The PICDEM™ Lab II Development Board Layout and Schematic Information Sheet

Overview

The PICDEM™ Lab II Development Board Layout and Schematic can be found on the Microchip web site:

www.microchip.com/picdemlabII

This board provides hardware design flexibility for experimentation through a variety of DIP microcontroller sockets coupled with a solderless breadboard. It also includes two fixed and one variable power supply, plus a USB to Serial/I2C™ converter. Additionally, it features a USB mini-B connector, two open format connectors (one for expansion, one for an LCD module), and a pair of mikroBUS™ host connectors to accommodate a variety of plug-in modules. The PICDEM Lab II is fully compatible with MPLAB® Code Configurator and MPLAB® X v3.05 or later.

Board Power-Up

On-board power consists of two fixed voltages and one variable voltage. The two fixed voltages are 5.0V and 3.3V and the variable supply can produce 1.2V to 4.5V. All three power supplies can be powered from the 9V barrel connector, the USB voltage from the USB-Serial/I2C™, or supplied via four test points (TP1 and TP2 for 5V, TP3 and TP4 for 3.3V).

Using USB power, the 3.3V and 5.0V supplies are limited to 100 mA. Using the 9V supply, both 3.3V and 5.0V are capable of 0.75A. Using external supplies, the board is limited to the external supplies limit, however, a maximum of a 3.0A to 5.0A limit is imposed on the breadboard contacts.

Out of the Box Labs

A complete selection of parts and wires for four individual labs are included with the PICDEM™ Lab II board:

- A Hello World LED Project
- An IR Remote Control Link
- A Power Converter Project
- A Class D Audio Amplifier

The lab manuals and additional labs are available on the Microchip web site: www.microchip.com/picdemlabII.

> **Note:** The recommended wire diameter for the white breadboard is AWG 22-29.

Board Layout

The PICDEM™ Lab II Development Board is shown in Figure 1.

The 28/40-pin socket, the 8/14/20-pin socket, the 18-pin socket and 8-pin socket are provided for connecting DIP package microcontrollers to the corresponding ICSP™ programming/debugging connectors ICSP4, ICSP3, ICSP2 and ICSP1.

Jumpers 2 and 6 control the source of the 3.3V and 5.0V input.

If both jumpers connect the center and the top contacts (toward the 9V input), the 3.3V and 5.0V are supplied by a pair of 1A switching regulators driven by the 9V input. If both jumpers connect the center and the right contacts (toward the Click™ board connectors), the 3.3V and 5.0V are supplied by the external power supply test points (TP1/2 5.0V, TP3/4 3.3V; red test points are positive connections and black are negative). If both jumpers connect the center and the bottom contacts, the 3.3V and 5.0V are supplied from the USB-Serial/I^2C.

The blue potentiometer R7 adjusts the variable power supply voltage and is capable of supplying maximum 100 mA.

J4 is a PICkit™ serial style connection for Serial/I^2C. This device will enumerate as both an I^2C peripheral and a COM port on a PC.

> **Note:** A driver is required for the I^2C™ operation, which can be downloaded, along with a terminal program, from the Microchip web site: www.microchip.com.

An additional USB Mini-B socket J17 is available through connector J22 for microcontrollers capable of supporting a USB interface. Connectors J5 and J8 provide GND, variable voltage, 3.3V, and 5.0V supplies.

Two Click™ boards may be loaded into the sockets and wired individually to any of the microcontrollers. Power and ground for the Click™ boards are supplied through existing connections to the sockets.
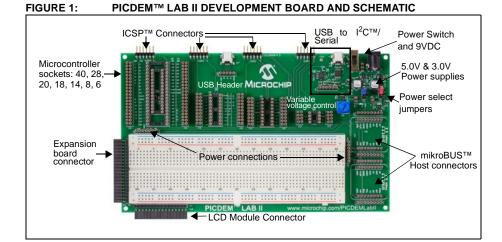
Connectors J9/10 and J11/16 are provided for connecting external boards, LCD modules or wires.

> **Note:** Only V_{SS} is connected to the microcontroller DIP sockets, V_{DD} must be supplied from the appropriate power supply voltage, see connectors J5 and J8 above.

Additional Recommended Equipment and Software:

- PG164130 PICkit™ 3 Programmer/Debugger
- DV244005 REAL ICE™ Programmer/Debugger
- MPLAB® X IDE
- MCC MPLAB® Code Configurator
- MPLAB® XC Compilers

FIGURE 1:   **PICDEM™ LAB II DEVELOPMENT BOARD AND SCHEMATIC**