Power measurements for the Railroad Crossing System

1. **LCD Display**
    - For the display characters:

      $V = 4.76\ V$

      $I = 0.14\ mA$

      $P_{1,display} = V * I = 4.76 * 0.14 = 0.666\ mW$
    - For the backlight:

      $V = 5.01\ V$

      $I = 21.2\ mA$

      $P_{1,backlight} = V * I = 5.01 * 21.2 = 106.2\ mW$
    - Total power dissipation:

      $P_1 = P_{1,display} + P_{1,backlight} = 0.666 + 106.2 = 106.9\ mW$
2. **Ultrasonic Sensors (x2)**
    - For a single sensor:

      $V = 5.01\ V$

      $I = 2.22\ mA$

      $P_{2,single} = V * I = 5.01 * 2.22 = 11.1\ mW$
    - For two sensors:

      $P_{2,total} = 2 * P_{2,single} = 2 * 11.1 = 22.2\ mW$
3. **Speaker**

   $V = 0.258\ V$

   $I = 34.4\ mA$

   $P_3 = V * I = 0.258 * 34.4 = 8.88\ mW$
4. **Servo Motor**

   $V = 4.69\ V$

$I = 0.217\ A$

$P_4 = V * I = 4.69 * 0.217 = 1.02\ W$

5. **RGB LED Common Cathode**

$V = 0.616\ V$

$I = 5.79\ mA$

$P_5 = V * I = 5.79 * 0.616 = 3.57\ mW$

Total Peak Power Dissipation:

$P_{total} = 106.9 + 22.2 + 8.88 + 1020 + 3.57 = \mathbf{1160\ \ mW = 1.16\ W}$