WHITE PAPER

Axis network audio and EVAC certified alarm systems

Use IP audio to complement your certified system

June 2025

AXIS COMMUNICATIONS

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1 Introduction

A certified EVAC (emergency voice alarm communication) system is mandatory in many types of buildings. Adding a PA (public address) system is optional. Axis network audio is a PA system for announcements and background music. An Axis network audio system can successfully complement an EVAC system in your building, but not replace the EVAC system.

This white paper explains why Axis network audio cannot be used as a certified fire alarm or EVAC system according to the EN 54 or NFPA 72 standards. We discuss how Axis devices can complement an EVAC system and provide several important benefits.

2 PA systems vs. certified EVAC systems

A PA system is used for general announcements, background music, and everyday communication. Modern PA systems, such as Axis network audio, are IP-based. They use active loudspeakers and related equipment such as microphones and amplifiers to address people with live or prerecorded messages.

An EVAC system is specifically designed to provide clear voice instructions during emergency situations such as evacuations or fires. An EVAC system is controlled by a fire detection system and plays a voice evacuation message in case of a detected fire.

A key difference between the two types of system is their purpose: PA systems are for everyday communication, while EVAC systems are for emergency information.

Another difference is certification. A certified EVAC system complies with the EN 54 series of standards for the European market (also used in several other parts of the world) or the NFPA 72 code for North America. PA systems are not covered by any standard.

3 Why is Axis network audio not certified according to EN 54 or NFPA 72?

Axis network audio products are not compliant with the EN 54 standards or NFPA 72 standards. IP-based products cannot be compliant, because certification requires another type of technology.

The standards are not intended to cover addressable loudspeakers. It is possible to use an IP-based system for EVAC, meaning that the amplifier or the microphone is IP-based, but you cannot use IP-based speakers. According to the standards, a certified EVAC system must use analog or digital cabling but not network cabling to connect amplifiers and loudspeakers.

4 How Axis network audio can complement an EVAC system

Being an IP-based PA system, Axis network audio is not intended to be used as a building's only system for critical emergencies. It is not a certified EVAC system according to established fire alarm standards.

However, installing a complementing Axis system in your building provides several benefits and additional functionality. With IP-based audio you can use the already existing network cabling for audio use cases. The Axis system can work alongside the certified EVAC system, enhancing overall communication capabilities without compromising life-safety functions.

Examples of what you can do with Axis audio:

- Enhance the certified EVAC system with audibility and intelligibility. Alternatively, set up the Axis system to be automatically muted in case of an alarm in the certified system.
- Be sure that the system works, by help of health monitoring with auto-speaker-test and connectivity status.
- Play background music and announcements in non-emergency situations.

- Schedule messages and alerts for daily operations, and update messages easily.
- Use zone-specific messaging for targeted communication. Also redesign and rezone the audio system layout easily and without losing liability.
- Integrate with cameras for visual verification of areas before making announcements

All Axis speakers and system devices come with built-in I/O that you can set up to be triggered by the certified system in case of a fire alarm. You can set it up to mute the Axis system entirely, or to mute the scheduled content and instead play a complementing alarm signal or voice alarm message to enhance the EVAC system. Should a certified EVAC system be required for an indoor installation, for example, you could use an optional Axis system as a complement for voice alarming outdoors.

The Axis solution is designed to coexist and not interfere with the active fire alarms. It does not send any information to, or exchange any information with, the fire detection system but only receives an input signal from it.

For practical guidance, see *How to connect a fire detection system to an Axis network audio solution*

Axis products intended for ceiling installations are plenum-rated. This means that they meet the requirements of specific safety standards (UL 2043) for use in plenum spaces. These products are designed to minimize smoke and toxic gas release in case of a fire, reducing the risk of harm to people and damage to equipment.

5 Is a certified system better than a non-certified system?

If a certified system is not mandatory in your building, it is not necessarily better than a non-certified system.

The certification (according to EN 54) gives no indication of what the general fire alarm system should look like. It does not cover overall requirements concerning audibility and intelligibility. Similarly it does not specify requirements on health monitoring for individual speaker functionality.

This means that certification does not necessarily mean that an EVAC system provides clear speech. And without health monitoring functionality, a failure in the line might go unnoticed. With the technology that is required for a certified system, this could mean that you lose the sound in the whole line and not only in the nonfunctional speaker.

When you have a certified system in place you typically want to avoid making changes. It has fixed cabled alarming zones, which require physical rewiring whenever you need to modify the zone configuration. Any changes can potentially impact not just the certification, but also overall safety and liability.

Making changes to an IP-based audio infrastructure is a lot easier. You can modify audio zones by just a few clicks in your audio management software, without touching the physical cabling. This adds flexibility in locations such as a retail shop or shopping mall, where you might need to adapt your audio zones whenever you change the interior design.

From an organizational point of view, the fire detection system and the voice alarm system are typically managed by the fire protection officer. The IP-based audio infrastructure is typically managed by the IT manager.

Appendix 1 EVAC system standards

While the EN 54 standards are highly focused on the performance and certification of individual components, the NFPA 72 standardization provides a comprehensive framework for system design, installation, and integration. Both sets of standards aim to ensure effective voice alarm systems but cater to different regulatory frameworks and market needs.

Appendix 1.1 European standards

EN 54 fire detection and fire alarm systems is a series of European standards that include product standards and application guidelines for fire detection and fire alarm systems and voice alarm systems. The product standards define product characteristics, test methods, and performance criteria against which the effectiveness and reliability of every component of fire detection and fire alarm system can be assessed and declared.

EN 54 is part of the building norms in Europe. It is partly used also in several countries in regions outside of Europe. EN 54 gives no indication of what the overall fire alarm system should look like. This is cross-referenced to national committees.

EN 54 specifies, for example:

- Analog 70 V or 100 V systems.
- Feedback loop – monitored link in case of a short circuit or cut cable.
- Redundancy – double power supplies and 70 V or 100 V line. Manual controls, fuses, calibration elements, and power supplies must be placed in closed racks only accessible with a tool or a key.

EN 54-16 specifies requirements for the voice alarm control and indicating equipment as a whole system.

EN 54-24 specifies requirements for the build quality and durability of voice alarm loudspeakers, including how they perform in different environmental and physical conditions. However, it does not consider the acoustic challenges of the specific installation site. This means that the standard provides a useful framework for designers to choose the right loudspeaker for a particular application but it does not guarantee that speech will be clear and understandable in the actual environment.

Appendix 1.2 North American standards

NFPA 72 is a comprehensive code developed by the National Fire Protection Association, governing the design, installation, and maintenance of fire alarm and voice alarm systems.

NFPA 72 is broader in scope compared with the European standardization and focuses not only on the equipment but also on system design, integration, and operational protocols. It provides detailed guidance on system configuration, wiring, survivability, audibility, intelligibility, and testing. It specifies the distribution and placement of loudspeakers and the system's operational behavior in various scenarios.

Survivability is a key focus, requiring circuits and equipment to maintain functionality during fire conditions, sometimes using enhanced wiring protection.

The emphasis is on the overall system's compliance with the code, including the proper integration and functioning of components.

The local fire marshal can approve a non-NFPA 72 compliant system.

T10219505/EN/M1.7/2506

About Axis Communications

Axis enables a smarter and safer world by improving security, safety, operational efficiency, and business intelligence. As a network technology company and industry leader, Axis offers video surveillance, access control, intercoms, and audio solutions. These are enhanced by intelligent analytics applications and supported by high-quality training.

Axis has around 5,000 dedicated employees in over 50 countries and collaborates with technology and system integration partners worldwide to deliver customer solutions. Axis was founded in 1984, and the headquarters are in Lund, Sweden.