

AUTONOMOUS RECORDER FOR DATA ACQUISITION IN HARSH ENVIRONMENTS

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ABSTRACT

The paper describes setup and test results of an autonomous shock resistant data recorder which addresses the existing need for reliable data acquisition in the harsh environment of strong blast loading. The recorder offers programmability for sampling rate, trigger level and pretrigger value. It features a 12 bit amplitude resolution, a maximum sampling rate of 210 kS/s, and a storage capability of 16.000 data points. The overall acquisition time varies from 75 ms to 150 s, depending on sampling rate and internal software. The recorder itself occupies a volume of only about 12 cm³. Shock resistance of the electronics was demonstrated in an analog version of the system against loads of more than 100,000 g.

As no cabling is required, the recorder offers extreme flexibility with respect to relocation. Furthermore, band width limitations and susceptibility to disturbances are minimized. The recorder can easily be programmed on-site, if required. And due to the integration of a nonvolatile RAM, data may be recovered days or even years after test performance, in case the system is buried in debris.

Setup and main features of the recorder will be presented along with test measurements verifying the working principles under extreme conditions.