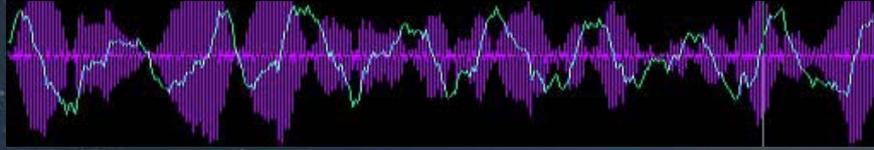




Digital smart scope for solitary sensor readout



www.nikhef.nl

Argentina
Malargue



Nikhef has produced a four channel low-power rugged 200 MSPS digital oscilloscope. The unique properties of this device are a fully programmable trigger logic, combined with remote readout and steering capabilities.

Triggered signals are time marked by a GPS module and have a relative time precision less than 3ns. This makes it possible to merge the data of several oscilloscopes, no matter where they are located on the globe.

The communication to the oscilloscope uses standard ethernet, and uses the Voipac PXA270 DIMM Module as an interface between the ethernet communication and an FPGA which serves as the main readout steering module. The DIMM Module does not only handle the uploading of new firmware into the FPGA, but also takes an active part in the triggering of the readout through the internet.

The combination of FPGA and CPU creates an extremely flexible data acquisition module which is easily configurable by end users. Therefore, this module is an ideal unit in a research environment. The development of this unit is aimed at a distributed setup in Argentina. The purpose of which is to measure the radio signal between 30 and 80 MHz of cosmic-ray induced showers. This measurement requires a huge amplification of the measured signal (about 50 dB) as well as a smart noise reduction algorithm. Furthermore the location of the experiment, away from power lines at 1400 meter altitude, makes the use of solar power the only viable option, thus requiring a low power readout device.

Even though this digital oscilloscope has been developed with a clear research project in mind, it is not hard to envision other solitary sensor readout projects requiring fast readout or data logging in which this oscilloscope on the internet could play a major role.

Specifications

4 Channels 200 MSPS each	Programmable trigger logic	Time marked triggersignals
Digital signal resolution 12 bit	Firmware loadable via ethernet	< 3ns accuracy of worldtime
Analog input bandwidth ≥ 100 MHz	Controllable via ethernet	Power voltage 9 to 18V
Analog input voltage +/- 160mVtop	Readout via ethernet	Power consumption < 9W