# Explorer 8 Development Board Layout and Schematic Quick Start Guide

## Overview

The Explorer 8 Development Board Layout and Schematic can be found on the Microchip web site:

www.microchip.com/explorer8

The Explorer 8 board is one of the latest demonstration boards for evaluating and demonstrating the capabilities and features of Microchip's 8-bit MCUs. It includes two fixed and one variable power supply, a 16x2 Character LCD module, a pair of mikroBUS™ Click™ board headers to accommodate a variety of plug-in modules, a pair of Digilent Pmod™ connectors, an in-line completely configurable connector, PICtail™ connectors and a USB-to-serial/I$^2$C™ converter. The Explorer 8 is fully compatible with the MPLAB® Code Configurator and MPLAB® X v3.00 or later.

## Board Power-Up

On-board power consists of two fixed voltages and one variable voltage. The two fixed voltages are of 5.0V and 3.3V, and the variable supply can produce 1.2V to 5V. All three power supplies can be run from a 9-Volt barrel connector, and the USB voltage from the USB-serial/I$^2$C, or supplied via four test points (TP1 and TP7 for 5V, TP6 for 3.3V and TP5 for variable supply voltage).

Using USB power, the 3.3V and 5.0V supplies are limited to 500 mA. Using the 9V supply, both 3.3V and 5.0V are capable of up to 1A. When using an external supply, the board is limited to a maximum of 5A, imposed on the breadboard contacts.

## Out of the Box Experience

The board comes with a PIC16F1719 installed and all jumpers are configured for an out of the box demo, displaying a small subset of board features. Simply connect the Micro-USB Cable from J18 to one of the PC's USB ports and press <S1> and <S2> to step through each section of the application code. Lab manuals and additional labs are available on the Microchip web site at http://www.microchip.com/explorer8. All jumpers are configured for an out of the box demo.

## Board Layout

The Explorer 8 Development Board is shown in Figure 1.

The 28/40-pin socket, the 8/14/20-pin socket, and the 80/84/44-pin PIM socket are provided for connecting a wide range of 8-Bit PIC® MCUs. ICSP™ programming/debugging connectors J26 or J12 are used to accommodate PICkit™, REAL ICE™ or ICD 3.

Jumpers 2, 14, 24 and 30 control the source of voltage for the Explorer 8. The user can select between the 3.3V, 5.0V and the variable supply voltage. The on-board linear regulators support up to 1A when connected to the 9-Volt DC supply. These voltages can be measured via test points such as TP1 and TP7 for 5.0V, TP6 for 3.3V and TP5 for the variable supply. The board can also be fully powered from the Micro-USB connector which can also be used for USB-serial/ I$^2$C communications. The blue potentiometer R25 adjusts a variable voltage for analog measurements.

J18 is a Micro-USB serial style connection for USB to serial/$I^2C$. This device will enumerate at both an $I^2C$ and a serial peripheral via a COM port on a PC.

> A MCP2221 driver is required for $I^2C$™ or serial operation and can be downloaded, along with a terminal program, from the Microchip web site at: http://www.microchip.com/wwwproducts/Devices.aspx?product=MCP2221.

Two MikroElektronika Click boards may be loaded into the sockets J32 or J35. Various communication ports and interfaces are controlled by Jumpers J41 through J50. Power and ground for the Click boards is supplied through the existing connections to the sockets.
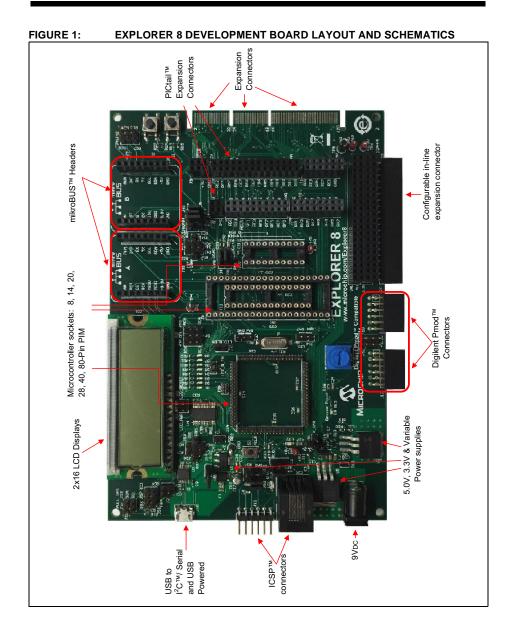
Two Digilent Pmod interfaces are available on the bottom middle of the Printed Circuit Board (PCB). Both sockets are the 12-pin version of the Digilent Pmod and provide eight I/O signal pins, two power pins and two ground pins. The signals are arranged so that they provide two of the 6-pin interfaces stacked.

Legacy Expansion Header for PICtail daughter card connectivity or user access to MCU pins is also available on the Explorer 8. Combining the PICtail connector with the J33 connector creates a completely configurable in-line connector capable of a power of 3.3V or 5.0V.

## Additional Recommended Equipment and Software

- PG164130 PICkit™ 3 Programmer/Debugger
- DV244005 REAL ICE™ Programmer/Debugger
- MPLAB® X IDE
- MCC MPLAB® Code Configurator
- MPLAB® X8 Compilers

**FIGURE 1:** **EXPLORER 8 DEVELOPMENT BOARD LAYOUT AND SCHEMATICS**