

MPLAB® REAL ICE™ In-Circuit Emulator

All-in-One In-Circuit Emulator/Programmer Solution for Microchip Flash Products

MPLAB REAL ICE In-Circuit Emulator System is Microchip's top-of-the-line high-speed emulator for PIC® Flash microcontrollers (MCUs) and dsPIC® Digital Signal Controllers (DSCs). It debugs and programs these devices with the powerful, yet easy-to-use graphical user interface of MPLAB Integrated Development Environment (IDE).

The MPLAB REAL ICE In-Circuit Emulator probe is connected to a PC using a high-speed USB 2.0 interface and is connected to the target with either a MPLAB ICD 3 system (RJ-11) compatible connector or with the high-speed, noise tolerant, Low-Voltage Differential Signal (LVDS) interconnection (CAT5).

The MPLAB REAL ICE In-Circuit Emulator System offers the following advantages:

- **Full-Speed Real-time Emulation**
MPLAB REAL ICE In-Circuit Emulator is designed to support high-speed processors running at maximum speeds, allowing embedded engineers to debug applications on their own hardware in real time.
- **Ruggedized Probe Interface**
Protection circuitries are added to the probe drivers to guard the probe kit from power surges from the target.
- **Legacy and High-speed Connectivity**
MPLAB REAL ICE In-Circuit Emulator comes standard with a MPLAB ICD 3 type connector (RJ-11). An optional Performance Pak offers high-speed, noise-tolerant, LVDS, extended length CAT5 standard (up to 10 feet or 3 meters) connectivity.
- **Logic Probe For External Triggers**
A logic probe is included and can be connected to the 14-pin header on the unit. It supports 8 user-selectable input/outputs that automatically adjust to the targeting voltage level. The outputs can also trigger an external logic analyzer or oscilloscope.
- **Trace Execution and Analysis**
Through its high-speed communication bus, connection schemes and trace-aware compilers, MPLAB REAL ICE In-Circuit Emulator offers multiple ways to trace execution and log information about running applications: real-time watch, data capture, streaming parallel trace using device I/O port or streaming serial trace using SPI/UART.
- **Portable, USB-powered and RoHS-Compliant**
Housed in a small (4.7" W x 3.4" D x 0.84" H) enclosure, the MPLAB REAL ICE In-Circuit Emulator is powered by the USB port, so an external power adapter is not required. MPLAB REAL ICE In-Circuit Emulator is CE and RoHS-compliant.



■ Ease of Maintenance and Feature Upgrade

Adding new device support and advanced features to the MPLAB REAL ICE In-Circuit Emulator is as simple as installing the latest version of MPLAB IDE, a free download at: www.microchip.com/mplab. MPLAB REAL ICE In-Circuit Emulator is also field upgradeable through a firmware download from MPLAB IDE.

■ Low Cost

At less than \$500, the MPLAB REAL ICE In-Circuit Emulator breaks the price barrier for a complete and advanced in-circuit emulator, offering new ways to interact with and debug applications at a fraction of the cost of traditional emulator systems.

Features

- Real-time execution
- Fast programming
- USB 2.0 high-speed interface to PC (480 Mb/s)
- MPLAB IDE integration (included free)
- Overvoltage/short-circuit monitor protection
- Low voltage: to 1.8 volts (1.8 to 5.25 range)
- Read/Write program and data memory of microcontroller
- Erase of program memory space with verification
- Stopwatch
- Hardware and software breakpoints
- Real-time watch
- Capture trace to log instruction execution and variable contents (~10 KB/s at 4 MHz 16-bit core)
- Port trace for high-speed upload of trace data
- High-speed option allows full-speed emulation, high-speed trace upload and long (validated 10 feet to 3 meters) cables
- Processor Paks provide debug interface with no reserved pins



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Products Supported

The MPLAB REAL ICE In-Circuit Emulator supports most Flash PIC MCUs and dsPIC DSCs. For the most current list of supported parts, review the "README" file located in MPLAB IDE. The firmware is continually being updated to add support for new devices. As new device firmware is released, it can be downloaded free of charge at: www.microchip.com.

Host System Requirements

- PC-compatible system with an Intel Pentium® class or higher processor, or equivalent
- 512 MB RAM recommended
- 150 MB hard drive space
- CD-ROM drive
- Available USB port
- Microsoft® Windows® 2000 or Windows XP®

Standard Probe Driver



The Standard Probe Driver uses a MPLAB ICD 3 type connector (RJ-11) to connect to the target application. Designs that are compatible with MPLAB ICD 3 debugging/programming are quickly converted to use MPLAB REAL ICE. This driver board is included in the MPLAB REAL ICE In-Circuit Emulator Probe Kit (DV244005).

Performance Pak (AC244002)



The optional Performance Pak consists of two circuit boards (driver and receiver) that employ two CAT5 cables. Debug pins are driven using LVDS communications, and additional trace connections allow high-speed serial trace uploads to the PC.

Ordering Information – MPLAB® REAL ICE™ Products and Accessories

Part Number	Description
DV244005	MPLAB REAL ICE In-Circuit Emulator Probe Kit, includes MPLAB REAL ICE In-Circuit Emulator and Standard Driver Board (compatible with MPLAB® ICD 3 RJ-11). This kit contains: one MPLAB REAL ICE In-Circuit Emulator probe, one standard probe driver, one 14-pin logic probe, one USB cable, one 6" RJ-11 modular cable and a CD containing MPLAB IDE software and product documentation.
AC244002	MPLAB REAL ICE In-Circuit Emulator Performance Pak, includes a high-speed driver to replace the standard driver board for high-speed LVDS communications, and a high-speed receiver board. The high-speed driver board uses a second connector for high-speed trace upload. The Performance Pak contains: one high-speed driver board, one high-speed receiver board, two 3 ft. CAT5 cables and one MPLAB ICD 3 RJ-11 to In-Circuit Serial Programming™ (ICSP™) adapter.
Various	MPLAB REAL ICE In-Circuit Emulator Processor Extension Paks, available for select PIC microcontrollers, plug into the processor socket on the target application and, in most cases, allow debug without reserving pins on the MCU.



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www.microchip.com/tools

Visit our web site for additional product information and to locate your local sales office.

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