MICROCHIP MPLAB ICD 5 In Circuit Debugger User Guide

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Contents

Install the Latest Software

Download the MPLAB® X Integrated Development Environment (IDE) software V6.10 or higher from **www.microchip.com/mplabx** and install onto your computer. The installer automatically loads the USB drivers. Launch MPLAB X IDE.

Connect to Target Device

1. Connect the MPLAB ICD 5 to the computer using a USB cable.
2. If you will be using Ethernet communication a Power Over Ethernet injector is mandatory. Connect external power* to the target board if not using debugger power.
   IMPORTANT NOTE: A USB connection is required at first to setup Ethernet communication.

Computer Connections

Target Connections

Target Connector

RJ-45/RJ-11
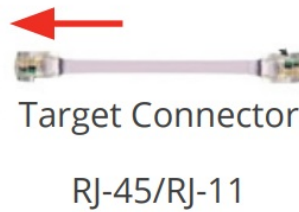
*External target board power supply provided by user.
Additional resources found in section 10.6.1 of the user's guide

Set Up Ethernet

To configure MPLAB ICD 5 for Ethernet, go to Project Properties > Manage Network Tools in MPLAB X IDE.

Use the following steps to set up your selected computer connection.

Set Up Ethernet

Ethernet Setup and Tool Discovery in MPLAB X IDE	
1	Connect the device to your PC via the USB cable. If you will be using Ethernet communication, a PoE injector is mandatory. ➜ A USB connection is required at first to setup Ethernet communication.
2	Go to Tools> Manage Network Tools in MPLAB® X IDE.
3	Under "Network Capable Tools Plugged into USB," select your debugger.
4	Under "Configure Default Connection Type for Selected Tool" select the radio button for the connection you want. **Ethernet (Wired/Static IP):** Input Static IP Address, Subnet Mask and Gateway. Click Update Connection Type.
5	If Ethernet communication was chosen, ensure the PoE injector is connected and then unplug the USB cable from your debugger unit. ➜ Keep the Manage Network Tools window open.
6	The debugger will restart automatically and come up in the connection mode you selected. Then: The LEDs will display for either a successful network connection or a network connection failure/error.
7	Now go back to the "Manage Network Tools" dialog and click on the Scan button, which will list your debugger under "Active Discovered Network Tools." Select the checkbox for your tool and close the dialog.
8	If your debugger is not found under "Active Discovered Network Tools," you can manually enter information in the "User Specified Network Tools" section. You must know the IP address of the tool (by the way of network admin or static IP assignment).

Connect to a Target

See the table below for the pin-out of the 8-pin connector on your target. It is recommended that you connect your target to the MPLAB ICD 5 using the flat 8-pin cable. However, you may use one of the legacy adapters provided in the MPLAB ICD 5 kit between the cable and an existing target.

Additional Information

Pinouts for Debug Interfaces

MPLAB® ICD 5							DEBUG					Target4	
8-Pin Modular Connector 1	Pin #	Pin Name	ICSP (MCHP)	MIPS EJTAG	Cortex® SWD	AVR® JTAG	AVR debugWIRE	AVR UPDI	AVR PDI	AVR ISP	AVR TPI	8-Pin Modular Connector	6-Pin Modular Connector
	8	TTDI		TDI		TDI				MOSI		1	
	7	TVPP	MCLR/Vpp	MCLR	RESET			RESET 3				2	1
	6	TVDD	VDD	VDD or VDDIO	VDD	VTG	VTG	VTG	VTG	VTG	VTG	3	2
	5	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	4	3
	4	PGD	DAT	TDO	SWO2	TDO		DAT 3	DAT	MISO	DAT	5	4
	3	PGC	CLK	TCK	SWCLK	TCK				SCK	CLK	6	5
	2	TAUX				RESET	RESET/dW		CLK	RESET	RESET	7	6
	1	TTMS		TMS	SWDIO 2	TMS						8	

1. Black (8-pin) cable must be used for EJTAG, JAG, SWD, and ISP.
2. SWO is used for trace. SWDIO is for debug.
3. Pin may be used for High-Voltage Pulse reactivation of UPDI function depending on device. See device data sheet for details.
4. These are example target connectors that are assumed similar to the debug unit (modular).

Pinouts for Data Stream Interfaces

MPLAB® ICD 5	DATA STREAM		Target2	
8-Pin Modular Connector	PIC® and AVR® Devices	SAM Devices1	8-Pin Modular Connector	6-Pin Modular Connector
Pin #	DGI UART/CDC	DGI UART/CDC	Pin #	Pin #
8	TX (target)	TX (target)	1	
7			2	1
6	VTG	VTG	3	2
5	GND	GND	4	3
4			5	4
3			6	5
2		RX (target)	7	6
1	RX (target)		8	

1. RX and TX pins moved because of wiring for other devices.
2. These are example target connectors that are assumed similar to the debug unit (SIL).

Create, Build and Run Project

 Execute your code in Debug mode

 Execute your code in Non-Debug (release) mode

 Hold a device in Reset after programming

Recommended Settings

Component	Setting
Oscillator	OSC bits set properly running
Power	External supply connected
WDT	Disabled (device dependent)
Code-Protect	Disabled
Table Read	Protect Disabled
LVP	Disabled
BOD	Vdd > BOD VDD min.
AVdd and AVss	Must be connected, if applicable
PGCx/PGDx	Proper channel selected, if applicable
Programming	VDD voltage levels meet programming spec

Note: See MPLAB IDE 5 In-Circuit Debugger online help for more information.

Reserved Resources

For information on reserved resources used by the debugger, see the MPLAB X IDE Help>Release Notes>Reserved Resources.

Documents / Resources

MICROCHIP MPLAB ICD 5 In Circuit Debugger [pdf] User Guide
MPLAB ICD 5 In Circuit Debugger, MPLAB ICD, 5 In Circuit Debugger, Circuit Debugger, Debugger

References

- **Empowering Innovation | Microchip Technology**
- **MPLAB® X IDE | Microchip Technology**
- **User Manual**