QUICK REFERENCE TABLES
and Interesting Facts

MIC/LINE CIRCUIT TYPES

Balanced: Audio signal consisting of the voltage difference between two conductors, neither of which is the shield; generally carried by a two-conductor-with-shield cable. There is no necessary relationship between the voltage on the conductors, and the ground potential of the shield. Balanced circuits are preferred over unbalanced circuits due to their ability to isolate ground and operate over long distances.

Unbalanced: Audio signal consisting of the voltage difference between a single conductor and shield (common, or ground). The audio signal is referenced to ground, requiring that the shield be connected at both source and destination, opening the possibility of amplifying induced hum and noise.

High-Impedance: Audio source or load impedance generally above 1000 \( \Omega \); typically 5,000 \( \Omega \) or greater. Common high impedance values are 10,000 \( \Omega \), 20,000 \( \Omega \), or 100,000 \( \Omega \). A high-impedance source can only feed a high impedance load or input.

Low-Impedance: Audio source or load impedance generally below 1000 Ohms; typically 600 Ohms or less. Common low impedance values are 600 \( \Omega \), 500 \( \Omega \), 150 \( \Omega \), 50 \( \Omega \). A low-impedance source can feed a high-impedance load without problems. Only a low-impedance source can feed a low-impedance input.

Note: RDL® products are generally designed with high-impedance inputs and low-impedance outputs, and can be connected balanced or unbalanced. This makes the product line inputs and outputs compatible with other modules and nearly all other equipment.

### POWER RELATIVE TO A.C. VOLTAGE
(AC Volts R.M.S. for Impedances in Ohms)

<table>
<thead>
<tr>
<th>Power</th>
<th>2 ( \Omega )</th>
<th>4 ( \Omega )</th>
<th>6.3 ( \Omega )</th>
<th>8 ( \Omega )</th>
<th>12.5 ( \Omega )</th>
<th>50 ( \Omega )</th>
<th>100 ( \Omega )</th>
<th>600 ( \Omega )</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 W</td>
<td>1.41</td>
<td>2.00</td>
<td>2.51</td>
<td>2.83</td>
<td>3.54</td>
<td>7.07</td>
<td>10.00</td>
<td>24.49</td>
</tr>
<tr>
<td>2 W</td>
<td>2.00</td>
<td>2.83</td>
<td>3.55</td>
<td>4.00</td>
<td>5.00</td>
<td>10.00</td>
<td>14.14</td>
<td>34.64</td>
</tr>
<tr>
<td>3 W</td>
<td>2.45</td>
<td>3.46</td>
<td>4.35</td>
<td>4.90</td>
<td>6.12</td>
<td>12.25</td>
<td>17.32</td>
<td>42.43</td>
</tr>
<tr>
<td>6 W</td>
<td>3.46</td>
<td>4.90</td>
<td>6.15</td>
<td>6.93</td>
<td>8.66</td>
<td>17.32</td>
<td>24.49</td>
<td>60.00</td>
</tr>
<tr>
<td>10 W</td>
<td>4.47</td>
<td>6.32</td>
<td>7.94</td>
<td>8.94</td>
<td>11.18</td>
<td>22.36</td>
<td>31.62</td>
<td>77.46</td>
</tr>
<tr>
<td>20 W</td>
<td>6.32</td>
<td>8.94</td>
<td>11.22</td>
<td>12.65</td>
<td>15.81</td>
<td>31.62</td>
<td>47.70</td>
<td>109.54</td>
</tr>
<tr>
<td>30 W</td>
<td>7.75</td>
<td>10.95</td>
<td>13.75</td>
<td>15.49</td>
<td>19.36</td>
<td>38.73</td>
<td>54.77</td>
<td>134.16</td>
</tr>
<tr>
<td>50 W</td>
<td>10.00</td>
<td>14.14</td>
<td>17.75</td>
<td>20.00</td>
<td>25.00</td>
<td>50.00</td>
<td>70.71</td>
<td>173.21</td>
</tr>
<tr>
<td>100 W</td>
<td>14.14</td>
<td>20.00</td>
<td>25.1</td>
<td>28.28</td>
<td>35.36</td>
<td>70.71</td>
<td>100.00</td>
<td>244.95</td>
</tr>
</tbody>
</table>

### DECIBELS & VOLTAGE

<table>
<thead>
<tr>
<th>dBu</th>
<th>R.M.S.</th>
<th>Peak-to-Peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>-60</td>
<td>0.775 mV</td>
<td>2.19 mV</td>
</tr>
<tr>
<td>-45</td>
<td>4.35 mV</td>
<td>12.31 mV</td>
</tr>
<tr>
<td>-35</td>
<td>13.8 mV</td>
<td>39.04 mV</td>
</tr>
<tr>
<td>-20</td>
<td>77.5 mV</td>
<td>219.24 mV</td>
</tr>
<tr>
<td>0</td>
<td>775.0 mV</td>
<td>2.19 V</td>
</tr>
<tr>
<td>+4</td>
<td>1.23 V</td>
<td>3.48 V</td>
</tr>
<tr>
<td>+10</td>
<td>2.45 V</td>
<td>6.93 V</td>
</tr>
</tbody>
</table>

### OHMS LAW AND POWER CALCULATION FORMULAS

- \( E=I*R \)
- \( I=E/R \)
- \( R=E/I \)
- \( P=I^2*R \)
- \( P=E^2/R \)

- \( E=\text{Voltage (volts)} \)
- \( I=\text{Current (Amps)} \)
- \( R=\text{Resistance (Ohms)} \)
- \( P=\text{Power (Watts)} \)

### WIRE SIZES AND RESISTANCE
(Solid Copper Wire)

<table>
<thead>
<tr>
<th>Gauge</th>
<th>Diameter (Inches)</th>
<th>Ohms/1000 Ft</th>
<th>Resistance at 68 °F</th>
<th>Feet/Ohm</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>0.2043</td>
<td>0.2485</td>
<td>4025.0</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>0.1620</td>
<td>0.3951</td>
<td>2531.0</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>0.1285</td>
<td>0.6282</td>
<td>1592.0</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>0.1019</td>
<td>0.9989</td>
<td>1001.0</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>0.08081</td>
<td>1.588</td>
<td>629.6</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>0.06408</td>
<td>2.525</td>
<td>396.0</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>0.05082</td>
<td>4.016</td>
<td>249.0</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>0.04030</td>
<td>6.385</td>
<td>156.5</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>0.03196</td>
<td>10.15</td>
<td>98.5</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>0.02535</td>
<td>16.14</td>
<td>61.95</td>
<td></td>
</tr>
</tbody>
</table>

### MACHINE SCREW DRILL SIZES
(Machine Screws, Drill Sizes for Clearance, Tap Holes, and Tap Sizes)

<table>
<thead>
<tr>
<th>Screw Number</th>
<th>Threads Per Inch</th>
<th>Tap Size</th>
<th>Drill Number For Tap</th>
<th>Drill Number For Clearance</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>48</td>
<td>3 x 48</td>
<td>47</td>
<td>39</td>
</tr>
<tr>
<td>4</td>
<td>40</td>
<td>4 x 40</td>
<td>43</td>
<td>31</td>
</tr>
<tr>
<td>6</td>
<td>32</td>
<td>6 x 32</td>
<td>36</td>
<td>28</td>
</tr>
<tr>
<td>8</td>
<td>32</td>
<td>8 x 32</td>
<td>29</td>
<td>19</td>
</tr>
<tr>
<td>10</td>
<td>32</td>
<td>10 x 32</td>
<td>21</td>
<td>10</td>
</tr>
</tbody>
</table>

RDL Technical Support - International: (928) 778-3554 US: (800) 933-1780 Europe: (31) 20-6238-983
STANDARD RESISTOR COLOR CODES

5-PERCENT RESISTORS

<table>
<thead>
<tr>
<th>COLOR</th>
<th>DIGIT</th>
<th>MULTIPLIER</th>
<th>TOLERANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black</td>
<td>0</td>
<td>1</td>
<td>--</td>
</tr>
<tr>
<td>Brown</td>
<td>1</td>
<td>10</td>
<td>--</td>
</tr>
<tr>
<td>Red</td>
<td>2</td>
<td>100</td>
<td>+/- 2%</td>
</tr>
<tr>
<td>Orange</td>
<td>3</td>
<td>1,000</td>
<td>--</td>
</tr>
<tr>
<td>Yellow</td>
<td>4</td>
<td>10,000</td>
<td>--</td>
</tr>
<tr>
<td>Green</td>
<td>5</td>
<td>100,000</td>
<td>--</td>
</tr>
<tr>
<td>Blue</td>
<td>6</td>
<td>1,000,000</td>
<td>--</td>
</tr>
<tr>
<td>Violet</td>
<td>7</td>
<td>10,000,000</td>
<td>--</td>
</tr>
<tr>
<td>Gray</td>
<td>8</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>White</td>
<td>9</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Gold</td>
<td>--</td>
<td>0.1</td>
<td>+/- 5%</td>
</tr>
</tbody>
</table>

1-PERCENT RESISTORS

<table>
<thead>
<tr>
<th>COLOR</th>
<th>DIGIT</th>
<th>MULTIPLIER</th>
<th>TOLERANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black</td>
<td>0</td>
<td>1</td>
<td>--</td>
</tr>
<tr>
<td>Brown</td>
<td>1</td>
<td>10</td>
<td>+/- 2%</td>
</tr>
<tr>
<td>Red</td>
<td>2</td>
<td>100</td>
<td>--</td>
</tr>
<tr>
<td>Orange</td>
<td>3</td>
<td>1,000</td>
<td>--</td>
</tr>
<tr>
<td>Yellow</td>
<td>4</td>
<td>10,000</td>
<td>--</td>
</tr>
<tr>
<td>Green</td>
<td>5</td>
<td>100,000</td>
<td>--</td>
</tr>
<tr>
<td>Blue</td>
<td>6</td>
<td>1,000,000</td>
<td>--</td>
</tr>
<tr>
<td>Violet</td>
<td>7</td>
<td>10,000,000</td>
<td>--</td>
</tr>
<tr>
<td>Gray</td>
<td>8</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>White</td>
<td>9</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Gold</td>
<td>--</td>
<td>0.1</td>
<td>--</td>
</tr>
</tbody>
</table>

MULTIPLE SPEAKER INSTALLATIONS
(Shows System Impedance Using 8 Ω Speakers)

4 Ω

2.67 Ω

2 Ω

5.34 Ω

8 Ω

COMMON PREFIXES USED IN ELECTRONICS

<table>
<thead>
<tr>
<th>Metric Prefix</th>
<th>Meaning</th>
<th>Associated with</th>
</tr>
</thead>
<tbody>
<tr>
<td>mega</td>
<td>million (1,000,000)</td>
<td>volts, ohms, hertz (cycles), amperes</td>
</tr>
<tr>
<td>kilo</td>
<td>thousand (1,000)</td>
<td>volts, ohms, hertz (cycles)</td>
</tr>
<tr>
<td>milli</td>
<td>one-thousandth (0.001)</td>
<td>volts, amperes, watts, ohms</td>
</tr>
<tr>
<td>micro</td>
<td>one-millionth (0.000,001)</td>
<td>volts, amperes, watts, ohms</td>
</tr>
<tr>
<td>pico</td>
<td>one-millionth of one-millionth</td>
<td>volts, amperes, farads</td>
</tr>
</tbody>
</table>

COMMON CONVERSIONS USED IN ELECTRONICS

- Centimeter = 0.3937 in.
- Inch = 2.54 centimeters
- Meter = 3.28 ft.
- Foot = 0.3048 meter
- Square centimeter = 0.155 sq. in.
- Sq. in. = 6.45 sq. cm.
- Gram = 0.0353 ounce
- Oz. = 28.35 grams
- Kilogram = 2.205 lb.
- Lb. = 0.4536 kg.