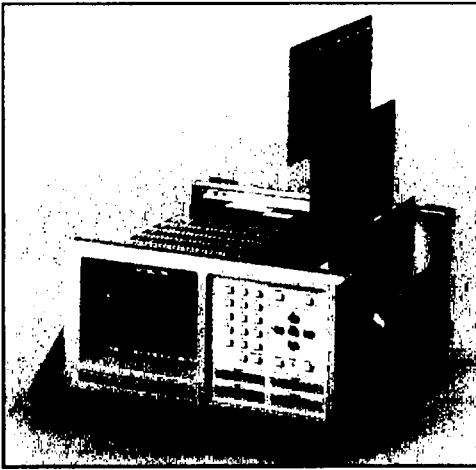
Data searching functions, microprocessor-specific on-screen notes, fast scrolling, and the ability to jump to any memory location are available on all disassembly probes. For processors with pre-fetch queues, instructions that are fetched, but not executed, are clearly marked.

1230/1230B MICROPROCESSOR AND BUS ANALYSIS GUIDE

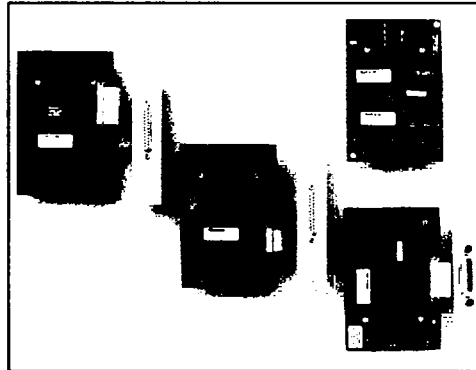
Processor/Bus	Package Style	Disassembly Probe	Channels Required	1230DPA Required
Intel				
8085	DIP	PM404	32	no
8031/8051	DIP	DP8031D	32	yes
8032/8052	DIP	DP8031D	32	yes
8086/8088	DIP	DP8086D	48	yes
80186/80188	PGA	DP186P	48	yes
8096/80C196	PLCC	DP96PL	48	yes
80286	PGA	DP286P	48	yes
80286	PLCC	DP286PL	48	yes
80386SX/387SX	PQFP	DP386SX	64	yes
Motorola				
6800/6802	DIP	PM407	32	no
6809/6809E	DIP	PM406	32	no
68HC11	all	DPHC11	32	yes
68000/68010	DIP	DP68KD	48	yes
68000/68010	PGA	DP68KP	48	yes
68332	PQFP	DP332	64	yes
Other				
Z80	DIP	PM402	32	no
6502/C02/C802	DIP	PM403	32	no
Buses				
GPIB	n/a	DPGPIB ^{*1}	16	yes
		1230 opt 07 ^{**2}	16	no
RS232	n/a	A6740G	8	no
STD	n/a	PM405	32	no

*1 Hardware interface and full disassembly.

**2 Hardware interface without disassembly.



Both the 1230DSM and 1230E1 cards install easily so that you can reconfigure your 1230/1230B in less than five minutes.



Option boards provide a range of additional capabilities and install in minutes. Options include parallel printer port, RS232 and GPIB communication interfaces, and on-line notes in foreign languages.

ORDERING INFORMATION

1230 16-Channel Logic Analyzer **\$2,995**

Includes: P6444 programmable-threshold probe, leadsets and grabber tips, operator's manual, quick reference guide, training video tape, training workbook, training test circuit, power cord

1230B 16 ch Battery-powered Logic Analyzer **\$4,895**
Includes: Same items as 1230 plus +12 V dc cigarette lighter adapter plug

OPTIONS FOR BOTH THE 1230 and 1230B

- Opt. 01 - RS-232 interface and S43R101 PC S/W **+\$495**
 - Opt. 02 - Parallel printer port **+\$195**
 - Opt. 03 - GPIB interface **+\$695**
 - Opt. 04 - International notes (English, German, French Canadian, French, Dutch, Spanish, and Italian) **+\$150**
 - Opt. 05 - Rackmount (1230 only) **+\$495**
 - Opt. 06 - Accessory bag **-\$65**
 - Opt. 07 - GPIB acquisition leadset **+\$195**
 - Opt. 08 - A6740G serial acquisition probe **+\$1,500**
 - Opt. 09 - International notes II (English, Danish, Finnish, Norwegian, and Swedish) **+\$150**
 - Opt. 1D - Delete P6444 probe **-\$600**
 - Opt. 1S - Substitute P6443 probe for P6444 **-\$200**
 - Opt. 20 - Delete video tape **-\$30**
 - Opt. 21 - Service manual **+\$200**
 - Opt. 22 - Service maintenance kit **+\$1,500**
 - Opt. 23 - Substitute VHS-PAL videotape **?**
- Warranty-Plus options are available.

1230E1 16 Channel Expander Card **\$1,200**

Includes: P6444 probe, leadsets and grabber tips
Opt. 1D - Delete P6444 probe **-\$600**
Opt. 1S - Substitute P6443 probe for P6444 **-\$200**

1230DSM 100 MS/s Digitizing Scope Card **\$2,995**

Includes: Two scope probes, operator's manual

LABASIC - Concepts of Logic Analysis Workbook **\$15**

LAGUIDE - Concepts Instructor's Guide **\$10**

LAMICRO - Micro System Debug Workbook **?**

FesTrak Micro Training Package **\$450**

1230C32 32-ch System / Parallel Printer Port **\$4,325**

Includes: 1230 with Opt. 02, one 1230E1 expander card

1230B32 32-ch Battery-powered System/Parallel Printer Port **\$6,025**

Includes: 1230B with Opt. 02, one 1230E1 expander card

FOR BOTH 1230C32 and 1230B32

Opt. 1D - Delete P6444 probes **-\$1,200**

Opt. 1S - Substitute two P6443 probes for P6444s. Additional options are listed below. **-\$400**

1230C48 48-ch System/Parallel Printer Port **\$5,525**

Includes: 1230 with Opt. 02, two 1230E1 expander cards

1230B48 48-ch Battery-powered System/Parallel Printer Port **\$7,225**

Includes: 1230B with Opt. 02, two 1230E1 expander cards

FOR BOTH 1230C48 and 1230B48

Opt. 1D - Delete P6444 probes **-\$1,800**

Opt. 1S - Substitute three P6443 probes for P6444s. Additional options are listed below. **-\$600**

1230C64 64-ch System Parallel Printer Port **\$6,725**

Includes: 1230 with Opt. 02, three 1230E1 expander cards

1230B64 64-ch Battery-powered System/Parallel Printer Port **\$8,425**

Includes: 1230B with Opt. 02, three 1230E1 expander cards

FOR BOTH 1230C64 and 1230B64

Opt. 1D - Delete P6444 probes **-\$2,400**

Opt. 1S - Substitute four P6443 probes for P6444s **-\$800**

ADDITIONAL OPTIONS FOR 1230 and 1230B SYSTEMS

Opt. 01 - RS-232 interface & S43R101 PC S/W **+\$495**

Opt. 03 - GPIB interface **+\$695**

Opt. 04 - International notes **+\$150**

Opt. 05 - Rackmount (1230 only) **+\$495**

Opt. 06 - Accessory bag **-\$65**

Opt. 07 - GPIB acquisition leadset **+\$195**

Opt. 08 - A6740G serial acquisition probe **+\$1,500**

Opt. 09 - International notes II **+\$150**

Opt. 20 - Delete video tape **-\$30**

Opt. 21 - Service manual **+\$200**

Opt. 22 - Service maintenance kit **+\$1,500**

Opt. 23 - Substitute VHS-PAL videotape **?**

Warranty-Plus options are available.

Product available within 24 hours through Tek Direct. Call 1-800-426-2200.

MICROPROCESSOR/BUS ANALYSIS PRODUCTS

- 1230DPA** - Disassembly probe adapter **\$400**
- DP8031D** - 8031/51/8032/52 probe - DIP **** \$700**
- DP8086D** - 8086/8088 probe - DIP **** \$1,500**
- DP188P** - 80186/80188 probe - PGA **** \$1,600**
- DP96PL** - 8096/80C196 probe - PLCC **** \$1,600**
- DP286P** - 80286 probe - PGA **** \$1,600**
- DP286PL** - 80286 probe - PLCC **** \$1,600**
- DP386SX** - 80386SX probe - PQFP **** \$2,200**
- DP332** - 68332 probe - PQFP **** \$2,500**
- DP68KD** - 68000/68010 probe - DIP **** \$1,200**
- DP68KP** - 68000/68010 probe - PGA **** \$1,200**
- DPHC11** - 68HC11 probe **** \$700**
- DPGPIB** - GPIB probe **** \$600**
- PM402** - Z80 probe **\$800**
- PM403** - 6502/C02/C802 probe **\$800**
- PM404** - 8085 probe **\$800**
- PM405** - STD bus probe **\$800**
- PM406** - 6809/6809E probe **\$800**
- PM407** - 6800/6802 probe **\$800**
- A6740G** - Serial acquisition probe **\$1,500**

*1 Requires 1230DPA disassembly probe adapter.

RELATED PRODUCTS

- P6443** - 16-channel TTL/CMOS probe **\$500**
- P6444** - 16-channel Programmable-threshold Probe **\$700**
- S43R101** - 1230/PC RS232 application S/W **\$95**
- 1230F01** - Field-installed RS-232 Interface & S43R101 PC S/W **\$450**
- 1230F02** - Field-installed parallel printer port **\$150**
- 1230F03** - Field-installed GPIB interface **\$650**
- 1230F04** - Field-installed international notes **\$125**
- 1230F05** - Field-installed rackmount hardware (1230 only) **\$450**
- 1230F09** - Field-installed international notes II **\$125**
- K217** - Instrument cart **\$570**
- Opt. 01 - Brown finish (matches 1230) **NC**
- Securing strap - Order 346-0070-03 **\$40**
- SMG50** - 20 SMT grabber tips **\$89**

INTERNATIONAL POWER PLUGS OPTIONS

Opt. A1-A5 - Available for the 1230/1230B **NC**
See page 488 for description.

Logic analyzer accessories are described in the Accessories section of this catalog. Please refer to page 444.

*2 Contact your local sales engineer.