Neutrik USA Today | Grounding XLR connectors

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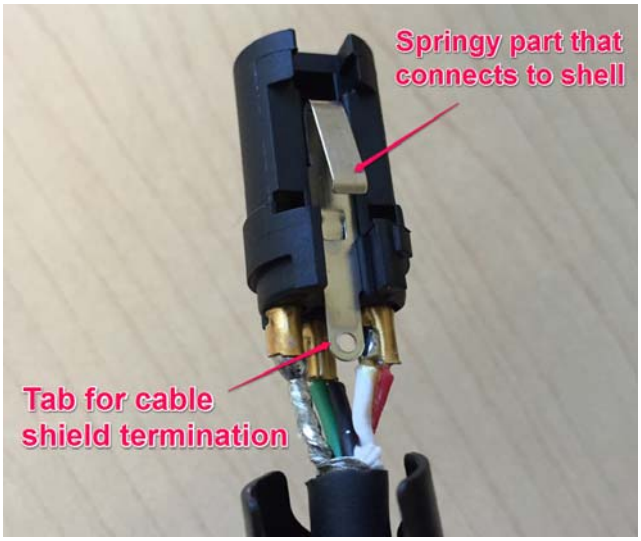
Best and customary practices for XLR cable and chassis connector grounding

Cable connectors

Neutrik is often asked whether the shiny silver tab (pictured below) on **typical** XLR cable connectors (Neutrik *XX series, RX series, X series*, etc.) should be connected to anything.



The point of this component, which is part of the original XLR specification, is to provide shield continuity to the cable connector's metal shell:

- The tab's hole can be soldered to the cable's shield wiring (or drain wire);
- The springy part of the same component, located closer to the cable end, makes a tight connection to the inside of the metal housing.

In the course of the evolution of the AV industry, it has come to be that this tab is practically never terminated. This means, in turn, that the shell is not grounded.[1] **When in doubt, simply leave this tab unterminated**.[2]

By contrast, some specialized XLR cable connectors **are** designed to send the ground signal through the shell. Examples of these specialized cable connectors are Neutrik's **EMC series** and **XCC series**.

[1] This grounding would be performed by wiring the shiny silver tab (shown below) to the cable shield—i.e. wiring the cable shield or drain wire both to the shiny silver tab and to pin 1.

[2] Many audio professionals would prefer it if this tab were always tied to the cable shield and pin 1. However, this is simply not done in the real world.

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Cable connector shells always make an electrical connection to chassis connector shells

Whether or not they are internally wired to the shield signal, XLR **cable connector** shells always make an electrical connection to **chassis connector** shells once the two are mated. All XLR **chassis connectors** (other than a very few plastic-shell connectors and some specialized ones[3]) have a dedicated ground contact inside the chassis connector shell by which this connection is made.

Chassis connector grounding

Typically, chassis connectors need to be grounded. The industry best practice is generally to tie all of the chassis connector shell, pin 1, and the enclosure shield to a common ground.

Chassis connectors typically make electrical contact with their metal panels automatically. This happens via the metal-to-metal contact of the panel to the chassis connector's flange, screwhole, or dedicated grounding component. If desired, the specialized shell contact at the rear of a chassis connector can **also** be wired to the metal panel. When doing so, use the shortest practical pigtail cable.[4]

Two cases where it becomes **necessary** to wire the chassis connector's specialized shell contact to a chassis ground are:

(a) when using non-conductive (plastic, wood, specially painted, etc.) panels, and/or

(b) cases where you want to jumper the shell contact to pin 1.

Chassis connector shell grounding addresses issues like the "Pin 1 problem" which are unrelated to whether the mating cable connector shell "floats" or connects to the cable shield. Of course, in cases where the cable connector shell **does** connect to the shield, then that cable connector shell will look for a ground path through the mating chassis connector shell, creating yet another reason why chassis connector shell grounding is critical.

Complication and controversy

XLR grounding is a complicated subject with a number of equipment-specific variables. It is also controversial. Opinions, theories, and empirical arguments over best practices have consumed thousands of pages of documentation over many decades and are ongoing. Consult a qualified electrical engineer or review the AES48 standard[5] as required.

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[3] These include Neutrik's obsolete FPP series and some quite rare, specialized A-series connectors.

[4] A longer cable will act as an antenna, so keep these distances as short as possible to avoid excessive resistance, impedance, capacitance, and noise.

[5] AES48 is titled "AES standard on interconnections - Grounding and EMC practices - Shields of connectors in audio equipment containing active circuitry."