



Cables and Connectors Guide

Cable Type	Connector(s)	Balanced?	Common Uses	Important Info
XLR	3-pin XLR (male/female) 	Yes	Balanced mic or line connections	Three conductors: signal+, signal-, and ground; standard for pro audio
1/4-inch TS	Tip-Sleeve (TS) 	No	Instruments, speaker cables	Two conductors: signal and ground; unbalanced; identical appearance to speaker cables
1/4-inch TRS	Tip-Ring-Sleeve (TRS) 	Yes (mono) / No (stereo)	Balanced audio or unbalanced stereo	Three conductors; stereo signal is unbalanced, mono balanced is possible
3.5mm TS	Mini TS 	No	Consumer mics, IR remotes	Rare; found in certain consumer devices and IR systems
3.5mm TRS	Mini TRS 	No	Aux inputs, headphone outputs	Stereo audio carried on tip and ring; unbalanced connection
3.5mm TRRS	Mini TRRS 	No	Headsets (with built-in mic)	Four conductors for left, right, and mic; pinout varies by device
RCA	RCA 	No	Consumer gear, DJ mixers, turntables	Unbalanced connection; short cable runs only; common in consumer setups
SpeakON	NL2, NL4, NL8 	Yes	Connecting amplifiers to speakers	Locks in place; multiple pin sets support multiple circuits; designed for high power

Glossary

XLR

A connector with three pins and three internal conductors: a positive signal wire, a negative signal wire, and a shield. It is commonly used for microphones and other professional audio gear. XLR cables support balanced connections, which help cancel out noise through a process called common mode rejection. These cables can carry mic level or line level signals.

TS (Tip Sleeve)

A connector with two conductive sections: a tip and a sleeve. These provide two connections that complete an electrical circuit between the source and destination. TS connectors are used with instrument cables and speaker cables, although the internal cable design is different. TS cables carry unbalanced signals.

TRS (Tip Ring Sleeve)

A connector with three conductive sections: a tip, a ring, and a sleeve. These form three connections through the cable. TRS connectors can carry a balanced mono signal or an unbalanced stereo signal, depending on how they are used. They are commonly found in professional gear and stereo headphone outputs.

3.5mm TS

A smaller version of the TS connector with two conductive sections. It is less common but sometimes used with consumer microphones or infrared remote systems. It carries unbalanced mono signals.

3.5mm TRS

A smaller version of the TRS connector with three conductive sections. It is usually used to carry unbalanced stereo audio. The tip and ring carry the left and right channels, and the sleeve provides a common return path. This type of connector is found on devices like smartphones and laptops.

3.5mm TRRS

A connector with four conductive sections: a tip, two rings, and a sleeve. It allows for four connections between the source and destination. It is commonly found on headsets and carries left and right headphone signals along with a microphone signal. All signals share a common ground, and the pin arrangement may vary by device.

RCA

A connector with a single pin and a surrounding sleeve. It forms an unbalanced connection and is used to carry line level signals. RCA connectors are most common in consumer and home audio systems, but they also appear occasionally on audio mixers.

SpeakON

A high current connector used to connect amplifiers to professional loudspeakers. SpeakON connectors lock in place and are safer than other types of speaker connectors. They are available in versions with two, four, or eight conductors to support multiple speaker circuits.

Signal & Connection Types

Balanced

A connection that uses two signal wires with equal impedance. Any noise picked up equally by both wires becomes a common mode signal and is canceled out by the differential input of the receiving device. This process is called common mode rejection. Balanced connections are highly effective at preventing noise, especially over long cable runs or near other electronic equipment.

Unbalanced

A connection that uses one signal wire and one ground. It is more susceptible to noise, especially when the cable is long or placed near other electronics. Unbalanced cables are best for short distances and simple setups.

Mic Level

A very low level audio signal produced by microphones, typically around -60 to -40 dBV. This type of signal must be amplified by a mic preamp before being recorded or processed.

Instrument Level

A low level signal generated by electric guitars and similar instruments. It is slightly stronger than mic level, usually between -40 and -20 dBV. Instrument signals also need to be boosted to line level using a preamp.

Line Level

The standard signal level for most professional and consumer audio gear after preamplification

+4 dBu = professional standard

-10 dBV = consumer standard

Speaker Level

A strong signal that has been amplified from line level and is powerful enough to drive a speaker. It requires cables and connectors specifically designed to carry speaker-level voltage, such as SpeakON.