
Information Sheet

INTRODUCTION

This document contains information about MPLAB® ICD 2 headers, which provide a development environment for specific Microchip devices. The following headers are available.

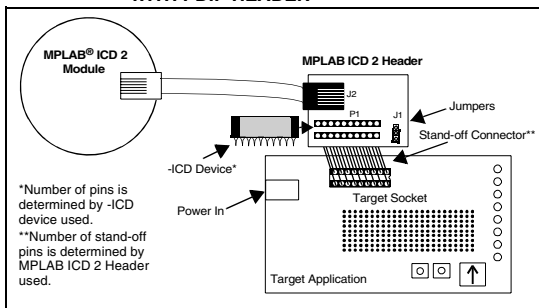
Header	Part Number	Devices Supported
8 Pin	AC162050	PIC12F629/675 ⁽¹⁾
	AC162058	PIC12F683
14 Pin	AC162052	PIC16F630/676 ⁽¹⁾
	AC162057	PIC12F635, PIC16F636
	AC162055	PIC16F684
	AC162056	PIC16F688
	AC162059	PIC10F200/2/4/6 PIC12F508/509 PIC16F505
18 Pin	AC162053	PIC16F627A/628A/648A ⁽¹⁾
	AC162054	PIC16F716
20 Pin	AC162060	PIC16F785
	AC162061	PIC16F685/687/689/690
64/80 Pin	AC162062	PIC18F67J10/87J10
1. These 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.		

MPLAB® ICD 2 Header

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 is used to connect to the target board.

FIGURE 1: MPLAB® ICD 2 MODULE CONNECTION WITH PDIP HEADER



INSTALLATION

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

1. Set up the header board.
2. Connect the header and MPLAB ICD 2.
3. Connect the header and the target board.

Set Up the Header Board

To set up a header board:

1. If the -ICD device is not soldered onto the header, plug the -ICD device into the socket on the top of the header.
2. Set any jumpers or switches to determine device functionality/selection as specified in the following sections.

8/14-Pin Headers

For some headers, device peripherals need to be selected by setting the jumper at the J1 location to the appropriate position. This will have the effect of selecting the device.

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
PIC12F635	2-3	PORTC, Comparator 2 Disabled

18-Pin Headers

For these headers, there are no jumpers/switches. 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.

MPLAB® ICD 2 Header

20-Pin Headers

For the PIC16F785 20-pin header, you will need to connect the jumper at the J2 location to enable the shunt register. See the device data sheet for more on this function.

For the PIC16F690 20-pin header, you will need to set the S1 switches to enable peripherals and choose devices.

Device	Switches				
	ADC	4kPFM	ECCP	SSP	USART
PIC16F685	DC	On	On	Off	Off
PIC16F687	DC	Off	Off	On	On
PIC16F689	DC	On	Off	On	On
PIC16F690	DC	On	On	On	On
DC = Don't Care. This function does not select the device, but needs to be "on" if you will be using the peripheral.					

64/80-Pin Headers

For these headers, there are no jumpers/switches. MPLAB IDE will select the correct device to emulate.

Connect the Header and MPLAB ICD 2

Connect the 9-inch modular interface cable between the MPLAB ICD 2 Module and the MPLAB ICD 2 Header.

Connect the Header and the Target Board

The header may be connected to the target board as follows:

- PDIP header socket to PDIP target socket with a stand-off (male-to-male connector)
- Header socket to plug on the target board
- Header socket to target socket with a transition socket (See MPLAB® ICE 2000/4000 Transition Socket Specification, DS51194)

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 ICD pin to enable the background debug mode. (See "Schematics" on page 6.)

ICD Device	Header	Emulated Devices
PIC12F675-ICD	8 Pin	PIC12F629/675
PIC12F683-ICD	8 Pin	PIC12F683
PIC16F505-ICD	14 Pin	PIC10F200/2/4/6 PIC12F508/509 PIC16F505
PIC16F636-ICD	14 Pin	PIC12F635, PIC16F636
PIC16F648A-ICD	18 Pin	PIC16F627A/628A/648A
PIC16F676-ICD	14 Pin	PIC16F630/676
PIC16F684-ICD	14 Pin	PIC16F684
PIC16F688-ICD	14 Pin	PIC16F688
PIC16F690-ICD	20 Pin	PIC16F685/687/689/690
PIC16F716-ICD	18 Pin	PIC16F716
PIC16F785-ICD	20 Pin	PIC16F785
PIC18F87J10-ICD	64/80 Pin	PIC18F67J10/87J10

PROGRAMMING NON-ICD DEVICES

The MPLAB ICD 2 header can only program the -ICD device, not the regular device. To program non-ICD 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. For the most up-to-date device programming specifications, see the Microchip web-site (www.microchip.com).

CALIBRATION BITS

The calibration bits for the band gap 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: 8-PIN HEADER

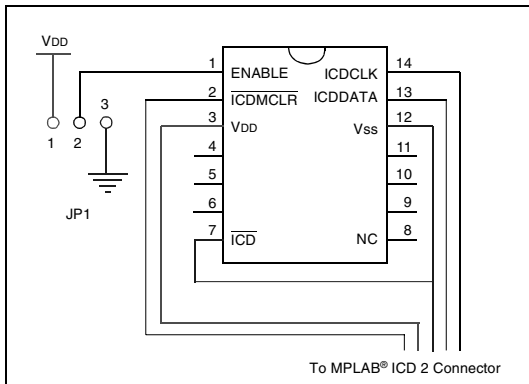
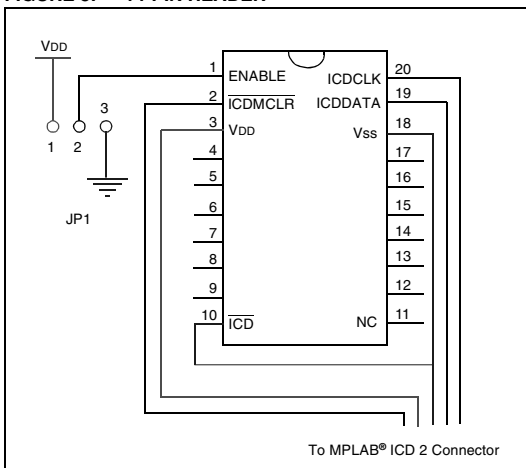


FIGURE 3: 14-PIN HEADER



MPLAB® ICD 2 Header

FIGURE 4: 18-PIN HEADER

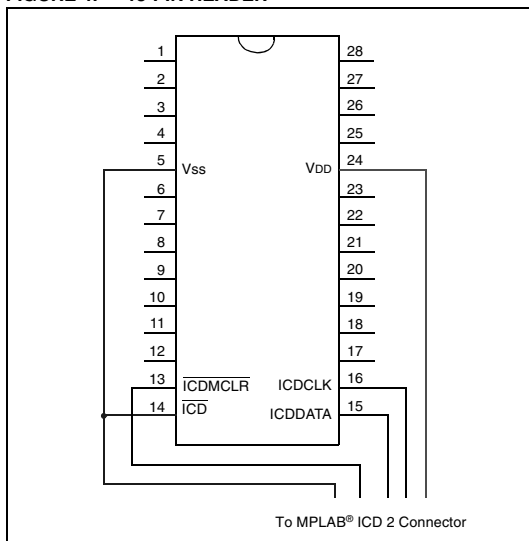


FIGURE 5: 20-PIN HEADER - PIC16F785

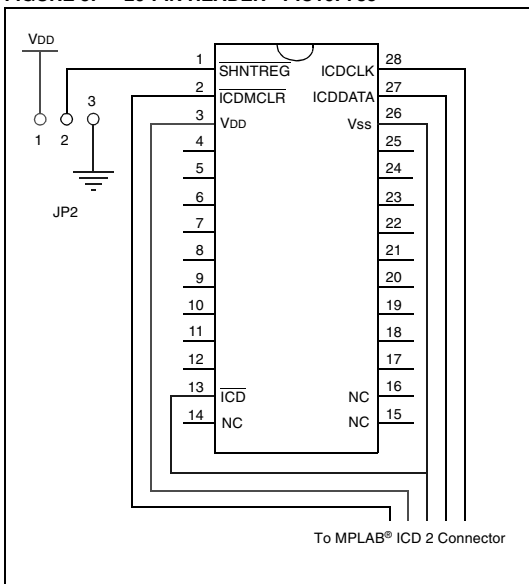


FIGURE 6: 20-PIN HEADER - PIC16F690

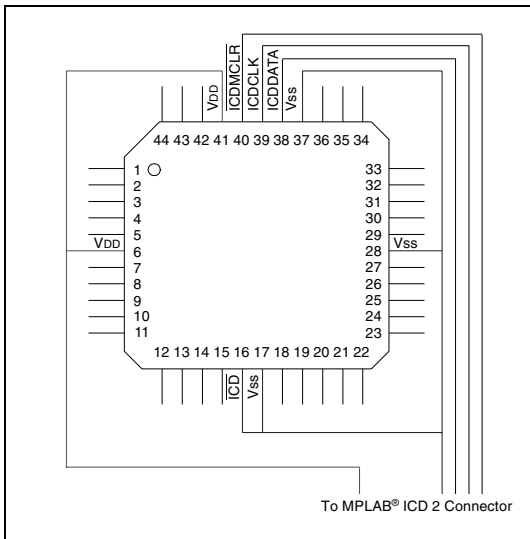
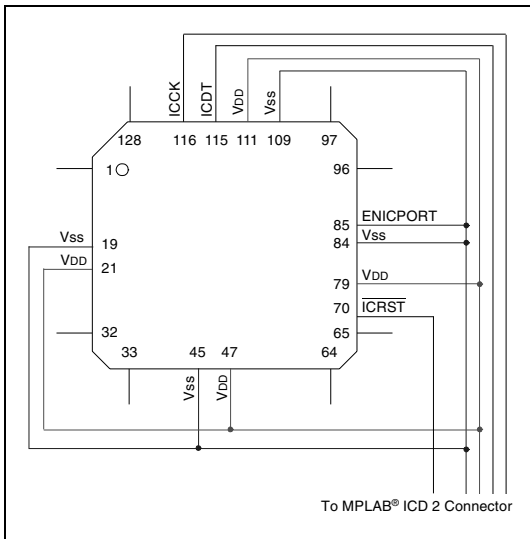


FIGURE 7: 64/80-PIN HEADER



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