

## Integrated Software Framework v2.04

### STANDARD FEATURES

- MPLAB® Harmony is a flexible, abstracted, fully integrated firmware development platform for PIC32 microcontrollers
- Broad range of Middleware Stack/Libraries, including: USB, TCP/IP, Wi-Fi™, File System, Graphics, Bootloaders, Bluetooth™, Audio, DSP, Math, Cryptography, Drivers, System Services, and more
- Over 160 Application Demonstrations with up to 600 application configurations to accelerate application development
- Seamlessly integrates third-party solutions (RTOS, Middleware, Drivers, etc.) into the software framework
- RTOS support, which includes: FreeRTOS™, OPENRTOS, Express Logic Thread X, SEGGER embOS®, Micrium® µC/OS-II™, Micrium µC/OS-III™
- Middleware support, which includes: SEGGER emWin®, InterNiche Technologies, Inc., wolfSSL, and PubNub®
- Both free and enabling license terms provided

For a detailed list of features, please visit the MPLAB Harmony Web page at:

[www.microchip.com/harmony](http://www.microchip.com/harmony)

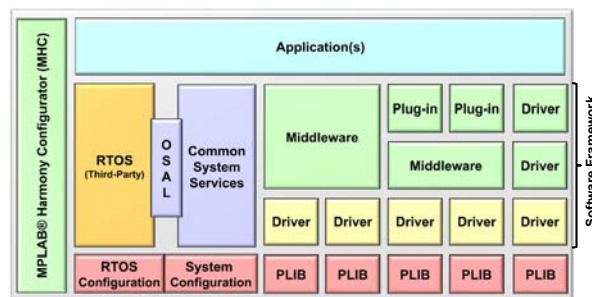
From the landing page, scroll down and select the **Features** tab.

### DESCRIPTION

MPLAB Harmony is a flexible, abstracted, fully integrated firmware development platform for PIC32 microcontrollers. MPLAB Harmony's modular architecture allows drivers and libraries to work together with minimal effort. It is scalable across PIC32 Microchip devices to custom fit customers' requirements.

MPLAB Harmony takes key elements of modular and object oriented design, adding an Operating System Abstraction Layer (OSAL) that provides the flexibility to use a Real-Time Operating System (RTOS) or work without one, and provides a framework of software modules that are easy to use, configurable for your specific needs, and that work together in complete harmony.

In addition, the MPLAB Harmony Configurator (MHC) and code development format allows for maximum reuse and reduces time to market.



### COMPLIANCE

Compliant with MISRA-C:2012 Mandatory Standards:

- MPLAB Harmony Peripheral Libraries
- TCP/IP Library

### DEVELOPMENT TOOLS

- MPLAB X IDE v4.0 or later is required
- MPLAB XC32 C/C++ Compiler v1.44 (ISO 26262)
- MPLAB X IDE plug-ins:
  - MPLAB Harmony Configurator (MHC) v2.04.xx

### THIRD-PARTY DEVELOPERS

Microchip offers a range of documentation to assist you with the design of your own software offerings for MPLAB® Harmony. These documents, which are provided with the installation Help, are also available for download from the MPLAB Harmony website (see **"Download Information"** for details).

- MPLAB Harmony Overview
- MPLAB Harmony Compatibility Guide
- MPLAB Harmony Tutorial
- MPLAB Harmony Driver Development Guide
- MPLAB Harmony Configurator User's Guide
- MPLAB Harmony Configurator Developer's Guide
- MPLAB Harmony Graphics Composer User's Guide
- MPLAB Harmony Test Harness User's Guide
- MPLAB Harmony Compatibility Checklist Worksheet

# MPLAB HARMONY v2.04

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## v2.04 FEATURE UPDATES AND ADDITIONS

### *Aria User Interface Library:*

- Improved drawing performance
- Added caching and pre-emption options
- Updated touch driver for maXTouch support, performance

### *MPLAB Harmony Graphics Composer:*

- New windows environment, docking, organization
- Enhanced asset manager, filtering, graphical displays
- Screen edit copy plus paste, zoom

### *External Display Controllers:*

- SSD1963 – new driver and example using PIC32MK devices
- ILI9488 – new drivers for SPI, parallel interfaces, maXTouch Xplained Ultra board
- 8-bit display buffer for LCCG, new global palette options
- Updated GPU library, new application examples for PIC32MZ DA devices
- Updated display manager to support above driver templates

### *New Application Examples:*

- BM64 Bluetooth BLE communication
- 8-bit palette support with simple motion
- External graphics assets from SQI memory and USB MSD
- Updates to graphics using GPU in the aria\_coffee\_maker demonstration
- New application example for PIC32MK using SSD1963
- New example with multiple language support for the SEGGER emWin Graphics Library
- Updated examples showing the 5" WVGA display
- Updated audio decoder using FLAC
- New application for audio encoding example to USB MSD plus FS
- Multiple new graphics and audio application configurations for PIC32MX devices

### *DSP Library:*

- Added CMSIS Library and support
- Revised C Math libraries, updated to include multiple family support

### *Third Party:*

- Updated WolfSSL with TLS 1.3 support

## DOWNLOAD INFORMATION

MPLAB Harmony, including the current release notes and Software License Agreement, is available for download by visiting:

<http://www.microchip.com/mplabharmony>

## ADDITIONAL RESOURCES

**MPLAB Harmony TV** offers a wide range of getting started and training videos. The video content is available by scrolling to the bottom of the MPLAB Harmony webpage at:

<http://www.microchip.com/mplabharmony>

The **Microchip Developer Site** provides short introductory videos, self-paced training modules, and answers to frequently asked questions.

<http://microchip.wikidot.com/harmony:start>