Passive VoIP amplifier

In a traditional cable television plant, when a subscriber's home power was lost, the home's television sets also were affected, making it of little consequence if the home's cable service remained operational. However, in today's high-bandwidth, multiple-services environment, this has changed. Cable systems have evolved from a video-only service to today's video, voice and data services. Most cable systems have launched or are in the process of launching telephone service over their networks using Voice over Internet Protocol (VoIP), which has a specific challenge: The addition of VoIP telephone service brings with it the added responsibility of providing customers with 911 lifeline service 24 hours a day, even during power outages.

To ensure that telephone service remains operational during power outages, cable customers with VoIP telephone service are provided with backup power for their cable modems. However, for the backup power to work properly, there can be no active devices in the coaxial cable line between the tap and the modem. As long as the tap-to-modem line remains free of active devices, the power backup for the modem will ensure that the home's telephone service remains operational during power outages. However, if an active device, such as a drop amplifier, is placed inline between the tap and the modem, then, as the home's power fails, so do the modem and the home's telephone service.

Why then would anyone place an ac-activated device inline between the tap and the modem with VoIP service present? The reality is that there are some homes that require a drop amplifier to boost the signal entering the home to serve the homes' multiple devices and distant RF outlets. In these homes some method of preventing telephone service interruption due to power outages must be provided.

A great deal of thought has been given to this problem and attempts have been made to resolve it, but, as can be seen, the traditional approach creates a different problem for service providers and homeowners.

Because it was the amplifier that caused the failure of the telephone service, it was thought that the simplest way to fix it would be to split off the telephony leg before it went through the amplifier (Figure 1). This traditional approach resolves the problem with amplifier failure during a power outage. However, when the power is interrupted and the amplifier shuts down, it simulates an open condition at the splitter output port attached to the amplifier. This has the same effect as having one leg of the splitter un-terminated—the return loss of the splitter is reduced to approximately 7 dB. The same is true when directional couplers are used. This reduction in return loss at the splitter will negatively impact the performance of voice service in the subscriber's home.

The solution is to install a CommScope passive VoIP amplifier (Figure 2), replacing the standard drop amplifier that creates problems with voice services during power outages.Installation of a CommScope passive VoIP amplifier solves both the return loss problem and improves the noise problems associated with the traditional approach (Figure 1). This simple solution utilizes power-held switches within the amplifier that impedence matches the amplifier circuit should a power failure occur, thus maintaining a passive path between the tap and the modem for the home's telephone service. The installation of a passive VoIP amplifier also eliminates the extra jumpers, unnecessary connectors, clutter and potential installation mistakes of the traditional approach.

Figure 1

Figure 2

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