Setting Up the MPLAB® PM3 Programmer

1 SOFTWARE INSTALLATION

To use MPLAB PM3 Device Programmer with a PC running Windows®, install the MPLAB IDE software, v6.41 or greater. (Check the web site for the latest version at: www.microchip.com/devtools.)

1. Insert the MPLAB IDE CD-ROM into the CD-ROM drive (Example: drive D) or download the software from the web site if newer.
2. Follow the on-screen instructions to install the MPLAB IDE software. Do not run the MPLAB IDE program yet.

2 USB DRIVER INSTALLATION

For USB only. When using RS-232 communications, proceed to Step 3.

IMPORTANT: Do not allow the Windows OS to pick a USB driver; it will not work and you will then not be able to install the proper driver without reinstalling the OS. Follow the procedure specified here for correct USB driver setup.

Follow the USB driver installation instructions that pop up at the end of MPLAB IDE installation. These instructions are also in the MPLAB IDE installation directory under `Driversnn/pm3_usb/ddpm3nn.htm`, where nn is the Windows OS version.
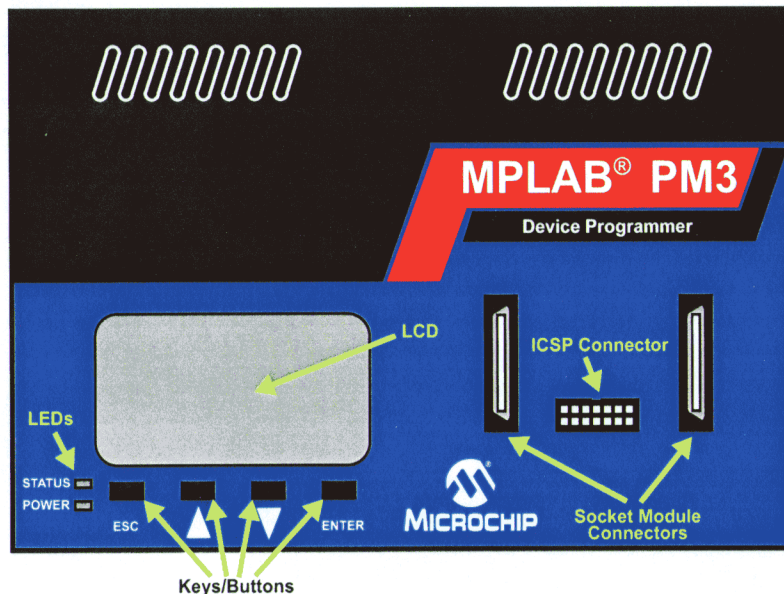
3 HARDWARE SETUP

1. **For USB Communication:** Connect one end of the USB cable to a USB port on the PC. Connect the cable from the PC USB port to the corresponding USB connector on the back of the MPLAB PM3 Programmer.
   For RS-232 Communication: Connect one end of the RS-232 cable to a COM port on the PC. Check the PC setup to see which communications port is available. Connect the cable from the PC COM port to the corresponding RS-232 connector on the back of the MPLAB PM3 Programmer.
2. Make sure the power switch on the MPLAB PM3 is in the "O" (off) position. Connect the power cord to the power supply, connect the power supply to the MPLAB PM3, and turn the power switch to "I" (on) to apply power.
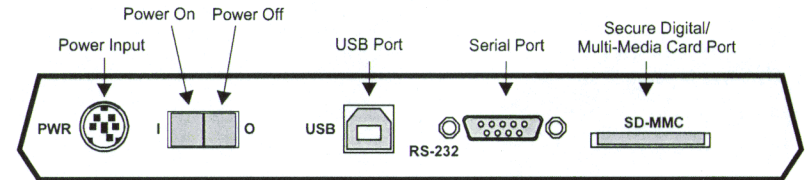
4 SOFTWARE SETUP

1. Launch MPLAB IDE. For RS-232 Communication only: Set the COM port FIFO buffers "Off" and the Flow Control to "Hardware". Refer to _Help>Topics>MPLAB PM3_ for on-line help. Select _Troubleshooting>Common Problems>Advanced Serial Communications Help>Setting up the port manually_ for instructions for your operating system.
2. From the MPLAB IDE menu, select _Configure>Select Device_. In this dialog, choose the device you want to program and click **OK**.
3. Select _Programmer>Select Programmer>MPLAB PM3_. Once MPLAB PM3 is selected, additional programmer options appear on the Programmer menu.
4. Select _Programmer>Settings_ and click on the **Communications** tab. Select the appropriate port for RS-232 (COM 1-4) or USB.
5. Select _Programmer>Enable Programmer_ to begin using the MPLAB PM3. Select _Help>Topics>MPLAB PM3_ to view on-line help for the programmer, including electrical specifications, socket module installation, ICSP™ pinouts, programming a device, etc. Select _Help>Topics>MPLAB IDE_ to view on-line help on creating projects and debugging code.

ICSP™ Implementation Considerations

The MPLAB® PM3 Device Programmer allows programming of PICmicro® microcontrollers that are already installed in a target board using ICSP (In-Circuit Serial Programming). However, the application circuit must be designed to allow all the programming signals to be directly connected to the PICmicro device and must compensate for the following issues. Figure 1 shows a typical circuit as a starting point when designing an application circuit for ICSP.

ISOLATE MCLR/VPP PIN

When the MCLR/VPP pin is connected to an RC circuit, the operation of ICSP is affected by the size of the capacitive load. It is recommended that you use a resistor or Schottky-type diode to isolate the RC circuit from the programmer. If the application circuit cannot isolate the RC circuit in this way, a series resistor up to 100 Ohm may be used to help prevent overshoot caused by the application circuit. In addition, if an external reset device is connected to MCLR, it must be isolated from the voltage applied by the programmer to this pin during programming. Typically, a series resistor between MCLR and the external reset device is used to limit the current to safe levels. See Application Note AN820 for more details on this topic.

ISOLATE PGC/PGD/PGM PINS

Pins RB6/PGC and RB7/PGD must be isolated from the application circuit to prevent the programming signals from being affected by the application circuitry. This isolation circuit must account for RB6/PGC and RB5/PGM being inputs on the PICmicro device and for RB7/PGD being bidirectional (can be driven by both the PICmicro device and the programmer). If the design permits, these pins should NOT be used by the applications. Consider what type of circuitry is connected to RB6/PGC, RB7/PGD and RB5/PGM and decide on how to isolate these pins. Figure 1 shows typical circuitry. It does not show any circuitry to isolate RB6/PGC, RB7/PGD and RB5/PGM on the application circuit as this is application dependent.

VDD

Typical circuits use several hundred microfarads of capacitance on VDD to help damp noise and ripple. However, this capacitance requires a fairly strong driver in the programmer to meet the rise rate timings for VDD. If an application circuit requires more power than the MPLAB PM3 programmer can supply, the application circuit may need to power itself. Refer to the MPLAB PM3 on-line help for further details.

VDD-ONLY (NON-HIGH VOLTAGE) PROGRAMMING

When using VDD-only ICSP mode, care must be taken to ensure RB5/PGM does not float high during power-on. Therefore, it is recommended that RB5/PGM be tied to system ground through a 10K resistor and that RB5/PGM is not used for the application circuit.
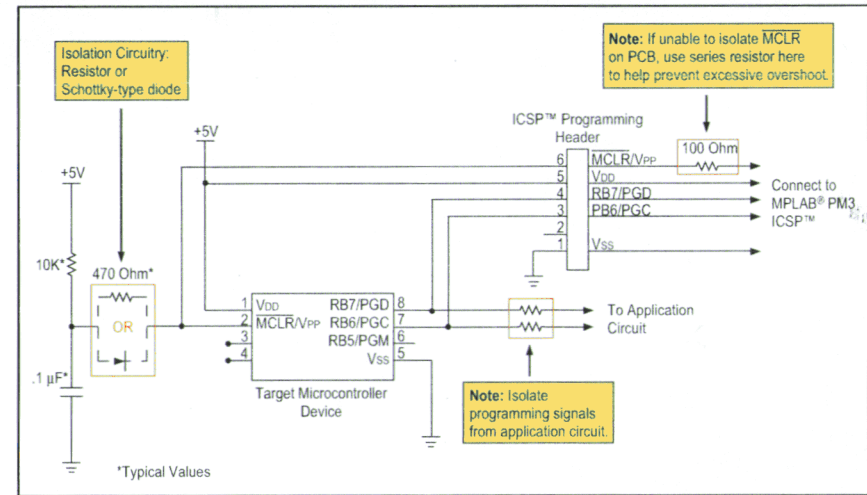

FIGURE 1:   TYPICAL ICSP APPLICATION CIRCUIT

GND

The MPLAB PM3 must be at the same ground potential as the application circuit.

ADDITIONAL SYSTEM CONCERNS

Some Microchip programming specifications require the device to be programmed at 5V. If an application circuit operates at 3V only, special considerations must be made, such as totally isolating the PICmicro device during programming.

PROGRAMMING ENVIRONMENT

Physical distance between the programmer and the application circuit affects the load capacitance on each of the programming signals. Therefore, the cable length must be kept as short as possible and properly terminated and shielded. Otherwise, the programming signals may be corrupted by ringing or noise.

FINAL NOTE

If programming problems exist once the application circuit is designed, verify that all programming signals meet the programming specification rise times and voltage levels.

MICROCHIP

MICROCHIP

ASSEMBLY NUMBER: 14-00596   **REV:** 6   **Product No:** DV007004

ASSEMBLY NAME: PRODUCT TREE, PM3 PROGRAMMER

Pack List

10-00362   ASSY, PM3 LIT/SOFTWARE KIT   Rev: C

Qty	Part Number	Description
1	DS30400	DOC, MPASM ASSEMBLER QUICK REFERENCE GUIDE
1	DS51322	DOC, dsPIC30F LANGUAGE TOOLS QUICK REFERENCE CARD
1	DS30210	DOC, "IMPORTANT INFORMATION" MICROCHIP INFORMATION
1	DS30030	DOC, WARRANTY/REGISTRATION CARD
1	DS51281	DOC, MPLAB IDE 6.xx QUICK START
1	DS51123	SOFTWARE, MPLAB CDROM

11-00181   ASSY, PM3 PROGRAMMER   Rev: 6

Qty	Part Number	Description
1	DS51474	DOC, MPLAB PM3 ICSP DEISGN GUIDE
1	DS51450	DOC, SETTING UP THE MPLAB PM3
1	CAB0008	CABLE, USB A-B M-M 6'
1	CAB0003	CABLE, RS-232 DATA CABLE, DB9 M/F SHIELDED 6 FT.
1	CAB0002	CABLE, IEC POWER CABLE
1	PS0015	POWER SUPPLY, 3.3V@5A, 5V@0.75A w/DIN CONNECTOR
1	07-00028	CABLE ASSY, PM3 ICSP CABLE