

The Relay G10 Transmitter (G10T) packs lots of technology into a small package to create the easiest to use and best sounding guitar wireless system in its class. All of the electronics and controls are integrated into the housing so that the only thing you need to do to use it is plug it into your guitar and play. There are no power switches, channel settings, level controls, or anything else to have to manage. Just like a cable, you plug it in, and it works.

To accomplish this, the G10T is designed to be able to automatically power on when plugged into a guitar, and to be able to automatically sense when it is plugged into the receiver/charger in order to charge its battery and to automatically pair the radio channel between the transmitter and receiver.

### **The G10T Power Pin**

In order to automatically turn on, the G10T has a small pin that can physically sense when it has been plugged into a guitar jack. When the G10T is plugged into a guitar jack, the pin is pushed in and the power will turn on (the light will turn green, assuming that the battery is charged).



A typical guitar output jack, shown at right, has a threaded sleeve, a contact point to electrically connect to the tip of the plug, and an electrical connection to the sleeve of the plug. When the G10T is inserted, the power enable pin will be pushed in by the jack's sleeve edge, which will turn on the power of the G10T.



If you could “see through” the guitar when plugged in, it would look something like this:



If a guitar's jack is significantly recessed into the wood, or if its jack has a non-standard depth, then it is possible that either the G10T body will impede the plug from fully inserting into the jack, or, when fully inserted, the plug's power enable pin may be too far from the jack sleeve to turn on. These occurrences are rare, but can be easily identified by noting that the power light will not turn on when the plug is inserted (even though the battery is charged). If you experience either of these two issues on a guitar you wish to use, we recommend using a simple 1/4" extender cable to remedy the issue (described later in this document).

### **Using G10T with Guitars that use Non-Standard Wiring**

In order to charge the battery and set the channel of the G10T, the receiver is able to provide power and communication on the "ring" of the transmitter's plug. If the G10T senses a voltage on the ring, it assumes that it is connected to a receiver. In this state, the G10T is charging and does not transmit audio.

The use of the ring of the plug does not interfere with any standard passive guitars since the wiring of a standard guitar jack contains just the guitar signal on the tip, and ground on the sleeve, leaving the ring not connected, as shown in the image in the previous section.

This standard type of connector is sometimes called "TS" for Tip-Sleeve, the names of the two conductors that are on it (it is also called a mono jack). The G10T plug connector is sometimes called "TRS", for Tip-Ring-Sleeve, the names of the three conductors used on it (it's also called a stereo jack).

Although the TS jack described above is most common in guitars, there are occasions where TRS jacks are used. Depending on how the guitar's TRS jack is used, this may or may not impact the G10T's operation.

The most common use of a TRS jack in a guitar is when it includes active electronics (circuitry that includes a battery). In order to preserve battery life, most of these guitars are designed so that the battery will be disconnected when there isn't a plug inserted in the jack. To do this, the most standard approach is to have the tip still be used for audio, the sleeve still for ground, but the battery's ground signal is connected to the ring. As a result, when no plug is inserted, the battery's ground is not connected to anything, so no battery drain occurs. If a standard guitar plug (TS or mono) is connected to the TRS jack, the long sleeve of the TS plug will connect the sleeve and ring of the jack, which will connect the battery's ground to the signal ground. This completes the circuit and powers on the guitar.



The G10T was designed to support this type of guitar. It automatically allows the battery current to pass through from the sleeve to the ring, allowing active electronics to function normally with the G10T connected.

It is possible that some guitars with active electronics choose to wire the jack so that the audio ground is connected to the ring, and the battery ground to the sleeve. In this case, the battery's ground will not

be connected to the sleeve, and the active circuitry will not work. There are two remedies to this situation. The first would be to rewire the guitar jack, reversing the connections to the sleeve and the ring. This should only be attempted by a qualified service technician to ensure that no damage to the guitar occurs. If this wiring is reversed, there will be no change in the guitar's operation, and the G10T will function with it normally.

The second solution would be to use a mono plug adapter or cable, as described later in this document.

Some acoustic guitars with active electronics also include processors, and in some cases, they use a more sophisticated method for turning its power on and off with a TRS jack. For example, some have a pull-up resistor attached to the ring of the jack, and turn on the power when it senses that the ring is connected to ground (as would occur if a TS plug was inserted). This configuration will not work with the G10T, since it will sense the voltage on the ring and assume that it is connected to the receiver for charging, and the guitar would not turn on since the ring is not connected to ground. The solution in this situation is to use a mono plug adapter or cable.

Lastly, some guitars have two signals, such as a piezo pickup and magnetic pickups, and will connect one of the pickups to the ring and the other to the tip. Although only the pickup connected to the tip will be heard, the G10T will normally work with this type of guitar, but if not, the solution once again would be a mono plug adapter or cable.

## **Solutions**

There are two simple external solutions for all of the scenarios described above. First, a simple adapter, such as a 1/4" mono adapter, will allow both the guitar's circuitry and the G10T to function properly. An example of a right angle adapter would be the Hosa GPP-151:



Alternatively, a short mono cable with a TS plug on one end and a TS jack on the other would solve any electrical and mechanical constraints. These can be easily soldered together at any desired length depending on your application.

