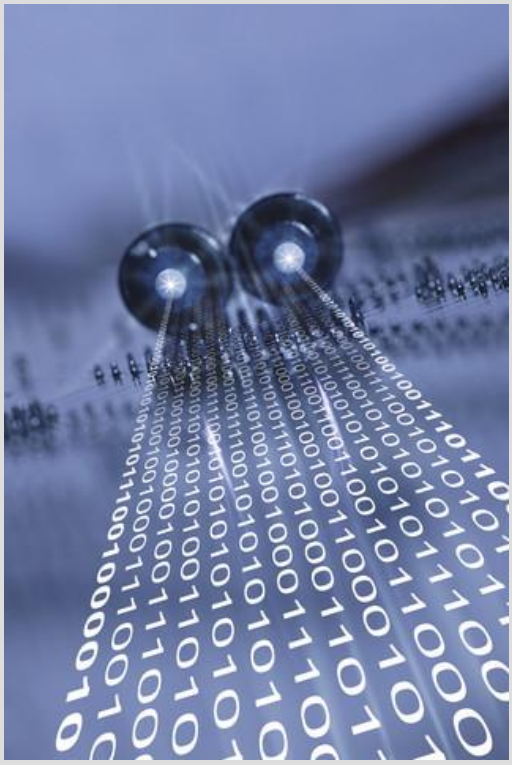
QOREX

Product Bulletin

# High Temperature Thermal Monitoring Systems

## Extreme Duty DTS Systems for Thermal Recovery & Geothermal Wells



# Extreme Duty DTS Systems

Distributed temperature sensors (DTS) technology provides accurate temperature measurement every meter or so along a sensing optical fiber several kilometers in length. This presents a unique subsurface measurement tool that provides real-time thermal imaging of the entire wellbore to track both static conditions and dynamic well events over time.

QOREX is pleased to offer extreme duty distributed temperature sensor (DTS) systems rated to 700°C. QOREX extreme duty DTS systems are built upon a platform of commercially available instruments and support components, and QOREX proprietary optical sensing cables designed and qualified for these extreme thermal conditions.

High temperature all-metal optical sensing cables, such as QOREX **HydroLight™** DTS cable, have been proven in steam flood applications in which with quartz-based optical fibers, the limiting material in the downhole sensing cable is the protective fiber coating. Recent activity in downhole electrical heater applications has led to the need for extreme duty DTS systems where temperatures exceed the upper ratings of high temperature polymers. QOREX applies its expertise and the test capabilities at its Connecticut factory to design and qualify sensing cables using metal-coated fiber, and subsequent DTS system engineering and performance operating on these fibers.

## Extreme Duty DTS

- Harsh Environment Specialists
- All Quartz/Metal Cable Construction
- Design and Qualification to 700°C
- 100% Factory Acceptance Testing of All Components
- Key Partners to Offer Fully Integrated Solution; Turn-Key to Data

All extreme duty DTS components undergo complete optical and mechanical tests, and calibration at temperature, as part of factory acceptance testing to offer greater assurance and reliability of the system operating in extreme field conditions. QOREX has been at the forefront of applying these high temperature solutions in the thermal recovery sector, and has built a solid reputation for brining customers optimized optical solutions with the highest level of reliability and performance, for error-free monitoring and continuous delivery of high quality data.

***QOREX Delivers DTS Systems Engineered for High Reliability, Performance, and Durability in the Intended Application***

# Extreme Duty DTS Systems

## System Specification

| | |
|---|---|
| Measurement Distance | 5km |
| Temperature Accuracy | 5.0°C |
| Temperature Resolution | 0.1°C |
| Nominal Update Rate | 20-Minutes |
| Temperature Measurement Range | 0-700°C |
| Minimum Spatial Resolution | 1.0m |
| Instrument Operating Temperature | -10° to 60°C |
| Instrument Storage Temperature | -40° to 80°C |
| Maximum Steady State Power Draw | <40W |
| Measurement Mode | Single or Dual-Ended |
| Data Interface | RS-232, USB, Ethernet |
| Number of Channels | 4 |
| Optional Enclosure | NEMA 4 |

## Configuration

QOREX works directly with client engineering staff to specify and design suitable sensing systems that meet particular customer requirements. Working with subcontractors, we manage the entire process from initial engineering design through installation, commissioning, and interface to customer IT and data management systems.

The system design for reliability features a passive quartz optical sensing fiber, with no moving parts, connected at surface to the active sensor interrogation and data acquisition module. The fiber is housed in a rugged armored sensing cable that withstands rigors of handling during installation and subsequent stress during well operations. The cable is terminated with a pressure seal at the wellhead, with a surface cable run to the instrumentation cabinet.

The system is easy to operate with no maintenance or field calibration after setup and configuration. An internal fiber reference assures high measurement repeatability over a wide operating temperature range over the lifetime of the instrument. The processor features programmable operating modes, fiber break detection and OTDR loss trace function reporting in dB. Easy MODBUS RS 485, TCP/IP or other data interface to client IT systems.

## Features

- Reliable, Easy Operation
- Low Maintenance, No Calibration
- Ruggedized High Temperature Armored Optical Sensing Cable
- Operates On Pure Silica Core Fiber for Hydrogen Environments
- Optional NEMA 4 Enclosure
- Single or Dual Ended Operation
- Fiber Break Localization and Loss Trace Reported in dB
- Programmable Operating Modes and Alarming Functions
- Expandable Internal Data Storage

# Extreme Duty DTS Systems

**Product Delivery**

QOREX is an independent supplier of turn-key downhole monitoring systems, specializing in harsh environment Oil & Gas thermal recovery and geothermal applications. The company was formed in 2007 by partners with over 50-years combined fiber optic experience, with focused activity over the past 12-years in upstream Oil & Gas fiber optic sensing system design and installation. QOREX engineering and factory operations are housed in a modern, purpose-built facility with dedicated device assembly, fiber mechanical and hydrogen test, and system integration and calibration laboratories. Working directly and with subcontractors, QOREX offers customers a total solution from engineering design through installation, commissioning, and interface to customer IT and data management systems. QOREX has established relationships with experienced oilfield services and well completions partners to assure proper integration and installation of the fiber optic system with conventional rigs and equipment. This allow flexibility in delivery of downhole monitoring systems with minimum disruption and risk to well operations, and assures long term system performance and reliability.

## Contact Information:

**QOREX**
**101 Hammer Mill Road**
**Rocky Hill, CT USA 06067**

**860 727-1031**

**QOREX Canada Ltd.:**
**406, 5723-10th Street NE**
**Calgary, Alberta, T2E 8W7**

**403 718-9887**

**info@.qorexllc.com**
**http://www.qorexllc.com**