



Pure Signal Technology

Application Note

November 18th, 2022

Crosstalk is a way of describing the electromagnetic interference that can occur between two wires, or even antennas that are in close physical proximity to each other and carrying information independently of one another. Crosstalk is not limited to photovoltaic systems. It can even be heard by carefully listening to incorrectly calibrated audio devices. This can cause a thin bleed of sound on one of the channels when using FM stereo audio or vinyl.

The new Tigo Pure Signal Transmitter allows multiple PLC transmitters to be linked together to provide a single, synchronized keep-alive signal to large arrays. This allows greater protection from signal interference, also known as crosstalk. This document explains the how crosstalk occurs in an array and the measures to mitigate it.

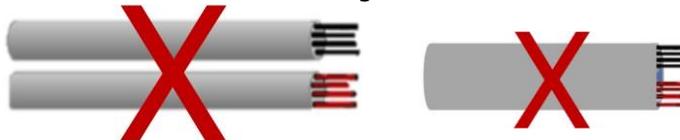
Design and installation requirements

To maintain signal integrity in a PLC system, best practices and product specifications must be adhered to. The following practices are required in a Tigo rapid shutdown system using powerline communication.

- ✓ The RSS Transmitter can accommodate a string with a maximum round-trip distance from positive to negative of 300m (985ft).
 - ✓ If the longest string in a system exceeds 300m, and is less than 500m, two cores may be used in series on the string to amplify the signal. Tigo Sales Engineering must approve this type of design.
- ✓ Up to a maximum of 10 RSS Transmitters with Pure Signal Technology can be connected to make a single Pure Signal.
- ✓ The total length of the daisy-chained communication wiring connecting all the RSS Transmitters in a single Pure Signal technology group must not exceed 100ft (30m).
- ✓ Positive/negative string conductors from the same the Pure Signal group should be arranged together in one conduit.

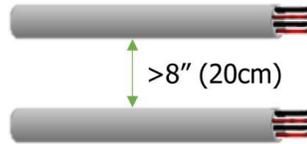


- ✓ Never separate the + and - of the same string.





- ✓ Maintain >8" (20cm) distance between conduits served by different Pure Signal groups and conductors of different systems.



- ✓ Never run +/- string conductors from different Pure Signal groups in the same conduit or within 20cm.



- ✓ Never place conductors from different Pure Signal groups or from different systems together in the same cable tray. Open cable trays provide no additional protection from crosstalk.



Wiring for Pure Signal Technology

The Pure Signal Technology RSS Transmitters communicate through a series wired connection. The first transmitter communicates to the next in series until the last transmitter has received the signal. This synchronizes the signal so every PV conductor in the conduit, raceway or cable tray is operating on the same beat. When this occurs, PV conductors will not interfere with each other's signals, reducing the likelihood of crosstalk.

Additional information and helpful links on Tigo's PLC Rapid Shutdown products can be found:

Product information: tigoenergy.com/product/rss-transmitter

Documentation: tigoenergy.com/downloads

Support: support.tigoenergy.com-Contact-Support

