SIEMENS

FibroLaser™

Linear Heat Detector

OTS30XX(S)

Fiber-optic linear heat detector, XX = 01, 02, 04, 06, 10

- Linear temperature measurement for quick fire detection and precise localization of the fire source
- Maximum length of the maintenance free sensor cable = 10 km
- Signal processing with OFDR-Technology (Optical Frequency Domain Reflectometry)
- 1000 free programmable zones
- Selectable alarm criteria
- High spatial resolution up to 0.25 m
- Information regarding the direction of the fire spread
- Redundant sensor system is possible
- Suitable for wind speeds of up to 10 m/s
- Laser product class 1M according to DIN EN 60825-1: 2014

Measuring principle

The FibroLaser is based on a laser beam being sent through a fiber-optic cable. The fiber-optic cable scatters a small part of the laser radiation at any point, back to the source. The backscatter is measured by the controller.

The near-infrared electromagnetic LED laser light radiation emitted is scattered in different ways by the fiber-optic cable:

- Rayleigh scattering
- Stokes scattering
- Anti-Stokes scattering

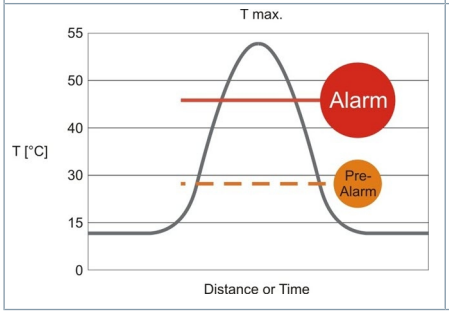
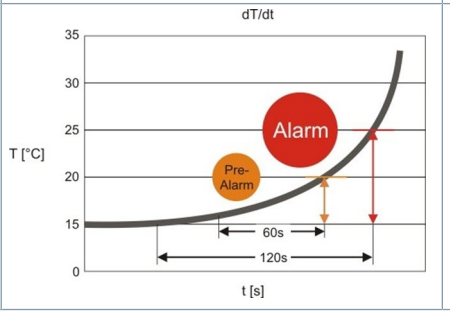
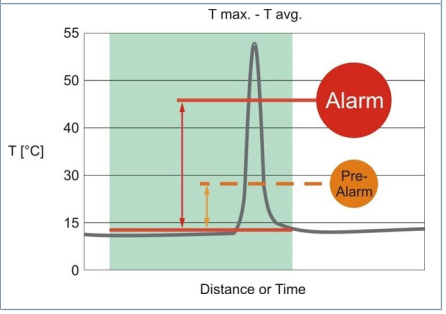
The Rayleigh scattered light has the same wavelength as the laser beam, the Stokes scattering has a slightly higher and the anti-Stokes scattering a slightly lower wavelength. The two Stokes scattering types are also referred to as Raman scattering. While Stokes scattering is not so temperature-dependent, anti-Stokes scattering is affected by the thermal energy of the fiber-optic cable's local temperature: The intensity increases with the temperature. The temperature of the fiberoptic cable is thus calculated from the intensity ratio between Stokes and anti-Stokes scattering.

Controller

- **Transmitter**
  - The Transmitter contains the laser and its control.
- **Receiver**
  - The Receiver contains the entire optical system.
  - Coupling of the laser light generated in the transmitter to the sensor cable.
  - Converting the back scatter light returned from the sensor fiber from an optical into an electrical signal and processes the electrical signal.
- **Digital unit**
  - This module controls the entire device and the measurement process.
  - Calculates the temperature profile along the sensor cable based on the received measurement data.
  - Manages the 4 integrated inputs (optional 40), which are used for resetting and forwarding external alarms or monitoring functions.
  - Controls the 12 outputs (optionally 106) which are used to forward alarms and malfunction reports to a fire alarm control panel.
  - The USB or Ethernet interface is used for commissioning. As an option a PC can be connected to the interface to display zones and/or the temperature profile (visualization software FibroManager).
  - Protocols of previous generation Controllers are supported (OTS-100, OTS-X).
- **Power supply**
  - The power supply supplies all components of the controller with the necessary operating voltages.
  - Controller selectable as DC 24 V (standard) or AC 115/230 V (optional).

Alarm criteria

The FibroLaser allows three different alarm criteria.

Exceeding a defined maximum temperature	Temperature rise too rapid	Excessive deviation from the average temperature of a zone
		

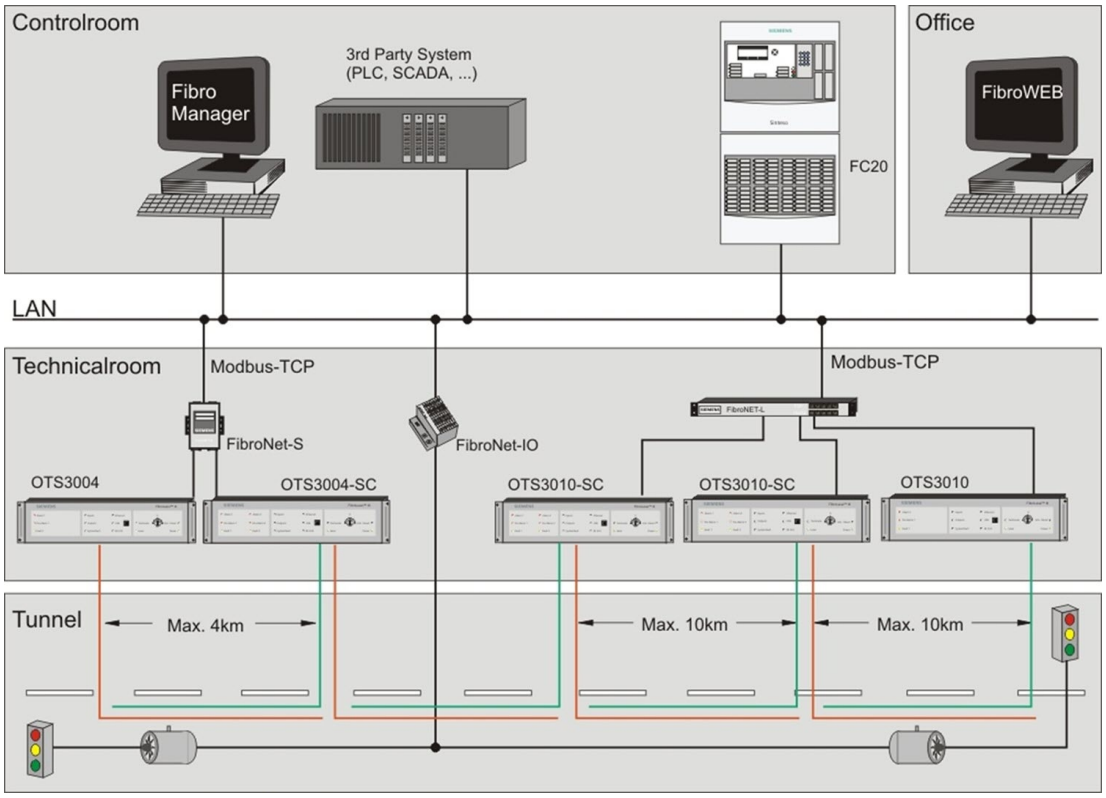
Use

Linear heat detectors are mainly used for applications in road tunnels and railway tunnels. The FibroLaser is also suitable for the monitoring of:

- Conveyor belts
- Underground mining transport systems
- Parking garages
- Industrial production facilities
- Theaters and operas
- Cable trays und cable ducts
- Escalators in subways and shopping centers
- Potentially explosive areas in refineries (Ex version)
- Power plants to monitor radioactively contaminated areas (interim storage, pump sump

Planning

Example:



Technical data

Mechanical data

Controller	19" Rack, 3 units of height
Dimensions (H x W x D)	13.1 x 48.3 x 33.8 cm
Color	grey
Weight	13 kg
Transportation box, dimensions (H x W x D)	Wood, 62 x 43 x 61 cm
Weight (with Controller and Installation set)	35 kg

Electrical data

Operating voltage 24VDC controller (EN 54-22)	DC 12…48 V
Mains voltage 115/230VAC controller	AC 100…240 V
Maximum power consumption	<25 W (max. 45 W at 60 °C)
Programmable inputs	4 (optional 40)
Programmable outputs (potential-free)	12 (optional 106)
Communication interface	FibroNET (TCP/IP, Modbus TCP/RTU, RS485, RS232)

Optical data

Laser wavelength	1064 nm
Optical connector	E2000 APC / 8°
Laser classification (OTS evaluation unit)	Laser class 1M according to EN60825-1: 2014
Max. measuring distance (OTS30XXS: XX = 01, 02, 04)	1, 2, 4 km

Laser wavelength	1550 nm
Optical connector	E2000 APC / 8°
Laser classification (OTS evaluation unit)	Laser class 1M according to EN60825-1: 2014
Max. measuring distance (OTS30XX: XX = 01, 02, 04, 06, 10)	1, 2, 4, 6, 10 km

Ambient conditions

Storage temperature	-35…+75 °C
Operating temperature	-10…+60 °C
Humidity (no condensation allowed)	≤95 % rel.
Protection category (IEC 60529 / UL50E)	IP41, type 2

Approval

VdS (EN 54-22)	G211076

Disposal

The device is considered an electronic device for disposal in accordance with European Directive and may not be disposed of as domestic waste.

- Use only designated channels for disposing the devices.
- Comply with all local and currently applicable laws and regulations.

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