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HP E3211S
Data Recorder/Analyzer

Product Overview

Powerful, easy-to-use data capture and analysis system using VXI hardware

Capture, view and analyze vibration data with confidence

HP RADI-EPC7 embedded 486 PC running Windows 3.1, manages the user interface and provides computational power for data capture and analysis.

Each HP E1431A input module accommodates up to 8 inputs, each with 16-bit dynamic range resolution and sampling rates from 1 to 65,536 samples per second per channel.

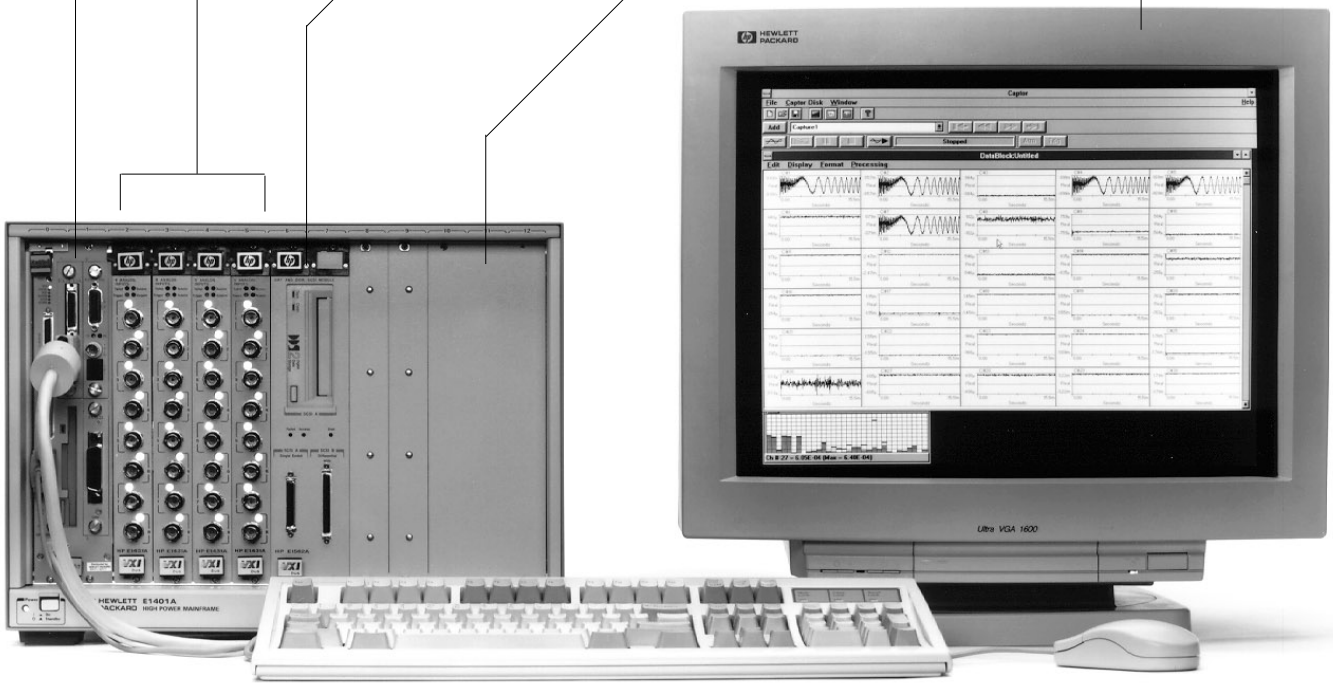
Choice of HP E1562A storage module (includes 2.1 GB disk drive and 4 GB DAT drive for convenient data backup) or HP E1562B (includes two 2.1 GB disk drives).

Industry-standard VXI platform and off-the-shelf components protect your investment.

Choice of HP E1401B 13-slot mainframe (for systems up to 64 input channels) or HP E1421A 6-slot mainframe (for systems up to 16 channels).

Optional HP BANC-350 IRIG-B module provides standard time-coding for captured data (not shown).

Selection of monitors including a 21-inch color monitor.



- Replaces conventional analog and digital instrumentation tape recorders
- Up to 64 channels of simultaneous recording at real-time, sustained rates of more than 6.0 Mbytes/second—without losing a byte of data.
- Simultaneous monitoring and recording lets you verify that the data you're collecting is the data you need.
- Built-in signal conditioning minimizes need for external equipment
- Fast sample rates and >80 dB dynamic range for accurate recording of transient events
- FFT noise floor less than -90 dB, channel-to-channel crosstalk less than 125 dB, and outstanding channel-to-channel phase match
- Powerful FFT and programmable math functions for complete, post-capture data analysis
- Flexible, Microsoft® Windows interface lets you edit, annotate, and print captured waveforms or export them to popular PC-based applications programs

Today's complex vibration measurements require reliable, accurate data capture. If your job is to capture that data—or to analyze it—you need an instrumentation recorder that delivers results you can trust.

Introducing a new kind of data recorder

The HP E3211S Data Recorder/ Analyzer doesn't look like a tape recorder. And it doesn't record like one either. It's more accurate, easier to use, and a lot less finicky than data-capture systems built around analog or digital tape recorders.

The HP E3211S combines efficient data capture techniques with easy waveform manipulation. You can use it to capture data, view results, and document tests. Typical applications include transient signal analysis, electrical and mechanical measurements, and general data recording and archiving.

Move beyond analog tape recorders

For years, HP made some of the best analog instrumentation recorders around (and we've heard that more than a few are still in use). So nobody knows the limitations of analog data recording more than we do.

We know about amplitude and frequency errors, distortion, and limited frequency response and dynamic range. We know about wow and flutter. And we know how time-consuming it is to keep everything calibrated, particularly with FM recording.

Move beyond digital tape recorders

Digital recording offers superior dynamic range, lower distortion, and greatly improved amplitude, phase and frequency accuracy. That's why many data-capture systems now use multi-channel digital tape recorders.

But most of these digital audio tape (DAT) machines were designed for the music industry—they were never intended to work as instrumentation recorders. Consequently, they typically require external anti-aliasing filters to avoid errors when making dynamic measurements.

And if you want to post-process your taped data with an analyzer, you have two unpleasant choices. You can try to make a tricky direct to digital connection between the tape recorder and your analyzer. Or you can use the tape machine's DAC to convert the signal back to analog, then measure it again with the analyzer, which will use its ADC to convert back to digital. (If you're counting, that's three trips between analog and digital.)

With the HP E3211S, you can perform signal analysis directly on the stored digitized data, bypassing all these conversion steps and their errors.

In other words, why use a digital DAT recorder that's more suited to recording pop music than critical vibration data?

Capture data with confidence, then share it

Lighten your load on test day

Capturing data for complex mechanical measurements hasn't been easy. You've got more important things to worry about than keeping track of extra equipment—and there's usually lots of it required, since most data recording jobs require transducers, signal conditioners, amplifiers, monitor scopes, tape recorders and strip chard recorders (all of which need to be calibrated and checked beforehand). Documenting your test session gets much simpler also. Your engineering units need be entered once and your test notes can be typed in with the event data and saved with the measured data.

With a flexible input configuration and built-in signal conditioning, the only equipment you'll need are your ICP® transducers and the HP 3211S.

Stop the bad data

How many times have you captured data from a complex, expensive test only to discover that a transducer fell off during the test and nobody noticed? (And now it's too late to repeat the test.)

Have you ever worked through the calculations realizing how expensive it is to repeat a complex, all-day vibration test because the signals weren't captured properly the first time around?

With the HP 3211S, you can monitor signals while capturing them to disk. If you see a problem, it's easy to halt the measurement session so you can fix the anomaly.

Share the good data

All too often, critical analysis of complex data is slowed because the raw data simply isn't available to those who need it. With the HP E3211S, data can be easily stored, re-used, and exported (across the room or around the world). So you can examine captured data as often—and as quickly as you need.

Store your data in a standard format

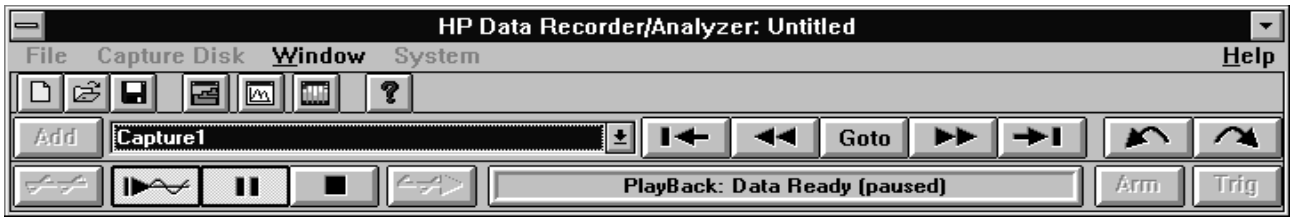
The best data in the world is useless if nobody can read it. Unlike some digital recorder formats, the HP E3211S stores data to disk in SDF (Standard Data Format). Leading third-party software vendors such as LMS and SDRC support the Hewlett-Packard SDF. Additionally, conversion routines are available to convert SDF to other popular formats such as Matlab, ASCII and others.

Recording duration times (real-time) using HP E3211S Data Recorder/Analyzer (Time in minutes)

SPAN Hz	Sampling Rate S/S	Number of Active Channels (using HP E1431A 8-Channel Modules) 8	16	24	32	40	48	56	64
25600	65536	31.7	15.85	10.57	7.93*	6.34*	N/A	N/A	N/A
12800	32768	63.4	31.71	21.14	15.85	12.68	10.57	9.06	7.93
6400	16384	126.8	63.42	42.28	31.71	25.37	21.14	18.12	15.85
3200	8192	253.7	126.84	84.56	63.42	50.74	42.28	36.24	31.71
1600	4096	507.4	253.68	169.12	126.84	101.47	84.56	72.48	63.42
•	•								
•	•								
•	•								
0.39	1.0								

* Requires the dual disk HP E1562B

Find data quickly, then view it and analyze it



Main user interface control window for the HP E3211S system.

Locate captured events quickly

With analog data recorders, finding a captured event is a real challenge. You have to wind or rewind the tape near the proper location, hoping that you correctly noted the readout from the mechanical counter. And if you didn't have the correct counter number (or forgot to set the counter in the first place), it might take hours to find just one event.

Of course, with analog recorders, you could dedicate a channel for voice recording and voice record the event status or record the IRIG-B time code signal, but finding the data of interest is still time consuming

With digital tape recorders, locating captured events is much easier. But you still have to shuttle the tape to find the event—and that can waste a lot of your time, particularly if the events are widely scattered. Now there's a better way to find recorded events. The HP 3211S is disk-based, so random-access searches are practically instantaneous. If something interesting happens while you're recording, simply click the mouse to register an event marker. Then when you're ready to review the data, another mouse click will take you right back to that event. And with the optional IRIG-B time code module, you can find what happened relative to the IRIG-B time reference.

View the data, then document it

There's more to data recording than simply capturing raw data. You need easy ways to examine captured waveforms and document your test results.

With the HP 3211S, you control how much data gets displayed—from 1 to 64 channels on the screen at once. You can also select the block size to adjust the amount of detail you'll see.

Because you're already running in Microsoft Windows, it's easy to select and print captured waveforms or export them to popular word processors or other applications programs. That means you can spend a lot less time learning the system software and a lot more time turning your captured data into information.

Analyze captured data with precision

The HP E3211S is more than just a fast, dependable data recorder. It's also a powerful and flexible data analysis system. Choose from the many FFT and programmable math functions to customize comprehensive, post-capture measurement routines.

System overview

Mainframe

Larger systems require the HP E1401B 13-slot VXI mainframe. This can accommodate up to eight input modules (each of which have 8 channels) for a total of 64 channels.

Smaller systems can use the HP E1421A 6-slot VXI mainframe. This can accommodate up to two input modules for a total of 16 channels (if an IRIG-B timecode module is installed, only one input module can be used for a total of 8 channels).

Input modules

The HP E1431A is an 8-channel, 25.5 kHz input module with outstanding features:

- Frequency spans from 0.39 Hz to 25.6 kHz in 2X steps (sampling rates from 1 to 65,536 samples/sec)
- Choice of differential or grounded input settings, ac/dc coupling, and power for ICP accelerometers
- Input ranges from 5 mVpk to 10 Vpk in 1, 2, 5 steps
- 1 MΩ input impedance (single-ended) or 2 MΩ (differential mode)
- Channel-to-channel phase match better than ±1.0 degree (25.6 kHz span) and ±0.5 degree (12.8 kHz span)
- 16-bit dynamic range resolution, with 16K sample FIFO per channel
- 80 dB spurious-free dynamic range

Data storage

Depending on your application, choose either the HP E1562A or the HP E1562B storage modules. Both feature sustained throughput to disk to ensure gap-free recording of critical events.

The HP E1562A contains a single 2.1 GByte disk drive and 4 GByte DAT drive for convenient backup of captured data. The HP E1562B contains two 2.1 GByte disk drives. Both have a dual SCSI-II interface. Note that the dual disk version doubles throughput peformance.

Data backup

If your system includes the HP E1562A storage module, you can use its internal DAT drive to back up critical data (from an individual file to the entire disk).

For systems with the HP E1562B storage module (which does not include a DAT drive), you can back up data by transferring it to an external storage device connected to the host PC.

Time coding

If your application requires precise, absolute time-stamping of captured data, you can install the optional HP BANC-350 IRIG-B module. Note that on 6-slot mainfraines, this reduces the number of input channels because it replaces an input module.

System controller and software

To integrate the HP E3211S Data/Recorder Analyzer, the HP RADI-EPC7 486 PC module manages the user interface and provides the computational power for data capture and analysis. See HP publication 5963-6698E for additional information on the HP RADI-IPC7A.

Other specifications

For more detailed specifications about components used in the HP E3211S, see the following documents:

- For specifications on the HP E1431A 8-channel 25.6 kHz input module, refer to HP publication 5963-2308E
- For information on the HP E1562A/B disk storage modules, refer to HP publication 5963-2319E and 5963-2320E
- For information on Hewlett-Packard DSP Engine Software and related VXI software, refer to HP publication E5962-0020E

Ordering Information

Contact your local Hewlett-Packard representative or the HP VXI Catalog p/n #5963-3718E for the latest HP E3211S configuration information. In general, order one product from each of the following groups:

Mainframe

HP E1401B 13-slot VXI mainframe or HP E1421A 6-slot VXI mainframe.

Storage Module

HP E1562A or HP E1562B disk storage module.

Monitor

Consult your local Hewlett-Packard representative.

Input Module

HP E1431A input module (order one to eight modules).

Controller

HP RADI-EPC7 486 PC module with Option 821 (EPConnect).

Additional options include:

- larger disk
- faster CPU clock
- additional RAM

Order only if needed:

HP BANC-350 IRIG-B Time-code generator/reader. This module requires:

HP E1407A C-size VXI module adapter.

Compatible Products

Data captured with the HP E3211S system is compatible with HP 35659A Data Viewer. Use the HP Data Viewer to prepare plots for effective reports and presentations or use it to view, format and compare data form different tests and instruments. This compatibility is achieved by using HP's standard data format (SDF).

The HP E3211S Data Recorder/Analyzer can also export data in a form that is directly compatible with spread sheet programs such as Microsoft Excel.

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For more information on Hewlett-Packard Test & Measurement products, applications or services please call your local Hewlett-Packard sales offices. A current listing is available via Web through AccessHP at http://www.hp.com. If you do not have access to the internet please contact one of the HP centers listed below and they will direct you to your nearest HP representative.

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