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	PIC12F629/675
14-Pin	AC162052	PIC16F630/676
18-Pin	AC162053	PIC16F627A/628A/648A

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.

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 A/D peripheral function, thus selecting 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**
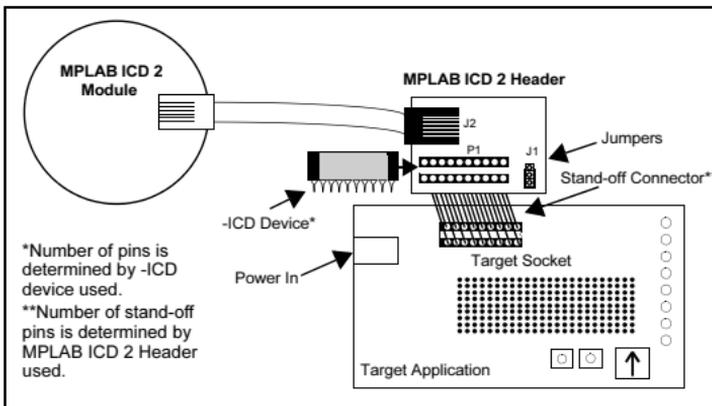
The MPLAB ICD 2 Header is installed by following these steps:

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 the device 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

6. For 18-pin headers, all three devices (PIC16F627A/ 628A/648A) have the same peripherals, there is no jumper and the PIC16F648A (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 is installed on the header:

Build Window

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

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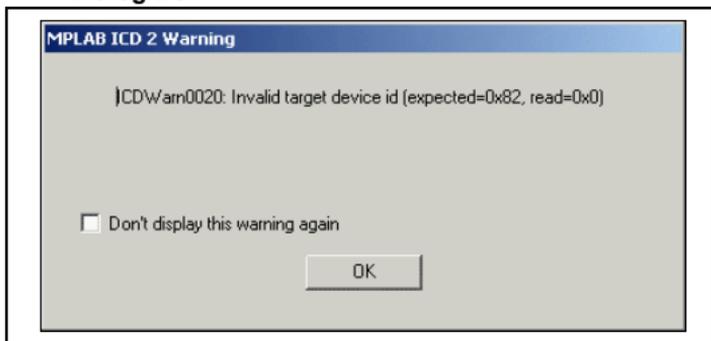
Ignore these warnings or disable them under the Warnings tab on the ICD Programming dialog.

8-PIN HEADER AND PIC12F675-ICD

The PIC12F675-ICD on the 8-pin MPLAB ICD 2 Header (AC162050) is used to emulate the PIC12F629/675 via the MPLAB ICD 2 Header. This device has an integrated ICD peripheral. The ICD peripheral is not available in the PIC12F629/675 devices; therefore these PICmicro devices cannot be used <u>direc</u>tly with the MPLAB ICD 2. The PIC12F675-ICD uses the <u>ICD</u> pin to enable the background debug mode.

14-PIN HEADER AND PIC16F676-ICD

The PIC16F676-ICD on the 14-pin MPLAB ICD 2 Header (AC162052) is used to emulate the PIC16F630/676 via the MPLAB ICD 2 Header. This device has an integrated ICD peripheral. The ICD peripheral is not available in the PIC16F630/676 devices; therefore these PICmicro devices cannot be used <u>direc</u>tly with the MPLAB ICD 2. The PIC16F676-ICD uses the <u>ICD</u> pin to enable the background debug mode.

18-PIN HEADER AND PIC16F648A-ICD

The PIC16F648A-ICD on the 18-pin MPLAB ICD 2 Header (AC162053) is used to emulate the PIC16F627A/628A/648A via the MPLAB ICD 2 Header. This device has an integrated ICD peripheral. The ICD peripheral is not available in the PIC16F627A/628A/648A devices and therefore these PICmicro devices cannot be used <u>directl</u>y with the MPLAB ICD 2. The PIC16F648A-ICD uses the <u>ICD</u> pin to enable the background debug mode.

PROGRAMMING NON-ICD DEVICES

The MPLAB ICD 2 Header can only program the -ICD device, not the PICmicro 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	Device Programming Specification
PIC12F629/675	DS41173
PIC16F630/676	DS41191
PIC16F627A/628A/648A	DS41196

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.

FIGURE 2: MPLAB ICD 2 HEADER SCHEMATIC - PIC12F675-ICD
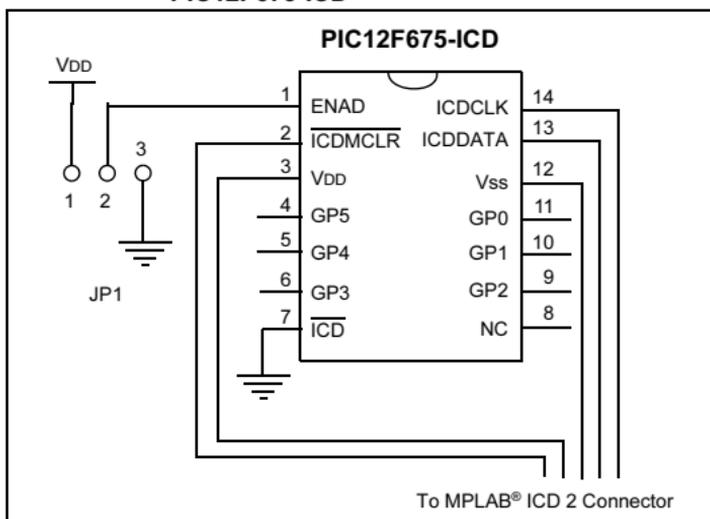
FIGURE 3: **MPLAB ICD 2 HEADER SCHEMATIC -**
PIC16F676-ICD
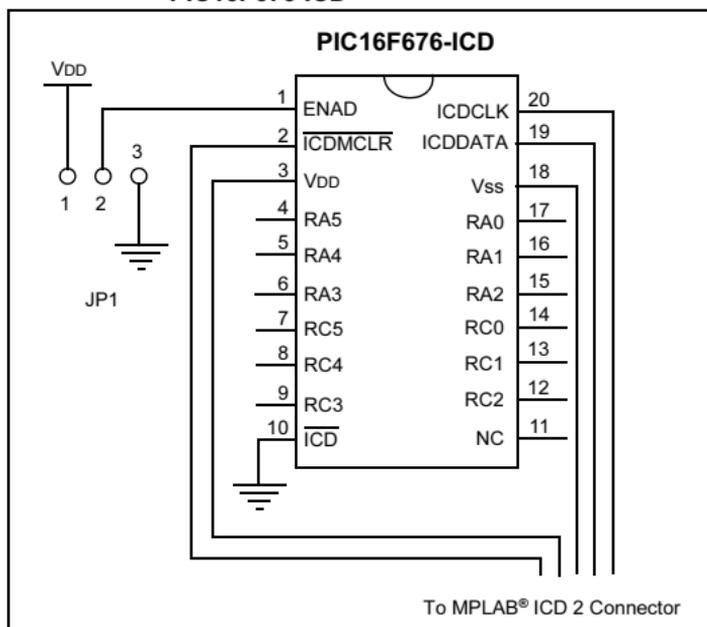
FIGURE 4: **MPLAB ICD 2 HEADER SCHEMATIC -**
PIC16F648A-ICD

PIC16F648A-ICD

Pin	Signal		Signal	Pin
1	RA2		RA1	28
2	RA3		RA0	27
3	RA4		RA7	26
4	RA5		RA6	25
5	Vss		VDD	24
6	RB0		RB7	23
7	RB1		RB6	22
8	RB2		RB5	21
9	RB3		RB4	20
10	NC		NC	19
11	NC		NC	18
12	NC		NC	17
13	ICDMCLR		ICDCLK	16
14	ICD		ICDDATA	15

To MPLAB® ICD 2 Connector
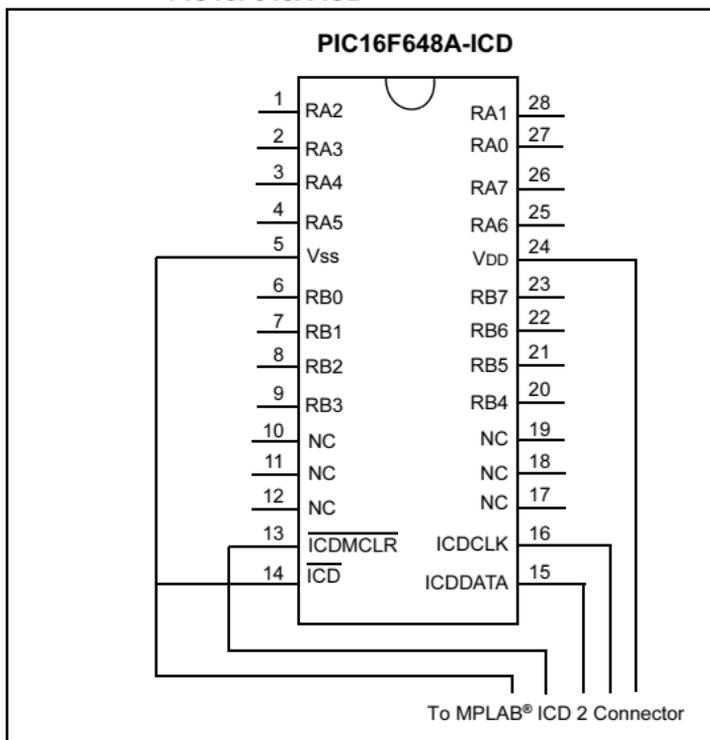
NOTES:

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, dsPIC, KEELOQ, MPLAB, PIC, PICmicro, PICSTART and PRO MATE and PowerSmart are registered trademarks of Microchip Technology Incorporated in the U.S.A. and other countries.

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

Accuron, Application Maestro, dsPICDEM, dsPICDEM.net, ECONOMONITOR, FanSense, FlexROM, fuzzyLAB, In-Circuit Serial Programming, ICSP, ICEPIC, microPort, Migratable Memory, MPASM, MPLIB, MPLINK, MPSIM, PICC, PICkit, PICDEM, PICDEM.net, PowerCal, PowerInfo, PowerTool, rfLAB, rfPIC, Select Mode, SmartSensor, SmartShunt, 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.

© 2003, Microchip Technology Incorporated. Printed in the U.S.A., All Rights Reserved.

Printed on recycled paper.

Worldwide Sales and Service

AMERICAS

Technical Support
Tel: 480-792-7627

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: 949-263-1888

Phoenix
Tel: 480-792-7966

San Jose
Tel: 408-436-7950

Toronto
Tel: 905-673-0699

ASIA/PACIFIC

Australia
Tel: 61-2-9868-6733

China-Beijing
Tel: 86-10-85282100

China-Chengdu
Tel: 86-28-86766200

China-Fuzhou
Tel: 86-591-7503506

China-Hong Kong SAR
Tel: 852-2401-1200

China-Qingdao
Tel: 86-532-5027355

China-Shanghai
Tel: 86-21-6275-5700

China-Shenzhen
Tel: 86-755-82901380

China-Shunde
Tel: 86-765-8395507

India
Tel: 91-80-2290061

Japan
Tel: 81-45-471- 6166

Korea
Tel: 82-2-554-7200

Singapore
Tel: 65-6334-8870

Taiwan
Tel: 886-2-2717-7175

Taiwan-Kaohsiung
Tel: 886-7-536-4818

EUROPE

Austria
Tel: 43-7242-2244-399

Denmark
Tel: 45-4420-9895

France
Tel: 33-1-69-53-63-20

Germany
Tel: 49-89-627-144-0

Italy
Tel: 39-0331-742611

Netherlands
Tel: 31-416-690399

United Kingdom
Tel: 44-118-921-5869

8/4/03