

What's the Difference Between Line and Mic Levels?



Line level versus mic level, simply stated, both refer to the voltage level of an audio signal.

Wired and wireless microphones are typically connected to mic-level inputs, whereas most other audio devices use line level. The voltage of each signal type varies significantly, however, making it important to know how they differ.

What is mic level?

A mic-level or microphone-level signal describes the voltage generated by a microphone when it picks up sound, typically just a few thousandths of a volt. This voltage varies in response to changes in sound level and distance. Of the four main types of audio signals, mic level is the weakest and requires a pre-amplifier to bring it up to line level. Microphone levels usually specified between -60 and -40 dBu. (dBu and dBV are decibel measurements relative to voltage.)

Several different types of devices are used to boost microphone levels to line-level signals. Mixers are probably the most popular piece of equipment, since they can also combine multiple signals together into a single output. But preamplifiers and mic-to-line amplifiers do the job just as well and are available as single-channel or multi-channel devices.

What is line level?

A line-level signal is approximately one volt, or about 1,000 times as strong as a mic-level signal, so the two do not ordinarily use the same input. This signal travels from your pre-amp to the amplifier that powers your speakers.

There are two standard line levels:

- -10 dBV for consumer equipment (like MP3 and DVD players)
- +4 dBu for professional equipment (mixing desks and signal processing gear)

The other two types of audio signals you'll run into are instrument and speaker levels. Like mic-level signals, instrument-level signals (such as an electric guitar or bass) require preamplification to bring them up to line level. Post-amplification speaker-level signals are even higher in voltage than line level and require speaker cables for safe signal transfer.

Matching Levels

It's crucial to match a device to the correct input, since there's no real technical tolerance for mistakes.

For example:

- Connecting a microphone to a line-level input will result in almost no sound at all, because the mic-level signal is too weak to drive the line-level input
- Connecting a line-level source to a mic-level input will cause the sound to be loud and distorted because the line-level signal is much stronger than what the mic input will accept. (Note: Inputs and outputs on some higher-end mixers are mic and line level switchable.)

Helpful Hints

- A mic-level input is typically a female XLR connector. A line-level input is typically an RCA jack, 1/4" phone jack, or 3.5 mm phone jack.
- Don't assume that the levels match just because one connector fits properly with another. Inputs are generally very clearly marked.
- If there is only a mic input on a device (for example, a digital recorder or a computer) and you need to connect a line level device to it, you can reduce the voltage by using an attenuator or a DI (Direct Injection) box, available at most music stores. There are even cable versions with built-in resistors that accomplish the same task.
- Different wireless receivers have different output levels.