BOSCH

MVC-IAA-GUN Gunshot Detector License, perpetual
Intelligent Audio Analytics

- ▶ Application-specific sound detectors designed to detect and identify target sounds from the ambient sound
- ▶ Based on SoundSee, an audio technology developed by Bosch
- ▶ Privacy protected, as no audio needs to leave the camera
- ▶ Seamless integration of audio metadata with the Intelligent Video Analytics metadata stream

Traditionally, security and detection systems are based on visual monitoring of assets and people. However, environmental conditions such as light changes and extreme weather may restrict vision. By including sound, there will be an additional layer of awareness for a more reliable and faster detection of incidents.

Intelligent Audio Analytics is a powerful AI-driven audio analytics software that detects and identifies target sounds against ambient sounds. It is based on Bosch SoundSee technology, a highly reliable machine learning technology for audio analytics. With AI-driven audio analytics software, Bosch supports security professionals, consultants, specifiers and end-users on their journey towards improved surveillance.

Since Intelligent Audio Analytics is based on audio signatures, it ensures that privacy is protected, as no audio information needs to be recorded or needs to leave the camera.

System overview

SoundSee
Bosch's SoundSee technology uses machine-learning to analyze information in emitted sounds. SoundSee was developed through a research partnership between Bosch and Astrobotic Technology Inc. that started in 2019. SoundSee was initially created to improve the operations of the International Space Station (ISS). Currently, this technology is available for commercial and security applications such as Intelligent Audio Analytics.

Functions

Sound detectors
A set of sound detectors can identify sound events such as gunshots and T3 / T4 alarms. The sound detectors are designed to trigger an alarm functionality to alert the operator when the sound event matches an audio signature of a sound detector.
Intelligent Audio Analytics offers two sound detectors:
- Gunshot Detector
- T3 / T4 Alarm Detector

More sound detectors are expected to be released in the future.

The installation environment of the device highly influences the performance of Intelligent Audio Analytics. Therefore, each sound detector is trained for various environments and background noises to improve overall performance.

Gunshot Detector
The Gunshot Detector is designed to detect and identify a discharge detection of various types of firearms, such as hand guns and long guns in for both indoor and outdoor applications. The algorithm detects over 15 different calibers and prevents false positives from similar audio signatures like car door slam or a truck backfiring.
In unobstructed areas, the detection distance is around 75 ft / 25 m but is dependent on ambient factors and gun types.

T3 / T4 Alarm Detector
The T3 / T4 Alarm Detector is designed to detect and identify nearby Audible Emergency Evacuation Signals. Buildings are required to install fire detection alarm systems. The signal transmitted by smoke alarms is an internationally standardized evacuation signal known as the temporal 3 pattern (T3), and for carbon monoxide alarms it is a temporal 4 pattern (T4). Intelligent Audio Analytics can detect both T3 and T4 signals. A T3 signal produces a pulsed audio signal of three beeps followed by a period of silence, and a T4 signal produces four beeps followed by a period of silence. In industrial and commercial open spaces, the detection distance is around 35 ft / 12 m. In domestic applications, it has a range of around 18 ft / 6 m.

Directional information
As the first camera to bring Intelligent Audio Analytics, the FLEXIDOME panoramic 5100i (IR) is also equipped with an integrated microphone array. With three digital MEMS audio sensors, it provides directional information on detected sounds. This helps to guide the operator to the area of interest and take immediate action.

Intelligence-at-the-edge concept
Audio Analytics runs on the device. There is no need for additional hardware or servers. The device is designed to create metadata to enable audio content analysis. Since the audio analysis is based on audio signatures, it ensures privacy protection, as no audio needs to be recorded nor to leave the device. Alarms can be transmitted to a video management system that runs extended alarm scenarios. By capturing audio without recording it, Intelligent Audio Analytics generates metadata that is seamlessly integrated in the Intelligent Video Analytics metadata stream. The metadata is sent via the network and can be recorded with the video stream. The audio metadata is ONVIF Profile M compliant, and can be easily integrated with other clients and systems. The event-based metadata contains:

• Detected event (Gunshot, T3, T4)
• Confidence level (1-99)
• dB level (0-90)
• Direction of arrival (0-360)
• Timestamp
• Settings configuration
• Threshold of detector (set by user)

Forensic search
The recorded metadata can be used for forensic search, enabling change in rules within the Bosch Video Management System, the Bosch Video Client, or 3rd party VMS. New tasks can be defined and adapted to each search, and the recorded metadata is then scanned and evaluated accordingly. Forensic search is extremely efficient and can scan extensive databases for events within seconds.

Parts included

Quantity	Component
1	Intelligent Audio Analytics perpetual license

Technical specifications

Common Product Platform (CPP)	
Intelligent Audio Analytics	Available on selected Bosch IP cameras with CPP14

Ordering information

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Order number **MVC-IAA-GUN**