

Fiber Optic Sensors for Distributed Monitoring of Soil and Groundwater in In-Situ Thermal Remediation

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Summary

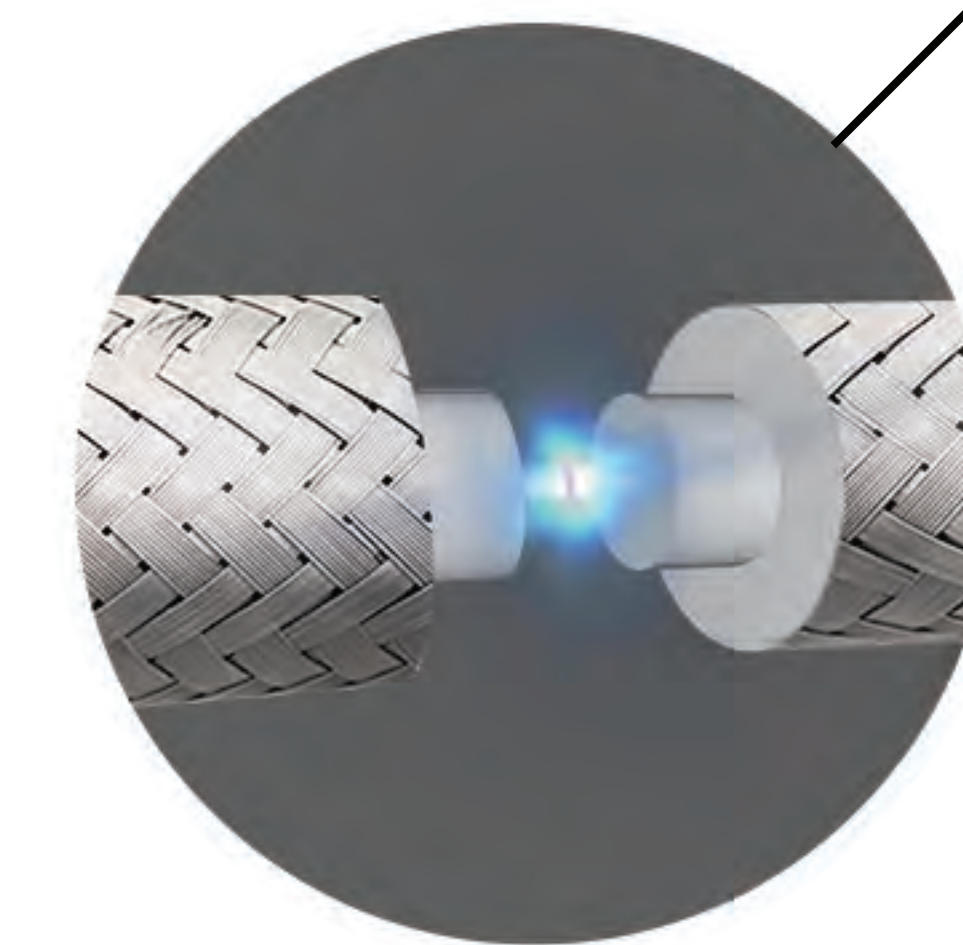
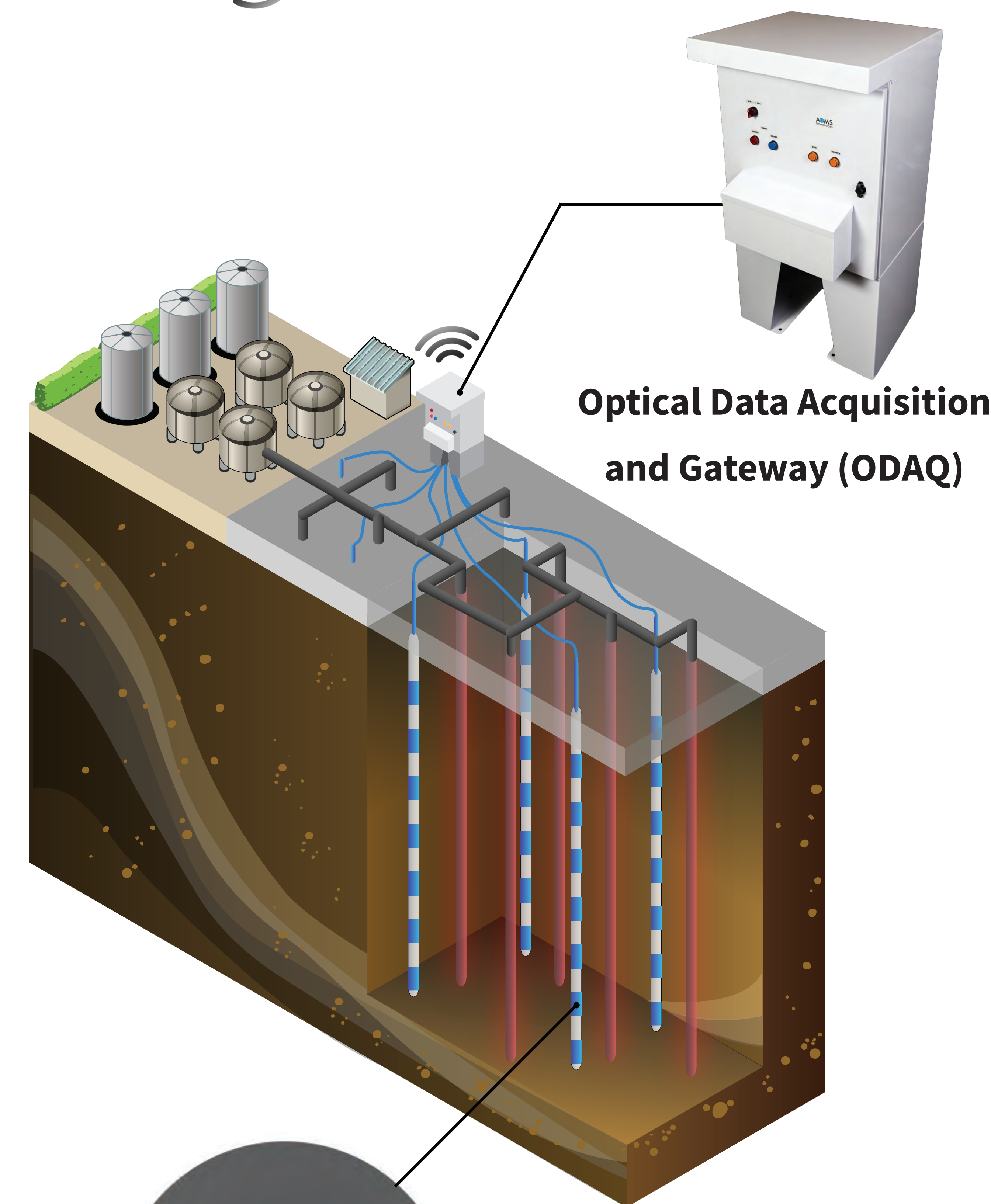
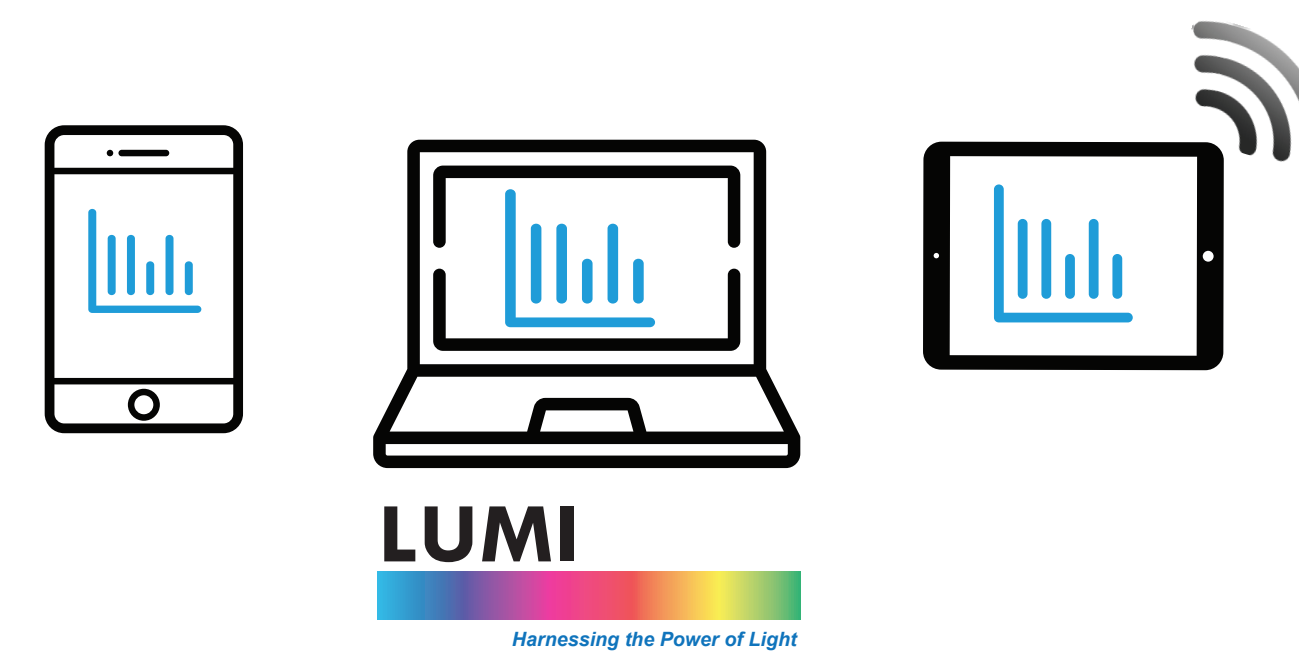
Temperature is a critical performance parameter in In-Situ Thermal Remediation (ISTR) to ensure heating effectiveness, optimize input energy, and analyze the cleanup process. The current monitoring instrumentation in thermal remediation is based on electronic sensors, i.e., thermocouples, RTDs, and thermistors. The harsh environment conditions, driven by corrosive chemicals (NAPL, DNAPL, PCBS, VOC, etc), high temperature, and electromagnetic interference negatively impact the performance and survivability of electronic sensors. Even if the temperature sensors survive the harsh environment conditions, they can be hardly reused in multiple remediation projects. As a result, the failure of sensors can incur additional capital and operating cost as well as customer dissatisfaction to environmental remediation service providers.

AOMS Fiber Optic Sensing System (AOMS-FOS)

By leveraging the power of optics and high-grade superalloys, AOMS fiber optic sensors have been designed to withstand the harsh environment conditions. AOMS multi-parameter distributed fiber optic technology outperform the existing electronic based sensors when it comes to real-time and continuous monitoring in ISTR sites.

AOMS sensing product is an end-to-end hardware/software platform which consists of sensing cables, data acquisition and gateway (ODAQ), and AOMS LUMI software. Each sensing cable, which can be hundreds of feet long, can accommodate up to 100 individual sensing points. AOMS data acquisition system and LUMI software are designed to monitor over 140 cables simultaneously providing real-time monitoring of 14,000 sensor points.

AOMS sensing platform is compatible with a broad range of ISTR technologies including Electric Resistive Heating (ERH), Electro-Thermal Dynamic Stripping Process (ET-DSP), Thermal Conductive Heating (TCH), Steam Enhanced Extraction (SEE), and gas thermal remediation.



Technical Specifications

Parameter	Value
Temperature range	-50 to 250 °C
Temperature accuracy	±0.1 °C
Liquid level range	0 to 500 mH ₂ O
Liquid level accuracy	0.2% FS

Features

- ① Integrated Sensing Platform
- 🛡️ Reliable in Harsh Environments
- ⚡ Electricity-Free
- ✅ Multi-parameter sensing
- 🔗 Multi-point Sensing
- 🎯 High Fidelity Data

Field Results

