

Agilent 54620A/C Logic Analyzers

Product Overview



Do you use your scope as your primary tool for troubleshooting digital circuits because you feel that your problems are not complex enough for a logic analyzer? Do you wish that your scope had the power of a logic analyzer without the complexity and cost of one?

If so, these are the logic analyzers for you. With familiar scope-like operation and high speed display, these are logic analyzers that you can simply set on your bench and use like your scope. Because you are a scope user, these are the logic analyzers that you already know how to operate.

The Agilent Technologies 54620A/C is designed to be used with your scope to quickly troubleshoot and debug your mixed signal and digital circuits. The 54620A is the choice for tight budget situations. Its monochrome raster CRT display provides bright crisp displays of our logic waveforms. The 54620C adds a full-color active matrix LCD display. With the addition of color, the logic analyzer's 16-channel display is easy to use. Colors can be used to group or highlight channels.

The Agilent 54620A/C offers:

- Scope-like control knobs
- Auto scale for one button set-up
- Trigger Input/outputs for use with your scope
- Automatic measurements of frequency, period, duty cycle, width, channel-to-channel delay, hold time, and set-up time
- Cursor measurements and read-out of waveform values in Hex or Binary
- Edge, pattern, and advanced triggering
- Store/recall of 16 front panel setups with channel labels
- Full-color active matrix LCD display (54620C)
- Monochrome raster CRT display (54620A)
- Optional GPIB or RS-232 remote control
- Optional hard copy to GPIB, RS-232, or parallel printers
- Weight 6.8 kg/15 lb.
- 3-Year Warranty



Agilent Technologies

Innovating the HP Way

- 16 Channels
- 500 MSa/s
- 3.5 ns Glitch Capture
- Simple Scope-Like Operation
- Full-Color Display with 54620C

Scope-like operation

The Agilent 54620A/C logic analyzers are designed for the person whose primary analysis tool is the oscilloscope, but often wishes for the additional power of a logic analyzer. This logic analyzer has a control panel that is very much like that of your scope. Simply turn a knob, much like you would on your scope, to make a change in the time per division or reposition a channel in the display. Analyzer set-up is simplified with a powerful Autoscale operation. Autoscale will turn on and display all channels that have activity. The time base will be set to give an optimally scaled display of all active signals.

Flexible triggering

The simplest and most scope-like triggering is provided in the edge triggering mode. The pattern mode extends the triggering to be a pattern of high, low, and "don't care" levels across all 16 of the 54620A's input channels as well as the external trigger input port. This pattern can be qualified

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with an edge. For those applications where more triggering power is needed to isolate the event of interest, the Advanced trigger mode is available.

High speed display

An important consideration of a troubleshooting tool is its ability to clearly display changes in the circuit under test. The 54620A/C employs an advanced four processor architecture, giving you a logic analyzer that can display changing waveforms in your system that would be missed by more traditional analyzers. Another benefit of the high speed display system is that the 54620A/C will respond instantly to your front panel control inputs. This eliminates a source of confusion in your troubleshooting process.

See more with color

The display of 16 logic channels can be somewhat confusing. By the use of color, you can group channels that are displaying related information, or specific channels can be highlighted. For example, address lines can be in one color while control lines are displayed in other colors. Alternate palettes allow the display to be customized for most favorable viewing.

Upgrade to meet your changing needs

You can upgrade the Agilent 54620A logic analyzer to produce hard copies to either printer or plotter Or, you can interface it to a computer with either GPIB or RS-232 interfaces.

Using the HP 34810B BenchLink Scope for Windows, you can easily upload the logic analyzer display to your personal computer for preparing a report, creating a presentation, or storing the analyzer's set-up for later use.

Input Channels	
Number of Channels	16 numbered 0–15
Channel Input Cable	54620-61801 with
·	channels grouped in two
	sets of 8. Instrument
	is compatible with
	0650-61607 cable and
	accessories.
Input R&C	~100k Ω and 8pF
Maximum Input	±40 V
Dynamic Range	±10 V about threshold
Minimum Input	500 mV peak to peak
	about threshold
Minimum Input	To meet timing accuracy,
Voltage Overdrive	the threshold value must
	be within 20% of the 50%
	value of the input signal
Threshold Setting	Threshold levels can be
	assigned to the input
	channels in groups of
	8 channels (0–7 and 8–15)
	and external trigger
Threshold Accuracy	± (13% of setting
	± 100 mV)
Preset Threshold Levels	TTL—1.5 V
	CMOS—2.5V
	ECL-1.3 V
Channel to Channel Skew	2.0 ns typical
	3.0 ns maximum

Horizontal System		
Sweep S <mark>peeds</mark>	1 s/div to 5 ns/div Main & Delayed Sweep Extended to 5s/div with Autoolitch disabled	М
Accuracy	001% of reading Main, Delayed sweeps, and verniers	G
Horizontal Modes	Main, Main and Delayed and post acquisition pan and zoom	

Cursor Accuracy

. >1μs

Single Channel	± (Sample Period + 0.05%
	of reading + 0.2% of
	screen width)
Dual Channel	± (Sample Period + Ch
	to Ch skew + 0.01% of
	reading + 0.2% of screen
	width)
Delay Jitter	10 ppm
Delay Range Pretrig	ger (Negative time)
Maximum delay is in	dependent of time reference
(left, center, right)	
Sweep Speed	Maximum delay
(per division)	divisions
5 ns	3,231
10 ns	1,615
20 ns	807
50 ns	323
100 ns	161
200 ns	80.7
500 ns	64.6
1 us	16

16

DI

Post-Trigger

start of sweep) from 5 ns/div to 1 µs/div-8.829 ms From 2 ms/div to 1 s/div —1,048,575 times sampling period, not to exceed 100 s. Delaved can be as fast as 5 ns/div but must be at least 2X main sweep. Acquired waveforms n may be panned across the display and/or expanded for enhanced viewing by simply changing time/div or delay settings.

(from trigger point to

Acquisition System

Maximum Sample Rate Resolution Simultaneous Channels Record Length	500 MSals Single bit 16 2 k samples at periods of 8 ns and slower (sweep speeds of 1 µs/div to 1 s/div) 8 k samples at sampling
	periods of 2 ns and 4 ns (sweep speeds of 5 ns/div to 500 ns/div), or all sweep speeds when Autoglitch mode is disabled
Maximum Update Rate	15 full screens per second independent of the number of channels being displayed.
Glitch Detect	Automatically activated at all sweep speeds where sampling period is slowed to be greater than 4 ns (1 µs/div and slower). Will detect glitches as narrow as 3.5 ns at all activated sweep speeds.
Trigger System	
-	

Sources	All Channels & External
Auto/ Normai Operation	Auto will produce a
	free running display if
	the trigger is not found.
	Normal causes the
	analyzer to wait
	indefinitely for a trigger
	to start acquiring data.

Modes: Edge, Pattern and Advanced

Edge

Pattern	Analyzer will trigger upon entering a pattern of high, low and don't	Storage Scope	Autostore saves previous sweeps in half bright display and the most	Probe Calibrator	Amplitude 5.0 V, Frequency 9.8 kHz	
care levels on all of t channels and extern trigger input. A sing	care levels on all of the channels and external trigger input. A single		recent sweep full bright display. This allows easy differentiation of	Power Requirements		
	edge (rising, falling, or either) can be ANDed and this pattern.		current and historic information.	Voltage selection Line Voltage Range Line Frequency	Automatic 90 to 250 Vac 48 to 445 Hz	
Advanced	Two unique pattern and edge terms can be combined with operations	Measurement Function	S	Max. Power Consumption	100 VA	
	to create a very specific trigger event.	Automatic Measurements	The analyzer will perform measurements on the	General		
Advanced Operators	And, Or, Then, Entered, Exited, Duration> time, Duration < time, and		selected input channel(s). These measurements are continuously updated.	Environmental Characteristics	Meets the requirements	
F.I. D	Occurs N times. Maximum Occurrence: 2 ²⁰ -1	Single Channel	Frequency, Period, + Width, - Width, and Duty Cycle	onundeenstees	Type III, Class 3, Style D equipment as described	
Eage Recovery	Sweep speeds of 5 ns/div to 1 μ s/div: 28 ns Sweep speeds of 2 μ s/div and	Dual Channel	Channel to Channel delay, Hold-time, and Set-up time.	Ambient Temperature Operating:	below: -10°C to +55°C	
Minimum Detection	sample period 13 ns + Ch to Ch skew	Cursor Measurements	Two cursors can be positioned on the	Nonoperating: Humidity* Operating:	-51°C to +71°C	
Pattern Width	at sweep speeds of 5 ns/div to 1 µs/div.		display to make time measurements or read the value of the wave	Nonoperating:	24 hours 90% RH at 65°C	
	At sweep speeds of $2 \mu ds/div and slower =$ (1 ns + 1 sample period + Ch to Ch skew + 0.01%)		forms at the center. The cursors will track changes in time/div	*Tested to Hewlett-Pac specification section 75	for 24 hours kard environmental 58 for call B-1 products	
Minimum Settable Duration	At all sweep = 2 sample periods of 16 nss, whichever is greater.	C	and delay controls. Readout in Time, 1/Time, Hex, and Binary.	Operating: Nonoperating: Vibration Operating	To 4,500 m (15,000 ft) To 15,000 m (50,000 ft) 15 min along each of the	
External trigger		Set-up Functions			three major axes; 0.025-in peak to peak displacement, 10 Hz to	
Input R & C	~ 1 m Ω and 12 pF.	Autoscale	Selects all active channels and places		55 Hzs in 1 minute cycles. Held at 10 min at	
Maximum Input Trigger Threshold	1007X probes. ± 40 V peak + 6 V, settable in 50 mV		channels not previously displayed will be added below those channels	Shock Operating	30 g. 1/2 sine, T1-ms duration. 3 shocks/axis along major axis. Total	
Increments Threshold Accuracy	+ 100 mV or 6% of setting		already being displayed with the lowest numbered	EMI	of 18 shock.	
Minimum Input Change Minimum Pulse Width	200 mV pp 20 ns		channel at the top. Higher numbered channels will be displayed in order	MIL-T-28800D	Meets the requirements in accordance with	
Trigger Output	Output is a rising edge at the trigger point.		down the display. Sweep speed is set to give an optimally scaled		MIL-1-28800 paragraph 3.8.3 table IX, and MIL-STD-461C	
Output Level	0 to >/=2.0 v into 50Ω 0 to >/=4.8 V open circuit		display of all the active channels. Triggering		CE01 : Part 2 CE03 : Part 2	
Jitter	~ 85 ns ± (Sample period + 10 ppm)		andare not affected. Requires a signal with > 49 Hz frequency.		CS01: Part 2 CS02: Part 2 (limited to 100 MHz)	
Maximum Output Rate	2 kHz with the analyzer stopped, 20/sec running.		Undo Autoscale function returns the instrument	RE01: Part 5 measured	CS06: Part 5 at 6 inches,	
Display System		Save/Recall	to the set-up prior to Autoscale being activated. 16 front panel set-ups	RE02: Part 2 (limited to 14 kHz to 100 kH	1 GHz) 10 dB relaxation,	
Display	54610A: 7" Raster CRT 54620C: 5.8"	Trace Memory	can be stored and recalled from nonvolatile memory. Two volatile pixel memo-	14 kHz to 1 GHz. This product meets the	requirement of the	
Resolution	active matrix color LCD 256 Vertical by 500 Horizontal points		ries allow storage of trace display waveforms.	European Communities 89/336/EEC.	(EC) EMC Directive	
Controls Graticule	Front panel intensity control Selectable 8 x 10 grid frame, or none	Channel Labels	Each channel may be identified with a six character label. Labels can be created from a	Emissions: EN55011/CISPR (ISM, Group 1, Cl	11 ass A equipment)	
			front panel label genera- tor and a library of up to 75 present and user defined labels.		3	

Immunity			
EN50082-1		Code ¹	Notes ²
IEC, 801-2 (ESD) 4kV CD, SkV AD		1	А
IEC 801-3 (Rad.) 3V/m		1	А
IEC 801-4 (EFT) 1kV	1	В	
Size			
Height:	172.7 mi	n (6.8 in	ı)
Width:	322.6 mi	n (12.7 i	in)
Depth:	317.5 mm (12.5 in)		
Weight:	6.8 Kg (15 lb)		
Safety	Self-cert	ified to	IEC
-	348/HD4	401, UL	1244,

CSA-C22 No. 231

(series M-89)

¹Performance Code

1 PASS—Normal operation, no effect.

- 2 PASS—Temporary degradation, self-recoverable.
- 3 PASS—Temporary degradation, operator intervention required.

4 PASS—Not recoverable, component damage.

²Notes

A TTL logic threshold with all cables disconnected. B TTL logic threshold with GPIB cable connected.

Ordering Information

54620A 16-channel 500 MSa Logic Analyzer
(supplied with 16-channel input cable assembly, User and Service Guide, as specified by language option) and line cord
54820C Color 16-channel 500 MSa Logic Analyzer
(supplied with 16-channel input cable assembly, User and Service Guide, as specified by language option) and line cord

Manual Language Options (please specify one)

ABA US English	ABF French	ABO Taiwan Chinese
ABD German	ABJ Japanese	AB1 Korean
ABE Spanish	ABZ Italian	

Instrument Options

Opt. 101 Accessory Pouch and Front Panel Cover Opt. 103 54654A Operator's Training Kit consists of a training signal board and lab workbook Opt. 104 1185A Carrying Case (designed to protect the instrument for shipment or checking as airline baggage) Opt. 106 HP 34810B BenchLink scope software. Windows software that interfaces the instrument (with a GPIB or RS-232 module installed) to a PC for storage, analysis, or easy integration of trace images into popular desktop publishing software. Opt. 001 RS-03 Magnetic shielding (added to the CRT) (not compatible with the 54620C) Opt. 1CM Rackmount Kit, seven-inch EIA standard rack mount p/n 5062-7345, compatible with fixed or pivoted slides

Optional Accessories

54650A GPIB Interface Module
54652 RS-232 and Parallel Interface Module
10070A 1.4 m 1X oscilloscope probe
10071A 1.5 m 150 MHz 10X oscilloscope probe
10072A probe adapter kit for 1007X Probes
01650-61607 16-Channel Woven Probe Cable, compatible with
1251-8106 20-pin header
01650-61608 16-Channel Probe Lead Set for use with 01650-61607 cable
E2421A SOIC Clip Adapter Kit
E2422A J lead plastic lead clip carrier test kit

Agilent Technologies' Test and Measurement Support, Services, and Assistance

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Our Promise

"Our Promise" means your Agilent test and measurement equipment will meet its advertised performance and functionality. When you are choosing new equipment, we will help you with product information, including realistic performance specifications and practical recommendations from experienced test engineers. When you use Agilent equipment, we can verify that it works properly, help with product operation, and provide basic measurement assistance for the use of specified capabilities, at no extra cost upon request. Many self-help tools are available.

Your Advantage

"Your Advantage" means that Agilent offers a wide range of additional expert test and measurement services, which you can purchase according to your unique technical and business needs. Solve problems efficiently and gain a competitive edge by contracting with us for calibration, extracost upgrades, out-of-warranty repairs, and on-site education and training, as well as design, system integration, project management, and other professional services. Experienced Agilent engineers and technicians worldwide can help you maximize your productivity, optimize the return on investment of your Agilent instruments and systems, and obtain dependable measurement accuracy for the life of those products.

Get assistance with all your test and measurement needs at: www.aqilent.com/find/assist

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