

Application Note

Ground Isolation for Carrier-band Taps

All electrical equipment should be connected to "ground" for safety and performance considerations. Ground can be a metal rod in the earth, a neutral wire in an electrical plug, or a grounding system in a building. Ideally, all grounds are at the same potential -- zero volts with respect to each other. In reality, potential differences can exist between "grounds" in various parts of a building or between buildings. These ground potential differences can be caused by a number of things, but the results are the same. Given a chance, ground currents will flow between different ground potentials.

Computer network cable can span large areas where the ground potentials may be different. If the cable is grounded in many places, as required for safety, the network cable carries a ground current. This current induces noise in the cable and degrades network performance.

In Figure 1, two non-isolated Carrier-band taps are shown attached to grounds at different potentials. The result is a ground current on the network cable segment between the two taps.

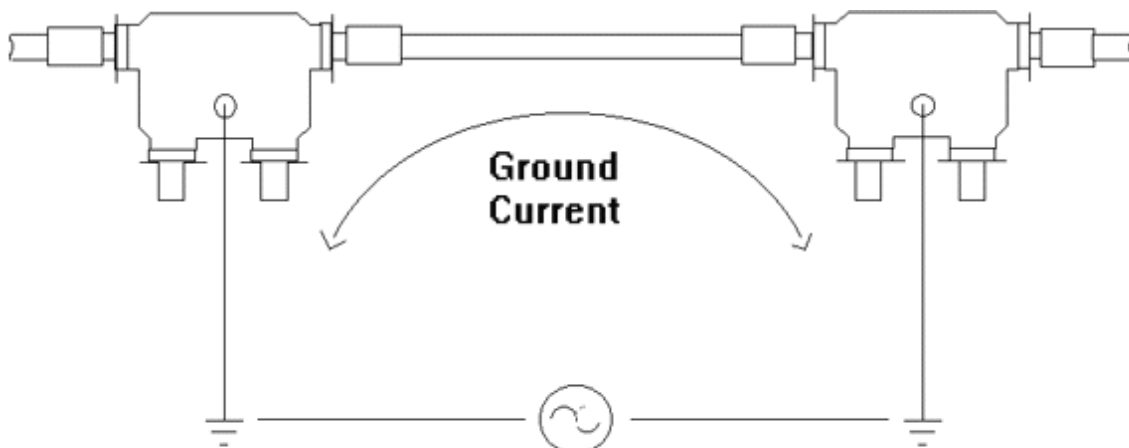


Figure 1. Ground current with non-isolating taps

Ground currents can be eliminated in Carrier-band networks by using ground isolating taps. Isolating taps have one trunk port isolated from the other trunk port and from the drop ports of that tap. This isolation does not allow ground currents to flow between the trunk cables attached to the isolating tap. The Carrier-band data signal flow on the trunk cable is unaffected.

The isolated trunk port on Relcom's Hi-Rel taps is marked by the dot T1. When taps are installed, the T1 dots should face in one direction on the trunk cable. When the taps are grounded, each segment of the trunk cable has its own ground. Even if grounds have different potentials, no ground current will flow through the isolating tap.

Figure 2 shows two ground isolated Carrier-band taps. The break in the case outline represents the isolation. In this example, no ground current can flow on the cable segment between the two taps regardless of the ground potential difference.

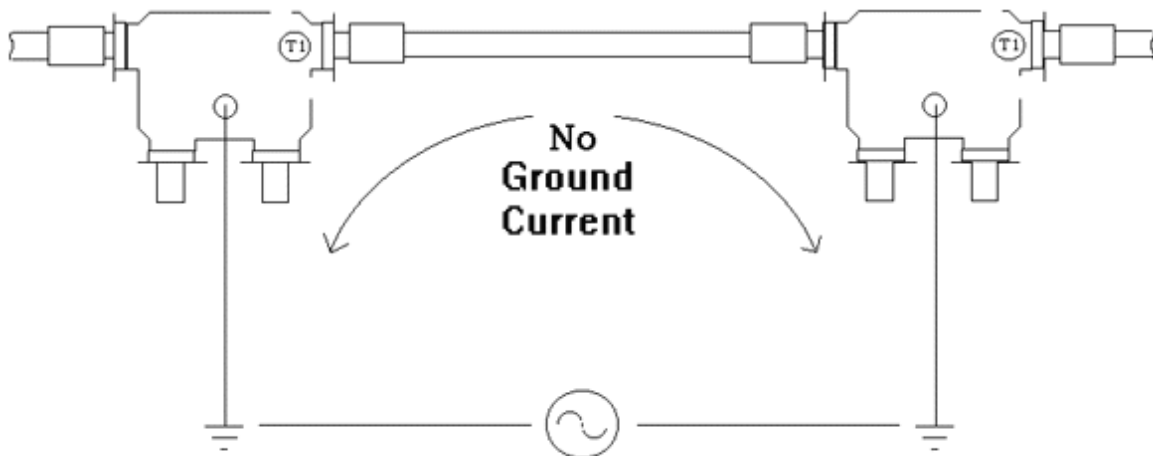


Figure 2. Isolating Tap Orientation