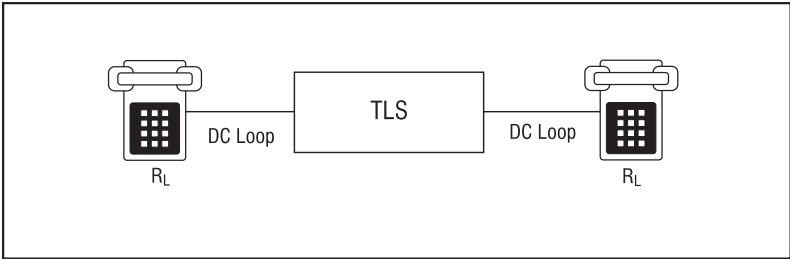


Loop Length FAQ

How far can my device be from my TLS/TLE?

Loop length, the distance from TLS/TLE to a telephone device, is determined by several factors.

1. The loop current setting in the TLS/TLE. Each TLS has a specific minimum or maximum loop current. The feature in the TLE is a loop current limiter, that is, the loop current's maximum value is programmed into the TLE Loop Parameters screen. The TLE is essentially a voltage source supplying loop current to the attached device.
2. The DC characteristics of the device (R_L). For example, most devices range from 180Ω to 360Ω DC load, with the average levels between 210Ω and 250Ω . So, the maximum loop length is determined by using the following formula:



$$[V(\text{source})/I(\text{loop current max})] - R_L \text{ load} = \text{Maximum DC loop.}$$

Note: DC Loop = one way distance x 2.

Example 1 (TLE):

The TLE voltage source is nominally 48 VDC and the TLE is set to 35 mA (default). With a DC load of 240Ω . The maximum DC loop is about

1100Ω , divided by 2 for the return path of the loop, makes the maximum distance (one way), less than 550Ω . Multiplied by 13 meters per Ω , and the theoretical maximum distance the device can be from the TLE is equal to 7,150 meters. Using a derate value of 10%, which would change the maximum loop length to slightly more than 6,000 meters or 18,000 feet.

Example 2 (TLS-3A or TLE-3B):

The TLS-3A/B, which is a constant current source, specification is that the TLS-3A or TLS-3B will provide a minimum of 25 mA with a 400Ω total loop resistance. So, if our total loop resistance is 400Ω , and the DC load is 240Ω , then the total loop can be 160Ω or 80Ω in one direction. 80Ω times the distance based upon our wire gauge equals the maximum distance. So, if we were using 24 gauge wire, 80 times 40 feet/ Ω equals 3,200 feet, or a little over 0.5 mile for each port.

Example 3 (TLS-4 or TLS-5):

The TLS-4/5, which is a restricted voltage source, specification is that the TLS-4 or TLS-5 will provide a minimum of 18 mA with a 500Ω loop. The restriction in the TLS-4/5 is that there are two $1,000\Omega$ resistors in the battery feed paths to limit the loop current for protective reason. Consequently, using Ohm's law, $(E/R = I)$, $48/2500 = 19.2$ mA. Derated by approximately 10% will give the 18 mA specification as stated in the reference manual. Using the formula, 500Ω total loop resistance, less the DC load of 240Ω , allows for 260Ω of loop length, divided by 2, times the distance per Ω for 24 gauge wire (40 feet per Ω) equals 5,200 feet.