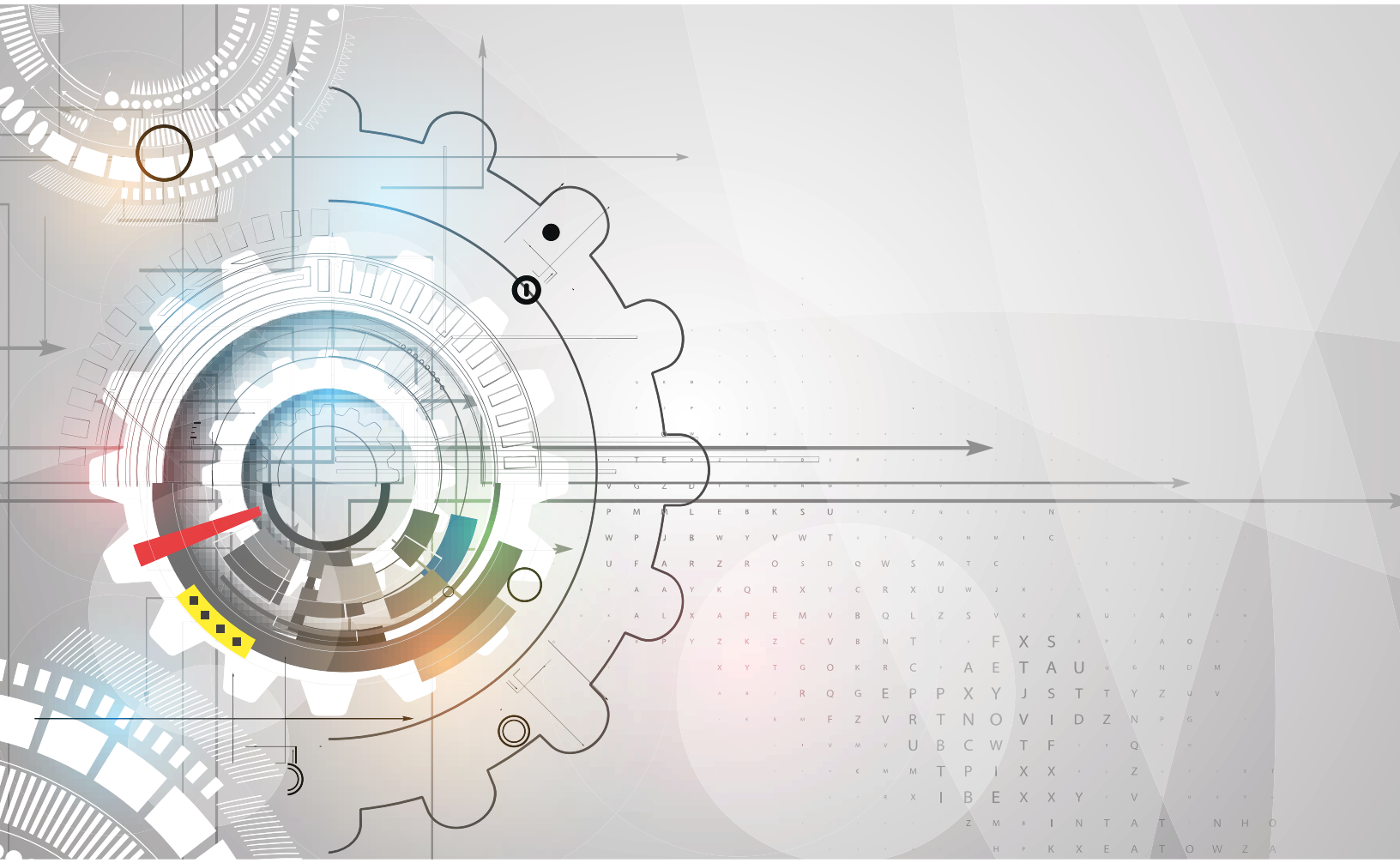
Quick Guide to Microchip Development Tools



MICROCHIP

microchip.com

Introduction

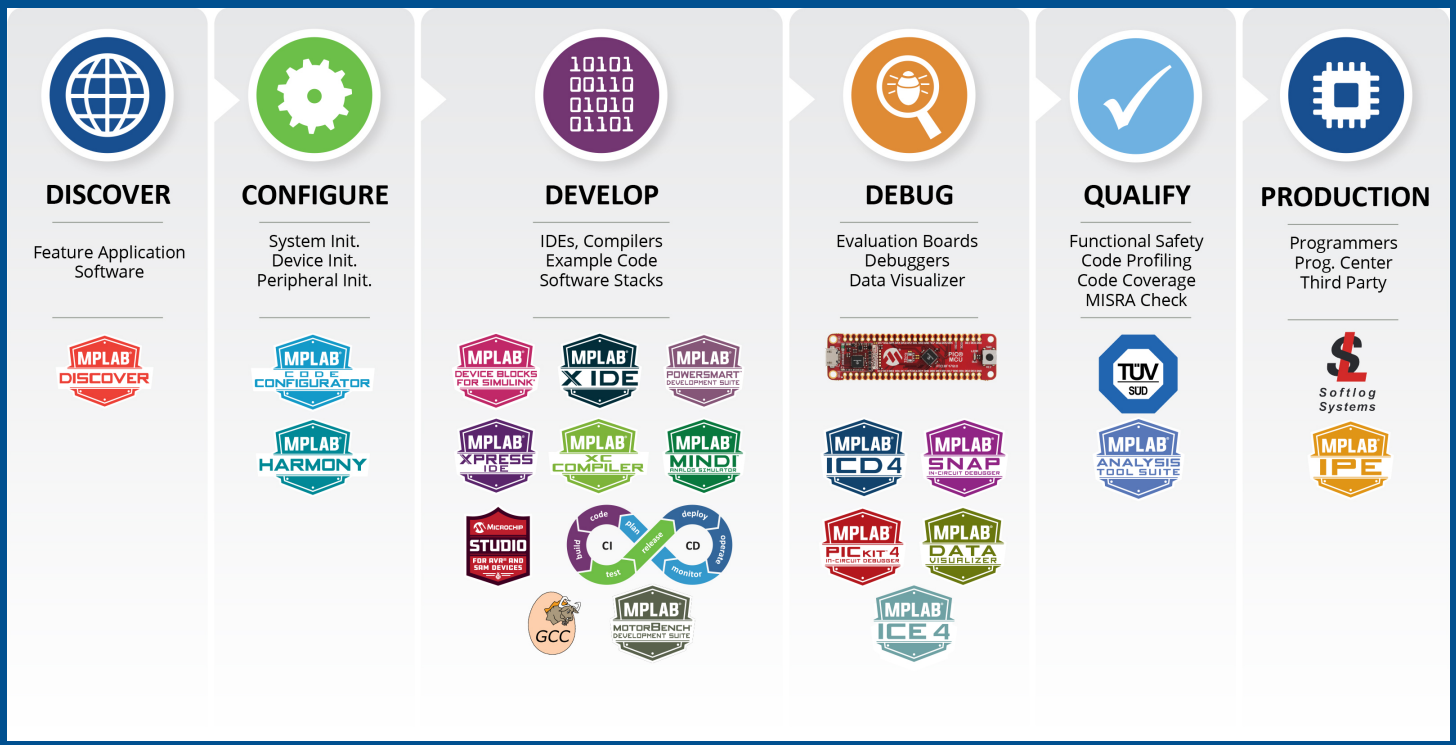
Easy-to-Use Portfolio of Hardware and Software Development Tools

We offer the most comprehensive tool chains for use with the industry's most popular products. In addition to our classic development tools for PIC® microcontrollers (MCUs) and dsPIC® Digital Signal Controllers (DSCs), we also offer development tools for AVR® and SAM MCUs and SAM microprocessors (MPUs). Although we produce approximately 2,000 development tools, only a selection are featured in this document. Visit our Products and Solutions areas on www.microchip.com to learn about tools that are specific to your design requirements.

Development Tool Selector

Our Development Tool Selector (DTS) is an online/offline application that allows you to discover development tools through a Graphical User Interface (GUI). Use its filter and search capabilities to easily find development tools associated with Microchip products. Just enter a development tool or Microchip device in the search box, and DTS quickly displays all related tools and devices. This tool is updated after every MPLAB® X Integrated Development Environment (IDE) release to provide you with the latest information.

Development Tool Ecosystem



MPLAB Discover

MPLAB Discover is a catalog of fully configured and complete source code, projects, examples and software applications to help jump-start your next project. Your selected code examples instantly populate in MPLAB Xpress Integrated Development Environment (IDE) for additional development. We included intuitive and powerful search capabilities in MPLAB Discover so you can search for content quickly and easily.

Atmel START

Atmel START is an innovative online tool for intuitive, graphical configuration of embedded AVR and SAM MCU software projects. It lets you select and configure software components, drivers and middleware, as well as complete example projects that are tailored to the needs of your application. The configuration stage lets you review dependencies between software components, conflicts and hardware constraints. To help resolve a conflict, Atmel START will automatically suggest solutions that fit your specific setup.

Use the graphical pin-mux and clock configuration to match your software and drivers with your own hardware layout. The tool also provides automated assistance for retargeting projects and applications for different devices. Getting your sample code to run on your board has never been easier.

Since Atmel START is an online tool, no installation is required. When you are finished with your configuration, you can download it for use with your preferred IDE, including MPLAB X IDE, Microchip Studio, Keil® or IAR, and continue your development. If you need to change the configuration later, you can load it in Atmel START, reconfigure it and continue where you left off.



START

Configure



MPLAB Code Configurator

MPLAB Code Configurator (MCC) is a free, graphical programming environment that generates seamless, easy-to-understand C code to be inserted into your project. Using an intuitive interface, it enables and configures a rich set of peripherals and functions specific to your application. MCC supports all of Microchip's 8-bit, 16-bit, and 32-bit MIPS, Arm® Cortex® based MCU and MPU device families. MCC is incorporated into both the downloadable MPLAB X IDE and the cloud-based MPLAB Xpress IDE.

- Free graphical programming environment
- Intuitive interface for quick-start development
- Automated configuration of peripherals and functions
- Minimizes reliance upon product data sheet
- Reduces overall design effort and time
- Accelerates generation of production ready code

MPLAB Harmony Graphics Composer

MPLAB Harmony Graphics Composer (MHGC) is our industry-leading system of tools and software for creating professional-looking embedded Graphical User Interfaces (GUIs) with 32-bit MCUs. The tight integration between MHGC, MHC and MPLAB X IDE allows you to focus on creating and debugging your application-specific code.



MPLAB Mindi™ Analog Simulator

MPLAB Mindi Analog Simulator reduces circuit design time and design risk by simulating analog circuits prior to hardware prototyping. The simulation tool uses a SIMetrix/SIMPLIS simulation environment, with options to use SPICE or piecewise linear modeling, that can cover a very wide set of possible simulation needs. This capable simulation interface is paired with proprietary model files from Microchip to model specific Microchip analog components in addition to generic circuit devices. This simulation tool installs and runs locally on your own PC. Once downloaded, an Internet connection is not required, and the simulation run time is not dependent on a remotely located server. The result is fast, accurate analog circuit simulations. Benefits include:

- Choose from SPICE or piecewise linear SIMPLIS models for accurate results in fast simulations
- Model a wide variety of analog systems using standard or Microchip proprietary component models
- Generate time or frequency domain responses for open- and closed-loop systems
- Perform AC, DC and transient analysis
- Use sweep modes to identify circuit sensitivities to device behaviors, load variations or tolerances
- Validate system response, control and stability
- Identify problems before building hardware

Develop

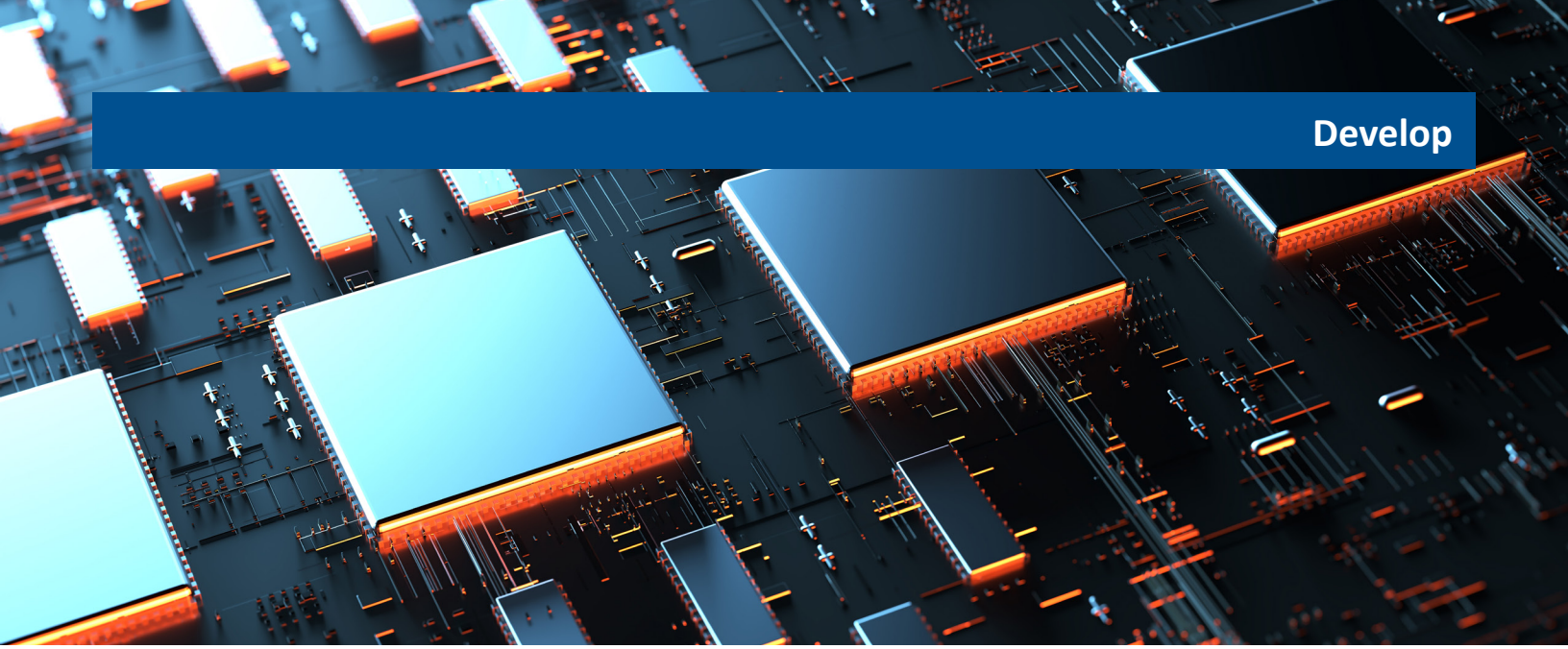
MPLAB X IDE

MPLAB X IDE is an expandable, highly configurable software program that incorporates powerful tools to help you discover, configure, develop, debug and qualify embedded designs for most of our microcontrollers and digital signal controllers. MPLAB X IDE works seamlessly with the MPLAB development ecosystem of software and tools, many of which are completely free. Based on the NetBeans IDE from Oracle, MPLAB X IDE runs on Windows®, Linux® and OS X® operating systems. Its unified GUI helps to integrate software and hardware development tools from Microchip and third-party sources to give you high-performance application development and extensive debugging capabilities. MPLAB X IDE can also seamlessly import your Arduino® sketches, providing a simple transition path from makerspace to marketplace.

The flexible and customizable interface allows you to connect multiple debug tools to your computer at the same time. You can select any tool you desire for a specific project or configuration within a project. With complete project management, visual call graphs, a configurable watch window and a feature-rich editor that includes code-completion and hyperlink navigation, MPLAB X IDE is fully equipped to meet the needs of experienced users while remaining flexible and user-friendly for even those who are new to the IDE.

MPLAB X IDE brings a host of features to help you quickly debug your projects and minimize your development time. Some newer features include:

- MPLAB Data Visualizer: No need to purchase extra visualizations tools since real-time streaming data can be viewed in Data Visualizer
- I/O View: Pin states can be verified and manipulated with I/O View for fast hardware verification
- Helpful Design Resources: Save time with useful links to software libraries, data sheets and user guides that are provided automatically
- Easy to Use: Register and bit definitions are now just a click away



Develop

MPLAB XC Compilers

Our line of award-winning MPLAB XC compilers provides a comprehensive solution for your project's software development and is offered in free, unrestricted-use downloads. Finding the right compiler to support your device is simple:

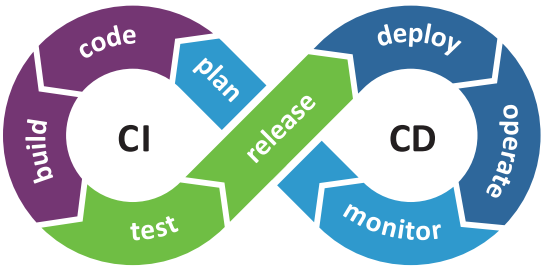
- MPLAB XC8 supports all 8-bit PIC and AVR MCUs
- MPLAB XC16 supports all 16-bit PIC MCUs and dsPIC DSCs
- MPLAB XC32/32++ supports all 32-bit PIC MCUs and SAM MCUs and MPUs
- Compiler Advisor is a free tool inside version 6.0 of MPLAB X IDE that will help you to determine which optimizations will best suit your specific project.

Features

When combined with MPLAB X IDE, the full graphical front end provides:

- Editing errors and breakpoints that match corresponding lines in the source code
- Single stepping through C and C++ source code to inspect variables and structures at critical points
- Data structures with defined data types, including floating point, display in watch windows

MPLAB X IDE CI/CD Wizard



You can use a Continuous Integration and Continuous Deployment (CI/CD) system to receive feedback quickly during your software development. Quick feedback can help improve the quality and reliability of your code by automating much of the building and testing process.

Our MPLAB X IDE CI/CD wizard gets you started by setting up a CI/CD system using an MPLAB X IDE project. The CI/CD system works to give you immediate feedback by testing early and often, which can alleviate potential issues before merging code into the main line.

Our CI/CD wizard uses two programs to set up the CI/CD system: Jenkins and Docker. Jenkins is a commonly used CI system that creates an automation workflow or pipeline in your infrastructure. Docker helps to containerize your system and provides a lightweight, scalable and maintainable build-and-test environment.

Develop



MPLAB Xpress Cloud-Based IDE

MPLAB Xpress cloud-based IDE is an online development environment that contains the most popular features of MPLAB X IDE. This simplified and distilled application is a faithful reproduction of our desktop-based program, which allows you to easily transition between the two environments.

MPLAB Xpress IDE is a perfect starting point for new users of PIC and AVR MCUs. It requires no downloads, no machine configuration and no waiting to get started on your system development.

It incorporates the latest version of MPLAB Code Configurator, which enables you to automatically generate initialization and application C code for 8- and 16-bit PIC MCUs, AVR MCUs and dsPIC DSCs using a graphical interface and pin map.

It offers massive amounts of storage so, you can store your current projects in the Cloud. The Community feature allows you to share your ideas with others and get inspiration for projects by exploring the shared code repository.

Best of all, MPLAB Xpress IDE is free and can be accessed from any Internet-connected PC or Mac® computer, anywhere in the world.

Compatible Hardware

- MPLAB Xpress evaluation boards
- Curiosity development boards
- Explorer 16/32 Development Board
- MPLAB PICkit™ 4 and MPLAB Snap Programmer/Debugger

Microchip Studio for AVR and SAM Devices

Microchip Studio is an IDE for developing and debugging AVR and SAM microcontroller applications. It merges all of the great features and functionality of Atmel Studio into Microchip's well-supported portfolio of development tools to give you a seamless and easy-to-use environment for writing, building and debugging your applications written in C/C++ or assembly code. Microchip Studio can also import your Arduino sketches as C++ projects to provide you with a simple transition path from makerspace to marketplace.

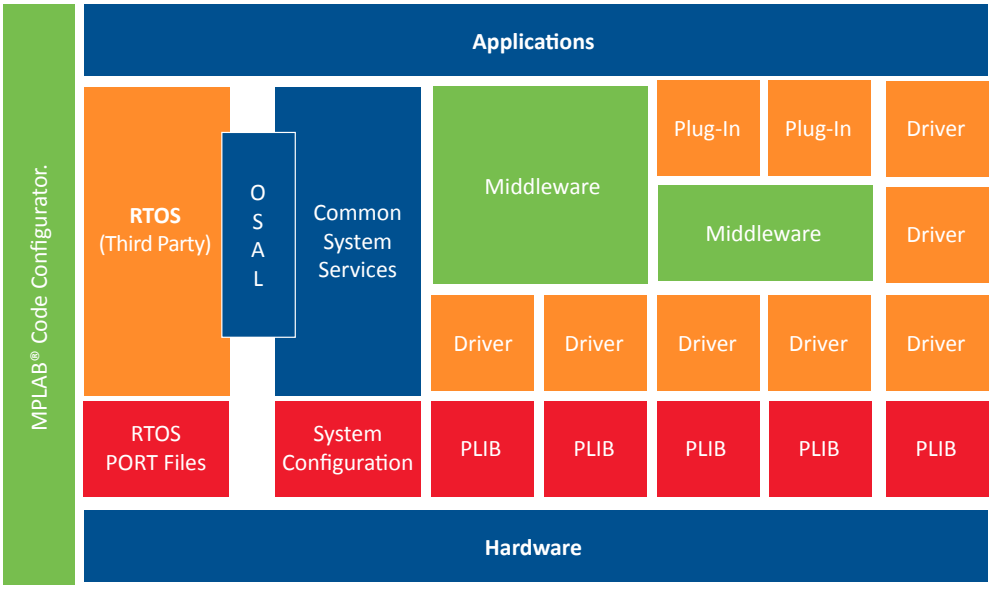
MPLAB Data Visualizer

Troubleshooting your code's run-time behavior has never been easier. MPLAB Data Visualizer is a free debugging tool that graphically displays run-time variables in an embedded application. Available as a plug-in for MPLAB X IDE or a stand-alone debugging tool, it can receive data from various sources such as the Embedded Debugger Data Gateway Interface (DGI) and COM ports. You can also track your application's run-time behavior using a terminal or graph. To get started with visualizing data, check out the Curiosity Nano Development Platform and Xplained Pro Evaluation Kits.

MPLAB Harmony Software Framework for PIC32 and SAM MCUs

MPLAB Harmony is a flexible, abstracted, fully integrated firmware development environment for PIC32 and SAM MCUs and MPUs. It enables robust framework development of interoperable RTOS-friendly libraries with quick and extensive Microchip support for third-party software integration. MPLAB Harmony includes a set of peripheral libraries, drivers and system services that are readily accessible for application development. Get the latest updates at microchip.com/harmony.

Architectural Block Diagram for MPLAB Harmony v3 - Comprehensive Embedded Software Development Framework





In-Circuit Emulators and Debuggers

We offer a range of programmers, emulators, debugger/programmers and extensions to support all device architectures, and more are on the way. All solutions are USB powered and fully integrated into their respective IDE. The MPLAB In-Circuit Debugger (ICD) 4 offers debugging and hardware features sufficient for most users. The MPLAB Snap In-Circuit Debugger/Programmer, MPLAB PICkit™ 4 In-Circuit Debugger/Programmer, Atmel ICE, J-32 Debug Probe and Power Debugger are economical choices for basic debugging functions. MPLAB ICD 4 and MPLAB PICkit 4 programmers/debuggers can be used as programmers in a production environment.

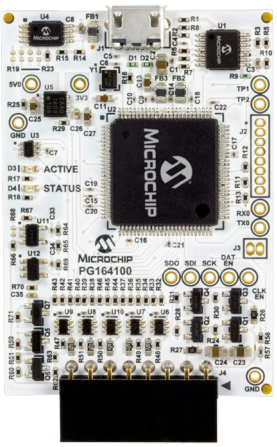
MPLAB ICD 4 In-Circuit Debugger (DV164045)

The MPLAB ICD 4 In-Circuit Debugger/Programmer is our fastest cost-effective debugging and programming tool for PIC and SAM MCUs and dsPIC DSCs. Its speed is provided by a 300 MHz, 32-bit MCU with 2 MB of RAM and a high-speed FPGA to yield faster communications, downloads and debugging. It debugs and programs with the powerful, yet easy-to-use, graphical user interface of MPLAB X IDE. It connects to your PC using a high-speed USB 2.0 interface and to the target with a debugging connector which is also compatible with the MPLAB ICD 3 In-Circuit Debugger/Programmer or MPLAB REAL ICE™ In-Circuit Emulator.



MPLAB PICkit 4 In-Circuit Debugger (PG164140)

With support for PIC, AVR and SAM MCUs and dsPIC DSCs this programmer/debugger features the same 300 MHz, 32-bit MCU as the MPLAB ICD 4 In-Circuit Debugger and matches the silicon clocking speed to program as fast as the device will allow. Its wide target voltage supports a variety of devices along with several debug protocols. It includes a high-speed USB 2.0 interface and a micro SD card slot to support Programmer-To-Go functionality.



MPLAB Snap In-Circuit Debugger (PG164100)

The MPLAB Snap In-Circuit Debugger/Programmer allows affordable, fast and easy debugging and programming of PIC, AVR and SAM MCUs and dsPIC DSCs using the powerful graphical user interface of MPLAB X IDE version 5.05 or later. It also features a 300 MHz, 32-bit MCU and a high-speed USB 2.0 interface.

MPLAB ICE 4 In-Circuit Emulator, Programmer and Debugger

The MPLAB ICE 4 In-Circuit Emulator system boosts productivity with feature-rich programming and debugging for PIC, AVR and SAM devices and dsPIC Digital Signal Controllers (DSCs). It offers a flexible development environment combined with the capabilities to develop power-efficient code while reducing debug time. It debugs and programs with a powerful and easy-to-use graphical user interface that uses the latest version of MPLAB X Integrated Development Environment (IDE), version 6.00.



Debug



J-32 Debug Probe

The J-32 Debug Probe is a JTAG emulator that supports all of Microchip's 32-bit MCU and MPU offerings, including Thumb mode. It supports download speeds up to 480 Mbps and maximum JTAG speeds up to 15 MHz. It also supports Serial Wire Debug (SWD), our In-Circuit Serial Programming™ (ICSP™) capability and ETB Trace.

In-Circuit Emulators and Debuggers

Feature	MPLAB® ICE4 In-circuit Emulator/ Programmer/ Debugger	MPLAB ICD 4 In-Circuit Debugger	MPLAB PICkit™ 4 In-Circuit Debugger	MPLAB Snap In-Circuit Debugger/ Programmer	Atmel-ICE	J-32 Debug Probe	Power Debugger
Products Supported	**PIC®, AVR® and SAM MCUs dsPIC® DSCs, SAM MPUs**	**PIC and SAM MCUs dsPIC DSCs***	**PIC, AVR and SAM MCUs dsPIC DSCs**	**PIC, AVR and SAM MCUs dsPIC DSCs***	**AVR and SAM MCUs**	**32-bit PIC and SAM MCUs SAM MPUs**	**AVR and SAM MCUs**
IDE Supported	MPLAB X IDE	MPLAB X IDE	MPLAB X IDE	MPLAB X IDE	Microchip Studio	MPLAB X IDE	Microchip Studio
USB 3.0 Speed	Super Speed	–	–	–	–	–	–
USB 2.0 Speed	High	High	High	High	High	High	High
USB Driver	Microchip	Microchip	Microchip	Microchip	HID + Microchip		
Segger	HID + Microchip						
USB Powered	No, Self -Powered	Yes	Yes	Yes	Yes	Yes	Yes
Wireless Connection	Wi-Fi®, Ethernet	No	No	No	No	No	No
Programmable V_{PP}	Yes	Yes	Yes	No	No	No	No
Power to Target	Yes, 1A	Yes, 1A	Yes, 50 mA	No	No	No	No
Programmable V_{DD}	Yes	Yes	Yes	No	No	Yes	No
V_{DD} Drain from Target	1 mA	< 1 mA	< 2 mA	< 1 mA	< 1mA	< 25 mA	< 1 mA
Overvoltage/ Current Protection	Yes, Hardware	Yes, Hardware	Yes, Software	Overvoltage Only	Yes, Hardware	Yes	Yes, Hardware
Breakpoints	Complex	Complex	Simple	Simple	Target Dependent	Yes	Target Dependent
Software Breakpoints	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Memory for Target Image Storage	No	No	Micro SD Card	No	No	No	No
Serialized USB	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Trace, Native	SWO	No	No	No	Coresight, SWO	Coresight, SWO	Coresight, SWO
Trace, Other (SPI, PORT, Inst)	SPI, Port, Native, PIC32 iFlowtrace™ 1.0/iFlowtrace 2.0	No	No	No	SPI, UART	No	SPI, UART, I²C, USART
Data Capture	Yes	No	No	No	No	Target Dependent	No
Logic/Probe Triggers	No	No	No	No	No	No	4 Channels
High-Speed Performance Pak (LVDS)	No	No	No	No	No	No	No
Production Programmer	Yes	Yes	Yes	No	No	Yes	No
Power Measurement/ Profiling	2 Channels	No	No	No	No	No	2 Channels
Power Debugging	Yes	No	No	No	No	No	Yes
CI/CD	Yes	No	No	No	No	No	No
Part Number	DV244140	DV164045	PG164140	PG164100	ATATMEL-ICE	DV164232	ATPOWERDEBUGGER
MSRP	$1799.00	$259.95	$57.95	$24.95	$140.00	$200.00	$200.00

*Full device support in progress. Please review documentation for complete list of supported devices.



MPLAB XC Licenses for Functional Safety

We offer TÜV SÜD certified functional safety compiler packages that support all our PIC, dsPIC, AVR and SAM devices to make your tool qualification effort easier. The packages include all the documentation, reports and certificates for a fully qualified development environment for the following functional safety standards:

- ISO 26262
- IEC 61508
- IEC 62304
- IEC 60730

MPLAB XC Compiler Licenses

Do you need to optimize your code size reduction or get better speed from your project's software? PRO licenses are available to unlock the full potential of the MPLAB XC compiler's advanced-level optimizations, maximum code size reductions and best performance. The MPLAB XC Compiler contains a free, 60-day trial of a PRO license for evaluation when activated.

MPLAB XC Compiler licenses come in a wide variety of licensing options, and most come with one year of High Priority Access (HPA). HPA must be renewed at the end of twelve months. HPA includes:

- Unlimited advanced optimizations on new compiler versions
- New architecture support
- Bug fixes
- Priority technical support
- Free shipping on all development tool orders from www.microchip.com/purchase

License Type	Installs On	# of Activations	# of Users	Wait Time Between Users	HPA Included
Workstation License	Workstation	3	1	None	Yes
Subscription License	Workstation	1	1	None	No
Site License	Network	1	Varies by Seat	None	Yes
Network Server License	Network	1	Unlimited	One Hour	Yes
Virtual Machine* License	Network	1	N/A	N/A	No
Dongle License	Dongle	N/A	Unlimited	None	No

*This license must be used in addition to a network server or site license to enable the license to work in a virtual machine environment.

MPLAB Analysis Tool Suite

MPLAB Analysis Tool Suite is a collection of analysis tools integrated into the MPLAB X Integrated Development Environment (IDE). It supports all Microchip MCU, MPU and CEC devices and offers a code coverage feature and a Motor Industry Software Reliability Association (MISRA®) check in the IDE. The code coverage feature provides visibility to the parts of your code that have been executed while the MISRA check in the IDE provides static code checking to ensure safe, secure, portable and reliable C code.

Microchip Library for Applications

The Microchip Libraries for Applications (MLA) enhances interoperability for applications that require more than one library for 8- and 16-bit PIC MCUs. Available software libraries include USB, graphics, file I/O, crypto, Smart Card, MiWi™ protocol, TCP/IP, Wi-Fi® and smartphone. The package includes source code, drivers, demos, documentation and utilities. All projects are prebuilt for MPLAB X IDE and MPLAB XC compilers.





MPLAB Cloud Tools Ecosystem

Discover, Configure and Develop: An Ecosystem for All Your Ideas

The MPLAB cloud tools ecosystem is a complete online solution for users of all skill levels to discover, configure, develop and debug embedded PIC and AVR MCU applications.

Key Features

- Intuitive entry into PIC and AVR development using our MPLAB development ecosystem
- Quick prototyping with our Curiosity development boards
- No software installation required

It's Easy to Get Started

- Search and Discovery: Access MPLAB Discover to find fully configured and complete source code projects
- Configure Code: Easily configure software applications with MPLAB Code Configurator
- Develop and Debug: Developing, debugging and deploying project applications directly from a preferred browser can be completed without any software installation

MPLAB® DISCOVER

MPLAB® XPRESS IDE

MPLAB® CODE CONFIGURATOR



ClockWorks® Configurator

ClockWorks Configurator is an online tool enabling you to create designs/configurations and request data sheets, part numbers and samples for those designs. The user interface is graphical and easy to use, and dynamic data sheets and block diagrams are generated instantly for all of your designs. At each phase email notifications are sent out to all involved parties to keep you up to date with the status of your request. ClockWorks Configurator has different views and level of accessibilities based on the user roles.

ClockWorks®
CONFIGURATOR

Additional Resources



Third-Party Tools

Over 300 third-party tool providers and premier partners offer a diverse range of development boards and software for almost every embedded application to complement the development tools we develop in house. Premier third-party partners with expertise in specific design areas are certified by our engineers to be the best in the industry and are recognized for providing superior support for their array of products.

Academic Program

Our Academic Program demonstrates our ongoing commitment to education by offering unique benefits and resources for educators, researchers and students worldwide. We are a resource for academia to help integrate our products and technologies into the classroom. Benefits include:

- Free access to labs, curriculum and course materials
- Silicon donations to help seed labs
- One-on-one consultations
- Tool samples for professors to evaluate
- 25% academic discount on many Microchip and third-party tools
- Free training on Microchip products and technologies
- Discounts when attending Microchip University

Integrated Programming Environment

Bundled in the MPLAB X IDE installation package, MPLAB Integrated Programming Environment (IPE) is a software application that provides a simple interface to access key programmer features quickly. It provides a secure environment for production programming.

motorBench® Development Suite

Available as a plug-in for MPLAB X IDE, the motorBench Development Suite is a GUI-based software development tool for Field-Oriented Control (FOC) of low-voltage motors (up to 48 volts and 10 amps). It accurately measures critical motor parameters, automatically tunes feedback control gains and generates source code for an MPLAB X IDE project using the Motor Control Application Framework (MCAF). This graphical, interactive development environment helps save time in starting up and running new motors with no load or a constant load, especially when the motor parameters are unknown.

The user interface takes you step by step through the project, with context-sensitive help files at your fingertips inside the tool.

- Measure and report the motor's electrical and the system's mechanical parameters
- Quickly get stable Proportional Integral (PI) control loop gains for velocity and torque
- See how the control loop gains affect the system through Bode plots
- Generate code straight into an MPLAB X IDE project
- Integrated help files guide you through each step

Curiosity Development Boards

Internet of Things Ready

Do you have an Internet of Things (IoT) design idea? Curiosity development boards can bring it to life. Use the on-board mikroBUS™ socket to easily add one of the many Click boards™ available from MikroElektronika to expand the functionality of your design. Out of the box, the development board offers several options for user interface.

dsPIC33CH Curiosity Development Board (DM330028-2)

The dsPIC33CH Curiosity Development Board is a cost-effective development and demonstration platform for the entire dsPIC33CH family of dual-core, high-performance DSCs

dsPIC33CK Curiosity Development Board (DM330030)

The dsPIC33CK Curiosity Development Board is a cost-effective development and demonstration platform for the dsPIC33CK family of single-core, high-performance DSCs.

Integrated Graphics and Touch (IGaT) Curiosity Evaluation Kit (EV14C17A)

This kit uses the SAME5x 32-bit MCU to implement a minimized chip-count graphics and 2D touchscreen solution for cost-sensitive applications without performance compromises. This innovative system of hardware platform and software libraries will demonstrate how to craft human-machine interfaces easily for a variety of applications without the need for an external touch controller.

SAM-IoT WG Development Board (EV75S95A)

Featuring a SAMD21G18 Arm® Cortex®-M0+ based 32-bit MCU, an ATECC608A CryptoAuthentication secure element IC and the fully certified ATWINC1510 Wi-Fi network controller, this small and easily expandable development board makes it easy to connect your embedded application to Google's Cloud IoT core platform.

PIC32MZ DA Curiosity Development Kit (EV87D54A)

This low-cost, flexible and accessible development platform featuere the PIC32MZ DA graphics MCU. It includes an integrated graphics adapter for interfacing the MCU's built-in multi-layer graphics controller and 2D graphics processor.

SAM D21 Machine Learning Evaluation Kit With TDK InvenSense 6-Axis MEMS (EV18H79A)

This evaluation kit features a SAMD21G18 Arm Cortex-M0+ based 32-bit MCU with on-board debugger (nEDBG), an ATECC608A CryptoAuthentication secure element IC, an ATWINC1510 Wi-Fi network controller, an MCP9808 high accuracy temperature sensor and a light sensor. It comes with an add-on board with a TDK InvenSense ICM-42688-P high-precision 6-axis MEMS motion sensor so you can collect data to train and create Machine Learning models.

SAM D21 Machine Learning Evaluation Kit With Bosch IMU (EV45Y33A)

This evaluation kit features a SAMD21G18 Arm Cortex-M0+ based 32-bit MCU with on-board debugger (nEDBG), an ATECC608A CryptoAuthentication secure element IC an ATWINC1510 Wi-Fi network controller, an MCP9808 high-accuracy temperature sensor and a light sensor. It comes with an add-on board with Bosch's BMI160 low-power Inertial Measurement Unit (IMU) so you can collect data to train and create Machine Learning models.

PIC24F LCD and USB Curiosity Development Board (DM240018)

The PIC24F USB and LCD Curiosity Development Board is a cost-effective, fully integrated development platform that allows you to explore the segmented LCD interfacing capabilities, USB connectivity and other features of low-power PIC24F MCUs.

PIC24F LCD Curiosity Development Board (DM240017)

The PIC24F LCD Curiosity Development Board is a cost-effective, fully integrated development platform that allows you to explore the segmented LCD interfacing capabilities and other features of low-power PIC24F MCUs.



Curiosity Nano Boards

AVR128DA48 Curiosity Nano Evaluation Kit (DM164151)

Take your next idea to market with a development board that you can keep in your pocket. With full program and debug capabilities, the AVR128DA48 Curiosity Nano Evaluation Kit offers complete support for your next design.

ATtiny1607 Curiosity Nano Evaluation Kit (DM080103)

With full program and debug capabilities, the ATtiny1607 Curiosity Nano Evaluation Kit offers complete support for your next design.

SAM D21 Curiosity Nano Evaluation Kit (DM321109)

Get easy access to the features of the SAM D21 MCU to integrate the device into a custom design with the SAM D21 Curiosity Nano Evaluation Kit.

PIC18F16Q41 Curiosity Nano Evaluation Kit (EV26Q64A)

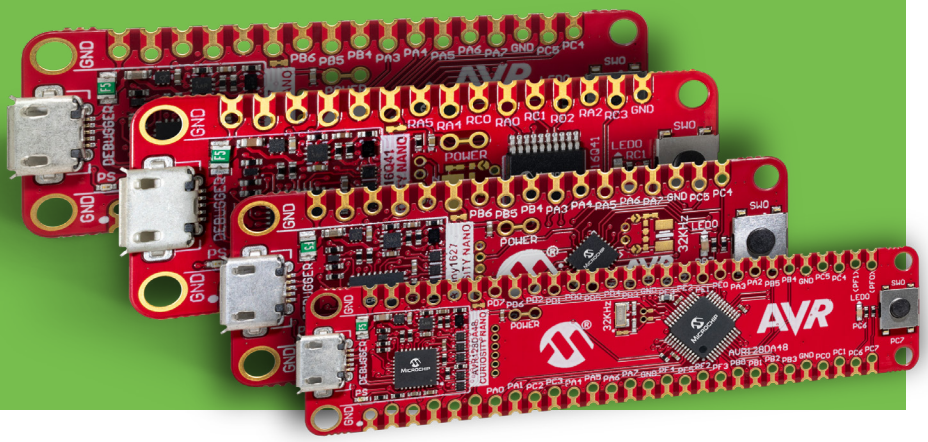
With full programming and debugging capabilities, the PIC18F16Q41 Curiosity Nano Evaluation Kit has pre-programmed firmware to start development immediately.

PIC16F18446 Curiosity Nano Evaluation Kit (DM164144)

With full program and debug capabilities, the PIC16F18446 Curiosity Nano evaluation kit offers complete support for your next design

PIC32CM MC00 Curiosity Nano Evaluation Kit (EV10N93A)

This evaluation kit provides easy access to the features of the PIC32CM MC MCU to integrate the device into a custom design. Since this kit includes an on-board Nano debugger, no external tools are required to program the PIC32CM MC device.





SAM E51 Curiosity Nano Evaluation Kit (EV76S68A)

This evaluation kit provides easy access to the features of the SAM E51 MCU to integrate the device into a custom design. It contains an on-board Nano debugger for programming and debugging, so you don't need any external tools to program the SAME51J20A device.

PIC24FJ64GU205 Curiosity Nano Development Board (EV10K72A)

The PIC24FJ64GU205 Curiosity Nano Development Board is a cost-effective hardware platform to evaluate the PIC24FJ 'GP2/GU2' family of MCUs.

ATtiny1627 Curiosity Nano Evaluation Kit (DM080104)

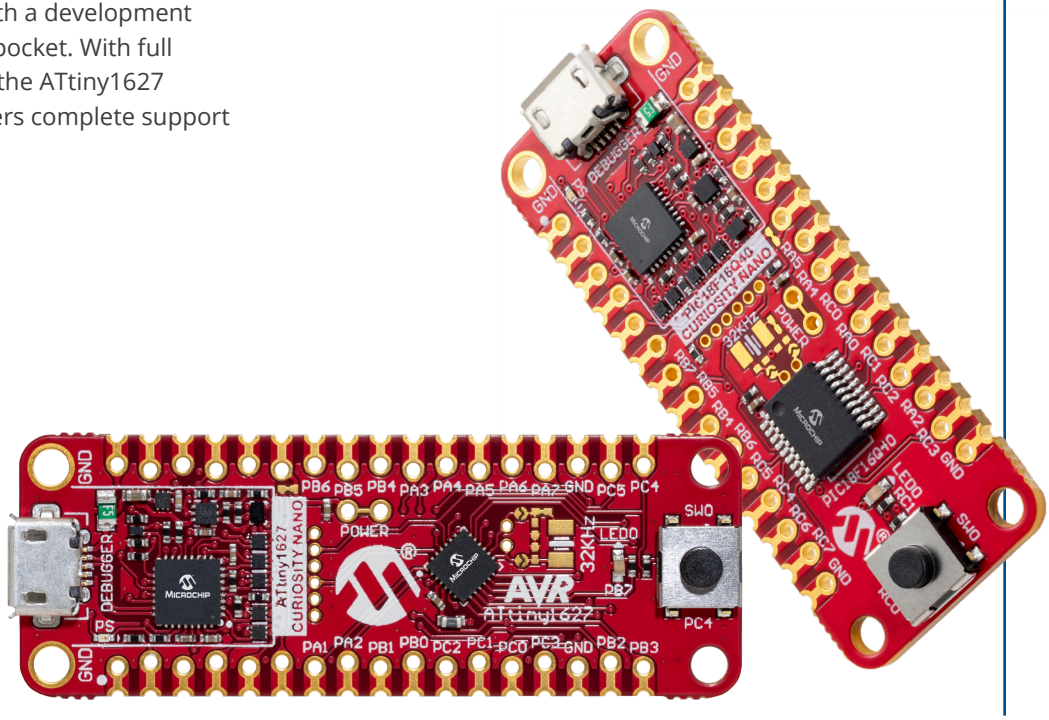
Take your next idea to market with a development board that you can keep in your pocket. With full program and debug capabilities, the ATtiny1627 Curiosity Nano Evaluation Kit offers complete support for your next design.

AVR128DB48 Curiosity Nano Evaluation Kit (EV35L43A)

With full program and debug capabilities, the AVR128DB48 Curiosity Nano Evaluation Kit offers complete support for your next design

PIC18F16Q40 Curiosity Nano Evaluation Kit (EV70C97A)

Pocket-sized but full of capabilities, PIC18F16Q40 Curiosity Nano Evaluation Kit offers complete support for your next design.





Expansion Boards for Xplained Pro Development Boards

We offer a variety of expansion boards that connect to the extension headers of any Xplained Pro development boards that make it easy to add radio, touch, display and many other functions to the development platform. These expansions boards are tightly integrated into the Microchip Studio IDE, and software libraries are available in the Advanced Software Framework (ASF).

ATWINC1500-XSTK Xplained Pro Starter Kit (ATWINC1500-XSTK)

The ATWINC1500-XSTK Xplained Pro Starter Kit is a hardware platform for evaluating the ATWINC1500 low-cost, low-power 802.11 b/g/n Wi-Fi® network controller module.

BNO055 Xplained Pro Extension Kit (ATBNO055-XPRO)

The BNO055 Xplained Pro Extension Kit comes with the Bosch BNO055 intelligent 9-axis absolute orientation sensor and an RGB LED.

Ethernet1 Xplained Pro Extension Kit (ATETHERNET1-XPRO)

The Ethernet1 Xplained Pro is an extension board that enables you to experiment with Ethernet network connectivity applications.

I/O1 Xplained Pro Extension Kit (ATIO1-XPRO)

The I/O1 Xplained Pro provides a light sensor, temperature sensor and microSD card.

OLED1 Xplained Pro Extension Kit (ATOLED1-XPRO)

The OLED1 Xplained Pro Extension Kit comes with a 128 × 32 OLED display, three LEDs and three push buttons.

PROTO1 Xplained Pro Extension Kit (ATPROTO1-XPRO)

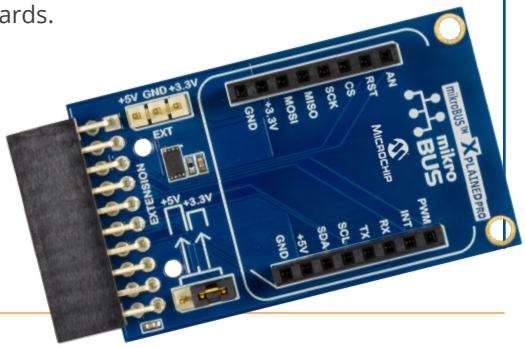
The PROTO1 Xplained Pro can be used as a gateway to other Xplained Pro extension boards with its own Xplained Pro extension header.

RS485 Xplained Pro Extension Evaluation Kit (ATRS485-XPRO)

The RS485 Xplained Pro extension evaluation kit is ideal for evaluation and prototyping applications involving RS485/422 features of the SAM C21 Arm Cortex-M0+ processor-based MCUs.

mikroBUS Xplained Pro (ATMBUSADAPTER-XPRO)

The mikroBUS Xplained Proallows you to use MikroElektronika's Click boards with Xplained Pro development boards.



Starter Kits

Starter kits are complete, affordable, turnkey solutions consisting of the hardware and software sufficient for exploring specific applications or the features of the device family they represent. Most kits include an on-board or separate debugger and tutorials. To get started, simply install and start MPLAB X IDE, connect the hardware and step through the easy-to-follow tutorials.

PIC-IoT WG Development Board (AC164164)

The PIC-IoT WG Development Board combines a powerful PIC24FJ128GA705 MCU, an ATECC608A CryptoAuthentication secure element IC and the fully certified ATWINC1510 Wi-Fi network controller to provide an easy and effective way to connect your embedded application to Google's Cloud IoT Core platform. The board also includes an on-board debugger and requires no external hardware to program and debug the MCU.

MPLAB Xpress Evaluation Boards

The centerpiece of the MPLAB Xpress evaluation board is the PIC16 MCU, which is an 8-bit device with the unique combination of low power consumption, performance to handle almost any application task and on-chip peripherals that enable you to control your system with a minimal amount of code. Peripherals can be set up graphically using the MPLAB Code Configurator plug-in, saving you weeks of development time. Each board features a mikroBUS socket to add Click boards, drag-and-drop programming and seamless integration with MPLAB Xpress cloud-based IDE.

- PIC16F18345 (DM164141)
- PIC16F18855 (DM164140)
- PIC16F18877 (DM164142)

Explorer 8 Development Kit (DM160228)

The Explorer 8 Development Kit is a full-featured development board and platform for 8-bit PIC microcontrollers. This kit is a versatile development solution, featuring several options for external sensors, off-board communication and human interface.

Explorer 16/32 Development Board/Kit

- DM240001-2 (stand-alone board)
- DM240001-3 (board with PIMs and cables)

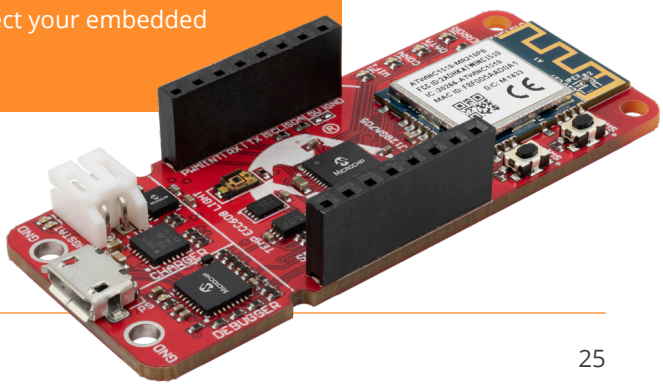
The Explorer 16/32 Development Board is a modular development system supporting PIC24, dsPIC33 and PIC32 devices. The board comes with several features including an integrated programmer/debugger, on-board USB communication and USB-to-serial communication bridge. The board's wide ecosystem includes mikroBUS, Pmod™ and PICtail™ Plus interfaces that support Click boards, Pmod boards and PICtail Plus daughter cards.

PICDEM™ Lab II Development Platform (DM163046)

The PICDEM Lab II Development Platform is a development and teaching platform for use with 8-bit PIC MCUs. At its center, a large prototyping breadboard enables you to easily experiment with different values and configurations of analog components for system optimization. Several external connectors allow for user-customizable expansion, while our library of labs and application notes enrich the development experience.

PIC-IoT WA Development Board (EV54Y39A)

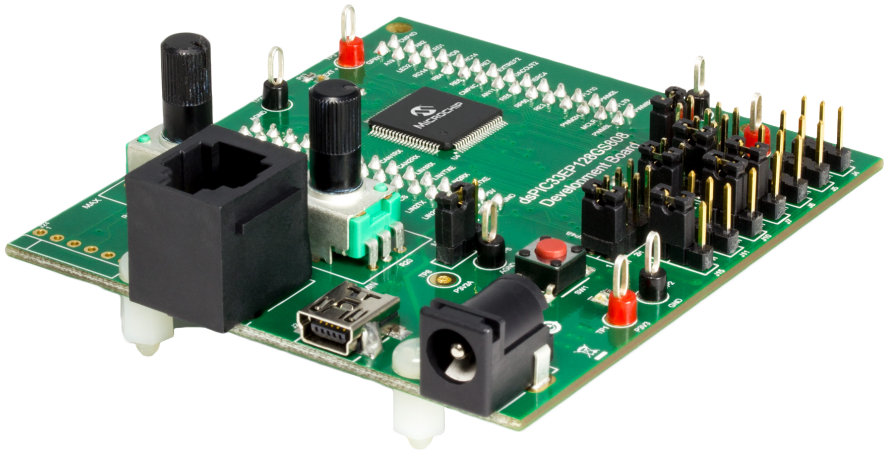
The PIC-IoT WA Development Board combines a powerful PIC24FJ128GA705 MCU, an ATECC608A CryptoAuthentication™ secure element IC and the fully-certified ATWINC1510 Wi-Fi® network controller - which provides the most simple and effective way to connect your embedded application to Amazon Web Services (AWS).



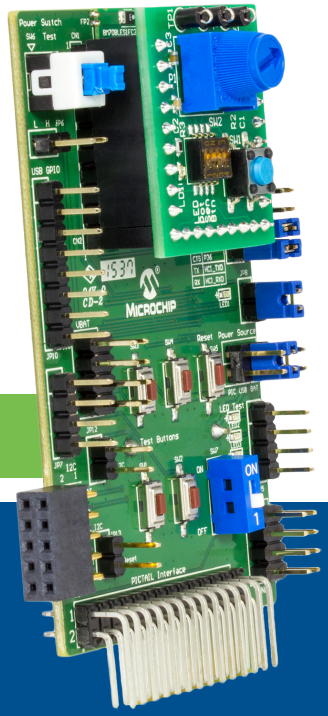


PIC32MK GP Development Kit (DM320106)

The PIC32MK GP Development Kit is a low-cost solution for building projects with the PIC32MK series MCUs with their rich assortment of CAN, USB, ADC and GPIO type inputs. This board also includes a Soloman Systec SSD1963 graphics driver and 30-pin connector for creating graphics applications using a variety of LCD panels.



Development Tools



Bluetooth

BM70 Bluetooth PICtail/PICtail Plus Board (BM-70-PICTAIL)

This board is designed to emulate the functionality of our BM70 Bluetooth Low Energy module, allowing you to evaluate the capabilities of the device. The board includes an integrated configuration and programming interface for plug-and-play capability. The development kit includes the BM70BLES1FC2 module and the BM70BLES1FC2 carrier board.

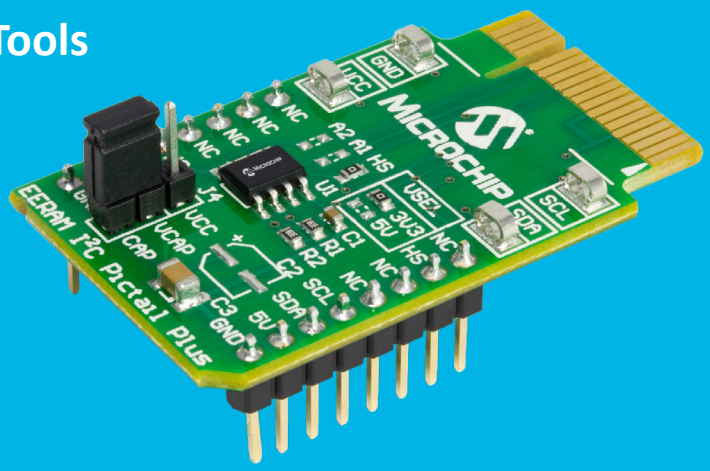
RN4870 Bluetooth Low Energy PICtail/PICtail Plus Daughter Board (RN-4870-SNSR)

This board is based on the ultra-compact RN4870 Bluetooth 4.2 Low Energy module, which uses a simple ASCII command interface over the UART. The daughter board can be used to evaluate the features of the RN4870 for creating Bluetooth Low Energy applications.

SAM B11 Xplained Pro Evaluation Kit (ATSAMB11-XPRO)

This kit is a hardware platform to evaluate the ATSAMB11-MR510CA module for creating a complete Bluetooth Low Energy application on an Arm Cortex-M0 based MCU. The ATSAMB11-MR510CA module is based on the ATSAMB11, our industry-leading lowest-power Bluetooth Low Energy 4.1-compliant SoC.

Application-Specific Development Tools



EERAM

EERAM I²C PICtail Kit (AC500100)

This kit includes two I²C serial EERAMPICtail boards: one featuring a 4 Kbit 47C04 EERAM and one featuring a 16 Kbit 47L16 EERAM. It provides PICtail Plus and mikroBUS connections and operates with the Explorer 8 Development Board, the Explorer 16/32 Development Board and many other tools.

Ethernet

KSZ9897 Switch Evaluation Board with LAN7801 and KSZ9031 (EVB-KSZ9897)

This board features a completely integrated triple-speed (10BASE-T/100BASE-TX/1000BASE-T) Ethernet switch with seven ports. The board has six physical ports and one USB-to-Ethernet port. The board also features the LAN7800 USB-to-Ethernet bridge and KSZ9031 Gigabit PHY.

KSZ9477 Managed Switch Evaluation Board with SAMA5D36 MPU (EVB-KSZ9477)

This board features a completely integrated triple-speed (10 BASE-T/100BASE-TX/1000BASE-T) Ethernet switch with five ports and one SFP port. The Arm Cortex-A5 based SAMA5D3 host processor implements advanced switch management features such as IEEE® 1588 v2, Audio/Video Bridging (AVB) and authentication.

LAN9252 (EVB-LAN9252-D51, EV44C93A) and LAN9253 (EVB-LAN9253-D51, EV50P30A)

KSZ8851SNL Evaulation Board (KSZ8851SNL-EVAL)

This board is for evaluating the KSZ8851 single-port Ethernet controller, which is ideal for applications requiring an SPI interface between the Ethernet controller and the host MCU. A basic software driver includes a configuration utility to set up the device.

LAN7800LC Evaluation Board (EVB-LAN7800LC)

With a ultra-low-cost BOM, this evaluation board integrates the USB Type-C® connector to implement a high-speed data transfer to Gigabit Ethernet with the on-board RJ45 connector. Software drivers for Windows, OS X and Linux operating systems are available.

PIC32 Ethernet Starter Kit II (DM320004-2)

This kit, which leverages the LAN8720A Ethernet PHY and our free TCP/IP software stack, provides the easiest and lowest-cost method to experience 10/100 Ethernet development with a PIC32 MCU.

LAN8720A PHY Daughter Board (AC320004-3)

Populated with a high-performance, small-footprint, low-power 10BASE-T/100BASE-TX Ethernet LAN8720A PHY, this board plugs into PIC32 starter kits for easy development of RMII Ethernet control applications.

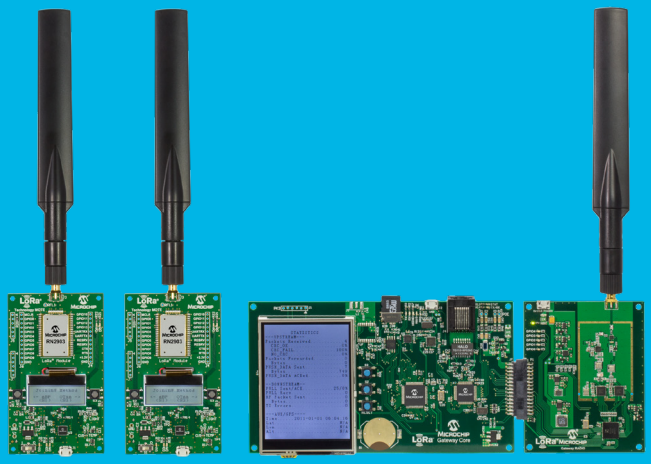
LAN9303 PHY Switch Daughter Board (AC320004-4)

When used with the PIC32 Ethernet Starter Kit II, this board provides an easy and low-cost way to implement 10/100 Ethernet switching. Use our free TCP/IP software to get your project up and running quickly.

Graphics and LCD

Integrated Graphics and Touch (IGaT) Curiosity Evaluation Kit (EV14C17A)

The IGaT Curiosity Evaluation Kit uses a 32-bit SAM E5x MCU to implement minimized chip-count graphics and a 2D touchscreen solution for cost-sensitive applications without performance compromises. This innovative combination of a hardware platform and software libraries will demonstrate how you can craft human-machine interfaces easily for a variety of applications without the need for an external touch controller.



LoRa Technology

915 MHz RN2903 LoRa Technology Mote (DM164139)

The RN2903 LoRa Mote is a LoRaWAN® Class A end device based on the RN2903 LoRa modem. As a stand-alone battery-powered node, the mote provides a convenient platform to quickly demonstrate the long-range capabilities of the modem, as well as to verify interoperability when connecting to LoRaWAN v1.0 compliant gateways and infrastructure.

LoRa Technology Evaluation Kit (DV164140-2)

The LoRa Technology Evaluation Kit makes it easy for you to test LoRa technology, range and data rate. The full-featured gateway board includes an LCD screen, SD card for configuring data, Ethernet connection, 915 MHz antenna and full-band capture radios. This kit also includes two RN2903 Mote boards (DM164139).

868 MHz RN2483 LoRa Technology Mote (DM164138)

The RN2483 LoRa Mote is a LoRaWAN Class A end device based on the RN2483 LoRa modem. It is ideal for IoT applications in remote locations. As a stand-alone battery-powered node, the mote provides a convenient platform to quickly demonstrate the long range capabilities of the modem, as well as to verify interoperability when connecting to LoRaWAN v1.0 compliant gateways and infrastructure.

RN2483/RN2903 LoRa Technology PICtail/PICtail Plus Daughter Board (RN-2483-PICTAIL for EU, RN-2903-PICTAIL for US)

The RN2483 and RM2903 LoRa Technology PICtail/PICtail Plus Daughter Boards showcase our RN2483/2903 LoRa technology transceiver modules.

MiWi™ Wireless Networking Protocol

MiWi Protocol Demo Kit – 2.4 GHz MRF24J40 (DM182016-1)

The MiWi Protocol Demo Kit – 2.4 GHz MRF24J40 is an easy-to-use evaluation and development platform for IEEE 802.15.4 applications. You can develop/debug and demo application code all on the same platform. The kit iis pre-programmed with the MiWi Mesh protocol stack, and it includes all hardware needed to rapidly prototype wireless applications.

Motor Control and Power Conversion

dsPIC33C Digital Power Starter Kit (DM330017-3)

This kit introduces and demonstrate the capabilities and features of Microchip's SMPS families of devices. It features on-board dsPIC33CK256MP505 DSC, SMPS power stages, loads, LCD display, USB/UART bridge and programmer/debugger, which eliminates the need for any additional hardware.

MCLV-2 (DM330021)

The dsPICDEM™ MCLV-2 Development Board provides a cost-effective method of evaluating and developing 3-phase sensored or sensorless Brushless DC (BLDC) and Permanent Magnet Synchronous Motor (PMSM) control applications. The board supports Microchip's 100-pin motor control Plug-In-Modules (PIMs) for the dsPIC33C, dsPIC33E and dsPIC33F Digital Signal Controllers (DSCs) and also for the PICM32MK and ATSAME70 families.

dsPIC33CK LVMC (DM330031)

The dsPIC33CK Low Voltage Motor Control (LVMC) Development Board is a cost-effective rapid development platform for Brushless DC (BLDC), Permanent Magnet Synchronous Motor (PMSM) and Internal Permanent Magnet (IPM) motor control applications. The LVMC development board is ideal to explore and prototype motor control applications that operate from 12 to 48 Volts and up to 10 Amps of continuous current.

Motor Control Starter Kit (DM330015)

This board includes a small 3-phase BLDC motor driven by a dsPIC33FJ16MC102 motor control device. It includes an integrated programmer and debugger, and it is powered by the included 9V power supply.

Low-Voltage Motor Control Development Bundle (DV330100)

Evaluate and develop dual/single motor controls to drive BLDC motors or PMSMs concurrently or one of each. The dsPIC DSC Signal Board supports 3.3V and 5V devices for various applications. It also has some frequently used human interface features and a variety of communication ports. The Motor Control 10–24V Driver Board (Dual/Single) supports currents up to 10A.

Buck/Boost Converter PICtail Plus Card (AC164133)

This development platform for the 'GS' family of dsPIC SMPS and digital power conversion dsPIC DSCs includes two independent DC/DC synchronous buck converters and one independent DC/DC boost converter. The board operates from an input supply of +9V to +15V DC and can be controlled by interfacing to the 28-pin Starter Development board or to the Explorer 16/32 Development Board.

dsPICDEM™ MCHV-2/3 Development System (DM330023-2/DM330023-3)

This high-voltage development system can be used to control Brushless DC (BLDC) motors, Permanent Magnet Synchronous Motors (PMSMs) and AC Induction Motors (ACIMs) in sensor or sensorless operation. The rated continuous output current from the inverter is 6.5 A (RMS), which allows up to approximately 2 kVA output when running from a 208V to 230V single-phase input voltage. The MCHV-3 adds support for Power Factor Correction (PFC) with a maximum output of 1 kW at 400V.

Power over Ethernet (PoE)

PIC18 PoE Development Kit (DV161001)

Consisting of a PIC18 PoE Main Board, PoE Programmer Adapter and I/O Starter Extension, the PIC18 PoE Development Kit provides everything you need to begin developing within the Ethernet of Everything (EoE) environment. Customization and experimentation are simplified via an extension header on the PIC18 PoE Main Board that is mikroBUS compatible so you can incorporate various sensors, controllers and drivers easily into your application.

Real-Time Clock/Calendar (RTCC)

MCP79410 RTCC PICtail Plus Daughter Board (AC164140)

This board demonstrates the MCP7941x and MCP7940x I²C RTCC family. It uses the PICtail Plus, PICtail and PICkit serial connector and operates with the PICDEM PIC18 Explorer Board, the XLP 16-bit Development Board and the PICkit Serial Analyzer tool.

MCP795xx PICtail Plus Daughter Board (AC164147)

This board demonstrates the features of the MCP795xx SPI RTCC family. It includes the 14-pin MCP795W2x and MCP795W1x devices and both PICtail and PICtail Plus connectors. Operating with the PICDEM PIC18 Explorer Board, the board hosts a coin cell for RTCC backup.

Serial EEPROM

MPLAB Starter Kit for Serial Memory Products (DV243003)

This kit includes everything necessary to quickly develop a robust and reliable serial EEPROM design, greatly reducing the time required for system integration and hardware/software fine tuning. It supports our UNI/O® bus, I²C, SPI and Microwire serial EEPROMs.

Total Endurance (TotalEnduranceSoftware)

This software provides functional visibility to serial EEPROM applications. Target systems are input via an advanced mathematical model, which predicts back the performance and reliability of the serial EEPROM in that target. Design trade-off analysis takes minutes and delivers robust design results.

Serial EEPROM PIM PICtail Pack (AC243003)

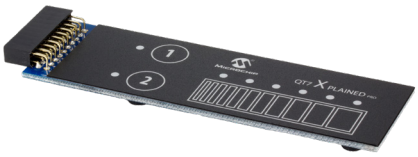
This is a package of four serial EEPROM (I²C, SPI, Microwire, UNI/O bus) PICtail boards that interface with the PICtail Plus connector, the MPLAB Starter Kit for Serial Memory Products (DV243003) and the MPLAB PICkit 4 In-Circuit Debugger.

Serial SRAM

SPI SRAM PICtail with Battery Backup (AC164151)

This PICtail and PICtail Plus development board can be used with our standard development boards to demonstrate the features of the 23LCV1024 1 Mbit Serial SRAM with battery backup.







Touch Buttons, Sliders, Wheels

MTCH108 Evaluation Board (DM160229)

This evaluation board provides an an easy-to-use platform for evaluating MTCH108/5/2 capacitive touch controllers. It features different button sizes and a proximity sensor.

MTCH1010 Evaluation Kit (EV24Z38A)

This kit enables a complete out-of-the-box experience to explore the water-tolerant and robust touch capabilities of the MTCH1010.

CAP1188/CAP1298 Evaluation Kits (DM160222/DM160223)

These two evaluation kits provide an easy platform for evaluating and developing a variety of capacitive touch sense applications using the CAP11xx family.

QT7 XPlained Pro Extension Kit (ATQT7-XPRO)

This touch extension board is used to evaluate the water and noise robustness of self-capacitance touch. The kit demonstrates water-tolerant touch using driven shield or Driven Shield+ technology, depending on the MCU used on the motherboard.

QT10 XPlained Pro Extension Kit (AC47H23A)

This touch extension board offers four buttons and a slider for capacitive mutual sensing. It enables you to explore the benefits of Boost Mode, which quaduples touch acquisition speed and/or doubles the Signal-to-Noise ratio (SNR).

Curiosity Nano Touch Adapter (AC80T88A)

This mechanical adapter connects the growing ecosystem of Curiosity Nano MCU boards with the world of XPRO touch extension boards.

BIST Xplained Pro Extension Kit (AC11C60A)

This daughter board for the XPRO and Curiosity Nano ecosystem adds the ability to introduce pin failures for Built-in Self Tests (BISTs) and/or Power On Self Tests (POSTs). The kit enables early testing in ISO 26262 or IEC 60730 regulated human interface projects.

Touchpads

Water-Tolerant 2D Touch Surface Development Kit (DM080101)

This kit enables easy evaluation of the 2D Touch Surface Library with water-tolerant touch buttons, a small touchpad with single- and dual-finger gesture recognition (taps, swipes and pinch/zoom). This board features an 8-bit AVR MCU, but we also offer a version that features an 8-bit PIC MCU (DM164149).

3D Gesture Sensing

MCG3140 Emerald Development Kit (DM160238)

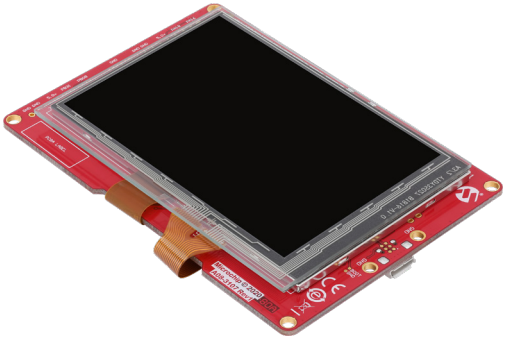
This kit builds a complete MGC3140 reference system for evaluation as well as the design-in of 3D gesture input sensing systems.

QT8 Xplained Pro Extension Kit (AC164161)

This kit is an extension board that enables easy evaluation of the 2D Touch Surface library. The kit demonstrates water tolerance and noise immunity on a touchpad.

Integrated Graphics and Touch (IGaT) Curiosity Evaluation Kit (EV14C17A)

The IGaT Curiosity Evaluation Kit uses a 32-bit SAM E5x MCU to implement a minimized chip-count graphics and 2D touchscreen solution for cost-sensitive applications without performance compromises. This innovative combination of a hardware platform and software libraries will demonstrate how to easily craft human-machine interfaces for a variety of applications without the need for an external touch controller.



Water-Tolerant 2D Touch Surface Development Kit for AVR and PIC MCUs (DM080101, DM164149)

These kits allow you to evaluate the 2D Touch Surface Library on a small (6 ×5) touchpad with single- and dual-finger gesture recognition (taps, swipes and pinch/zoom). The boards provide the identical features and performance, but DM80101 is controlled by an 8-bit AVR MCU and DM164149 is controlled by an 8-bit PIC MCU.



ATtiny817 Water Tolerance Demonstration Kit (ATTINY817-QTMOISTD)

This kit combines best-in-class conducted immunity and water tolerance. It uses Driven Shield+ technology to implement a solution that passes conducted immunity testing per IEC 61000-4-6 specifications while simultaneously being immune to false touches due to water on the touch surface.



USB

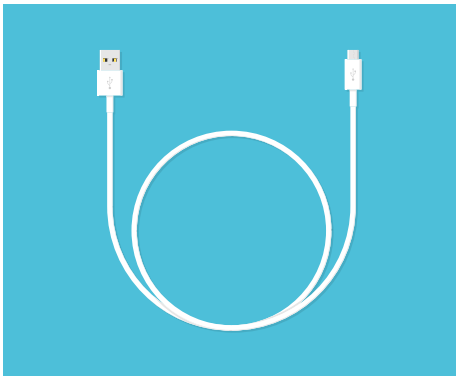
USB4604 Hi-Speed USB 2.0 Programmable 4-Port Controller Hub Evaluation Board (EVB-USB4604)

The EVB-USB4604 is used to evaluate the full-featured USB46x4 family of programmable controller hubs. These USB hubs offer full programmability and unique features such as FlexConnect and I/O bridging.



USB3740 Hi-Speed USB 2.0 2-Port Switch Evaluation Board (EVB-USB3740)

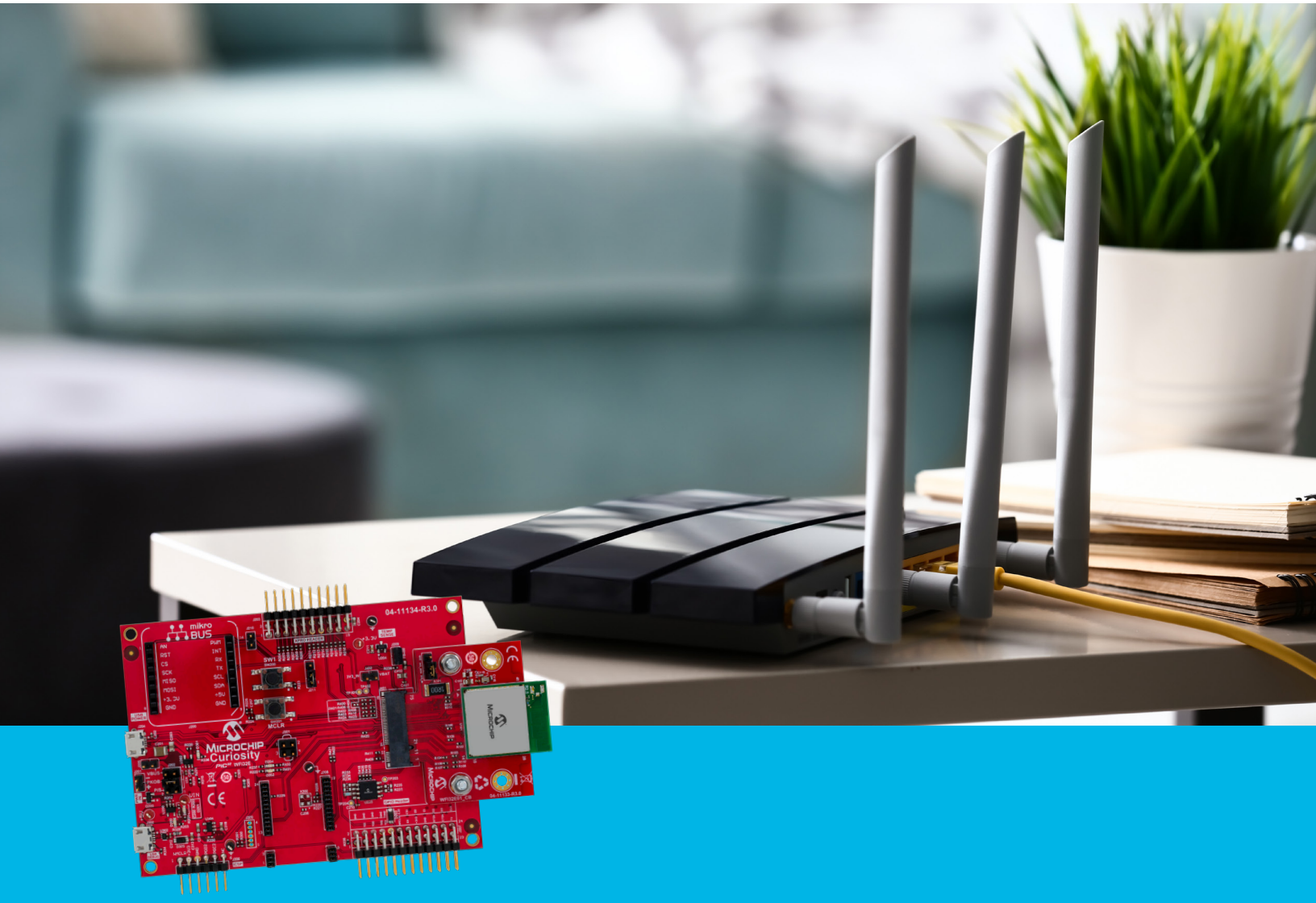
The EVB-USB3740 is used to evaluate our USB3740 USB 2.0 compliant 2-port switch. Some applications require a single USB port to be shared with other functions. The USB3740 is a small and simple 2-port switch providing system design flexibility.



USB3750 Hi-Speed USB 2.0 Port Protection with Integrated Switch and Charger Detection Evaluation Board (EVB-USB3750)

The EVB-USB3750 is used to evaluate our USB375x family of integrated USB 2.0 port protection devices. The USB375x integrates a high level of ESD protection to the USB port, which is typically exposed to the harsh environment of the outside world. It also incorporates our Hi-Speed USB 2.0 switch as well as battery charger detection, all in a conveniently small package.





Wi-Fi

PIC32 WFI32E Curiosity Board (EV12F11A)

This board is an easy-to-use tool to evaluate the performance of the WFI32E01PC Wi-Fi MCU module, which contains the PIC32MZW1, a highly integrated IoT system core supporting smart Wi-Fi functionalities and a premium MCU. The board is a fully functional development platform that supports system-level prototyping design and IoT cloud connectivity with voice control.

WINC1500 Xplained Pro Evaluation Board (ATWINC1500-XPRO)

The extension board allows you to evaluate the WINC1500 low-cost, low-power 802.11 b/g/n Wi-Fi network controller module.

Analog Development Tools

CAN and LIN

dsPIC33EV 5V CAN-LIN Starter Kit (DM330018)

The dsPIC33EV 5V CAN-LIN Starter Kit features the dsPIC33EV256GM106 DSC for automotive and motor control applications. The starter kit contains serial data ports for CAN, LIN and SENT, a self-contained USB programming/debug interface and an expansion footprint for flexibility in application hardware development.

MCP25625 PICtail Plus Daughter Board (ADM00617)

The MCP25625 PICtail Plus Daughter Board is a simple CAN board designed to be used with boards containing the PICtail Plus connector. The board also has the PICkit Serial connector for interfacing to the PICkit Serial Analyzer tool. The single-chip CAN node solution consists of the MCP25625 CAN controller with integrated transceiver.

SAM HA1G16A Xplained Pro (ATSAMHA1G16A-XPRO)

The SAMHA1G16A Xplained Pro Evaluation Kit is ideal for evaluating and prototyping with SAMHA1G16A Arm Cortex-M0+ based MCUs.

High-Voltage Drivers

HV582 96-Channel High-Voltage Driver IC Evaluation Board (ADM00697)

HV583 128-Channel High-Voltage Driver IC Evaluation Board (ADM00677)

These boards offer a flexible input/output connection interface for implementing display and printer driver applications. The boards are designed around the HV582/3, a unipolar, 96-channel low-voltage serial to high-voltage parallel converter with push-pull outputs.

DN2470-Based Linear Regulator Input Voltage Range Extender Evaluation Board (ADM00682)

This board provides an off-line linear regulation demonstration using the 700V depletion-mode FET. The board features off-line regulation using three different selectable LDOs: MCP1754, MCP1755 and MCP1790.

LED Drivers

HV98100 120VAc Off-Line LED Driver Evaluation Board (ADM00786)

The HV98100 120 VAC Off-Line LED Driver Evaluation Board is designed to demonstrate the performance of the HV98100 LED driver IC. The evaluation board drives a 120V LED string at 120 mA from a 120 VAC input voltage with high input power factor and low total harmonic distortion.

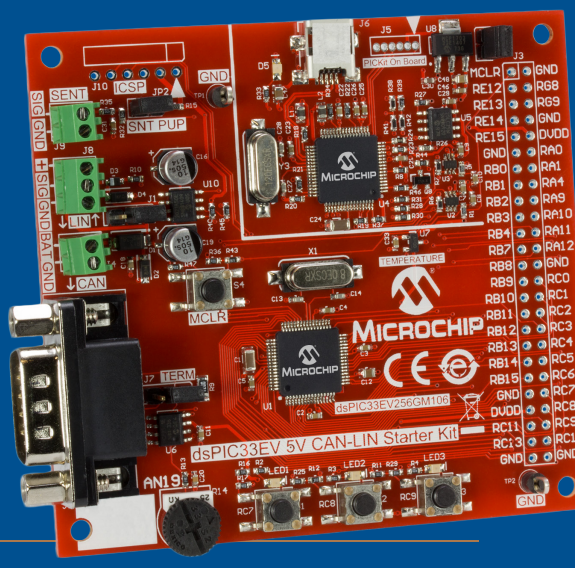
Motor Drivers

ATA6826-DK (ATA6826-DK)

This application board allows loads to be easily adapted via its row connector pins. Design software controls its SPI interface via the PC parallel port. The board contains everything needed to start operation, including a link cable to PC 25-lead 1:1, application note and data sheet.

ATA6823-DK (ATA6823-DK)

This development kit contains a main board with an H-bridge gate driver (ATA6823), external FETs and DC motor. The controller board is populated with an ATmega88 microcontroller and also features an LCD display.





Arduino® Boards for Makers

Our AVR 8-bit MCUs and 32-bit Arm-based MCUs power a variety of Arduino's easy-to-use boards including:

Arduino UNO

The reference standard in the Arduino development environment, the Arduino UNO is usually the entry point into the Arduino ecosystem. It is supported by thousands of examples, projects and tutorials on the web. The board's form factor, now in its third major revision, is known throughout the Maker community as Arduino Shield R3. The Arduino UNO is based on our ATmega328P microcontroller (MCU), which is one of the most popular MCUs in the Maker/DIY space.

Arduino Micro

This board is a small-form-factor board that is based on the ATmega32u4 instead of the ATmega328P. The ATmega32u4 is in the same family at the ATmega328P, but also features a USB 2.0 low/full speed USB interface on chip. This board is supported by a large number of examples and projects in the Arduino environment.

Arduino Nano

This board is essentially a clone of the Arduino UNO in a small DIP-like package similar to the Arduino Micro. Like the UNO, the Nano is based on the ATmega328P and provides an external USB serial bridge chip that is located on the bottom side of the board. This board, along with the Arduino Mini, is a very popular choice for wearables projects because of its small size.

Arduino Nano Every

This board is the latest update to the popular Nano footprint. It uses the ATmega4809 MCU, which provides more Flash and RAM memory plus an improved power supply at a more economical price.

Arduino Mega 2560

This board is the largest ATmega-based Arduino platform. For projects running out of program space and GPIO pins, the Mega 2560 is the end of the line for the 8-bit MCU-based Arduino family. Because the 100-pin ATmega2560 MCU offers so many I/O pins, a new Shield format was introduced to support it. The ATmega2560 provides 256 KB of program memory, 8 KB of RAM and multiple copies of basic peripheral interfaces such as UART, SPI and I^2C channels. The Arduino Mega 2560 continues to be one of the base processor platforms for many 3D printers because of the large number of GPIO pins available.

Arduino MKR 1000

This board is the first MKR-based form factor board introduced by Arduino. The MKR format is similar to, but not the same as the Nano, Micro and Mini footprints of the smaller Mega platforms. Its smaller form factor is suitable for wearable projects and more Pro Maker projects that require a more robust and compact form factor. The Arduino MKR 1000 is based on the SAMW25 Wi-Fi SOC, an FCC-certified module that combines the SAMD21G18 MCU with the WINC1500 low-power 802.11 b/g/n Wi-Fi controller. The module also includes an ATECC508A CryptoAuthentication IC which supports AWS for secure connectivity to the Amazon cloud.

Arduino MKR Zero

This board is the MKR footprint-based version of the Arduino Zero with some extra connections to take advantage of the I^2S digital audio interface. The micro SD socket allows digital audio files to be stored externally in standard MS-DOS file system formats. This is a very popular platform for audio-based wearables.

Arduino MKR WAN 1300

Based on the SAM D21 MCU, the Arduino MKR WAN 1300 combines the Arduino Zero base processor with a LoRa module.

Third-Party Tools

Books

Embedded C Programming Book and E3mini Board Bundle for CCS Compilers (TBDL001)

This bundle includes *Embedded C Programming: Techniques and Applications of C and PIC MCUs,* a book by Mark Siegesmund, and the E3mini Development Board. This book provides a hands-on introductory course on concepts of C programming using a PIC MCU and the CCS C compiler.



Compilers and IDEs

CSS

CCS provides a line of full-featured C compilers for 8-bit and 16-bit MCUs. These compilers include a generous library of built-in functions, pre-processor commands and ready-to-run example programs to quickly jump-start any project. Several versions are available, depending on which MCU families you plan to use and whether you prefer a command-line tool or a full-featured IDE. The CCS IDE provides several advanced features, including a unique Profiler Tool to track time and usage information for use on functions, code blocks as well as receiving live data from running programs. CCS compilers are compatible with MPLAB X IDE and MPLAB programmer/debuggers. For more information, please visit:
www.microchip.com/ccs.

- PCM - CCS C Command-line Compiler for Midrange Family of PIC MCUs (SW500003-DL)
- PCH - CCS C Command-line Compiler for PIC18 Family of PIC MCUs (SW500002-DL)
- PCD CCS C Command-line Compiler for PIC24 MCUs/ dsPIC DSCs (SW500021-DL)
- PCWH CCS C IDE Compiler for Baseline, Midrange, and PIC18 Families of PIC MCUs (SW500004-DL)
- PCWHD CCS C IDE for Microchip 8-bit and 16-bit PIC MCU Families (SW500024-DL)

MikroElektronika

MikroElektronika provides a line of optimizing C, basic and Pascal compilers for 8-, 16- and 32-bit MCUs. Each compiler features an intuitive IDE, advanced optimizations, lots of hardware and software libraries and additional tools that will help you in your work. A comprehensive Help file is included with ready-to-use examples designed to jump start your projects. The compiler license includes free upgrades and product lifetime tech support, and it can be used on multiple computers (USB dongle included). Object files created with MikroElektronika compilers can be imported into MPLAB X IDE if desired. For a listing of products, please visit: www.microchip.com/mikroe.

SOMNIUM DRT Cortex-M IDE

The SOMNIUM DRT Cortex-M IDE provides you with the best possible C/C++ code quality along with state-of-the-art debug, all in a single professional development tool which allows you to create high-quality designs, reduce costs, get your product to market faster.

- TSW1017 - 1-User, Fixed License
- TWS1018 – 3-User, Floating License



Development Hardware

Click boards by MikroElektronika

Many of our latest development boards feature a mikroBUS connector that allows you to add functionality to your project quickly and effortlessly using the vast selection of Click boards available from MikroElektronika. Visit Microchip's third-party site for more information.





mikromedia workStation v7 (TMIK021)

The mikromedia workStation v7 provides a full development environment for mikromedia boards. It features an on-board debugger, multimedia modules, four mikroBUS host sockets and a large breadboard area.

mikromedia Board for PIC24 (TMIK010)

The mikromedia Board for PIC24 is a palm-sized unit with amazing multimedia capabilities. Based on the PIC24F256GB110 with USB On-The-Go (OTG), it includes a 320 × 240 TFT display with touchscreen, stereo MP3 codec, 8 MB serial Flash, microSD card slot, headphone jack and USB connector. Powered by USB, the board can easily play MP3 files from a microSD card with full 320 kbps quality.

mikromedia Board for PIC32 (TMIK012)

The mikromedia Board for PIC32 fits comfortably in the palm of your hand and provides amazing multimedia capability. Based on the PIC32MX460F512L MCU, it includes a 320 × 240 TFT display with touchscreen, stereo codec, 8 MB serial Flash, microSD card slot, headphone and microphone jacks and a USB connector. Powered by USB, the board is capable of playing videos directly from a microSD card at 15 fps.

mikromedia PROTO Shield (TMIK032)

The mikromedia PROTO Shield is an extension board that is pin compatible with all mikromedia boards from MikroElektronika. It enables users to place components and provide additional functionality to the base mikromedia board.



CCS EZ Web Lynx 3V Module (TDKEZW3)

CCS EZ Web Lynx 5V Module (TDKEZW5)

EZ Web Lynx is a simple embedded Ethernet integration device to get a product online fast. This tiny unit can be added easily to any existing electronic design to provide Ethernet capability, reducing your development and engineering time.

CCS EZ Web Lynx 3V Development Kit (TDKEZW3-DEV)

CCS EZ Web Lynx 5V Development Kit (TDKEZW5-DEV)

These low-cost kits includes all hardware, software and documentation needed to speed integration of EZ Web Lynx Ethernet modules into your design. Monitor and control analog and digital I/O on the docking station using custom HTML tags. Use the IDE to develop custom dynamic web pages and send alarm/status emails simply by programming in HTML. Complete documentation includes design examples for temperature monitoring, using conditional HTML tags and controlling pin I/O.

CCS PRIME8 Production Programmer (Touchscreen) (TPGPRM8-2)

The latest version of CCS's Prime8 Production Programmer (53504-830) is a low-cost way to program up to eight devices concurrently. Prime8 operates in stand-alone mode or when connected to a PC. The unit will supply up to 200 mA at 2–5V to power target devices. It can program all devices in the PIC10, PIC12, PIC14, PIC16, PIC17, PIC18, PIC24, dsPIC DSC and PIC32 families. The newest features include flash-drive readability, faster programming speed and a graphics display touchscreen menu with easy-to-read icons.



Development Software

Flowcode 7 for AVR MCUs/Arduino Products – Standard (TSW1013)

Flowcode 7 is a flowchart-style programming tool that enables you to create complex electronic and electromechanical systems. The tool utilizes graphics in place of complex coding, meaning it is ideal for both beginners and experienced engineers. Flowcode 7 software is straightforward and easy to use, so you can develop your ideas in no time.

MikroElektronika Visual TFT (SW500189)

Visual TFT is a Windows application for rapid development of graphical user interfaces on TFT displays. It generates source code for all MikroElektronika compilers—mikroC, mikroBasic and mikroPascal—for all supported MCU and DSC architectures, including PIC MCUs. With many drag-and-drop components, it makes building applications easy and fast. Visual TFT runs on Windows computers and supports all multimedia boards from MikroElektronika, as well as ten TFT controllers and five different display sizes.

SOMNIUM DRT Microchip Studio Extension (TSW1016)

SOMNIUM DRT Microchip Studio Extension enhances the Microchip Studio IDP to provide superior C and C++ code generation quality to help you build smaller, faster and more energy-efficient software for your SAM MCU without changing your development environment or source code. Achieve the best-quality design with reduced costs and reach the market faster.

Oscilloscopes

Saleae Logic Pro 8 - USB Logic Analyzer (TSAL0004)

The Saleae Logic devices connect to your PC over USB. Just download the software at www.saleae.com. Navigate to your data easily and intuitively with Logic's fluid and fully animated mouse-driven interface. Saleae products support decoding for over 20 different protocols.

- Saleae Logic 8 - USB Logic Analyzer (TSAL0003)
- Saleae Logic Pro 16 - USB Logic Analyzer (TSAL0005)



OpenScope

OpenScope MZ Test Instrument (TDGL027)

OpenScope MZ (Digilent 410-324) is a portable multi-function programmable instrumentation module. You can connect it to your computer (via Wi-Fi or a USB cable) to acquire, analyze, visualize and control signals from circuits, sensors and other electronic devices. Unlike typical USB instruments, OpenScope MZ can also be programmed to run standalone like an Arduino or Raspberry Pi®, but with high-speed precision analog and digital I/O. At the core of the OpenScope MZ is a powerful PIC32 MZ processor.

Programmers and Debuggers

Softlog offers a full line of production-quality in-circuit gang programmers. These include:

- ICP2GANG-DP 4-Channel Gang Programmer (TPG100004)
- ICP2GANG 4-Channel Gang Programmer (TPG100005)
- ICP2GANG-DS Secure Gang Programmer (TPG100006)

Softlog SEC-DS Secure Programming Upgrade for ICP2 Programmers (SW500090)

Softlog SEC4CH-DS Secure Programming Upgrade for ICP2GANG Programmers (SW500091)

The Softlog SEC-DS Secure Programming Upgrade is a secure programming extension for Softlog programmers that provides several layers of protection, utilizing breakthrough technology to dramatically reduce the risk of unauthorized reconstruction of hex data and limit how many times a hex file can be programmed. Secure programming operates on two levels: the admin level and the user level.



Softlog ICP2 Production Quality In-Circuit Programmer (TPG100001)

The Softlog ICP2 Production Quality In-Circuit Programmer is a cost-effective programmer that operates with a PC or as a stand-alone unit.

Softlog ICP2PORT-P Production Quality In-Circuit Service Programmer (TPG100010)

The Softlog ICP2PORT-P Production Quality In-Circuit Service Programmer is specially designed to meet your service programming needs. This compact, battery-powered device supports up to six different programming environments, making it an ideal, low-cost solution for field upgrades.

Softlog ICP2(HC) Production Quality In-Circuit High-Current Programmer (TPG100008)

The Softlog ICP2(HC) Production Quality In-Circuit High-Current Programmer is a cost-effective programmer that operates with a PC or as a stand-alone unit.

Softlog ICP2PORT Production Quality In-Circuit Service Programmer (TPG100009)

The Softlog ICP2PORT Production Quality In-Circuit Service Programmer is specially designed to meet your service programming needs. This compact, battery-powered device supports up to six different programming environments, making it an ideal, low-cost solution for field upgrades.

CCS Load-n-Go Handheld In-Circuit Programmer (TPG1LG01)

Load-n-Go is a low-cost handheld in-circuit programmer that supports PIC10, PIC12, PIC14, PIC16, PIC18, PIC24 MCU and dsPIC DSC families. Running on four AA batteries, this mobile programmer can go where no PC or laptop could go before. The simple user interface seamlessly allows for quick field programming of targets with up to four firmware images. Load-n-Go can also be powered via USB or with a 9V AC adapter and used as a regular ICD/ICSP with the CCS IDE compilers.

Tag-Connect In-Circuit Cable Legged Version (TC2030-MCP)

Tag-Connect In-Circuit Cable No Legs (TC2030-MCP-NL)

Tag-Connect cables provide a simple, reliable means of connecting debuggers and programmers or other test equipment to your PCBs while lowering board costs and facilitating efficient production programming.

Protocol Analyzers

Total Phase

Total Phase Beagle™ USB 480 Protocol Analyzer (TTP100001)

The Beagle USB 480 Protocol Analyzer (Total Phase TP320510) is a low-cost, non-intrusive high-speed USB 2.0 bus monitor that includes real-time USB class-level decoding. The Beagle USB 480 analyzer is capable of capturing and interactively displaying high-speed USB bus states and traffic in real time with timing at 16.7 ns resolution. It comes with software and royalty-free API.

Total Phase Beagle USB 12 Protocol Analyzer (TTP100002)

The Beagle USB 12 Protocol Analyzer (Total Phase TP320221) is a non-intrusive full-low-speed USB 2.0 protocol analyzer featuring 21 ns resolution. This analyzer allows you to monitor what is happening on the USB bus in real time.

Total Phase Beagle I²C/SPI Protocol Analyzer (TTP100003)

The versatile Beagle I²C/SPI Protocol Analyzer (Total Phase TP320121) is the ideal tool for the embedded engineer who is developing an I²C-or SPI-based product.

Total Phase Aardvark I²C/SPI Host Adapter (TTP100005)

The Aardvark I²C/SPI Host Adapter (Total Phase TP240141) is a fast and powerful I²C bus and SPI bus host adapter through USB. It allows you to interface a Windows, Linux, or Mac OS X PC via USB to a downstream embedded system environment and transfer serial messages using the I²C and SPI protocols.

Total Phase I²C Development Kit (TTP100006)

The I²C Development Kit by Total Phase (TP120112) is a comprehensive and cost-effective kit that bundles together a complete set of Total Phases, industry-leading I²C development tools and popular accessories. With this kit, you can exercise target devices on an I²C bus as a master device, simulate an I²C master or slave device, program and verify I²C-based devices and passively monitor an I²C bus in real time with bit-level timing down to 20 ns.

Total Phase Komodo™ CAN Duo Interface (TTP100008)

The Komodo CAN Duo Interface (Total Phase TP360110) is a two-channel USB-to-CAN adapter and analyzer. The Komodo interface is an all-in-one tool capable of active CAN data transmission and non-intrusive CAN bus monitoring. The Komodo CAN Duo Interface features two independently customizable CAN channels, a royalty-free API and cross-platform support for Windows, Linux, and Mac OS X.

Wi-Fi

CCS EZ Web Lynx Wi-Fi Development Kit (TDKEZWIFI-DEV)

This low-cost kit includes all hardware, software and documentation needed to speed integration of EZ Web Lynx Wi-Fi modules into your design. Monitor and control analog and digital I/O on the docking station using custom HTML tags. Use the IDE to develop custom dynamic web pages and send alarm/status emails simply by programming in HTML.



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