Linear Heat Series

Fiber Optic Linear Heat Detection System

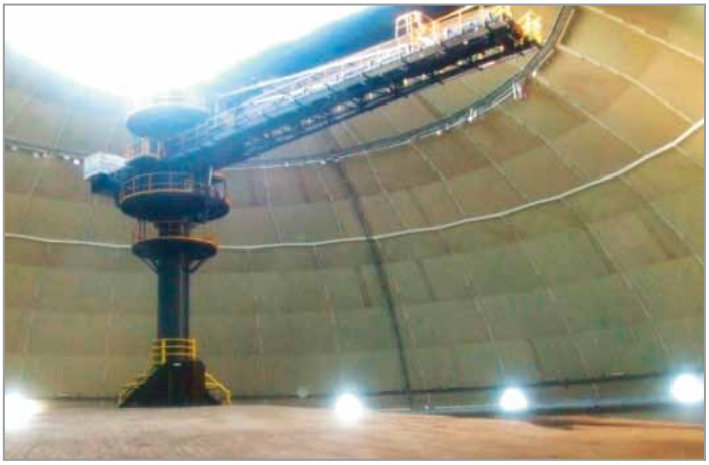
- Tunnels & Metros
- Conveyer Belts
- Parking Lots
- Manufacturing Warehouse Facilities
- Refineries and Power Plants

Intelligent Solutions

Are you looking for a trusted partner?

AP Sensing is your global solution provider in the fiber optic fire detection market. AP Sensing has more than 20 years of OTDR (Optical Time Domain Reflectometry) expertise. The heart of AP Sensing's Distributed Temperature Sensing Solution is based on key optoelectronics developed by Agilent Technologies (formerly Hewlett Packard Co.), the global leader in optical measurement and an innovator in optoelectronic assembly techniques. AP Sensing is ISO 9001 certified.

With strong commitment and dedication to the fire detection market we are constantly optimizing our solution package to enable reliable asset protection in challenging environments. We cooperate with well known and highly recognized partners to complete our offering and to prove the system capabilities in a wide range of fire detection scenarios.



How do you secure your assets reliably under adverse environmental conditions?

Without question a full scale fire in your facility will have devastating consequences. It will destroy your investments, cause down-time and risk lives. A variety of fire detection technologies is often the right solution; however, proper fire protection is not simple when your facility is exposed to harsh environmental conditions. Industrial facilities produce dirt, dust, humidity and corrosive conditions throughout production, storage and transportation systems. Conventional fire detection technology often fails to offer a reliable, cost effective solution. Conventional equipment often produces false alarms, even with significant efforts to keep the fire detection system properly maintained.

AP Sensing's "Linear Heat Series" has been designed to minimize your operational costs and to work with maximum reliability under severe environmental conditions like:

- Dirt, Dust, Corrosive Atmospheres
- High Humidity
- Dynamic Temperature Fluctuations
- Solvent Vapors, Radioactive Radiation
- ATEX Classified Areas

Would you like to minimize maintenance efforts in large scale facilities?

In general safety systems demand highly reliable and extremely quick fire detection. Solutions need to be immune to interference and free of false alarms. They should continue to monitor regardless of the enormous heat and rapid spread of smoke. With conventional means, fulfilling these requirements requires complicated installation, commissioning and maintenance efforts. This is particularly the case in large, distributed manufacturing facilities, refineries, power plants, silos, warehouses, cold stores, conveyor belt systems, cable trays and tunnels.

AP Sensing´s DTS systems address these problems by using standard fiber optic cable as a precise, distributed heat sensor. They are easy to install and virtually maintance free. The fiber optic cable can withstand extremely high temperatures and can be several thousand meters long.

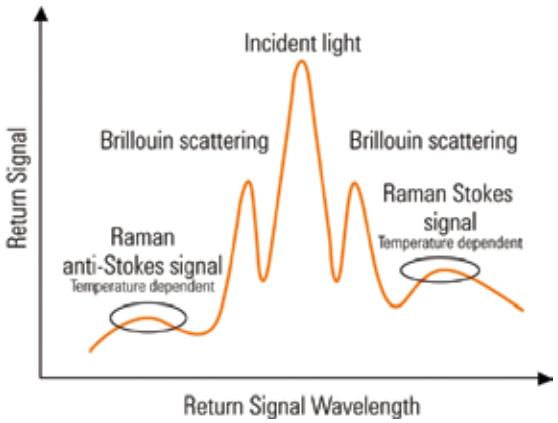
AP Sensing's "Linear Heat Series" – perfect for your mission.

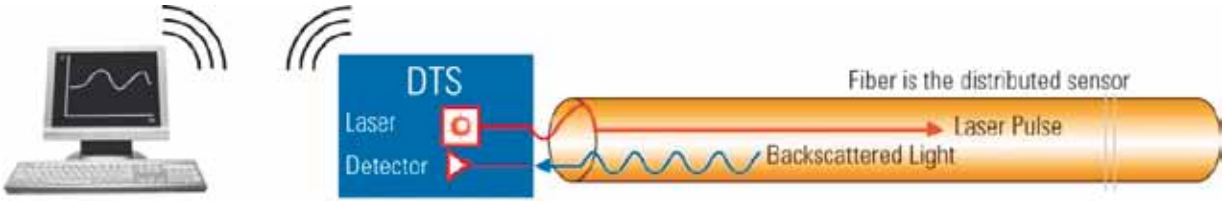
No doubt, AP Sensing's fire protection technology suits your fire safety demands and saves you money, especially for large scale applications in hazardous environments.

Application	Solution
Tunnel / Large Sized Facility	… just one cable
Cable Tray / Transformer / Generator	… immune to EMC
Conveyor Belt / Silo	… immune to dirt and dust
False Floor / Inaccessible Area	… maintenance free
Cold Store	… immune to humidity
Mining / Refinery / Floating Roof Tanks	… ATEX certified
Nuclear Power Plant / Disposal	… immune to radiation and corrosive atmospheres

Imagine thousands of detection points and you just install a simple cable

AP Sensing's fiber optic, linear heat detection systems leave no area unmonitored and display the real-time temperature and heat transfer of the entire area at once. Based on the quantum mechanical RAMAN-effect and a patented code-correlation measurement technique AP Sensing's "Linear Heat Series" measures an accurate temperature profile along the optical fiber over several thousand meters with measurements every 10 seconds. With an extremely high level of integration and unique optical assembly technology, AP Sensing offers you full protection combined with worry free permanent operation. All AP Sensing systems are designed and proven to ensure maximum quality with the lowest failure rate in the industry.





Sensitivity is a matter of your individual settings

In large scale applications the sensor cable will often run through different areas with various temperature conditions. The portal areas of tunnels, for example, are more effected by daily or seasonal temperature fluctuations than areas inside the tunnel. Manufacturing facilities always have sections with high or low ambient temperatures, depending on the machinery deployed. To cover these various temperature conditions efficiently and accurately, AP Sensing's "Linear Heat Series" enables you to configure different sensitivities on the same cable run, regardless of how long your sensor cable actually is. The fastest fire detection and lowest false alarm rate are in balance even with difficult conditions and different applications. All alarm conditions are met using various alarm criteria simultaneously such as maximums, rates-of-change, and an intelligent adaptive maximum criteria which takes the ambient temperature into account.

Tunnel installation set up examples:

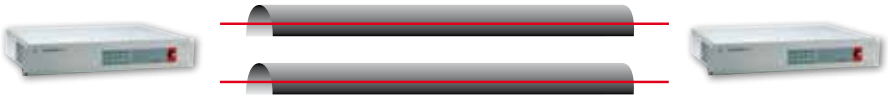
Setup I: 1 spur; no redundancy

Setup II: 1 spur; full redundancy

Setup III: 2 spur; no redundancy

Setup IV: 2 spur, full redundancy

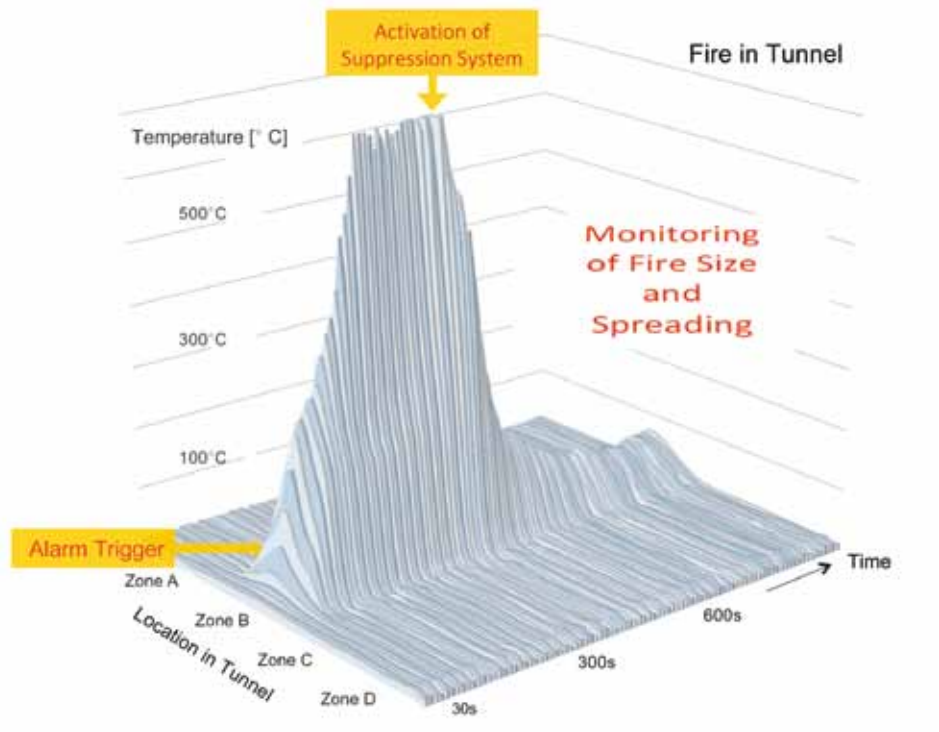
Setup V: 2 spur, full redundancy



Setup VI: 1 loop, cable redundancy only

Fire monitoring, not just detection

AP Sensing's "Linear Heat Series" capabilities are far beyond conventional fire detection systems. The systems have the capacity to not only detect fires quickly; but, to also detect individual fires precisely within a few meters. The systems are unaffected by wind and able to determine the size and direction of a spreading fire over time. No other fire detection system is able to withstand temperatures up to 1000°C, 1832°F, without losing monitoring capability. Fiber optic based fire detection and monitoring systems allow fire fighting counter measures to be used effectively before and throughout the fire event.



We offer the right sensor cables for your application

Regardless of dirt, dust, corrosive environments, organic vapors, extreme temperatures or radiation – we offer the sensor cable that best fits your needs. AP Sensing's solutions include cables for low cost, standard or specialized applications. All cables have an expected lifespan of 30 years and are maintenance free.

Easy integration into your management system

The system can be integrated easily into your management platform (e.g. SCADA systems) by either directly communicating over Ethernet (TCP/IP), using SCPI (Standard Commands for Programmable Insruments), or Modbus RS 232, RS 422, RS 485 and TCP/IP. Additionally, it can be combined with a relay extension module which can trigger up to 256 relays per channel. If needed, these relays are used to extend the 20 embedded relay outputs offered by the instrument.

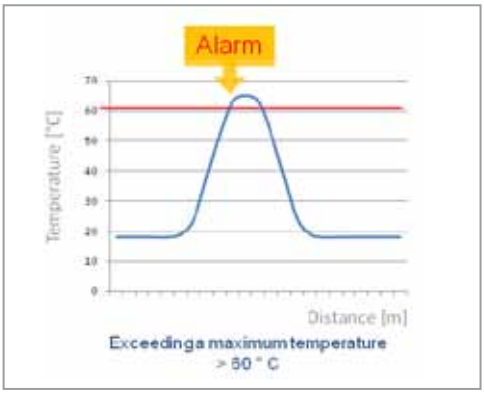
Safety Features

AP Sensing's "Linear Heat Series" is designed for worry free operation in hazardous environments.

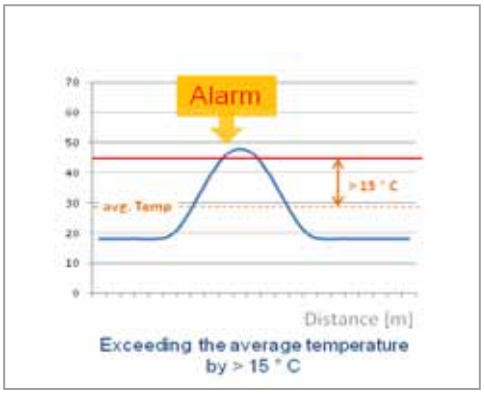
Features	Benefits
Fast, accurate and reliable fire detection	Highest safety and lowest false alarm rate even in hazardous environments
Industry leading technology, quality and lifespan	Reduced service and support costs
Freely programmable alarm criteria per zone	Different alarm sensitivities on the same cable run allows precise and selective trigger of counter measures.
Sensor cables are imperishable against environmental influences and maintenance free	Worry-free permanent operation even in hazardous areas with lowest cost of ownership.
Sensor cables are light, flexible and easy to install	Reduced installation efforts and easy deployment in cable route, underground conveyor belts, storage facilities and false floors.
Sensor cables offer highest durability against temperatures up to 1000°C (1832°F)	Fire spread and size assessment at the scene of accident to activate and supervise counter measures effectively.
Easy system integration, scalability, standard interfaces and protocols	Plug & Play capabilities, regardless of the given technical environment
Low power semiconductor laser and single receiver design	Enables inherently safe operation with maximum lifespan, widest operating temperature range and lowest power consumption.

- **Longest range on market – up to 8km per channel**
- **Up to 2 sensing channels, single and loop configurations**
- **Widest operating temperature range**
- **Lowest laser output power – inherently safe in operation**
- **Low power consumption – 15 W typically**
- **10 second cycles**
- **1 meter resolution**
- **ATEX certified – II (1) GD ; M2**
- **UL 521, ULC S530, VdS EN 54-5 Certified**
- **Certified for maximum spacing of up to 50ft (UL and ULC)**

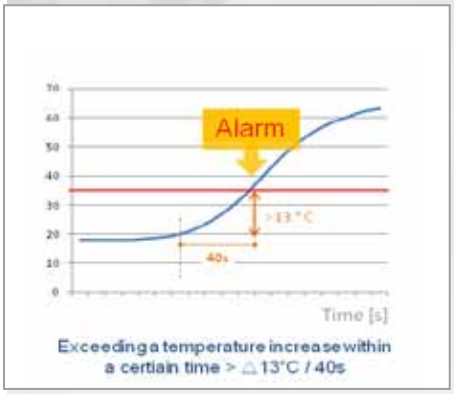
- Up to 256 freely configurable alarm zones with up to 5 alarm parameters per zone:
  - static maximum
  - adaptive maximum (takes ambient temperature into account)
  - three individual temperature gradients to cover different heat risings
- Fiber break detection and localization
- Real loop / dual ended measurement mode with automatic fiber break recovery
- Direct triggering of alarms can be performed with up to 256 potential-free relay outputs, can be used for direct activation of sprinklers, horns, ventilation system and much more
- DTS Calibration Wizard allows easy calibration of each fiber segment, accounting for splices, connectors, or variances in fiber properties
- Provides an easy to understnad loss (db) trace like an OTDR



Exceeding a maximum temperature > 80 ° C



Exceeding the average temperature by > 15 ° C



Exceeding a temperature increase within a certain time > △13°C / 40s

AP Sensing's leadership in quality is based on intelligent design, proven components and decades of experience

The instrument design is based on a low power semiconductor laser (Laser Class 1M) for maximum lifespan. We utilize a proprietary code correlation technique which provides the longest measurement range on the market. Additionally, AP Sensing's "Linear Heat Series" has a patented single receiver design which ensures long lasting measurement stability by eliminating drift effects well-known with dual receiver design. This unique design avoids the need for system recalibration. Furthermore, with the lowest optical output power AP Sensing's "Linear Heat Series" is inherently safe for operators. Also, AP´s DTS systems can be deployed in explosive environments without additional safety measures.

Solid instrument design with key components specified at:

- Calculated System MTBF: 33 years
- Calculated Laser MTBF: 60 years
- Switches tested to 100 M cycles or 63 years

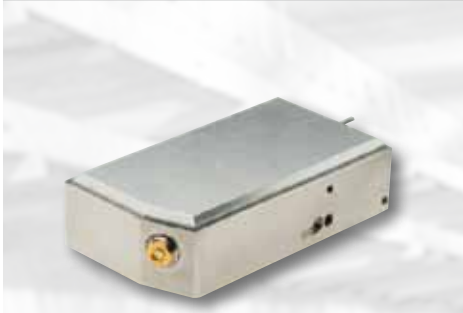
Our lifespan and quality are due to Agilent's 20 years of OTDR experience, proven ICs and solid manufacturing processes with the industries lowest failure rates in photonic test & measurement.

The instrument is independent of the communication infrastructure and will continuously monitor even with network outages. It is designed to work in remote locations and is automatically up and running within 30 seconds after a power interruption. The instrument runs with a proven real time operating system (VXWorks), which is stable and not susceptible to viruses.

- LAN interface enables simultaneous remote access from multiple locations
- Open programming interface is fully documented which enables easy integration with customized programs

Works anywhere; no air-conditioning needed!

The industries widest operating range is achieved by the highly integrated optoelectronic block. The laser and detector are temperature stabilized, ensuring accurate measurements over the entire temperature range. The block is hermetically sealed in inert gas protecting it against condensation, dust or moisture; this ensures long term, stable operation, independent of ambient temperature changes.



Certifications:

- VdS EN54-5, Class A1
- Product Safety: IEC 61010-1:2001 and deviations acc. to CAN/CSA-C22.2 No. 61010-04; UL 61010-1:2004
- Laser Safety: IEC 60825-1:2001
- FDA ackn. for Laser Sources: Class 1M; FDA 21CFR 1040.10+ Laser Notice No. 50
- Electro-Magnetic Compatibility: IEC 61326:2002
- Environmental Testing: IEC 60068-2-6/-64; IEC 60068-2-27
- ISO 9001:2000
- UL 521, ULC S530

Service and Support

Our reputation is based on the industry's lowest failure rate and best application fit. AP Sensing offers global service & support with a wide range of additional services and extended warranty. Every instrument and system we sell comes with a global warranty.

AP Sensing is your strategic business partner for success.

Authorized Distributor of AP Sensing Products:

For more information on Distributed Temperature Sensing products, applications or services, please contact:

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