

IT 327 Lab #8

Transmission Lines

Objective:

Analyze the properties of different media types by looking at their reflections using a TDR (Time Domain Reflectometer).

Procedure:

Be sure to take plenty of pictures and include them in your write-up with an appropriate caption.

Spend some time becoming familiar with the Tektronix 1502B Metallic TDR. Choose 4 types of cables of various lengths and label them in your write-up. The procedures below apply to all 4 cables that you choose. The type of cable is printed on the cable itself.

1. Learn about all of your samples by finding the characteristic impedance (Z_0) of the cable on general chart of cables. Then find the Velocity of Propagation (V_p) of the cable from the manufacturer. You can find Z_0 and V_p on the class website under the lab link or online. Label your findings in your write-up.
2. Using a meter stick or tape measurer, measure the length of each of your cables and record it in your write-up.
3. Plug the cable into the TDR open ended and adjust the V_p on the TDR until the length of your cable is displayed. Take a picture of the display. Write down the V_p from the TDR and compare it to the manufacturer.
4. Record the length of the cable as shown by the TDR using the V_p from the manufacturer.
5. Terminate the cable with a resistance that matches the Z_0 of the cable. Take a picture of the display and record the results of the TDR. Be sure to include the results in your write-up.
6. Now, short the cable on the other end and take a picture of the display and record the results of the TDR. Be sure to include the results in your write-up.

Results:

Make an organized table with all of the information of your cables so that they can be compared to each other.

Cable Manufacturer $Z_0(\Omega)$ V_p -Manufacture (%) V_p -TDR (%) Actual Length(m) TDR Length (M)

Conclusions: In addition to the follow questions, add your own conclusion as instructed in the syllabus:

Why did putting Z_0 termination on the end of the cable had the effect it did?

What are three applications of TDR?

How can reflections be good? How can they be bad?