

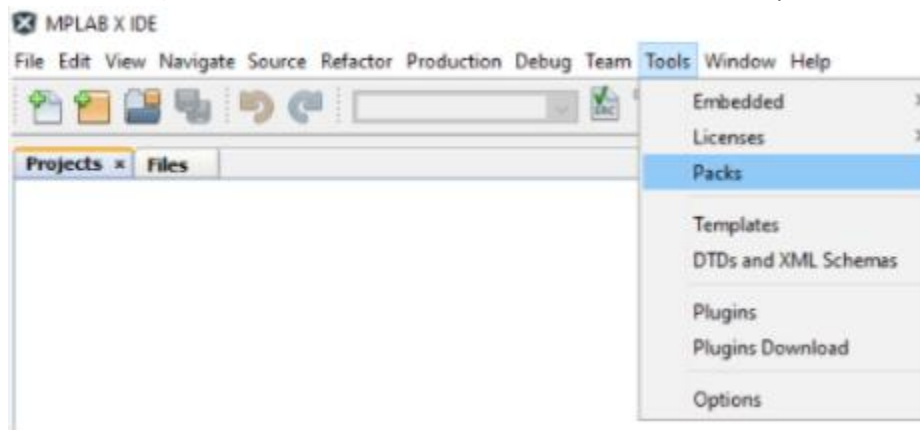


MPLAB® Code Configurator Setup for Software Development on PIC32CX_BZ2/WBZ45x

Pre-requisite: Clone the EA71C53A repo available at <https://github.com/MicrochipTech/EA71C53A>

1. Install MPLAB x IDE, instructions available in EA71C53A\MPLAB X IDE folder
2. Install XC32 Compiler, instructions available in EA71C53A\Compiler
3. Install Device Family Part Pack, located in EA71C53A\MPLAB X IDE

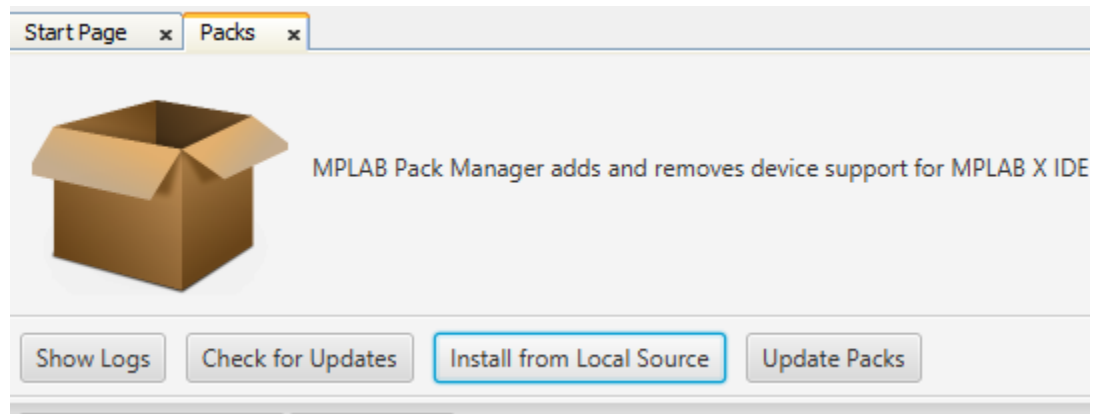
Device Family Packs are device description files (.PIC files for PIC® devices, .ATDF files for AVR® and SAM devices), which contain SFR names, memory regions, programming information. Device-dependent source code files (i.e., peripheral header files) are being moved to DFPs. XC8 (AVR target) and XC32 (SAM target) are implemented today. Libraries will be part of the DFP on XC8 (AVR, CSTARTUP) and XC32 – XC16 will store the libraries in the compiler directory.



3.1 Open the MPLAB X IDE and select Tools > Packs

3.2 Click “Install from Local Source”

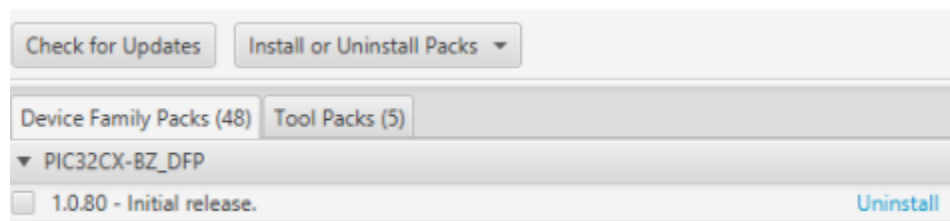




3.3 **Locate (EA71C53A\MPLAB X IDE) and select the device family pack **Microchip.PIC32CX-BZ_DFP-1.0.xx** in **MPLAB X IDE** directory**

Local Disk (C:) > EA71C53A > MPLAB X IDE				
	Name	Date modified	Type	Size
	Microchip.PIC32CX-BZ_DFP-1.0.80	1/27/2022 10:55 PM	Atmel Pack File	3,504 KB
	MPLABX_IDE	1/26/2022 7:47 PM	Adobe Acrobat D...	86 KB

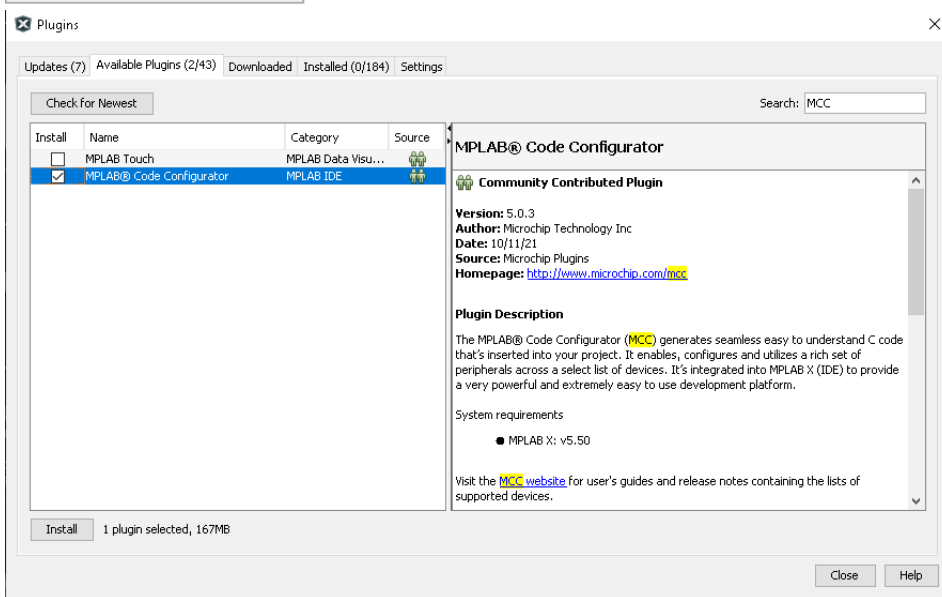
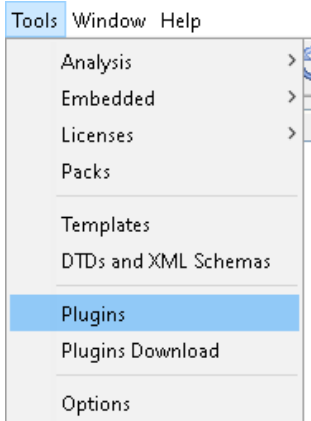
3.4 **Verify** the installation of device family pack by searching in the window – search for “bz” keyword



Restart MPLAB X IDE

4. Install MCC plugin in the IDE, restart the IDE after installation

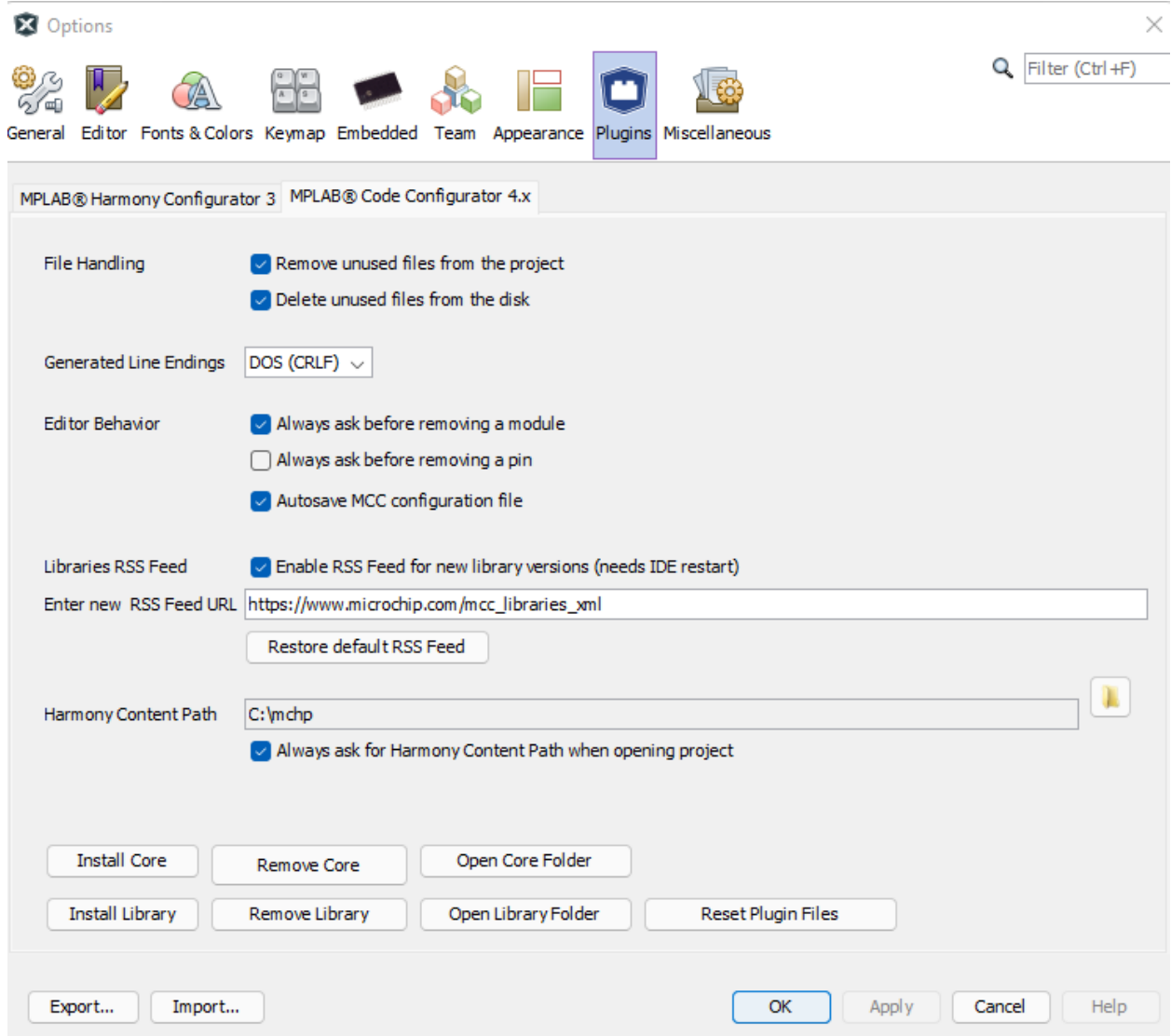




5. Configure the Plugin Options

Several aspects of the operation of the MCC can be managed by using the “Options” panel (see figure below), which can be invoked by clicking Tools → Options → Plugins → MPLAB Code Configurator in the menu bar of the MPLAB X IDE.





Note: “Harmony Content Path” should be in root directory (maximum 1 folder deep and folder name cannot exceed 4 letters)

For example -> **C:\mchp** or **C:\test** are **acceptable** “Harmony Content Path”



C:\Microchip

C:\test\microchip **are not acceptable** path choices.

This note is added to avoid a known issue of Maximum File path, see [here](#) for more information

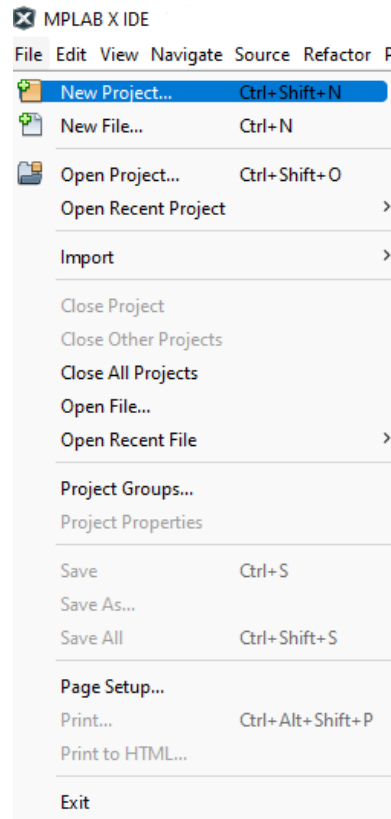




6. Clone the Harmony repositories (required content for SW Development) using MCC Content Manager Wizard

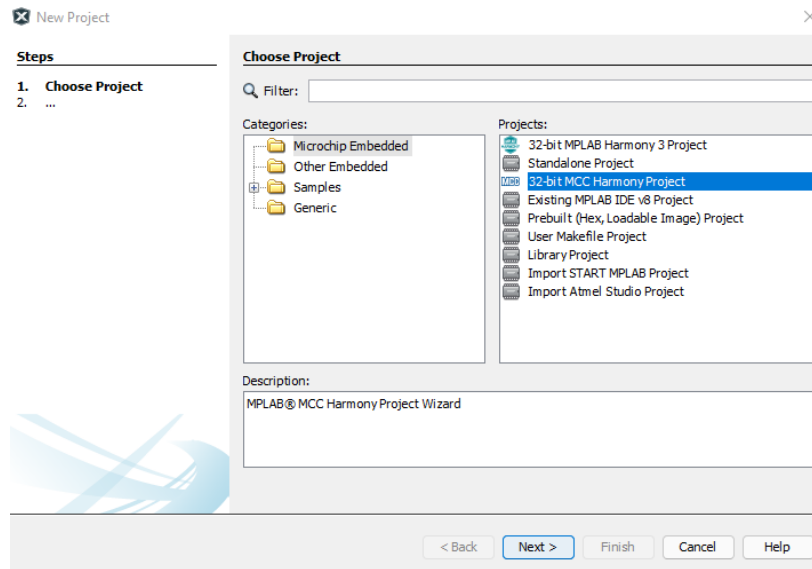
- 6.1 Create a new “MCC Harmony” project (In order to clone the Harmony repositories user needs to create an empty project and clone the required repositories)

- 6.1.1 Select “New Project”

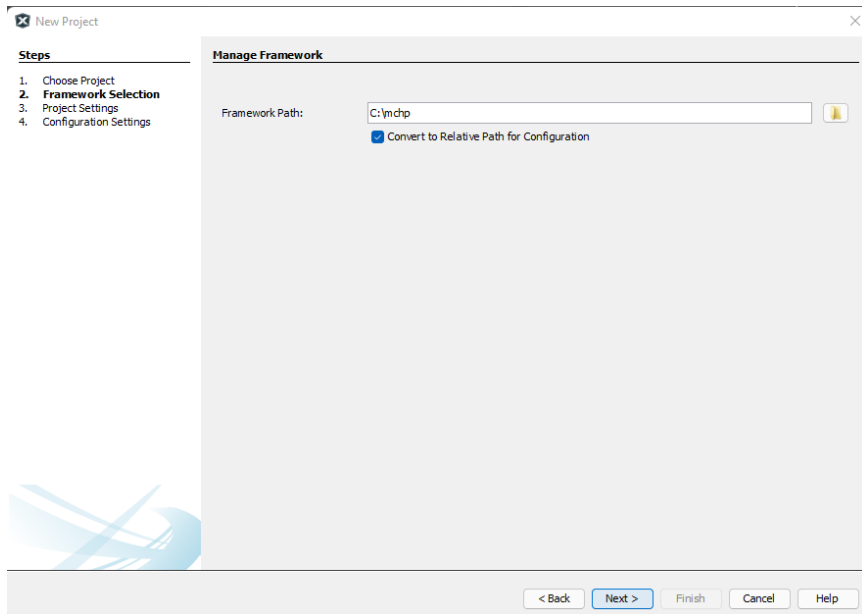


- 6.1.2 Select “32-bit MCC Harmony Project”





6.1.3 Framework Selection



6.1.4 Project Settings





New Project

Steps

1. Choose Project
2. Framework Selection
3. **Project Settings**
4. Configuration Settings

Name and Location

Location: C:\Users\user\HarmonyProjects\MyProject_4

Folder: newProject

Name:

Path: C:\Users\user\HarmonyProjects\MyProject_4\firmware\newProject.X

Show Visual Help

< Back Next > Finish Cancel Help

6.1.5 Configuration Settings

New Project

Steps

1. Choose Project
2. Framework Selection
3. Project Settings
4. **Configuration Settings**

Configuration Settings

Name: default

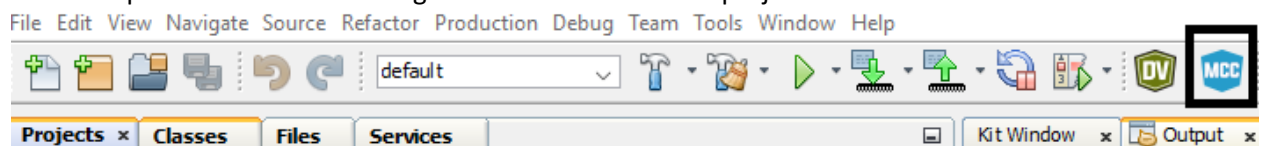
Device Family: WBZ Target Device: WB2451

Device Filter:

Show Visual Help

< Back Next > Finish Cancel Help

6.2 Open “MPLAB Code Configurator” after creation of project



MCC content manager window will appear in IDE

6.3 Select “MPLAB Harmony” from the content manager window





MCC Content Manager Wizard

1. Content Type 2. Required Device Content

Select a Content Type

MCC Melody ⓘ Supports the MCC Builder Supports content versioning at driver level An Iteration of MCC Generated Code Works both on- and off-line Release notes and supported devices Select MCC Melody	MCC Classic ⓘ Development process you are accustomed to All components and libraries that you have used before Release notes and supported devices Select MCC Classic	MPLAB® Harmony ⓘ Embedded Software Development Framework for 32-bit Microcontrollers and Microprocessors Release notes and supported devices Select MPLAB Harmony
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Library support may be a key factor in your choice of MCC flavor:

> MCC Melody and MCC Classic - Library Summary	> MPLAB Harmony - Library Summary
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Still unsure which content type is right for your project?

[See More Details](#)

Select “Optional Content” as shown below





Optional Content

Select optional content to be made available in Device Resources for selection

Optional Content		
Component	Version	Description
> <input type="checkbox"/> Harmony Bootloader		
> <input type="checkbox"/> Harmony Chip Support Package		
> <input type="checkbox"/> Harmony Networking Stack and Solutions		
> <input type="checkbox"/> Harmony USB solutions		
▼ <input type="checkbox"/> Harmony Core		
<input checked="" type="checkbox"/> bsp	3.10.0	
<input checked="" type="checkbox"/> core	3.10.0	
<input checked="" type="checkbox"/> zlib	1.2.11	
▼ <input type="checkbox"/> Harmony Cryptography solutions		
<input checked="" type="checkbox"/> crypto	3.7.5	
<input type="checkbox"/> crypto_apps_encrypt_decrypt	3.7.1	
<input type="checkbox"/> crypto_apps_large_hash	3.7.1	
<input type="checkbox"/> crypto_apps_speed_test	3.7.1	
> <input type="checkbox"/> Harmony Aerospace solutions		
> <input type="checkbox"/> Harmony Graphics (Aria) solutions		
> <input type="checkbox"/> Harmony CryptoAuthLib solutions		
> <input type="checkbox"/> arm Mbed OS		
> <input type="checkbox"/> Harmony Capacitive Touch solutions		
> <input type="checkbox"/> Harmony littlefs solutions		
> <input type="checkbox"/> Harmony AWS solutions		
▼ <input type="checkbox"/> Harmony WolfSSL solutions		
<input type="checkbox"/> wolfMQTT	1.7.1	
<input type="checkbox"/> wolfssh	1.4.1	
<input checked="" type="checkbox"/> wolfssl	4.7.0	
> <input type="checkbox"/> X2C for Harmony		
▼ <input checked="" type="checkbox"/> CMSIS FreeRTOS		
<input checked="" type="checkbox"/> CMSIS-FreeRTOS	10.3.1	

Ensure all components are selected as displayed below (ignore versions for now). Version selection will be done at a later stage





Kit Window

Output

Start Page

Content Manager

MCC Content Manager Wizard

[1. Content Type](#)
[2. Required Device Content](#)

Finish

Required Content

Some required content must be downloaded. The following content will be downloaded when you click on "Finish".
To change content versions later, access the Content Manager from Device Resources.

Component	Version
csp	3.10.0
mhc	3.8.2
quick_docs	1.4.0
dev_packs	3.10.0
bsp	3.10.0
core	3.10.0
CMSIS-FreeRTOS	10.3.1
crypto	3.7.5
zlib	1.2.11
wolfssl	4.7.0

Select "Finish" The downloading of selected components from harmony repositories will take some minutes.

If all the selected components are cloned successfully, MCC logs in IDE will display this information

Output

Search Results

Kits

Configuration Loading Error

MPLAB® Code Configurator

MCC Log

```

21:55:43.015    INFO: Available content:
Device provider: (CLASSIC) com.microchip.mcc.harmony.Harmony3Library 1.0.3 @ C:\Users\cl7143\.mcc\libraries\harmony3library-1.0.3.mc3lib
Content mode: HARMONY
Content:
(CLASSIC) com.microchip.mcc.harmony.Harmony3Library 1.0.3 @ C:\Users\cl7143\.mcc\libraries\harmony3library-1.0.3.mc3lib
(HARMONY) CMSIS-FreeRTOS 10.3.1 @ C:\mchp\CMSIS-FreeRTOS
(HARMONY) bsp 3.10.0 @ C:\mchp\bsp
(HARMONY) core 3.10.0 @ C:\mchp\core
(HARMONY) crypto 3.7.5 @ C:\mchp\crypto
(HARMONY) csp 3.10.0 @ C:\mchp\csp
(HARMONY) dev_packs 3.10.0 @ C:\mchp\dev_packs
(HARMONY) mhc 3.8.2 @ C:\mchp\mhc
(HARMONY) quick_docs 1.4.0 @ C:\mchp\quick_docs
(HARMONY) wolfssl 4.7.0 @ C:\mchp\wolfssl
(HARMONY) zlib 1.2.11 @ C:\mchp\zlib
21:55:43.066    INFO: Adding library com.microchip.mcc.harmony.Harmony3Library v1.0.3
21:55:43.070    INFO: Loading libraries : Start
21:55:43.078    INFO: Adding library com.microchip.mcc.harmony.Harmony3Library v1.0.3
21:55:43.187    INFO: Loading library "com.microchip.mcc.harmony.Harmony3Library", version 1.0.3, revision unknown, built from core version 5.3.0-melody-test-q.
21:55:43.188    INFO: Loading libraries : Success
  
```

If in the process a failure to download a particular component appears, try redownloading again only the component that failed to download.

For example, if user received a prompt from MCC saying "dev_packs" was not download, close the MCC reopen MCC again and start from step 3, with the "dev_packs" as the only missing component for downloading and select "Finish"





Kit Window x Output x Start Page x Content Manager x

MCC Content Manager Wizard

[1. Content Type](#) [2. Required Device Content](#) [Finish](#)

Required Content

Some required content must be downloaded. The following content will be downloaded when you click on To change content versions later, access the Content Manager from Device Resources.

Component ↑↓	Version ↑↓
dev_packs	3.10.0

Optional Content

Select optional content to be made available in Device Resources for selection

7. Select/Confirm the Harmony Framework Path

HarmonyFramework

Select the HarmonyFramework path

Path:

Next Choose Path Default

Note: Framework Path selection window appears beneath the Initializing Project pop-up, users should Choose Path as “C:\mchp”

HarmonyFramework

Select the HarmonyFramework path ☒ Skip DFP and CMSIS Selection

Path:

Next Choose Path Default

Project Graph Window will appear after choosing the framework path and successful initialization of project

File Edit View Navigate Source Refactor Production Debug Team Tools Window Help

Projects Files Classes Resource Management [MCC] x

Project Resources

- Libraries
- Harmony
- System
- System

Device Resources

Content Manager

getch: Noninter... semiproject - Dashboard Core Versions [MCC] x

MCC Core Versions

- Libraries
- Libraries may be updated in the Content Manager.

Kit Window x Start Page x Project Graph x

View: Root

Device Family Pack (DFP) System CMSIS Pack

8. Change content versions as mentioned below in the table using the content manager from Device Resources and select “Apply”

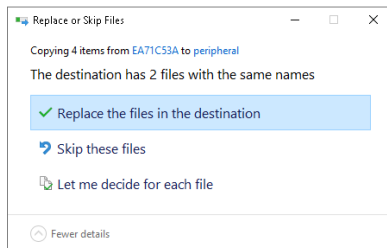


csp	3.10.0	MPLAB® Code Configurator Content Manager
core	3.10.0	MPLAB® Code Configurator Content Manager
mhc	3.8.0	MPLAB® Code Configurator Content Manager
dev_packs	3.10.0	MPLAB® Code Configurator Content Manager
bsp	3.10.0	MPLAB® Code Configurator Content Manager
CMSIS-FreeRTOS	10.3.1	MPLAB® Code Configurator Content Manager
crypto	3.7.2	MPLAB® Code Configurator Content Manager
wolfssl	4.7.0	MPLAB® Code Configurator Content Manager
wireless	211211	EA71C53A\H3
PIC32CX-BZ_DFP	1.0.80	EA71C53A \MPLAB X IDE

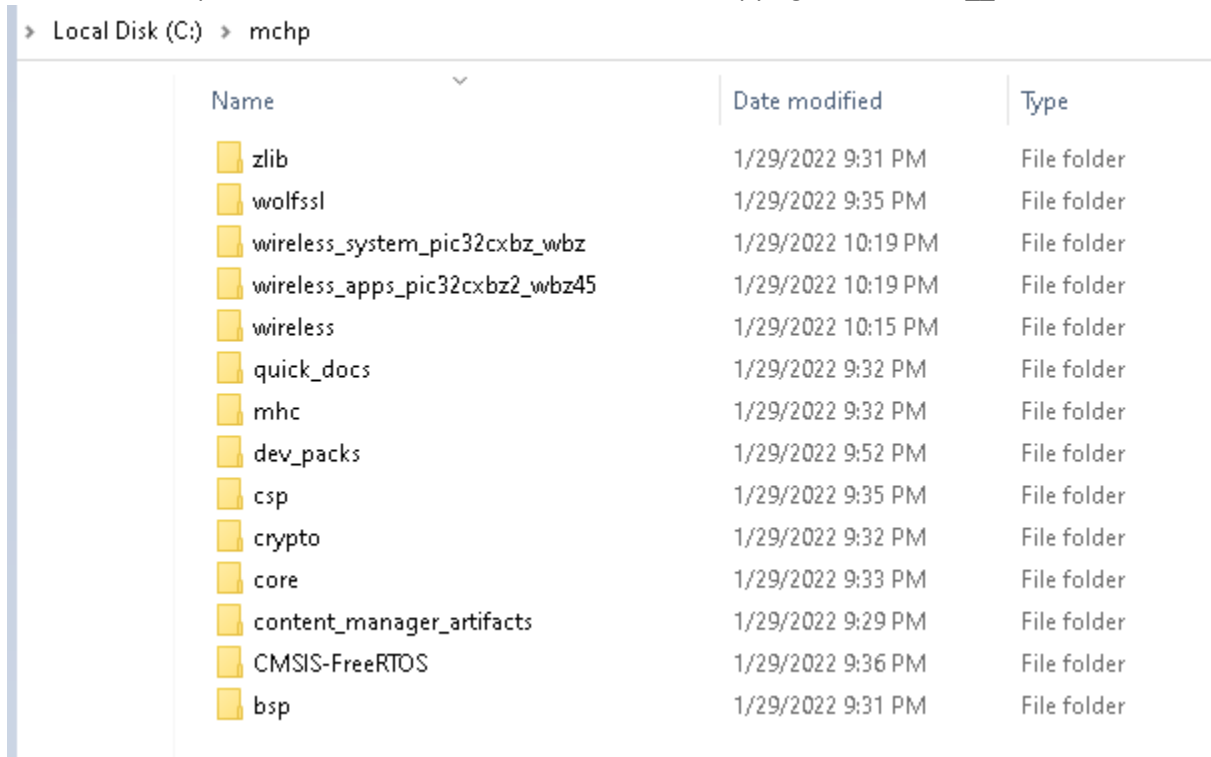


Wireless_system_pic32cxbz_wbz		EA71C53A \H3\
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9. After successfully checking out the right version of content/components, Harmony Framework needs to be selected again and Project will be reinitialized with the new versions of content
 - Follow instructions mentioned in step 7 -
10. Copy the “clk_pic32cx_bz” folder located in “EA71C53A\” folder to “C:\mchp\csp\peripheral” folder, A prompt will appear warning destination has same file names - Select "Replace the file in the destination".



11. Copy the “wireless__” folders (3) located in “EA71C53A\H3” to “C:\mchp”
Here is an example of how the folder should look like after copying the “wireless__” content



Next Steps





12. Open existing application examples/ develop a new application – visit -
mchp\wireless_apps_pic32cxbz2_wbz45\apps\

13. How to open, build and program an existing application example

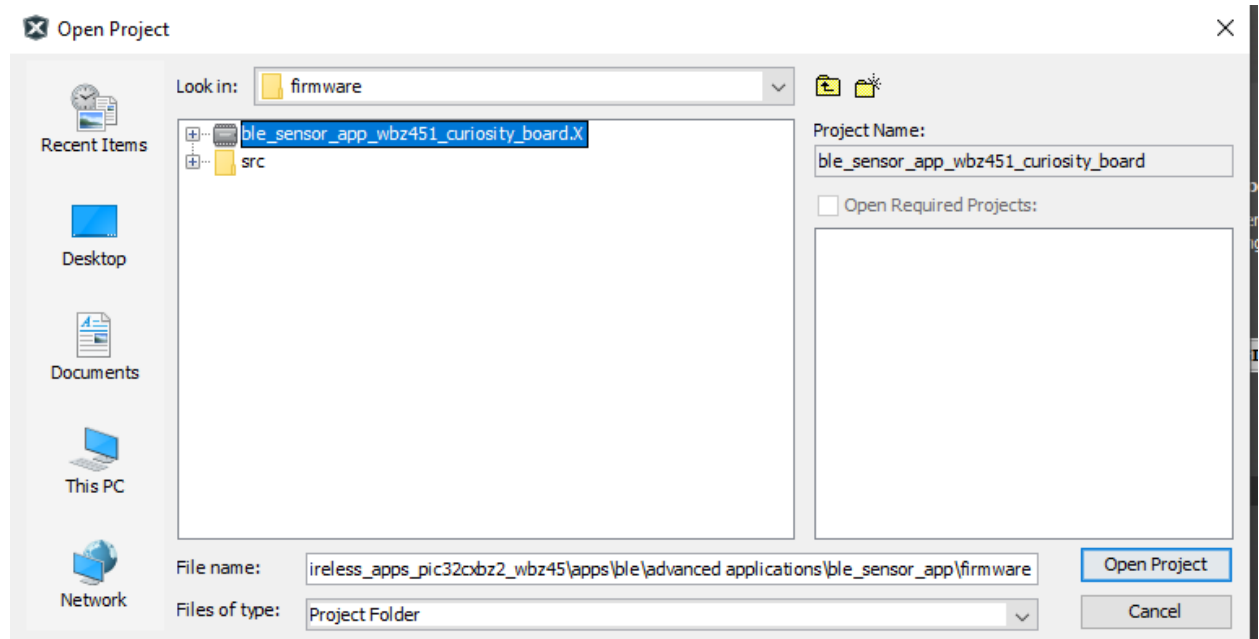
Pre-requisites: Complete steps 1-11

13.1 Connect Curiosity Board to the PC using usb cable

13.2 Open MPLAB IDE

13.3 Select **File > Open Project**

13.4 Select the project from C:\mchp\wireless_apps_pic32cxbz2_wbz45\apps\ble\advanced applications\ble_sensor_app\firmware



Information related to the workings of the application example are available in readme.md file available in the ble_sensor_app folder or Getting Started html

13.5 Open Project Properties

13.5.1 Select WBZ451 Curiosity Board as hardware tool for programming

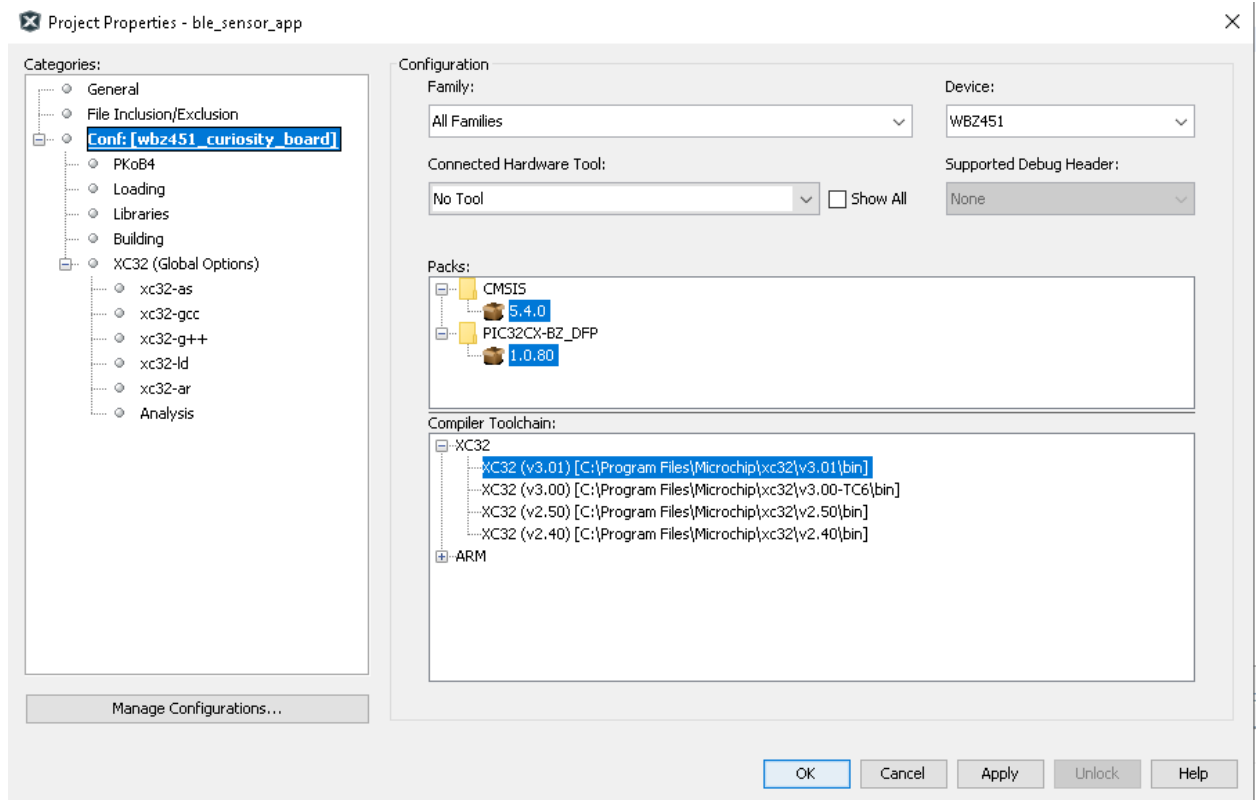
13.5.2 Ensure DFP v1.0.xx is selected and CMSIS v5.4.0

Note: DFP version should match the version mentioned in table 1

13.5.3 select XC32 v3.01 compiler (in case user has several versions of XC32 compilers installed)

Note: Compiler version should match the version mentioned in table 1





13.6 Select option **Build Project** in IDE to compile the application example



13.7 Plug the Curiosity Development board to PC using usb cable

13.8 Select option **Run Project** in IDE to program the target – the onboard debugger will program the example application



Note: A smartphone App might be needed to explore the full feature set of Application examples, users can refer to readme.md (markdown reader recommended) available in respective Application Example folder or Getting Started html points to the instructions of the Application example

