

## Integrated Software Framework v2.02b

### 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)

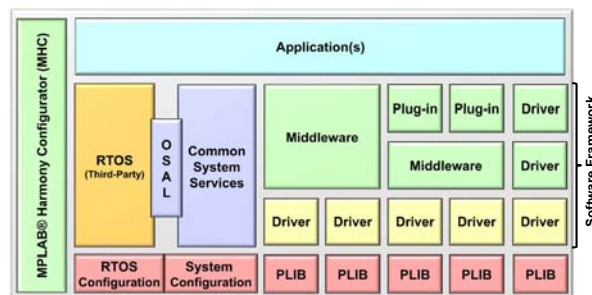
From the landing page, scroll down and select the **Features** tab.

### 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

### DEVELOPMENT TOOLS

- MPLAB X IDE v3.40 or later is required
- MPLAB XC32 C/C++ Compiler v1.42 (ISO 26262)
- MPLAB X IDE plug-ins:
  - MPLAB Harmony Configurator (MHC) v2.01.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 v2.02b

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## v2.02b FEATURE UPDATES AND ADDITIONS

MPLAB Harmony v2.02b includes the following updates and additions:

Updated graphics tool chain, now MPLAB Harmony Composer Suite

- Revised display manager / driver generator
- Revised MPLAB Harmony Graphics Composer (MHGC)
  - New widget toolbox (all new functions)
  - New resource manager / viewer
  - New drawing tree manager
  - New string & font manager
  - Revised image manager / editor
  - Revised event manager
- Replaced graphics library
  - Removed GOL library
  - New 'Aria' Graphics library
- New Hardware Abstraction Layer (HAL)
  - Used as interface to Aria or third party engines
- Replaced image input engine
  - Removed GRC input tool
  - New Graphic Asset Converter (GAC)
  - Enabled PNG, GIF, JPEG and BMP native formats
  - New PNG decoder
- New Application / Demonstrations
  - 3 new graphics demos (more to come)
  - Renamed for tool chain clarity
  - 1 demo (audio) revised to use the framework
- Revised SEGGER emWin demos & library
  - Now use new HAL interface
  - Renamed for clarity
  - 2 graphics demos + 1 audio demo
  - Library was updated to v5.38

New audio applications

- emWin Media Player
  - PIC32 MZ + MEB2 media player using SEGGER emWin graphics
- SDCARD USB Audio
  - PIC32 MZ + MEB 2 MP3 audio player from SD card
  - Used to accompany new eLearning / quick start guides
- Other demonstrations revised to be compatible with new graphics
  - Many will be updated in the next release

New USB application

- USB multiple LUNs (logical units)
- Demonstrates multiple mounted drives

Added ADC Configuration tool for ADCHS version of ADC driver

- Added MIPS16 support for uCOS III and ThreadX RTOS
- Added SDR support for SQL driver

## Utilities:

- MHC and MPLAB Harmony Graphics Composer
  - Configuration Import/Export/Move/Copy
  - Updated pin management features

Please refer to the v2.02b Release Notes for additional information (see "[Download Information](#)").

## 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>

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**Note the following details of the code protection feature on Microchip devices:**

- Microchip products meet the specification contained in their particular Microchip Data Sheet.
- Microchip believes that its family of products is one of the most secure families of its kind on the market today, when used in the intended manner and under normal conditions.
- There are dishonest and possibly illegal methods used to breach the code protection feature. All of these methods, to our knowledge, require using the Microchip products in a manner outside the operating specifications contained in Microchip's Data Sheets. Most likely, the person doing so is engaged in theft of intellectual property.
- Microchip is willing to work with the customer who is concerned about the integrity of their code.
- Neither Microchip nor any other semiconductor manufacturer can guarantee the security of their code. Code protection does not mean that we are guaranteeing the product as “unbreakable.”

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