

# MPLAB® ICD 2 In-Circuit Debugger/Programmer

## In-Circuit Debugging Basics

Traditionally, embedded systems engineers use in-circuit emulators (ICE) to develop and debug their designs and then programmers to transfer the code to the devices. The in-circuit debugging logic, when implemented, is part of the actual microcontroller silicon and provides a low-cost alternative to a more expensive ICE. In-circuit debugging offers these benefits:

- Low cost
- Minimum of extra hardware
- Expensive sockets or adapters are not needed
- Debugging and programming a production line board is possible

However, it has the following trade-offs:

- Use of some target system resources such as I/O pins, program memory, data memory, and stack space. As a result, some portions of an embedded application may not be debugged.
- Triggering and breakpointing are limited to the built-in capabilities of the in-circuit debugging logic.
- The target chip must be running with a clock and a supply voltage. Often an emulator probe can run without external hardware.

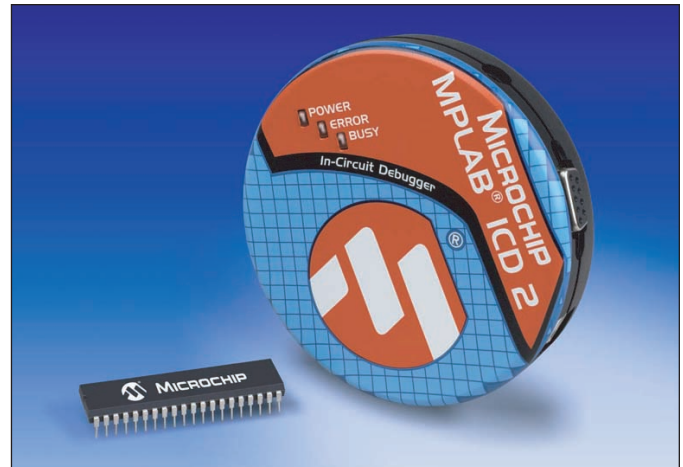


## All-in-one Debugger/Programmer Solution for Flash Products

The MPLAB ICD 2 (In-Circuit Debugger 2) allows debugging and programming of PIC® and dsPIC® Flash microcontrollers using the powerful graphical user interface of the MPLAB Integrated Development Environment (IDE), included with each kit. The MPLAB ICD 2 is connected to the design engineer's PC using USB or RS-232 interface and can be connected to the target via an ICD connector. The connector uses two device I/O pins that are shared between in-circuit debugging and In-Circuit Serial Programming™.

## Host System Requirements

- PC-compatible system with a Intel Pentium® class or higher processor, or equivalent
- A minimum of 32 MB RAM
- A minimum of 40 MB available hard drive space
- CD-ROM drive (for use with the accompanying CD)
- Available USB or RS-232 port
- Microsoft® Windows® 98, Windows NT® 4.0, Windows 2000 or Windows XP USB support may be limited by the Windows operating system, particularly Windows 98/NT.



## Features

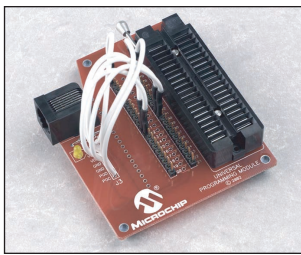
- USB (Full Speed 2 Mbits/s) and RS-232 interface to host PC
- Real-time execution
- MPLAB IDE compatible (free copy included)
- Built-in over voltage/short circuit monitor
- Firmware upgradeable from PC/web download
- Totally enclosed
- Supports low voltage to 2.0 volts (2.0 to 6.0 range)
- Diagnostic LED's (Power, Busy, Error)
- Read/Write program and data memory of microcontroller
- Erase of program memory space with verification
- Freeze-peripherals at breakpoint

## Products Supported

The MPLAB ICD 2 currently supports most PIC and dsPIC Flash microcontrollers. Flash PICmicro MCU's not supported are PIC16F72/73/74/76/77/83/84A.

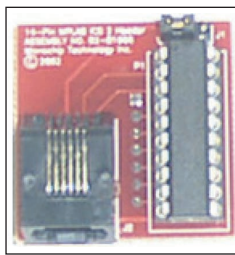
The MPLAB ICD 2 firmware is continually being updated to add support for new devices. A review of the README file located in MPLAB IDE is recommended for the most current list of supported parts. As new device firmware becomes available, free downloads are available at [www.microchip.com](http://www.microchip.com).

## Universal Programming Module



The Universal Programming Module can be used in conjunction with the MPLAB ICD 2 to provide an easy means for programming 300 to 600-mil PDIP Flash devices. It features a 40-pin ZIP socket, an MPLAB ICD 2 connector, programming indicator and configuration jumpers.

## MPLAB ICD 2 Headers



For 8-pin (PIC12F629/675), 14-pin (PIC16F630/676) or 18-pin (PIC16F627A/628A/648A) devices, limited I/O make integrated in-circuit debugging impractical. Instead, in-circuit debugging is made possible by using a header containing an equivalent device with integrated in-circuit debugging peripheral. For debugging, the header is connected

to the MPLAB ICD 2 module via the MPLAB ICD 2 connector and is inserted into the target socket with a stand-off connector.

### Part Numbers and Ordering Information – MPLAB® ICD 2 Products and Accessories

Part Number	Description	Availability
DV164005	ICD 2 Module (Includes ICD 2 Module and USB Cable)	Now
DV164006	ICD 2 Evaluation Kit (Includes ICD 2 Module, USB Cable, RS-232 Cable, Power Supply and PICDEM™ 2 Plus Demonstration Board - DV163022)	Now
DV164007	ICD 2 Module ws (Includes ICD 2 Module, USB Cable, RS-232 Cable and Power Supply)	Now
AC162049	Universal Programming Module Works with DV164005, DV164006 and DV164007 above)	Now
AC162048	RS-232 and Power Supply Kit (Use with DV164005 above for RS-232 communication)	Now
DM163022	PICDEM 2 Plus Demonstration Board (Includes PIC18F452, PIC16F877, LCD 2 x 16 Display, LED's, RS-232 Port, Piezo Sounder, Temperature Sensor, Demonstration Programs, Unassembled Source Code and More)	Now
AC162050	Header Interface (8P DIP) for PIC12F629/675	Now
AC162051	Header Interface (28P/40P DIP)	Now
AC162052	Header Interface (14P DIP) for PIC16F676/630	Now
AC162053	Header Interface (18P DIP) for PIC16F627A/628A/648A	Now
AC162054	Header Interface (18P DIP) for PIC16F716	Q1/04

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