What is Input Sensitivity?

A common misunderstanding is the purpose and function of the input sensitivity or "gain" as it's often called, on an amplifier or DSP. First things first, input sensitivity is **not** a volume control! Setting input sensitivity maximizes the signal to noise ratio by matching the input sensitivity to the output voltage on the preceding source, which may be a head unit, DSP, or integration product. Maximizing the input voltage strength by balancing it's proportion to the source unit should ensure maximum output potential with minimal clipping and/or distortion at most volume levels. An audio system with properly set gain structure should be loud, dynamic and free of distortion.
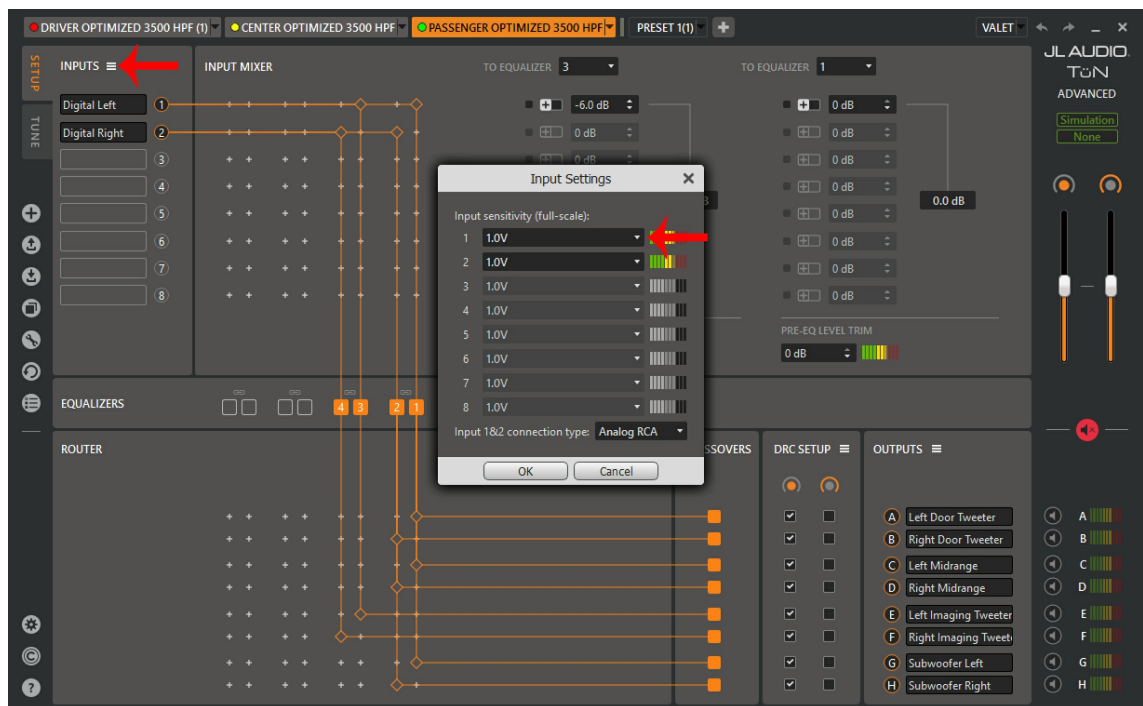
Input sensitivity is adjustable on an amplifier or DSP due to the fact that the signal strength varies from the previous source's outputs. If the input signal strength is too low the amplifier most likely won't reach it's maximum output. Increasing the input sensitivity will ensure the amplifier now has the ability to produce it's maximum, non-clipped output potential. Likewise, if the signal strength is too high the input sensitivity should be lowered so the amplifier isn't overdriving the "hot" signal and reaching it's maximum non-clipped output too early. If the input sensitivity isn't lowered on a higher voltage input signal there is a strong risk of clipping and distortion at higher volume levels.

When adjusting input sensitivity it's recommended to set the previous source's volume or output potential to 75%. This provides a bit of gain overlap for various types of music, the music's recording quality as well as the varying signal strength between the sources (Bluetooth®, AM/FM, USB, CD, Satellite Radio, etc). Using an Oscilloscope is the best method to set input sensitivity. A scope will detect the clipping point of the DSP or amplifier's outputs when playing a frequency appropriate sine wave (50 Hz for subwoofer amplifiers and 1 kHz for full-range amplifiers). The needed sine waves can be found on the FiX™ Calibration CD or downloaded from the Audio Files article. Playing the correct sine wave, slowly adjust the input sensitivity until the sine wave is at it's largest on the scope's display without showing any clipping. Clipping on an oscilloscope will be detectable by seeing flat spots at the peaks of the sine wave.

https://youtu.be/2eRYzXBmWq8

If an oscilloscope is not available, follow our 9-Step Level Setting Guide to properly set input sensitivity as seen in the video above. If using RD Amplifiers, follow the shorter 7-Step RD Amplifier Level Setting Guide , which takes advantage of the RD's clipping indicator LED.

It's also important to remember that input sensitivity is not just a feature on amplifiers. Many system tuning DSP's such as the   TwK™ 88 utilize input sensitivity as well. Adjustment to TwK™ 88 input sensitivity can be made by clicking the   icon next to the INPUTS label on the SETUP tab within TüN 2.0 software. This will bring up a menu that has pull-down menus with varying input sensitivity voltages to select.