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SMAD (Modular Data Acquisition System): The New Digitizer from France for Waveform Technologies

CEA/DASE has developed a new digitizer for waveform technologies. It is compatible with all CTBT specifications and requirements, including authentication and command & control / PKI. It allows digitizing 1 to 4 channels at 8, 20, 50 or 100 sps. The full scale input range can either be 40, 20,10 or 5 Vpp. Data are time tagged by GPS, authenticated by using DSS (1024 bits) or ECDSA and sent in CD1.1. Command & Control, including key management, is implemented through authenticated e-mails and ssh. The SMAD has an average power consumption of 5.5 Watts. For very remote sites that does not require authentication, a low power version (1W including UHF telemetry) is available. Thanks to PTS support, the digitizer was successfully tested at SNL for seismic application in 2012. The purpose of this evaluation was to perform system noise analysis with estimates of system band-width dynamic range for an STS2 application and to determine the following device specifications: bitweight, input terminated noise, bandwidth limited dynamic range, power consumption, common-mode rejection, cross-talk, analog bandwidth, relative transfer function, total harmonic distortion, time-tag accuracy, statistics, and drift. The test results were in response to static and to tonal-dynamic input signals.

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