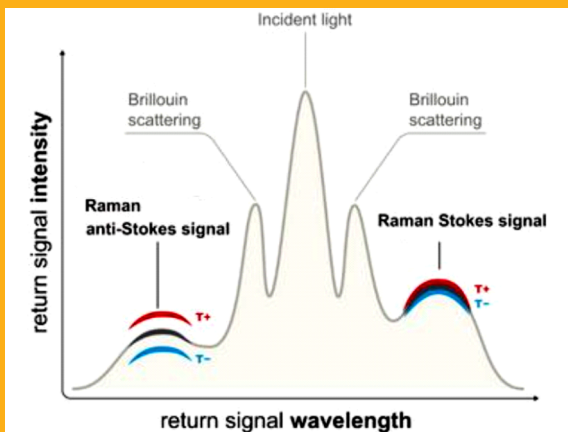


Working Principle

When light source (laser) is incident on the optical fiber, it is scattered by the fiber glass molecules as it propagates down the fiber and exchange molecules with lattice vibration. As the light scattered down the fiber optical cable nearly all the scattered light has a wavelength identical to the incident light, called Rayleigh scattering. A small amount of the scattered light has a different wavelength called Raman scattering which produce stokes signal and anti-stokes signal, is reflected back to transmitted end where it is analyzed. The difference between intensities of backscattered anti stokes and stokes signals gives the measure of temperature at point. Measurement of arriving time at transmitting end is used to get position of temperature reading, known as Optical time domain reflectometry.



DTSenz

Optical Fiber Distributed Temperature Sensor

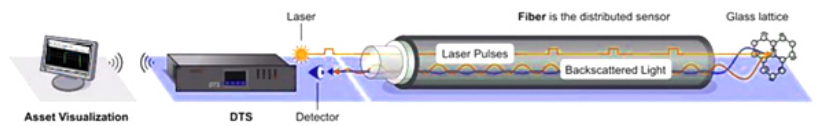


Fig 1. Schematic Representation of Raman DTS

Introduction

Optical fiber distributed temperature sensor enable to monitor continuous temperature profile along the length of a fiber. Fiber itself is used as a sensing material. Distributed temperature sensing (DTS) can provide thousands of temperature measurements over a long distance, a few kilometers. Our DTS system works on the principle of Raman light scattering combined with OTDR (optical time domain reflectometry).

Optical Specifications

Parameter	Remarks
Sensing Range	10 km
Measurement Time	1 sec per channel
Temperature Accuracy	±2°C @10 km, 6s
Temperature Resolution	0.1°C
Sampling Resolution	0.4 m
Spatial Resolution	2 m
Position Accuracy	±1 m
Sensing Temperature Range	-20 to120°C standard cable
Number of Channels1	4 ch w/ optical switch
Sensing Fiber	MMF
Working Temperature	-10 to +50°C
Storage Temperature	-40 to +70°C
Relative Humidity	5 to 90%
Power Supply	240 V AC
Power Consumption	15 W

Pigtail

Item	Specifications
Fiber Type	62.5 / 125 / 900 μ m MMF
Fiber Length	1000 \pm 10 mm
Fiber Color	White
Fiber Connector	FC/APC

Interface

Interface	Specifications
Outputs	RS485 (Modbus)
	RJ45(UDP/TCP-IP)
POWER	3PIN (GND, NC, 12V)
Rs232	4PIN (RXD, TXD, GND, NC)

Features

Intrinsically Safe

Widely used for petrochemical, nuclear & electric power

01

Fiber Sensor

Use existing fiber as continuous sensors; Easy to install and maintenance free

02

Linear Monitoring

Suitable for monitoring large linear assets, such as tunnels, metros, cables, conveyer belts etc.

03

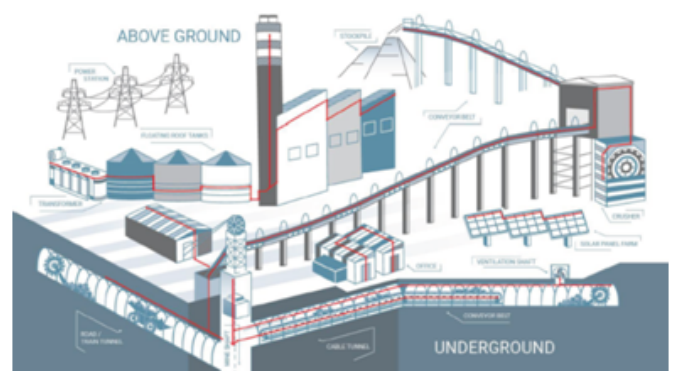
Chemically Stable

Good for well monitoring, chemical process etc.

04

Applications

- Linear temperature sensing along pipelines and tunnels.
- Fire prevention.
- Leakage detection in oil and gas pipelines.
- Conveyor belt monitoring.
- Power transmission lines.
- Transformer winding temperature measurement.
- Reactor skin temperature monitoring.



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