

# MPLAB® PICKit™ 4 In-Circuit Debugger

## QUICK START GUIDE



### GETTING STARTED

#### 1 Install the Latest Software

Download the MPLAB X IDE software from [www.microchip.com/mplabx](http://www.microchip.com/mplabx) and install onto your computer. The installer automatically loads the USB drivers. Launch MPLAB X IDE.

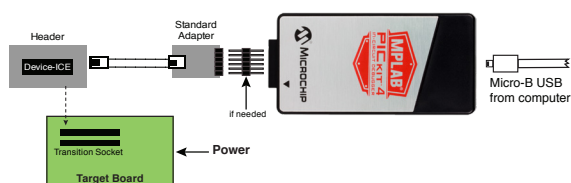
#### 2 Connect to Target Device

1. Connect the MPLAB PICKit 4 to the computer using the supplied Micro-B USB cable.
2. Attach the communications cable between the debugger and target board.
3. Connect external power to target board.

##### Typical Debugger System – Device with On-Board Debug Circuitry



##### Alternative Debugger System – ICE Device



\*External target board power supply to be provided by user.

#### 3 Create, Build and Run Project

1. Refer to the MPLAB X IDE User's Guide or online help for instructions to install language tools, create or open a project, and configure project properties.
2. Check that the configuration bits in your code match the Recommended Settings below.
3. To execute your code in Debug mode, perform a debug run. To execute your code in Non-Debug (release) mode, perform a run. To hold a device in Reset after programming, use the Hold in Reset icon in the toolbar.



##### Recommended Settings

Component	Setting
Oscillator	<ul style="list-style-type: none"><li>• OSC bits set properly</li><li>• Running</li></ul>
Power	Supplied by target
WDT	Disabled (device dependent)
Code-Protect	Disabled
Table Read Protect	Disabled
LVP	Disabled
BOD	V <sub>DD</sub> > BOD V <sub>DD</sub> min.
JTAG	Disabled
AV <sub>DD</sub> and AV <sub>SS</sub>	Must be connected
PGC <sub>x</sub> /PGD <sub>x</sub>	Proper channel selected, if applicable
Programming	V <sub>DD</sub> voltage levels meet programming spec

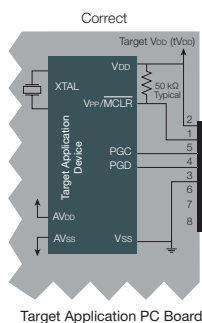
**Note:** See MPLAB PICKit 4 In-Circuit Debugger online help for more information.

##### Reserved Resources

For information on reserved resources used by the debugger, see the MPLAB PICKit 4 In-Circuit Debugger online help.

## ADDITIONAL INFORMATION

### Circuitry and Connector Pinouts



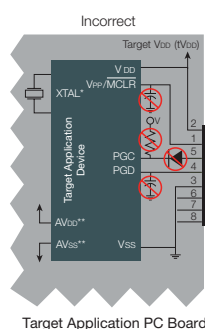
Connect  
Pin 1 to Pin 1



### Typical 6-Pin ICSP Pinout

Pin	Target	MPLAB® PICKIT 4
1	MCLR/VPP	NMCLR
2	VDD Target	VDD
3	VSS (ground)	Ground
4	PGD (ICSPDAT)	PGD
5	PGC (ICSPCLK)	PGC
6	Do Not Connect	Do Not Connect
7		Reserved for Future use
8		Reserved for Future use

### Target Circuit Design Precautions



- **Do not use pull-ups on PGC/PGD:** they will disrupt the voltage levels, since these lines have programmable pull-down resistors in the debugger.
- **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 capacitors on MCLR:** they will prevent fast transitions of VPP. A simple pull-up resistor is generally sufficient.
- **Do not use diodes on PGC/PGD:** they will prevent bidirectional communication between the debugger and the target device.
- **Do not exceed recommended cable lengths:** Refer to the Hardware Specification of the MPLAB PICKIT 4 online help or user's guide for cable lengths.

### Pinouts for Additional Interfaces

MPLAB® PICKIT 4	Debugging and Programming			Data Stream	
	ICSP	MIPS EJTAG	Cortex® SWD	DMCI/DGI U(S)ART/CDC	DGI SPI
1	VPP/NMCLR				
2	VDD	VIO_REF	VTG	VTG	
3	GND	GND	GND	GND	
4	PGD	TDO	SWO		MISO
5	PGC	TCK	SWCLK		SCK
6	AUX	NRESET	NRST	(SCK)	
7	TDI	TDI		TX	MOSI
8	TMS	TMS	SWDIO	RX	SS

\*\* 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.