

REF TEK 125A "TEXAN" MINIATURE SEISMIC RECORDER SPECIFICATIONS



Model	125A-03 (P/N 97101-00)
Mechanical	
Size	3" (7.6cm) diameter x 7.7" (19.6cm) length
Weight	<2.5 lbs (1.1 kg) including 2 "D" cell alkaline batteries
Operating Temperature	-40°C to 60°C
Watertight Integrity	Water immersion without leaking in 2m water (48 hours), air tight to 2.5 psi
Shock	Survives 1m drop on any axis
Power	
Internal Voltage:	"D" cell alkaline, two required 1.6 VDC – 3.0 VDC
Internal Current:	50 mA – sleep 25 mA – standby 125 mA – operating
External Voltage:	5 – 15 VDC
External Current:	50 mA @ 12V
A/D Converter	
Input Impedance	2 Mohms, 0.2 uFd, differential
Common Mode Rejection	>70 dB
Gain Selection	Variable Gain x4 – x256 (by factor of 2)
Full Scale Input	5 Vpp – 78.125 mV (by factor of 2)
Type	Δ - Σ modulation, 256 KHz base rate
Sample Rate	1000, 500, 250, 200, 125, 100, 50 sps
Data Storage	
Word Size	24-bit two's-complement (3 bytes per sample)
Storage Type	Hi-Speed USB Flash Drive
Capacity	256, 512 MB
Trigger for Crustal Studies	
Description	Recording windows are programmed by the host PC as start and stop time
Time Trigger	1000 trigger times may be programmed
Record Length	A minimum of 1 second to maximum time that will fill the data storage
Time Base	
Frequency	2.048 MHz, electronic control
Stability	\pm 0.1 ppm from 0 to 50°C; \pm 0.3 ppm from -20 to 0°C
Host Interface	
Type	USB 2.0 for command / control, data upload, firmware download

Ordering Information	
Part No.	Description
97101-00	125A-03: Miniature Seismic Recorder, Texan
97159-00	125A-HUB: Hub, Assembly, 15 Ports, USB
97160-00	125A-GPS-DISTRIBUTION: Distribution Box, 130 GPS to 125A-HUB
97158-00	125A-TRANSCASE: Transcase, 15 Texans, no electronics
97161-00	125A-PC INTERFACE: Interface, PC to three 125A-HUBs
97190-06	125-8080: Assembly Cable, 125A External Power, 6' (1.8m)
97150-00	130-GPS Receiver/Clock
97163-00	130-8015-33: Cable, 130 to GPS, 33 ft. (~10m)
97169-00	130-8039A: Power Cable AC w/Ext. Bat., A&B
97267-00	Connector, U229-U, 5 Pin
97143-00	OPSDOCSET/CD-125A: Manual, Operations Reference, 125A, CD



KEY FEATURES:

- Low Power 24-Bit ADC:
- Powered from 2 "D" Cell Batteries
- Small, Lightweight
- Sealed Aluminum Case
- Solid-state Data Storage
- Time Base Stability 0.1 ppm
- GPS Synchronization
- Industry Standard Hi-Speed (480Mbit) USB2.0 Interface

APPLICATIONS:

- Active Source Crustal Studies:
- Refraction and Reflection
- Exploration 3-D Noise Testing
- Tomographic Arrays
- Aftershock Studies
- Micro-Zonation Survey



Model 125A-03

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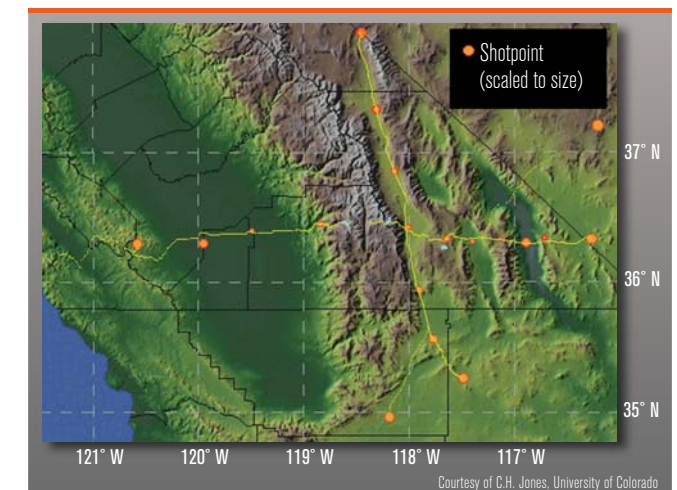
The REF TEK 125A Miniature Seismic Recorder "Texan" is an important advancement in the seismology industry. The Texan's self-contained, compact design allows greater flexibility and the ability to easily integrate into system operations.

In crustal scale refraction experiments, hundreds of instruments are deployed over several hundred kilometers for two to four days duration. Recordings are made based on pre-set time windows at a rate of 100 samples per second (sps).

Because explosions are typically being recorded, a maximum of 50 time windows of 120-second duration will also be recorded.

The Texan's data storage requirement for this application is about 2 MB. Timing accuracy for the four day period must be within \pm 5 msec relative to the shot time.

For crustal scale reflection experiments, instruments are deployed for three to five days with six to eight hour continuous recordings using a vibrator energy source. After each day's recording, data is downloaded, and the Texan is initialized for the next day's recording. Because the data may be stacked, time accuracy must be within \pm 2 msec.



This topographic map shows a typical active crustal studies experiment plan.



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Related REF TEK Sub-systems:

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 Strong Motion Accelerographs, 130-SMHR & 130-SMA
 Accelerometers, 147-01 & 131B
 Broadband Seismometers, 151B-120, 151B-60, 151B-30
 Advanced Seismic Networks

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System Operation

The self-contained Texan features a low-noise differential input amplifier, 24-bit analog-to-digital converter (ADC), solid-state data storage, and batteries, all in a sealed aluminum case. Up to 15 Texans are stored, setup, and transported. For setup, the Texans are connected to a hub that provides power, connection to the host computer via Hi-Speed USB2.0, and timekeeping signals from a GPS receiver.

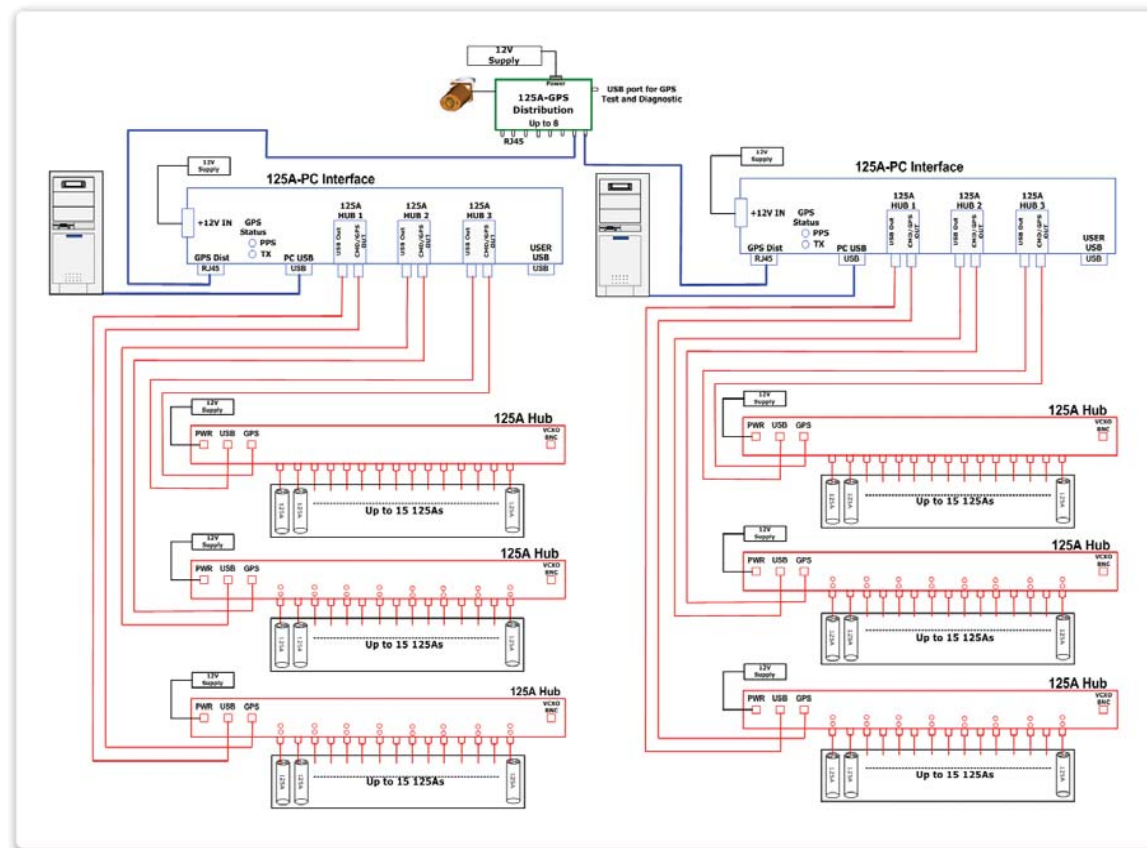
The hub provides several important functions:

1. The hub provides for 15 Texan connections, a connection to the USB host, and one port for daisy-chaining additional hubs. Several hubs can be operated in parallel allowing simultaneous connection between a single host computer and numerous Texans.

2. Routes the 130-GPS Receiver/Clock signals to each Texan for synchronizing internal time to UTC and precisely setting the internal oscillator frequency.

3. Supplies power to the Texans for setup and data retrieval.

After setup, the Texans are deployed for recording. A state LED displays the operating condition of the Texan. This feature clearly informs the user that the battery voltage is sufficient, time is set, the acquisition program loaded, and the unit is either ready to acquire or is acquiring data. During the recording session, the Texan can be retimed or data may be downloaded to a laptop PC. At the conclusion of the experiment, the Texans are returned to the setup facility, retimed, and the data downloaded to the workstation for processing.



Water geyser from under water explosion during CTBT tests in Wyoming, summer 1997.



Drilling shot holes during Polonaise experiment, May 1997.

How The Name "Texan" Came About

The Miniature Seismic Recorder is a joint project between the Texas Universities Seismic Instrumentation Alliance¹ with funds from the State of Texas Advanced Technology Program thus the name "Texan." In addition, support is provided by IRIS/PASSCAL² and several Texas-based energy companies.

¹ The Texas Universities Seismic Instrumentation Alliance includes the University of Texas at El Paso, Rice University, and the University of Texas at Dallas.

² Program for the Array Seismic Studies of the Continental Lithosphere under the Incorporated Research Institutions for Seismology, an international consortium with 100 member institutions.



Demonstrating the installation of a 125A station.