ModusToolbox™ Programmer GUI user guide

ModusToolbox™ Programmer version 5.9

About this document

A newer version of this document may be available on the web here.

Scope and purpose

ModusToolbox™ Programmer is a stand-alone, cross-platform, flash programmer tool that provides a graphical user interface to Program, Erase, Verify, and Read the flash of the target device. It is delivered with the ModusToolbox™ Programming tools package, and it supports HEX, SREC, ELF, HCD and BIN programming file formats.

Intended audience

This document helps you learn how to use the ModusToolbox™ Programmer GUI to perform various operations on devices.

Document conventions

Convention	Explanation
Bold	Emphasizes heading levels, column headings, menus and sub-menus
Italics	Denotes file names and paths.
`Monospace`	Denotes APIs, functions, interrupt handlers, events, data types, error handlers, file/folder names, directories, command line inputs, code snippets
File > New	Indicates that a cascading sub-menu opens when you select a menu item

Abbreviations and definitions

The following define the abbreviations and terms used in this document:

Term	Description
CMSIS	Arm® Cortex® Microcontroller Software Interface Standard.
CMSIS-DAP	CMSIS Debug Access Port.
OpenOCD	The Open On-Chip Debugger is the debugger tool that provides on-chip programming support. This tool acts as a backend of the ModusToolbox™ Programmer application.
Data File	The data file for programming in the hex or binary format
DP	The Debug Port register of the Arm Cortex CPU. Used for programming and debugging, along with the corresponding SWD-address bit selections.
Flash kernel/loader	The firmware file loaded into the MCU's RAM. Sometimes referred to as RAM program, Flash kernel, Flash loader.
GDB	GNU Project Debugger – GNU.org.
JTAG	Joint Test Action Group. Specifies the use of a dedicated debug port while implementing a serial communication interface for low-overhead access without requiring direct external access to the system address and data buses.
MCU	Microcontroller Unit.
PSOC™	A family of microcontroller integrated circuits. These chips include a CPU core and mixed-signal arrays of configurable integrated analog and digital peripherals.
Region	Logical areas within the target device the programmer operates on.
SWD	Serial Wire Debug interface.
QSPI	Quad Serial Peripheral Interface. A name used for SPI external memory interfaces

About this document

Reference documents

Refer to the Infineon programming solutions website for more information as needed.

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1 Overview

ModusToolbox™ Programmer supports the following features:

- Programming Infineon MCUs' internal and external memories
  - PSOC™ 6 MCUs, including corresponding starter kits and evaluation boards
  - PSOC™ 4 MCUs, including corresponding starter kits and evaluation boards
  - PMG1, PAG2S and WLC1 MCUs, including corresponding evaluation boards
  - EZ-PD™ CCG7S and CCG7D MCUs, CCG2, CCG3PA, CCG3PA2, CCG3PA3, CCG4, CCG6, CCG8
  - XMC7xxx, XMC5xxx, , CYT6BJ, CYT4BB/BF, CYT4DN/EN, CYT2Bx, CYT3Bx/CYT3DL, CYT2CL
  - PSOC™ Control C3 (PSC3M5, PSC3P5, PSC3P2, PSC3M3, PSC3M6, PSC3P6, PSC3P8, PSC3M8, PSC3P7, PSC3M7)
  - PSOC™ Edge E84
- AIROC™ Wi-Fi/Bluetooth® platforms (CYW4390x, CYW4343W, CYW20829, CYW208xx, CYW55513 and others), including corresponding starter kits and evaluation boards
- Connectivity devices via support of development boards
- Windows, Ubuntu and macOS
- Programming external memory devices using PSOC™ 6 external memory interfaces (EBI / QSPI)
- Programming external memory of AIROC™ Wi-Fi devices
- KitProg3 and MiniProg4 hardware
- SEGGER J-Link Base and J-Link Ultra hardware
- OpenOCD via machine interface (MI) to 3rd party debug hardware
- Cross-platform CyBridge library – I^2C, SPI, UART communications and USB devices detection
- KitProg3 firmware update

2 Installing ModusToolbox™ Programmer

ModusToolbox™ Programmer is delivered as part of the ModusToolbox™ Programming tools package. A link is available to download/install from the IDC webpage here:

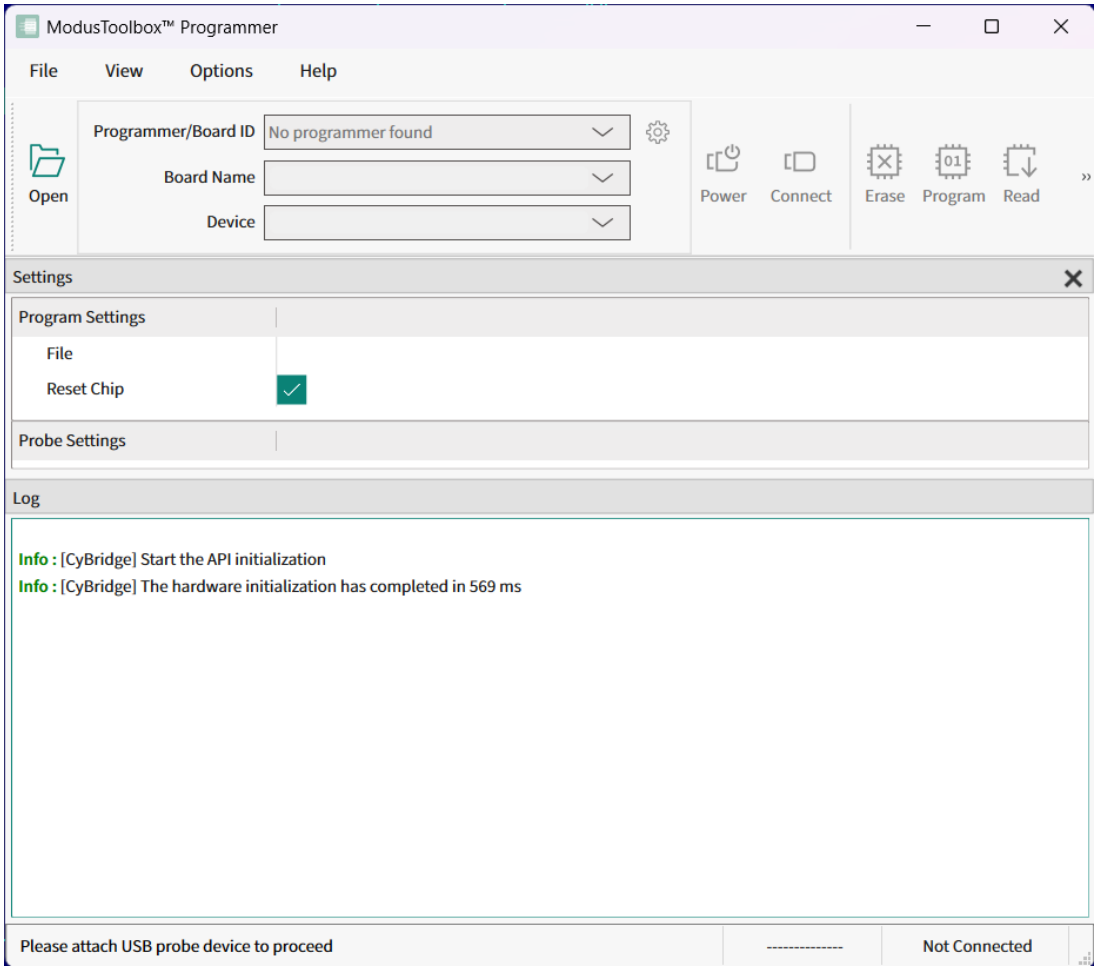
https://softwaretools.infineon.com/tools/com.ifx.tb.tool.modustoolboxprogtools

For installation details, see section 3 of the ModusToolbox™ Programming tools release notes.

3 Getting started

3.1 Run ModusToolbox™ Programmer

To run the ModusToolbox™ Programmer GUI application, navigate to the ModusToolbox™ Programming tools install location, open the mtb-programmer folder, and run the executable. The GUI opens and looks similar to this:

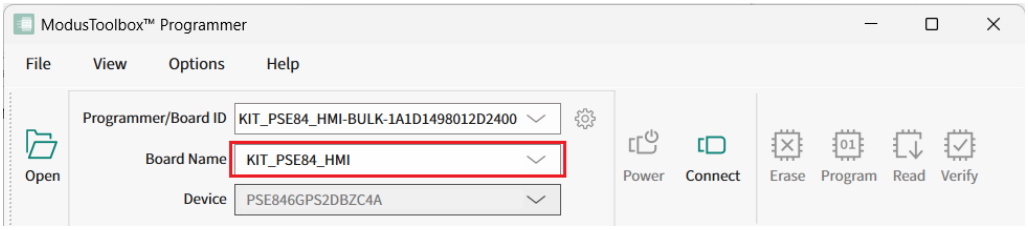


In this case, no kit or device is connected, and a message displays asking you to connect a device.

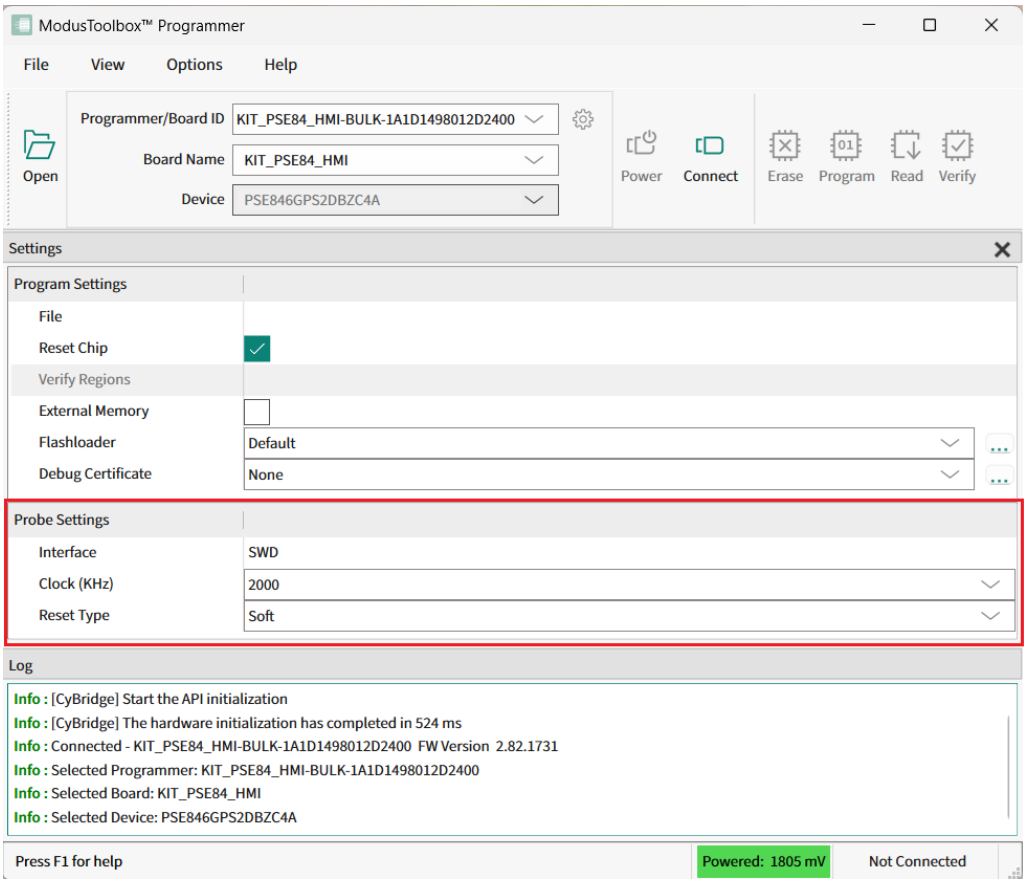
3.2 Select device

1. Connect the device to the host computer. Select the hardware programmer in the **Programmer/Board ID** drop-down.

2. Select the kit name in the **Board Name** drop down.

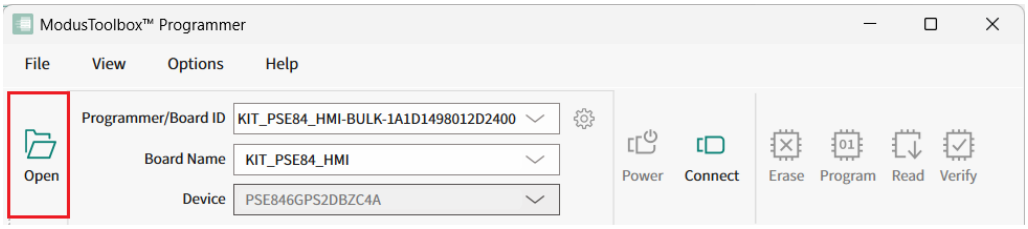


ModusToolbox™ Programmer displays information under **Probe Settings**.

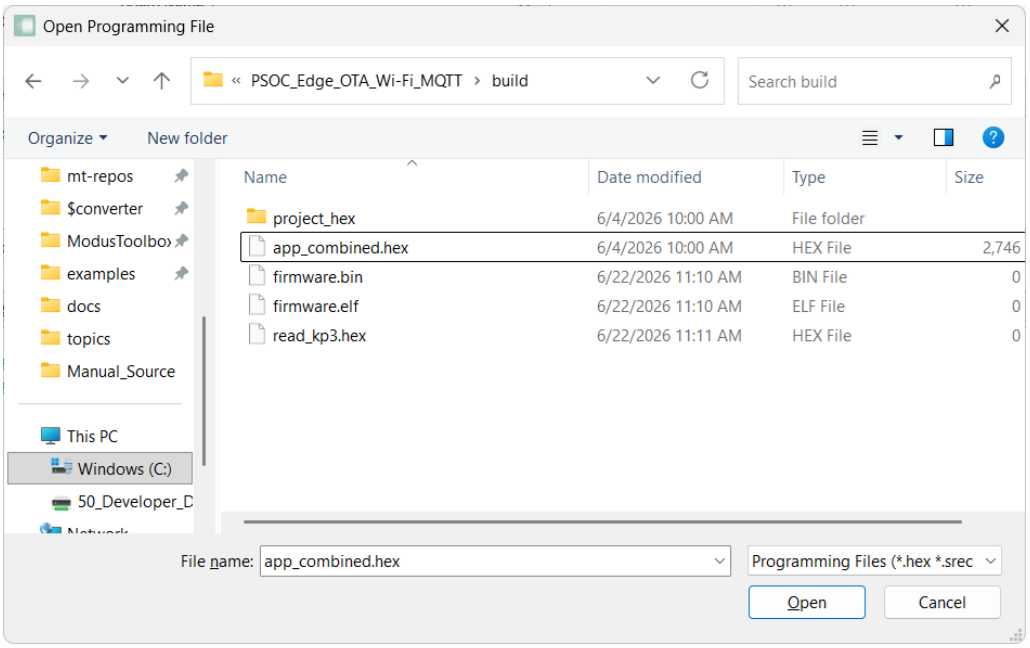


3.3 Load programming file

1. Click **Open**.



2. On the Open Programming File dialog, navigate to the location of the HEX, SREC, ELF, or BIN file to load, select it, and click **Open**.



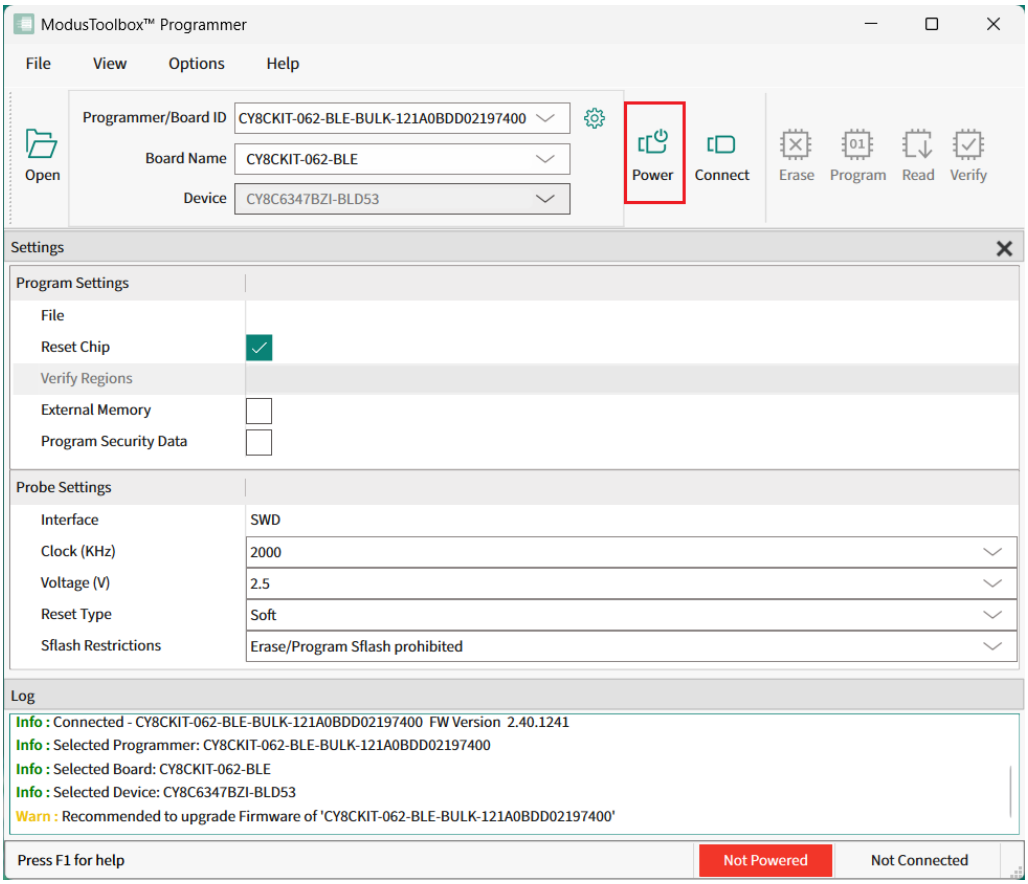
***Note**: The drag and drop functionality is supported in the application allowing you to quickly load files by dragging them into the application window. Drag and drop is supported regardless of whether the connect button is pressed.*

*After changing the Hex file while connected to a PSOC™ 6 device with the External Memory option enabled, we recommend to re-connect the programmer to the device (click **Disconnect**, then **Connect**).*

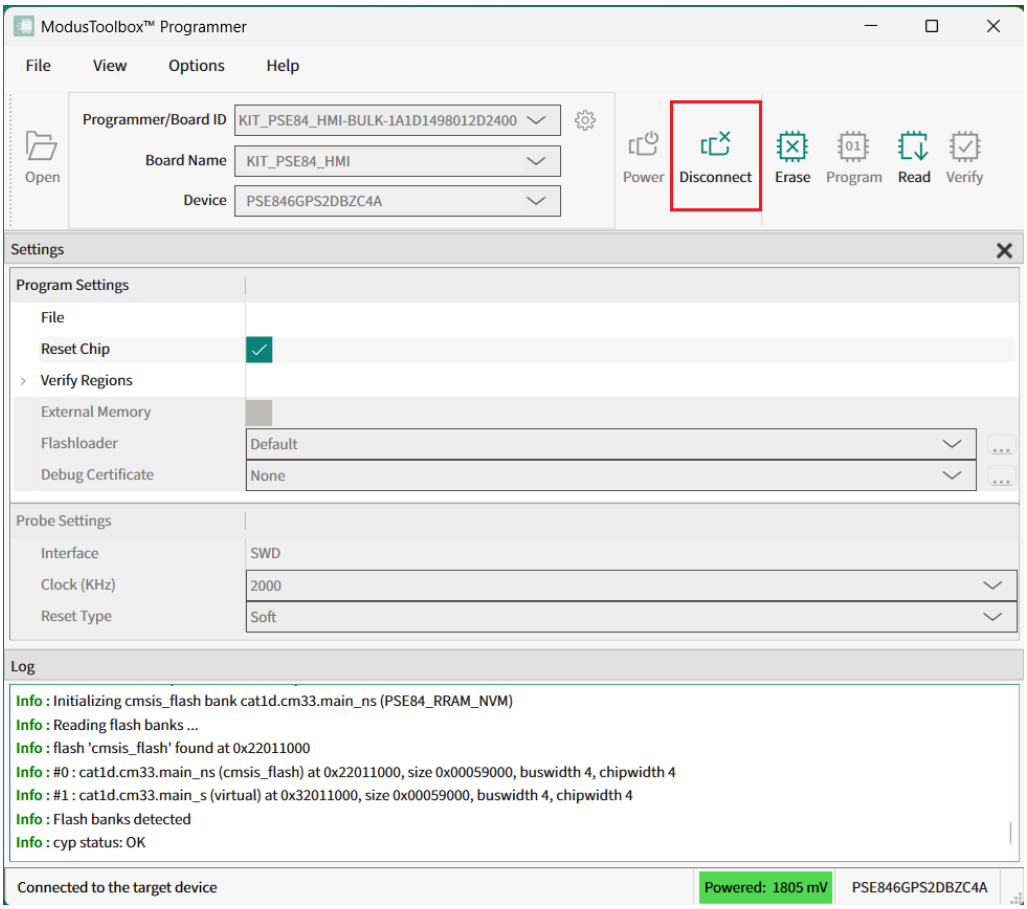
This is required to reload the correct QSPI configuration from the updated programming file.

3.4 Connect device

1. If the device is not powered, the status message "Not Powered" is displayed in the Status Bar. Click **Power** to power up the device.

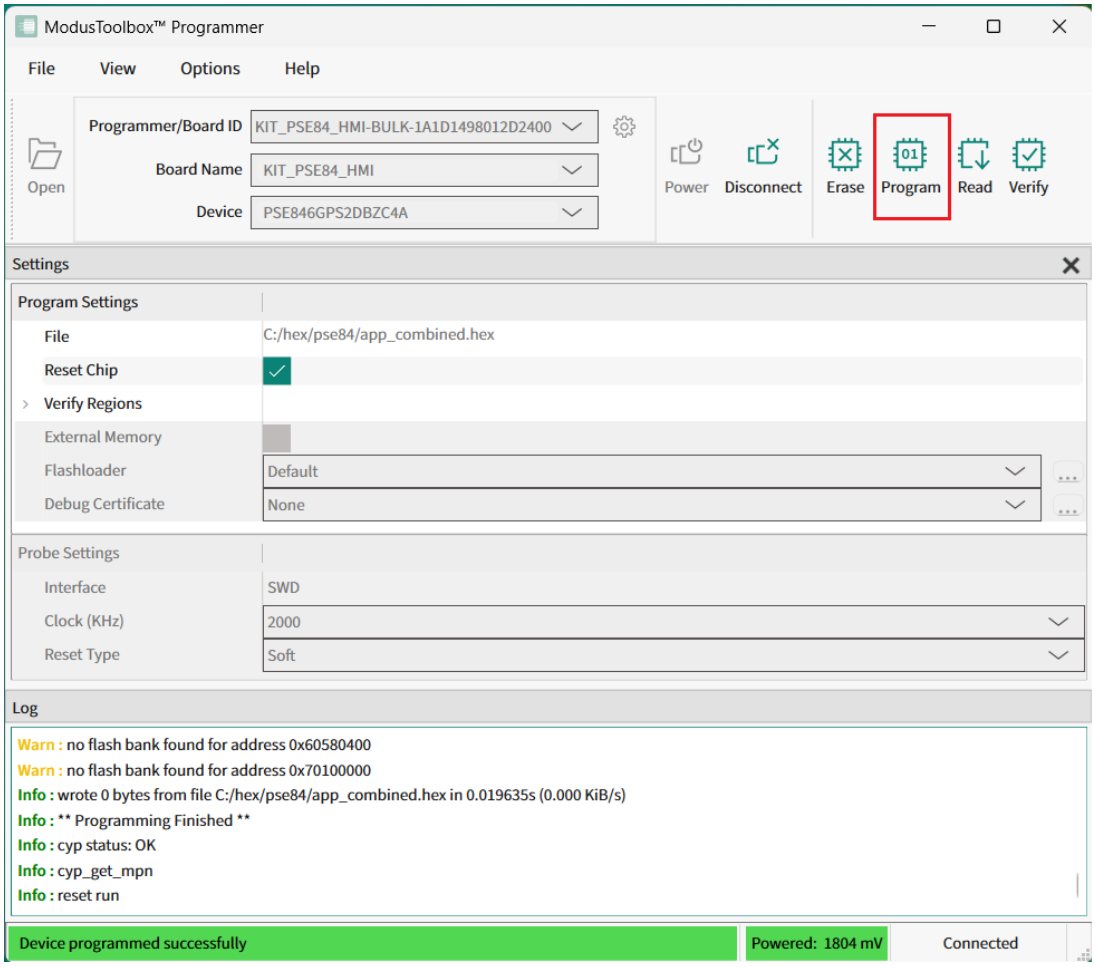


2. Click **Connect**. ModusToolbox™ Programmer communicates with the device and displays various messages in the **Log**. Then, a message in the Status Bar indicates that it is connected. The **Connect** button toggles to **Disconnect**.



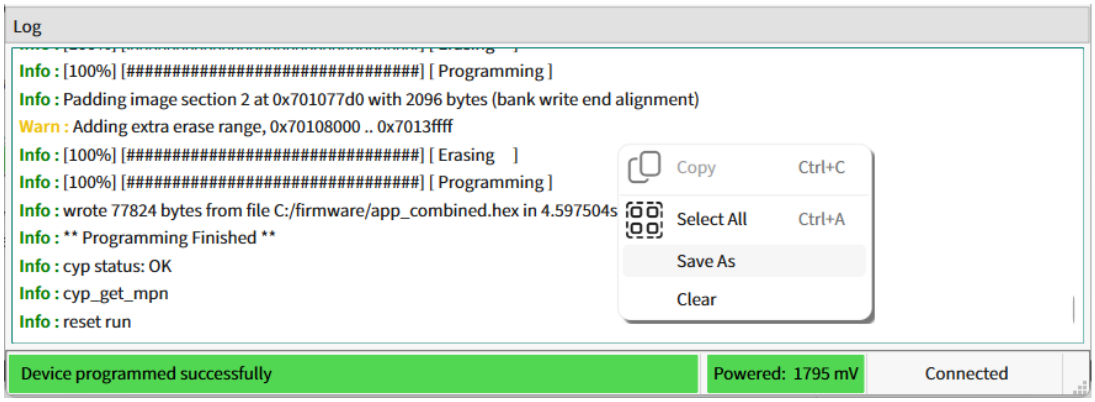
3.5 Program device

Click **Program**. ModusToolbox™ Programmer downloads the program file onto the device and displays messages in the Log.



3.6 Save log file

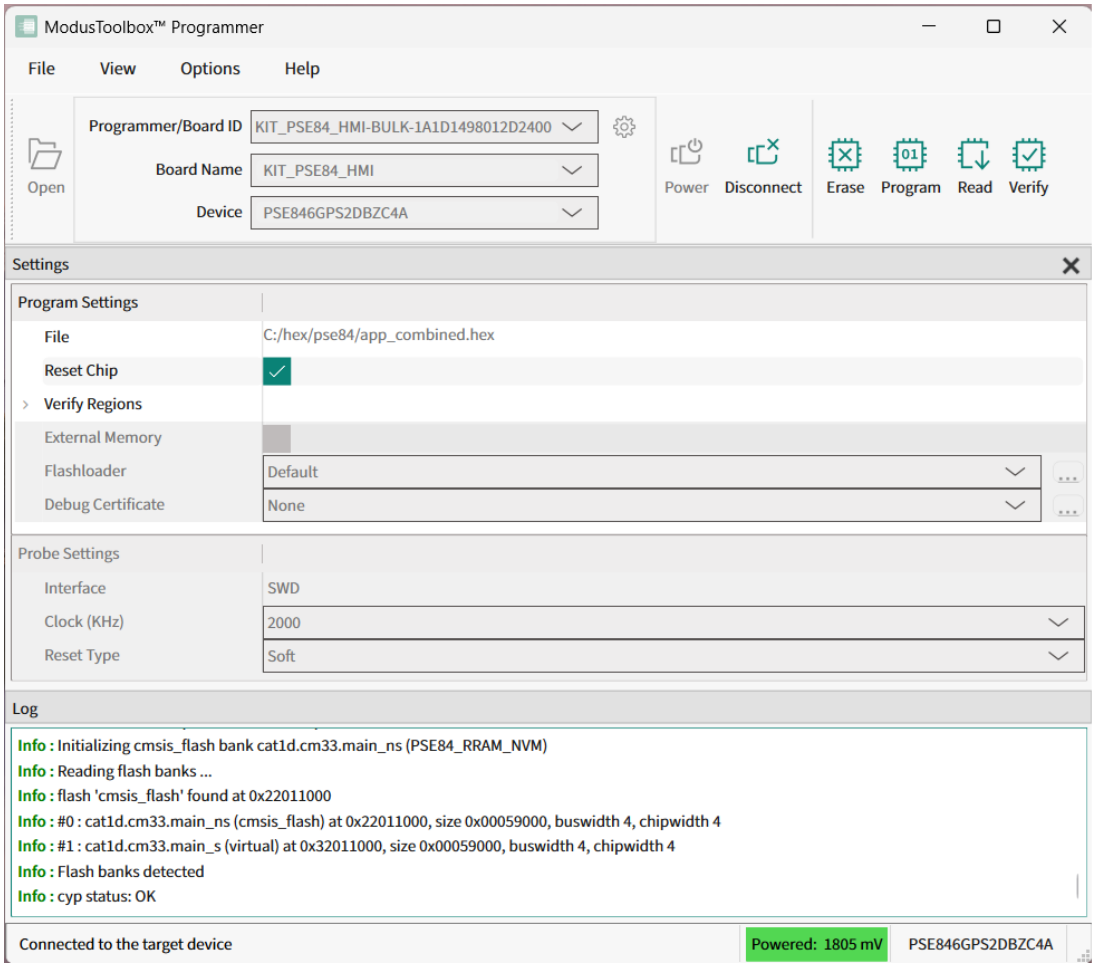
Right-click in the **Log** section and select **Save As**.



***Note**: You can also select the **Select All** command to select the text, then copy and paste the text to the file you selected.*

4 GUI description

ModusToolbox™ Programmer contains menus and toolbar commands to perform actions. This chapter describes the various GUI elements.



4.1 Menus

File

The **File** menu contains the following commands:

- **Open (Ctrl+O)** – Opens the programming file.
- **Connect/Disconnect (Alt+Q)** – Connects and disconnects the selected device.
- **Program (Alt+G)** – Programs the selected device with the selected file.
- **Erase (Alt+E)** – Erases the selected device.
- **Read (Alt+R)** – Reads flash of the selected device into a HEX or SREC file.
- **Verify (Alt+Y)** – Verifies that the selected device is programmed correctly.
- **Recent Files** – Lists up to five recently loaded programming files.
- **Exit (Alt+F4)** – Closes the ModusToolbox™ Programmer application.

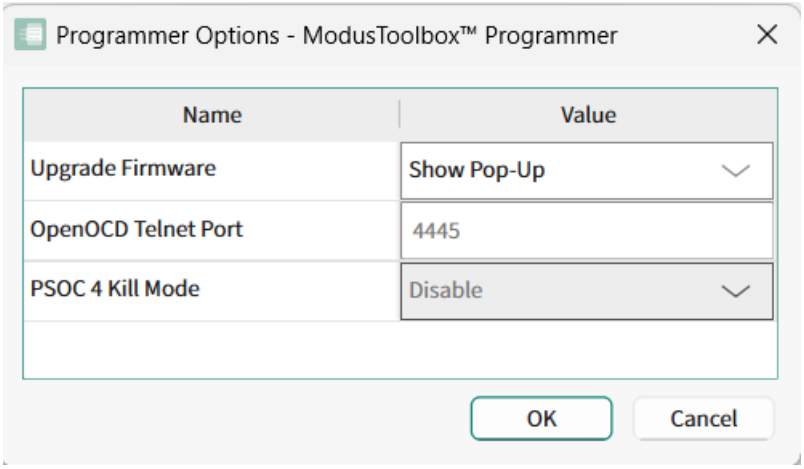
View

The **View** menu contains the **Settings** check box. Select it to view the **Settings** section of the window; unselect it to hide the **Settings** section. See Settings.

Options

The **Options** menu contains the following commands:

- **Programmer Options** - Opens a dialog to set the **Upgrade Firmware** mode and other options.



  - **Upgrade Firmware** mode:
    - **Automatically** – The firmware is updated automatically when the tool opens.
    - **Show Pop-up** – A dialog displays asking if you want to upgrade the firmware.
    - **Ignore** – The firmware is not updated and no prompt displays.
  - **OpenOCD Telnet Port**: This option specifies the port number of the OpenOCD telnet connection.
  - **Kill Mode**: Use this option to enable/disable the transition into Kill mode for PSOC™ 4, PMG1, PAG2S, WLC1 and CCGx devices
- **Upgrade Firmware** - When this command is enabled, select it to upgrade the programmer firmware on the device.

Verify Regions

The **Verify Regions** menu is available only if the **Verify Regions** option is selected in **Program Settings**.

Help

The **Help** menu contains the following commands:

- **View Help (F1)** – Opens this document.
- **About ModusToolbox™ Programmer** – Opens the About box.

4.2 Toolbar

The toolbar contains the **Open**, **Erase**, **Program**, **Read**, and **Verify** commands, which are also located on the **File** menu. There are also a few pull-down menus to select the specific device to use, and a **Board Preferences** button, a **Power** command, and a **Connect**/**Disconnect** command.

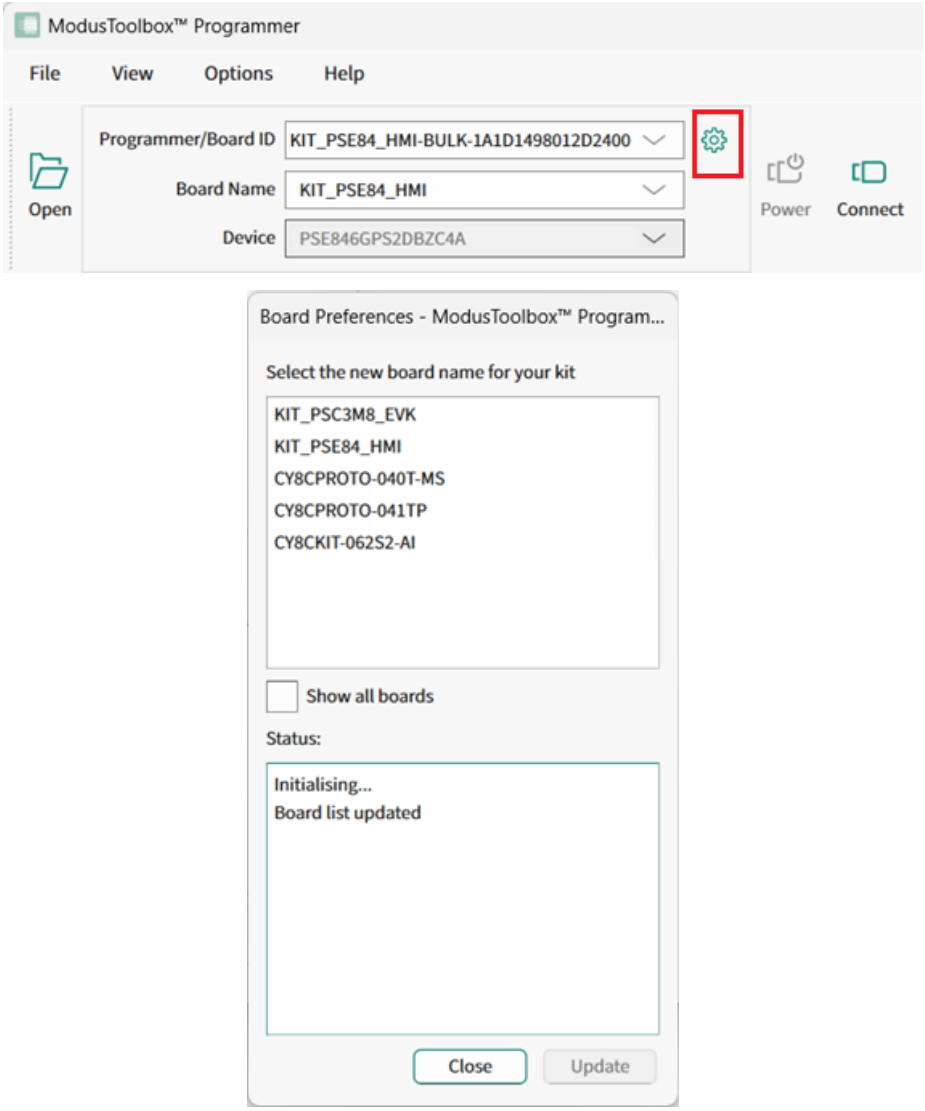
Programmer/Board ID

This displays a list of all currently connected probes with a serial number or other identifier (for example, COM port number) from which you can select the desired Programmer.

4 GUI description

KitProg3 Board Preferences

This command opens a Board Preferences dialog to update the UID for the selected board.



Use the **Board Preferences** button to update the KitProg3 board configuration or to change the name of the development kit selected in **Programmer/Board ID** pull-down.

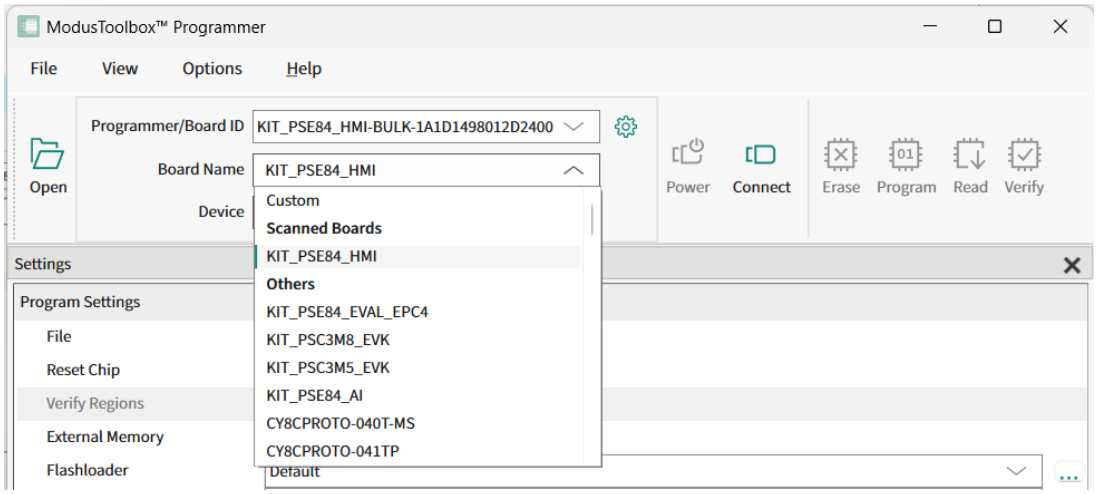
Some KitProg3 development kits were released to market with missing board configuration in the EEPROM or this configuration might be out of date. In this case, the **Board Preferences** button is active and allows you to update the device details for such a kit.

Select the correct board name for your KitProg3 programmer device and click the **Update** button. See the Update KitProg3 Board Name section for more details.

Board Name

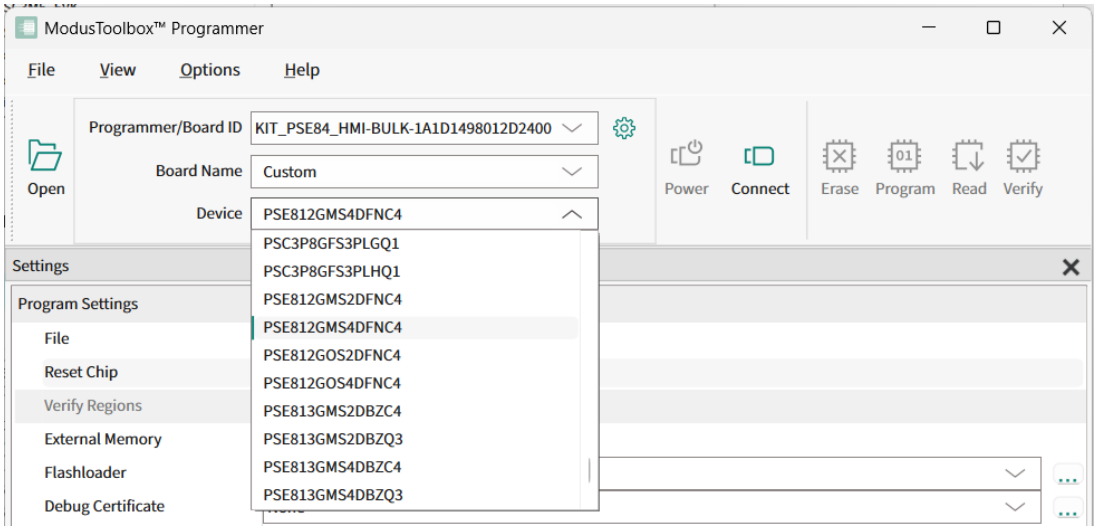
The **Board Name** pull-down allows you to choose the appropriate Kit name for the selected **Programmer/ Board ID**.

- Under the **Scanned Boards** entry, there is a short list of best matched Kit names detected by the tool.
- Under the **Others** entry, there is a list of all other Kit names available for the selected programmer device.
- When selecting the **Custom** board, the tool allows you to manually specify the particular target device connected to a stand-alone programmer (such as MiniProg4) or a KitProg3 with modifiable MCU module. **Custom** board is only available for KitProg3, MiniProg4 and J-Link programmers.

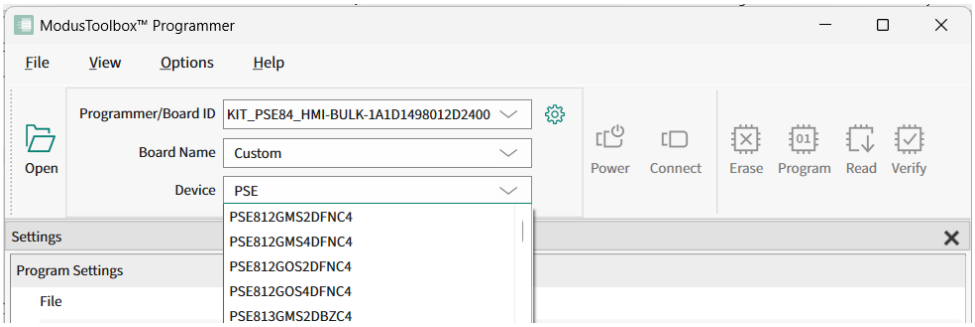


Device

This displays a list of all supported target devices. It is enabled only if you select **Custom** for the **Board Name** option.



***Note**:* ***Board Name** and **Device** pull-downs support auto-completion. Start typing in either pull-down and the tool will suggest corresponding board names.*



Power

Use the **Power** button to power on and off the selected device.

Connect/Disconnect

Use the **Connect** button to connect to and disconnect from the selected device.

4.3 Settings

The **Settings** section of the tool allows you to update the program and probe/target settings as follows:

Program Settings

- **File** – Use this to select the programming file to perform actions on or with.
- **Offset** – This is an optional offset parameter; it can be an integer or hexadecimal value. The relocation offset is added to the base address for each section in the image when the image is programmed. This option is visible only if a binary or elf file is selected for programming operations.
- **Reset Chip** – Use this to reset the chip after the Program operation completes. This option resets the target chip and runs the programmed firmware on it.
- **Verify Regions** – Use this option to define flash regions used during device verification. This allows to verify user defined flash regions of the PSOC™ MCU. This option does not change behavior of the Program operation. See Verify custom flash regions for details.
- **External Memory** – Enables/disables the programming of external memory in the target device. For PSOC™ 6x MCUs, this option enables programming of the QSPI regions. This is also used for programming external memory of AIROC™ Wi-Fi devices.
- **Program Security Data** – Allows programming security regions if the target device supports this capability. For example, for PSOC™ 61 PSOC™ 62, and PSOC™ 63 MCUs, this option enables programming the eFuse region.
- **Target AP** – Allows you to select the target access port (DAP) that will be used for programming. Possible values include: CM0, CM4, and SYS_AP. This option is available only for PSOC™ 64 MCUs.
- **Flash Size Limit** – Limits the size of application flash available for programming operations. This option is available only for PSOC™ 64 MCUs.
- **Programming Mode** – Use this option to define programming mode for PMG1 devices. The mode options include:
  - Reset: This programming mode enables acquisition of the target device in the Test mode.
  - PowerCycle: In this mode, the programmer cycles power to acquire the device.
- **Flashloader** – Use this option to select the patched QSPI CMSIS flashloader file (in FLM format). This flashloader is used for external flash programming.

***Note**: To be able to program custom external flash you should also provide the appropriate QSPI configuration file (qspi_config.cfg), generated by the ModusToolbox™ QSPI Configurator tool. This file should be located in the same directory as the patched flashloader file.*

- **Debug Certificate** – Use this option to specify the location of the debug certificate binary file. The debug certificate is used for programming AIROC™ CYW20829 targets in Secure lifecycle mode.
- **ECC Config** – Use this option to enable or disable the ECC error reporting. This option is only applicable for read flash operations of some MCUs.
- **Chip Protection** – Use this option to apply Chip Protected or Kill mode for PSOC™ 4, PMG1, PAG2S, WLC1 and CCGx devices.
- **RRAM Offset** – Use this option to modify the offset for RRAM memory (flash bank) for PSOC™ Edge E84 EPC4 devices. The minimal allowed RRAM offset value is 0xA000.

Probe Settings

The **Probe** settings allow you to configure the programming and target device before you connect to it. These settings are available when ModusToolbox™ Programmer is not connected to the device.

- **Interface** – To select the hardware (debug) interface for communication with the target device. The possible values include: SWD and JTAG if supported by the device.
- **JTAG Chain** – To select the interested target device in the JTAG chain. This option is only available for probes supporting JTAG interface. See Program PSOC™ 6/Control C3/Edge E84 MCU in JTAG chain for details.
- **Voltage (V)** –To select the power supply voltage of the target device in Volts. This option is available only if the selected probe has the power control capability.
- **Clock (KHz)** – To select the frequency of the hardware interface in KHz. This option is available only if the selected probe supports configurable frequencies.
- **Reset Type** – Specifies the type of the Reset Chip operation. The possible values include: Soft and XRES:
  - Soft is a software reset type that sends the system reset request to the ARM core.
  - XRES is a hardware reset type that toggles the XRES hardware line.
- **Sflash Restrictions** – Specifies the Sflash programming behavior. This option is available only for PSOC™ 61/62/63, XMC7xxx/XMC5xxx, FX3G2, CYT3Bx/CYT3DL, CYT4Bx, CYT4DNJ, and CYT2Bx MCUs. The possible values include:
  - Erase/Program of Sflash is prohibited.
  - Erase and Program of USER/TOC/KEY is allowed.
  - Erase of USER/TOC/KEY and Program of USER/TOC/KEY/NAR is allowed.
  - Erase and Program of entire Sflash is allowed.

5 Programming operations

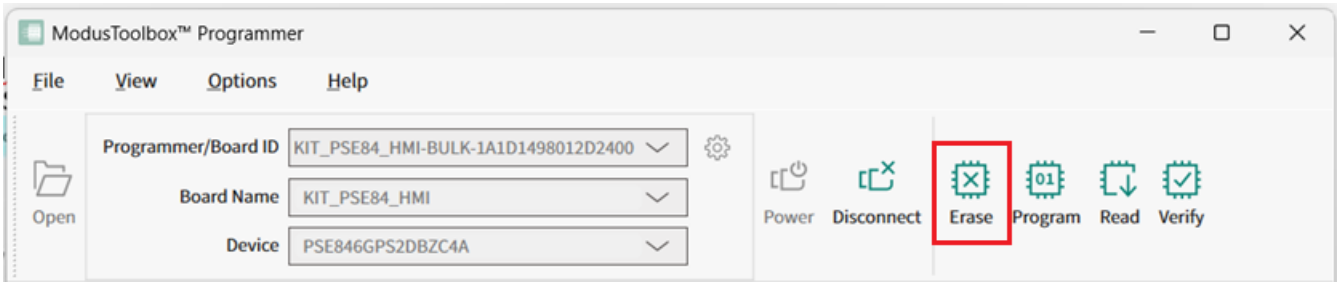
This chapter covers the various programming operations you can perform using the ModusToolbox™ Programmer tool.

- Erase device
- Program device
- Program device and Reset Chip
- Program binary file with Offset
- Program External Memory
- Program PSOC™ 6/Control C3/Edge E84 MCU in JTAG chain
- Verify device
- Verify device with External Memory
- Verify custom flash regions
- Read device
- Program eFuse region of PSOC™ 6/TRAVEO™ T2G/XMC7xxx/XMC5xxx MCU
- Program chip-protected/Kill Mode for PSOC™ 4 MCU
- Program secure AIROC™ CYW20829 MCU
- Program QSPI memory with patched flashloader
- Program AIROC™ CYW955513EVK-01, CYW955913EVK-01, and CYW9M2BASE-43012BT boards
- Update KitProg3 Board Name

5.1 Erase device

1. Connect to the device (see Connect device).
2. Click the **Erase** button.

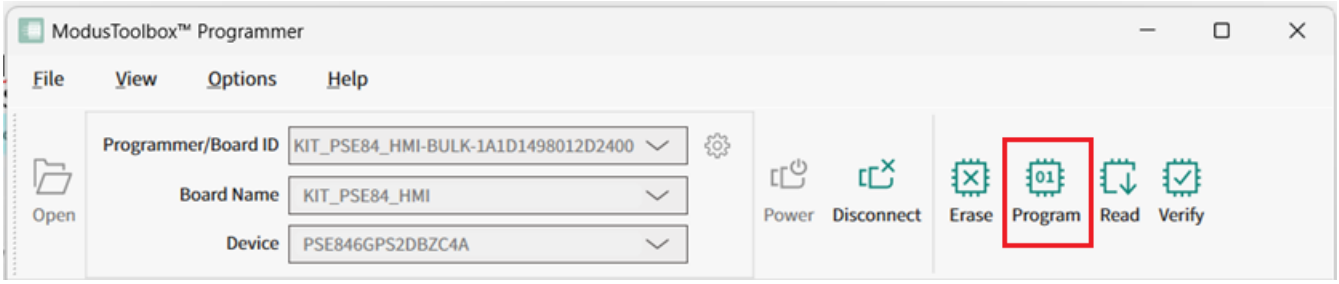
ModusToolbox™ Programmer erases the device and displays various messages in the Log. Then, a message in the Status Bar indicates that the device was erased successfully or that an error occurred.



5.2 Program device

1. Connect the device to the host computer and select it in the **Programmer/Board ID**, **Board Name**, and **Device** drop-downs.
2. Select the programming file as described in Load programming file section.
3. Connect to the device (see Connect device).
4. Click the **Program** button.

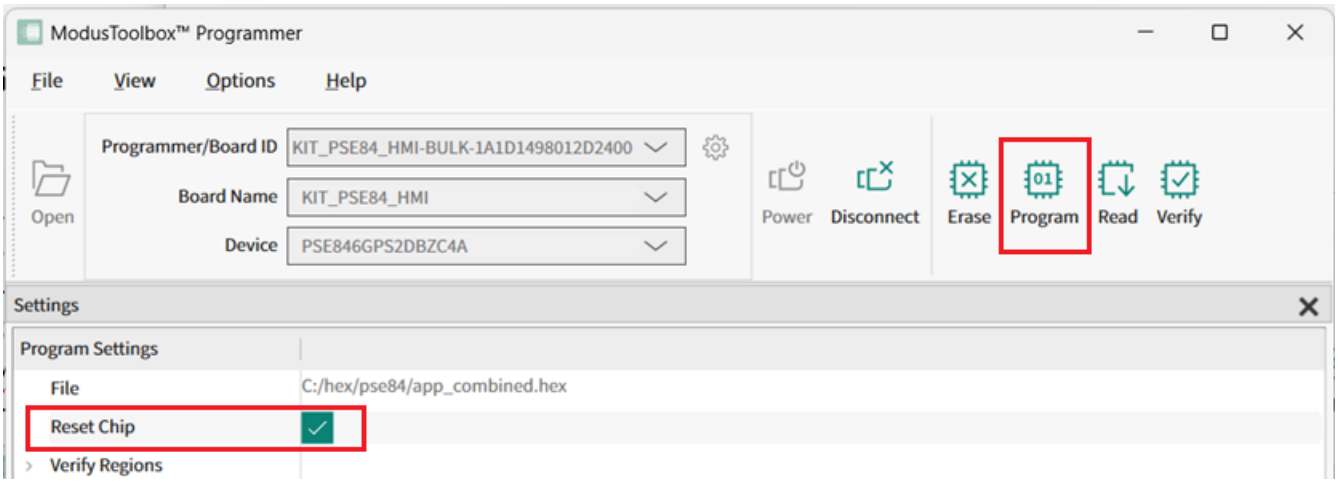
ModusToolbox™ Programmer programs the device and displays various messages in the Log. Then, a message in the Status Bar indicates that device was programmed successfully or that an error occurred.



5.3 Program device and Reset Chip

1. Connect the device to the host computer and select it in the **Programmer/Board ID**, **Board Name**, and **Device** drop-downs.
2. Select the programming file as described in the Load programming file section.
3. Connect to the device (see Connect device).
4. Select the **Reset Chip** check box under **Program Settings**.
5. Click the **Program** button.

ModusToolbox™ Programmer programs the device and displays various messages in the **Log**. Then, a message in the Status Bar indicates that the device was programmed successfully or that an error occurred.

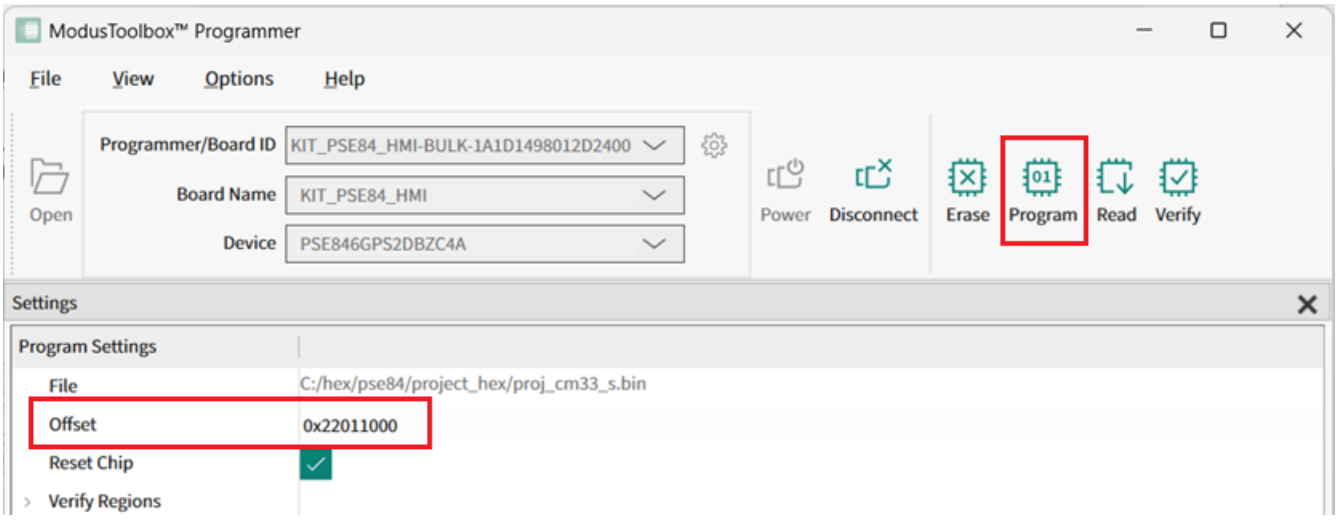


The target device is reset and running.

5.4 Program binary file with Offset

1. Connect the device to the host computer and select it in the **Programmer/Board ID**, **Board Name**, and **Device** drop-downs.
2. Select a **binary** programming file as described in the Load programming file section.
3. Connect to the device (see Connect device).
4. Enter the desired address in the **Offset** field under **Program Settings**.
5. Click the **Program** button.

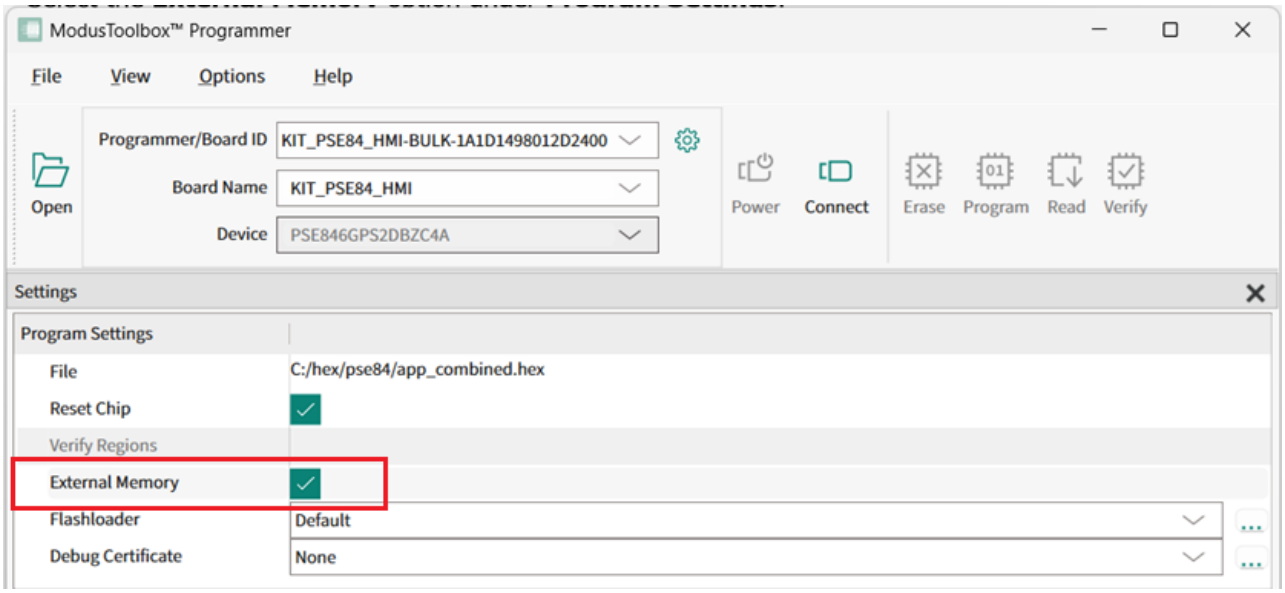
ModusToolbox™ Programmer programs the device and displays various messages in the Log. Then, a message in the Status Bar indicates that the device was programmed successfully or that an error occurred.



***Note**: Offset options is available only for binary programming files.*

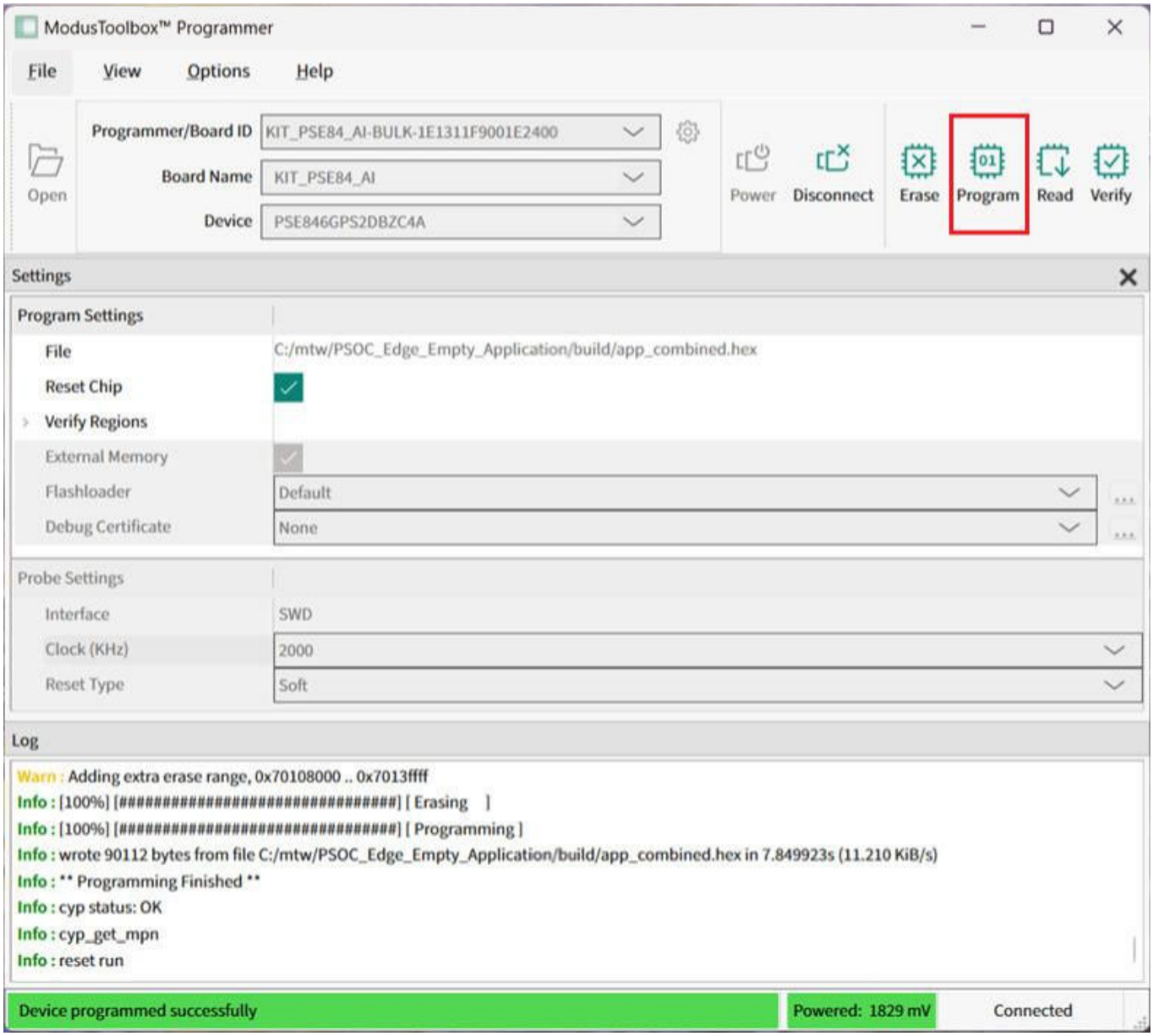
5.5 Program External Memory

1. Attach and select a device that supports external memory (for example, CY8CKIT-062-WiFi-BT with QSPI support).
2. Select the **External Memory** option under **Program Settings**.



3. Select the programming file as described in the Load programming file section. The programming file should contain external memory region(s) and correct QSPI configuration data.
4. For PSOC™ 6 devices only, select **Erase/Program USER/TOC/KEY allowed** option under **Probe Settings > Sflash Restrictions**.
5. Connect to the device (see Connect device).
6. Click the **Program** button.

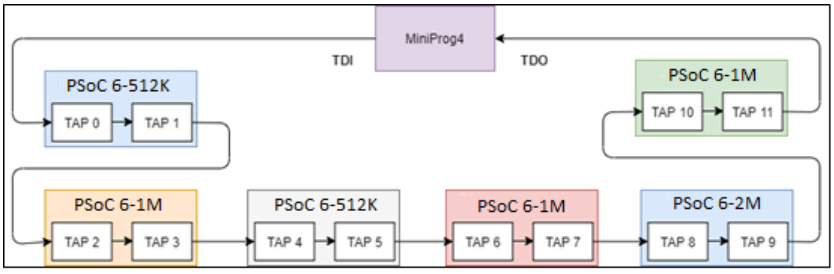
ModusToolbox™ Programmer programs the device and displays various messages in the **Log**. Then, a message in the Status Bar indicates that the device was programmed successfully or that an error occurred.



5.6 Program PSOC™ 6/Control C3/Edge E84 MCU in JTAG chain

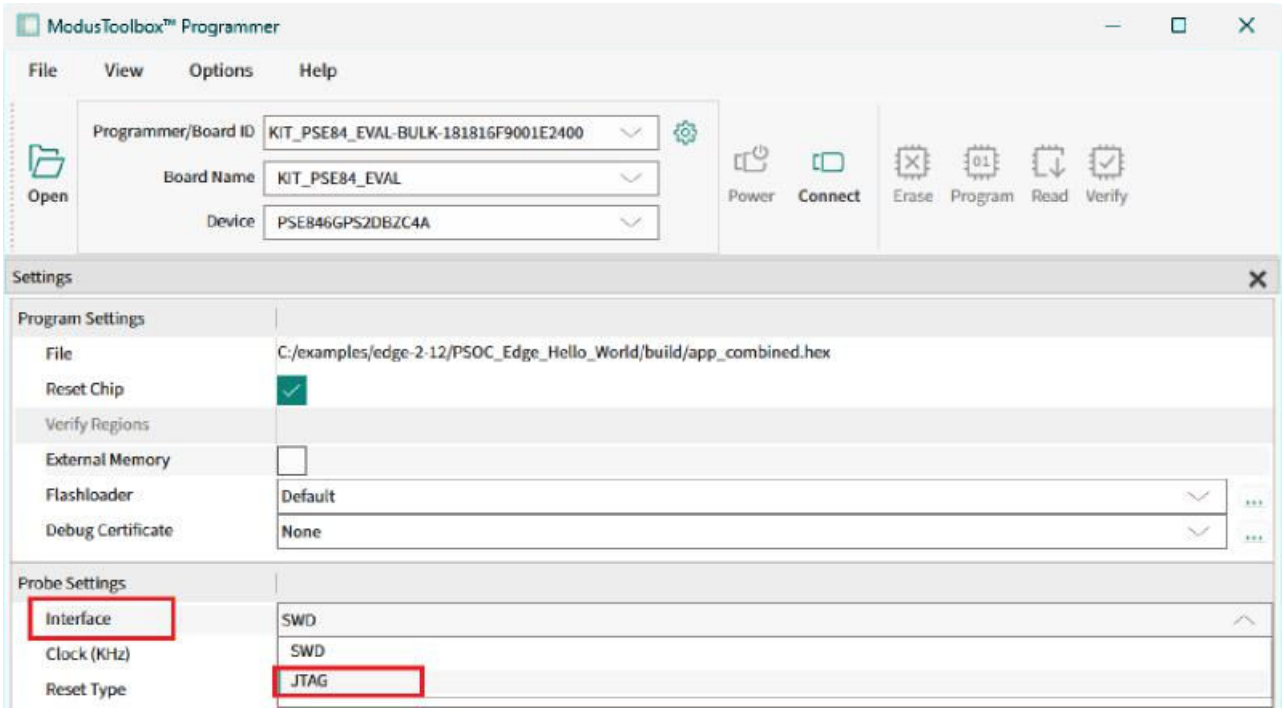
1. Connect the host computer to a MiniProg4 or J-Link probe attached to several MCU targets in the JTAG chain.

   The following hardware configuration is used in this example:

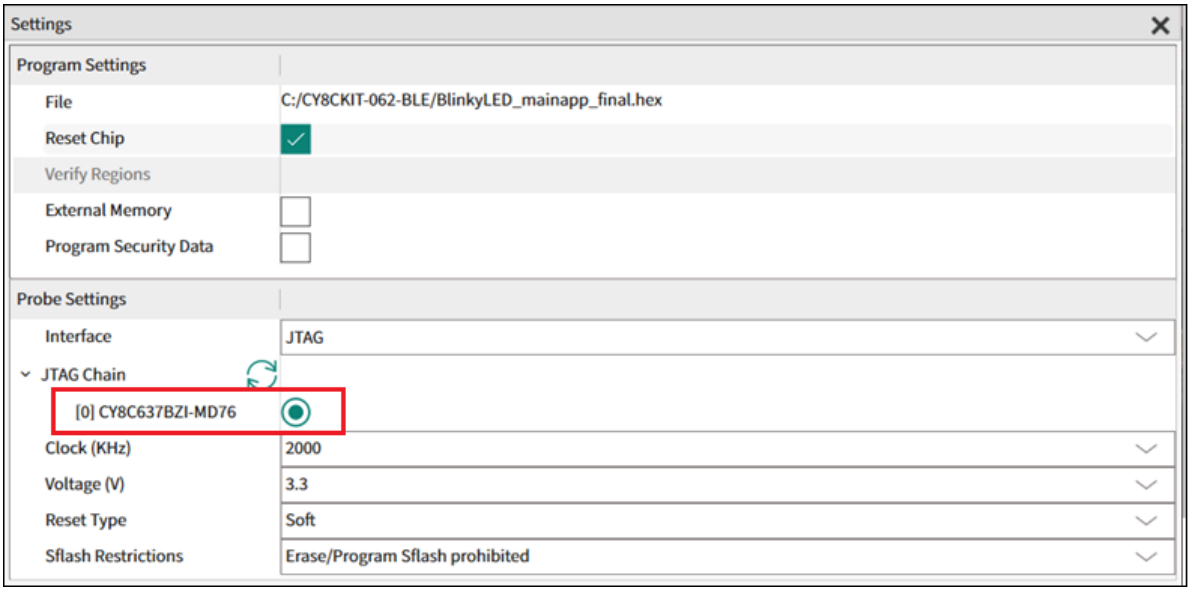


   The sample JTAG chain configuration contains six serially-connected PSOC™ MCU targets.

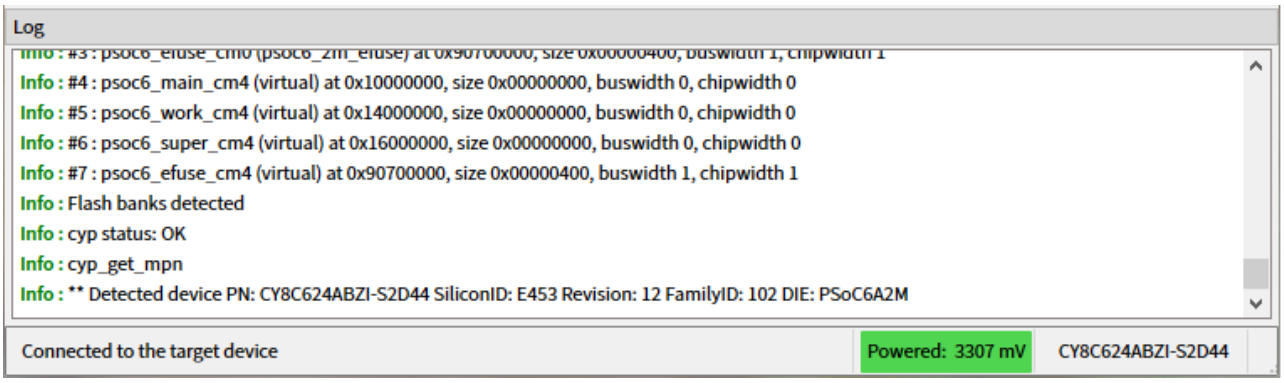
2. Select the MiniProg4 probe and target device in the **Programmer/Board ID**, **Board Name**, and **Device** drop-downs, and ModusToolbox™ Programmer will display information under **Probe Settings**. Ensure the JTAG chain is powered.
3. Select the JTAG interface in the Interface drop-down.



ModusToolbox™ Programmer queries the JTAG chain and displays detected devices under the JTAG Chain option in Probe Settings. The list of devices in the chain contains target names for supported devices and ID codes for those which are not supported.

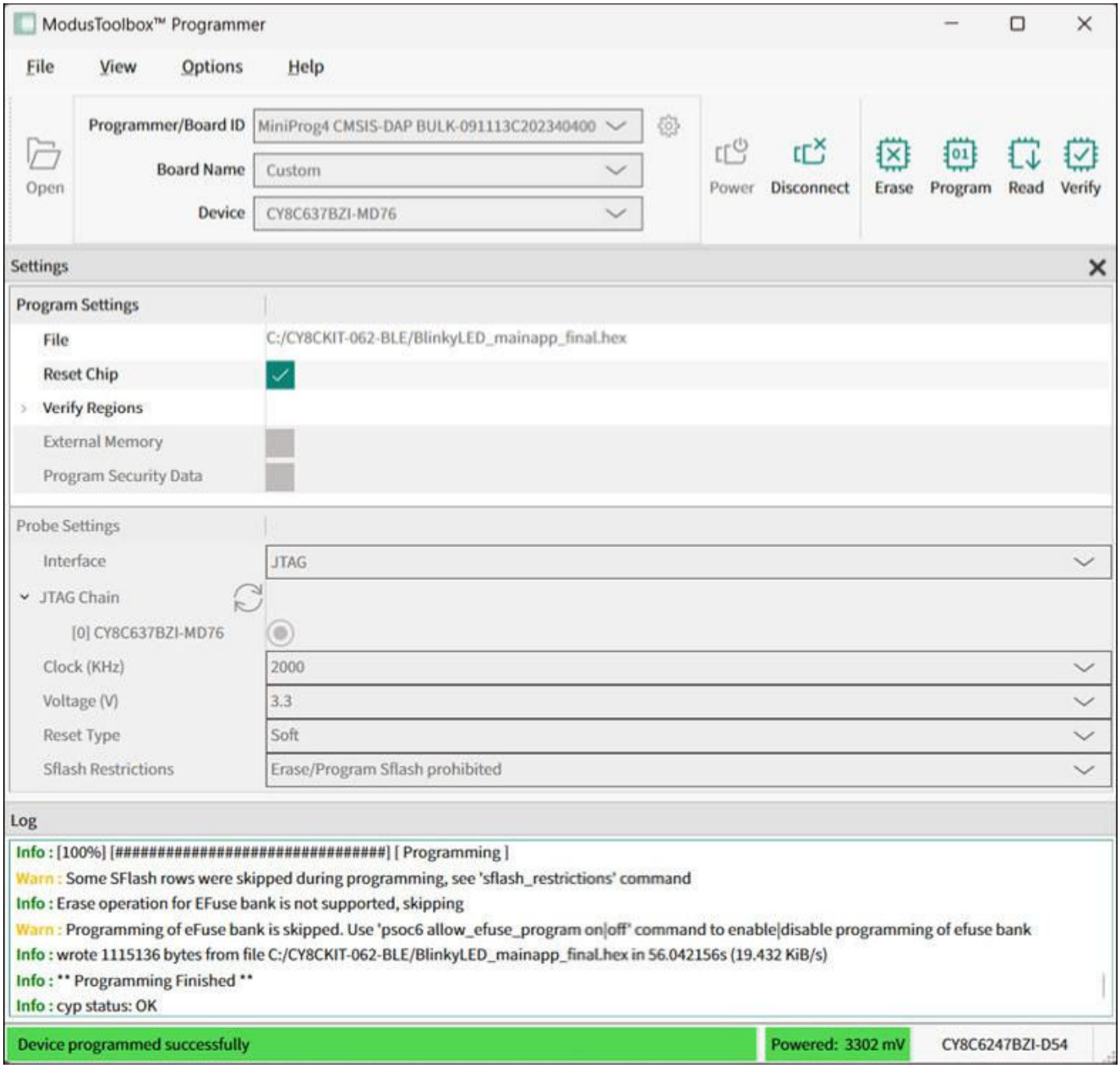


4. Select the desired target device in the list by clicking the radio button next to the target name.
5. Select the programming file as described in the Load programming file section.
6. Click **Connect**. ModusToolbox™ Programmer communicates with the device and displays various messages in the **Log**. Then, a message in the Status Bar indicates that it is connected.



7. Click the **Program** button.

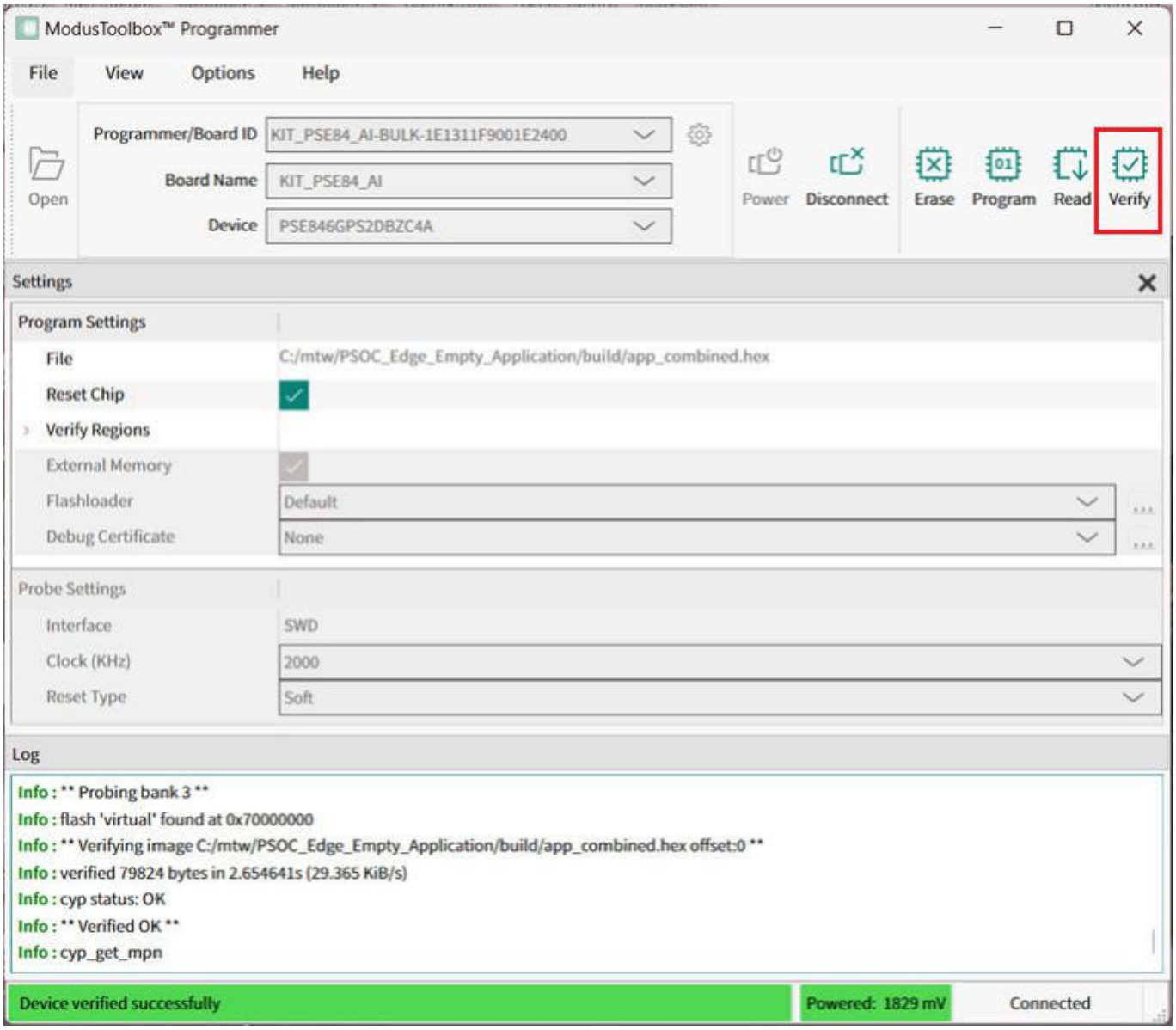
ModusToolbox™ Programmer programs the device and displays various messages in the **Log**. Then, a message in the Status Bar indicates that the device was programmed successfully or that an error occurred.



5.7 Verify device

1. Connect the device to the host computer and select it in the **Programmer/Board ID**, **Board Name**, and **Device** drop-downs.
2. Select the programming file as described in the Load programming file section.
3. Connect to the device (see Connect device).
4. Click the **Verify** button.

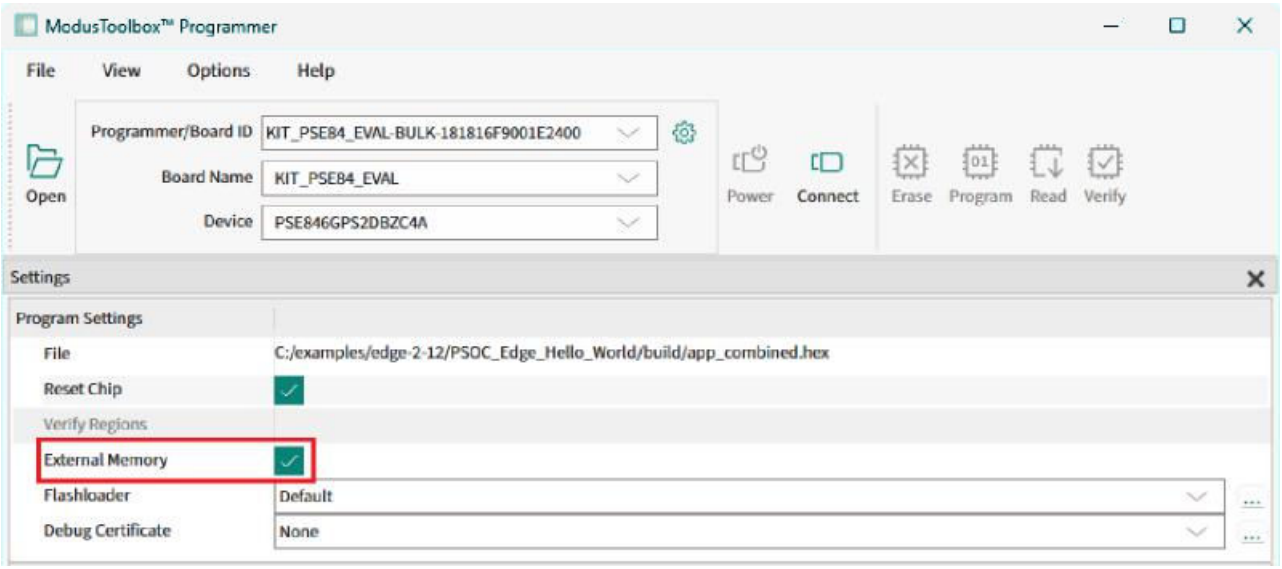
ModusToolbox™ Programmer performs the Verify device operation and displays various messages in the **Log**. Then, a message in the Status Bar indicates that the device was verified successfully or that an error occurred.



5.8 Verify device with External Memory

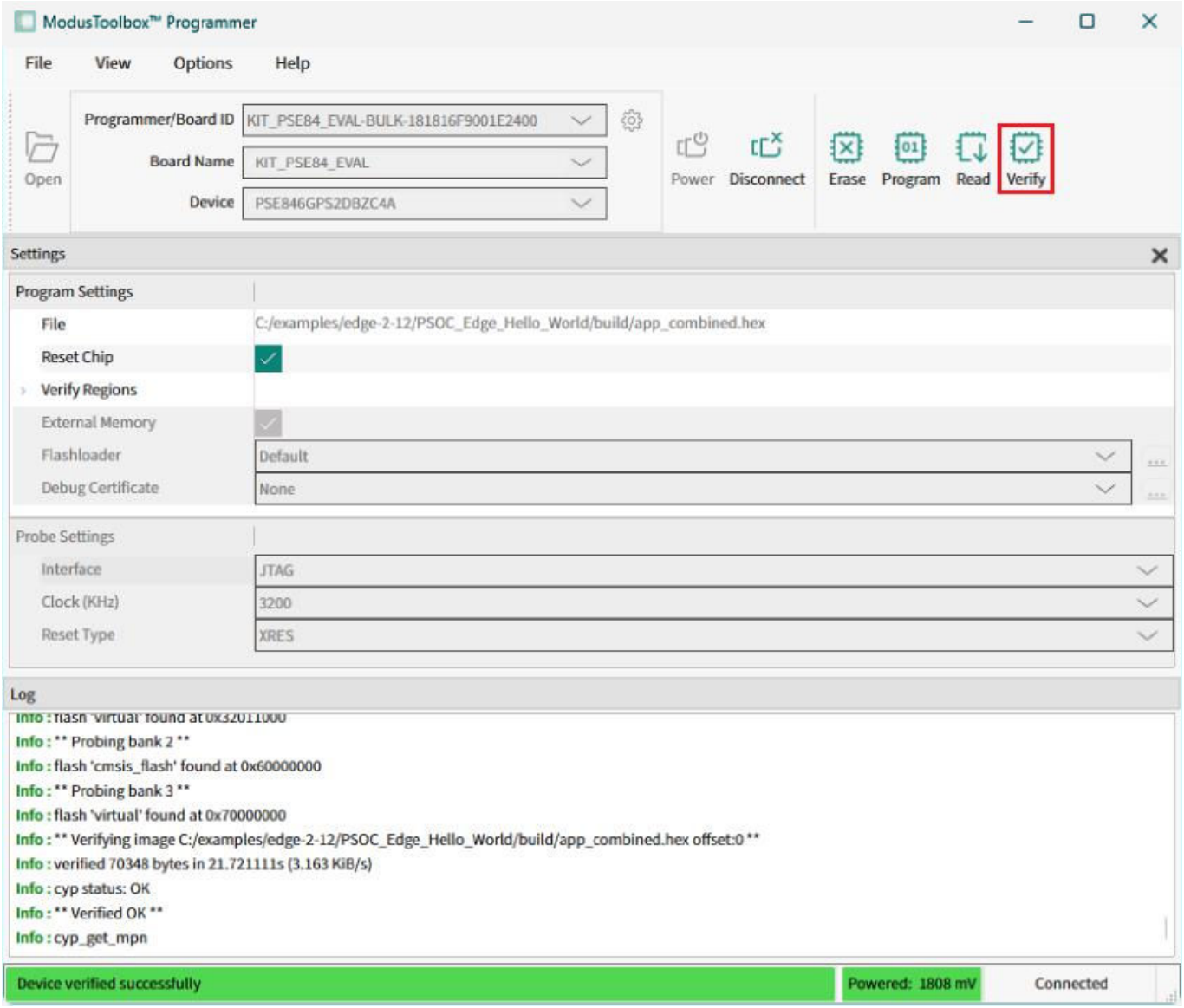
1. Connect the device that supports external memory (for example, CY8CKIT-062-WiFi-BT with QSPI support) to the host computer and select it in the **Programmer/Board ID**, **Board Name**, and **Device** drop-downs.
2. Select the programming file as described in the Load programming file section. The programming file should have external memory region(s).
3. Select the **External Memory** option under **Program Settings**.

4. Connect to the device (see Connect device).



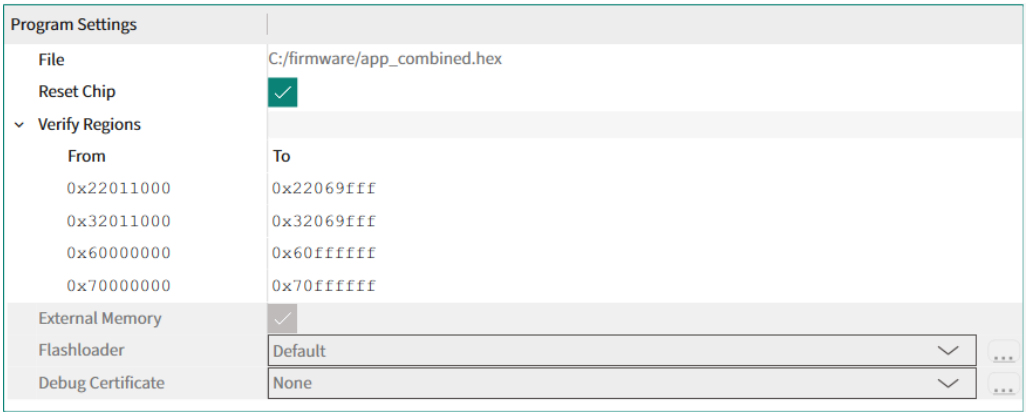
5. Click the **Verify** button.

ModusToolbox™ Programmer verifies the device and displays various messages in the **Log**. Then, a message in the Status Bar indicates that the device was verified successfully or that an error occurred.

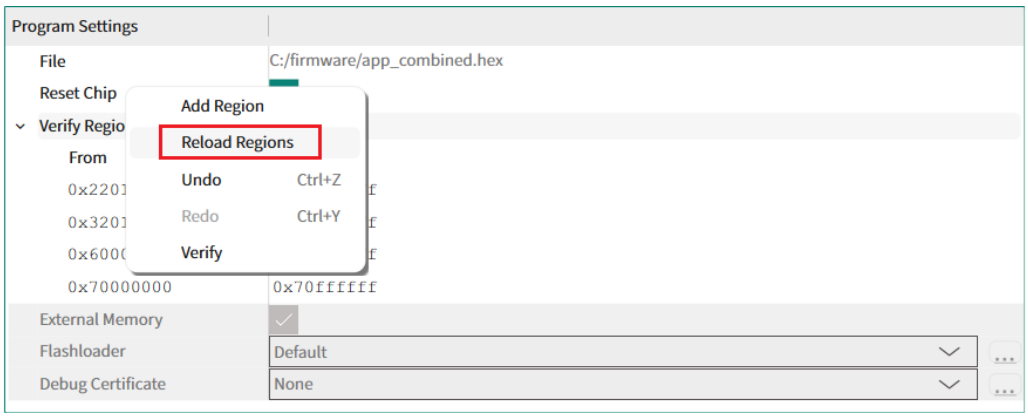


5.9 Verify custom flash regions

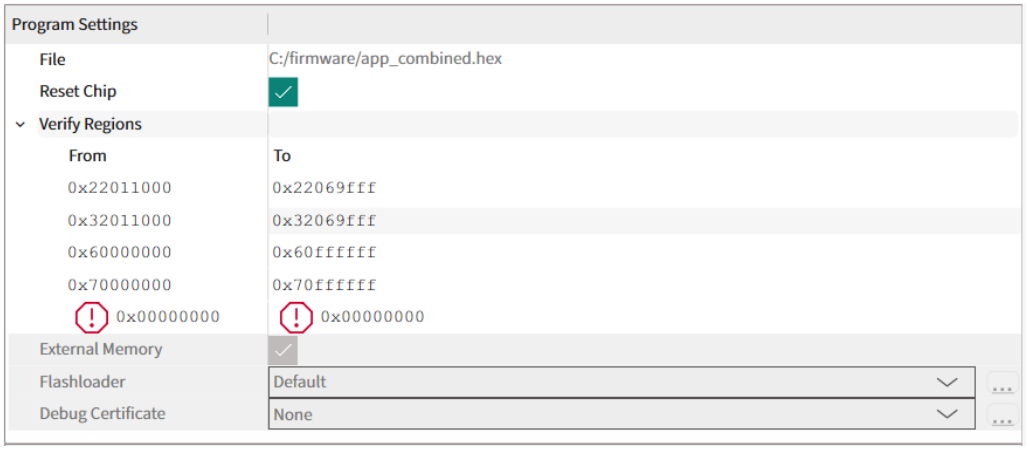
1. Connect the device to the host computer and select it in the **Programmer/Board ID**, **Board Name**, and **Device** drop-downs.
2. Select the programming file as described in the Load programming file section.
3. Connect to the device (see Connect device).
4. Expand Verify Regions option in Program Settings to see the list of flash regions available for verification. By default, only supported by target device regions are displayed:
   - application
   - AUXflash
   - Sflash
   - eFuse
   - QSPI



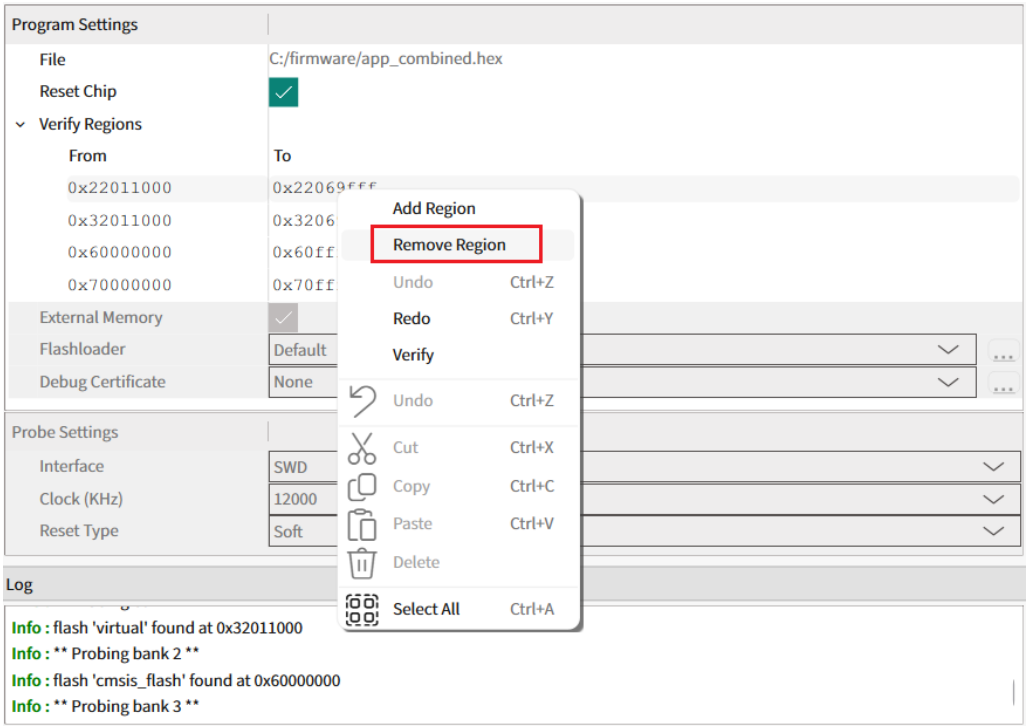
5. Right-click on **Verify Regions** or any region entry to open the context menu.



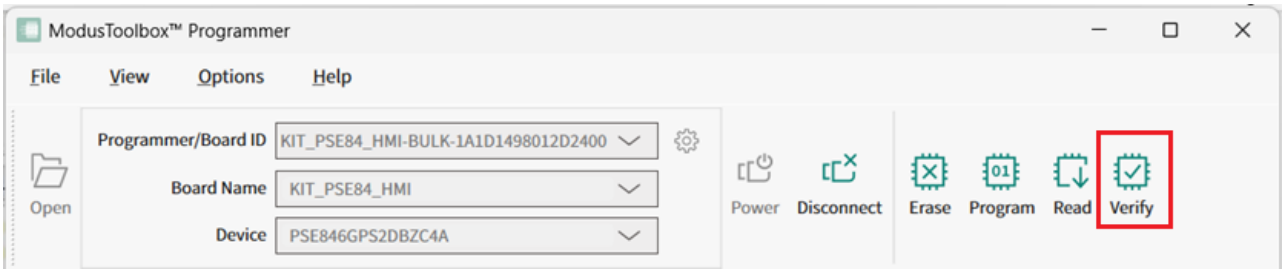
6. To add a custom flash region, select **Add Region**. Select the added list entry, and enter the correct values for start and end addresses of the region.



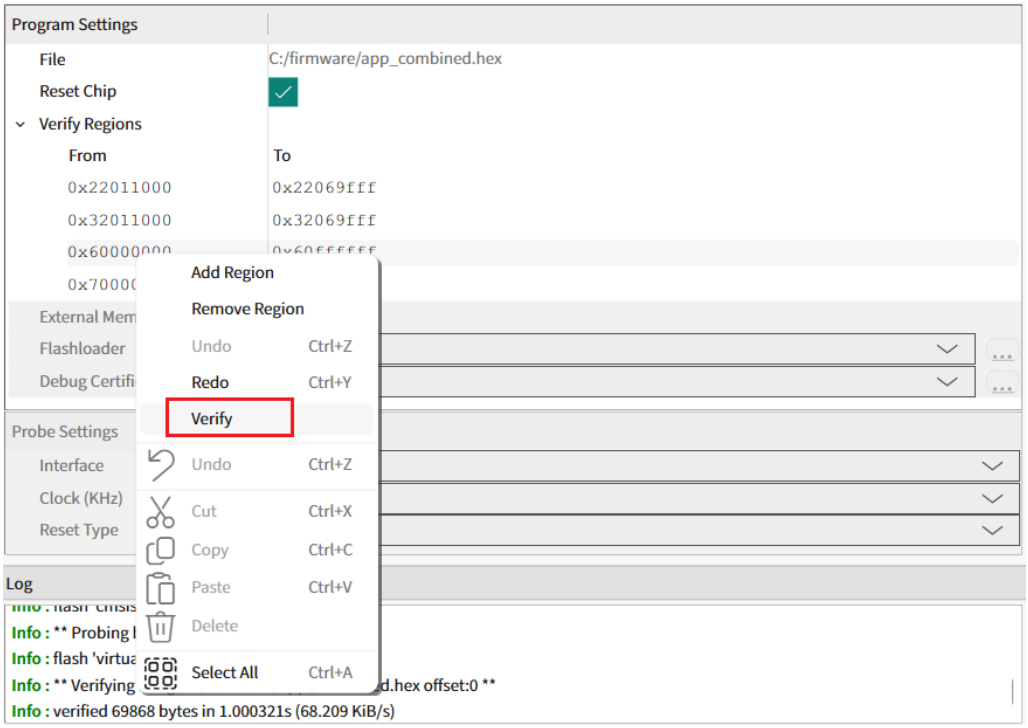
7. To remove any region in the list, right-click the desired region entry and select **Remove Region**.



8. To revert any previous change, select **Undo**.
9. When finished with the list of regions, start device verification by clicking the **Verify** button on the toolbar.

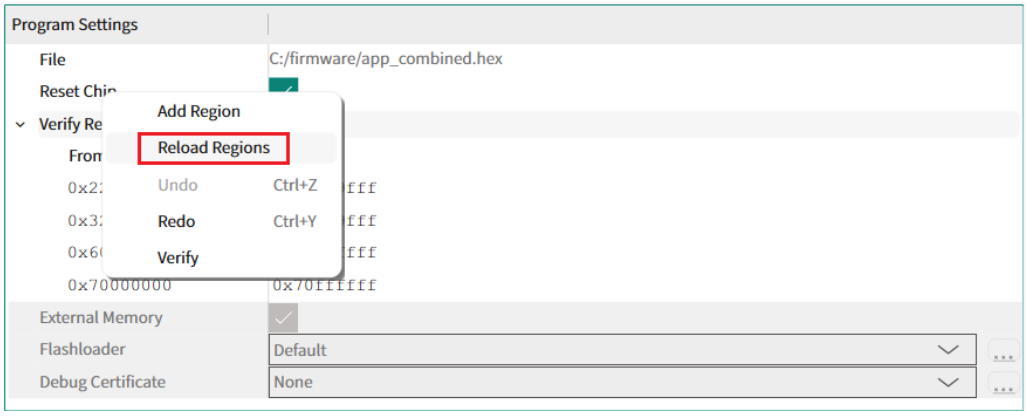


You can also select **Verify** on the context menu.



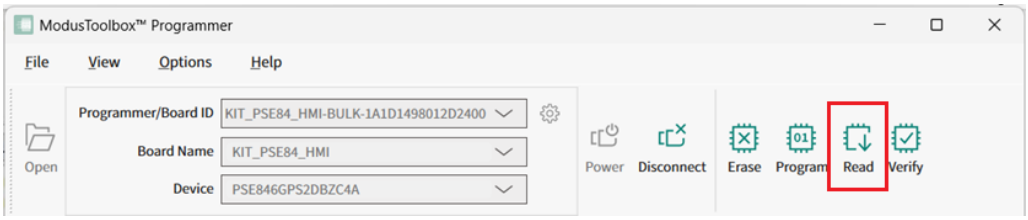
ModusToolbox™ Programmer verifies only the regions specified in the **Verify Regions** list. Then, a message in the Status Bar indicates that the device was verified successfully or that an error occurred.

10. To reset the **Verify Regions** list to its default state select **Reload Regions** from the context menu. This action will remove all custom regions and load default regions corresponding to the flash map.

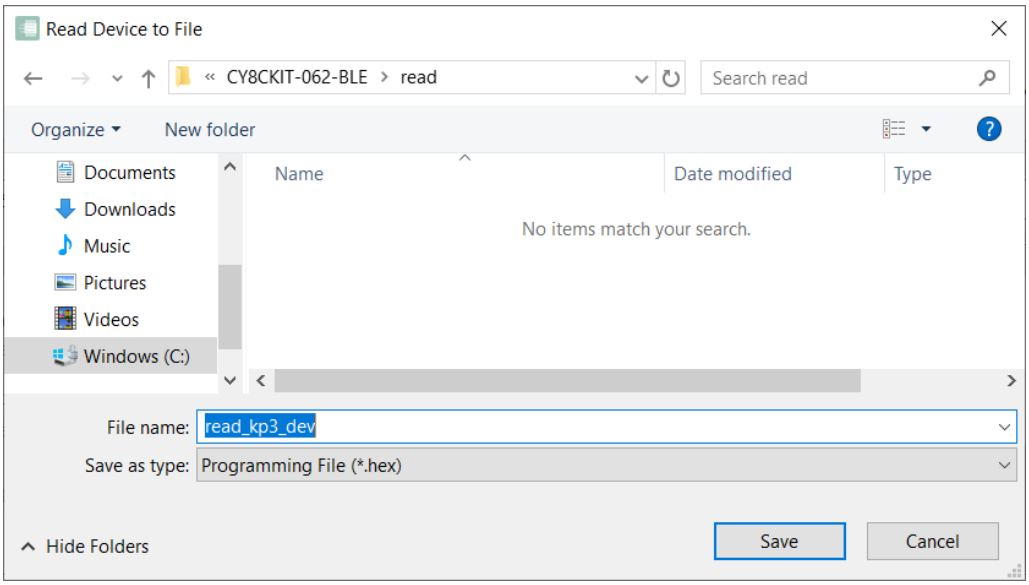


5.10 Read device

1. Connect the device to the host computer and select it in the **Programmer/Board ID**, **Board Name**, and **Device** drop-downs.
2. Connect to the device (see Connect device).
3. Click the **Read** button.

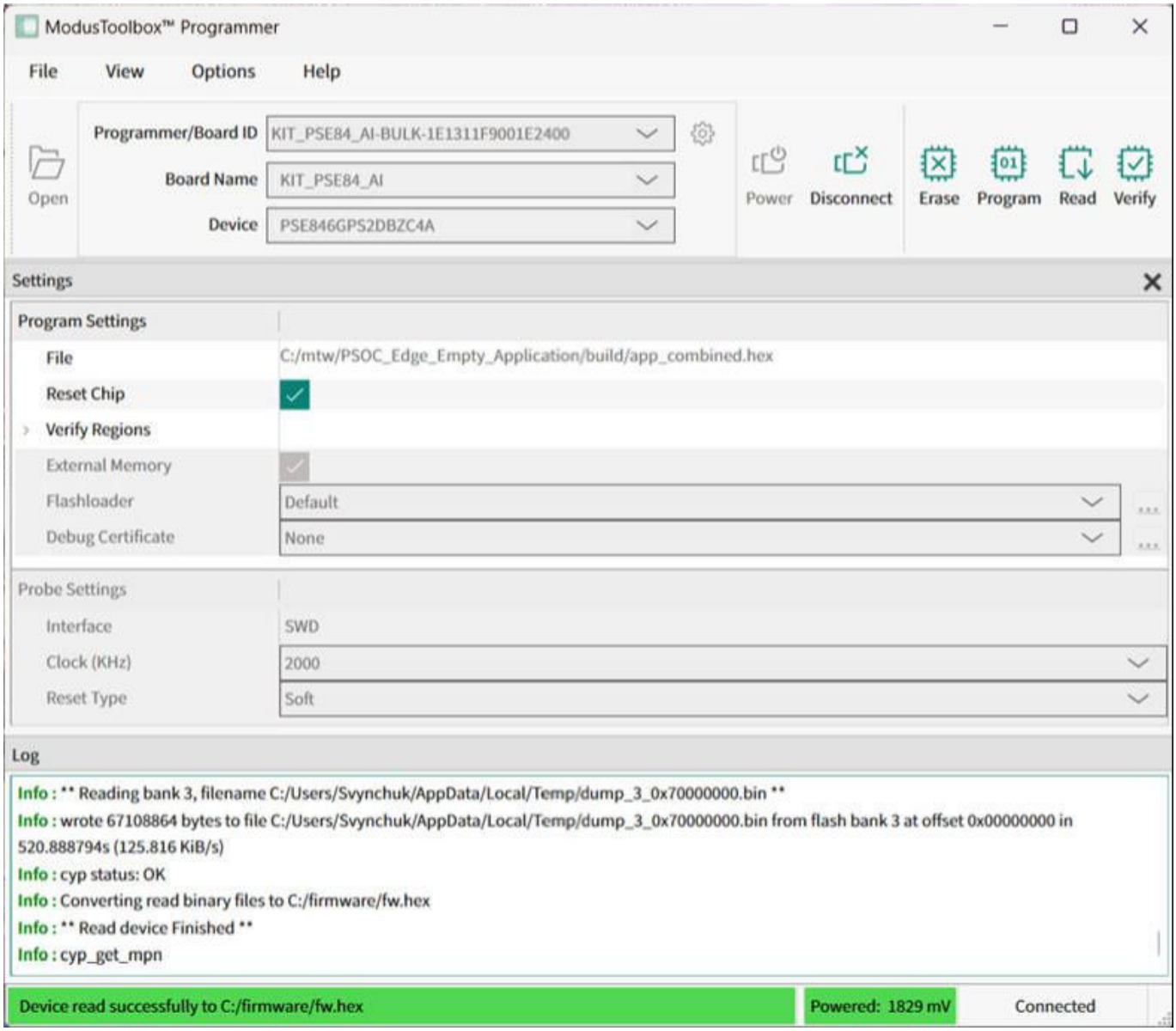


4. On the Read Device to File dialog, navigate to the location of the HEX or SREC file to be saved, enter the file name, select the file type in the **Save as type** drop-down, and click **Save**.



***Note**: Under Ubuntu Linux, specify the full file name with an extension (e.g. kp3-dev.srec); otherwise, the file will be saved in HEX format.*

ModusToolbox™ Programmer performs the Read device operation and displays various messages in the **Log**. Then, a message in the Status Bar indicates that the device was read successfully or that an error occurred.

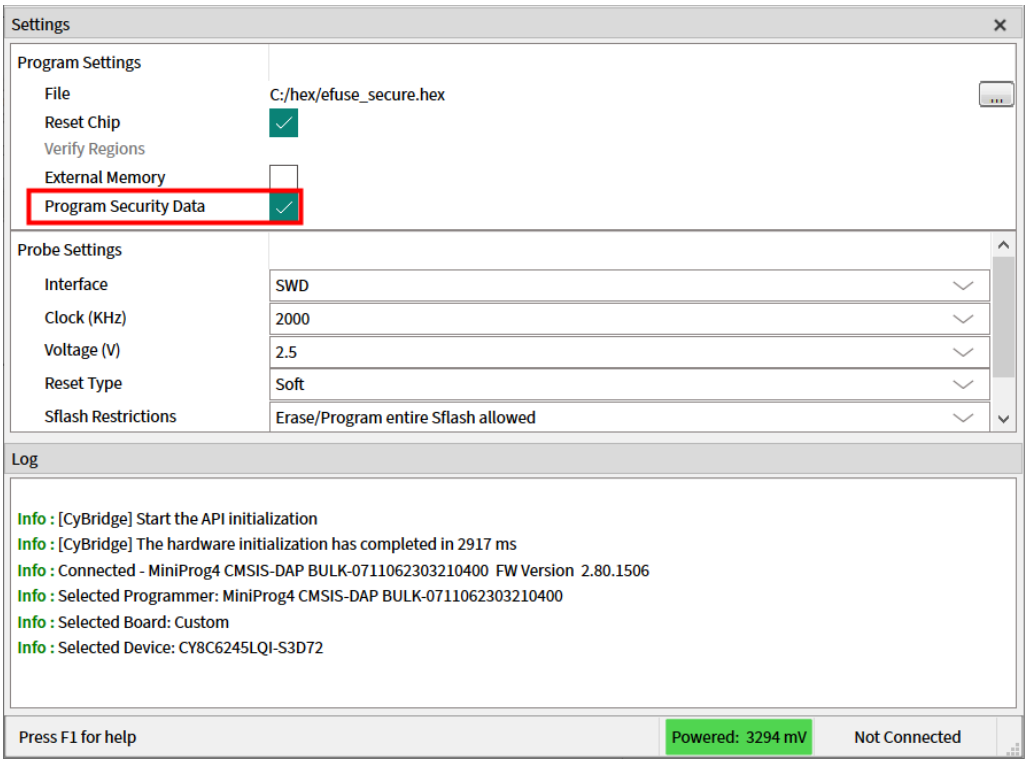


***Note**: Read Device feature is not available for the boards based on WICED-Bluetooth hardware programmers.*

5.11 Program eFuse region of PSOC™ 6/TRAVEO™ T2G/XMC7xxx/XMC5xxx MCU

1. Connect the device to the host computer and select it in the **Programmer/Board ID**, **Board Name**, and **Device** drop-downs.
2. Select the programming file as described in the Load programming file section. The programming file should contain valid eFuse data region (at address 0x90700000).
3. Select the **Program Security Data** check box under **Program Settings**.

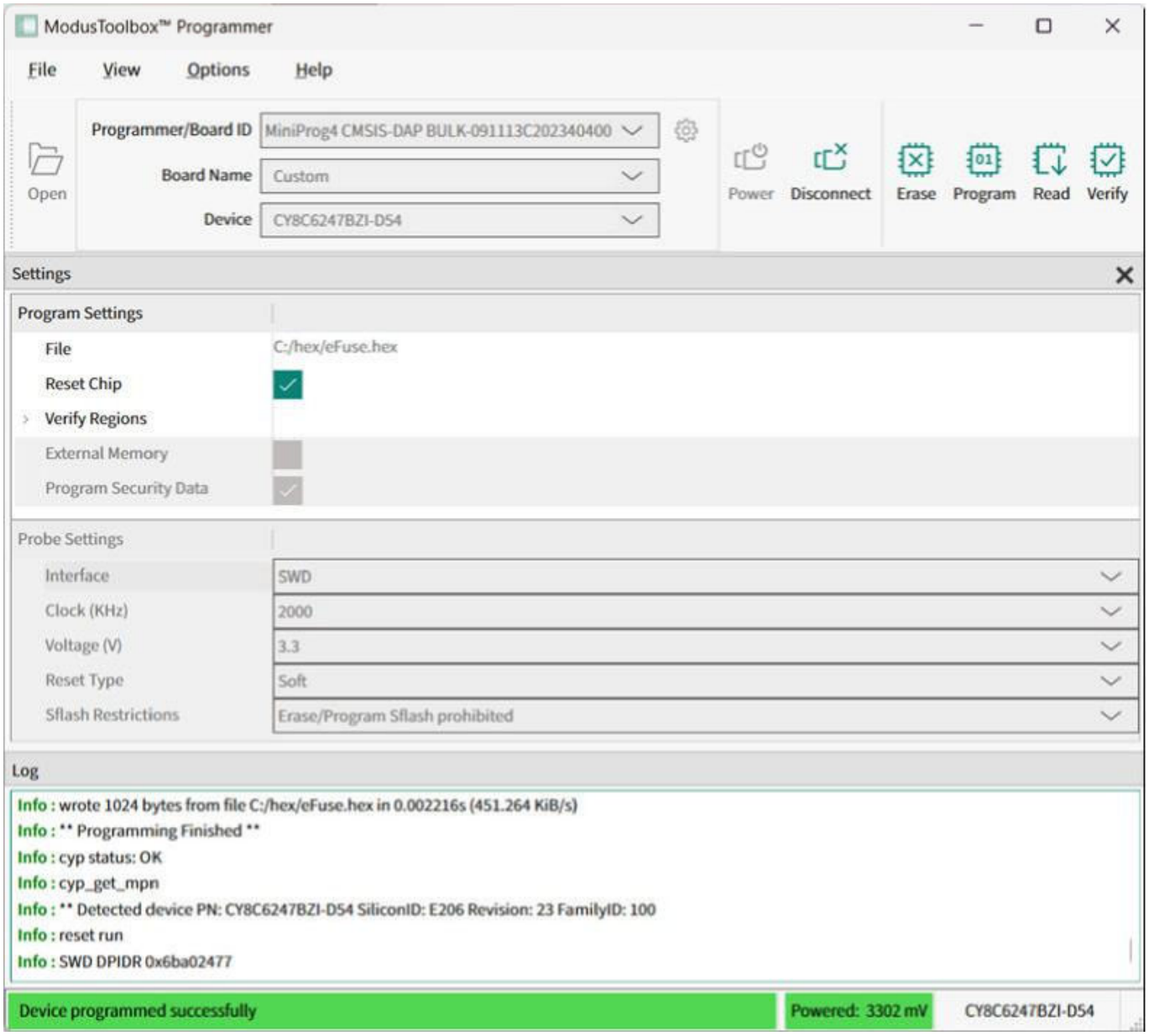
5 Programming operations



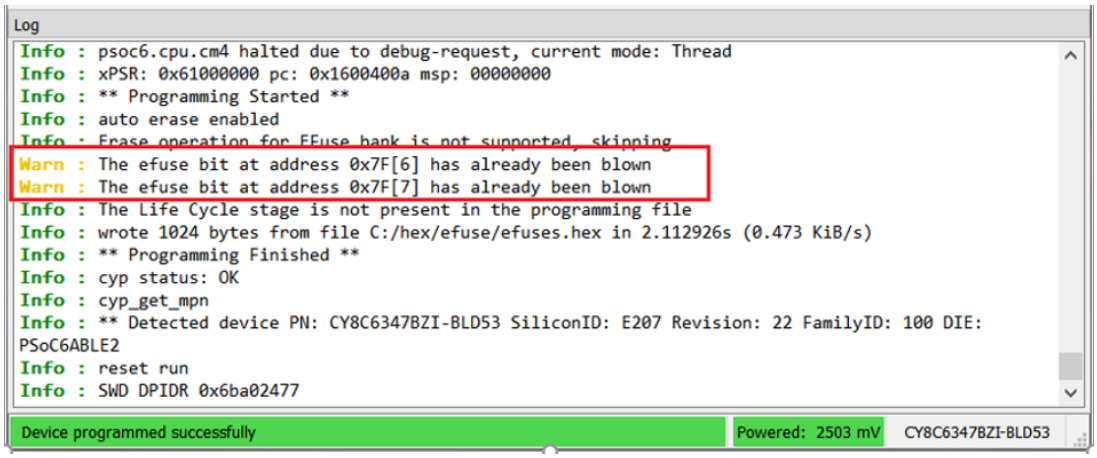
4. Connect to the device (see Connect device).
5. Click the **Program** button.

ModusToolbox™ Programmer programs the device and displays various messages in the Log. Then, a message in the Status Bar indicates that the device was programmed successfully or that an error occurred.

5 Programming operations



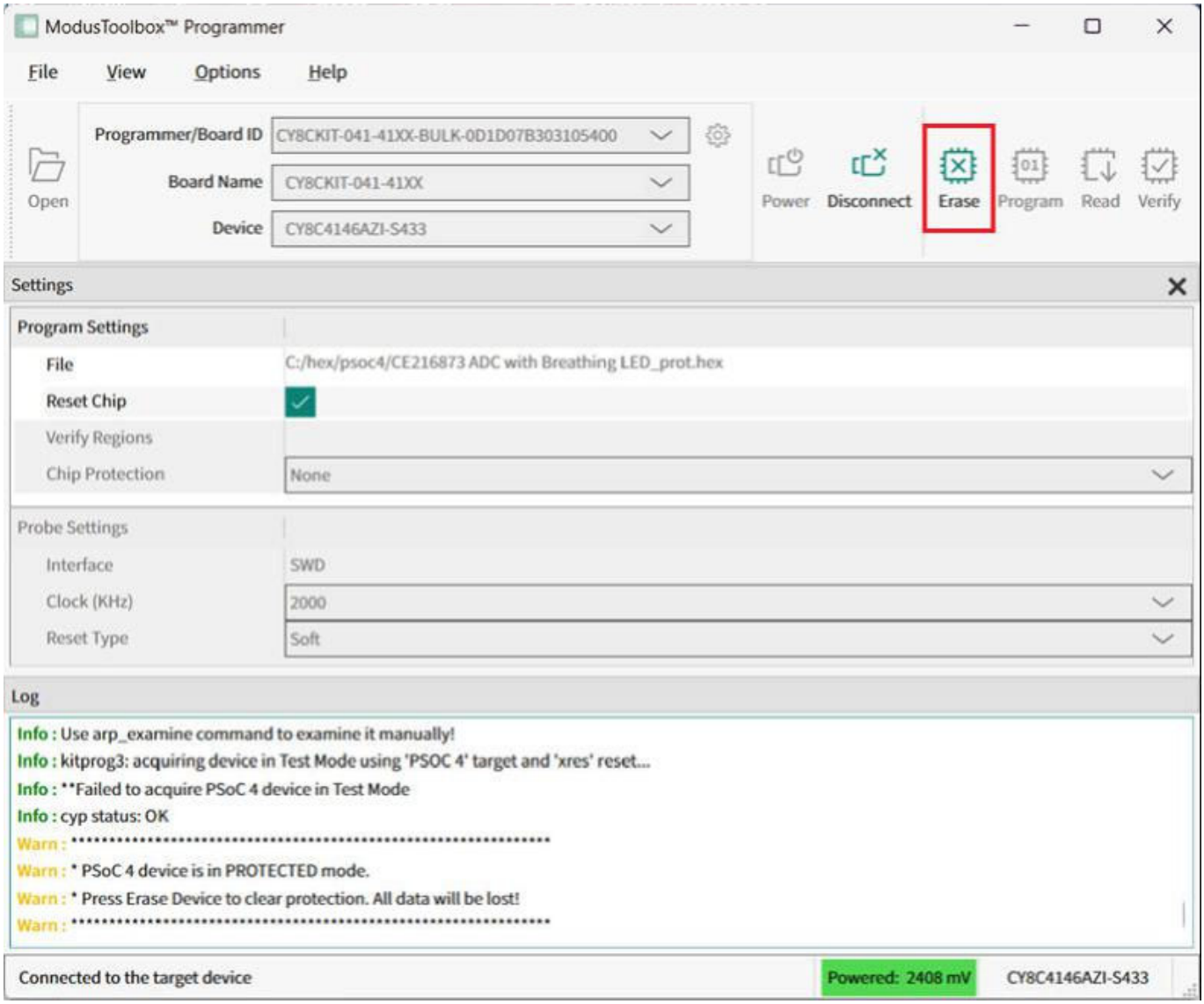
If some eFuse bits have been already programmed before, a warning message "The efuse bit at address xx has been already blown" appears in **Log**.



5.12 Program chip-protected/Kill Mode for PSOC™ 4 MCU

The chip-level protection mechanism restricts access of the programmer application to silicon resources. In this mode, access to flash, SRAM, and most of the registers in the PSOC™ 4, PMG1, PAG2s, and CCGx are disabled.

If you try to connect ModusToolbox™ Programmer to a chip-protected PSOC™ 4/CCGx device, a warning message indicates that the device is in protected mode. The only available operation is **Erase** device in this case.

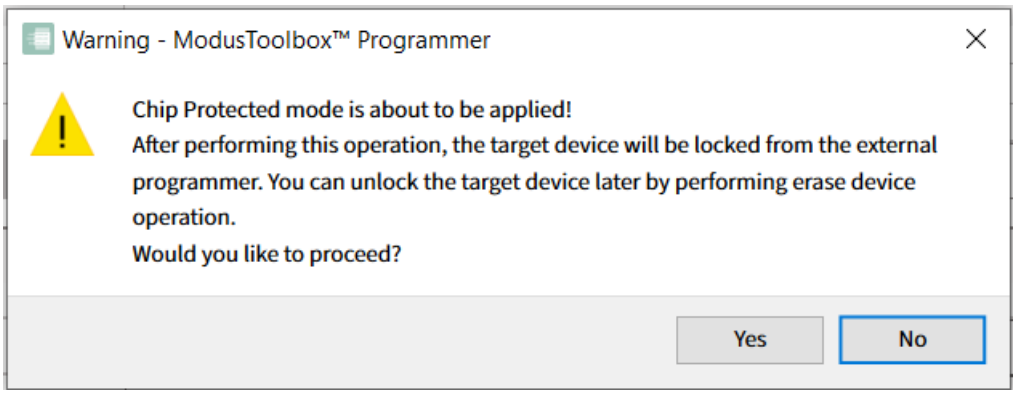


Use the **Erase** button to clear chip protection and move target to the open state.

5.12.1 Switch to Protected mode

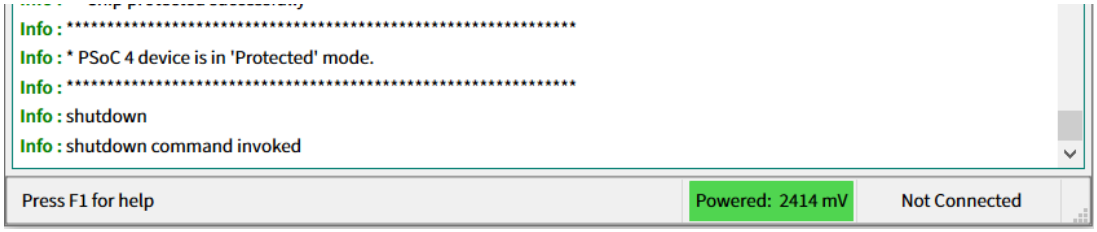
This operation temporarily disables access to chip's resources.

1. Connect the device to the host computer and select it in the **Programmer/Board ID**, **Board Name**, and **Device** drop-downs.
2. Select the **Chip Protection** pull-down and select **Protected** mode.
   A warning message asking for confirmation is displays.



3. Click **Yes** to apply **Protected** mode for your PSOC™ 4, PMG1, PAG2S and CCGx.

When the operation completes, the log is appended with a message, and the device is disconnected from the programmer automatically.

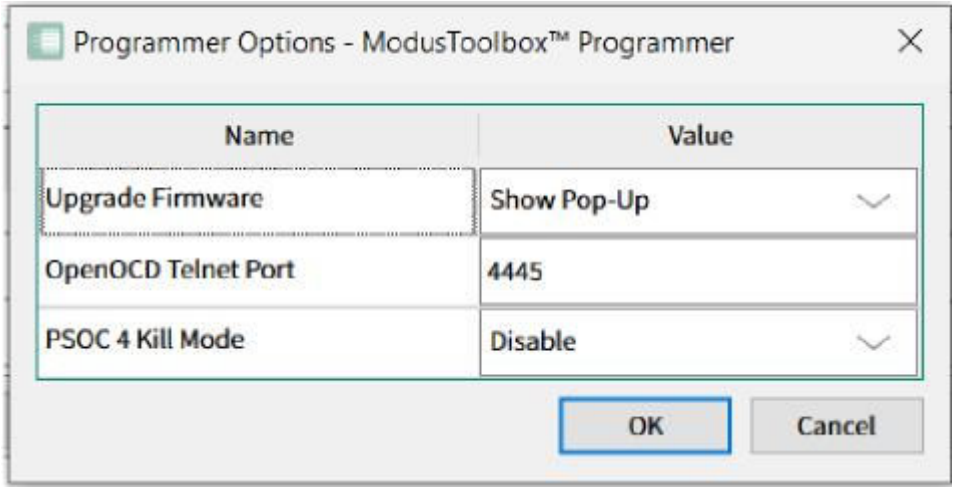


5.12.2 Switch to Kill mode

Attention**: **Be aware that after applying Kill mode your device will be permanently locked from any external debugger or programmer software. This operation is not reversible.

1. Connect the device to the host computer and select it in the **Programmer/Board ID**, **Board Name**, and **Device** drop-downs.

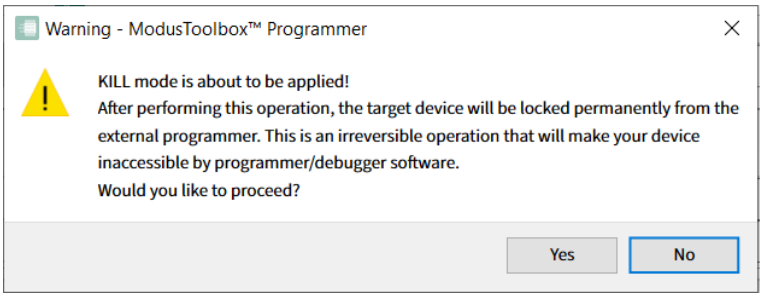
2. To use Kill mode, go to **Options > Programmer Options** and enable it in **PSOC 4 Kill Mode** drop-down.



3. Connect to the device (see Connect Device).

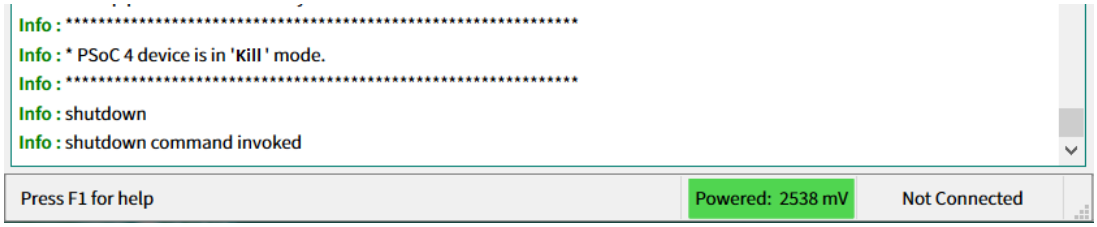
4. Click the **Chip Protection** pull-down and select **Kill** mode.

A warning message asking for confirmation is displays.



5. Click **Yes** to apply Kill mode for your PSOC™ 4, PMG1, PAG2S and CCGx.

When the operation completes, the log is appended with a message, and the device is disconnected from the programmer automatically.

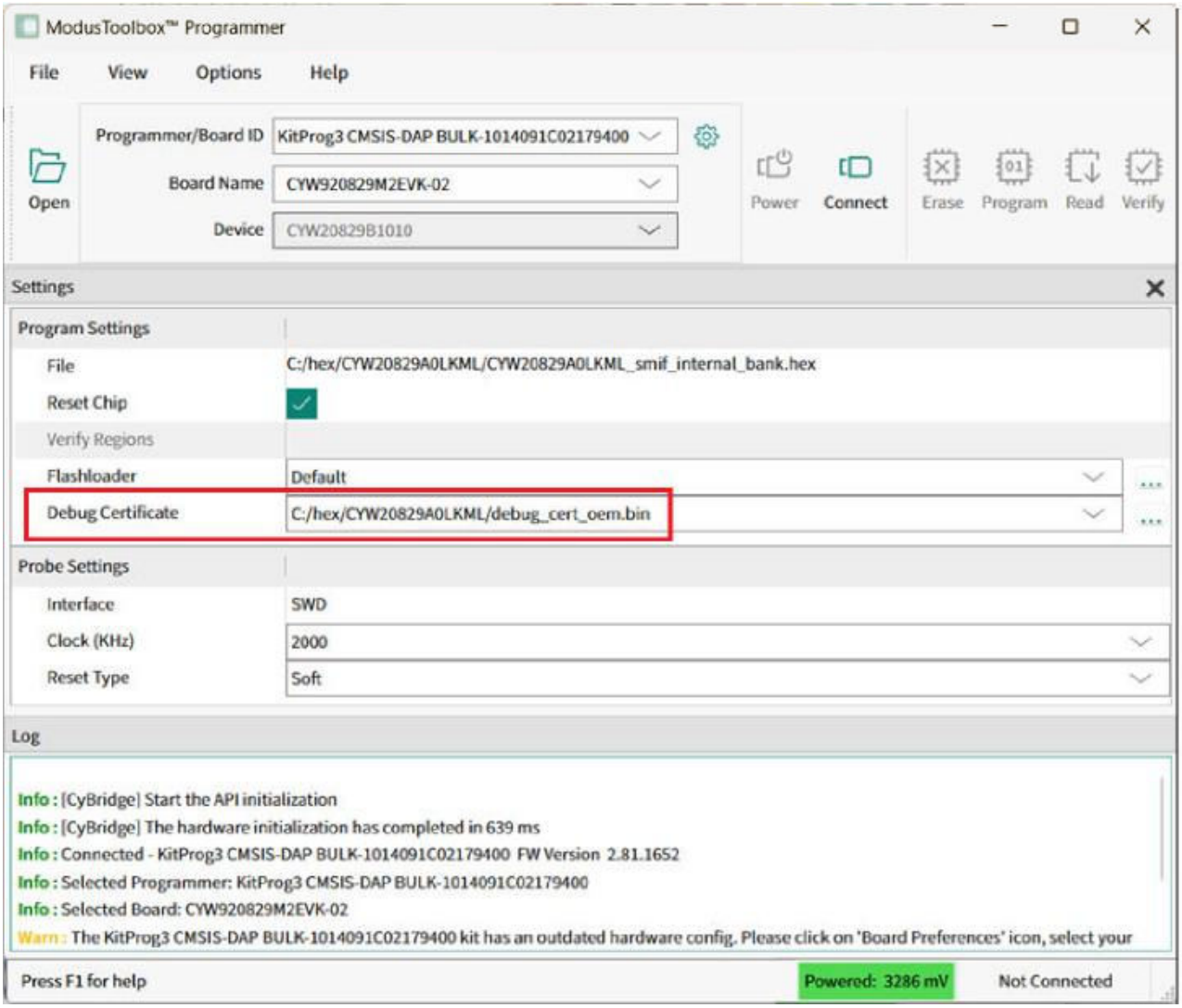


5.13 Program secure AIROC™ CYW20829 MCU

You can program the flash of an AIROC™ CYW20829 device in Secure lifecycle mode only by providing a valid debug certificate file.

1. Connect the device to the host computer and select it in the **Programmer/Board ID**, **Board Name**, and **Device** drop-downs.
2. Select the programming file as described in the Load programming file section.
3. Click on the **Debug Certificate** option under **Program Settings** and select the certificate file in the dialog.

   The path will display under **Settings**.



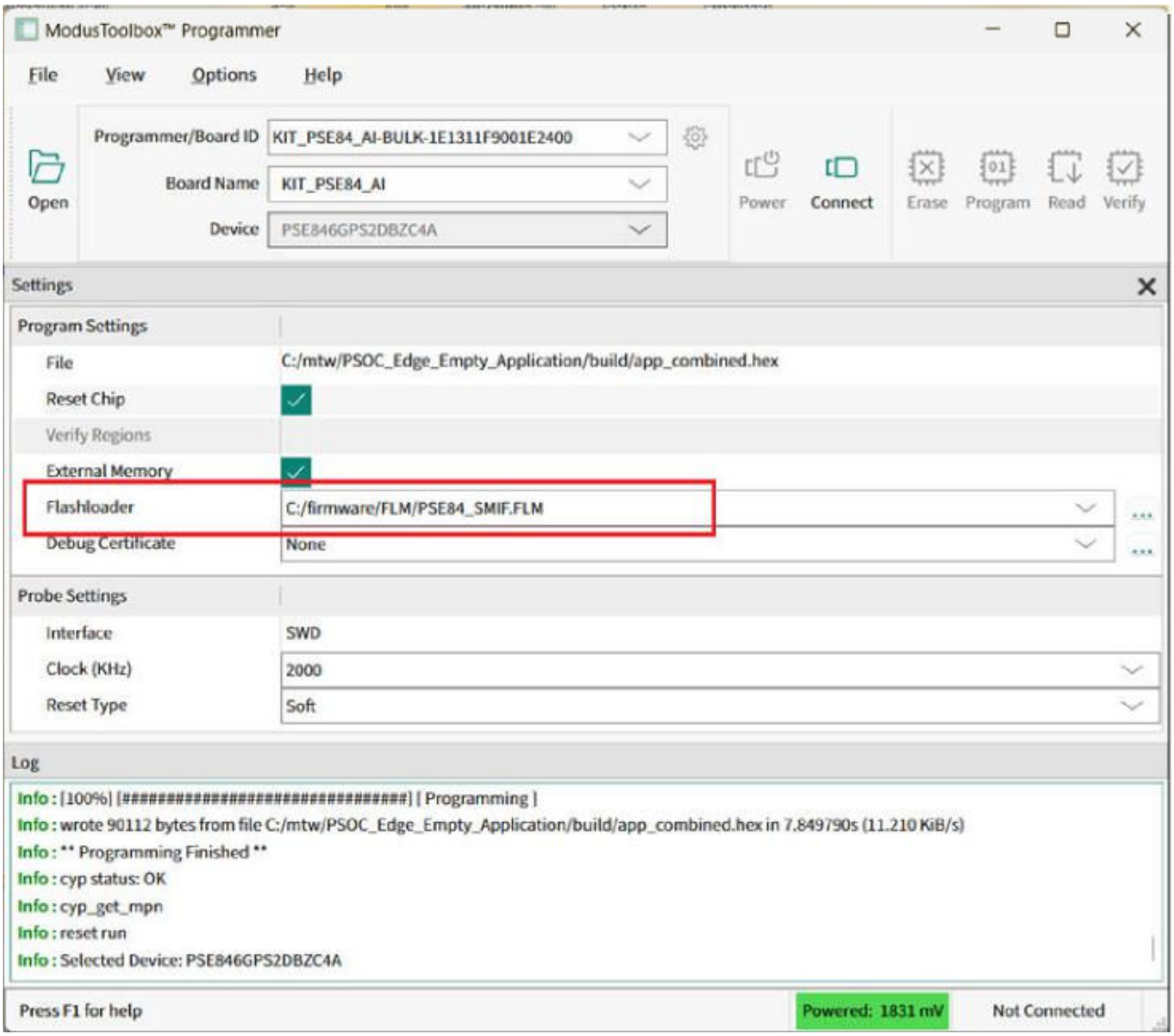
4. Connect to the device (see Connect device).
5. Click the **Program** button.

5.14 Program QSPI memory with patched flashloader

This feature is supported by AIROC™ CYW20829 devices, as well as PSOC™ Edge E84, XMC7100/7200 and CYT4Bx MCUs. It allows you to specify the patched flashloader file in FLM format along with the appropriate QSPI configuration. Patched flashloaders contain data about how your external memory is configured.

1. Connect the device to the host computer and select it in the **Programmer/Board ID**, **Board Name**, and **Device** drop-downs.
2. Select the programming file as described in the Load programming file section.
3. Select the **External Memory** option under **Program Settings** (if supported).
4. Click on the **Flashloader** option under **Program Settings** and select the patched flashloader (FLM) file in the dialog.

   The path will display under **Settings**.



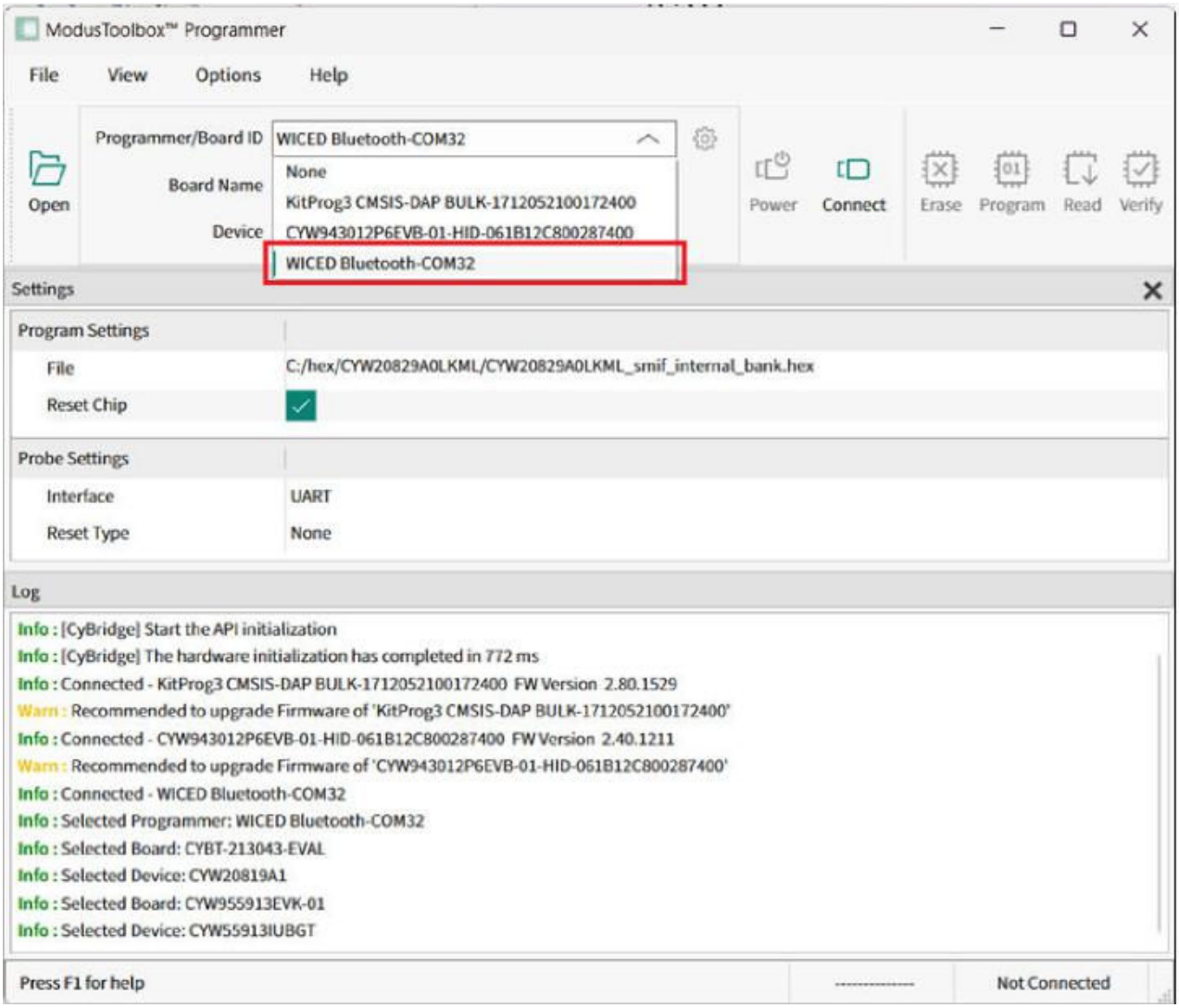
5. Connect to the device (see Connect device).
6. Click the **Program** button.

***Note**:* *To be able to program custom QSPI memory, you should also provide the appropriate QSPI configuration file (qspi_config.cfg) generated by the ModusToolbox™ QSPI Configurator tool. This file should be placed in the same directory as the patched flashloader file; it is located and read by ModusToolbox™ Programmer automatically.*

Refer to the QSPI Configurator user guide for more information about patching flashloaders.

5.15 Program AIROC™ CYW955513EVK-01, CYW955913EVK-01, and CYW9M2BASE-43012BT boards

1. Connect the device to the host computer and perform recover device procedure as described in How to recover AIROC™ Bluetooth® devices on failure.
2. Click the Programmer pull-down and select 'WICED Bluetooth-PortXX' programmer.



***Note**: The CYW9M2BASE-43012BT board should be switched to Dual UART mode first, otherwise the WICED Bluetooth® programmer will be unavailable in the **Board Name** pull-down menu. To do this, press the hardware 'Mode' button on the Kit, hold it for 3 seconds, then release it.*

3. Open the **Board Name** pull-down and select the appropriate board name (e.g., CYW955513EVK-01)
4. Select the programming file as described in the Load programming file section.
5. Connect to the device (see Connect device).
6. Click the **Program** button.

ModusToolbox™ Programmer programs the device and displays various messages in the Log. Then, a message in the Status Bar indicates that the device was programmed successfully or that an error occurred.

5.16 Update KitProg3 Board Name

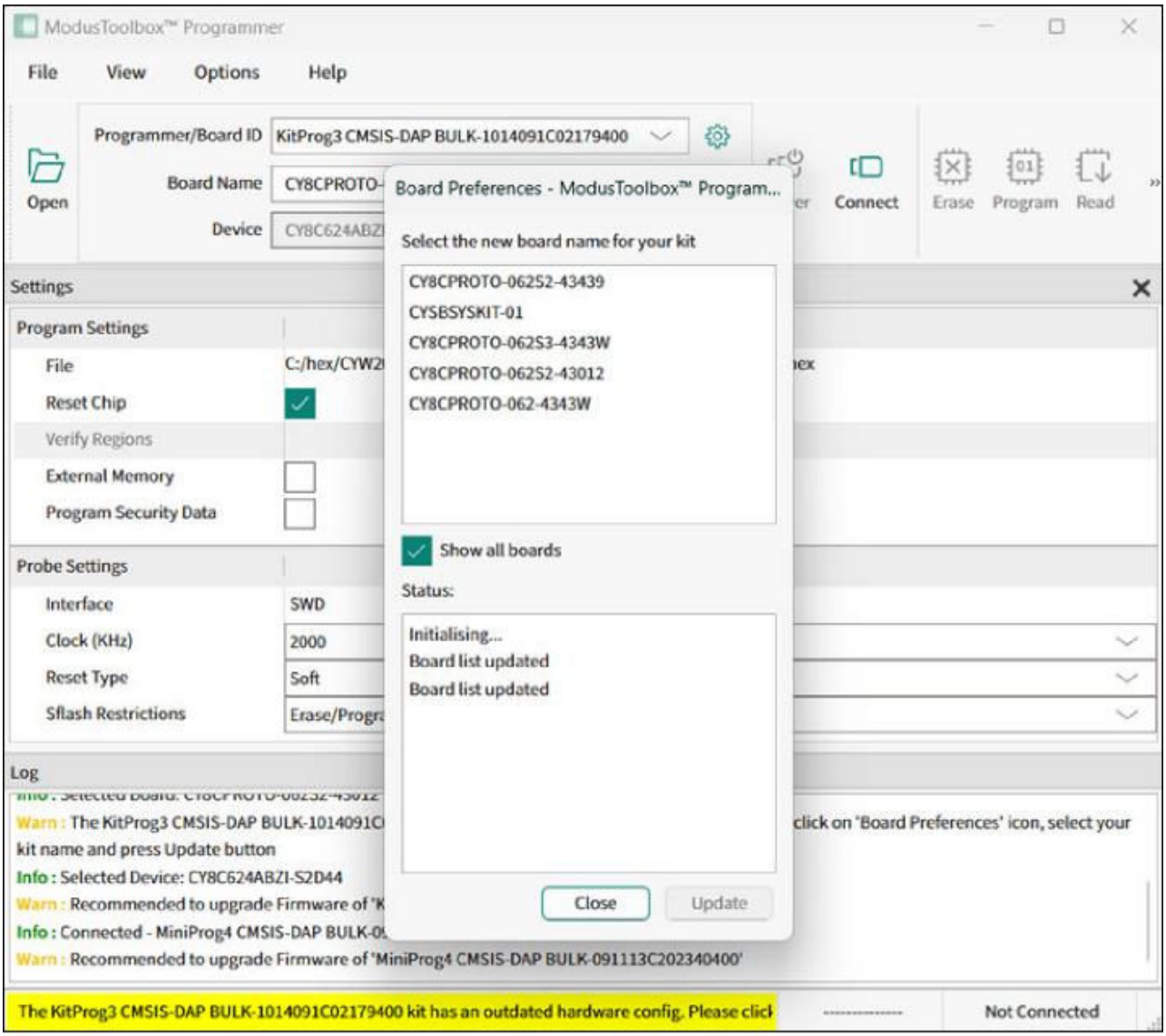
Some KitProg3 development kits were released to market with missing board configuration in the EEPROM. In this case, the **Programmer/Board ID** displays the kit as generic KitProg3 device as:

KitProg3 CMSIS-DAP Bulk-1014091C02179400

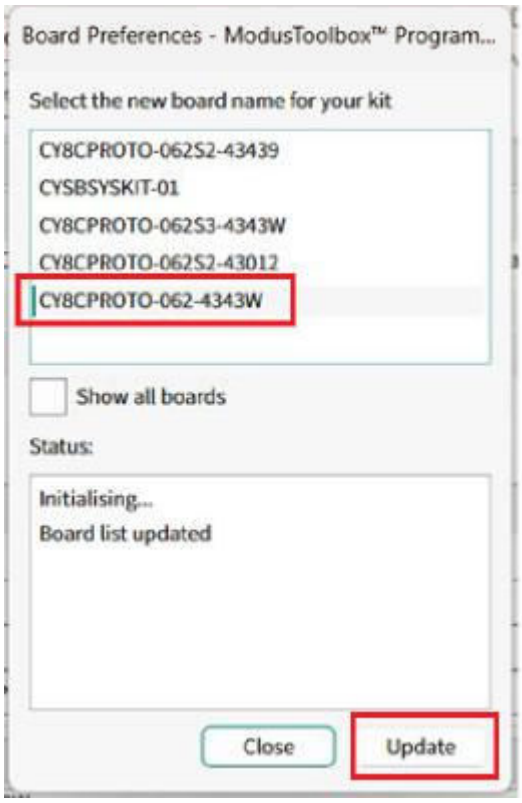
Some development kits may require updating the name of the board after changing SOM modules on them for example:

KIT_PSE84_EVAL_EPC2 (EPC4).

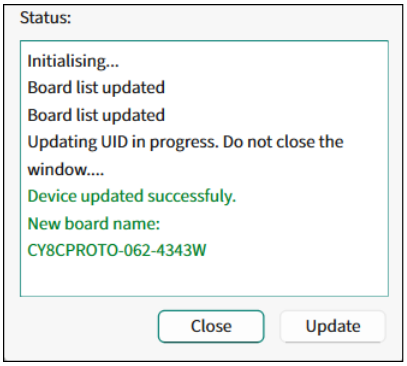
1. Click on the **Board Preferences** button to update the name of your kit. The Board Preferences dialog opens.
2. As needed, click on the **Show all boards** check box to display the full list of supported names.



3. Select the correct board name for your kit in the list and click the **Update** button.

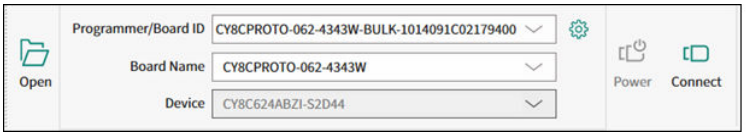


The tool checks if the selected name corresponds to the actual connected KitProg3 device. Board configuration is updated in the EEPROM of KitProg3. The success status and a new board name are displayed.



***Note**: The "Device not updated" error means an incorrect kit name was selected.*

4. Click the **Close** button, the dialog closes and the updated board name displays in the pull-downs.



6 Troubleshooting

6.1 Limitations

- ModusToolbox™ Programmer does not support RAM programming, you can program only the flash memory of a target device, except for devices that support only RAM such as CYW9M2BASE-43012BT and CYW955513EVK-01 kits.
- Programming devices in DAPLink mode is not supported. You have to switch your device into CMSIS-DAP BULK mode by pressing the mode selection button.

6.2 How to recover AIROC™ Bluetooth® devices on failure

If the program operation for an AIROC™ Bluetooth® device fails, it is possible the memory on the board has been corrupted by a previously loaded application, or the application used a custom baud rate that the download process does not detect.

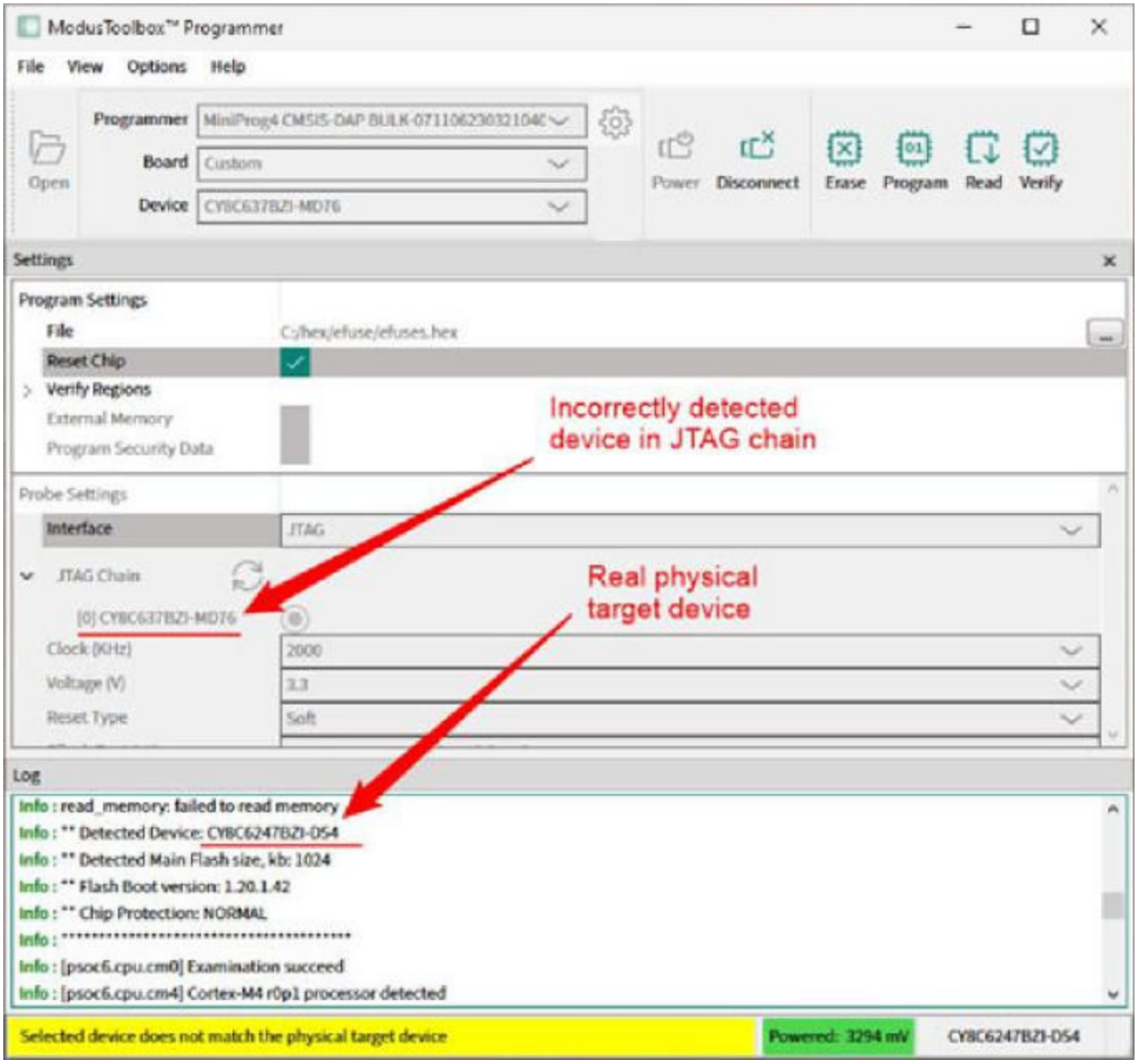
To recover from this, it may be necessary to reset the board to factory defaults, as follows:

1. Press and hold the **Recovery** button (SW1).
2. Press the **Reset** button (SW2).
3. Release the **Reset** button (SW2).
4. Release the **Recovery** button (SW1).

6.3 Incorrect PSOC™ 6 device names (MPN) in JTAG chain

Some PSOC™ 6 target devices may be displayed with incorrect part numbers in the JTAG chain. This issue shows only those PSOC™ 6 targets having incorrect value written to JTAG ID Code register.

6 Troubleshooting



You can ignore this inconsistency in device names if you see the warning "Selected device does not match the physical target device" after clicking **Connect** button.

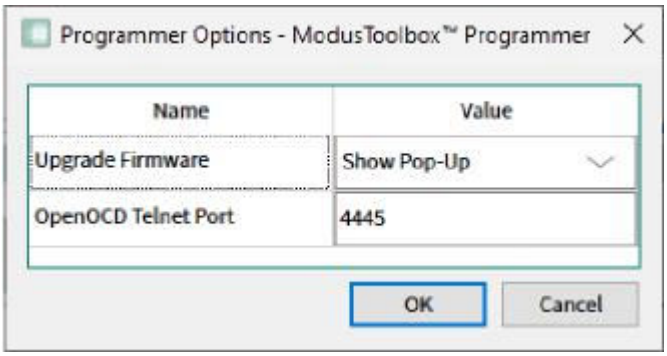
7 Upgrading firmware

The ModusToolbox™ Programmer application allows you to upgrade KitProg2, KitProg3, and MiniProg4 device firmware.

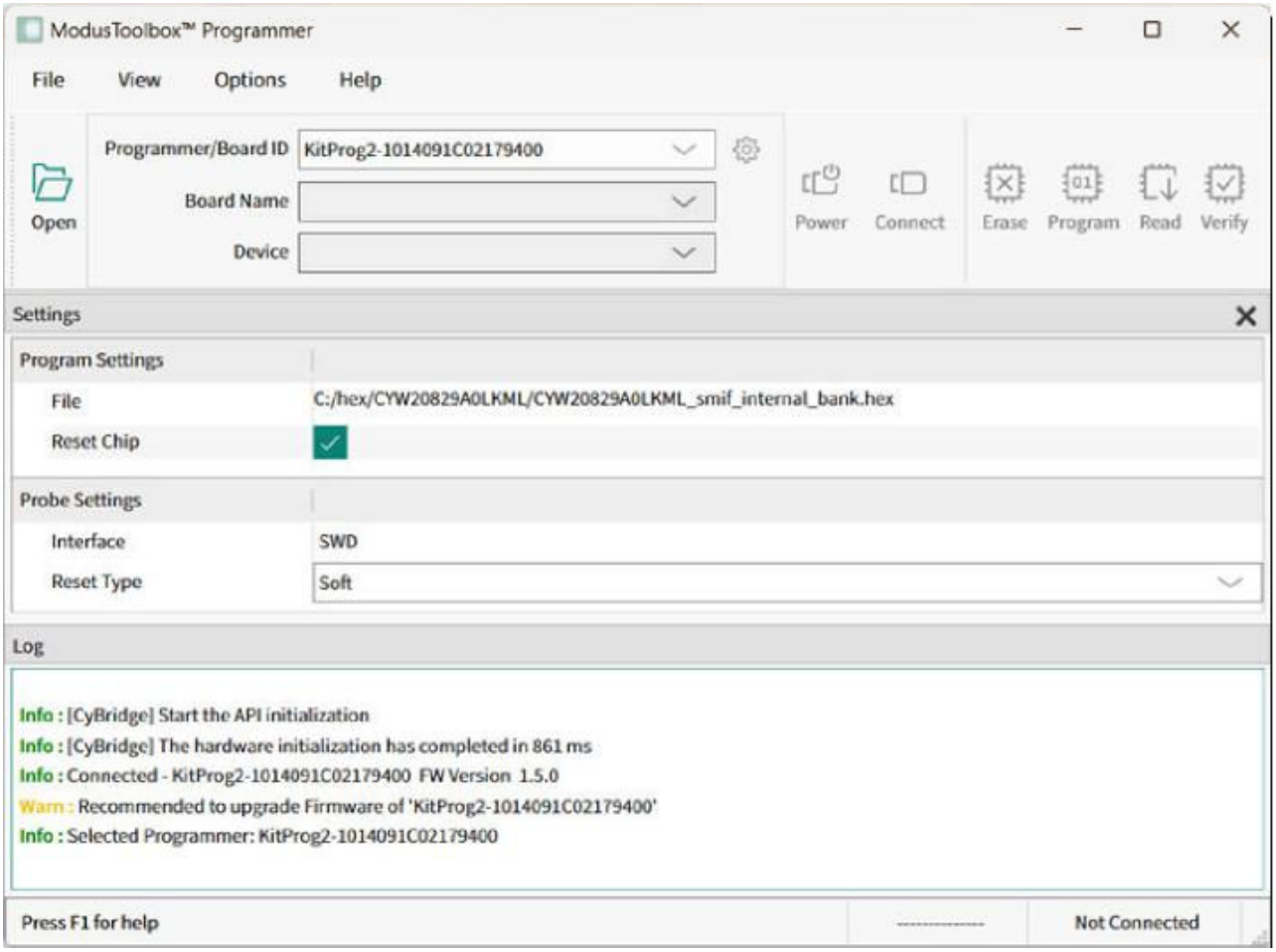
7.1 Upgrade KitProg2 firmware

The following upgrade process is based on the CY8CKIT-062-WIFI-BT hardware.

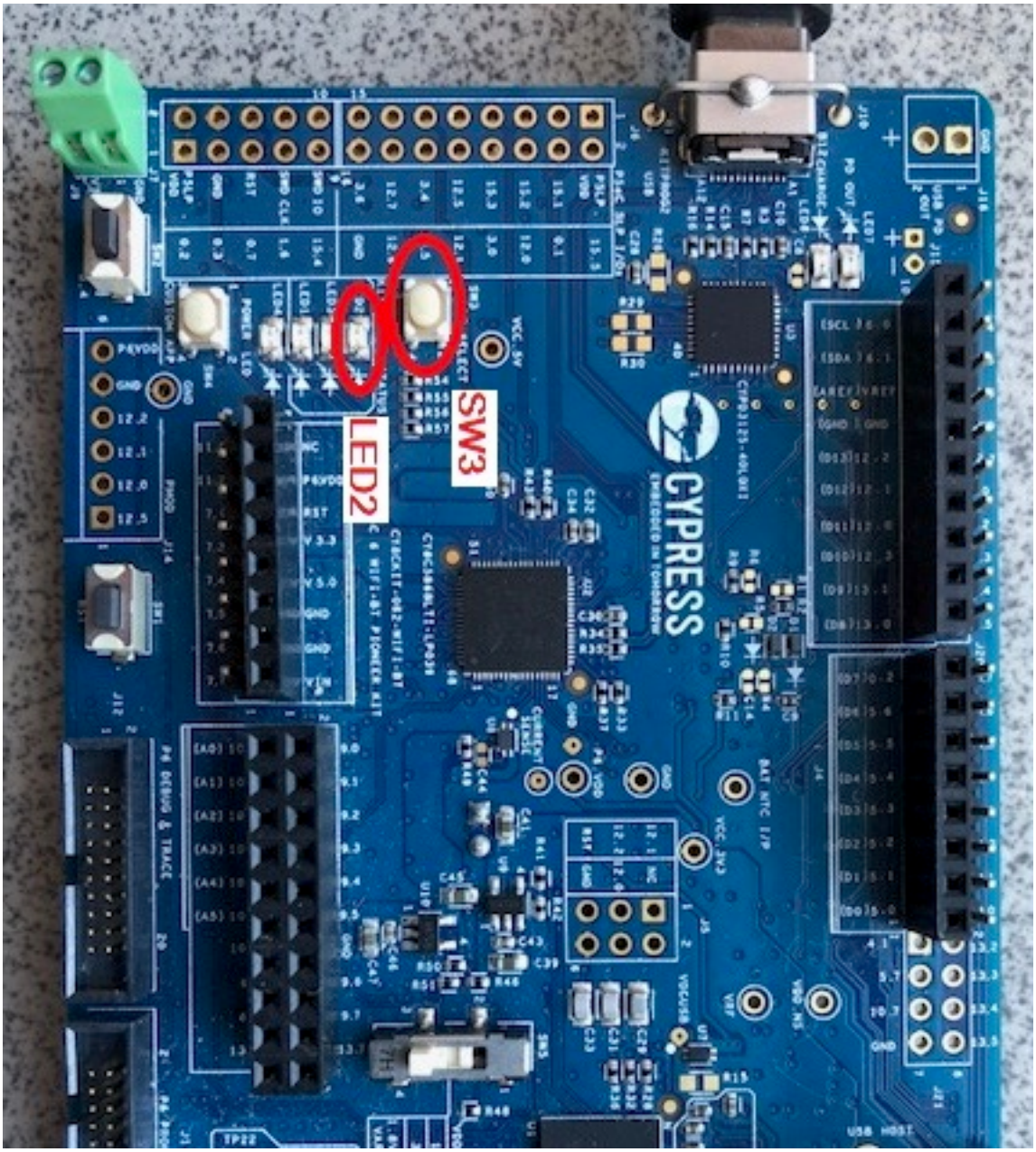
1. Run the ModusToolbox™ Programmer application.
2. Go to **Options > Programmer Options** and select the **Show Pop-Up** value for the **Upgrade Firmware** option.



3. Click **OK** to apply the changes.
4. Connect the device with the KitProg2 firmware to the host PC. Ensure that the KitProg2 device is in Native KP2 mode.

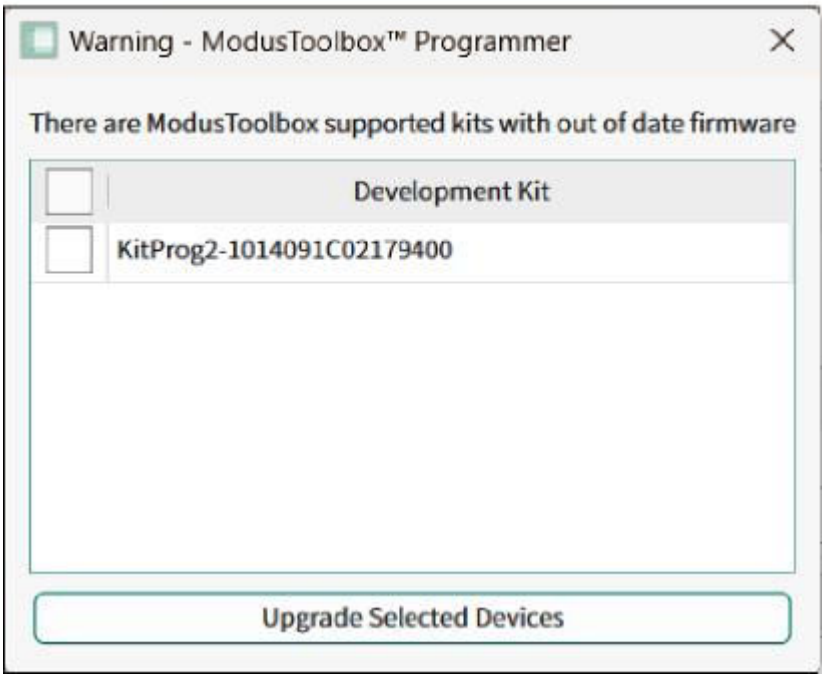


5. If **LED2** is off, press the **SW3** (Mode Select) button and hold it for about 1 second. When **LED2** is on, the device is ready for upgrading the firmware.



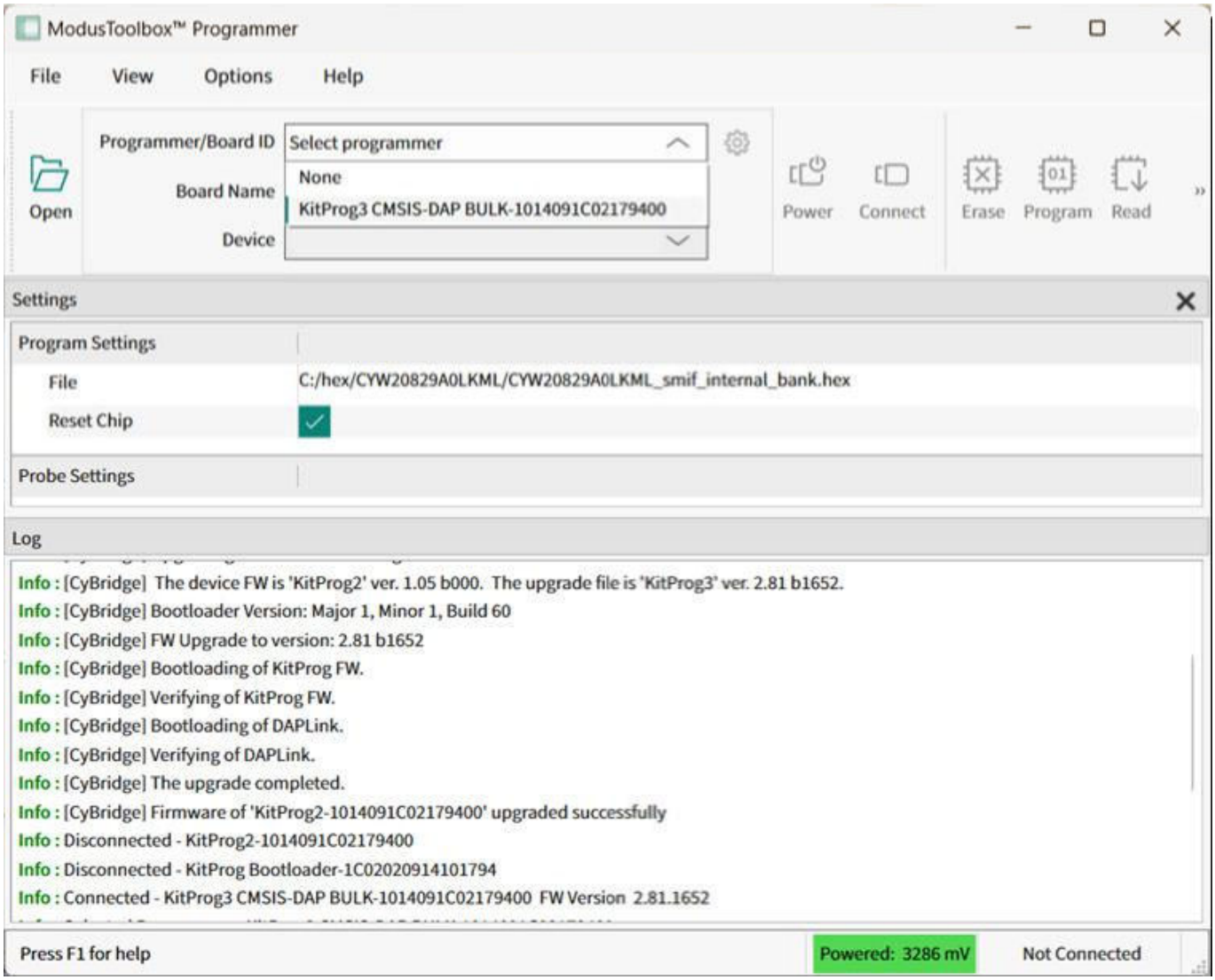
A warning dialog displays with the "Firmware is Out of Date" message.

7 Upgrading firmware



6. Select the KitProg2 device in the list and click the **Upgrade Selected Devices** button to start the upgrade process.

After the upgrade process completes, the message "Firmware of 'KitProg2-xx' upgraded successfully" displays in the **Log** view. The KitProg2-xx programmer disappears from the **Programmer/Board ID** drop-down. The **Board Name** drop-down is populated with the names of the supported KitProg3 Kits.

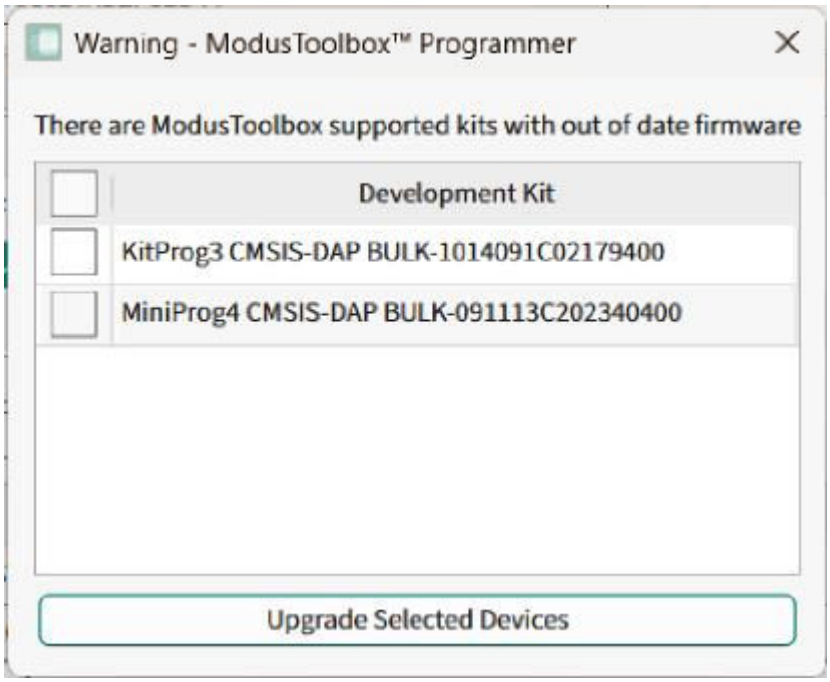


7.2 Upgrade KitProg3 on kit or MiniProg4 firmware

Follow this process to upgrade KitProg3 on a kit or MiniProg4 firmware:

1. Run the ModusToolbox™ Programmer application.
2. As needed, go to **Options > Programmer Options** and select the **Show Pop-Up** value for the **Upgrade Firmware** option.
3. Connect the KitProg3/MiniProg4 device to the host PC. A warning dialog with the "There are ModusToolbox supported kits with out of date firmware" message displays.

7 Upgrading firmware



4. Select the KitProg3/MiniProg4 device(s) to be upgraded.
5. Click the **Upgrade Selected Devices** button to start the upgrade process.

After the upgrade process completes, the message "Firmware of 'KitProg3-xx' upgraded successfully" or "Firmware of 'MiniProg4 xx' upgraded successfully" displays in the **Log** view.

Revision history

Version	Date	Description
**	2023-07-18	New document.
*A	2018-10-30	Updates for Production milestone: • Various screen captures • Description of the Platforms pull-down menu • Description of the Clock option in Probe Settings
*B	2019-07-19	Updated to version 2.1. • Added Verify Regions menu • Added JTAG Chain instructions • Added Verify Custom Flash Regions section
*C	2019-10-11	List of changes: • User Guide clean-up in whole document • Updated section "Features" • Updated section "Limitations" • Updated section "Settings" • Added section "How to recover AIROC™ Bluetooth® devices on failure"
*D	2020-05-04	List of changes: • Updated to version 3.0 • Updated screen shots across the document • Made modifications with new features of CYP 3.0 • Added section "Program eFuse region of PSoC™ 6 MCU" • Corrected mistakes
*E	2021-03-18	List of changes: • Updated to version 4.0 • Updated all sections with new screen shots • Updated sections "Getting Started", "Settings", "Program PSoC™ 6 MCU in JTAG Chain" • Added section "Program chip protected PSoC™ 4 MCU" • Corrected mistakes
*F	2022-03-15	List of changes: Updated to version 4.0.1 Updated section "Introduction" Updated section "Installing CYP"
*G	2022-10-28	List of changes: • Updated to version 4.1.0 • Minor updates across the document
*H	2023-02-14	List of changes: • Updated to version 4.2.0 • Updated section 4.2.4.1 • Added sections 5.14 and 5.15 • Minor updates across the document

Revision history

Version	Date	Description
*I	2023-09-12	List of changes: • Updated to version 5.0.0 • Changed title of the tool and user guide to ModusToolbox™ Programmer • Tool is now part of Programming tools package; installation instructions now included in the release notes
*J	2024-04-29	List of changes: Updated to version 5.1.0 Added section 3.2 - Select device Updated most screen-shots across document due to updates in toolbar's design (Program, Board and Device drop-downs) Updated section 4.2.1 Updated section 5.6, 5.12 Added section 5.16, 6.3
*K	2024-06-03	List of changes: • Updated to version 5.2.0 • Updated devices in section "Overview"
*L	2024-08-16	Updated to version 5.2.x for back-end changes
*M	2024-10-04	Updated PSoC™ product category trademark to PSOC™
*N	2025-03-14	List of changes: • Updated to version 5.4.0 • Updated most screen shots across document due to updated button icons
*O	2025-06-16	List of changes: • Updated to version 5.5.0 • Added section 5.17 "Apply Kill/chip-protected mode for PSOC™ 4 device" • Updated section 4.1.3.1 with Kill mode option
*P	2025-09-24	List of changes: • Updated to version 5.6.0 • Updated list of supported device families in section "Overview" • Updated most screen-shots and their page alignment across document due to updates in the UI • Consolidated info on PSOC™ 4 Protected and Kill modes from section 5.17 and 5.13, added 5.13.1 and 5.13.2 subsections • Removed redundant 5.17 section
*Q	2025-12-12	List of changes: • Updated to version 5.7.0 • Updated list of supported device families in section "Overview" • Added information about drag and drop
*R	2026-03-12	List of changes: • Updated to version 5.8.0. Changed most screen shots and some UI control descriptions • Added section 5.16 Update KitProg3 Board Name

Revision history

Version	Date	Description
*S	2026-06-10	List of changes: • Updated to version 5.9.0. • Updated section 1 - Overview • Updated images

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