MPLAB X

Integrated Development Environment

Using MPLAB ICD 3 In-Circuit Debugger

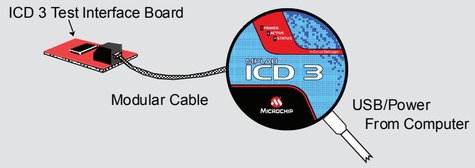
1 Install the Latest Software

Install the MPLAB® X IDE software onto your computer by downloading it from www.microchip.com/mplabx. Launch the application.

2 Configure USB Communications

When you install MPLAB X IDE on a Mac or Linux computer, the installer automatically loads the USB drivers.
When you install MPLAB X IDE on a Windows® computer, you must follow the instructions on the Start Page, "MPLAB IDE v8 Users - Important," to correctly install the USB drivers.

3 Use the ICD 3 Test Interface Board

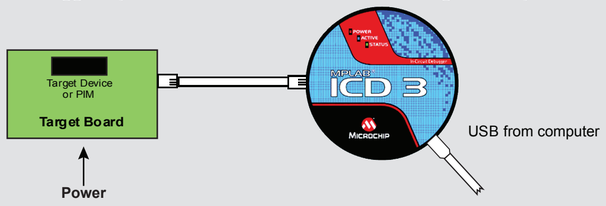


Use the supplied ICD 3 Test Interface Board to verify that the debugger is functioning properly:
1. Disconnect the debugger from the computer.
2. Connect the ICD 3 Test Interface Board to the debugger using the modular cable.
3. Reconnect the debugger to the computer.
4. Launch MPLAB X IDE. **Ensure that all existing projects are closed.**
5. Select Debug>Run Debugger/Programmer Self Test, then, select the specific "ICD 3" you want to test and click **OK**.
6. Ensure the ICD 3 Test Interface Board and cable are connected. Click **Yes** to continue.
7. View the self test results in the debugger's Output window.
8. After the debugger passes the self test, disconnect the ICD 3 Test Interface board from the debugger.

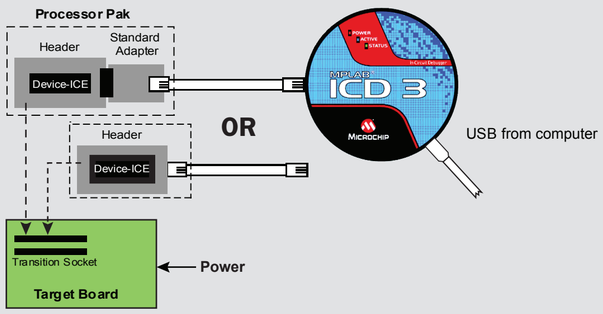
4 Connect to Target Device

1. Ensure the MPLAB ICD 3 is attached to the computer using the USB cable, if not already.
2. Remove the ICD 3 Test Interface Board and attach the modular 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 Configuration (without loss of pins)



5 Create, Build and Run Project

1. Select and install the language tools (compiler, assembler, etc.) for developing your code. See the 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 "ICD 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 below.
6. To execute your code in Debug mode, perform a debug run (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 (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

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	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

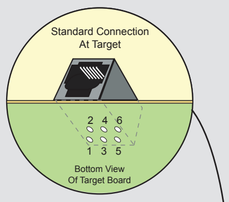
Note: See MPLAB ICD 3 in-circuit debugger online help for more information.

Reserved Resources

For information on reserved resources used by the debugger, see the MPLAB ICD 3 in-circuit debugger online help.

Circuitry and Connector Pinouts

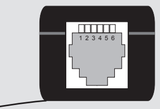
Target Connector Pinout



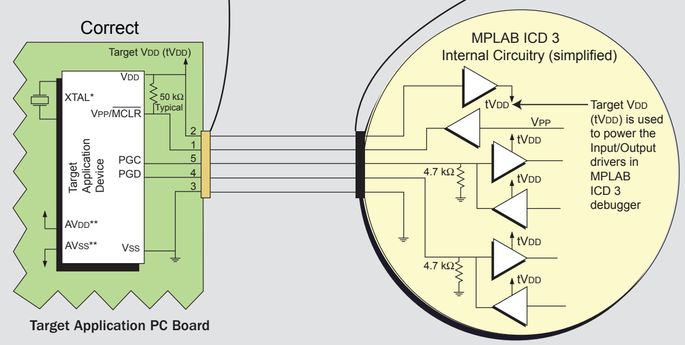
Modular Connector Pin	Microcontroller Pin
1	$\overline{MCLR}/V_{PP}$
2	V_{DD}
3	Ground
4	PGD (ICSPDAT)
5	PGC (ICSPCLK)
6	Do not connect*

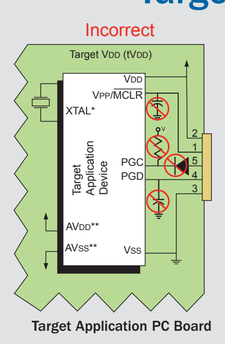
*Reserved for future use.

MPLAB ICD 3 RJ-11 Jack Pinout



Pin	Signal
PGM	1
PGC	2
PGD	3
Ground	4
V_{DD}	5
$\overline{MCLR}/V_{PP}$	6





*Target device must be running with an oscillator for the debugger to function as a debugger.
**If the device has AV_{DD} and AV_{SS} lines, they must be connected for the debugger to operate.

Target Circuit Design Precautions

- **Do not use greater than 100 µF capacitance on V_{DD}:** depending on the overall load, it will prevent the target from powering quickly when MPLAB ICD 3 is the source of power.
- **Do not use capacitors on $\overline{MCLR}$:** they will prevent fast transitions of V_{PP}.
- **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 MPLAB ICD 3.
- **Do not use multiplexing on PGC/PGD:** they are dedicated for communications to MPLAB ICD 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 MPLAB ICD 3 and the target PIC® MCU.
- **Do not exceed recommended cable lengths:** refer to the Hardware Specification section of the MPLAB ICD 3 online help or user's guide for cable lengths.

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