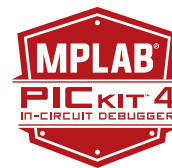


MPLAB® PICKit™ 4 In-Circuit Debugger

QUICK START GUIDE



GETTING STARTED

1 Install the Latest Software

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

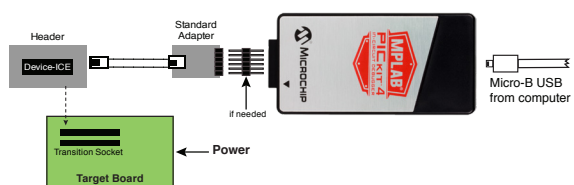
2 Connect to Target Device

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">• OSC bits set properly• Running |
| Power | Supplied by target |
| WDT | Disabled (device dependent) |
| Code-Protect | Disabled |
| Table Read Protect | Disabled |
| LVP | Disabled |
| BOD | V _{DD} > BOD V _{DD} min. |
| JTAG | Disabled |
| AV _{DD} and AV _{SS} | Must be connected |
| PGCx/PGDx | Proper channel selected, if applicable |
| Programming | V _{DD} voltage levels meet programming spec |

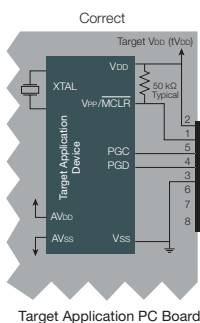
Note: See MPLAB PICKit 4 In-Circuit Debugger online help for more information.

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



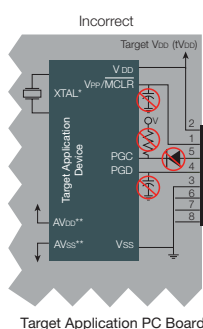
Connect
Pin 1 to Pin 1



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 Pin # | 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 | SW ₀ | | 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.