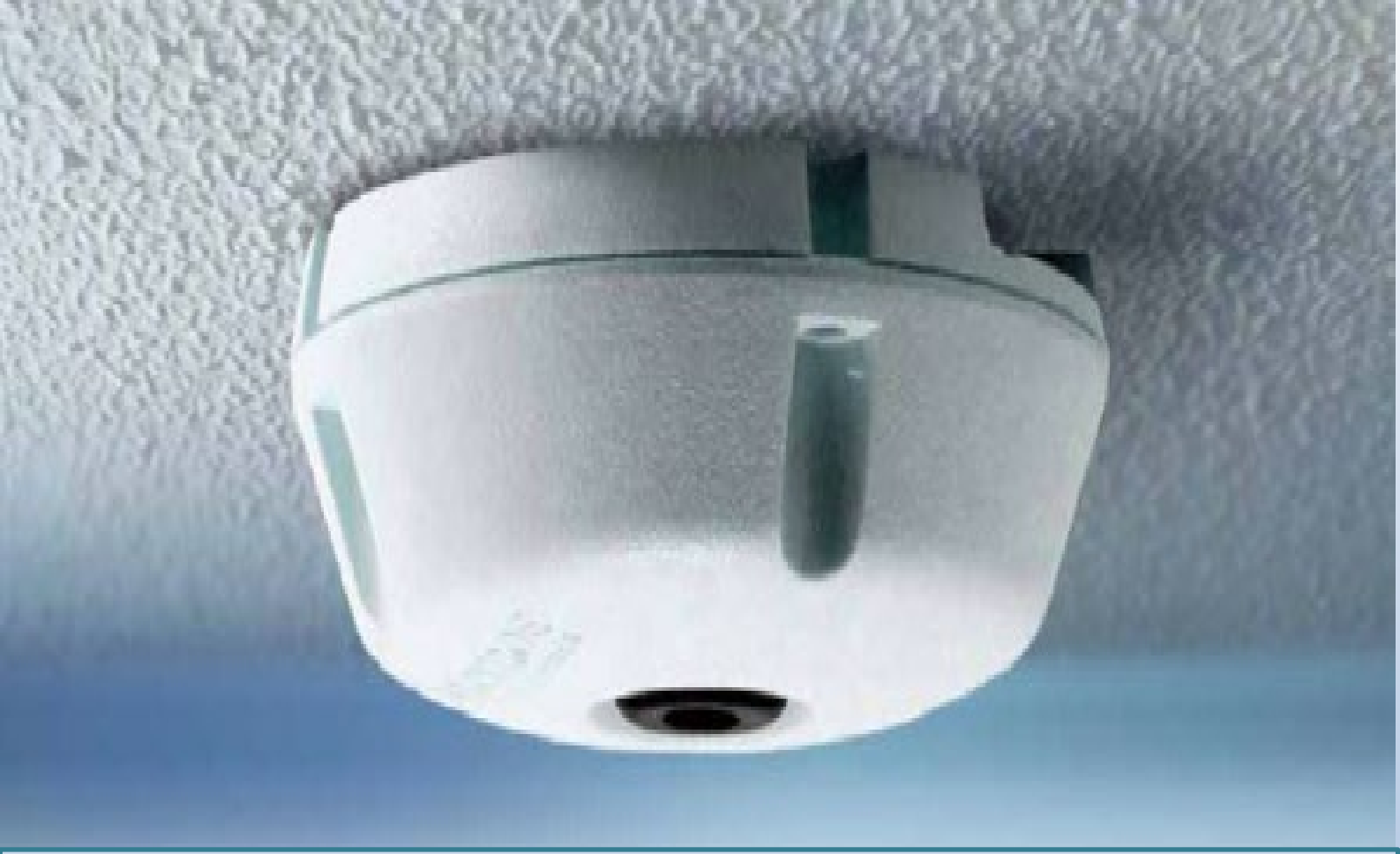
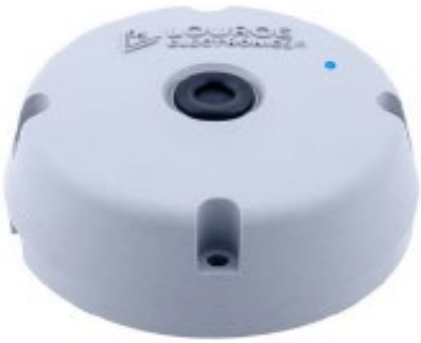


Best Practices for
Selecting Audio

LOUROE ELECTRONICS
World Leader in Audio Monitoring Technology

Contents



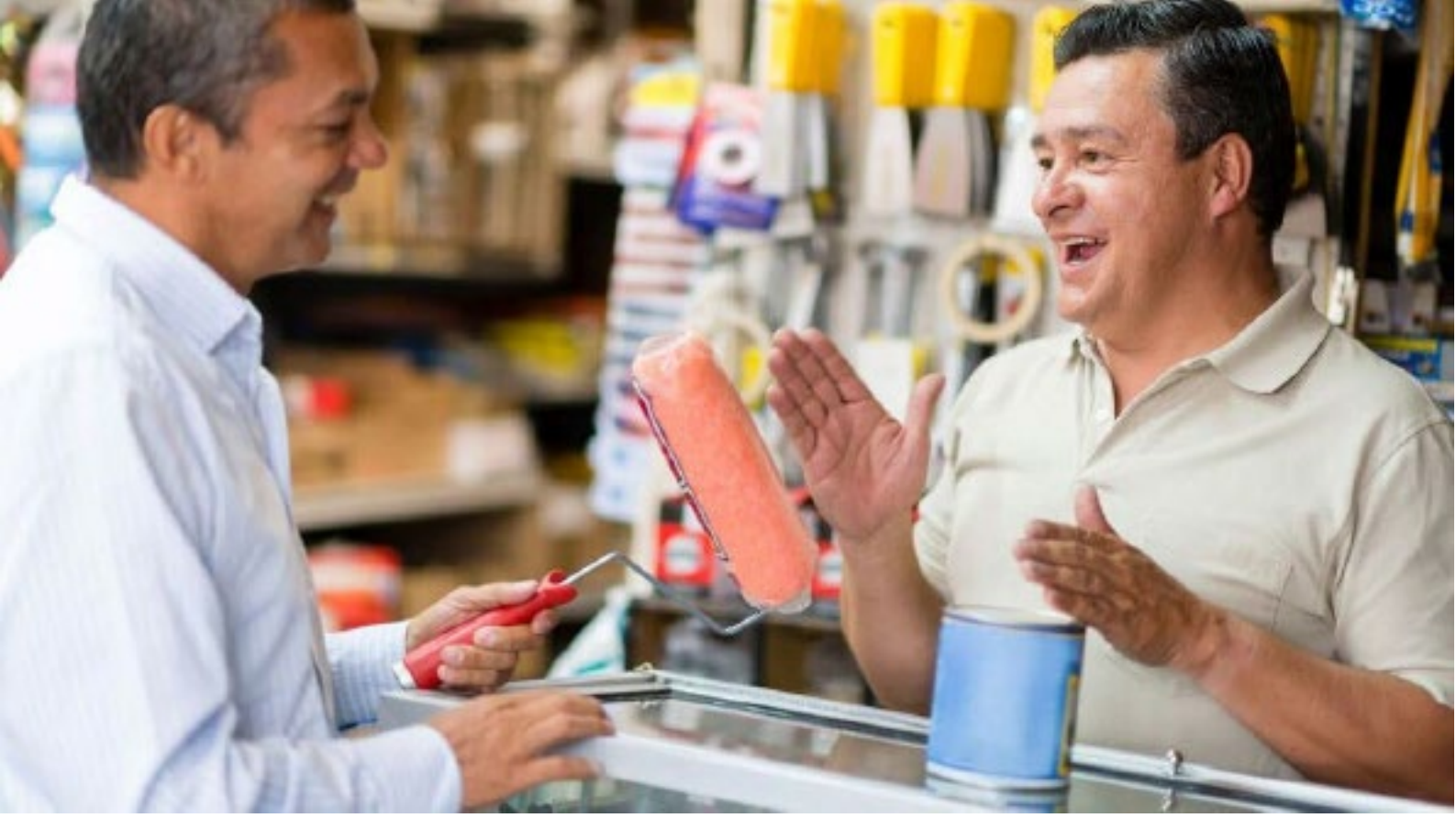
Chapter 1

Why Audio

Audio should be a part of a serious solution considered when evaluating security systems and upgrades. Recently, a masked gunman walked into a jewelry store; As he points a gun at the cashier demanding the loot, he mysteriously leans in and appears to mutter something to the cashier.

Because there is no audio being recorded, operators have no idea the masked robber is telling the cashier to meet them at 5 o'clock sharp for their share of the cut.
It should go without being said that this is the proverbial smoking gun in the investigation -- an inside job foiled by audio capture.
Except, it didn't happen. Without audio, investigators have no idea of the verbal transaction between the cashier and robber.
In this scene, we can see that just by adding audio, the dynamics of the crime are completely changed. It's akin to adding audio in an otherwise silent film. We're able to see the full picture and the dynamics at play. And thus, the value of audio is becoming evident. The question is, how do you select the right microphone for your application?

> "Audio is a must. You can actually hear people talking in other areas of our store, even though the microphone is mounted above the checkout counter. "
>
> -Moe Keshawi Manager at Northridge, CA UPS Store



Chapter 2
The Right Mic for the Right Situation

One of the most common and confusing challenges when designing or adding a mic to a video surveillance system is knowing which mic to use (Line Level or Mic Level). This can easily be found by looking up the Model of camera being installed on the Data or Spec Sheet of the camera under the AUDIO IN section of the data sheet.
Refer to the examples below.
LINE LEVEL MICROPHONES need power (12VDC). In this case, the microphone should be powered or amplified with a 12V DC base station, interface, or power supply. Line Level microphones have a cable distance of 1000' and should use a 2 Conductor shielded cable, 22 gauge with a 24 gauge drain wire (West Penn 452 or equivalent).
MIC LEVEL MICROPHONES draw power directly from the IP Camera (1.8VDC - 4.5VDC). Louroe Mic Level Mics come with a 20' pre-made cable with a stereo plug on one end that can be plugged directly into the Audio Input of an IP camera. The distance limitation is recommended not to be more than 20'.

Security without audio is akin to watching a silent movie.

Chapter 3

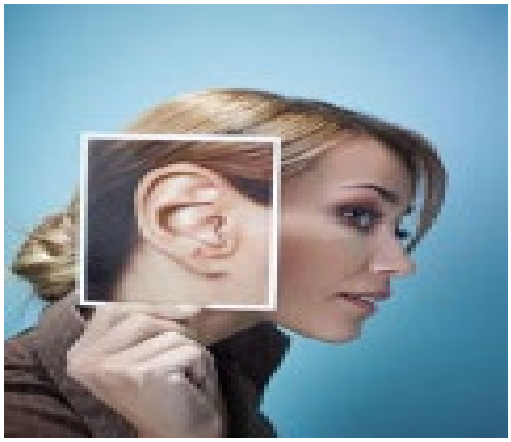
Directional, Omni-Directional, or Bi-Directional: Which is right for me?

When selecting a microphone, consider the microphone's operating use and environment. Just like with a video camera, you need to know the height of the ceiling, what type of material is used on the walls, floors, and ceiling (e.g. drop ceiling or hard cap), and most importantly – what type of audio do you want to capture?

This will help determine the desired pickup pattern of a microphone.

Microphones may be either directional or omni-directional.

If mounting a microphone in the ceiling of a police department interview room, you would use an omni-directional (all directions) microphone. If mounting a microphone in a wall plate near an entry door, you would use a directional (specific direction) microphone. Lastly, if you're installing audio in a counseling session or in a bank teller booth, bi-directional audio would be ideal.



Verifact® A: An omni-directional microphone frequently mounted on the ceiling indoors.

Verifact® B: An omni-directional microphone with an extended microphone cable allowing the microphone to be mounted 3 ft from its housing. Frequently used indoors in areas with high ceilings.

Verifact® C: An omni-directional microphone designed for small or unusual housing requirements. Frequently used indoors.

Verifact® D: An omni-directional microphone housed in a stainless-steel. The device fits into a single gang electrical box and is frequently used indoors on wall or ceiling mounts. The microphone assembly is mounted on the rear of the stainless-steel faceplate. Also available in vandal proof

Verifact® E: An omni-directional microphone housed inside a single-gang weather resistant box. Designed for outdoor applications. Surface mount only.

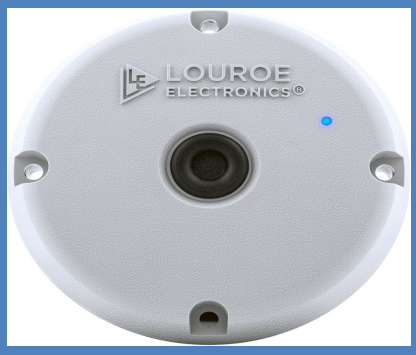
Verifact® K: A directional microphone designed for areas with excessive background noise or where the ambient sound level is high. (Trains, buses, etc.) Designed for indoor use.

Verifact® L: A bi-directional microphone designed to pick up sound in front of or in the rear of the device. (Bank teller lines, counseling offices, magistrate's office, etc.). Frequently used indoors.

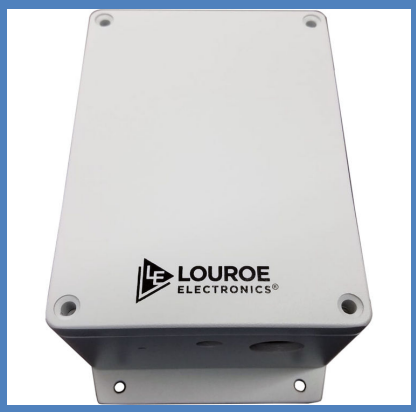
Gain Control is available for the A, B, C, D, & E mics and can be ordered with AGC (Automatic Gain Control) which provides controlled signal amplitude at the output.

Chapter 4

IP Microphones



Digifact™ A



Digifact™ E

The all-new Digifact™ A and Digifact™ E are IP microphones with an onboard processor to meet today's security needs. The Digifact features a quad-core processor that streams audio over multiple industry standards including Real Time Streaming Protocol (RTSP) and can be easily connected to leading VMS platforms. It incorporates audio and signal processing for clear audio capture quality and a wide dynamic range.
The microphone's decibel level threshold alarming can create alarms based on specific dB levels and trigger relay outputs to cameras or other equipment making it capable of operating independently or as part of a larger security solution.
The Digifact™ A is utilized Indoors where the Digifact™ E is used in outdoor environments.

The benefits to these IP Mics are:
- Smart IP microphone
- PoE connectivity (IEEE802.3af compliant)
- Sound decibel level threshold alarming
- Digital alarm output ports

Regardless of analytic type, event notifications can be transmitted in one of two ways: **TCP / IP Notification** or **event API**. Both transmissions are compatible with most Video Management Systems (VMS). For IP notifications, the stream is sent using RTSP or HTTP streaming protocols. The second method is done by using a contact closure relay. The relay connects the output of the device running the analytic to the input of the access control, security panel, or any security device that an alarm input.

Chapter 5

Compatibility & Considerations

When trying to determine whether the camera is Line Level or a Mic Level, the easiest way is to refer to the specific camera model in use. This can be found under the camera's data sheet found online.

Alarm Inputs	2
Alarm Outputs	1 relay output 32 VDC, 150 mA max.
Audio	1x mono line in, 1x mono line out
• Signal line in	94 kOhm typical, 1 Vrms max.
• Signal line out	1 kOhm typical, 1 Vrms max.

Location

When consider which microphone to use, you should run yourself through a few preliminary questions:

- Will this mic be mounted in the ceiling or on a wall?

- Will there need to be a mic on either side of a counter? (i.e. Bank Teller)

- How high is ceiling? Will the mic need to be extended down from above? (E.g. ceiling greater than 30')

- How large is the room and what is the intended use of audio? What kind of audio are you looking to pick up?

- Operating environment material: Is it wood, cement, or open air? Other considerations include the difference between drop ceiling or sheet rock-styled walls (commercial or education) compared to hard cap ceiling and cement floors and walls(holding cells).

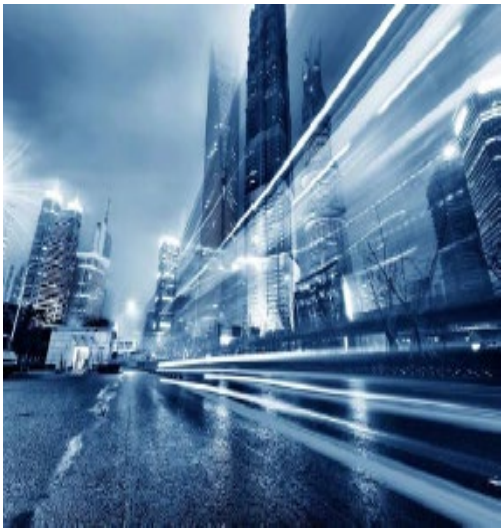
- Gain control considerations: Think about the sound of handcuffs or engine noise. Using a microphone where you can adjust the gain, you can help address areas with excessive background noise.

Chapter 6

Audio and the Law

> “It is not unlawful to monitor oral communication when prior consent is given. Consent may be expressed or implied.”
> U.S.C. 18, Chapter 119, Sec. 2511(d)

Audio laws have long been misunderstood by the security industry. Audio provides little to no risk to integrators when used properly and with signage posted clearly on entrances.
When mounting a microphone, regardless of whether you’re attaching the device to an video sensor camera or passing audio directly to a Video Management System (VMS), it’s important to not place the microphone anywhere a person would reasonably expect privacy like a bedroom.



Questions regarding audio monitoring and the law are one of the most frequent inquiries we receive from our customers. Under U.S. law, audio monitoring is legal as long as there is no expectation of privacy amongst those being monitored, and state laws are quite similar.When properly applied within legal and ethical bounds, audio can significantly improve a video security system. Conversations can occur with people at remote locations and important events can be more fully documented. Even nonverbal indicators of aggression and crime can be monitored for greater detection and response.

For consumers today, audio is an integral part of their everyday lives, from voice command virtual assistants like **consumer electronic units, to smart phone applications**. In security, **audio is being increasingly adopted to identify alarm events, enhance communications, and provide an added layer of protection**. As societal expectations and overall comfort with audio have evolved, the security integration industry has progressed to recommend the importance of audio in the total security solution.

The Law

U.S.C. 18, Chapter 119, Sec. 2511(d)
It is not unlawful to monitor oral communication when prior consent is given. Consent may be expressed or implied. Implied Consent is given through facts (written acknowledgement), actions (being verbally told by establishment), or even by silence (visual stickers). This gives reasonable understanding that consent is inferred. It is expected that if a person objects to being monitored or recorded, that they would respond by saying they do not want to be monitored or recorded.

Want to learn more about audio and the law?
Check out our free guide below.

Learn More Here