

Detroit Lions American Football Team

Fireray® protects the 'Home of Football' in Detroit

FFE's Fireray® 3000 smoke detection system has been installed to protect against fire in the huge indoor training ground used by the Detroit Lions American football team.



The indoor training ground at Allen Park (Gensler)

KEY FACTS

Economically but effectively protecting the 95,000-square foot indoor practice field with smoke detectors presented a significant challenge due to the size of the space, the presence of obstacles and varying ambient light levels.

The Fireray® 3000 optical beam detector offered a solution, with the narrow infrared beam preventing obstacles from causing false alarms, and Light Cancellation Technology maintaining the system's sensitivity in all lighting conditions.

Remote testing capabilities and automatic gain adjustment to compensate for dust levels kept maintenance time and costs to a minimum.

The challenge

One of the oldest franchises in the NFL, the Detroit Lions have a long and proud history in the annals of American football. Although they play their matches at Ford Field in downtown Detroit, the home of the team is their headquarters and training facility at Allen Park in Dearborn, Michigan. This complex was constructed in the early 2000s and was certified by the US Green Building Council under their LEED scheme (Leadership in Energy and Environmental Design) for its use of recycled and renewable materials, and natural lighting. The centrepiece of the building is the 95,000-square foot (8,826 m²) indoor training field, the largest in the USA at the time of its construction, with a ceiling height of 110 feet (33.5 m) to allow space for kicking practice.

The size of the space makes the use of point or aspirating smoke detectors both costly and impractical, as a large and complex network would be required to ensure rapid detection. It is in these applications that the advantages of

beam detectors come to the fore. Smoke particles are very effective at scattering light, and so the brightness or intensity of a light beam through which smoke passes will reduce at a point beyond the smoke-filled area. Optical beam smoke detectors take advantage of this phenomenon to detect the presence of very low levels of smoke across large distances.

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We installed the Fireray 3000 units as part of an upgrade, replacing older Fireray 2000 units. It is a solid, state-of-the-art fire detection system and is ideal for those parts of our building where a wet suppression (sprinkler) system could not be installed. I would certainly recommend the Fireray 3000 for this type of application.

Mark Glenn, Facilities Manager at the Allen Park complex.

Focussing tightly on a solution

Although beam smoke detectors clearly offered a major advantage in this application, there were several aspects that presented challenges to their use. Firstly, there were many reflective surfaces in the building to maximise the efficient use of light; these can cause fluctuations in the measured light levels which could affect the accuracy of beam detection systems. Secondly, obstacles were present that risk interfering with the passage of the beam across the width of the building. In particular, it was a requirement that the beam had to pass through 24-inch (61 cm) gaps in the protective netting on the sidelines of the training field.

SimplexGrinnell, who installed the new system, recommended FFE's Fireray® 3000 infra-red optical beam smoke detection system, which has an end-to-end configuration. The system features a transmitter and a receiver installed at the extremities of the area being protected, with a narrow and precisely focussed infra-red beam passing from one to the other.



Diagram of beam path in an end-to-end optical beam smoke detector

Both the transmitter and receiver on the Fireray® 3000 are designed to be set up and aligned easily by a single engineer using thumbwheels mounted on the units. An in-built laser is used for visual targeting of the receiver towards the transmitter. Accurate alignment of the beam then follows, with flashing green or amber LEDs on the receiver indicating whether the signal is too high or too low. Thanks to this precise alignment capability, the Fireray® 3000 can protect a wide range of distances, from 5 to 120 metres, which was sufficient even for the indoor training ground. Furthermore, the beam can pass through gaps as small as the diameter of the receiver lens (approximately 70 mm) if the system is installed and aligned correctly, and so the sideline netting presented no difficulties either.

Another key reason for recommending the Fireray®3000 system for this application was its patented Light Cancellation Technology (LCT). LCT continuously monitors and compensates for the ambient light level while the system is in operation, which allows the detector to cope with all manner of challenging light conditions, both natural and artificial, without compromising detection or generating false alarms. This unique technology makes the Fireray® 3000 particularly suitable for protecting spaces with high levels of natural or reflected light which can vary significantly throughout the day.

Keeping running costs down

Another important aspect of the system was its maintenance. The transmitters and receivers required mounting at a reasonable height to ensure that they would detect hot smoke particles as they rise from a fire, which inevitably made access to the detectors more time-consuming and expensive. The Fireray® 3000 addresses this concern by automatically adjusting the gain of the detector to compensate for a build-up of dust on the lenses, which reduces the required cleaning frequency.

It is also possible to test the system remotely using the separate controllers mounted at ground level, each of which can monitor up to two receiver units. A fire condition at the receiver is simulated and a signal is sent from the controller to the site fire control panel. This test, which doesn't involve any interaction with the detectors themselves, is accepted by local fire authorities as part of the routine testing and maintenance regime required for compliance with the UL 268 smoke detector standard.

Both these features allowed the detectors in Allen Park to be mounted at positions for optimum detection efficiency, without being unduly constrained by accessibility concerns. Seven sets of Fireray® 3000 detectors were finally installed at carefully chosen locations throughout the indoor training field to give coverage of all areas.



Fireray® 3000 transmitters, receivers and controller