

Unplugging your DSK/OMAP/LCDK – 8 August 2012

Objective: To allow the DSK (digital signal processing (DSP) starter kit), OMAP-L138 zoom experimenter kit, or LCDK (low cost development kit) to operate on battery power.

Background: All of these boards are powered by an AC power supply that converts wall outlet power to approximately 5 volts DC. These boards connect to the AC power supply via a DC power plug, which is also called a barrel connector. The outer portion of the barrel is 5.5 mm in diameter (ground) and the inner post is 2.5 mm in diameter (5 volts DC). The approximate quiescent currents for these boards are shown in the table below.

Board name	Quiescent current
TMS320C6713	150 mA
OMAP-L138 Zoom Experimenter Kit	230 mA
LCDK	395 mA

When the DSP core is actually performing low intensity calculations, these currents will rise slightly (10-20%).

Solution: Since the required currents and voltages are within the capability of most USB-based external batteries, one possible solution is to buy or assemble a cable that will connect the battery to the board.

Buy the cable: You are looking for a cable similar to a “USB 2.0 A to 5.5/2.5mm Barrel Connector Jack DC Power Cable” that can be found at

<http://cgi.ebay.com/ws/eBayISAPI.dll?ViewItem&item=170753281224>

Assemble a cable: As shown, we used spare cables and cut off the unneeded portion of the cable. The “red” and “black” wires correspond



to the +5 volt DC and ground connection of the USB specification. The “green” and “white” wires are used for data transfer, and are therefore not used in this application. The “red” wire needs to be

soldered to the wire corresponding to the center part of the DC power plug. We used an ohmmeter to verify the wiring of this connector. After soldered these two connections together, the exposed conductors need to be properly insulated (we using electrical tape, alternatively, heat shrink tubing could have been used).

Testing: After assembly, we connected the cable to the battery and observed the system's output voltage using an oscilloscope. This step verifies that you have the correct polarity and that your battery is actually providing about five volts.

Final testing: Connect the cable to the battery and to the DSP board. If you are using the OMAP-L138 board you will need to power up the system by turning on the slide switch. The fully assembled and working system is shown below. The Hyperjuice 100 Watt-hour (20 amp-hour) system shown, should power the OMAP-L138 board for about three days. We operated the system for more than a day without difficulty!

