SENTEK INSTRUMENT

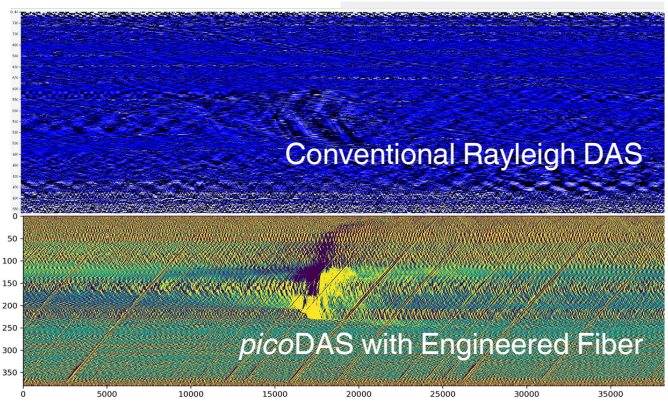
Advanced Optical Sensing

High Performance Fiber Optic Distributed Acoustic Sensing System (DAS)

*pico*DAS Omni is a high performance fiber optic distributed acoustic sensing system (DAS) built on the *pico*DAS platform. It retains the exceptional performance available with Sentek engineered sensing fiber while adding Rayleigh sensing capability using standard singlemode fiber.

Key Features

- Very high sensitivity with engineered fiber
- Excellent channel-to-channel uniformity and spatial isolation
- No measurable sensitivity degradation with distance using engineered sensing fiber
- Rayleigh sensing capability using standard singlemode fiber



With Sentek engineered sensing fiber, *pico*DAS Omni provides very low self noise, excellent sensing uniformity, and no measurable cross-sensitivity between neighboring sensing channels. These advantages are maintained over long distances. Omni also supports Rayleigh sensing using standard singlemode fiber when engineered fiber is not required.

*pico*DAS™ Omni



Sentek's *pico*DAS technology combines engineered sensing fiber, interrogator design and signal processing to provide very high sensitivity and highly uniform distributed measurements. *pico*DAS™ Omni retains these performance advantages while adding Rayleigh sensing capability using standard singlemode fiber.

Ideal For Challenging Applications

- Oil and Gas
  - Borehole seismic and well integrity monitoring, production and injection monitoring, fracture performance monitoring
- Geotechnical
  - Geothermal modeling, embankment dam monitoring
- Security
  - Intrusion detection, border security monitoring, strategic asset protection
- Natural Environments
  - Hydrology, seismology, near-surface geophysics
- Carbon Capture
  - CO_2 storage monitoring
- Mining
  - Tailings dams, microseismic, process flow and rock-mass monitoring

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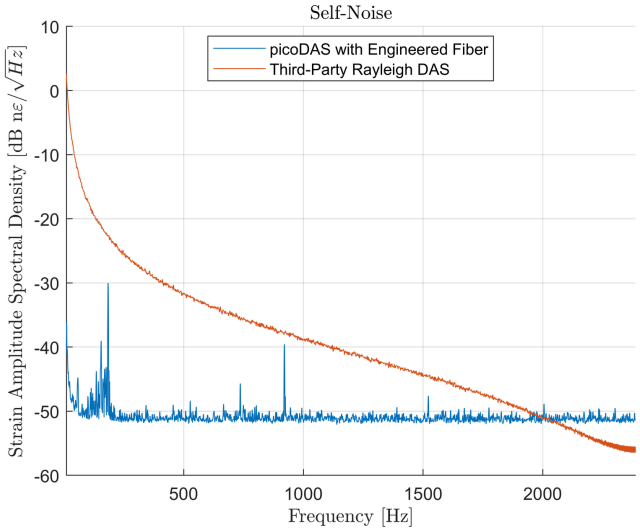
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*pico*DAS Omni

Self Noise

Here we compare the system noise floor, or “self noise,” of *pico*DAS using Sentek engineered sensing fiber and a third-party Rayleigh DAS system. Self noise determines the smallest vibration or strain that the DAS can detect. Lower self noise enables detection of weaker seismic or acoustic events.

Sentek engineered sensing fiber provides particularly strong low-frequency performance for demanding weak-signal measurements. Using standard singlemode fiber, *pico*DAS Omni also achieves <3nϵ typical RMS self noise and <20pϵ/√Hz median self noise at 1kHz.



*pico*DAS with engineered sensing fiber provides excellent low-frequency performance for signals such as microseisms, small leaks and subtle structural vibrations.

Technical Specifications

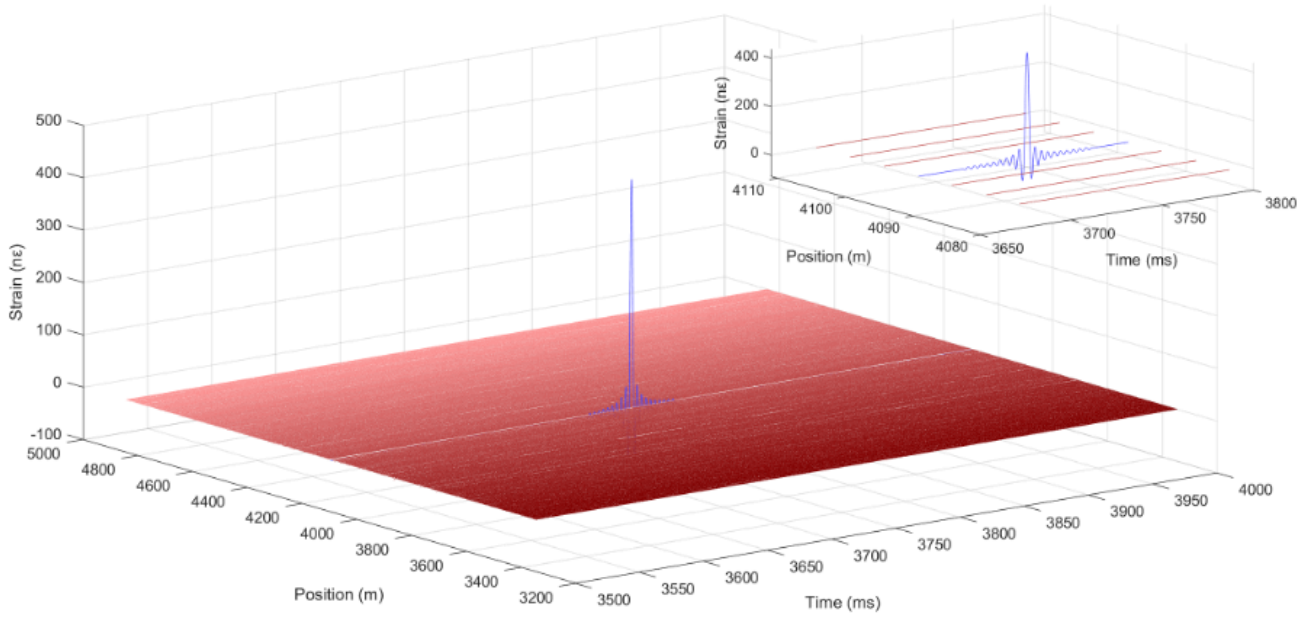
Model	***pico*DAS Omni**
Spatial Resolution[1]	5m
Maximum Sensing Range	13km
Sampling Rate	6-125kHz
RMS Sensitivity	Engineered fiber: <0.15nϵ typical, <0.5nϵ max Standard fiber[2]: <3nϵ typical
Self Noise at 1kHz	Engineered fiber: <2pϵ/√Hz median Standard fiber[2]: <20pϵ/√Hz median, <30pϵ/√Hz P95
Sensitivity Disparity	<20% with engineered fiber
Interrogator Dimensions and Weight	15 x 45 x 44cm, 7.5kg
Computer Interface	Ethernet
Power	240/110V, 50/60Hz
Power Consumption	35W Max
Operating Temperature/Humidity	0 to 45°C ; 5-95%
Fiber Connector	E-2000/APC

[1]Custom resolution options available. [2]Standard-fiber values characterized over ~4km of standard singlemode fiber.

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*pico*DAS Omni



Engineered Fiber: No Cross Talk

This measurement demonstrates the long-range sensing and highly uniform acoustic performance of the *pico*DAS platform using Sentek engineered sensing fiber. Using a 5km sensing fiber with 5m spatial resolution, the system generated 1,000 discrete sensor outputs. The red “carpet” plot shows 360 representative channels with remarkably consistent noise floors, maintained within ±20% of the mean.

A 4.95m fiber segment positioned 4.2km from the interrogator was wrapped around a piezoelectric cylinder and excited with an impulse strain signal. The resulting response, shown in blue, demonstrates excellent signal fidelity and spatial isolation, with **no measurable cross-talk into adjacent engineered sensing segments**.

Sentek’s *pico*DAS platform has been deployed in multiple wells for microseismic event detection. The graph on the right shows a representative microseismic event captured with high signal quality using fiber deployed in a water-filled borehole. This result is especially significant because the acoustic signal was strongly attenuated by the well casing before reaching the fiber. The clarity of the data demonstrates *pico*DAS's suitability for demanding downhole acoustic measurements and weak-event detection.

