

Relationship between gain and signal-to-noise ratio (SNR)

Signal-to-noise ratio is a measure of how much useful audio signal you have compared to unwanted background noise.

- **Signal** = the sound you want (e.g., voice, instrument)
- **Noise** = the sound you don't want (e.g., hiss, hum, interference)

It's usually expressed in decibels (dB). **Higher SNR = cleaner sound. Lower SNR = noisy sound.**

Gain is the control that sets how much of your mic or instrument's signal gets into the mixer.

It's the first adjustment in the signal chain—before EQ, compression, effects, or volume faders.

The Real Purpose of Gain is to **Optimize signal-to-noise ratio**: You want the cleanest, strongest signal without distortion.

✓ Best Practices - Gain

- **Start with faders down** to avoid feedback while adjusting gain.
- **Gain is not volume**—it sets the input level before EQ, compression, and fader.
- **Use consistent input sources** during soundcheck to avoid surprises during live performance.
- **Document gain settings** for recurring setups (e.g., choir mics, pastor's lav).

Step	Action	Details / Tips
1	Select the Input Channel	Use the "Select" button to choose the channel you want to adjust. Confirm the correct source is patched.
2	Ensure Signal is Present	Have the performer speak, sing, or play at typical volume. Use phantom power if needed (e.g., for condenser mics).
3	Watch the Input Meter	On the mixer screen or channel strip, monitor the input level. Look for consistent signal, not just peaks.
4	Adjust the Gain Knob	Turn the gain knob until the signal peaks around -18 dB to -16 dB on the meter. Avoid going above 0 dB.
5	Check for Clipping	Ensure no red lights or "clip" indicators flash. If they do, reduce gain immediately.
6	Use the Solo (PFL) Button	Press "Solo" to listen to the pre-fader signal in headphones. Confirm clarity and headroom.
7	Repeat for All Channels	Set gain individually for each mic/instrument. Don't copy settings blindly—each source is unique.
8	Save the Scene (Optional)	Once gains are set, save the scene or preset to avoid redoing work later.