

A Simple LED Voltage Monitor for Anderson Connector Equipped Power Lines

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Amateur radio operators recognize that the continuity of electrical power to emergency communications equipment is essential. The probability that conventional power sources will be disabled during, or in the aftermath of, an emergency event is high.

A multitude of 12v DC electrical connectors are in use, but we recognize that the Anderson Powerpole is the connector of choice being adopted by most Emcomm groups nationally and internationally. Glendora Emergency Response Communications is registered as an official Powerpole user. See www.powerwerx.com/registry.asp. The LED voltage indicator with Anderson connectors allows the user to conveniently monitor line voltage to equipment. Several LED voltage indicators may be used concurrently to monitor the voltage in various points in the power line.

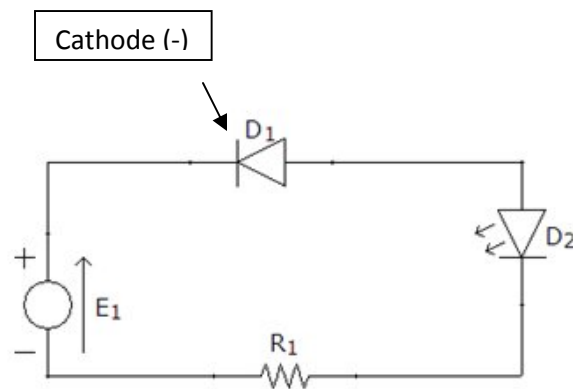


Fig 1. LED Voltage Indicator Circuit Diagram

E_1 = 12 VDC

D_1 = 1N4739 Zener Diode, breakdown voltage 9 volts (reverse bias)

D_2 = MLED 3 mm red LED, 2 volt, 20 milliamp (standard)

R_1 = 330 ohms

This is a very simple circuit to monitor a DC power supply such as a 12 volt storage battery or a regulated power supply. The Zener diode conducts when the voltage reaches the diode's reverse breakdown voltage. The reverse breakdown voltage of D1 is approximately 11 volts plus or minus .5 volt. R1 is large enough so that the current through D2 does not destroy the device. Most amateur mobile transceivers are designed for 13.8 Volts plus $\pm 15\%$, so if the LED is not illuminated the optimum voltage range has not been reached. The radio may still operate however.

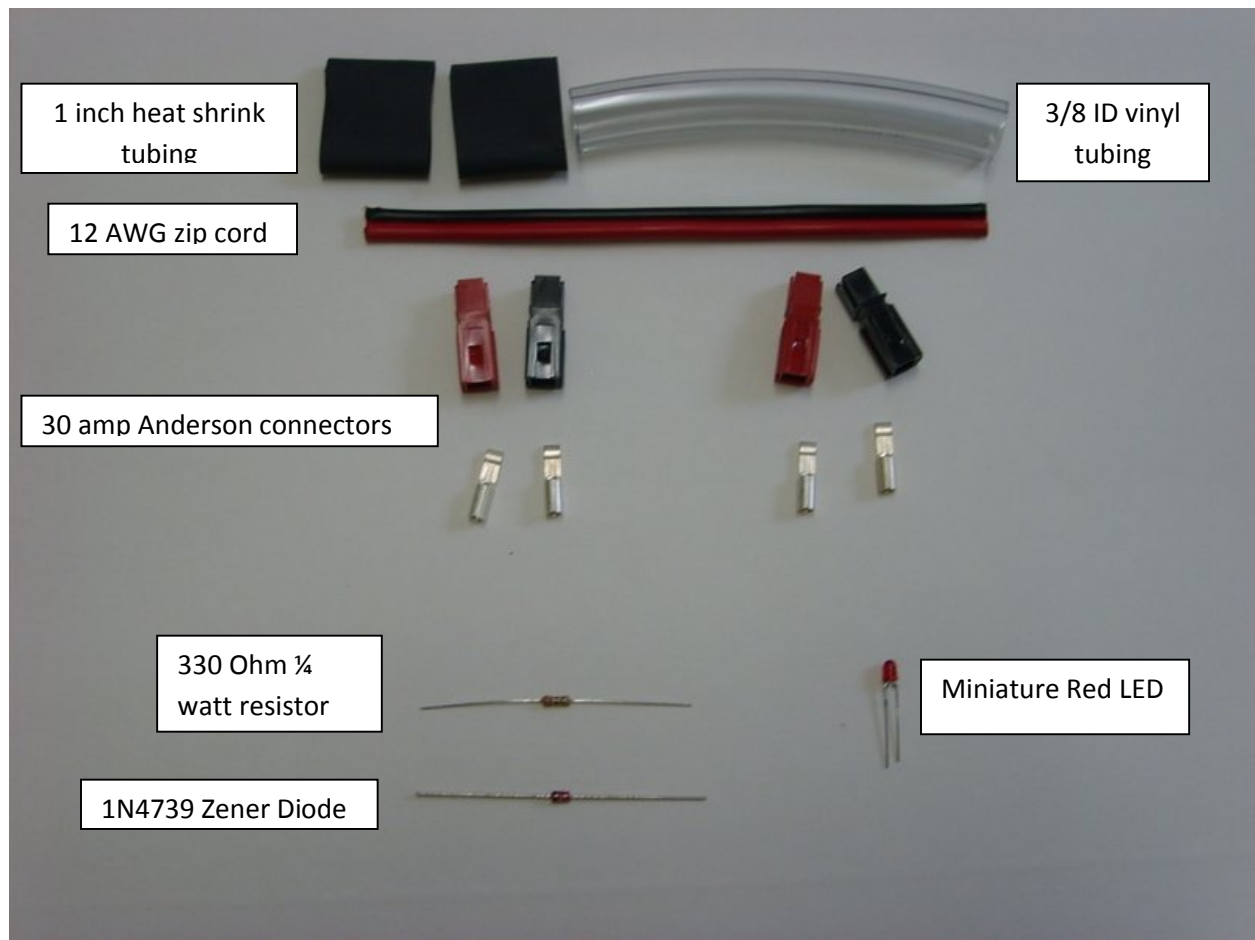


Fig 2. LED Voltage Monitor Kit Components

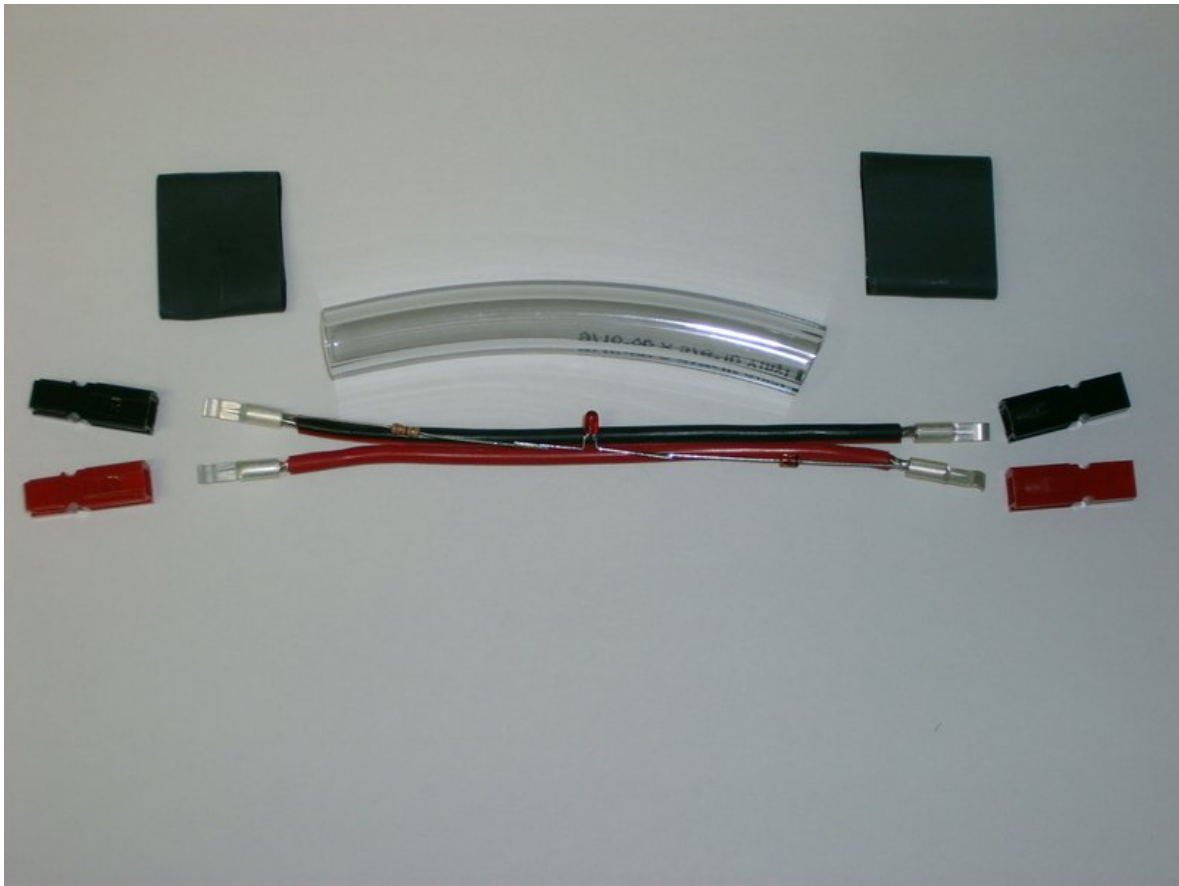


Fig 3. LED Voltage Monitor showing partial assembly

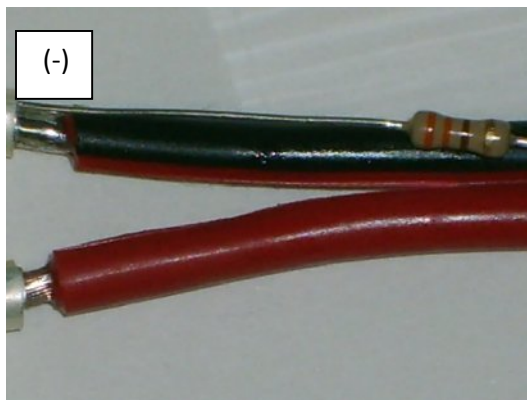


Fig 4. 330 Ohm 1/4 watt resistor
Connected to negative

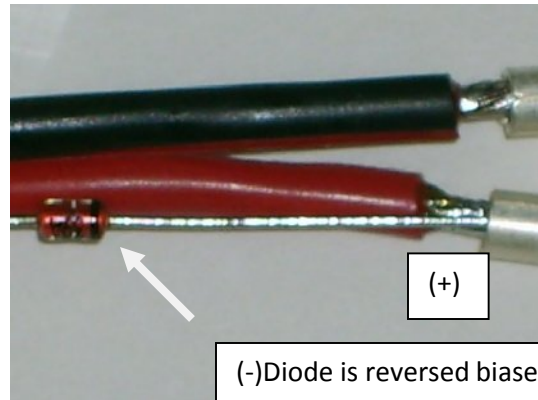


Fig 5. 1N4739 Zener Diode
Connected to positive

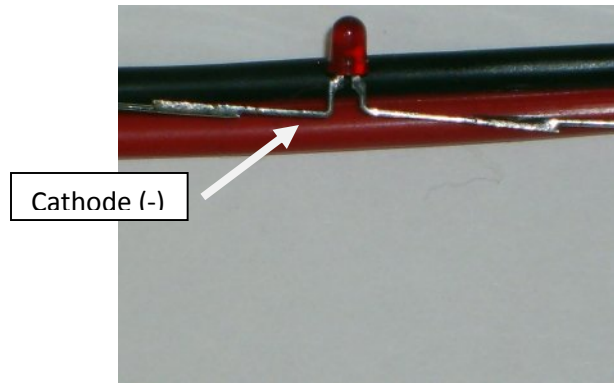


Fig 6. Miniature Red Diode



Fig 7. Completed LED Voltage Monitor

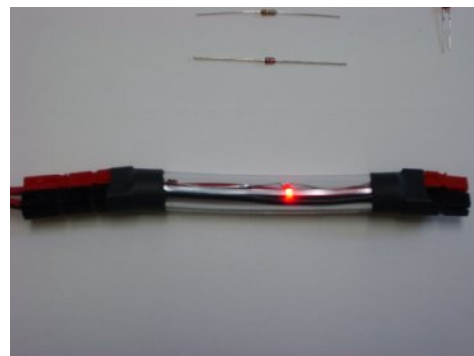


Fig 8. Monitor Powered Up



Fig 9. LED Voltage Monitor in service