



OTS-X

FibroLaser™

Linear Heat Detector

(OTS = Optical Temperature Sensor / X = 1, 2, 3, 4)

- **Linear temperature measurement for quick fire detection and precise localization of the fire source**
- **Signal processing with OFDR-Technology** (Optical Frequency Domain Reflectometry)
- **128 free programmable zones**
- **Selectable alarm criteria**
- **High spatial resolution – up to 0.5 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: 2007**
- **VdS approval (G205105)**
- **FM approval (3009255)**

Measuring principle

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

The infrared electromagnetic laser radiation emitted is reflected in different ways by the fiber-optic cable:

- Rayleigh scattering
- Stokes scattering
- Antistokes scattering

The Rayleigh scattering 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 temperature-independent, Antistokes 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 thus results from the intensity ratio between Stokes and Antistokes scattering.

Controller

The controller is modularly designed and has the following partial modules:

Transmitter:

- This module contains the laser and its control.

Receiver:

- This module contains the entire optical design including coupler and optical receiver.
- Coupling of the laser light generated in the transmitter module to the sensor cable.
- Converting the back scatter light returned from the sensor fiber from an optical into an electrical signal.

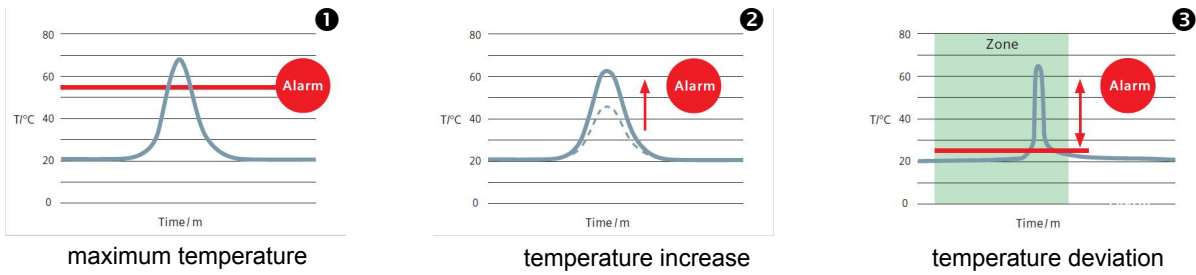
Digital module:

- 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 are used for resetting, external alarm transmission or monitoring functions.
- The 10 outputs (optional 20) enable alarm and malfunction reporting to a fire detection center.
- The RS232 interface is needed 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 FibroVIS).

Power supply:

- The power supply supplies all components of the controller with the necessary operating voltage.
- Controllers are offered with 24 VDC (standard) or 115/230VAC (optional).

Alarm criteria



The FibroLaser allows three different alarm criteria:

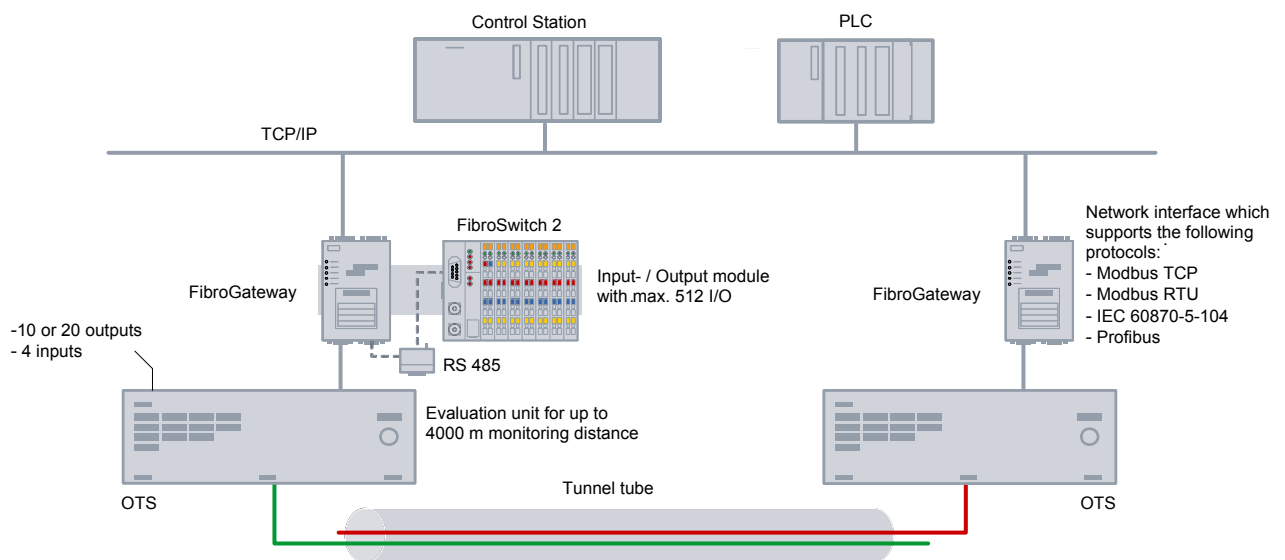
- ❶ surpassing a defined maximum temperature,
- ❷ experiencing a rapid temperature increase and
- ❸ deviating too far from the average temperature of a zone.

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
- 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)	13,3 x 44,9 x 31,8 cm
color	grey
weight	10.2 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 (DC 24V Controller)	DC 22 ... 30 V
mains voltage (AC 115/230V Controller)	AC 85 ... 264 V
maximum power consumption	50 W
programmable inputs	4
programmable outputs (potential-free)	10 (optional 20)
communication interface	RS232

Optical data

maximum laser power at outlet	150 mW
laser wavelength	980 nm
optical connector	E2000 / 8° bevel grinding
laser classification (OTS evaluation unit)	class 1M according to EN60825-1: 2007
maximum measuring distance (OTS-1, -2, -3, -4)	1, 2, 3, 4 km

Environmental conditions

storage temperature	-30 ... +70 °C
operating temperature	0 ... 40 °C
humidity (no condensation permitted)	≤95 % rel.
protection category (IEC 60529)	IP30

Approvals

VdS	G 205105
FM	3009255

Details for ordering

Typ	Art.-Nr.	Bezeichnung
OTS-1-24V	18061024	OTS-1-24V FL-Controller
OTS-1-115/230V	18061230	OTS-1-115/230V FL-Controller
OTS-2-24V	18062024	OTS-2-24V FL-Controller
OTS-2-115/230V	18062230	OTS-2-115/230V FL-Controller
OTS-3-24V	18063024	OTS-3-24V FL-Controller
OTS-3-115/230V	18063230	OTS-3-115/230V FL-Controller
OTS-4-24V	18064024	OTS-4-24V FL-Controller
OTS-4-115/230V	18064230	OTS-4-115/230V FL-Controller

The FibroVIS Basic software and the actual OTS-X firmware are included in delivery.

The required installation set must be ordered separately!

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Document no. **A6V10262519_b_en**
Edition 10.2010

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Manual FibroLaser
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