OpreX™ Field Instruments | Application Notes

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Distributed Temperature Sensor DTSX3000 / DTSX200

Distributed Temperature Sensing Enhances Site Safety, Asset Monitoring and Facilities Maintenance Function

Intrinsically safe systems for leak detection, industrial process, and asset monitoring.

Ruggedized fiber optic sensor cable is deployed on the monitored area for continuous temperature monitoring along the entire cable length – no discrete sensors are required.

Areas of temperature change indicating leakage or other process abnormalities can be detected for corrective action.

Principal monitoring applications:

- Heat build-up along industrial conveyor systems
- Cable tunnels, ducts, trays or rack systems where heat build-up could become a fire hazard
- Power cable operating temperatures for real-time thermal capacity rating and smart grid optimization
- Furnace chamber deterioration diagnosis via external wall surface temperature profiling

DTSX Fiber Optic Distributed Temperature Sensing System

Features:

- Easy process control system integration
- Wide operating environment range
- Compact and ultra-low power consumption
  - Measure up to 50 km
  - Optional 2-, 4-, 16-channel modular optical switch
  - Ethernet and Serial Modbus Communications
  - LAS 2.0 and WITSML 1.3.1.1 data formatting option
  - STARDOM Field Controller (NFCP050) option
  - Field enclosure with solar panels, batteries, and wireless communications available

= LAS is Log ASCII Standard
= WITSML is Well-site Information Transfer Standard Markup Language

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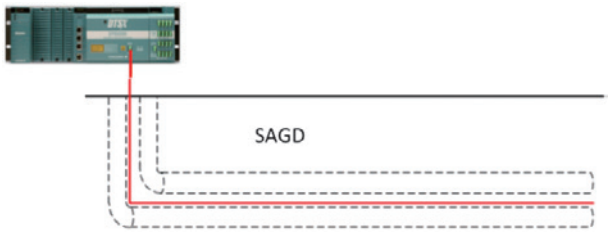
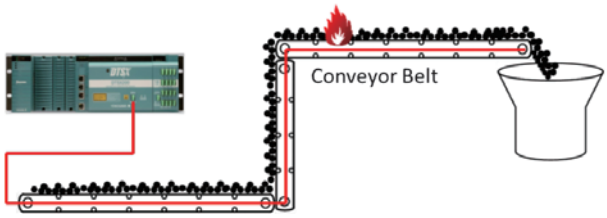
Application Examples

Wellbore Dynamics / Geophysical Monitoring



Wellbore temperature distribution profile can be used to detect thermal events related to steam breakthrough and oil & gas intake position, or other geophysical conditions.

Conveyor System Safety Monitoring

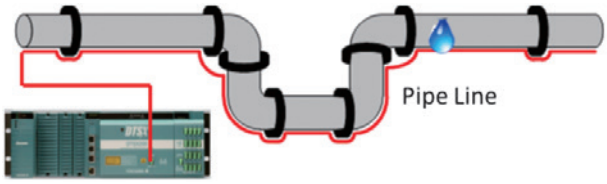


DTSX can be used to detect heat build-up along conveyor systems indicating mechanical component failure or potential combustion conditions.

Cable Rack Monitoring

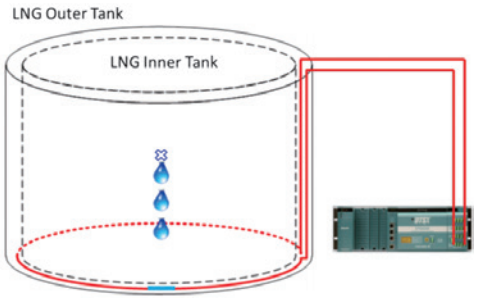
DTSX can be easily deployed along cable tunnels, ducts, trays or rack systems where heat build-up could indicate the potential for a fire hazard, or conductor over-temperature condition.

Pipeline Leak Detection System



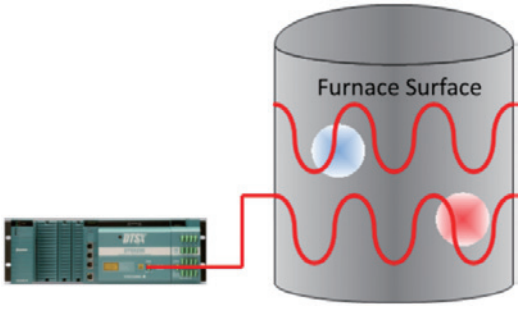
DTSX thermal profiles can be used to detect leak locations along LNG, liquid ammonia and other compressed gas pipelines where escaping content creates a thermal variance from normal background temperatures.

LNG Storage Tank



DTSX is commonly used for LNG tank leak detection by monitoring the expected differential in temperatures between the inner and outer liners comprising the tank system.

Furnace Chamber Skin Temperature Monitoring



Furnace chamber or reactor vessel liner deterioration diagnosis via external wall surface temperature profiling.

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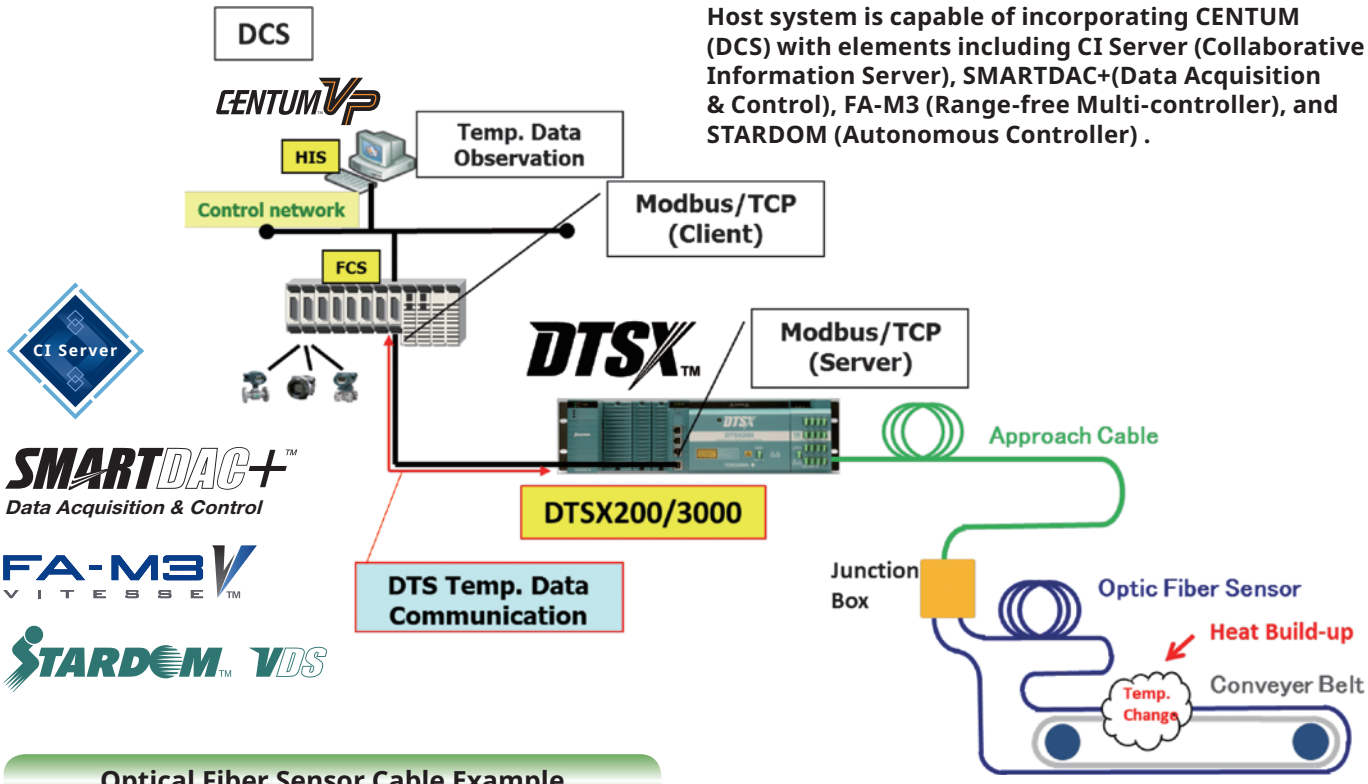
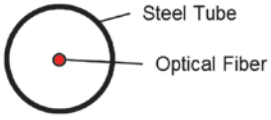
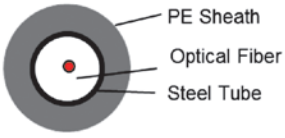
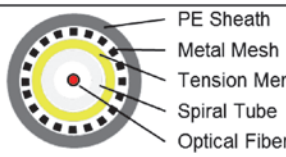
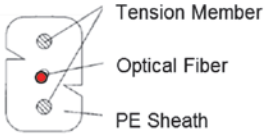
System Configuration Example



Host system is capable of incorporating CENTUM (DCS) with elements including CI Server (Collaborative Information Server), SMARTDAC+(Data Acquisition & Control), FA-M3 (Range-free Multi-controller), and STARDOM (Autonomous Controller) .

Optical Fiber Sensor Cable Example

	Cable Type	Temperature Range	Applications
1. FIMT (Fiber in Metal Tube) (SUS, Incoloy Alloy)		Low(-200℃~) Normal(-20~+70℃) High(~+300℃)	Furnace chamber LNG Pipeline, Tank Cable Rack System Conveyor System Oil & Gas Wellbore
2. FIMT with PE Sheath		-20~+70℃	Cable Rack System Conveyor System Tunnel Fire Detection
3. Flexible Metallic		-20~+70℃	Cable Rack System Conveyor System Room Temperature
4. Non-metallic (Flame Retardant Polyethylene)		-20~+70℃	Cable Rack System Conveyor System Room Temperature

DTSX3000

Power Module | DTS Module | Optical Switch Module (Option)

Long Range

DC10-30 V
AC100 V-240 V Selectable

2ch/4ch/16ch Selectable

Variety Distance Range Lineup

- **DTSX3000-S ~ 10 km**
- **DTSX3000-N ~ 16 km**
- **DTSX3000-M ~ 30 km**
- **DTSX3000-L ~ 50 km**

Specification is available by GS (General Specification)
DTSX3000: GS 39J06B40-01EN, GS 39J02B40-01EN

DTS: Distributed Temperature Sensor

DTSX200

Power Module | DTS Module | Optical Switch Module (Option)

Mid. Range

DC10-30 V
AC100 V-240 V Selectable

2ch/4ch/16ch Selectable

- **DTSX200 ~ 6 km**

Specification is available by GS (General Specification)
DTSX200: GS 39J06B45-01EN, GS 39J02B45-01EN

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Yokogawa Electric Corporation

www.yokogawa.com

YOKOGAWA ELECTRIC CORPORATION
9-32, Nakacho 2-chome, Musashino-shi, Tokyo 180-8750, Japan

YOKOGAWA CORPORATION OF AMERICA
12530 West Airport Blvd, Sugar Land, Texas 77478, USA

YOKOGAWA EUROPE B.V.
Euroweg 2, 3825 HD Amersfoort, The Netherlands

YOKOGAWA CHINA CO., LTD.
Room 1801, Tower B, THE PLACE, No.100 Zunyi Road, Changning District, Shanghai, China

YOKOGAWA MIDDLE EAST & AFRICA B.S.C.(c)
P.O. Box 10070, Manama, Building 577, Road 2516, Busaiteen 225, Muharraq, Kingdom of Bahrain

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