



HIGH-ACCURACY AND LONG RANGE DISTRIBUTED TEMPERATURE SENSING SYSTEM (DTS) FOR HARSH ENVIRONMENTS

Reliable and high performance Raman OTDR interrogator for field applications. Measures full temperature profile over fiber optic sensing cables.

Description

The DiTemp Harsh Reading Unit is designed for distributed temperature measurements over distances of up to 12 km, with 1 m spatial resolution and 10s measurement time. Featuring a built-in 4 channels multiplexer, it is designed for use as a stand-alone unit in harsh environments. It features low energy consumption and an extended operational temperature range. (SIL 1/2 assessment) Depending on configuration and redundancy, the DiTemp system has been assessed as SIL 1 or SIL 2 compatible (Safety Integrity Level).

The DiTemp Harsh is a unique tool for the measurement of distributed temperature over several kilometers in harsh environment (from desert to arctic). It is a powerful diagnostic instrument for the identification and localization of potential problems. It allows the monitoring of local temperature at thousands locations by mean of a single optical fiber and in just one measurement. Its inherent high stability and self-referenced principle of operation allow on-line or off-line long-term monitoring of large structures.

The measuring principle is based on the RAMAN effect and the Optical Time Domain Reflectometry (OTDR) method. Laser pulses are coupled into the fibers where the photons interact with the molecules of the fiber material. Some photons are scattered backwards and they carry information on the thermal motion of the molecules they were scattered by. Consequently, the spectrum of the backscattered light carries information on temperature of the fibers. This effect can be used to measure temperature along the optical fiber. The system is used in a wide range of applications that require distributed temperature sensing, such as temperature monitoring of concrete in massive structures, leakage detection of pipelines, seepage monitoring in dams and levees, waste disposal sites, smart buildings, just to name a few.

Key Features

- Harsh environment operation
- Short measuring time
- Up to 12 km
- Multiple channel
- Low power
- Long term stability
- Cost effective
- Remote control
- Non-volatile on board memory
- SIL 1/2 Assessment

Applications

- Pipeline leak detection
- Dam and Levee seepage monitoring
- Smart buildings
- Power Cable Rating and hot spot detection
- Distributed temperature sensing

Technical features

Distance range:	Harsh SR → 0 -5 km Harsh XR → 0 - 12 km
Spatial resolution:	Harsh SR → 1 m Harsh XR → 1 m
Sampling resolution:	Harsh SR → 0.5 m Harsh XR → 0.5 m
Temperature resolution:	down to 0.1°C (project specific performance estimations available upon request)
Number of channels:	4 ch in-built mux
Fiber typology:	MMF 50/125 µm (ITU.T G.651)

Technical specifications

Operating temperature:	Harsh SR → -40°C to +65°C Harsh XR → -5°C to +65°C
Storage temperature:	-5°C to +80°C
Power consumption:	Harsh SR → 0.5 W stand-by, 18 W operating Harsh XR → 0.5 W stand-by, 24 W operating
DC Power:	12V or 24V
Dimension (HxWxD):	114.5 x 303.5 x 365.7 mm
Weight:	7 kg
Communication options:	Satellite / Wireless modem, GSM modem, Direct link PC, Serial SR-232, Wired Ethernet

Certification and compliance

Classified to EN 60825-1 (2007) as a class 1M laser product CE compliant.

BS EN 61010-1:2001; BS EN 61326-1:2006; BS EN55022:1998; BS EN61000-4-3:2006; FCC CFR47 pt15 (USA), ICES-003 (Canada)

Accessories and ordering information

- 14.2013 DiTemp Harsh Reading Unit
- 14.2014 DiTemp ATTS
- 20.2010 DiView Data Management Software