

Using Salvo with Microchip MPLAB-ICD

Introduction

Microchip®'s (<http://www.microchip.com/>) MPLAB-ICD® is a low-cost in-circuit debugger for use with PIC16F87X Flash family of PICmicro® devices. Users can debug source code, debug hardware in real time, and program the microcontroller via in-circuit serial programming (ICSP). MPLAB-ICD support is integrated into the MPLAB IDE®.

This Application Note explains how to use Salvo™ with MPLAB-ICD and the HI-TECH® (<http://www.htsoft.com/>) PICC® compiler. Other compilers may require similar attention to work properly with MPLAB-ICD.

Setting Up the Compiler

A Salvo-certified compiler is required to build Salvo applications. Application Note *AN-4 Building a Salvo Application with HI-TECH PICC and Microchip MPLAB* explains how to compile Salvo applications within MPLAB.

MPLAB-ICD reserves for itself a small amount of code space and some General Purpose RAM in the target processor. The locations and amounts vary over different PIC1616F87X PICmicros, and the PICC compiler needs to be aware of this when compiling your Salvo. PICC has a link-time command-line argument, `-ICD`, for integration with MPLAB-ICD.

In your MPLAB project, select **Project > Edit Project**, highlight the executable (`[.hex]`) node and choose **Node Properties**. Select **Compile for MPLAB-ICD**, as shown below in Figure 1:

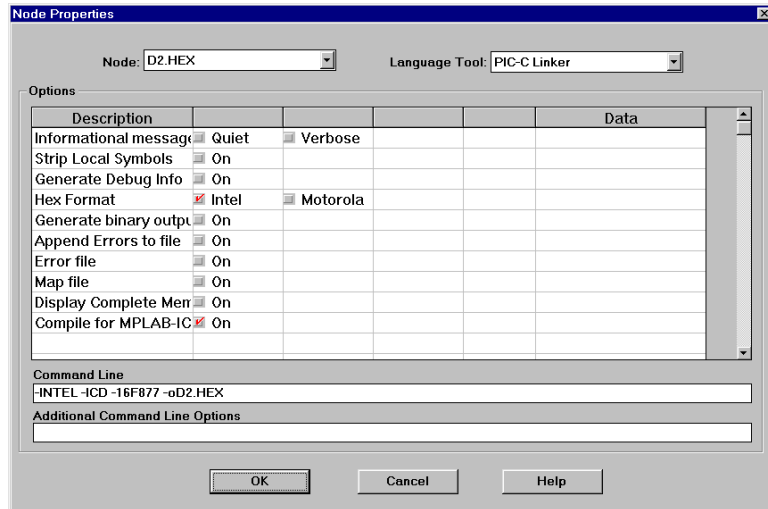


Figure 1: Setting PICC Compiler Options for MPLAB-ICD

Choose OK to finish. You can now make your project and use all of MPLAB-ICD's features while debugging your Salvo application.

Debugging Troubleshooting

One important difference between MPLAB-ICD and the more powerful (and more expensive) PICMASTER® and MPLAB-ICE® in-circuit debugging tools from Microchip is the behavior while making, downloading and debugging application software.

Specifically, after making a project and downloading the executable code to the development system via the Program button in the MPLAB-ICD window, *MPLAB-ICD will run your program for a short amount of time¹* before displaying the Status: Waiting for user command message.

This means that when you begin executing your program via Debug > Run > Run or Debug > Run > Step, the PIC16F87X PICmicro on the MPLAB-ICD Header or Demo Board may have already executed a large number of instructions in your program. If your code sets any Special Function Registers² that are cleared only through Power-On Reset (POR), and not through other³ non-power-up resets, those changes may already be in effect once you begin to run or debug your program.

In other words, you cannot assume the Power-On Reset state for the PICmicro's SFRs immediately after programming the Flash PICmicro via MPLAB-ICD.

Note Power-On Reset behavior varies across the different in-circuit tools and MPLAB-SIM. See MPLAB Help for more information.

Microchip's higher-end in-circuit debugging tools do not exhibit this behavior, nor does MPLAB-SIM.

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- ¹ Approximately 100ms, as measured at Pumpkin. This time is independent of the PIC's clock frequency.
 - ² E.g. T1CON, the Timer1 control register. T1CON is cleared only by a Power-On Reset. Therefore the T1OSCEN bit, once set, remains set until a full Power-On Reset has occurred.
 - ³ E.g. -MCLR or watchdog timer resets.