Using MPLAB® ICD 2

1 Install the Latest Software

NOTE: Do not connect the RS-232 or USB cable until after the MPLAB IDE software is installed.
Install the MPLAB IDE software onto your PC using the MPLAB IDE CD-ROM or download the software from the Development Tools page of the Microchip web site (www.microchip.com).
DO NOT run the MPLAB IDE program at this time.

2 Configure PC Communications

For RS-232

1. Connect MPLAB ICD 2 to a PC COM port via an RS-232 cable.

RS-232

2. Select the COM port to set up for communication, i.e., *Control Panel>System>Hardware>Device Manager>Ports> COMx*, (where x = 1, 2, 3, etc.), right-click on the desired COM port, and select Properties.
3. Click the Port Settings tab and set "Flow Control" to "Hardware".
4. Click the Advanced button. In the Advanced Settings dialog, turn off (uncheck) "Use FIFO buffers".

For USB

IMPORTANT: Do not allow Windows® OS to pick a USB driver. You must follow the installation instructions in the following file for proper driver installation: `C:\Program Files\ Microchip\MPLAB IDE\ICD2\Drivers\ ezicd2.htm`.
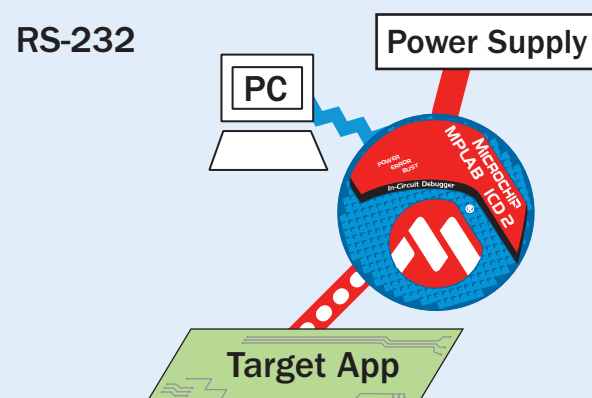
1. Connect MPLAB ICD 2 to a PC USB port via a USB cable.

USB
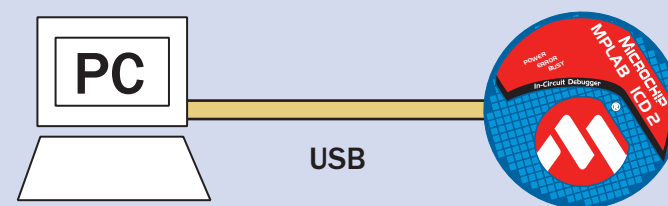
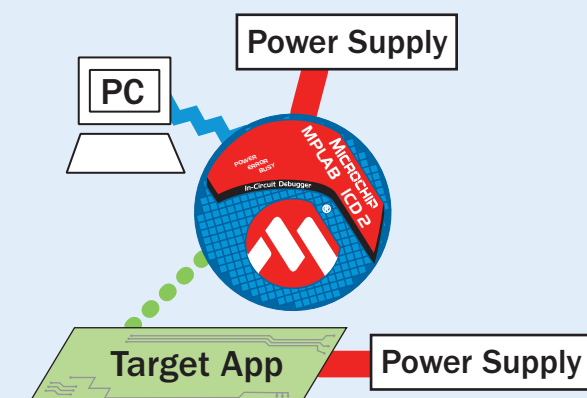2. Follow the instructions in ezicd2.htm mentioned above to install the drivers.

3 Connect Power and Target Application

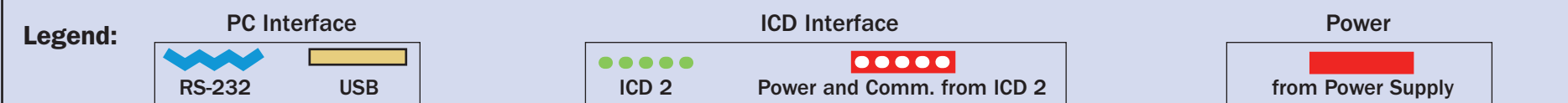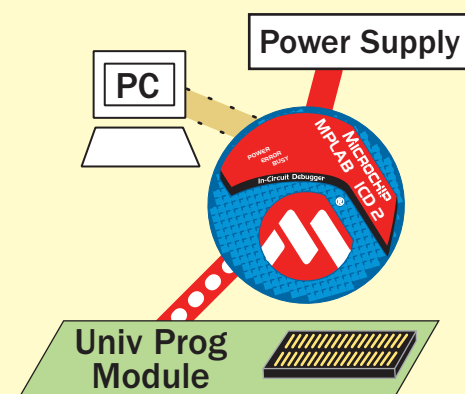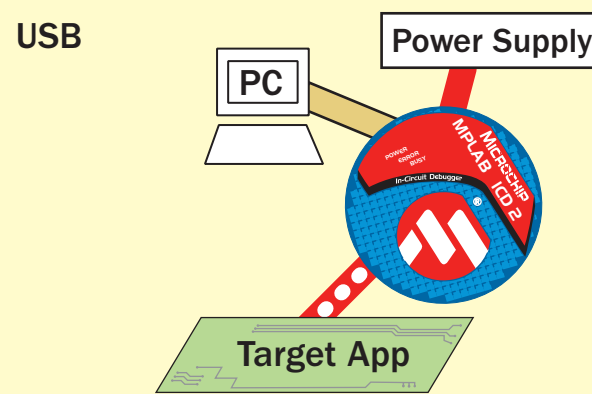| Target Powered from MPLAB ICD 2 (<200 mA, 5V only to Target)	Target Powered from Power Supply	Programming with the Universal Programming Module (AC162049)
NOTE: Always apply power to MPLAB ICD 2 before applying power to your target applications.		

Legend:

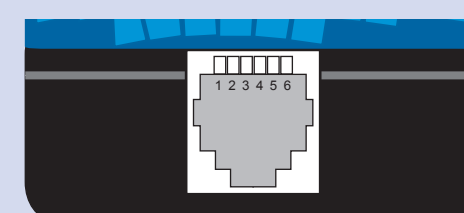| PC Interface	ICD Interface	Power
RS-232 USB	ICD 2 Power and Comm. from ICD 2	from Power Supply
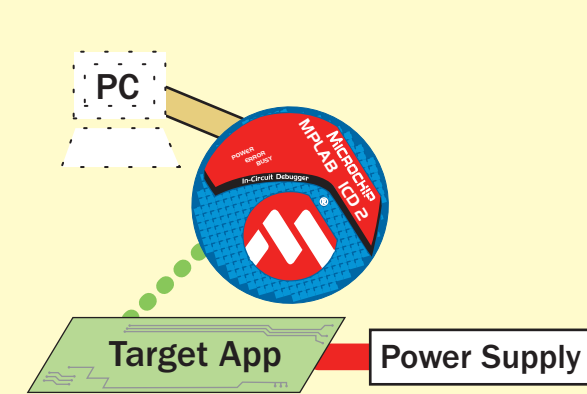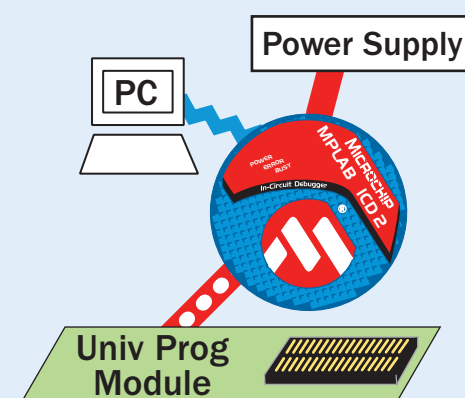
4 Configure MPLAB IDE

Open the MPLAB IDE program and configure the MPLAB IDE software to work properly with MPLAB ICD 2:
1. For debugging, select *Debugger>Select Tool>MPLAB ICD 2*. For programming, select *Programmer>Select Programmer>MPLAB ICD 2*. MPLAB ICD 2 should not be selected as a programmer and debugger simultaneously.
2. To set the communications port for MPLAB ICD 2, select *Debugger/Programmer>Settings>Communication* tab and choose a port (USB, COM1, COM2, etc.). Click Apply.
3. Select the Power tab. If you are supplying power directly to the target application, verify the Power target circuit from MPLAB ICD 2 checkbox is empty. If you want to power the target circuit from the MPLAB ICD 2, select the checkbox. Click OK.

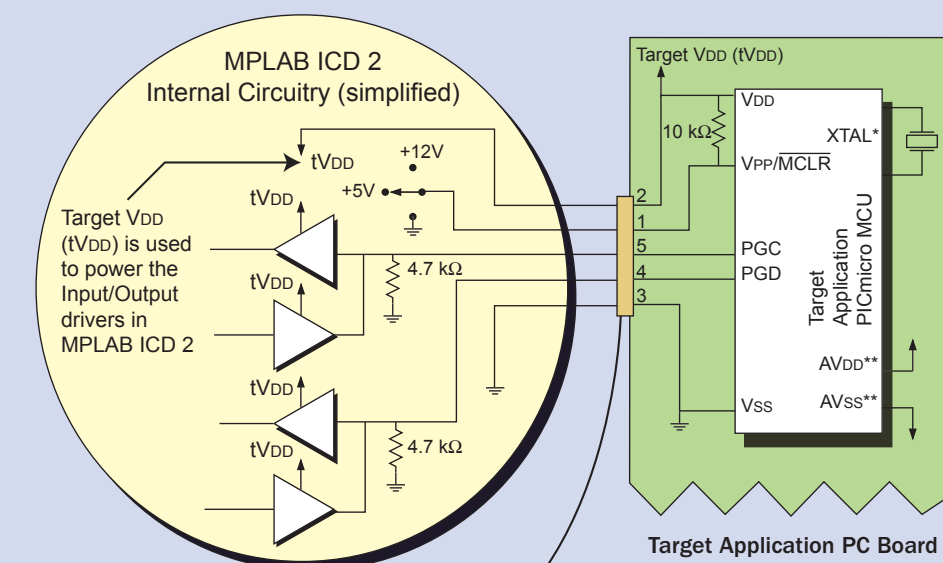## Additional Information

MPLAB ICD 2 RJ-12 Jack Pinout

Pin	Signal
Not Used	1
PGC	2
PGD	3
Ground	4
VDD	5
MCLR/VPP	6

Electrical Connections to Target

Target Application PC Board

*Target PICmicro MCU must be running with an oscillator for MPLAB ICD 2 to function.

**If the PICmicro MCU has AVDD and AVss lines, they must be connected for MPLAB ICD 2 to operate.

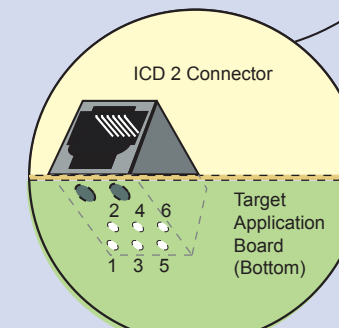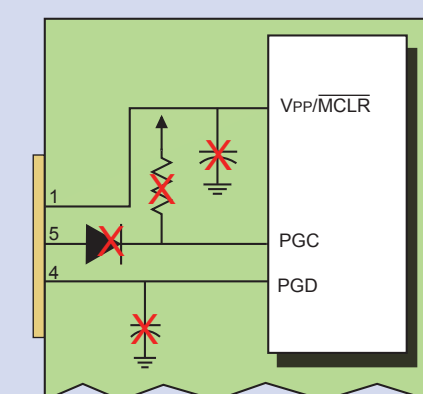| Modular Connector Pin	Microcontroller Pin
6	Not Used
5	PGC
4	PGD
3	Ground
2	VDD
1	MCLR/VPP

Guidelines

- Oscillator – must be operational for MPLAB ICD 2 debug operations.
- Power – must be connected to target. Internal buffers on PGC and PGD are connected to MPLAB ICD 2's VDD when MPLAB ICD 2 is powering the target (less than 200 mA, 5V operation only). When the target has its own power supply, the target VDD is connected to these buffers. This also provides level translation (down to 2V) for low voltage operation.
- WDT – Disable the Watchdog Timer while debugging.
- Code Protect – Disable all code protection while debugging.
- Table Read Protect – Disable all table read protection while debugging.
- Reserved Resources – Avoid reserved program memory and file registers used by the debugger. See Reserved Resources section below.
- LVP – Do not enable Low Voltage Programming.
- PLL – Switching to PLL oscillator requires power down of target.
- AVDD and AVss – If target PICmicro® MCU has these Analog power pins, they also must be connected to the proper power and ground.
- Ensure that configuration bits are correctly programmed, especially for the oscillator.

Target Circuit Design Considerations

- No pull-ups on PGC/PGD – they will divide the voltage levels since these lines have 4.7 kΩ pull-down resistors in MPLAB ICD 2.
- No capacitors on PGC/PGD – they will prevent fast transitions on data and clock lines during programming and debug communications.
- No capacitors on MCLR – they will prevent fast transitions of VPP.
- No diodes on PGC/PGD – they will prevent bidirectional communication between MPLAB ICD 2 and the target PICmicro MCU.

Reserved Resources (See on-line help or readme for specifics)

MPLAB ICD 2 has the following restrictions and reserves certain on-chip resources for debugging. After the target PICmicro MCU is programmed to run without MPLAB ICD 2 in your application, none of these restrictions apply:

- MCLR/VPP is shared for programming and reset control.
- Low-voltage ICSP programming (LVP) must be disabled.
- PGC and PGD are reserved for programming and in-circuit debugging. Usually these are the RB6 and RB7 pins.
- A few general purpose file registers are reserved.
- One stack level is reserved for the PIC12FXXX and PIC16FXXX MCU families. Two stack levels are reserved for the PIC18FXXX MCU family.
- An area in upper program memory is reserved.
- Shadow registers are used in the PIC18XXX MCU's

MICROCHIP