

DAP105 Application Note

5 February 2015

Overview:

The DAP105 is a Differentially Amplified Probe for use with the D-105 Test Set. Unlike conventional probes with a single point of pickup, the DAP incorporates a two sided paddle capable of amplifying signal differences between each side. This feature is especially useful when sensing TriPlex, the preferred tone when bleed-over or cross coupling appears on adjacent pairs.

Simplex Tone

Simplex tone applies the same phase and amplitude signal on the Tip and Ring with ground reference. Since the customer only hears the difference between Tip and Ring, Simplex is often referred to as "Quiet" tone. Conventional single point probes can sense the signal present on the pair because a technician holding the probe provides a connection to the ground reference. Locating tone by this method is common practice and in many cases the optimum choice.

Advantage

The technician can rapidly locate tone in bundles or binders using Simplex. Once the binder group has been located pairs can be quickly sorted until the loudest tone is found. A standard procedure would then be to short the pair while another technician at the sending end confirms the short. This procedure verifies Tip and Ring are the same at both ends.

Disadvantage

If poor cable bonding, grounds, or water filled cable exist Simplex tone is cross coupled to adjacent pairs making positive identification difficult or in severe cases impossible. Often bleed-over can be minimized by ensuring sheath continuity on old and new sections by tying several pairs in the old cable to the old and new sheath, keeping all leads as short as possible.

TriPlex Tone

TriPlex tone method applies opposite phase signals on Tip and Ring with signal ground reference. This method is audible to a POTS customer and should only be used when other methods of identification have been exhausted.

Advantage

Because of the opposing phase, and the twist of the pair cross coupling is significantly reduced, even in cables with poor sheath continuity or bonding. When using the DAP105 inserted between the Tip and Ring, the tone amplitude will double in sound level making positive identification possible.

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Disadvantage

Given the objective of using TriPlex to reduce bleed-over, the signal level picked up by holding a probe on the outside of the pair is also reduced. This is especially true if both the Tip and Ring are against one side of the paddle.

Conclusion

The DAP105 is an optional probe for the D105. It is capable of locating Simplex and TriPlex tones. The DAP has the ability of sensing both Tip and Ring differentially. In Simplex the DAP105 works with the squelch feature on the D105 to measure minor signal level variations not normally detected with the human ear. In TriPlex mode it provides positive feedback when the correct pair has been located.

Simplex tone should always be used when locating cable pairs under normal conditions. The DAP105 provides optimum results when only one side of the probe is held against the pairs. Placing the probe between the pair will reduce the tone level.

TriPlex tones can be used when cable conditions cause severe bleed-over or cross coupling. The DAP105 is the ideal probe in this scenario. Placing the probe paddle between the Tip and Ring yields the best results. Placing the Tip and Ring on the same side of the probe will reduce the tone level.