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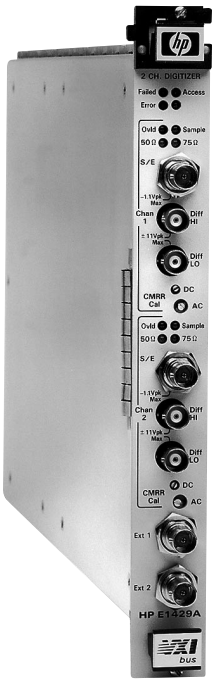
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Find the *Keysight / Agilent E1429A* at our website: ***Click HERE***

20 MSa/s Digitizer
HP E1429B

Technical Specifications

- **0.05 Sa/s to 20 MSa/s sample rate, 12-bit resolution**
- **2 channels of 512 kSa/channel, segmentable memory**
- **Built-in test**
- **Local Bus capability**
- **Message-/register-based programming supported**



Description

The HP E1429B digitizer is a **C-size, 1-slot, message-based VXI module.** It makes 12-bit, 20 MSa/s measurements, and contains two analog channels, memory, timebase, and data paths. The HP E1429B is functionally identical to the HP E1429A, except the E1429B supports local bus.

Ideally suited for transient signals, the HP E1429B's arm/trigger circuits can be programmed to wait for the transient to occur. Up to 128 pre- and post-arm data sets can be stored in its segmentable memory. If power is lost, the HP E1429B keeps the data intact in its non-volatile memory. Both message- and some register-based programming is supported by the HP E1429B.

SCPI commands are used to program at a high level. Register-based reads and writes are supported for high-speed data-only access. An on-board voltage reference is used to verify that the HP E1429B is operational. Attenuators, amplifiers, A/Ds, memory, timebase, and digital circuits are tested upon power-up and upon receipt of the *TST command. The normal path for retrieving data is the VXI data transfer bus. An alternate higher-speed data path over the VXI Local Bus is available on the HP E1429B.

Refer to the HP Website directory of addresses (URLs) for instrument driver availability and downloading instructions.

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Analog

Each channel has its own analog electronics, including signal conditioning and A/D converters. By providing separate paths, the input gains and impedances can be matched to the incoming signals.

A differential and a single-ended input on each channel allow a mix of signal types to be connected. The differential inputs offer a high impedance to minimize circuit loading, while the single-ended inputs can be programmed for 50 or 75 Ω to match source impedances.

Memory

A segmentable, battery-backed memory is dedicated to each channel. Up to 128 segments can be defined to allow multiple pre- and post-arm events to be captured. When using the pre- and post-arm mode, the HP E1429B loops within a segment until it records the programmed number of post-arm readings. The HP E1429B will then move to the next segment and wait for the next arm. The single ported memory (not FIFO) can be read after the measurements have taken place.

A replaceable battery preserves readings in memory when power is lost. The data will still be intact even when the HP E1429B is removed from the mainframe.

Time Base and Triggering

Both channels sample at the same time. The sample rate can be driven by internal or external timebase references. These references can be divided to provide variable sample rates up to 20 MSa/s in 1-2-5 steps. Dual sample rates can be used in the pre- and post-arm mode, wherein the sample rate changes upon receipt of an arm event.

Arm and trigger signals can be generated internally or received from a variety of sources on the VXI backplane and the faceplate BNCs. In addition, the arm and trigger signals can be sourced by the HP E1429B to synchronize multiple instruments.

Data Paths

The normal path for retrieving data is the VXI data transfer bus. An alternate higher-speed data path over the VXI Local Bus is also available on the HP E1429B.

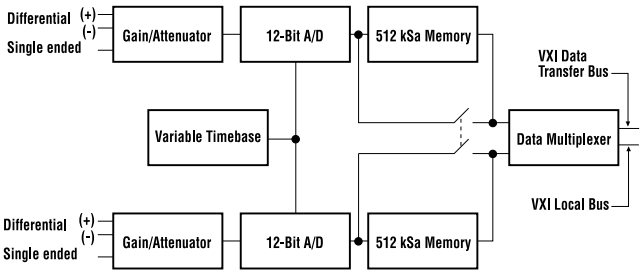
The HP E1429B uses VXI Local Bus according to a protocol common to several VXI products. With this protocol, data is transferred at very high speeds into modules such as the HP E1488A Instrument Memory. Other Local Bus compatible products are the HP E1430A, HP E1431A, HP E1432A, HP E1485A, and HP E1488A.

Programming

Both message- and some register-based programming is supported by the HP E1429B. SCPI commands are used to program at a high level. Register-based reads and writes are supported for high-speed data-only access.

Built-in Self-Test

An extensive self-test uses an on-board voltage reference to verify that the HP E1429B is operational. Attenuators, amplifiers, A/Ds, memory, time-base, and digital circuits are tested upon power-up and upon receipt of the *TST command. By running the self-test, you gain a high degree of confidence that the HP E1429B is operational.



HP E1429B Block Diagram

Specifications

In accordance with IEEE Std. 1057 Trial-Use Standard for Digitizing Waveform Recorders. This document available from IEEE.

General

Number of channels:	2
Built-in DSP:	No
Alias protection:	Oversample
Basic accuracy:	0.5%
Low-Frequency CMRR:	68 dB
Variable bandwidth:	External Filters
2 dB Input range headroom:	No
Dual-Ported memory:	No
Dual-Rate sampling:	Yes

Sampling

Resolution:	12 bits, including sign
Effective bits:	10 bits at 100 kHz; 9.5 bits at 10 MHz *(typical on 1V range, 50 Ω input, full scale input)*
Sample rates:	0.05 to 20 MSa/s
Sample sequence:	1-2-5
Dual sample rate:	switches between programmed rates upon receipt of arm

Memory

Memory:	512 kSa/channel, battery-backed
Segmented memory:	yes

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Input

Input impedance: 50 or 75 Ω single-ended and 1 MΩ||20 pF differential *(both inputs on each channel, DC coupled nominal)*

Signal ranges: 50/75 Ω: 0.1 V to 1 V; 1 MΩ: 0.1 V to 100 V in 1-2-5 steps

Bandwidth: 50 MHz @ 1 V single-ended, 5 MHz @ 10 V differential, typical

Filtering: 10 MHz nominal, 2-pole Bessel, switchable

Signal to noise ratio: −62 dB typical

Time Base

Internal reference: 20 MHz, ±50 ppm, <25 ps rms jitter typical

Reference sources: internal crystal, faceplate BNC, CLK 10, and ECLTRG

Timebase resolution: 50 ns

Arm and Trigger

Each trigger event chuases one A/D conversion in both channels; each Arm event allows acquisition of a burst of one or more dual-channel A/D conversions.

Programmable arm delay: 50 ns to 32 ms using internal 20 MHz reference *(derived from reference)*

Pre-arm capture: yes

Readings per arm: 1, 7 or 16,777,215, or continuous post-arm; 0 or 3 to 65,535 pre-arm

Re-arm rate: up to 2 MHz *(non-segmented memory)*

Arm sources: internal, faceplate BNC, input voltage level, TTLTRG, and ECLTRG, and logical OR of any two signals

Trigger: on event

Trigger (sample clock) sources: internal, VME read, faceplate BNC, TTLTRG, and ECLTRG

ECLTRG functions: arm, trigger, and reference *(input and output)*

TTLTRG functions: trigger and arm *(input)* arm and ready for trigger *(output)*

Connectors

EXT1 faceplate BNC: arm and trigger (input)arm, trigger and reference (output)

EXT2 faceplate BNC: trigger and reference *(input)*

Backplane Connector Shielding

To ensure compliance with RFI levels specified in standards EN55001 and CISPR11, this product requires the Backplane Connector Shields installed in an HP VXI C-size mainframe. Option 918 is available with the purchase of a new HP mainframe; accessories, HP P/Ns E1400-80920 and E1421-80920, are available for retrofitting existing HP mainframes HP E1401A/B and HP E1421B respectively (one accessory per mainframe required).

VXI Characteristics

VXI device type: Message-based

Data transfer bus: A24 slave;A16/A24, D8/D16, D32 data read only

Size: C

Slots: 1

Connectors: P1/2

Shared memory: n/a

VXI busses: Local Bus A-row (left), Local Bus C-row (right), TTL Trigger Bus, ECL Trigger Bus

C-size compatibility: Yes

Instrument Drivers

See the HP Website (http://www.hp.com/go/inst__drivers) for driver availability and downloading.

Command module firmware: n/a

Command module firmware rev: n/a

I-SCPI Win 3.1: n/a

I-SCPI Series 700: n/a

C-SCPI LynxOS: n/a

C-SCPI Series 700: n/a

HP VEE Drivers: Yes

VXI*plug&play* Win Framework: Yes

VXI*plug&play* Win95/NT Framework: Yes

VXI*plug&play* HP-UX Framework: No (not available at time of publication)

Module Current

	I_{PM}	I_{DM}
+5 V:	3.1	0.5
+12 V:	0.2	0.04
−12 V:	0.2	0.04
+24 V:	0.1	0.05
−24 V:	0.1	0.05
−5.2 V:	4.1	0.05
−2 V:	1.3	0.12

Cooling/Slot

Watts/slot: 41.50

ΔP mm H_2O: 0.80

Air Flow liter/s: 3.80

Ordering Information

Description	Product No.
20 MSa/s, 12-bit digitizer w/ local bus	HP E1429B
3 yr. retn. to HP to 1 yr. OnSite warr.	HP E1429B W01
SHIELD, BACKPLANE CONN	HP E1400-80920
VXI BACKPLANE CONN SHLD KT	HP E1421-80920

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