14.2012 DITEMP LIGHT RAMAN OTDR

For distributed temperature sensing

SMARTEC

GENERAL DESCRIPTION

The DiTemp® is a unique tool for the evaluation of distributed temperature over several kilometers. 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 shot. Its inherent high stability and self-referenced principle of operation allows on-line or off-line long-term monitoring of large structures.

TECHNICAL DESCRIPTION

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 spectral analysis is combined with measuring the propagation time of the laser pulses along the fiber (radar principle) as the speed of light in the fiber is known. Scanning the entire length of the fiber by short intervals (e. g. 1m) the temperature profile along the fiber is determined. It is important to know that the measured temperature of each interval is the average temperature of that individual fiber section. Due to the high speed of light, fiber lengths of many kilometers can be scanned within fractions of a second.

The system consists of reading unit, sensing cable and accessories. The optical fibers, which are integrated into robust cables, are the temperature sensitive elements and allow the measurement of temperature profiles at arbitrary times, quasi-continuously with a high spatial and temperature resolution along the cable. This is a requirement for the investigation of thermal processes.

The system is used in a wide range of applications that require distributed temperature sensing, such as temperature monitoring of concrete in massive structures, waste disposal sites, on- and off-shore sites in gas and oil industry, hot spots, cold spots and leakage detection of flow lines and reservoirs, building installations, just to name a few.

FEATURES

- **Entry level system**
- **Short measuring time**
- **Up to 4 km**
- **Multiple channel**
- **Low power**
- **On-board PC**
- **Long term stability**
- **Cost effective**
- **Remote control**

NOVA METRIX

TECHNICAL FEATURES

- **Distance range** → 0 – 4 km
- **Spatial resolution** → 2 m
- **Sampling resolution** → 2 m
- **Temperature resolution** → see below
- **Number of channels** → 4 ch in-built mux
- **Fiber typology** → MMF 50/125 μm (ITU.T G.651)

TECHNICAL SPECIFICATIONS

- **Operating temperature** → 0°C to 40°C
- **Storage temperature** → -15°C to +65°C
- **Humidity** → 5% to 95% RH, non condensing
- **AC Power** → 110V – 240V, 50Hz – 60Hz
- **DC Power** → 24V or 48V supply option
- **Power consumption** → 40W – 50W maximum
- **Dimension (HxWxD)** →87 x 435 x 445 mm
- **Weight** → 9 kg
- **Communication options** → OPC, RS-232, Modbus, Ethernet, Volt free alarm module
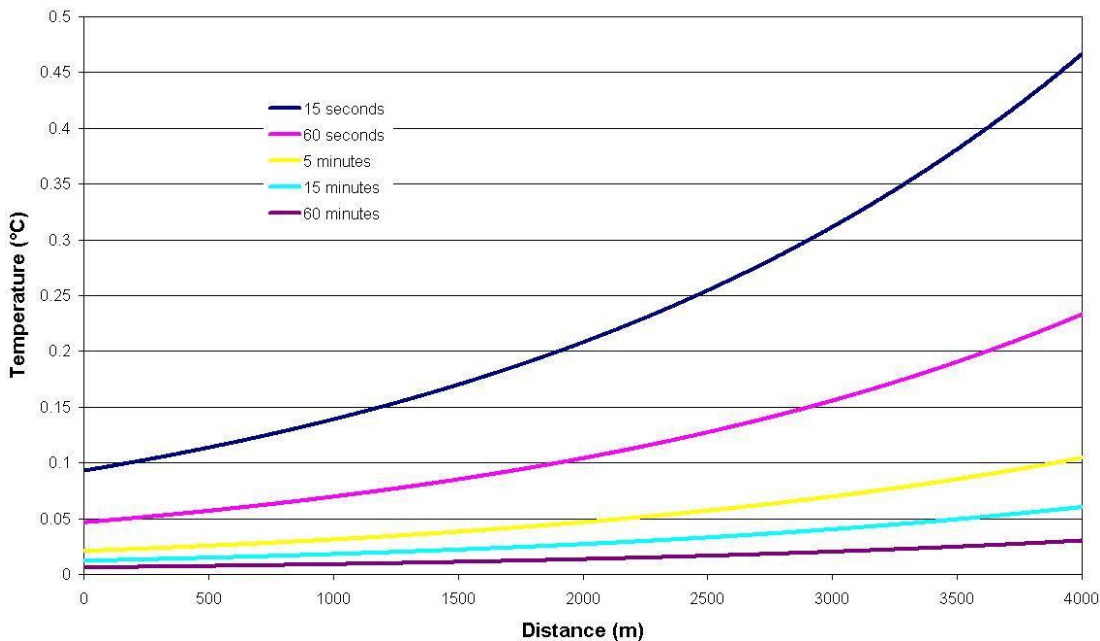
CERTIFICATION AND COMPLIANCE

SAFETY

The DiTemp Light system is classified to EN 60825-1 (2001-03) as a class 1M laser product. The DiTemp Light system (1mW mean power output) is suitable to monitor Zone 0 Hazardous areas according to the European Commission report no. EUR 16011 EN (1994)

EMC

EN 61326:1997/A1:1998; Conducted Emission: Class B; Radiated Emission: Class A**; EN 61000-4-6: 1996; EN 61000-4-4: 1995; EN 61000-4-2: 1995/A1: 1998/A2: 2001; EN 61000-4-11: 1994; EN 61000-3-2: 1995; EN 61000-3-2: 2000; EN 61000-3-3: 1995 ** excluding monitor and keyboard

CE MARK

Accordance with 89/336 EEC EMC directive accordance with LVD 72/23 EEC directive: EN 41003; EN 50178; EN 60065; EN 60825-1; EN 60950; EN 61010 -1

ACCESSORIES AND ORDERING INFORMATION

- **14.2012 DiTemp Light Reading Unit**
- **14.2010 DiTemp Alarm Relay Module**
- **20.2010 DiView Data Management Software**

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