DTSX Series
Distributed Temperature Sensor

Intrinsically safe leak detection, industrial process and asset monitoring systems

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 50km
- 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

Bulletin 39J06B40-01E

www.yokogawa.co.jp
**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.

**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.
Host system is capable of incorporating CENTUM (DCS) with elements including FAST/TOOLS (SCADA), STARDOM (Autonomous Controller) and FA-M3 (Range-free Multi-controller).

### System Configuration Example

- **DCS**
- **CENTUM V**
- **HIS**
- **Control network**
- **Temp. Data Observation**
- **Modbus/TCP (Client)**
- **Modbus/TCP (Server)**
- **DTSX200/3000**
- **Optic Fiber Sensor**
- **Approach Cable**
- **Junction Box**
- **Heat Build-up**
- **Temp. Change**
- **Conveyor Belt**

### Optical Fiber Sensor Cable Example

<table>
<thead>
<tr>
<th>Cable Type</th>
<th>Temperature Range</th>
<th>Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. FIIT (Fiber in Metal Tube) (SUS, Incoloy Alloy)</td>
<td>Low(-200°C~) Normal(-20~+70°C) High(+300°C)</td>
<td>Furnace chamber, LNG Pipeline, Tank, Cable Rack System, Conveyer System, Oil &amp; Gas Wellbore</td>
</tr>
<tr>
<td>2. FIIT with PE Sheath</td>
<td>-20~+70°C</td>
<td>Cable Rack System, Conveyer System, Tunnel Fire Detection</td>
</tr>
<tr>
<td>3. Flexible Metallic</td>
<td>-20~+70°C</td>
<td>Cable Rack System, Conveyer System, Room Temperature</td>
</tr>
<tr>
<td>4. Non-metallic (Flame Retardant Polyethylene)</td>
<td>-20~+70°C</td>
<td>Cable Rack System, Conveyer System, Room Temperature</td>
</tr>
</tbody>
</table>
**DTSX Series**

**DTSX3000**

- **Power Module**
- **DTS Module**
- **Optical Switch Module (Option)**

**Long Range**

**Variety Distance Range Lineup**
- **DTSX3000-S** ~10km
- **DTSX3000-N** ~16km
- **DTSX3000-M** ~30km
- **DTSX3000-L** ~50km

Specification is available by GS (General Specification)

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**DTS Module**

- **DC10-30V**
- **AC100V-240V**
- Selectable

**DTSX200**

- **Power Module**
- **DTS Module**
- **Optical Switch Module (Option)**

**Mid-Range**

- **DTSX200** ~6km

Specification is available by GS (General Specification)

<table>
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<tr>
<td>DTSX200</td>
<td>~6km</td>
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</tbody>
</table>

**DTS Module**

- **DC10-30V**
- **AC100V-240V**
- Selectable

- **2ch/ 4ch/ 16ch Selectable**