Fiber optic GPR for Dummies

Diego Domenzain

Making it work

1. Assemble antennas
    - Make sure they turn on by pushing the on/off button and watching a bright red light appear on their led thingy
    - Turn them off
2. Connect antennas to DVL
    - Tx (source) is lower entry in DVL:
        - Top plug (light gray) goes to "input" in antenna (dark gray)
        - Do NOT connect low plug
    - Rx (receiver) is upper entry in DVL:
        - Top plug (light gray) goes to "input" in antenna (dark gray)
        - Low plug (dark gray) goes to "output" in antenna (light gray)
    - You SHOULD check which cable is which by putting light in one end and seeing on which end comes out. *Some* people label them flipped.
3. Turn DVL on
4. Under `GPR Parameters` choose `Pulser setting` to `PE100 1K`

f_o MHz	λ_o m	$\lambda_o/4$ m
50	2	0.5
100	1	0.2
200	0.5	0.1
250	0.5	0.1
500	0.2	0.05

Table 1: Approximate wavelengths for $\varepsilon_{max} = 9$ ($v_{min} = 0.1$ m/ns). You can do your own by computing $\lambda_o = 300/f_{o,MHz}/\sqrt{\varepsilon_{max}}$.

f_o MHz	λ_o m	$\lambda_o/4$ m
50	1	0.2
100	0.5	0.1
200	0.25	0.05
250	0.2	0.05
500	0.1	0.02

Table 2: Approximate wavelengths for $\varepsilon_{max} = 30$ ($v_{min} = 0.05$ m/ns). You can do your own by computing $\lambda_o = 300/f_{o,MHz}/\sqrt{\varepsilon_{max}}$.