MPLAB® ICD 2 HEADER

Information Sheet

INTRODUCTION

This document provides installation information for MPLAB® ICD 2 headers, which provide a development environment for specific PICmicro® devices.

MPLAB ICD 2 Header	Part Number	Devices Supported
8-Pin	AC162050 AC162058	PIC12F629/675 PIC12F683
14-Pin	AC162052 AC162057 AC162055 AC162056	PIC16F630/676 PIC12F635, PIC16F636 PIC16F684 PIC16F688
18-Pin	AC162053 AC162054	PIC16F627A/628A/648A PIC16F716

Since in-circuit debugging requires the loss of clock, data and MCLR pins, MPLAB ICD 2 development with actual devices is not practical. A special -ICD device is used with the MPLAB ICD 2 to provide separate clock, data and MCLR pins and frees all normally available pins to the user.

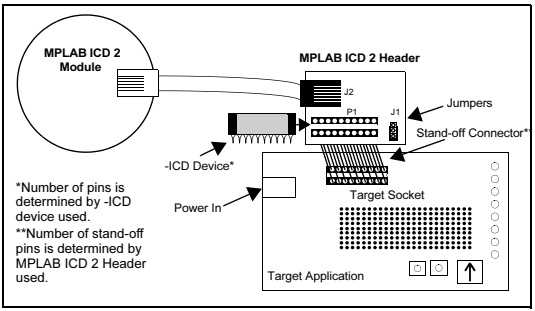
Note: PIC12F629/675, PIC16F630/676 and PIC16F627A/628A/648A devices cannot be programmed or read using MPLAB ICD 2 while GP1/RA1 is high (V_{IH}). Move circuitry that makes GP1/RA1 high to another I/O pin during development. See device programming specifications for more information.

This special -ICD device is mounted on the top of the header and its signals are routed to the MPLAB ICD 2 connector. On the bottom of the header is a socket that plugs into the user's target via the stand-off connector.

The 8-pin and 14-pin headers have a jumper to enable or disable the peripheral functions on the device. In some cases, this selects the device. The 18-pin header does not have a jumper (all devices have the same peripherals), so the device with the largest memory is always selected.

INSTALLATION

FIGURE 1: MPLAB ICD 2 MODULE CONNECTION WITH HEADER



The MPLAB ICD 2 Header is installed by following these steps:

1. Plug the -ICD device into the DIP socket (P1 location) on the MPLAB ICD 2 Header board.
2. Connect the 9-inch modular interface cable between the MPLAB ICD 2 Module and the MPLAB ICD 2 Header.
3. Insert the appropriate male-to-male header (stand-off) onto the target board socket.
4. Plug the MPLAB ICD 2 Header board into the stand-off.
5. For 8-pin and 14-pin headers, select device peripherals by setting the jumper at J1 location to the appropriate position.

PICmicro Device	Jumper Setting	Peripheral Function
PIC12F629	2-3	A/D Disabled
PIC12F675	1-2	A/D Enabled
PIC16F630	2-3	A/D Disabled
PIC16F676	1-2	A/D Enabled
PIC16F636	1-2	PORTC, Comparator 2 Enabled
	2-3	PORTC, Comparator 2 Disabled
PIC16F684 PIC16F688	None	None

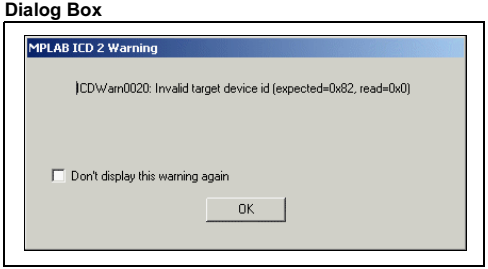
6. For 18-pin headers, there is no jumper. The device with the most program memory is always selected.

   If PIC16F627A or PIC16F628A devices are selected for MPLAB ICD 2 development in MPLAB IDE, the following warnings will be received, since the PIC16F648A (device with the most program memory) is installed on the header:

   Build Window

   ICDWarn0020: Invalid target device id (expected=0x82, read=0x0)

   Dialog Box



   Ignore these warnings or disable them under the Warnings tab on the ICD Programming dialog.

DEVELOPING WITH ICD DEVICES

An ICD device on a corresponding MPLAB ICD 2 header is used to emulate regular (non-ICD) devices. E.g., the PIC12F675-ICD on the 8-pin header is used to emulate the regular PIC12F675 device for debug operation.

The ICD device has an integrated ICD peripheral. The ICD peripheral is not available in regular (non-ICD) devices; therefore these regular PICmicro devices cannot be used directly with the MPLAB ICD 2. The ICD device uses the $\overline{\text{ICD}}$ pin to enable the background debug mode. (See “Schematics” on page 5.)

ICD Device	Header	Emulated Devices
PIC12F675-ICD	8-pin	PIC12F629 PIC12F675
PIC16F676-ICD	14-pin	PIC16F630 PIC16F676
PIC16F636-ICD	14-pin	PIC16F636
PIC16F684-ICD	14-pin	PIC16F684
PIC16F688-ICD	14-pin	PIC16F688
PIC16F648A-ICD	18-pin	PIC16F627A PIC16F628A PIC16F648A
PIC16F716-ICD	18-pin	PIC16F716

PROGRAMMING NON-ICD DEVICES

The MPLAB ICD 2 Header can only program the -ICD device, not the regular devices. To program the PICmicro devices with the MPLAB ICD 2, use the Universal Programming Module (AC162049) or design a modular interface connector on the target. See the appropriate specification for connections:

Device	Programming Specification
PIC12F629/675	DS41191
PIC16F630/676	DS41191
PIC16F627A/628A/648A	DS41196
PIC16F636	DS41204
PIC16F684	DS40060
PIC16F688	DS41204
PIC16F716	DS40245

CALIBRATION BITS

The calibration bits for the bandgap and internal oscillator are always preserved by the MPLAB ICD 2 to their factory settings.

MPLAB ICD 2 PERFORMANCE

The PICmicro devices do not support partial program memory erase; therefore, users may experience slower MPLAB ICD 2 performance than with other devices.

ADDITIONAL INFORMATION

Please refer to the MPLAB ICD 2 User's Guide (DS51331), MPLAB IDE Help and the MPLAB ICD 2 Readme for additional information.

SCHEMATICS

The following schematics show header electrical connections.

FIGURE 2: MPLAB ICD 2 HEADER SCHEMATIC - 8 PIN

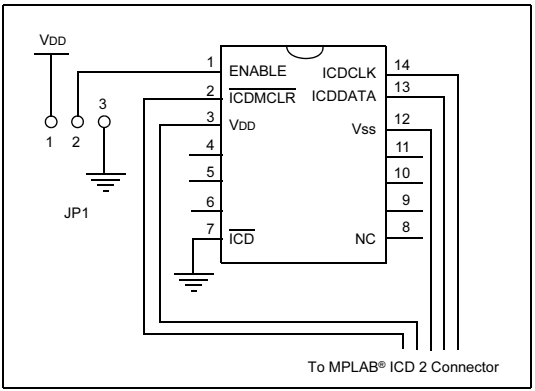


FIGURE 3: MPLAB ICD 2 HEADER SCHEMATIC - 14 PIN

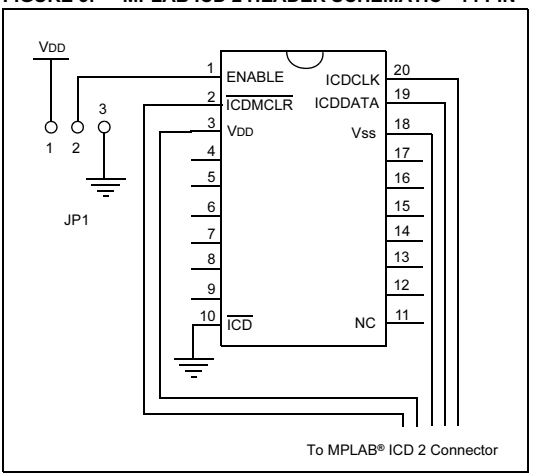
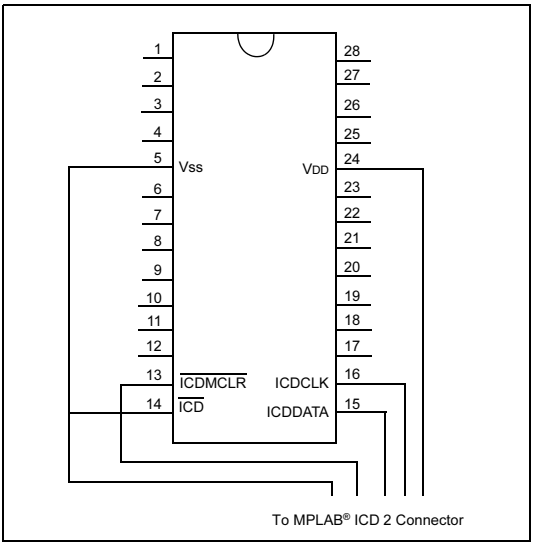


FIGURE 4: MPLAB ICD 2 HEADER SCHEMATIC - 18 PIN



NOTES:

NOTES:

NOTES:

Information contained in this publication regarding device applications and the like is intended through suggestion only and may be superseded by updates. It is your responsibility to ensure that your application meets with your specifications. No representation or warranty is given and no liability is assumed by Microchip Technology Incorporated with respect to the accuracy or use of such information, or infringement of patents or other intellectual property rights arising from such use or otherwise. Use of Microchip's products as critical components in life support systems is not authorized except with express written approval by Microchip. No licenses are conveyed, implicitly or otherwise, under any intellectual property rights.

The graphics in this document are for illustration only. Microchip reserves the right to modify the contents of its development systems.

Trademarks

The Microchip name and logo, the Microchip logo, Accuron, dsPIC, KEELOQ, microID, MPLAB, PIC, PICmicro, PICSTART, PRO MATE, PowerSmart, rfPIC, and SmartShunt are registered trademarks of Microchip Technology Incorporated in the U.S.A. and other countries.

AmpLab, FilterLab, Migratable Memory, MXDEV, MXLAB, PICMASTER, SEEVAL, SmartSensor and The Embedded Control Solutions Company are registered trademarks of Microchip Technology Incorporated in the U.S.A.

Analog-for-the-Digital Age, Application Maestro, dsPICDEM, dsPICDEM.net, dsPICworks, ECAN, ECONOMONITOR, FanSense, FlexROM, fuzzyLAB, In-Circuit Serial Programming, ICSP, ICEPIC, MPASM, MPLIB, MPLINK, MPSIM, PICkit, PICDEM, PICDEM.net, PICLAB, PICtail, PowerCal, PowerInfo, PowerMate, PowerTool, rfLAB, rfPICDEM, Select Mode, Smart Serial, SmartTel and Total Endurance are trademarks of Microchip Technology Incorporated in the U.S.A. and other countries.

Serialized Quick Turn Programming (SQTP) is a service mark of Microchip Technology Incorporated in the U.S.A.

All other trademarks mentioned herein are property of their respective companies.

Printed on recycled paper.

Worldwide Sales and Service

AMERICAS

Atlanta
Tel: 770-640-0034
Boston
Tel: 978-692-3848
Chicago
Tel: 630-285-0071
Dallas
Tel: 972-818-7423
Detroit
Tel: 248-538-2250
Kokomo
Tel: 765-864-8360
Los Angeles
Tel: 949-462-9523
Phoenix
Tel: 480-792-7200
San Jose
Tel: 650-215-1444
Toronto
Tel: 905-673-0699

ASIA/PACIFIC

Australia
Tel: 61-2-9868-6733
China-Beijing
Tel: 86-10-8528-2100
China-Chengdu
Tel: 86-28-8676-6200
China-Fuzhou
Tel: 86-591-8750-3506
China-Hong Kong SAR
Tel: 852-2401-1200
China-Shanghai
Tel: 86-21-5407-5533
China-Shenyang
Tel: 86-24-2334-2829
China-Shenzhen
Tel: 86-755-8203-2660
China-Shunde
Tel: 86-757-2839-5507
China-Qingdao
Tel: 86-532-502-7355
India-Bangalore
Tel: 91-80-2229-0061
India-New Delhi
Tel: 91-11-5160-8632
Japan-Kanagawa
Tel: 81-45-471- 6166
Korea-Seoul
Tel: 82-2-554-7200
Singapore
Tel: 65-6334-8870
Taiwan-Kaohsiung
Tel: 886-7-536-4818
Taiwan-Taipei
Tel: 886-2-2500-6610
Taiwan-Hsinchu
Tel: 886-3-572-9526

EUROPE

Austria-Weis
Tel: 43-7242-2244-399
Denmark-Ballerup
Tel: 45-4420-9895
FranceMassy
Tel: 33-1-69-53-63-20
Germany-Ismaning
Tel: 49-89-627-144-0
Italy-Milan
Tel: 39-0331-742611
Netherlands-Drunen
Tel: 31-416-690399
England-Berkshire
Tel: 44-118-921-5869

10/20/04

QUALITY MANAGEMENT SYSTEM
CERTIFIED BY DNV
ISO/TS 16949:2002

Microchip received ISO/TS-16949:2002 quality system certification for its worldwide headquarters, design and wafer fabrication facilities in Chandler and Tempe, Arizona and Mountain View, California in October 2003. The Company's quality system processes and procedures are for its PICmicro® 8-bit MCUs, KEELOQ® code hopping devices, Serial EEPROMs, microperipherals, nonvolatile memory and analog products. In addition, Microchip's quality system for the design and manufacture of development systems is ISO 9001:2000 certified.