

Microphone Selection: Line Level vs Mic Level

February 2021

When selecting a microphone to use in a security system, most integrators begin by verifying compatibility with the cameras or recorders used in the system. When reviewing product specifications for cameras and recorders, there will generally be an entry for “Audio In.” This entry will typically list audio specifications as “line in,” “mic in,” or “line/mic selectable.”

As the name suggests, a “line in” input is compatible with a line level microphone. These microphones, also referred to as “powered microphones” require a connection to a power supply. The circuitry amplifies the sounds picked up by the microphone to a standardized signal level. With a powered signal, a typical line level microphone can transmit an audio signal over a long distance without perceptible loss in audio fidelity. Line level audio is a nearly universal standard for security technologies.

In recent years, certain IP camera manufacturers have begun supporting mic level microphones. Denoted on spec sheets as “mic in,” these inputs support a passive microphone which does not require an external power supply. In contrast to line level microphones, a mic level microphone will send a much weaker signal and therefore has a limitation to how far away from an IP camera it can be placed. However, this distance limitation generally does not restrict the proper placement of the microphone or otherwise restrict the performance of the security system. In most cases, the convenience of being able to connect a microphone without power outweighs any negative effect of the distance limitation.

A small but increasing number of camera manufacturers will list audio input specifications as “line/mic” selectable. For these cameras both microphone types are compatible. When installing and configuring the system, log into the camera’s audio setup menu to select the input type that corresponds to your microphone type. If for any reason the wrong input type is selected, it will be immediately apparent. A mic level microphone connected to a line level input will result in faint or inaudible sound. A line level input requires a much stronger signal that a mic level microphone provides. Conversely, a line level microphone connected to a mic level input will result in distorted and overdriven sound as a line level microphone sends a much stronger signal than a mic level input can receive. In either case, simply changing the audio input type in the camera menu will resolve the issue.

Considering microphones with different signal levels and power requirements will ensure proper interoperability with security equipment. When the system is designed correctly, both line level and mic level microphones will add intelligible sound to video security.