SIEMENS

OTS30XX(S)

FibroLaser™

Linear Heat Detector

(OTS = Optical Temperature Sensor / XX = 01, 02, 04, 06, 10)

- **Linear temperature measurement for quick fire detection and precise localization of the fire source**
- **The maximum length of the maintenance free sensor cable is 10km**
- **Signal processing with OFDR-Technology** (Optical Frequency Domain Reflectometry)
- **1000 free programmable zones**
- **Selectable alarm and pre-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 DIN EN 60825-1: 2014**
- **VdS approval EN 54-22 (G211076)**

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, whereas 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 fiber-optic 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 including coupler and optical receiver.
– 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.
– Amplification and filtering of the electrical signals.

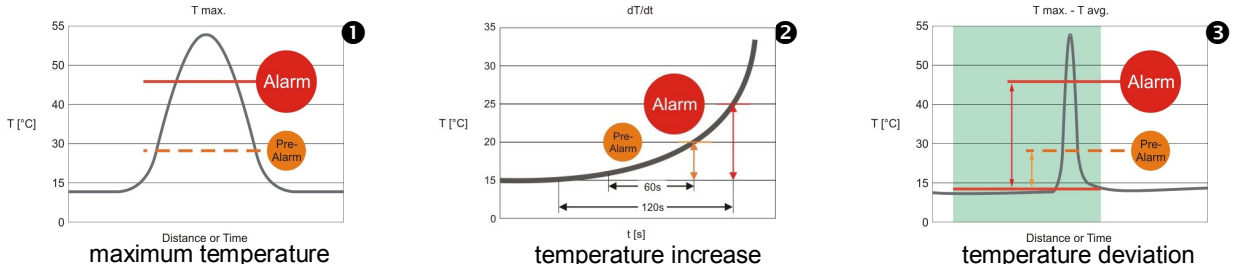
Digital part:

– The digital module controls the entire device and the measurement process.
– It calculates, based on the received measurement data, the temperature profile along the sensor cable.
– The 4 integrated inputs (optional 40) are used for resetting, external alarm transmission or monitoring functions.
– The 12 outputs (optional 106) enable alarm and malfunction reporting to a fire detection center.
– The USB or Ethernet interface is used for commissioning via PC. As an option, a PC can be connected at 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.
– Controllers are offered with 24 VDC (standard) or 115/230VAC (optional).

Alarm criteria



maximum temperature | temperature increase | temperature deviation

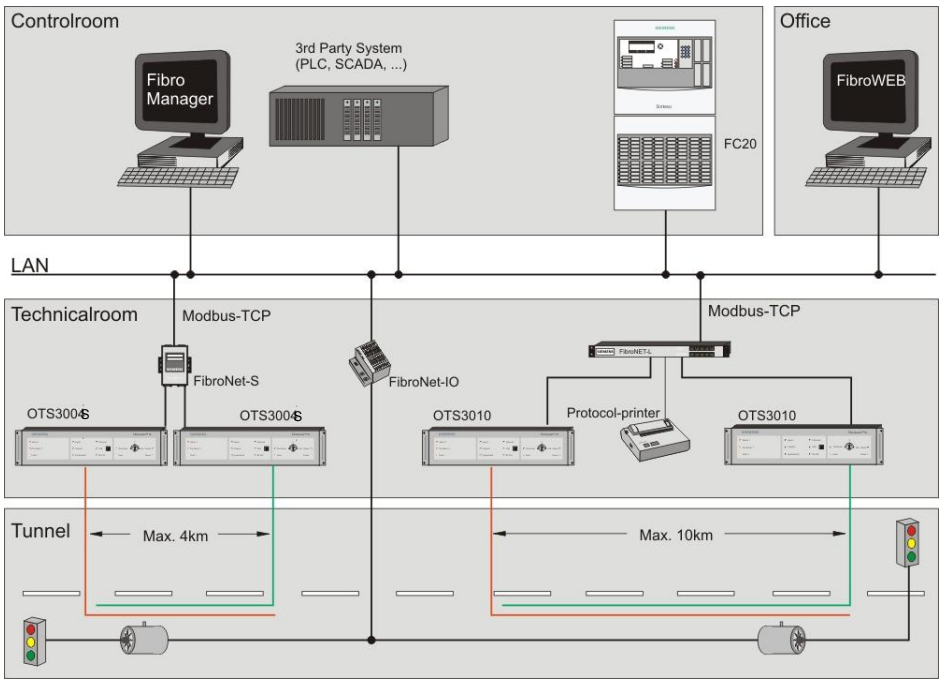
The FibroLaser allows three different alarm and pre-alarm criteria:
❶ surpassing a defined maximum temperature,
❷ experiencing a rapid temperature increase and
❸ deviating too far from the average temperature of a zone.

Applications

Linear heat detectors are mainly used for applications in traffic tunnels (road and railway tunnels). Besides the main application, there are other application areas in use today, such as:

– in conveyor belts in coal power plant
– in underground mining, to monitor transport systems
– in steel production, to monitor production facilities
– in refineries, to monitor explosive areas (EX-Version)
– in power plants, to monitor cable platforms and shafts
– in underground train stations and shopping centres, to monitor escalators
– in power plants, to monitor radioactively contaminated areas (interim storage, pump sump)

Project example



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	wood
dimensions (H x W x D)	62 x 43 x 61 cm
weight (with Controller and Installation set)	35kg

Electrical data

operating voltage (24VDC Controller)	DC 12 … 48 V
mains voltage (115/230VAC Controller)	AC 100 … 240 V
power consumption	<25W (max. 45 W/60°C)
programmable inputs	4 (optional 40)
programmable outputs (potential-free)	12 (optional 106)
Communication	FibroNET (TCP/IP, Modbus TCP/RTU, RS485, RS232)

Optical data

laser wavelength	1064 nm
optical connector	E2000 / 8° bevel grinding
laser classification	class 1M according to EN60825-1: 2014
Max. measuring distance (OTS30xxS: xx = 01, 02, 04)	1, 2, 4km
laser wavelength	1550 nm
optical connector	E2000 / 8° bevel grinding
laser classification	class 1M according to EN60825-1: 2014
Max. measuring distance (OTS30xx: xx = 06, 10)	6, 10km

Environmental conditions

storage temperature	-35 … +75 °C
operating temperature	-10 … +60 °C
humidity (no condensation permitted)	≤95 % rel.
protection category (IEC 60529)	IP51

Approvals

VdS (EN 54-22)	G211076

Disposal

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

- Dispose of the device through channels provided for this purpose.
- Comply with all local and currently applicable laws and regulations.

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