



Pinnacle™ High-Sensitivity Laser Detector

Frequently Asked Questions/Answers

What is Pinnacle?

Pinnacle™ is an ultra high sensitivity laser-based spot-type smoke detector being offered by System Sensor, the world's leading manufacturer of smoke detectors and associated products. Pinnacle senses the earliest particles of combustion which provides the earliest recognition of fire. Pinnacle not only offers ultra high sensitivity, but also high stability with nuisance alarm reduction.

How does Pinnacle work?

The principles of laser detection used in Pinnacle are similar to those of standard photoelectric technology. In a photoelectric smoke detector, an LED emits light into a sensing chamber that is designed to keep out ambient light while allowing smoke to enter. Any particles of smoke entering the chamber will scatter the light and trigger the photodiode sensor.

Pinnacle works on the same light scattering principle, but with 100× greater sensitivity. This high-sensitivity is due to the nature of the laser itself, which is literally amplified light. Using an extremely bright, controlled laser diode, the laser beam is transmitted through the chamber to a light trap to eliminate any reflection. If a particle of smoke enters the chamber, light from the laser is scattered. The detector checks the nature of the scattered light to determine whether it is actually smoke that is present. If a positive determination is made, the alarm is signaled.

Is a detector as sensitive as Pinnacle prone to false alarms?

No. Pinnacle's microprocessor-based design with patented on-board algorithms verify the presence of smoke before alarming. These algorithms include multi-stage drift compensation, internal self-diagnostics, and superior transient signal rejection algorithms. The sensor can reject false alarms signals even when set to extremely high sensitivity.

Should I use Pinnacle instead of an aspirating system?

In the past, aspirating systems were the only detection solution available for high sensitivity and early warning. Today, the new laser-based spot type detection performs as good as or better than competing aspirating technologies in high sensitivity environments, however, it provides significant additional benefits to the end user.

First, Pinnacle can pinpoint the exact location of the fire. It is able to detect smoke at extremely low levels, sometimes before the smoke is visible to the human eye. By knowing which detector is in alarm, the source of the smoke is much easier to determine. In an aspirating sys-

tem, this is not possible because the system cannot identify which sampling port delivered smoke to the detector.

Second, the total cost of an installed laser system is less than an aspirating system in most cases. The cost to install a laser spot type system is comparable to the cost to install a standard spot type detection system. An aspirating system, however, requires the installation of pipe and fittings by a qualified installer.

Third, Pinnacle is actually more sensitive than an aspirating system. In an aspirating system, the smoke is sensed at one central unit. In the case of a small, localized fire, most sampling ports draw in clean air, diluting the smoke levels in the measuring chamber. With Pinnacle, measurement points away from the fire do not degrade response time, regardless of fire size.

Can Pinnacle be used in conjunction with other spot type smoke detectors such as Filtrex™, Acclimate™, or a photoelectric detector?

Yes, Pinnacle integrates well with other types of smoke detection systems to achieve optimized fire protection in each area of the building. Aspirating systems require unconventional installations and do not allow other types of detectors within the system. In many cases, high sensitivity detection is only required in one area of a building.

What are considered suitable applications for Pinnacle?

Pinnacle's early warning technology is ideal in any environment where there is a substantial cost of downtime or a significant investment in installed equipment.

For example:

- Telecommunications switching stations
- Computer rooms
- Clean Rooms
- Hospitals
- Museums, archives, and historic buildings

What are considered to be unsuitable applications for Pinnacle?

Areas with:

- Cooking fumes
- Condensed water vapors, steam or fog
- High levels of airborne dust
- Motor vehicle exhaust
- Welding or other processes that cause airborne combustion particles

How is Pinnacle different from a photoelectric smoke sensor?

Engineers focused on two goals to improve the ability of photoelectric detectors to detect fast-flaming fires: boosting the signal and reducing noise. More signal provides earlier warning and increases the ability to detect the extremely small smoke particles of a fire, particles so small they cannot be easily detected by a standard photoelectric detector. Meanwhile, reducing the noise helps reduce the probability of a false alarm.

This is where patented on-board algorithms come into play, distinguishing between transient signals caused by airborne dust and the first puff of smoke. Before these special algorithms were developed, laser detectors were useful only in extremely clean environments. However, that is no longer the case with Pinnacle. By selecting the sensitivity of the detector in the control panel, Pinnacle can protect many environments where rapid response and pinpoint accuracy are critical.

In a typical photoelectric detector, which uses a widely dispersed light beam from an LED, noise levels can be high. The laser beam, conversely, is extremely focused, concentrated and small. When this light is received by a specially designed light trap, Pinnacle achieves an even lower noise level. The narrow focus of the laser beam reduces the reflected light in the sensing chamber and results in a high signal to noise ratio (with noise defined as reflected light).

What different sensitivity levels are available with Pinnacle?

Users can select from nine different sensitivities in a range from .02-2% per foot for either pre-alarm or alarm settings. This gives the user great flexibility in configuring a system to a wide variety of different applications. These levels are:

- Level 1 – 0.02%/ft. smoke (0.06%/m obscuration)
- Level 2 – 0.03%/ft. smoke (0.10%/m obscuration)
- Level 3 – 0.05%/ft. smoke (0.16%/m obscuration)
- Level 4 – 0.10%/ft. smoke (0.33%/m obscuration)
- Level 5 – 0.20%/ft. smoke (0.66%/m obscuration)
- Level 6 – 0.50%/ft. smoke (1.65%/m obscuration)
- Level 7 – 1.00%/ft. smoke (3.24%/m obscuration)
- Level 8 – 1.50%/ft. smoke (4.85%/m obscuration)
- Level 9 – 2.00%/ft. smoke (6.41%/m obscuration)

Where has Pinnacle been tested?

Pinnacle has been tested in clean rooms and telecommunications facilities. The tests were performed and observed by independent fire industry professionals. Some of the tests were conducted as head-to-head comparison with prevailing technologies of the day for those types of facilities. To date, dozens of tests and tens of thousands of installations have been conducted in every major market worldwide. The conclusion has been the same – spot type laser detection performs as good as or better than competing technologies in these types of facilities, but it provides significant additional benefits to the end user.

System Sensor Sales and Service

System Sensor Headquarters

3825 Ohio Avenue
St. Charles, IL 60174
Ph: 800/SENSOR2
Fx: 630/377-6495
Documents-on-Demand
800/736-7672 x3
www.systemsensor.com

System Sensor Canada

Ph: 905.812.0767
Fx: 905.812.0771

System Sensor Europe

Ph: 44.1403.276500
Fx: 44.1403.276501

System Sensor in China

Ph: 86.29.524.6253
Fx: 86.29.524.6259

System Sensor in Singapore

Ph: 65.273.2230
Fx: 65.273.2610

System Sensor – Far East

Ph: 85.22.191.9003
Fx: 85.22.736.6580

System Sensor – Australia

Ph: 613.54.281.142
Fx: 613.54.281.172

System Sensor – India

Ph: 91.124.637.1770 x.2700
Fx: 91.124.637.3118



It Makes Sense

800/736-7672

www.systemsensor.com