

# MPLAB X

## Integrated Development Environment

# USING PICKIT™ 3 IN-CIRCUIT DEBUGGER

### 1 Install the Latest Software

Install the MPLAB® X IDE software onto your computer by downloading it from [www.microchip.com/mplabx](http://www.microchip.com/mplabx). Launch the application.

### 2 Configure USB Communications

The PICKit 3 uses generic USB drivers that are installed automatically. You do not need to do anything.

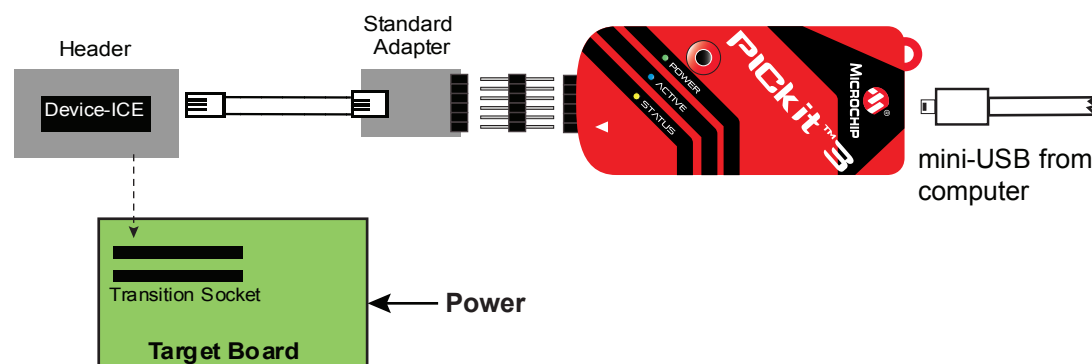
### 3 Connect to Target and Power

1. Attach the PICKit 3 to the computer using the USB cable.
2. Attach the communications cable between the debugger and target board.
3. Connect power to the target board.

#### Typical Debugger System – Device With On-Board Debug Circuitry:



#### Alternate Debugger System – ICE Device:



### 4 Create, Build and Run the Project

1. Select and install the language tools (compiler, assembler, etc.) for developing your code. See the [www.microchip.com](http://www.microchip.com) web site for more choices.
2. Use the New Project wizard (File>New Project) to create a project, or open an existing project (File>Open Project).
3. Configure the debugger by right clicking on the main project and selecting "Properties." Click on "PICKit 3" for options.
4. Configure your language tools in the Properties dialog by clicking the language tool name for options. Click **OK** when done.
5. Check that the configuration bits in your code match the Recommended Settings listed on this poster.
6. To execute your code in Debug mode, perform a debug run by selecting **Debug>Debug Project**. A debug run will build the project, program the target with the image and debug executive, and start a debug session.  
OR  
To execute your code in Non-Debug (release) mode, perform a run by selecting **Run>Run Project**. A run will build the project, program the target with the image and run the device.  
To hold a device in Reset after programming, use the Hold in Reset icon in the toolbar instead of using Run Project.

## ADDITIONAL INFORMATION

### Circuitry and Connector Pinouts



Pin 1 Indicator

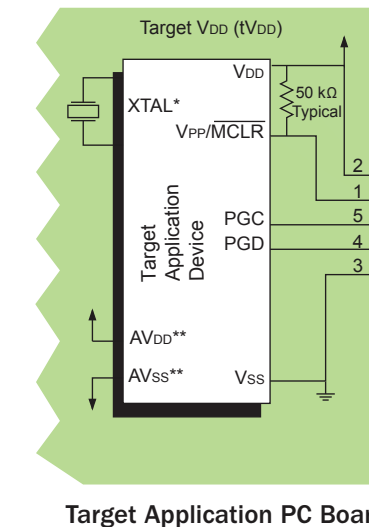
- \*Target device must be running with an oscillator for the debugger to function as a debugger.
- \*\*If the device has AVDD and AVSS lines, they must be connected for the debugger to operate.

#### Target Connector Pinout

Pin	Signal
1	MCLR/VPP
2	VDD Target
3	VSS Ground
4	PGD (ICSPDAT)
5	PGC (ICSPCLK)
6	Do not connect*

\*Reserved for future use.

#### Correct



Target Application PC Board

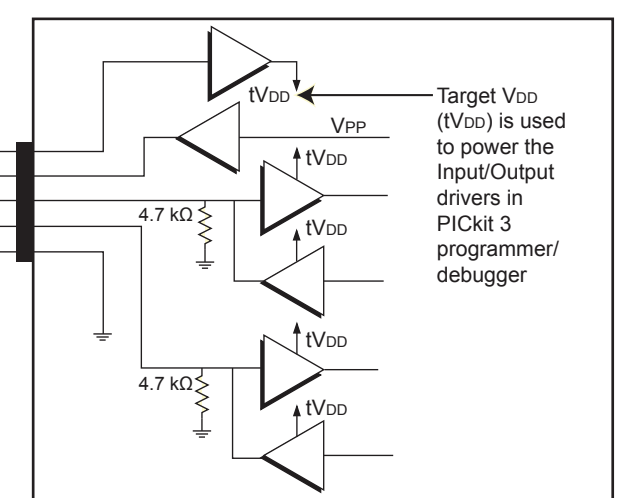
#### PICKit 3 Connector Pinout

Pin	Signal
1	MCLR/VPP
2	VDD Target
3	VSS Ground
4	PGD (ICSPDAT)
5	PGC (ICSPCLK)
6	Do not connect*

\*Reserved for future use.

#### PICKit 3

#### Internal Circuitry (simplified)

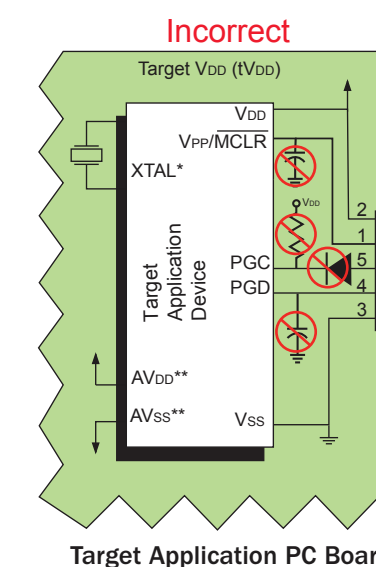


### Recommended Settings

COMPONENT	SETTING
Oscillator	· OSC bits set properly · Running
Power	Supplied by target
WDT	Disabled (device dependent)
Code-Protect	Disabled
Table Read Protect	Disabled
LVP	Disabled
BOD	VDD > BOD VDD min
JTAG	Disabled
AVDD and AVSS	Must be connected
PGCx/PGDx	Proper channel selected, if applicable
Programming	VDD voltage levels meet programming specs

**Note:** See the PICKit 3 online help for more information.

### Target Circuit Design Precautions



Target Application PC Board

- **Do not use greater than 100 µF capacitance on VDD:** depending on the overall load, it will prevent the target from powering quickly when PICKit 3 is the source of power.
- **Do not use capacitors on MCLR:** they will prevent fast transitions of VPP.
- **Do not use pull-ups on PGC/PGD:** they will divide the voltage levels since these lines have 4.7 kΩ pull-down resistors in PICKit 3.
- **Do not use multiplexing on PGC/PGD:** they are dedicated for communications to PICKit 3.
- **Do not use capacitors on PGC/PGD:** they will prevent fast transitions on data and clock lines during programming and debug communications.
- **Do not use diodes on PGC/PGD:** they will prevent bidirectional communication between PICKit 3 and the target PIC® MCU.
- **Do not exceed recommended cable lengths:** refer to the Hardware Specification section of the PICKit 3 online help or user's guide for acceptable cable lengths.

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