



PROGRAMMING PROCEDURE:
EV64F02A Mixed Signal Data Capture
Evaluation Board

Microchip Information

Trademarks

The “Microchip” name and logo, the “M” logo, and other names, logos, and brands are registered and unregistered trademarks of Microchip Technology Incorporated or its affiliates and/or subsidiaries in the United States and/or other countries (“Microchip Trademarks”). Information regarding Microchip Trademarks can be found at <https://www.microchip.com/en-us/about/legalinformation/microchip-trademarks>.

ISBN:

Legal Notice

This publication and the information herein may be used only with Microchip products, including to design, test, and integrate Microchip products with your application. Use of this information in any other manner violates these terms. Information regarding device applications is provided only for your convenience and may be superseded by updates. It is your responsibility to ensure that your application meets with your specifications. Contact your local Microchip sales office for additional support or, obtain additional support at www.microchip.com/en-us/support/design-help/client-support-services.

THIS INFORMATION IS PROVIDED BY MICROCHIP "AS IS". MICROCHIP MAKES NO REPRESENTATIONS OR WARRANTIES OF ANY KIND WHETHER EXPRESS OR IMPLIED, WRITTEN OR ORAL, STATUTORY OR OTHERWISE, RELATED TO THE INFORMATION INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY, AND FITNESS FOR A PARTICULAR PURPOSE, OR WARRANTIES RELATED TO ITS CONDITION, QUALITY, OR PERFORMANCE.

IN NO EVENT WILL MICROCHIP BE LIABLE FOR ANY INDIRECT, SPECIAL, PUNITIVE, INCIDENTAL, OR CONSEQUENTIAL LOSS, DAMAGE, COST, OR EXPENSE OF ANY KIND WHATSOEVER RELATED TO THE INFORMATION OR ITS USE, HOWEVER CAUSED, EVEN IF MICROCHIP HAS BEEN ADVISED OF THE POSSIBILITY OR THE DAMAGES ARE FORESEEABLE. TO THE FULLEST EXTENT ALLOWED BY LAW, MICROCHIP'S TOTAL LIABILITY ON ALL CLAIMS IN ANY WAY RELATED TO THE INFORMATION OR ITS USE WILL NOT EXCEED THE AMOUNT OF FEES, IF ANY, THAT YOU HAVE PAID DIRECTLY TO MICROCHIP FOR THE INFORMATION.

Use of Microchip devices in life support and/or safety applications is entirely at the buyer's risk, and the buyer agrees to defend, indemnify and hold harmless Microchip from any and all damages, claims, suits, or expenses resulting from such use. No licenses are conveyed, implicitly or otherwise, under any Microchip intellectual property rights unless otherwise stated.

Microchip Devices Code Protection Feature

Note the following details of the code protection feature on Microchip products:

- Microchip products meet the specifications contained in their particular Microchip Data Sheet.
- Microchip believes that its family of products is secure when used in the intended manner, within operating specifications, and under normal conditions.
- Microchip values and aggressively protects its intellectual property rights. Attempts to breach the code protection features of Microchip product is strictly prohibited and may violate the Digital Millennium Copyright Act.
- Neither Microchip nor any other semiconductor manufacturer can guarantee the security of its code. Code protection does not mean that we are guaranteeing the product is “unbreakable”. Code protection is constantly evolving. Microchip is committed to continuously improving the code protection features of our products.

Preface

Chapter 1.

All documentation becomes dated, and this manual is no exception. Microchip tools and documentation are constantly evolving to meet customer needs, so some actual dialogs and/or tool descriptions may differ from those in this document. Please refer to our website (microchip.com) to obtain the latest documentation available.

Documents are identified with a “DS” number. This number is located on the bottom of each page, in front of the page number. The numbering convention for the DS number is “DSXXXXXXXXA”, where “XXXXXXXX” is the document number and “A” is the revision level of the document.

For the most up-to-date information on development tools, see the MPLAB® IDE online help. Select the Help menu, and then Topics, to open a list of available online help files.

INTRODUCTION

This chapter contains general information that is useful to know before using the Mixed-Signal Explorer GUI. Items discussed in this chapter include:

- [Document Layout](#)
- [Conventions Used in this Guide](#)
- [Recommended Reading](#)
- [The Microchip Website](#)
- [Product Change Notification Service](#)
- [Customer Support](#)
- [Document Revision History](#)
- [Index](#)

DOCUMENT LAYOUT

This document describes different methods on how to upgrade the firmware on the Data Capture Board. The manual layout is as follows:

- **Chapter 1. “Method 1: Using Mixed-Signal Explorer GUI”** – Important information about the upgrade of firmware using the Mixed-Signal Explorer GUI.
- **Chapter 2. “Method 2: Using MCHP USB Service”** – Describes how the MCHP USB Service can be used to upgrade the firmware
- **Chapter 3. “Method 3: Using Java Bootloader Application”** – Describes the firmware update using the Java Bootloader Application

MIXED-SIGNAL EXPLORER GUI USER'S GUIDE

CONVENTIONS USED IN THIS GUIDE

This manual uses the following documentation conventions:

DOCUMENTATION CONVENTIONS

| Description | Represents | Examples |
|--|---|------------------------------------|
| Arial font: | | |
| Italic characters | Referenced books | <i>MPLAB® IDE User's Guide</i> |
| | Emphasized text | ...is the <i>only</i> compiler... |
| Initial caps | A window | the Output window |
| | A dialog | the Settings dialog |
| | A menu selection | select Enable Programmer |
| Quotes | A field name in a window or dialog | "Save project before build" |
| Underlined, italic text with right angle bracket | A menu path | <u><i>File > Save</i></u> |
| Bold characters | A dialog button | Click OK |
| | A tab | Click the Power tab |
| N'Rnnnn | A number in verilog format, where N is the total number of digits, R is the radix and n is a digit. | 4'b0010, 2'hF1 |
| Text in angle brackets < > | A key on the keyboard | Press <Enter>, <F1> |
| Courier New font: | | |
| Plain Courier New | Sample source code | <code>#define START</code> |
| | Filenames | <code>autoexec.bat</code> |
| | File paths | <code>c:\mcc18\h</code> |
| | Keywords | <code>_asm, _endasm, static</code> |
| | Command-line options | <code>-Opa+, -Opa-</code> |
| | Bit values | <code>0, 1</code> |
| | Constants | <code>0xFF, 'A'</code> |

MIXED-SIGNAL EXPLORER GUI USER'S GUIDE

| | | |
|--|---|---|
| Italic Courier New | A variable argument | <i>file.o</i> , where <i>file</i> can be any valid filename |
| Square brackets [] | Optional arguments | mcc18 [options] <i>file</i> [options] |
| Curly brackets and pipe character: { } | Choice of mutually exclusive arguments; an OR selection | errorlevel {0 1} |
| Ellipses... | Replaces repeated text | var_name [, var_name...] |
| | Represents code -supplied by user | void main (void) { ... } |

MIXED-SIGNAL EXPLORER GUI USER'S GUIDE

RECOMMENDED READING

This user's guide describes how to use the Mixed-Signal Explorer Graphical User Interface (GUI). Other useful documents are listed below. The following Microchip documents are available and recommended as a supplemental reference resource:

- Mixed-Signal-Explorer-User-Guide.pdf
- Mixed-Signal-Explorer-Release-Notes.pdf

THE MICROCHIP WEBSITE

Microchip provides online support via our website at microchip.com where files and information are easily available to customers. The website contains the following:

- **Product Support** – Data sheets and errata, application notes and sample programs, design resources, user's guides and hardware support documents, latest software releases and archived software
- **General Technical Support** – Frequently Asked Questions (FAQs), technical support requests, online discussion groups, Microchip consultant program member listing
- **Business of Microchip** – Product selector and ordering guides, latest Microchip press releases, listing of seminars and events, listings of Microchip sales offices, distributors and factory representatives

PRODUCT CHANGE NOTIFICATION SERVICE

Microchip's customer notification service helps keep customers current on Microchip products. Subscribers receive e-mail notifications whenever there are changes, updates, revisions or errata related to a specified product family or development tool of interest.

To register, access the Microchip website at microchip.com, select **Product Change Notification** and follow the registration instructions.

CUSTOMER SUPPORT

Users of Microchip products can receive assistance through several channels:

- Distributor or Representative
- Local Sales Office
- Field Application Engineer (FAE)
- Technical Support

Customers should contact their distributor, representative or field application engineer (FAE) for support. Local sales offices are also available to help customers. A listing of sales offices and locations is included in the back of this document, under **Worldwide Sales and Service**.

Technical support is available at: microchip.com/support.

DOCUMENT REVISION HISTORY

Revision A (March 2026)

- Initial Release of this document.

Chapter 1. Method 1: Using Mixed-Signal Explorer GUI

Figure 1-1 FW Update Menu



The **Firmware Update** Menu (**Figure 1-1**) opens the Firmware Update View (**Figure 1-2**) from where the connected Data Capture board firmware can be updated.

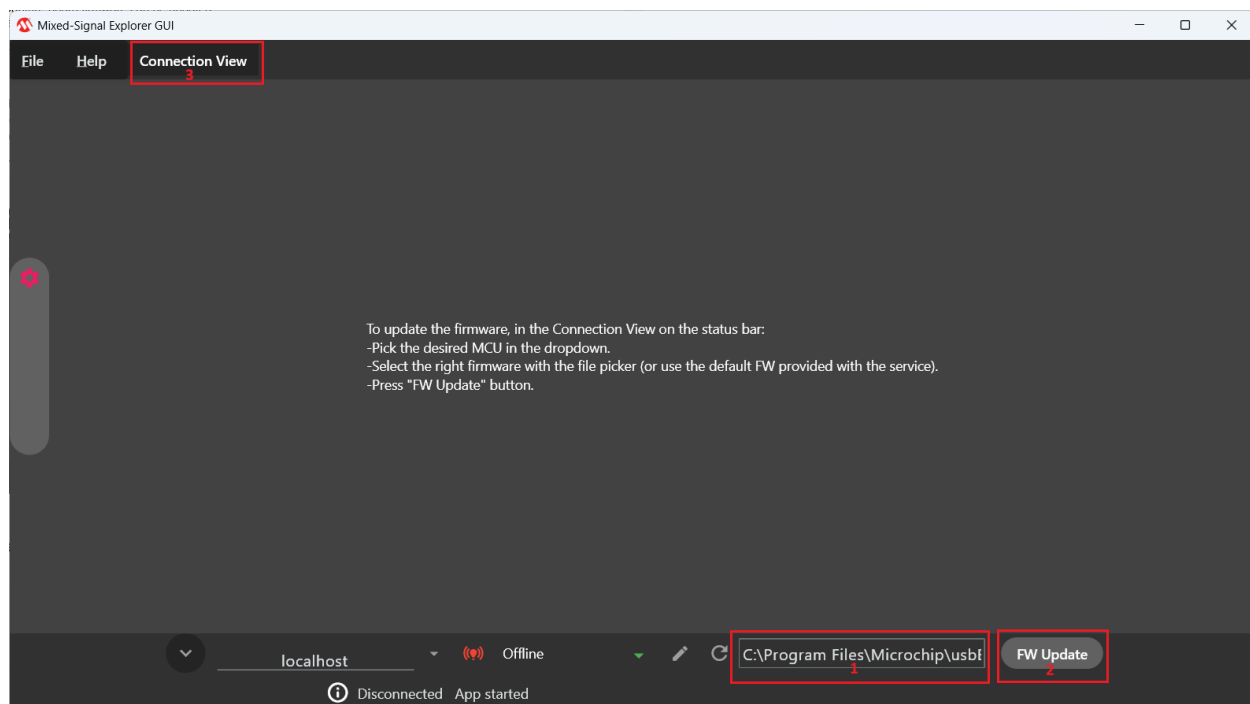
To update the firmware:

Connect to the service and select the desired device. If the Data Capture Board is not present in the dropdown, put it in bootloader mode first as per referenced instructions (see **Entering Bootloader Mode:**

)

1. The application will try to automatically select a firmware file. To manually select the file, click the **Firmware** text box (1). This opens a window to select the firmware file.
2. Select the **FW Update** button (2). A message appears on top of the bar indicating if the update succeeded or failed.
3. To switch back to the Connection View, press the **Connection View** menu button (3).

Figure 1-2 Firmware Update View



Entering Bootloader Mode:

- Press down both BOOT button and RESET button together: BOOT button first.
- The RUN and STATUS LEDs will slowly blink alternately. At this moment, release the RESET button first and after that the BOOT button.

Chapter 2. Method 2: Using MCHP USB Service

- 1) Get the `ev64f02a_pic32mz_hsbridger4_xx.xx.xxx.zip` firmware from the following location `C:\Program Files\Microchip\usbBridgeService\firmware` after installing the MCHP USB Bridge Service. You can also create your own zip file for the firmware to flash on the Data Capture Board starting from a hex file.

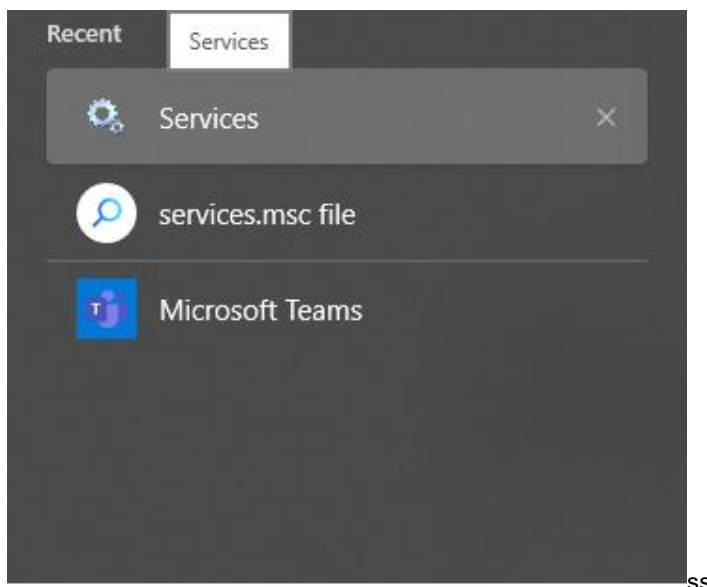
Note: The firmware is a packed zip file ready to use with MCHP USB Bridge Service.

However, if you are starting with a hex file, use the following steps:

- a. Rename the hex file as `firmware.hex` and put it in a separate folder called `firmware`
 - b. Create an `info.txt` file in the same folder with content like the following:

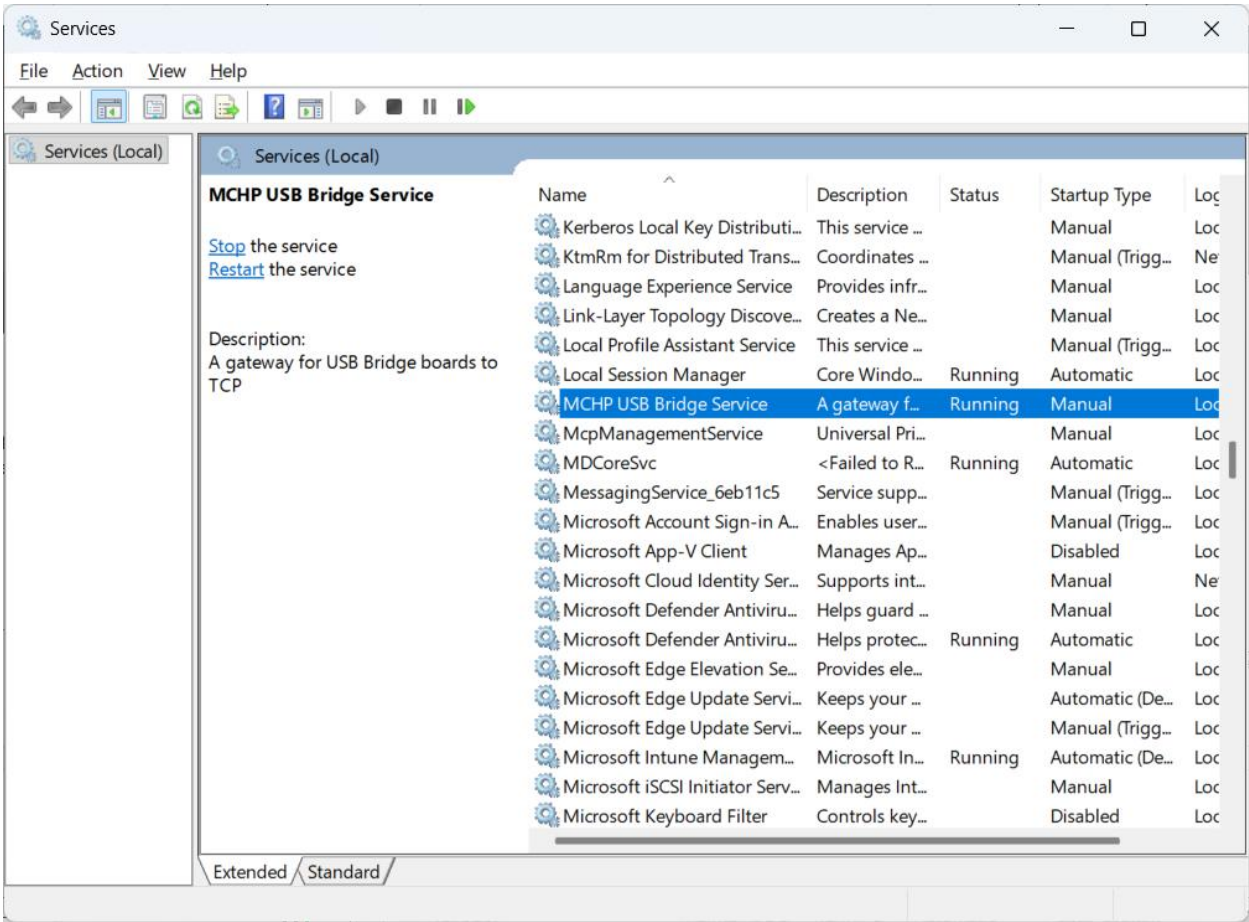
```
{ "usbDeviceType":26, "fwVersion":"24.04.001",  
  "usbDeviceName":"EV64F02A_PIC32MZ_HSbridgeR4" }
```
 - c. Zip the folder and rename the archive accordingly
- 2) Download and install the MCHP USB Bridge Service from the following page: <https://www.microchip.com/en-us/development-tool/EV64F02A>
 - 3) Start the MCHP USB Bridge Service from `services.msc` (you can find it by searching it in the search bar of Windows: Figure 2-1)

Figure 2-1 Searching for services.msc



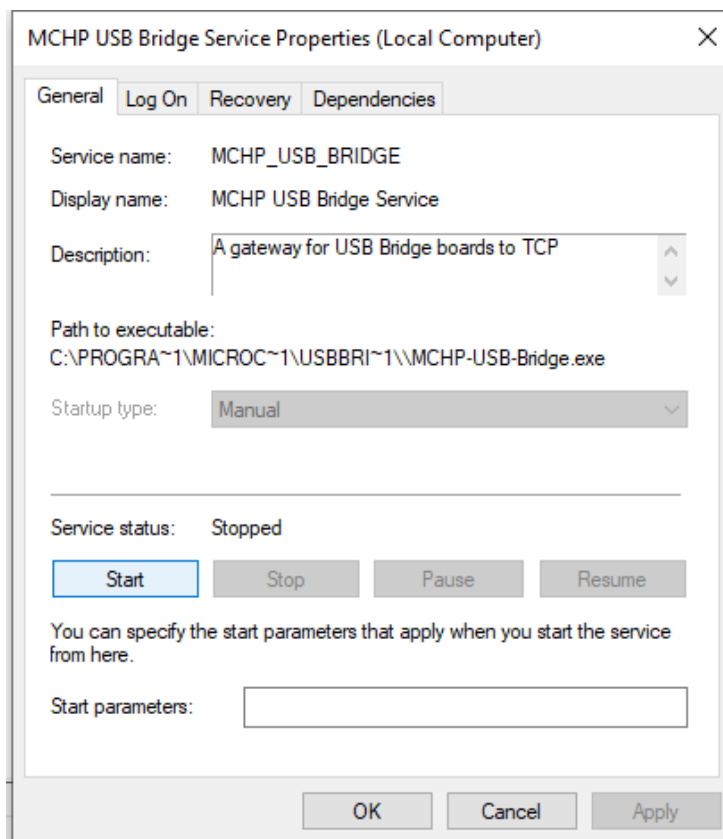
- 4) Under Services Control Manager (Figure 2-2), find "MCHP USB Bridge Service" and double click it.

Figure 2-2 Services Control Manager



5) When it is selected, it will open a new menu as shown below (Figure 2-3). Click “Start” button.

Figure 2-3 MCHP USB Bridge Service Properties



- 6) Connect the **PIC32MZ Mixed Signal Data Capture Board (EV64F02A)** to the PC hosting the service via a USB cable.
- 7) Type the following in your browser:
<http://localhost:12110/>

Note: If IP address of the host is different from local PC type:
<http://ipaddress:12110/>

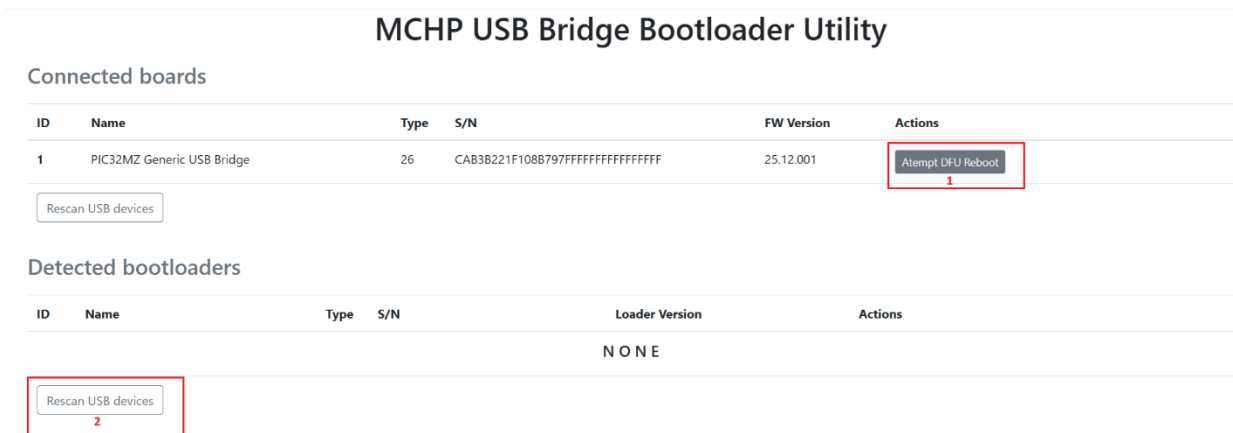
Note: How do I find my IP address?

First, click on your Start Menu and type `cmd` in the search box and press <Enter>. A black and white window will open where you will type `ipconfig /all` and press <Enter>. There is a space between the command `ipconfig` and the switch of `/all`. Your IP address will be the IPv4 address.

- 8) Click button '**Attempt DFU Reboot**' (Figure 2-4 (1)) if the MCU is not in bootloader Mode

MIXED-SIGNAL EXPLORER GUI USER'S GUIDE

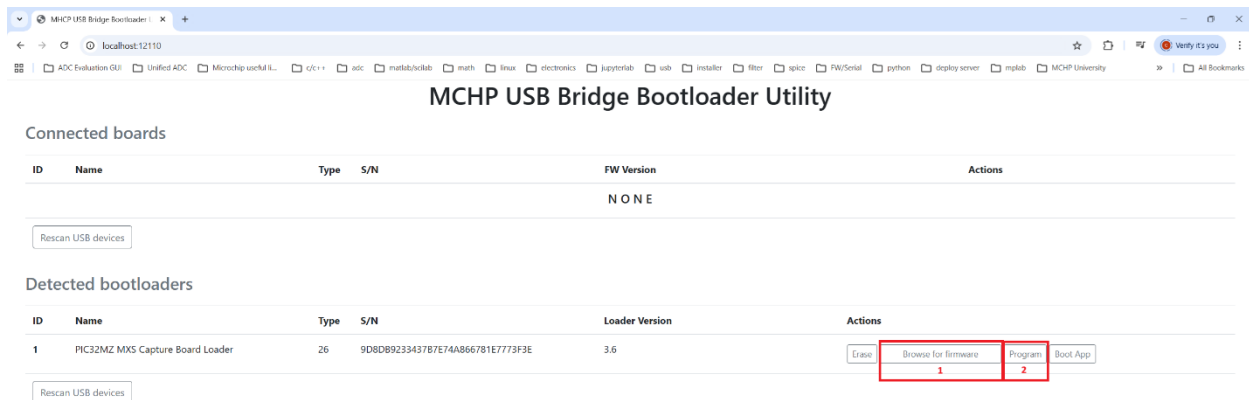
Figure 2-4 MCHP USB Bridge Bootloader Utility



If the board is not displayed it means that the current firmware does not support the display of the web page and we need to put it in bootloader mode first using another method (see **Entering Bootloader Mode:**) and then continue with the web page.

- 9) On the web page, in the “Detected bootloaders section”, press “Rescan USB devices” (Figure 2-4 (2))

Figure 2-5 MCHP USB Bridge Bootloader Utility



- 10) Click the 'Browse for firmware' button and upload the packaged zip file (Figure 2-5 (1)).
- 11) Press Program button (Figure 2-5 (2)).
- 12) After programming is complete successfully, a green LED will stay on.

The selected firmware will be programed into the MCU device.

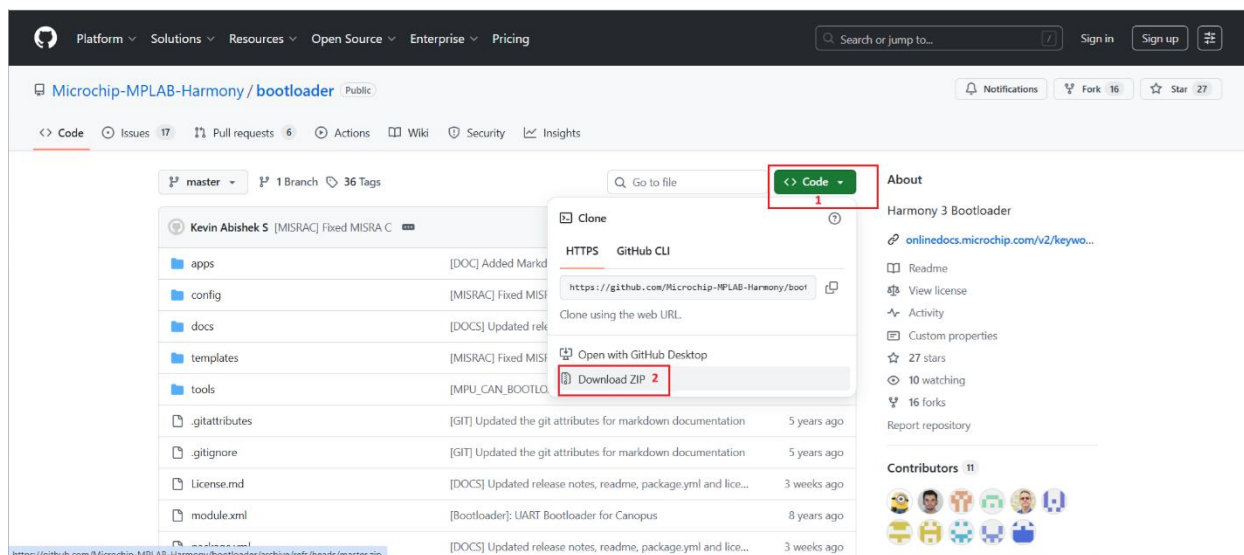
Chapter 3. Method 3: Using Java Bootloader Application

- 1) A Java JRE needs to be installed.
- 2) Get the Java application which will do the actual programming while preserving the bootloader

All details can be found at the following page: [Home > MPLAB® Harmony 3 Bootloader Library > USB Device HID Bootloader > USB Device HID Bootloader Unified Host Script Help](#) (<https://onlinedocs.microchip.com/>)

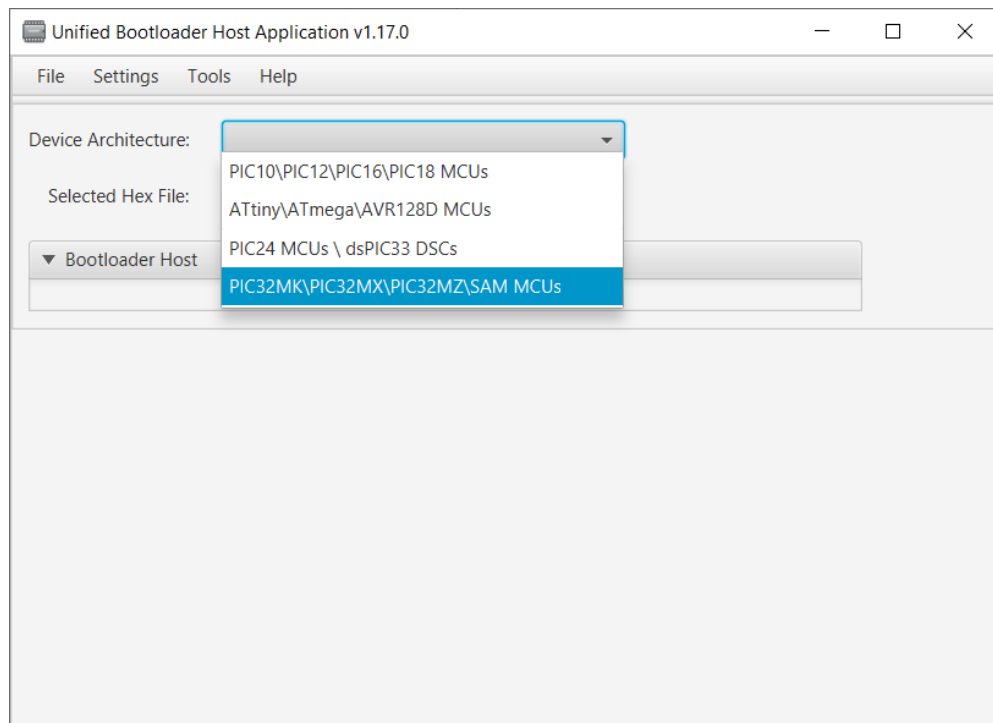
- The next repository needs to be downloaded as ZIP file from GitHub: <https://github.com/Microchip-MPLAB-Harmony/bootloader>. Click on green button called **Code** (Figure 3-1 (1)) then on the **Download ZIP** (Figure 3-1 (2)) button.

Figure 3-1 Downloading the Java Bootloader Application



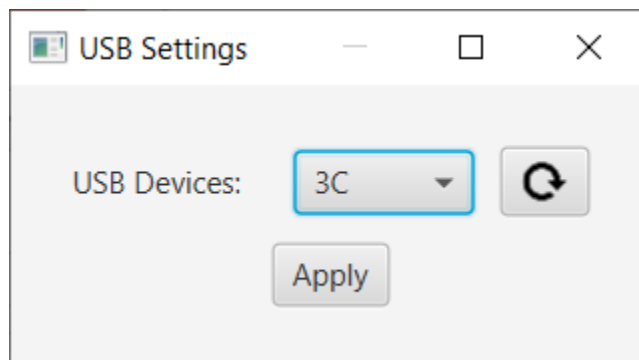
- The bootloader-master.zip folder needs to be unarchived.
 - The application is in the folder at path `tools/UnifiedHost-*/UnifiedHost-*.jar`
- Put the EV64F02A in bootloader mode first as per referenced instructions (see **Error! Reference source not found.**).
- 3) Run the jar file from the downloaded zip file, by double clicking which will run it using the installed JRE.
 - 4) From File menu press "Open > Load file (*.hex)"
 - 5) Copy the archive `ev64f02a_pic32mz_hsbridger4_xx.xx.xxx.zip` firmware from the following location `C:\Program Files\Microchip\usbBridgeService\firmware` to a different location and unarchive it.
 - 6) In the load file window select `firmware.hex` from the folder resulted from the archive.
 - 7) Select the device architecture as in the following image (Figure 3-2):

Figure 3-2 Unified Bootloader Host Application



- 8) Select protocol as USB
- 9) Press Configure button and in "USB Settings" window select USB Device 3C as in the following image (Figure 3-3):

Figure 3-3 USB Settings



- 10) Press Apply
- 11) Press "Program Device".
- 12) When the program is complete successfully, a message will be displayed in the application.
- 13) Then reset the device by pressing "**RESET**" button

INDEX

| Alphabetical order | Meaning |
|--------------------|-------------------------------|
| ADC | Analog-to-digital converter |
| BE | Big Endian |
| CLI | Command Line Interface |
| CSV | Comma Separated Values |
| DAL | Device Access Layer |
| DNL | Differential Nonlinearity |
| FFT | Fast Fourier Transform |
| FW | Firmware |
| GUI | Graphical User Interface |
| HW | Hardware |
| INL | Integral Nonlinearity |
| INSTALLDIR | Installation Directory |
| IP | Internet Protocol |
| ksps | Kilo-Samples Per Second |
| LE | Little Endian |
| MCHP | Microchip |
| MCU | Microcontroller Unit |
| S/N | Serial Number |
| SW | Software |
| Rev | Revision |
| PC | Personal Computer |
| SPI | Serial Peripheral Interface |
| TCP | Transmission Control Protocol |
| USB | Universal Serial Bus |