



## GETTING STARTED GUIDE

# AmbiqSuite SDK

Ultra-Low Power Apollo SoC Family

A-SOCAPG-GGGA01EN v2.0



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## Revision History

Revision	Date	Description
1.0	May 2017	Document initial public release
1.10	June 2017	General reformatting/clean-up
2.0	September 14, 2022	Updated document template.

# Table of Contents

<b>1</b>	<b>Introduction .....</b>	<b>5</b>
<b>2</b>	<b>Overview .....</b>	<b>6</b>
<b>3</b>	<b>Updated to Windows PATH .....</b>	<b>7</b>
<b>4</b>	<b>J-Link Tools .....</b>	<b>8</b>
<b>5</b>	<b>Keil <math>\mu</math>Vision MDK Development Environment .....</b>	<b>12</b>
<b>6</b>	<b>IAR Embedded Workbench .....</b>	<b>13</b>
<b>7</b>	<b>Atollic TrueSTUDIO .....</b>	<b>14</b>
<b>8</b>	<b>Eclipse/GCC .....</b>	<b>16</b>

SECTION

1

# Introduction

This Getting Started Guide is designed to step a user through the first few screens for the J-Link tools and for each of the IDEs in order to provide quick success with the new look and feel of the AmbiqSuite.

## SECTION

# 2

## Overview

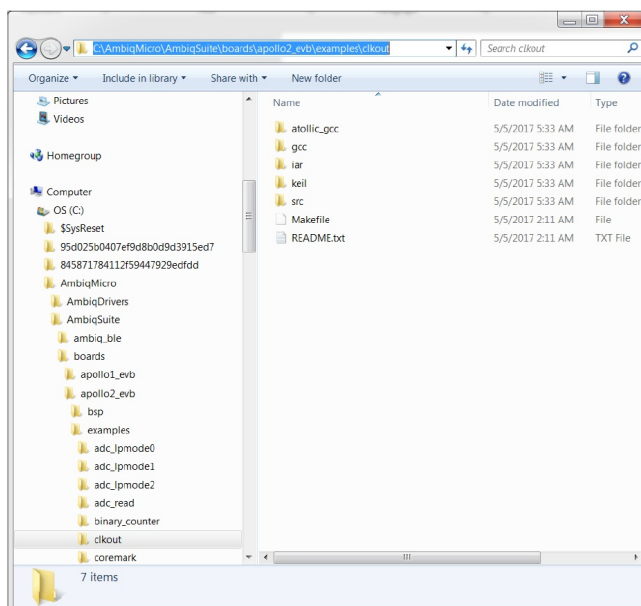
This version of the AmbiqSuite SDK is designed to target a family of Arduino compatible Evaluation Boards known as `apollo1_evb` and `apollo2_evb`. These boards are designed to be widely compatible with the Arduino ecosystem of reference shield boards. In addition, they include a SEGGER J-Link debugger on-board so there is no need for an external debugger.

This version supports example projects for the following toolchains:

- IAR Embedded Workbench 8.11.1
- Keil uVision 5.23
- Atollic TrueSTUDIO 7.1.2
- GCC 5.3.1

Project templates are released for each toolchain. They are found in the subdirectories inside each example project directory.

Figure 2-1: Example Project Directory



SECTION

3

## Updated to Windows PATH

Once the tools are installed, be sure to update the Windows PATH environment variable to include the following additional paths (optional based on toolchain):

- C:\Program Files (x86)\Atollic\TrueSTUDIO for ARM 7.1.2\ARMTools\arm-atollic-eabi\bin
- C:\Program Files (x86)\Atollic\TrueSTUDIO for ARM 7.1.2\ARMTools\bin
- C:\Program Files (x86)\IAR Systems\Embedded Workbench 8.0\common\bin
- C:\Keil\_v5\UV4

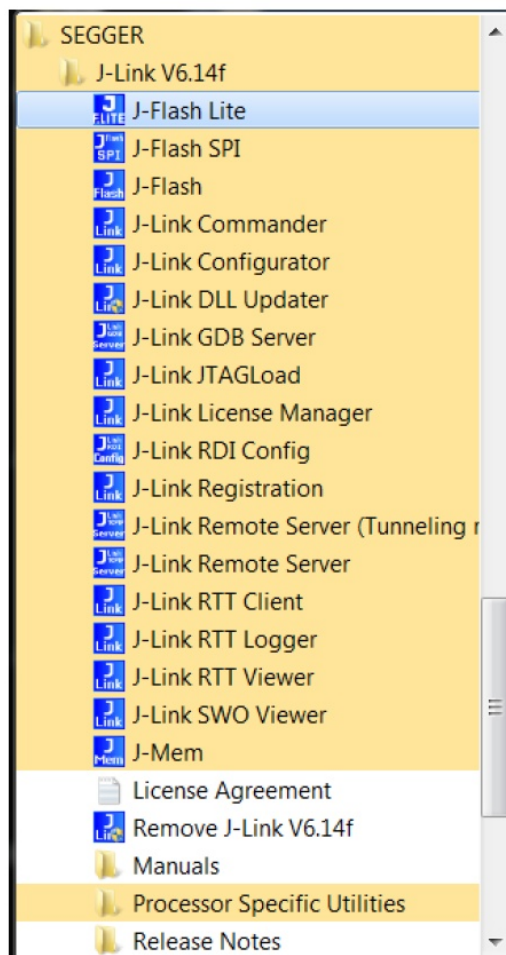
## SECTION

# 4

## J-Link Tools

The J-Link tools of interest are the J-Flash Lite and the J-Link SWO Viewer. J-Flash is used to load pre-compiled binaries into the device flash. J-Link SWO Viewer is used to see the resulting application output.

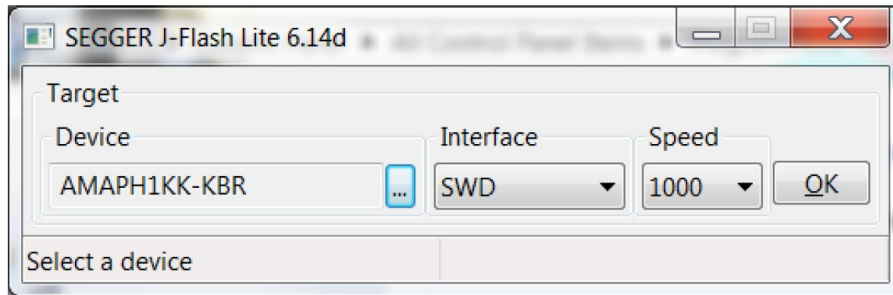
Figure 4-1: J-Link SWO Viewer





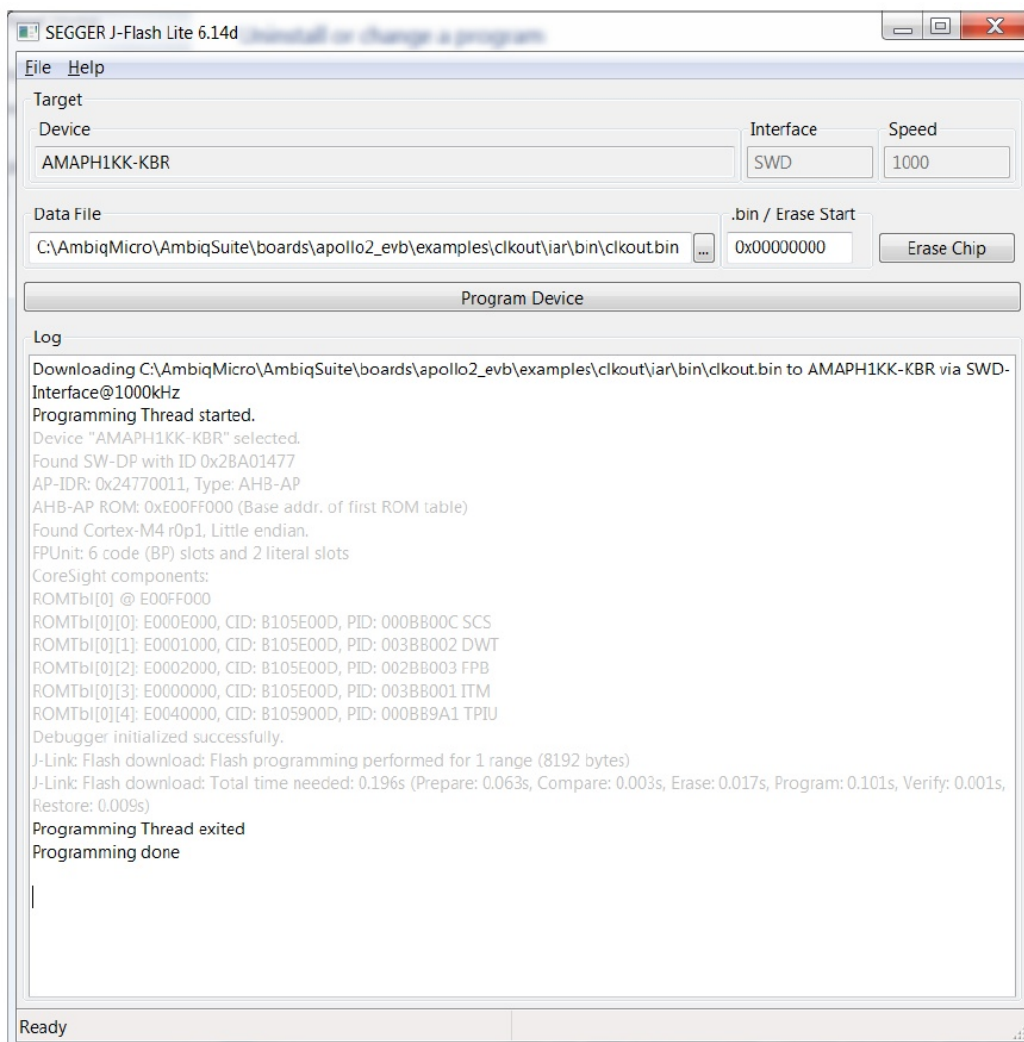
When J-Flash Lite is launched it may require configuration to the following (AMAPH1KK-KBR and speed of 1000 or 1MHz).

Figure 4-2: SEGGER J-Flash Lite Configuration



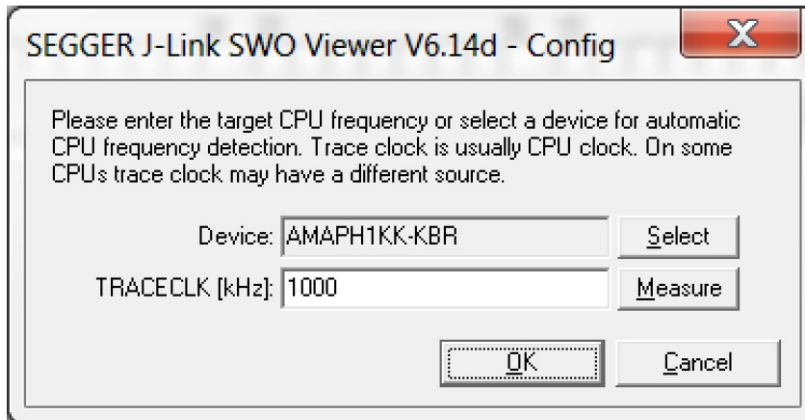
The J-Flash program itself just requires navigating to the proper directory (e.g. C:\AmbiqMicro\AmbiqSuite\boards\apollo2\_evb\examples\clkout\iar\bin\hello\_world.bin) and selecting Program Device. The result should look as follows:

Figure 4-3: SEGGER J-Flash Lite Program



Next, start the J-Link SWO Viewer. Configuration is also required as follows:

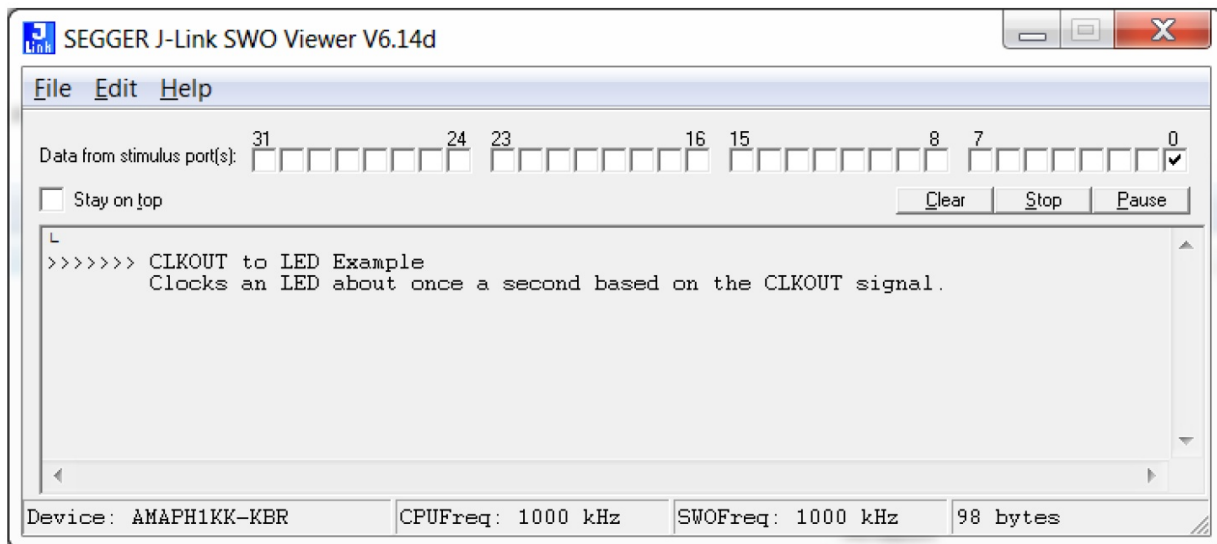
Figure 4-4: J-Link SWO Viewer



Note: Make sure the **TRACECLK** is set to 1000 or 1MHz.

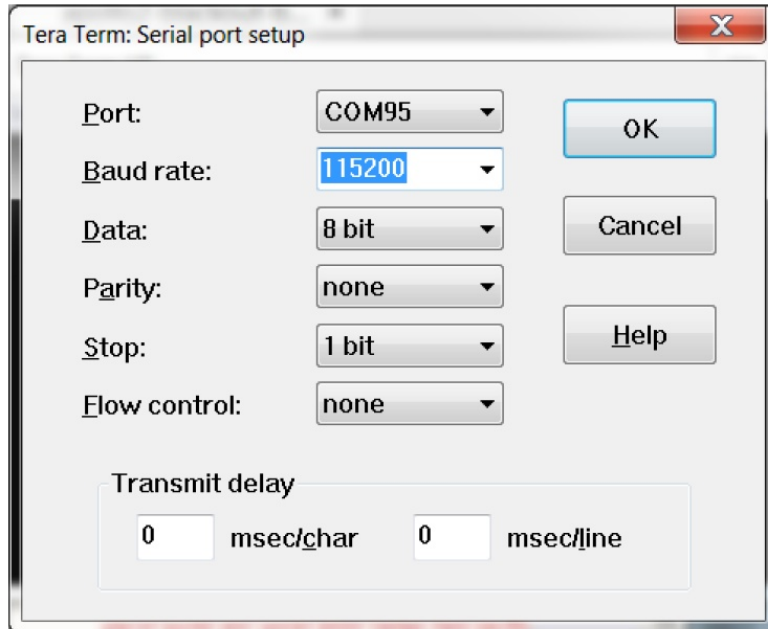
Finally, press the **SYSTEM RESET** on the EVB and the program should run, displaying the following:

Figure 4-5: System Reset Running Program



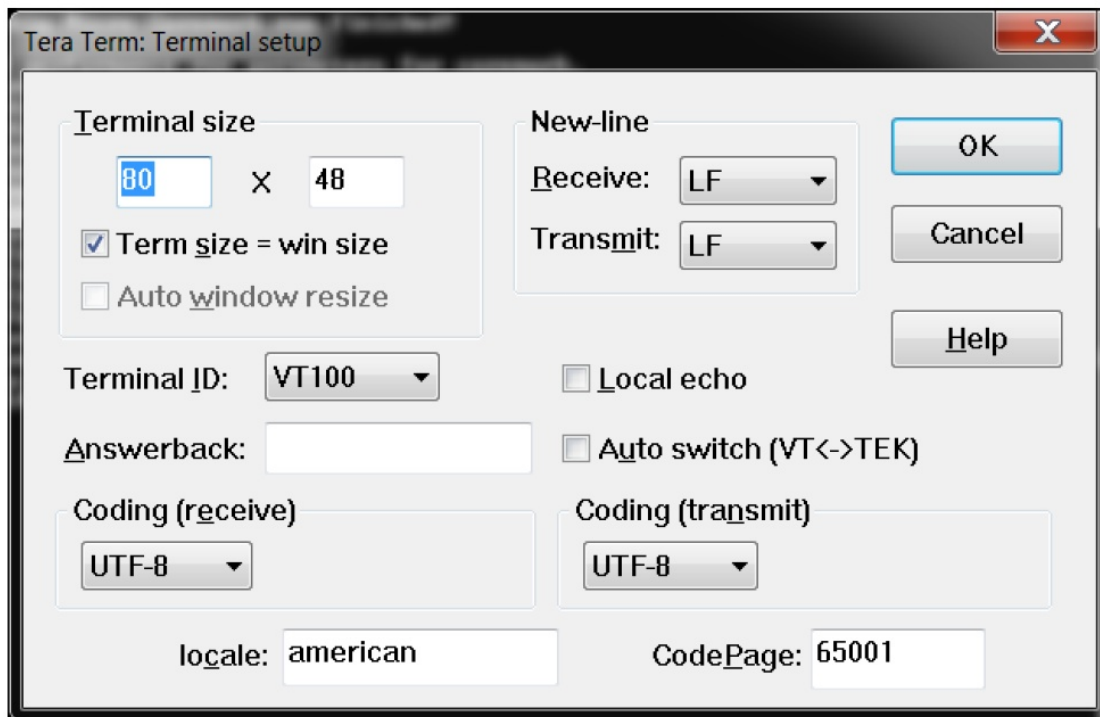
Some of the examples require output on the UART0 which is also routed through the SEGGER debug interface. The UART port is called **JLink CDC UART Port** and the settings for using the UART are as follows:

Figure 4-6: Settings for Using the UART



Also note that it may be necessary to change the settings for the EOL to Line-Feed similar to this:

Figure 4-7: Settings for the EOL to Line-Feed



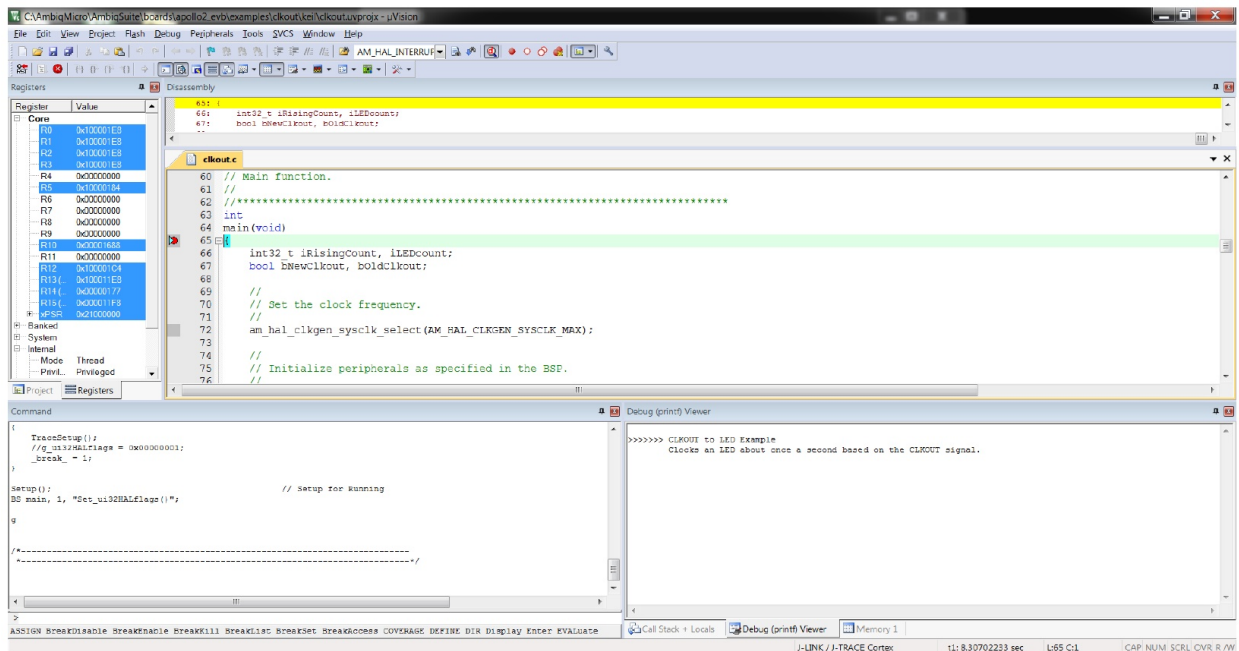
## SECTION

# 5

# Keil $\mu$ Vision MDK Development Environment

The Keil MDK projects are set up to run the SWO output through the Debug (printf) Viewer. This can be brought up by selecting **View > Serial Windows > Debug (printf) Viewer**. The output appears as follows:

Figure 5-1: Debug (printf) Viewer Output



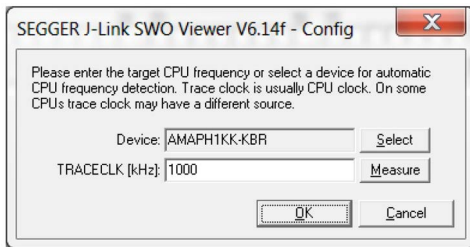
## SECTION

# 6

## IAR Embedded Workbench

The IAR project can be selected inside the appropriate subdirectory by double-clicking on the desired IAR IDE Workspace file. The project may be rebuilt as desired. When the debugger is launched for the first time in the project, the following message is displayed:

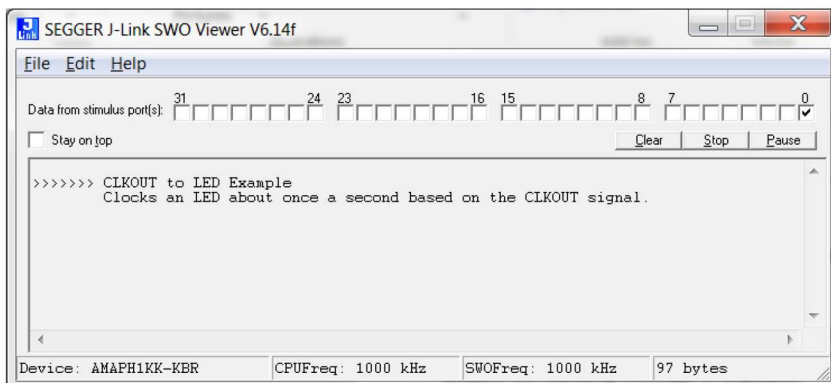
Figure 6-1: Message After Launching Debugger



**NOTE:** The J-Link SWO Viewer has an interaction with the IAR Embedded Workbench such that the sequence of terminating a debug session vs. shutting down the J-Link SWO Viewer matters. The proper order to avoid this problem is to first terminate the debug session followed by shutting down the Viewer.

The output should be displayed as follows:

Figure 6-2: Debugger Display



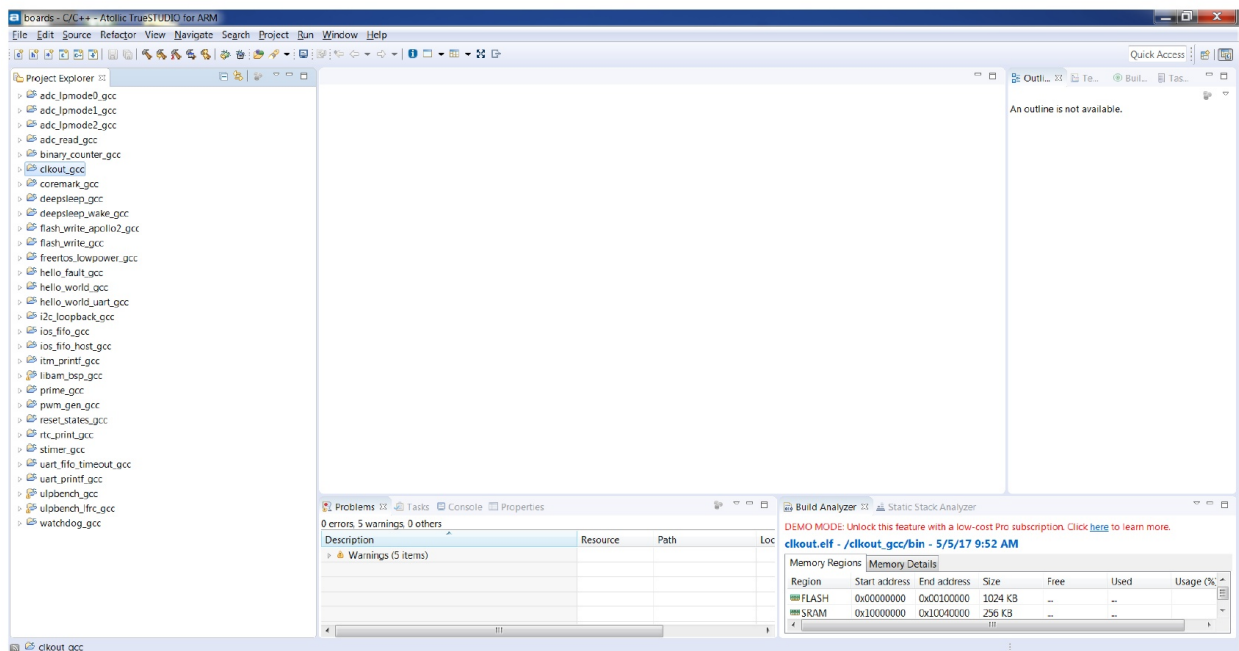
## SECTION

# 7

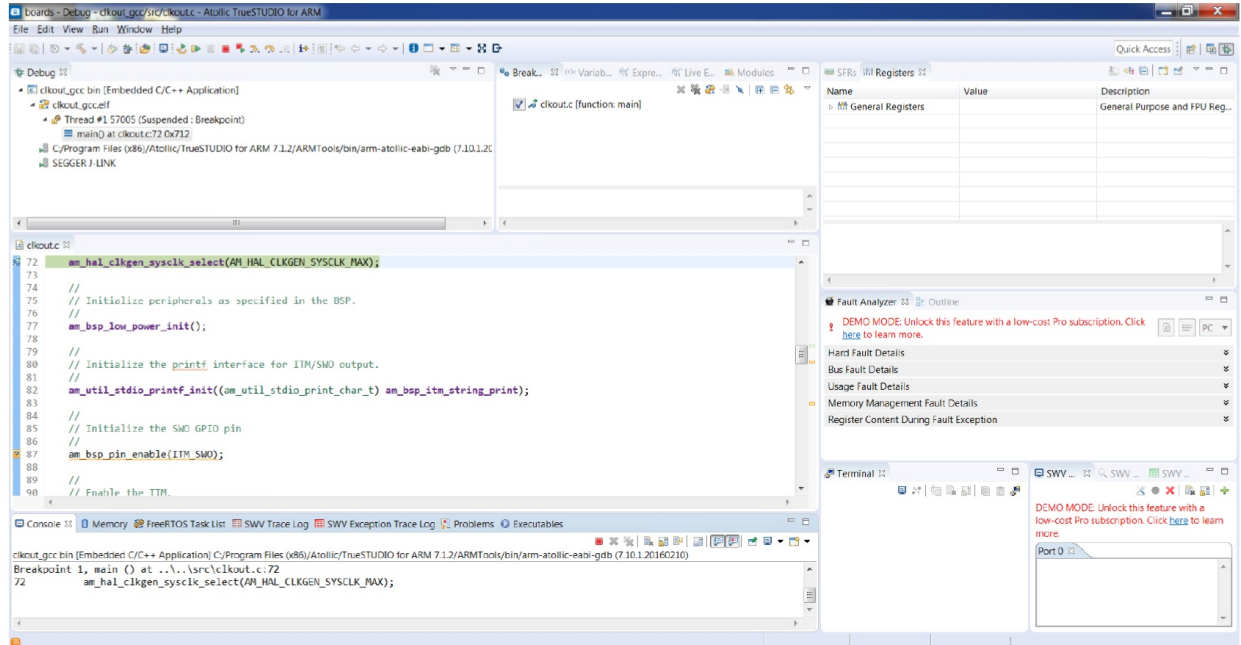
# Atollic TrueSTUDIO

Use the following procedure to open existing projects in the Project Explorer:

1. Launch the Atollic TrueSTUDIO and set up the workspace in:  
`C:\AmbiqMicro\AmbiqSuite\boards`
2. Wait for the Upgrade windows to finish (5 seconds) and close the window.
3. Select **File > Import General > Existing Projects into Workspace**.
4. Click **Browse**, then navigate to the `/boards/<target>` directory of interest (e.g., `/boards/apo11o2_evb`).
5. Click **Finish** to select all the projects, or de-select the unwanted projects. The Project Explorer should appear as below:



6. Select the **clkout\_gcc** project.
7. Build the project.
8. Select debug. The debugger project should appear as follows:



**NOTE:** The J-Link SWO Viewer has an interaction with the TrueSTUDIO such that the sequence of terminating a debug session vs. shutting down the J-Link SWO Viewer matters. The proper order to avoid this problem is to first terminate the debug session followed by shutting down the Viewer.

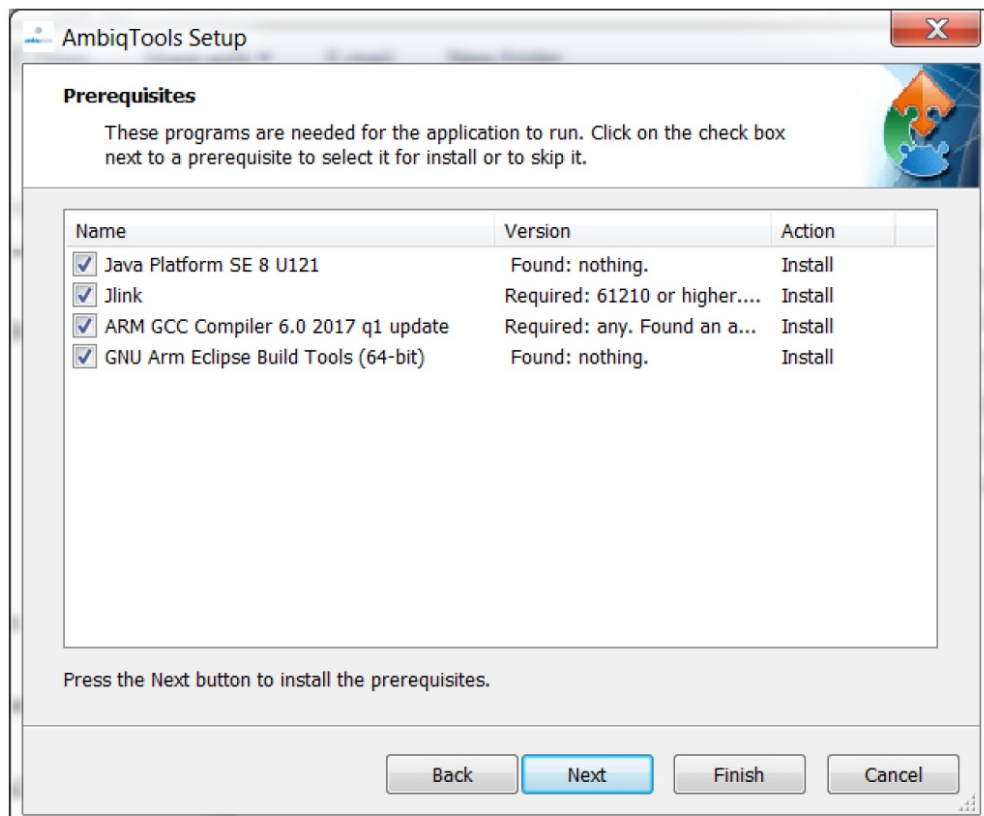
SECTION

8

# Eclipse/GCC

**NOTE:** The Eclipse/GCC environment is not operational due to an unforeseen interaction between the IDE and the J-Link GDB Server which has yet to be resolved.

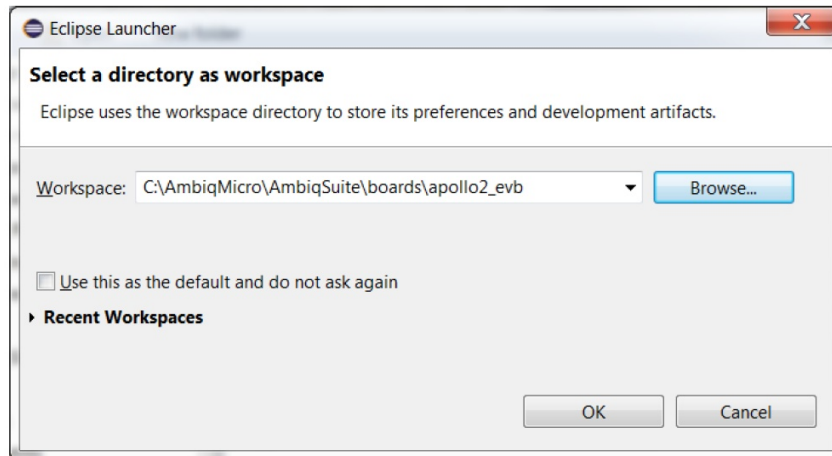
The Eclipse environment is packaged into an Ambiq-Tools installer which provides for the installation of the required Java run-time environment, SEGGER J-Link tools, Arm GCC cross-compiler tool chain, and the GNU Arm Eclipse build tools, as follows:



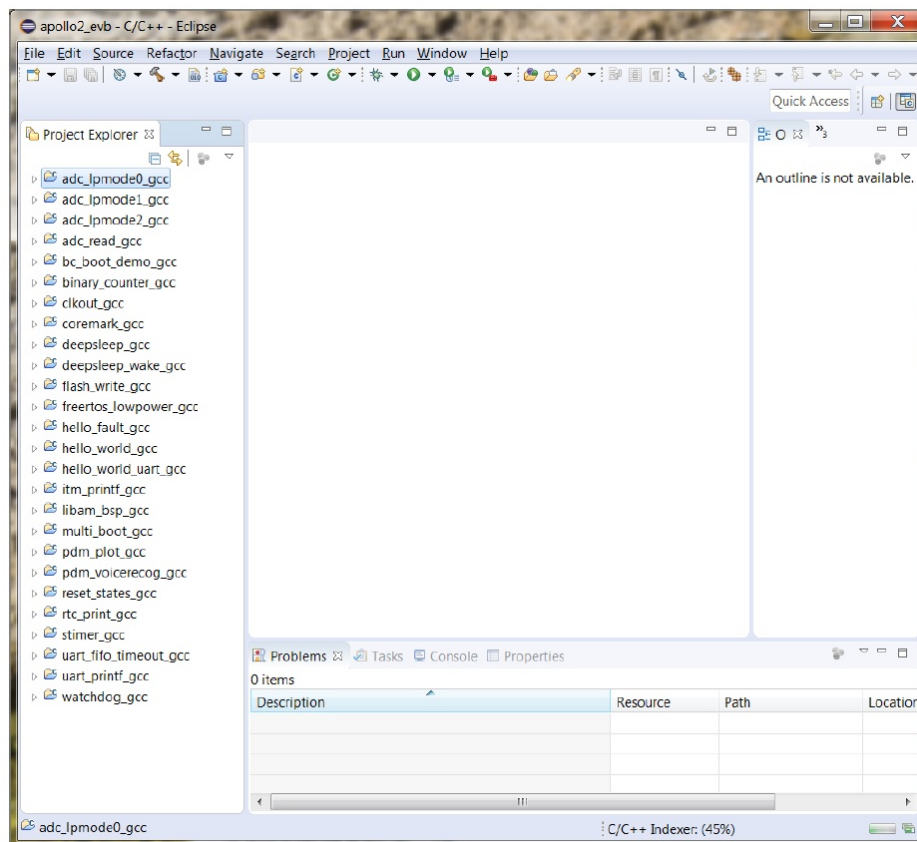


Use the following to select and build a project:

1. Follow the installation steps to get started with the Eclipse environment.
2. Once the tools are installed, the first step is to create a new workspace as follows:



3. After the standard Eclipse Welcome screen, the user may Import all the **apollo2\_evb** projects by selecting **Import**, then select **General > Existing Projects into Workspace**, then **Browse**, **OK**, and **Finished**. This should create a project screen that looks like this:



4. Next, select the desired project and then select **Clean/Build** the project.



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