

# PSOC™ Control C3 (PSC3M3x, PSC3P2x, PSC3M5x, PSC3P5x)- Exporting ModusToolbox™ to IAR and Keil IDEs

Customer training workshop (CTW)

February 2026

public

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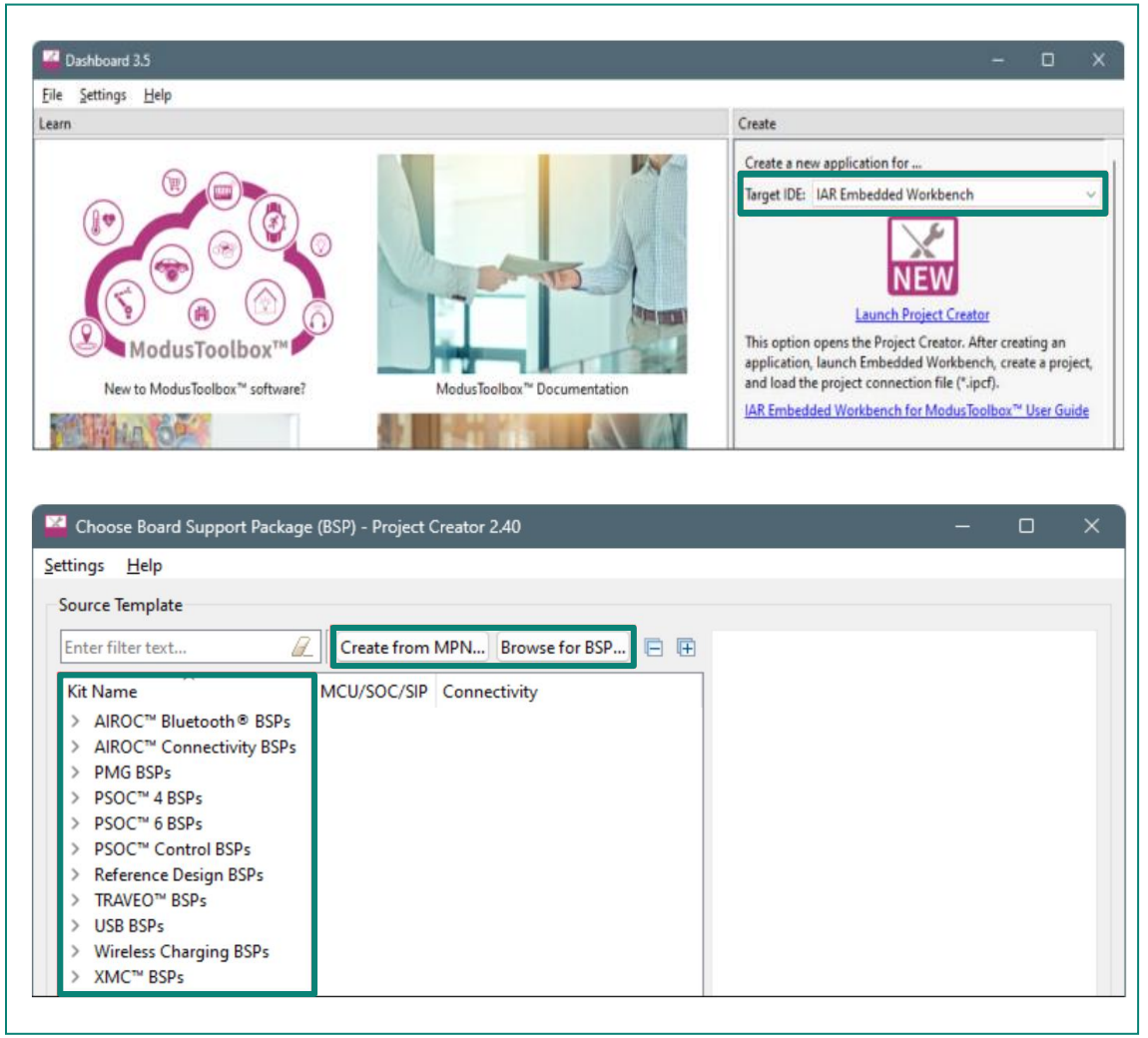
# ModusToolbox™ to IAR Embedded Workbench

# Create/export application for IAR Embedded Workbench

1. Open the **Project Creator** tool from the ModusToolbox™ **Dashboard** and create a ModusToolbox™ application for IAR Embedded Workbench.
2. Choose the board support package (BSP) from one of the following options:
   a. Select the **BSP** from the list
   b. Click the **Create MPN** button to create a BSP from a product
   c. Select a BSP available on disk





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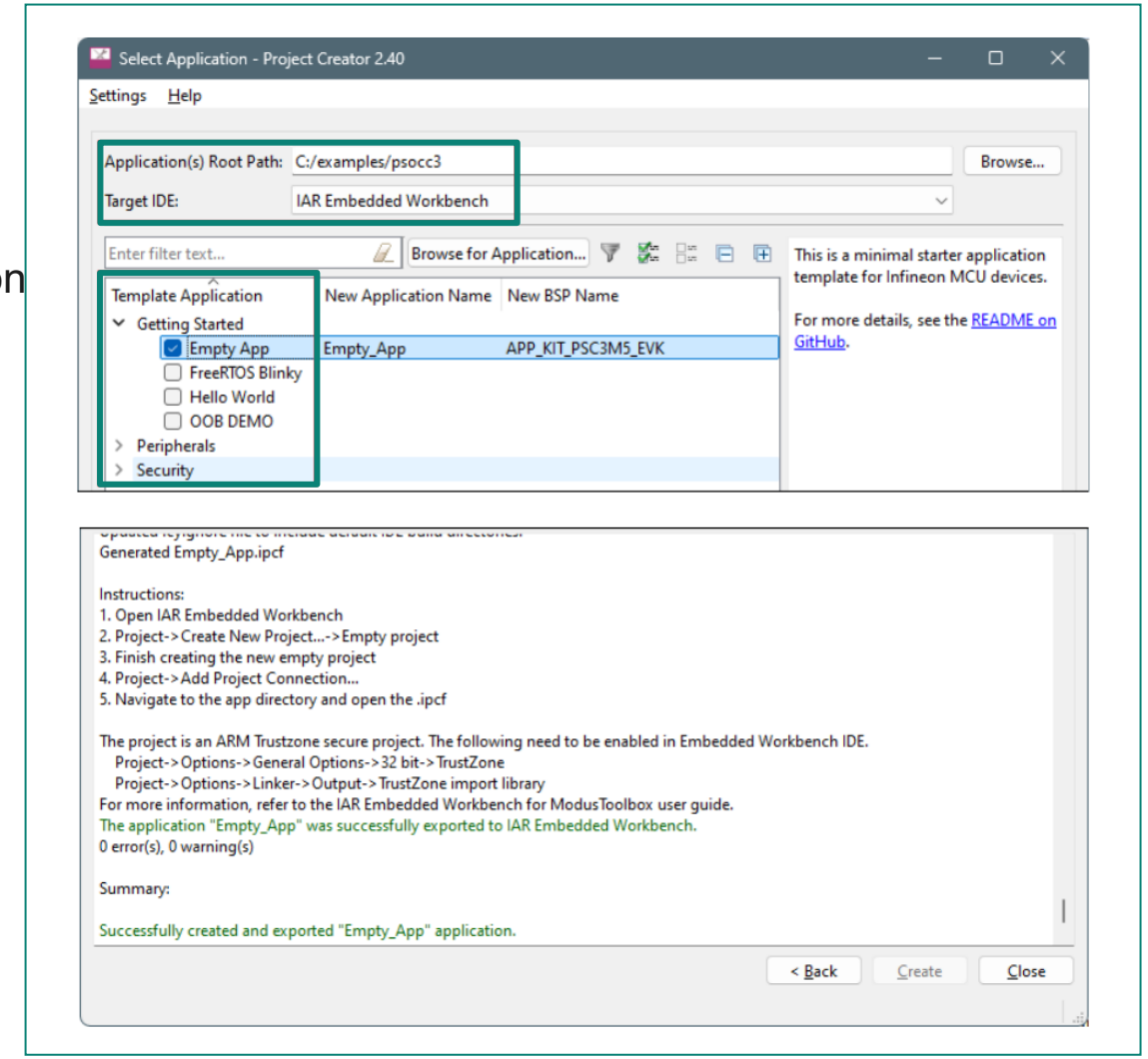
# Create/export application for IAR Embedded Workbench (contd.)

3. On the next page, select the location and the application to create. Notice that the **Target IDE** is already selected from the **Dashboard**.
4. Click **Create**. Observe that the success message appears on the console once the process is complete.
5. Click **Close**.





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# Create/export application for IAR Embedded Workbench (contd.)

- If a ModusToolbox™ application was created for another IDE or the command line, you can export it for use in IAR instead of creating a new one. To do this, open a terminal window (use modus-shell on Windows) and run:

```
make ewarm CY_IDE_PRJNAME=[project-name] TOOLCHAIN=IAR
```

- Replace [project-name] with the name of your root application/project folder
- This command updates the Embedded Workbench configuration files to use the IAR toolchain, but it does not change the ModusToolbox™ application's makefile. As a result:
  - Builds in IAR Embedded Workbench will use the IAR toolchain
  - Builds in ModusToolbox™ will continue using the toolchain specified in the makefile
- To let ModusToolbox™ build to also use the IAR toolchain, edit the TOOLCHAIN variable in the makefile


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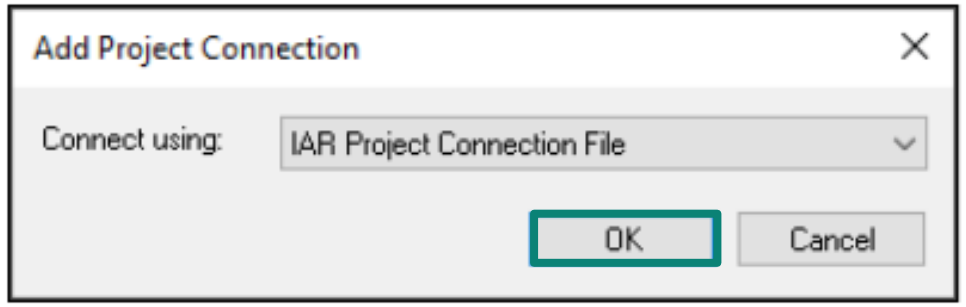
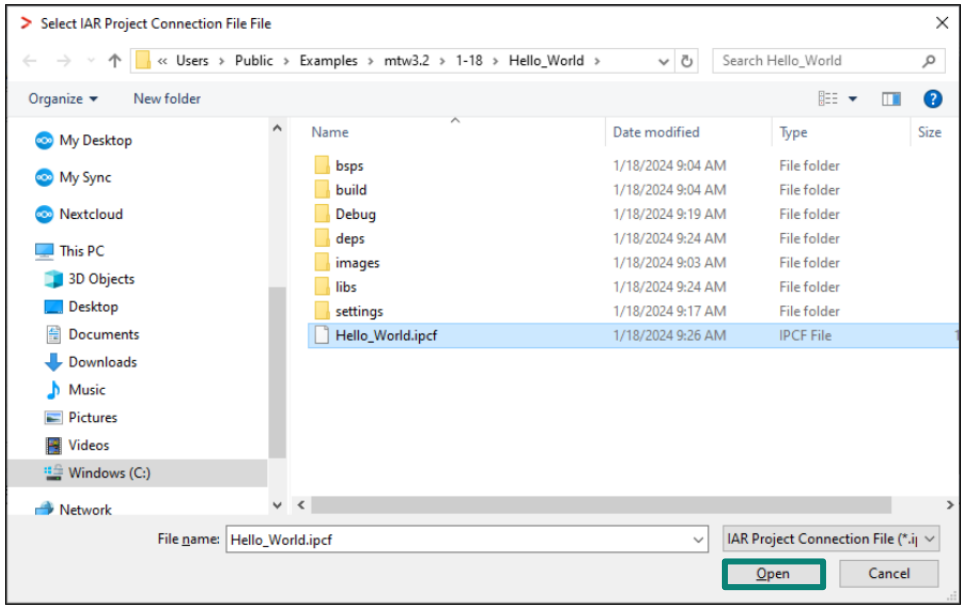
# Create IAR workspace and project

After creating or exporting an application, an IAR project connection file (*.ipcf*) appears in the ModusToolbox™ application/project directory. For example: Hello_World.ipcf. To use the ModusToolbox™ application with IAR, do the following:

1. Launch IAR Embedded Workbench.
2. Select **File** > **New Workspace**, select **File** > **Save Workspace**, and enter a desired workspace name (**.eww*) in the directory containing the ModusToolbox™ workspace.
3. Select **Project** > **Create New Project** > **Empty project** and click **OK**.
4. Browse to the ModusToolbox™ project directory, enter a desired project name (**.ewp*), and click **Save**.
5. Select **Project** > **Add Project Connection** and on the dialog ensure that IAR Project Connection File is selected; click **OK**.





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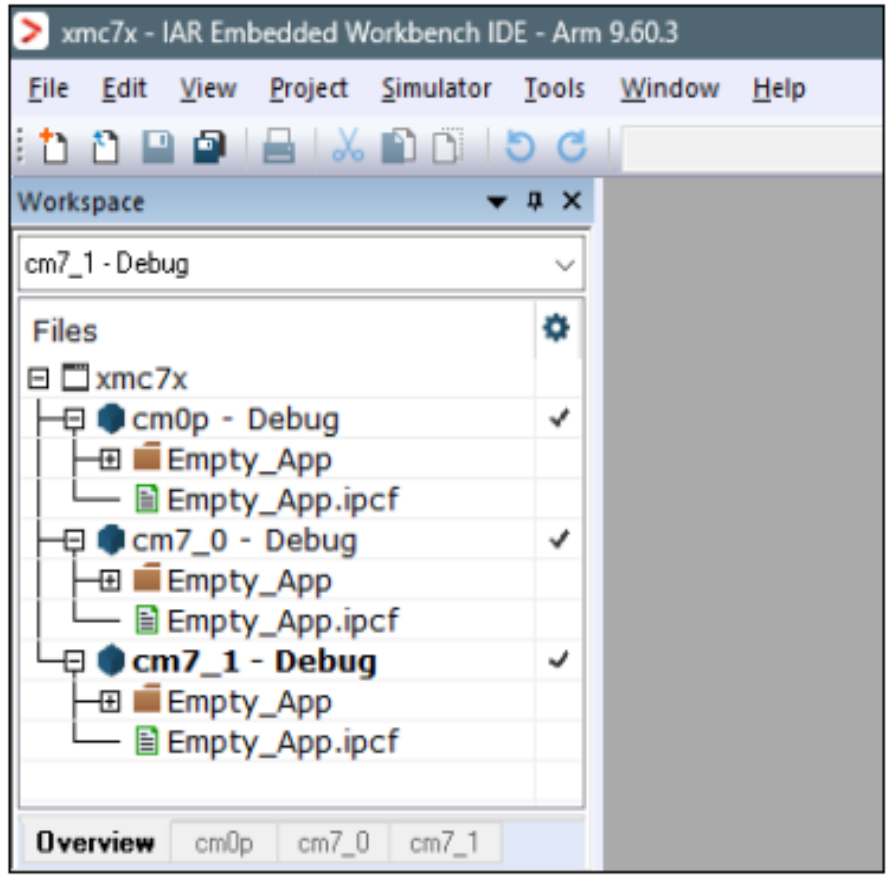
# Create IAR workspace and project (contd.)

6. Select **Project** > **Add Project Connection** and on the dialog ensure that "IAR Project Connection File" is selected; click **OK**.
7. If your application has multiple cores/projects, repeat the process to create an IAR project for each core and add the *.ipcf* file for each as well.
8. Once all projects have been created and connected, make sure to save the workspace and projects.




### Next steps

In the simplest cases, the .ipcf file contains all required build settings, so configuring the build settings is generally not required. However, there are several cases and different devices for which configuring build settings is required, such as using TrustZone® mode, post-build image processing like combining several additional images, or signing images or remaps to another memory region. See the applicable device section for information on build settings configuration, build/debug application, and device programming if it is attached [1].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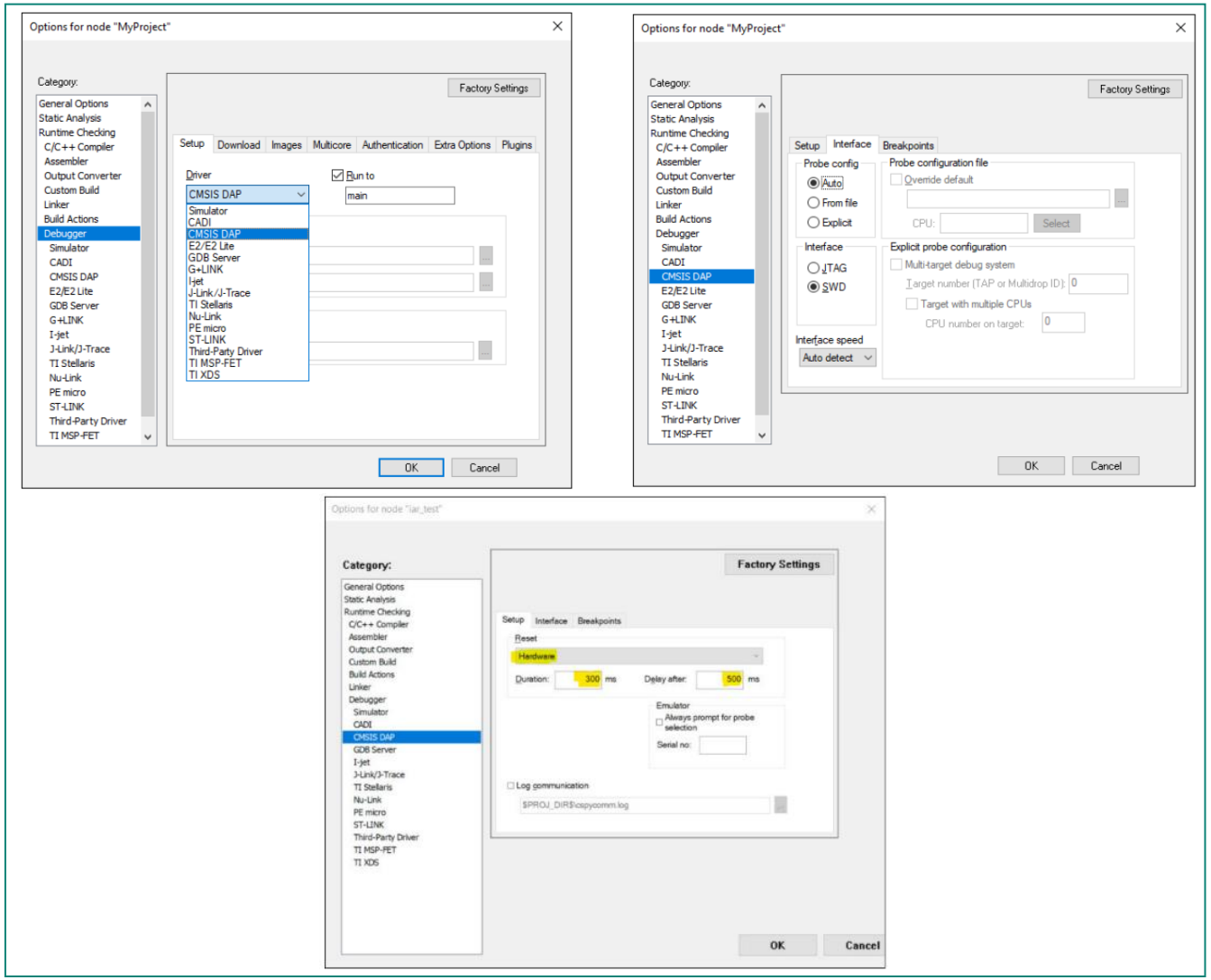
# Steps to use kitProg3/miniProg4 in IAR

Follow the steps to use kitProg3 with IAR software:

1. In IAR Embedded Workbench, open the Options dialog, go to **Debugger**, and select **CMSIS-DAP** in the driver list.
2. Select the **CMSIS-DAP** node, switch the interface from **JTAG** to **SWD**, and set the Interface speed to **2 MHz**.

   **Note:** When using MiniProg4 with a single-core PSOC™ 6 MCU, you must specify a special type of Reset under the Setup tab, as shown in the figure.
3. Click **OK**.





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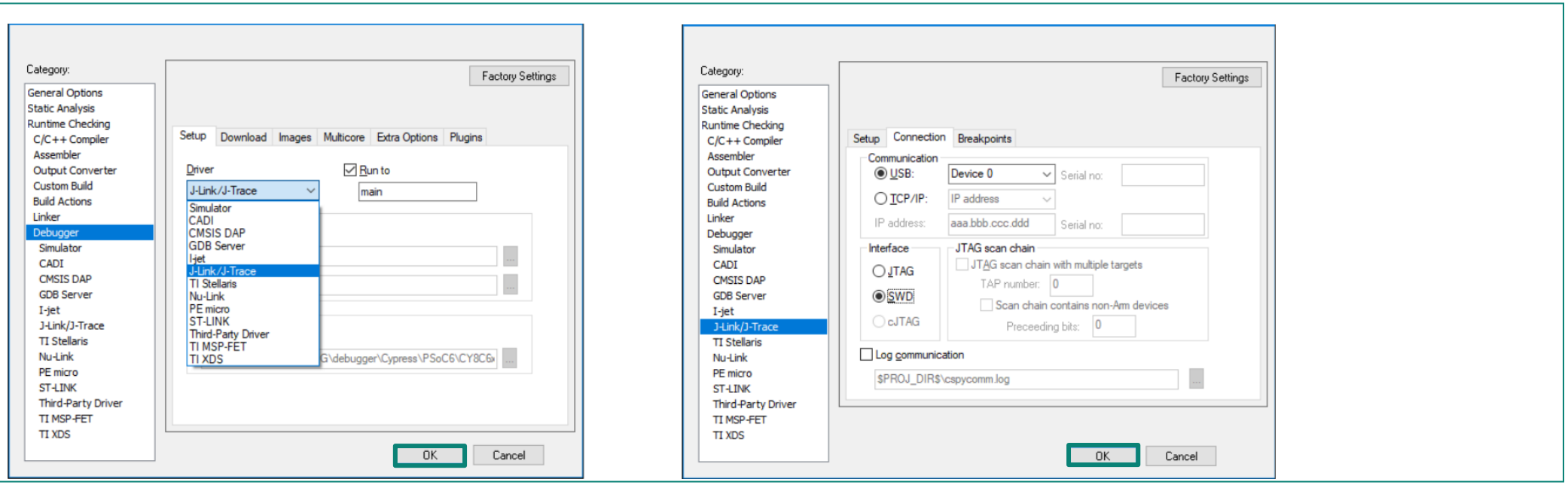
# Steps to use J-link debugger in IAR

Follow the steps to use the J-link debugger with the IAR software:

1. Open the Options dialog and select the **Debugger** item under **Category**.
2. Then select **J-Link/J-Trace** as the active driver.
3. Select the **J-Link/J-Trace** item under **Category**, and under the **Connection tab**, switch the interface to **SWD**.
4. Connect a J-Link debug probe to the 10-pin adapter (this needs to be soldered on the prototyping kits).





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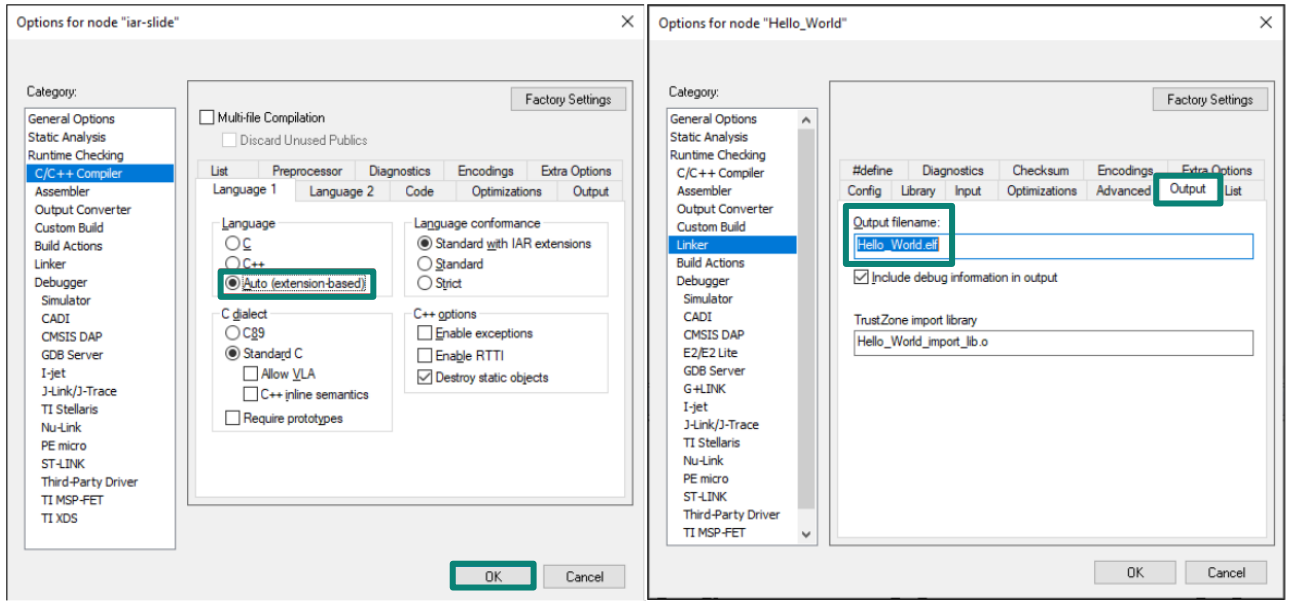
# Build options, and prebuild / postbuild settings in IAR

1. In cases where your application includes C++ files, you need to configure the C/C++ Compiler option.
2. Right-click the project and **select Options > C/C++ Compiler > Language 1**, select **Auto (extension-based)**, and click **OK.**
3. To set various build options, use the sections on the IAR Embedded Workbench Project Options dialog where you can enter command-line options, as follows:
   a. C / C++ Compiler > Extra Options
   b. Assembler > Extra Options
   c. Linker > Extra Options
4. If using a postbuild script that works with .elf files, switch to the **Linker > Output tab** and change the file extension from ".out" to ".elf" in the **Output filename** field.
5. Click **OK** to close the Options dialog.





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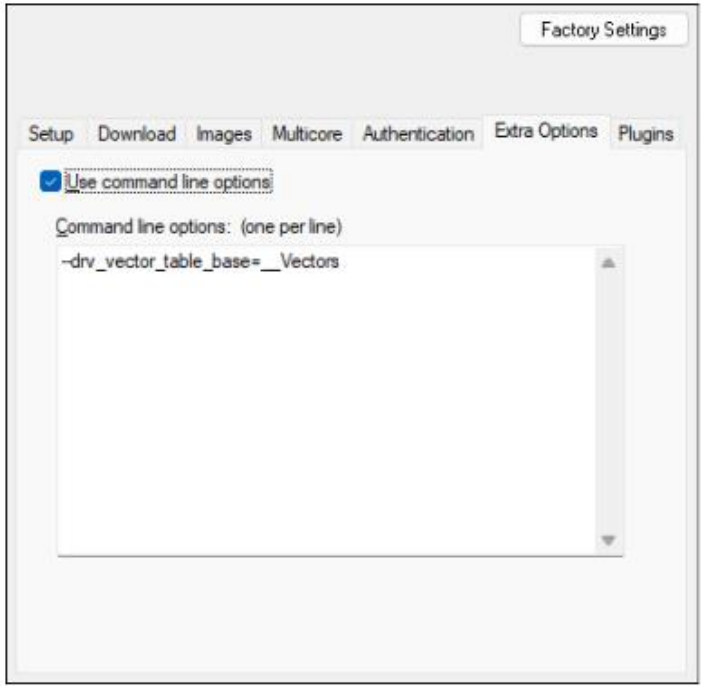
# Program and Debug an application

1. To set var when you open the application in IAR Embedded Workbench, you need to check the TrustZone setting. Open the Options dialog, go to **General Options > 32-bit** and verify that the TrustZone® Mode is set to "Secure."
2. Save the application and select Project > Make to build it.
3. Open the options dialog to the **Extra Options tab**, select the Use command line options check box, and paste the following command-line option:

```
--drv_vector_table_base=__Vectors
```

4. Click **OK** to close the Options dialog.
5. Select **Project > Build** Target to build the application.
6. Select **Project > Download > Download file…** and select the [project_name.hex file in [project_root]\build\APP_KIT_PSC3M5_EVK\Debug [you might have to switch to **All Files (*.*)**].
7. Select **Project >Debug without Downloading.**





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2 **ModusToolbox™ to Keil µVision IDE** **14**

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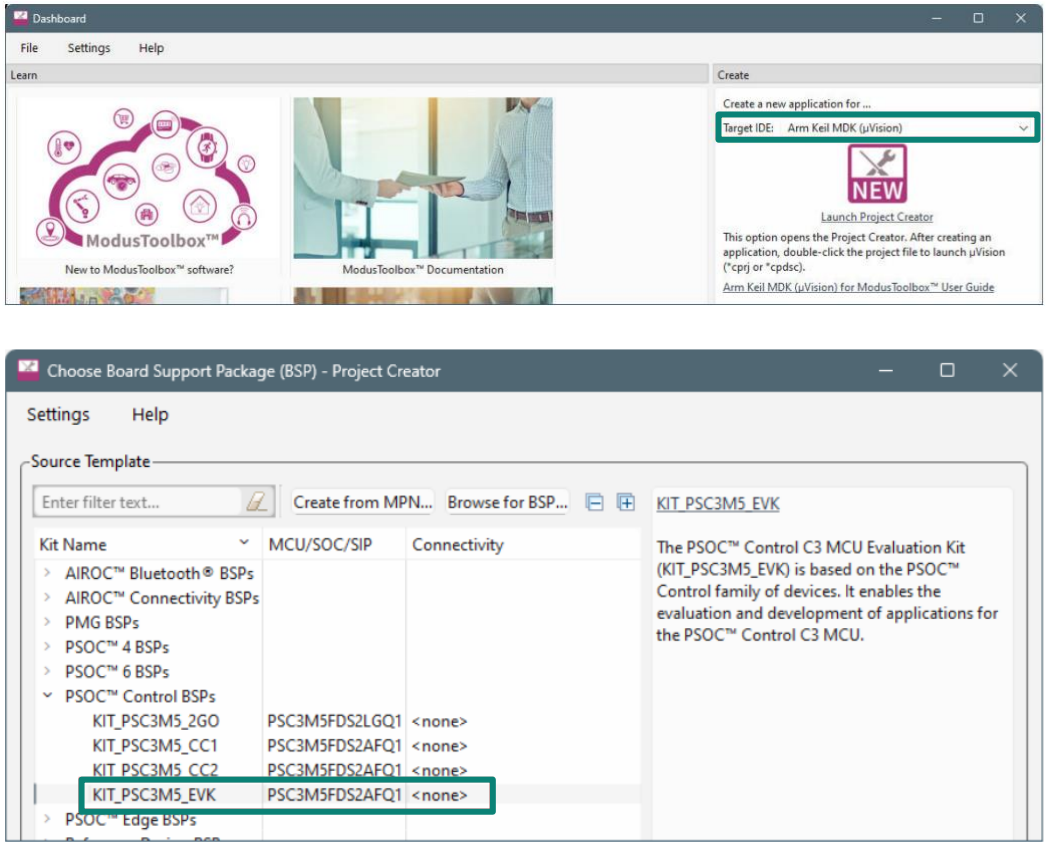
# ModusToolbox™ to Keil µVision IDE

# Create/export application for Keil µVision

1. From the ModusToolbox™ Dashboard, open the Project Creator tool and create a ModusToolbox™ application for Keil µVision.
2. Choose the BSP from one of the following options:
   a. Select the BSP from the list
   b. Click the Create MPN button to create a BSP from a product
   c. Select a BSP available on disk





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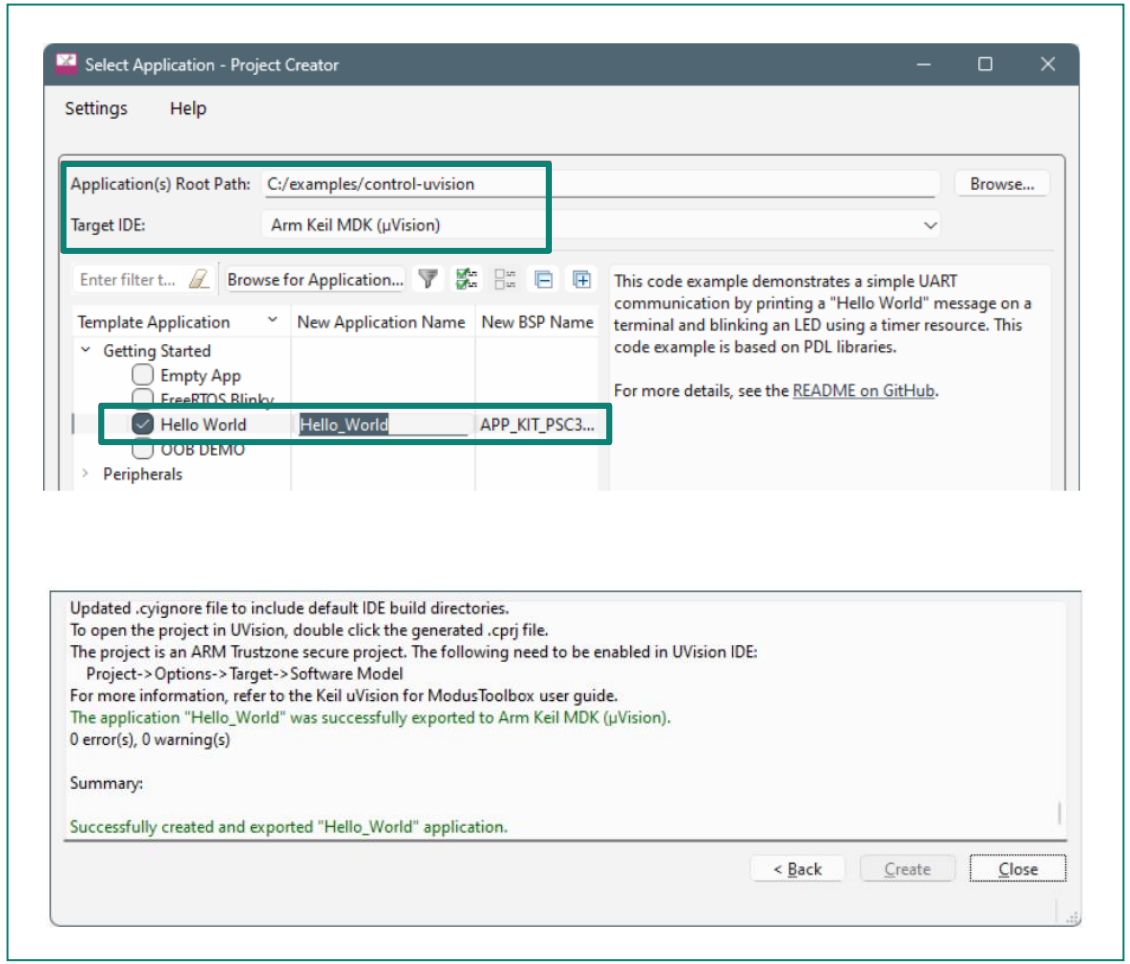
# Create/export application for Keil µVision (contd.)

3. Select the location and the application to create. Observe that the Target IDE is already selected from the Dashboard.
4. Click Create. Observe that the success message appears on the console once the process is complete.
5. Click Close.





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# Create/export application for Keil µVision (contd.)

**Export existing application**

- If you already have a ModusToolbox™ application created for another IDE or the command line, you can export it for use in Keil µVision instead of creating a new one. To do this, open a terminal window (use modus-shell on Windows) and run:

```
make uvision CY_IDE_PRJNAME=[project-name] TOOLCHAIN=ARM
```

- Replace [project-name] with the name of your root application/project folder
- This command updates the Keil µVision configuration files to use the Arm® toolchain; however, it does not change the ModusToolbox™ application's makefile, resulting in:
  - Builds in Keil µVision will use the Arm® toolchain
  - Builds in ModusToolbox™ will continue using the toolchain specified in the makefile
- To enable ModusToolbox™ builds to use the Arm® toolchain as well, update the TOOLCHAIN variable in the makefile
- Check the output log for instructions and information about various flags


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# Create/export application for Keil µVision (contd.)

**Post-build script**

– When creating or exporting an application for use in Keil µVision, a script file named ide_postbuild.bat is generated. This script updates the hex file as required for security and multi-core support. To run this script, set the CY_COMPILER_ARM_DIR environment variable

– For example:

```
CY_COMPILER_ARM_DIR=C:/Keil_v5/ARM/ARMCLANG
```

**Note**: Use forward slashes (including Windows) due to UNIX/Linux path conventions.


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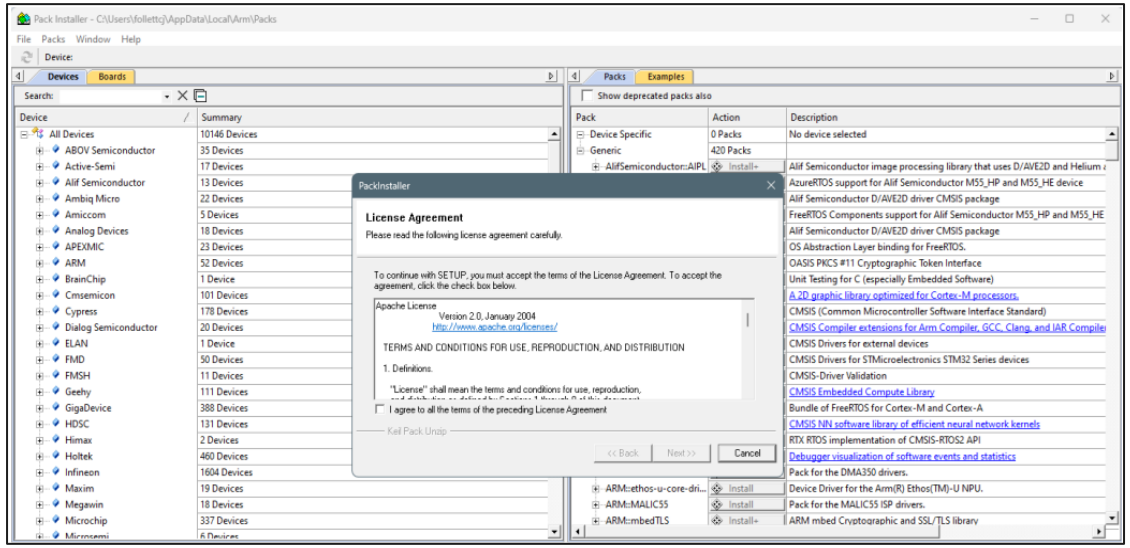
# Create Keil µVision project

Creating or exporting the application generates *.cprj file in the application/project directory. The .cprj file extension should have the association enabled to open it in Keil µVision.

1. Double-click the *.cprj file. This launches the Keil µVision IDE. The first time you do this, a dialog box appears, as shown in the figure.
2. Install the device pack. You only need to do this once per device type.
3. Follow the steps in the Pack Installer to properly install the device pack.
4. When complete, close the Pack Installer, and the application will be created in the IDE.
5. If working with a multi-core or multi-project application, a cprj file is created in each sub-project directory.
6. Double-click the *.cprj file in each folder (for example, PSOC™ Edge: cm33s, cm33ns, and cm55; XMC7xxx: cm0p, cm7_0, and cm7_1).





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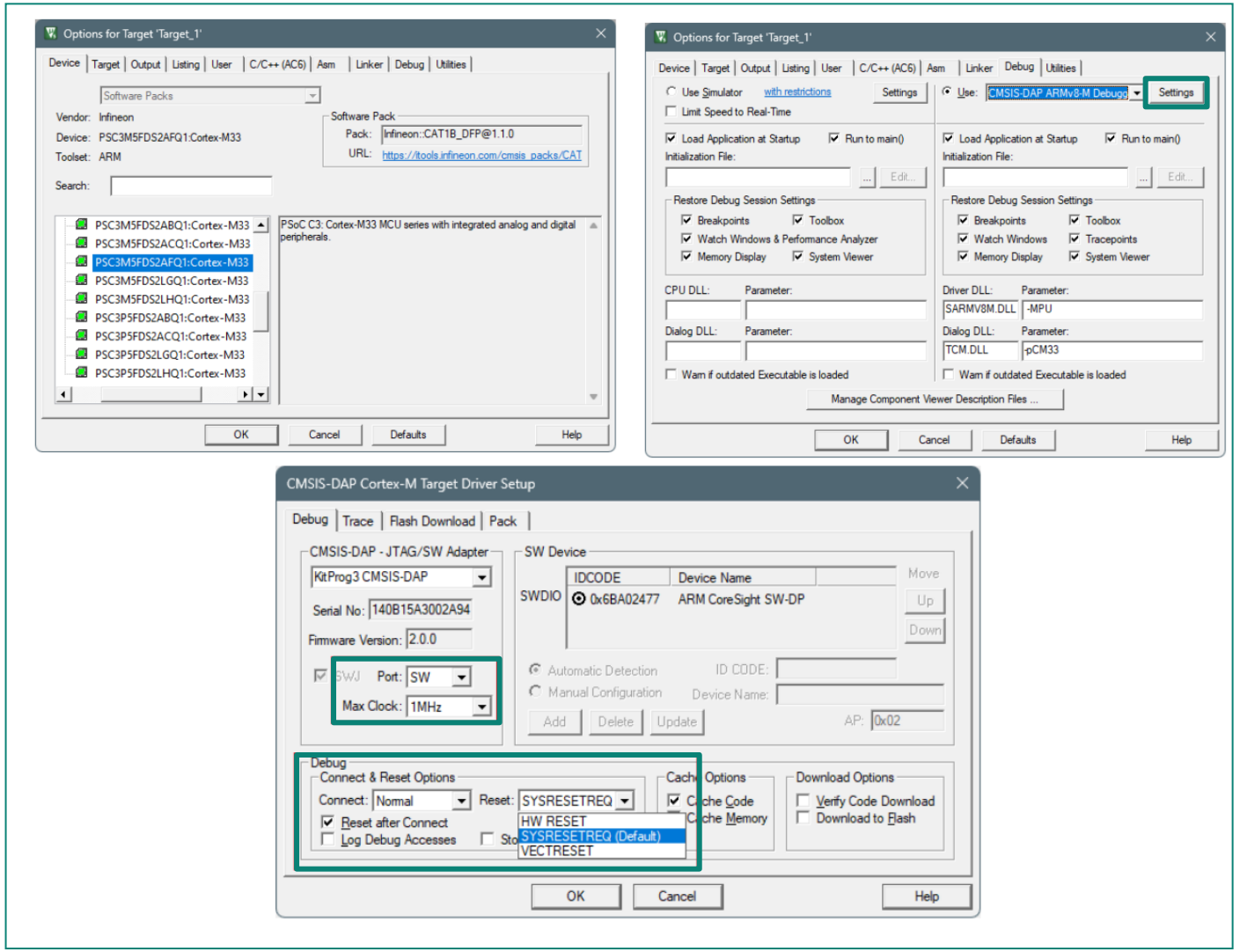
# Steps to use kitProg3/miniProg4 in Keil µVision

Follow the steps to use kitProg3 with the Keil software:

1. Select the Device tab in the Options for Target dialog and check that the correct core is selected.
2. Select the Debug tab.
3. Click the Settings button.
4. On the Target Driver Setup dialog on the Debug tab, select the following.
   - Set Port to SW
   - Set Max Clock to 1 MHz
   - Set Connect to Normal
   - Set Reset to SYSRESETREQ (Default)
   - Enable Reset after Connect option





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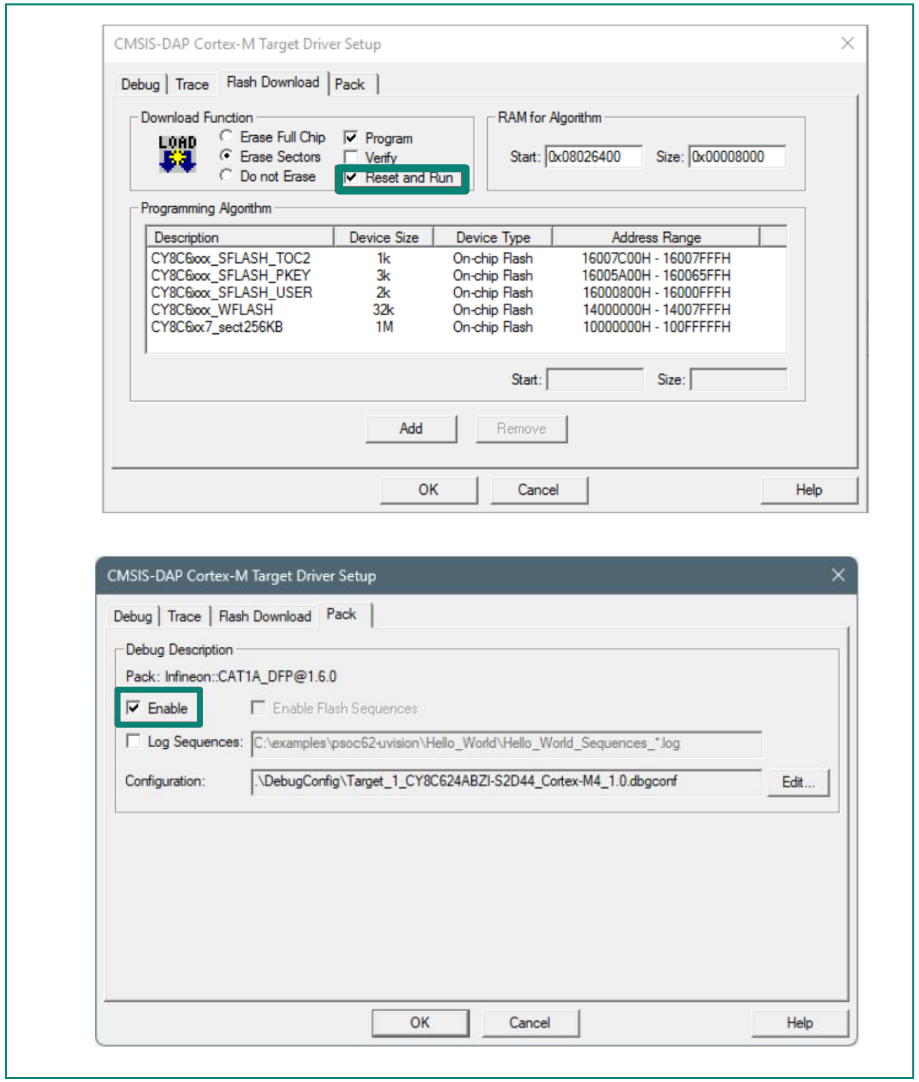
# Steps to use kitProg3/miniProg4 in Keil µVision (contd.)

5. Select the Flash Download tab and select the Reset and Run option after download.
6. Select the Debug tab.
7. Select the Pack tab and check if the appropriate DFP is enabled.





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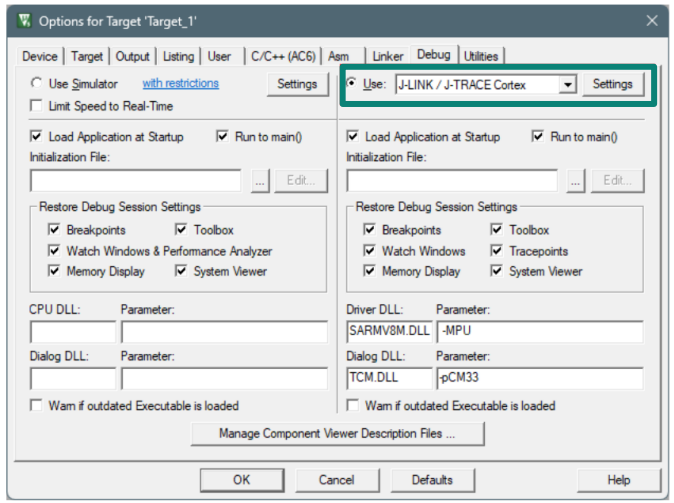
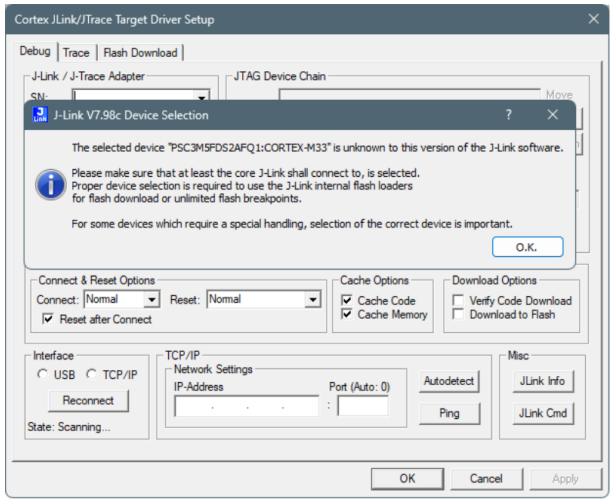
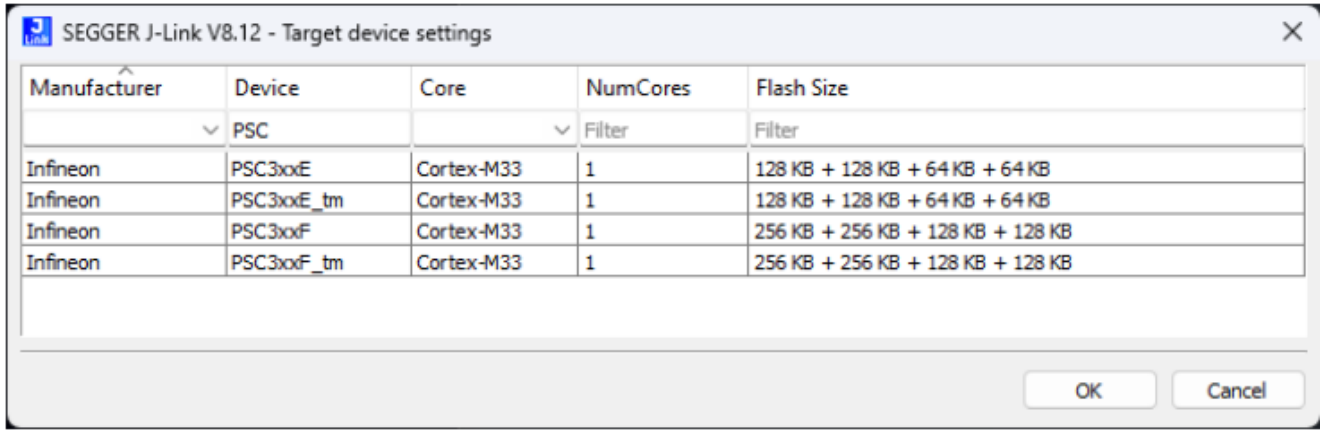
# Steps to use J-link debugger in Keil µVision

Follow the steps to use the J-Link debugger with the Keil software:

1. Ensure to have the J-Link software v8.12 or newer.
2. Select the Debug tab in the Options for Target dialog, select J-LINK / J-TRACE Cortex as debug adapter, and click Settings.
3. If you see the following message (shown in the figure 2), click OK in the Device selection message box.
4. Select the appropriate device in the Target device settings and click OK.





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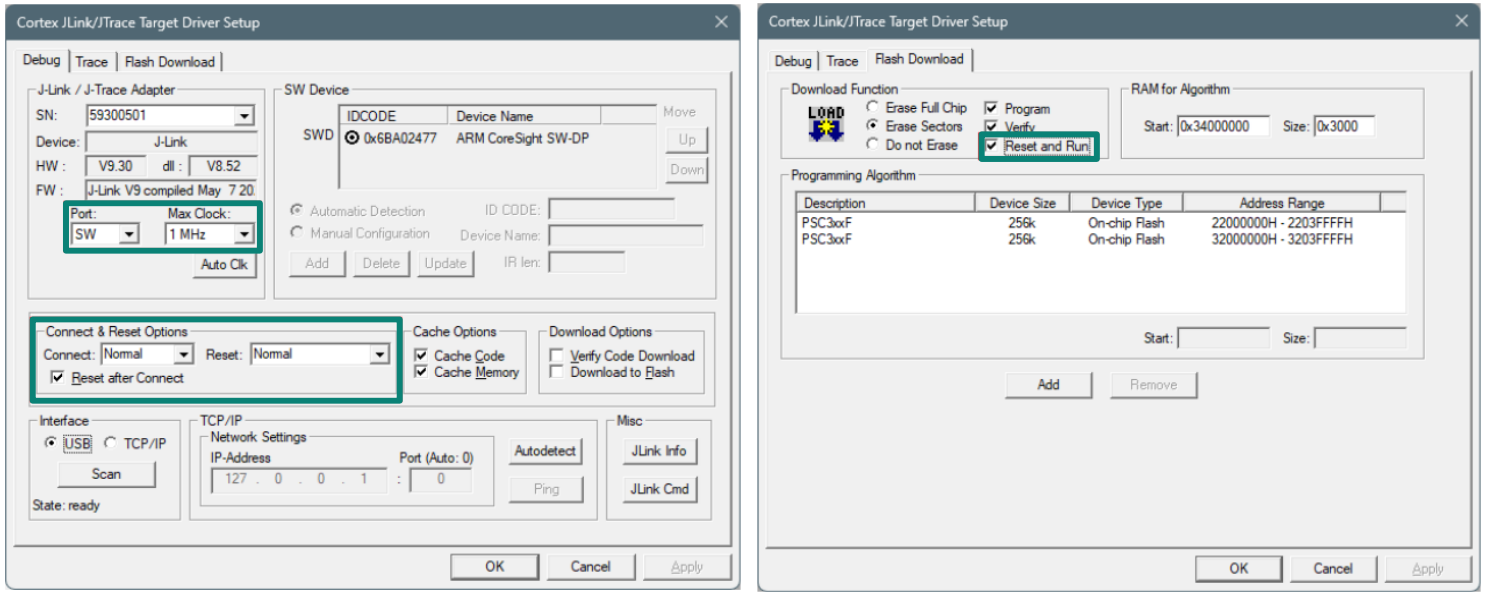
# Steps to use J-link debugger in Keil µVision (contd.)

5. Go to the Debug tab in the Target Driver Setup dialog and select:
   a. Set Port to SW
   b. Set Max Clock to 1 MHz
   c. Set Connect to Normal
   d. Set Reset to Normal
   e. Enable Reset after Connect option
6. Select the Flash Download tab in the Target Driver Setup dialog and select the Reset and Run option after download, if needed.





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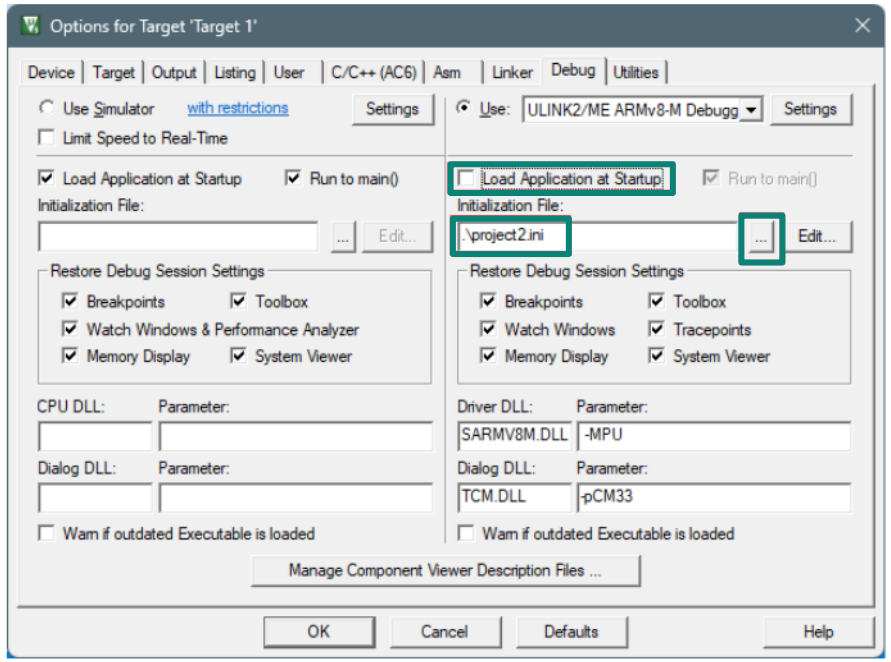
# PSOC™ Control C3 application (contd.)

9. Select the project2.ini file in the Initialization File field.
10. Click OK to close the Options dialog.
11. Select Project > Build Target to build the application and execute post-build commands.
12. Configure the applicable debugger settings. See previous sections
13. To program the device, select Flash > Download.
14. To start the debugger, select Debug > Start/Stop Debug Session.





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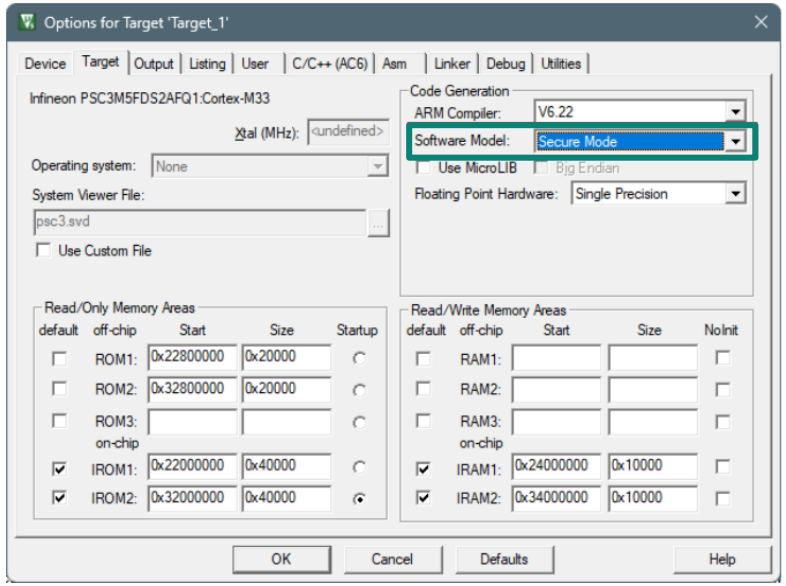
# PSOC™ Control C3 application

1. Open the application in Keil µVision, ensure to check the TrustZone® to Secure Mode
2. Save the application and select Project > Build Target to build it. The output should display the progress, ending with text similar to the text shown in the figure below.

```
linking...
bsps/TARGET_APP_KIT_PSC3M5_EVK/TOOLCHAIN_ARM/linker_s_flash.sct(107): warning: L6329W: Pattern
*(.cy_sharedmem) only matches removed unused sections.
bsps/TARGET_APP_KIT_PSC3M5_EVK/TOOLCHAIN_ARM/linker_s_flash.sct(113): warning: L6314W: No
section matches pattern *(Veneer$$CMSE).
Program Size: Code=16902 RO-data=1438 RW-data=312 ZI-data=64844
Finished: 0 information, 2 warning and 0 error messages.
".\Hello_World_Objects\Hello_World.axf" - 0 Error(s), 2 Warning(s).
Build Time Elapsed:  00:00:22
```





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# PSOC Control C3 application (contd.)

The devices are shipped with a default policy. In order to create a valid hex file for programming and debugging in this state, ensure to configure the application.

1. Create a **postbuild.bat** file in the root directory of the project. The primary purpose of this is to shift the application image from the C-Bus region to the S-Bus region. This is done because the Arm® compiler attempts to copy the Load region to the Execution region, which is read-only. The bat file contains three separate lines, for example:

```
C:\Keil_v5\ARM\ARMCLANG\bin\fromelf --output "Hello_World_Objects/tmp.hex" --i32combined
"Hello_World_Objects/Hello_world.elf"

[path-to-gcc]\bin\arm-none-eabi-objcopy -O ihex "Hello_world_Objects/tmp.hex"
"Hello_world_Objects/Hello_world.hex" --change-addresses 0x20000000

del "Hello_world_Objects\tmp.hex"
```


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# PSOC™ Control C3 application (contd.)

2. Create project.ini and project2.ini files in the project root folder. These initialization files provide LOAD commands that are needed for the application.
3. Add the following text to the project.ini file and click Save.

```
LOAD $L@L.hex
```

4. Add the following text to the project2.ini file and click Save.

```
LOAD $L@L.elf NOCODE
g, main
```


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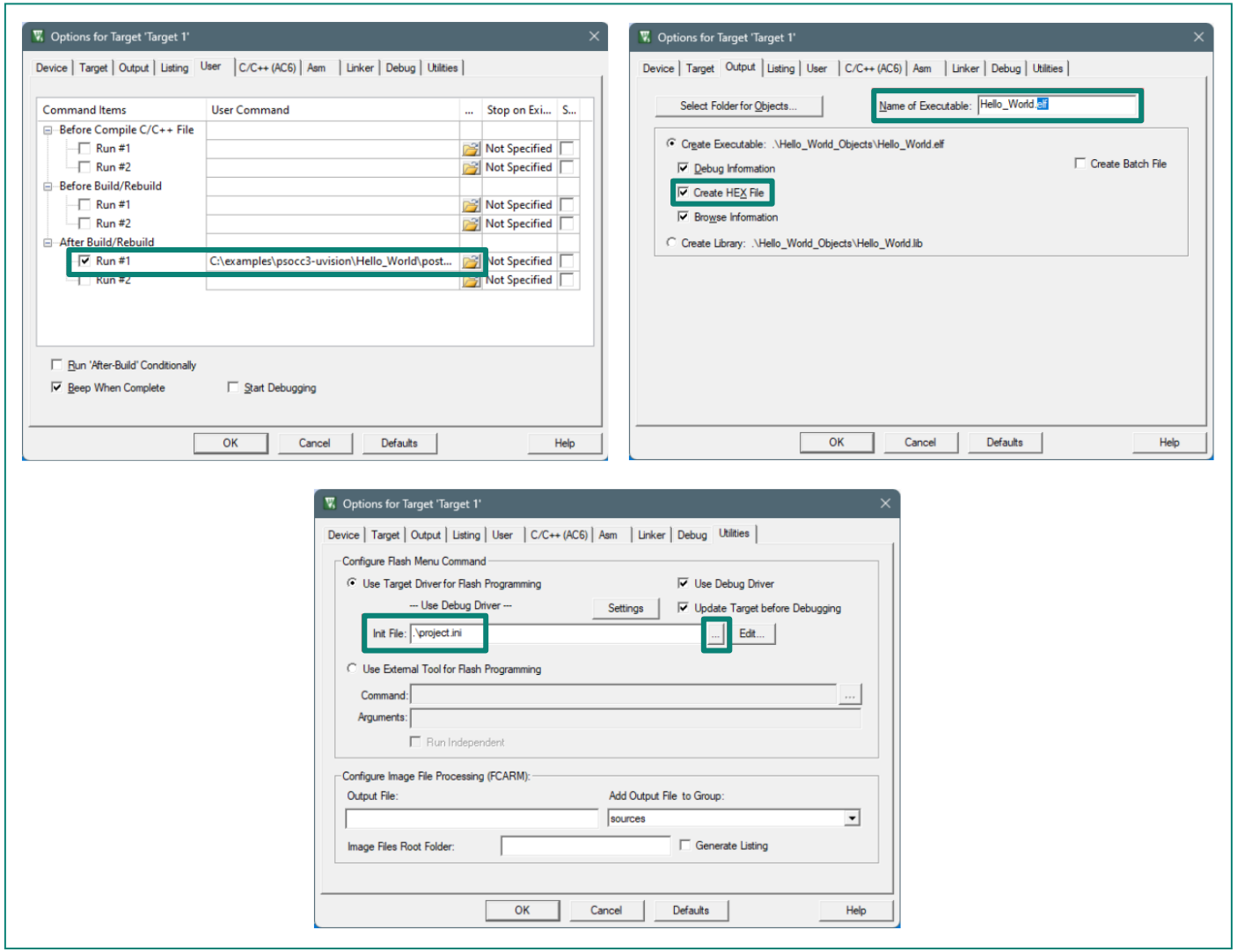
# PSOC™ Control C3 application (contd.)

5. Open the Options for Target dialog, select the User tab, select the After Build/Rebuild Run #1 check box, and select the postbuild.bat file.
6. Switch to the Output tab and add a ".elf" extension to the file in the Name of Executable field and select the Create HEX File check box.
7. Switch to the Utilities tab, select the project.ini file in the Init File field.
8. Switch to the Debug tab. Ensure to load the Application at Startup is not checked.





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# References


1. IAR Embedded Workbench for ModusToolbox™ user guide
2. Keil µVision for ModusToolbox™ user guide



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# Revision history

| Document revision | Date | Description of change |
|---|---|---|
| ** | 2026-01-01 | Initial release |
| *A | 2026-02-05 | Added the steps to set up debugger and program |


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