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8-bit Microcontrollers Starter Kit

Starter Kit Quick Guide

Version 1.16

Contents

List of figures

1   Introduction

This document introduces software environment and development recommendations for the 8-bit MCU Starter Kit. It offers an easy way to develop an ABOV 8-bit MCU.

1.   8-bit MCU Starter Kit includes H/W module which is called OCD (for 96 series) or 8-bit Writer (for 94/97 series). Therefore, no additional H/W is required for debugging.

2.   8-bit MCU Starter Kit includes example guide for LED blinky.

2   User requirements

2.1   Hardware

1.   ABOV 8-bit Starter Kit Board

   A.   This Starter Kit is available for the devices including 94/ 96/ 97 core series.

      i.   A96G140, A96G166, A96G174, A94B114, A96L322, A96L523, and etc.

   B.   This Starter Kit supports additional 8-bit MCU.
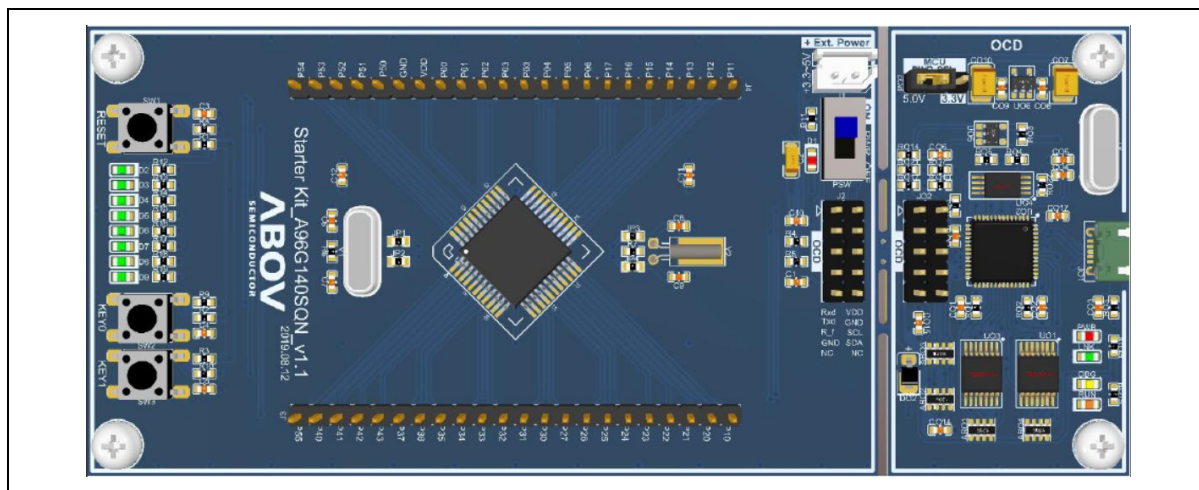

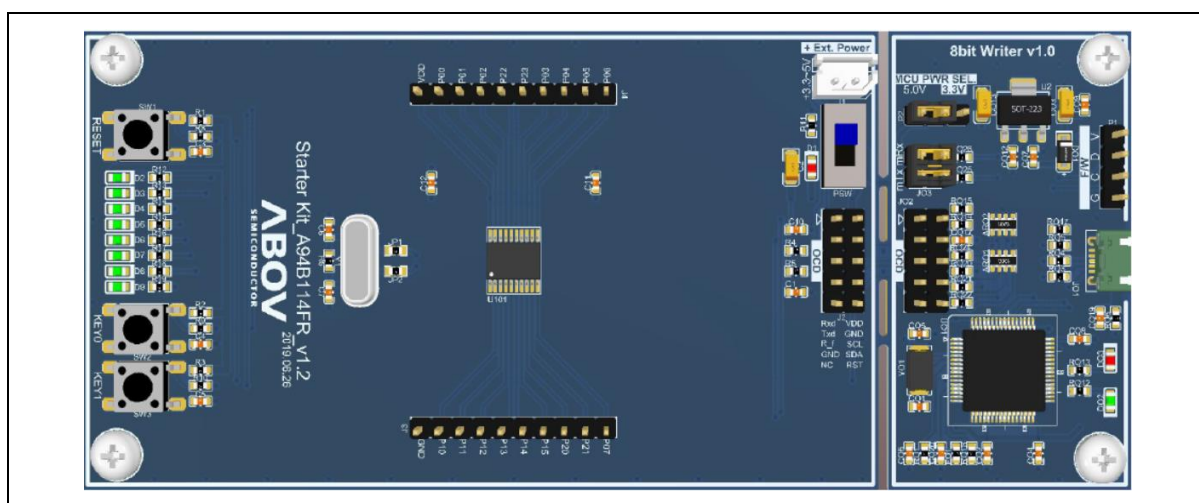**Figure 1. Starter Kit Board (Hardware) / 96 Series (OCD)**

Figure 2. Starter Kit Board (Hardware) / 94, 97 Series (8-bit Writer)

2.2   Software

1.   Keil complier (uVision5)

2.   EVK software (Including Led_Blinky sample code)

Figure 3. Compiler (Software)

2.3   Reference documents

1.   Starter Kit Quick Guide

2.   Starter Kit HW Manual

3.   Starter Kit Schematic

4.   Product User's Manual

5.   Example Code

6.   OCD II Lite Software (In case of 8-bit 94, 97 Series MCU)

Category	Title	Type	Language	Issue Date	Size	Download
Datasheet	DS_A96G14x_Eng	📕	Eng	2020-02-06	3.6 MB	⬇
User's Manual	UM_A96G14x_Eng	📕	Eng	2020-02-06	7.6 MB	⬇
Application Note	AN_Comparison between A96G140 vs MC96F6432A_Eng	📕	Eng	2020-02-03	756 KB	⬇
Application Note	AN_Hardware Design Guide for Noise Immunity for 8bit 32bit Devices_Eng	📕	Eng	2020-02-07	1.5 MB	⬇
Example Code	Example Code_A96G140	📁		2020-02-03	1.1 MB	⬇
Starter Kit	STK_Schematic_A96G140	📕	-	2020-02-07	2.7 MB	⬇
Starter Kit	STK_Manual_A96G140_Eng	📕	Eng	2020-02-06	1.3 MB	⬇
Starter Kit	STK_Gerber_A96G140	📁	-	2020-02-06	697 KB	⬇
Starter Kit	STK_Quick Guide_A96G140_Eng	📕	Eng	2020-02-06	1.9 MB	⬇

Figure 4. Reference Documents

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2.4   System requirements

1. Windows PC (7, 8, 10)

2. USB micro-B type cable

Figure 5. Window PC & Micro-B cable

2.5   ABOV website

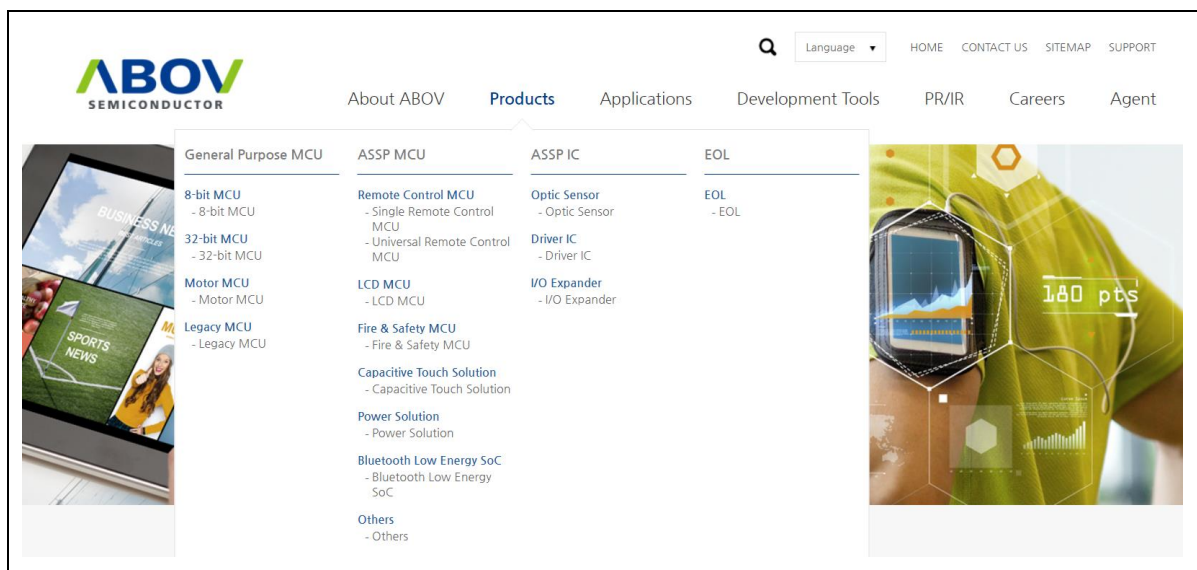For detailed information about corresponding software and documents, you can visit our website at https://www.abovsemi.com.

Figure 6. ABOV Semiconductor Website

3　　OCD debugger (96 series)

3.1　　Building and running LED_Blinky project (example A96G140)

Running application code (LED_Blinky) makes it easier to start the Starter Kit. When following the steps below, LEDs on the board turn on and off:

　　　　Step 1.　　　Prepare the Starter kit Board

　　　　Step 2.　　　Set up the Starter kit Board

　　　　Step 3.　　　Connect the Starter kit to your PC

　　　　Step 4.　　　Run the LED_Blinky Project

　　　　Step 5.　　　Compiling LED_Blinky

　　　　Step 6.　　　Download LED_Blinky

　　　　Step 7.　　　Debugging LED_Blinky

　　　　Step 8.　　　Check the LED_Blinky Operation

3.2   Prepare the Starter Kit board

Hardware components of the Starter Kit

1. The Starter Kit consists of a device board and an OCD board (debugger). It is possible to use separately as needed.

2. Device board configuration

    A. ABOV 8-bit MCU, X-TAL (optional)

    B. Pin Headers connected to MCU

    C. LED, switch and jumper to check input/output, reset, and debugger pins

3. OCD board (debugger) configuration

    A. Programmable and debuggable OCD (USB connection to PC) on ABOV 8-bit MCU
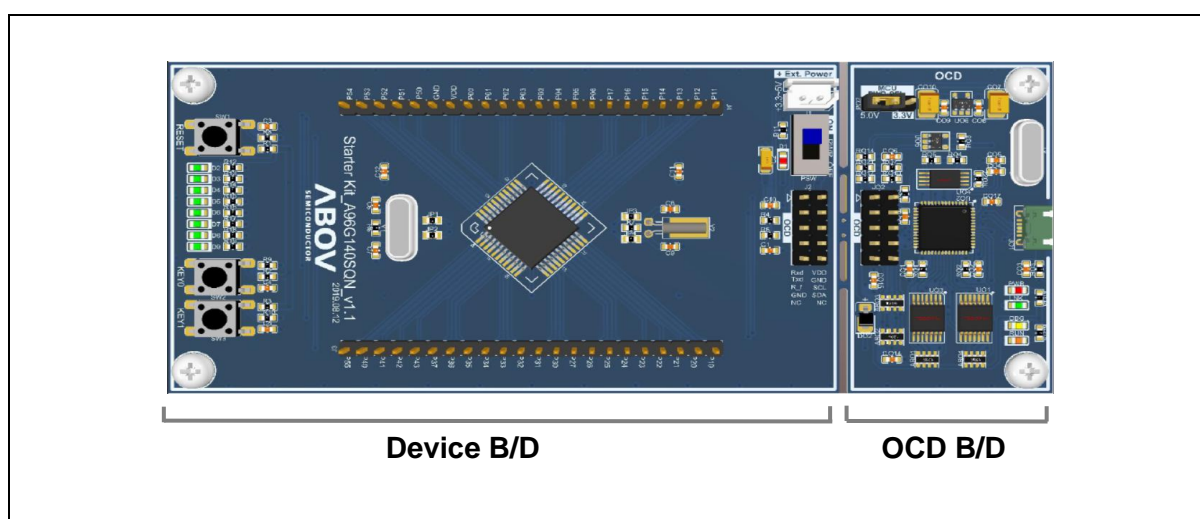

Figure 7. Starter Kit B/D

3.3　　　　Set up the Starter Kit Board

Set jumpers to control the Starter Kit

1.　The Starter Kit uses USB power-①

　　A.　Choose 3.3V and 5.0V (check the maximum operation voltage by referring to the specification sheet).
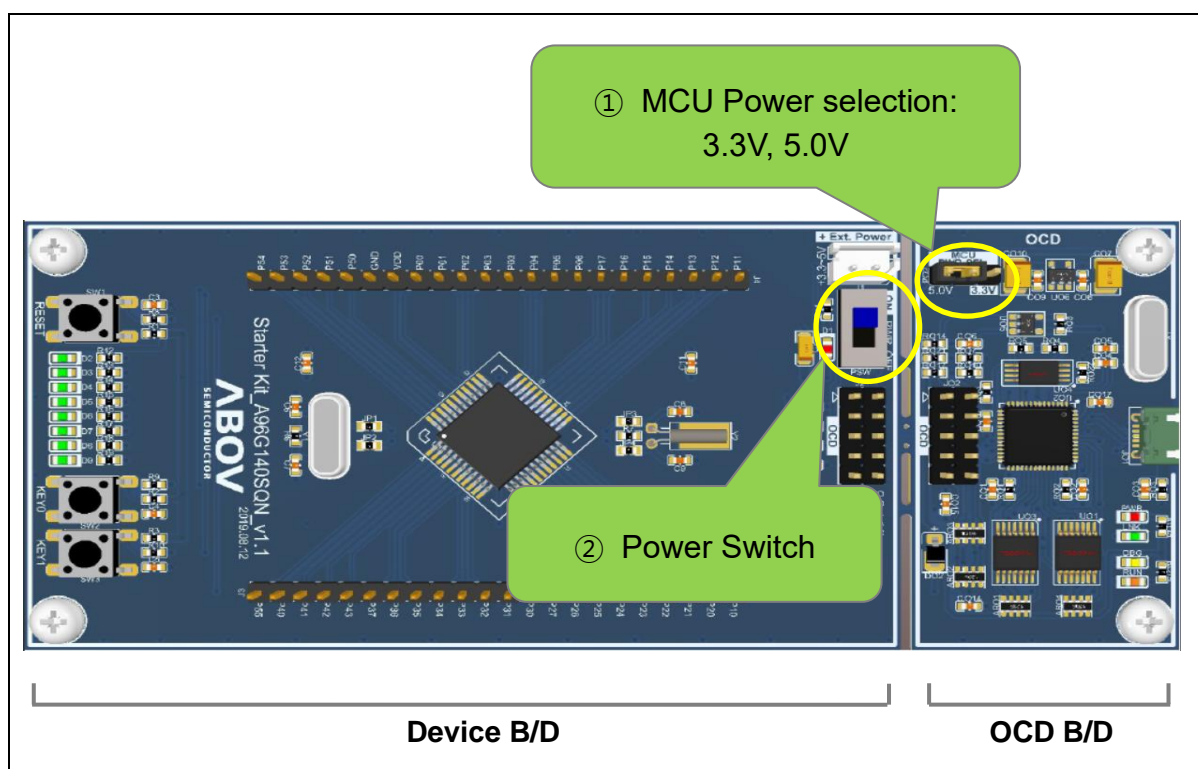
2.　Power switch selection-②

Figure 8. Starter Kit Jumper & Switch

3.4   Connect the Starter Kit to your PC

PC connection via USB on the Starter Kit

Connect the USB 2.0 (micro-B type) cable to the Starter Kit as shown in Figure 9.

1.   If the PC is properly connected, the power LED on the device board will be turned on. -①

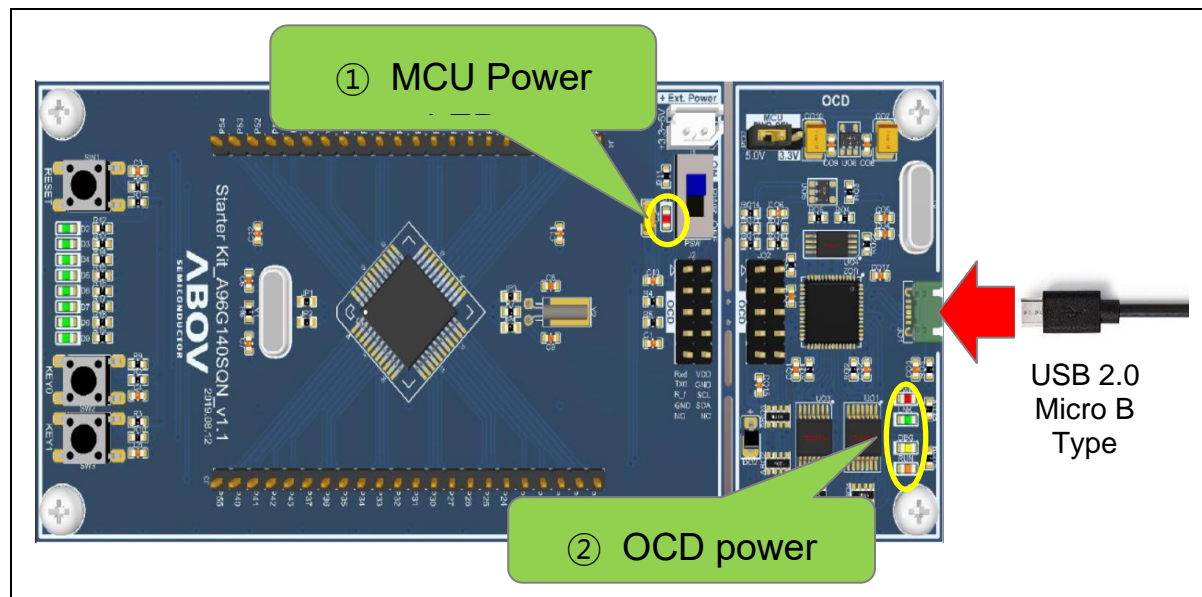2.   The status LED on the OCD board (debugger) will be turned on -②

Figure 9. Starter Kit and USB Connection

Recognition of the hardware (device drivers) on your PC

The OCD board (debugger) uses a USB interface.

1.   USB driver installation is required.

2.   Download the USB driver installation from ABOV website (https://www.abovsemi.com)

3.   Once the OCD board (debugger) is connected, it will be shown as "ABOV OCD".
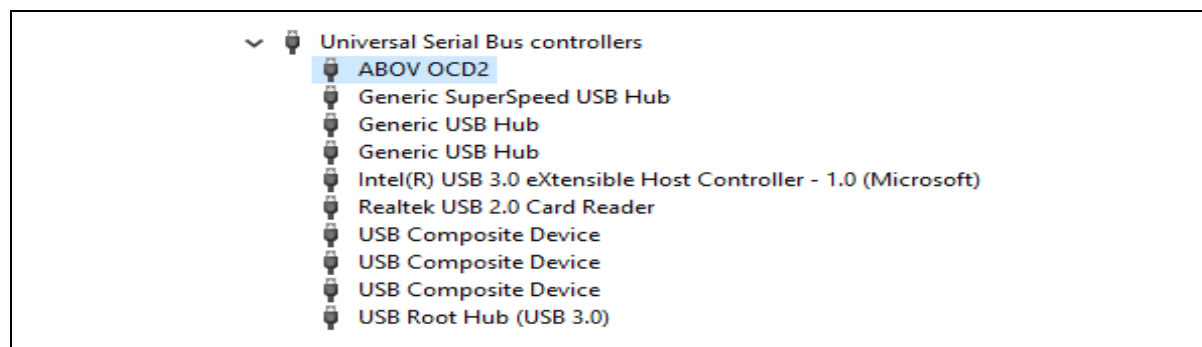

Figure 10. OCD (Debugger) at Device Manager

3.5   Run the LED_Blinky project

Before downloading the LED blinky example, Keil uVision5 for 8051 and OCD debugger S/W must be installed on your PC.

1.   Execute "Keil uVision5".

2.   Execute OCD debugger tool.

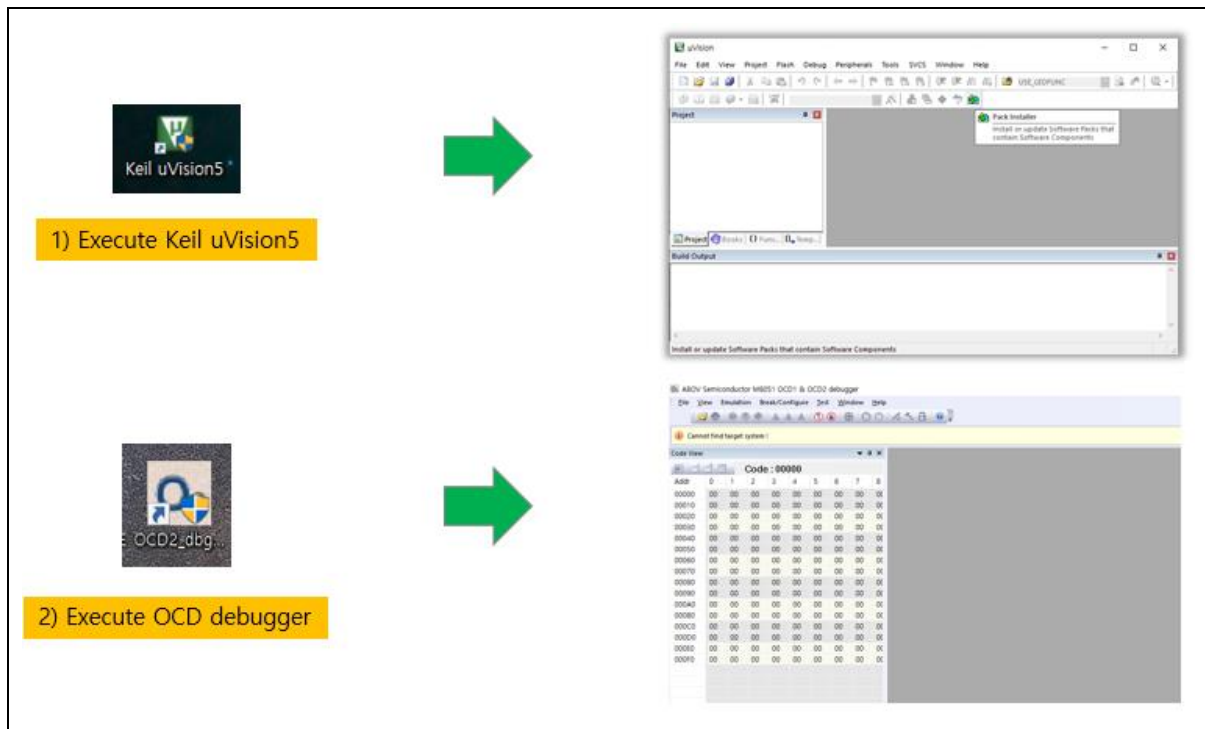   A.   The debugger software supports the 96 series developed by ABOV 8-bit MCU.

Figure 11. Execute Keil uVision5 & OCD Debugger Tool

3. Download the Evaluation Kit (example source) from ABOV official website.

   A. Decompress the file, and select "LED Blinky" in the example sources.

   B. Execute "LED Blinky" example project.

Figure 12. Download Evaluation Kit (Example Source)

4. The example source is opened in the location of the configured folder, and uVision5 will be running as shown below.

A. The folder contains the Keil Project and the sample file of the selected example.
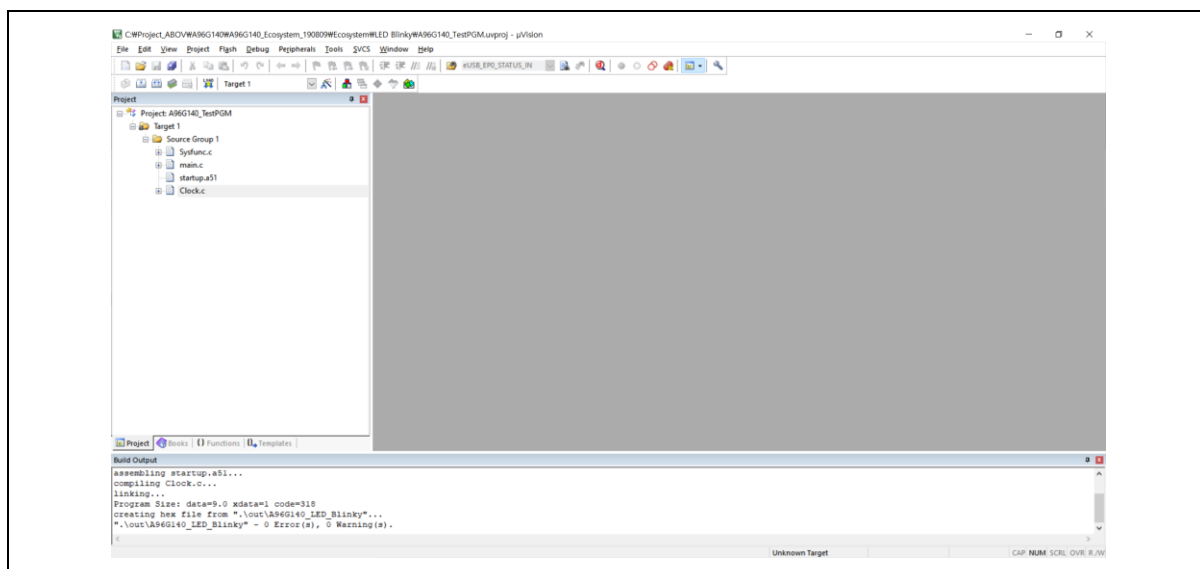

Figure 13. uVision5 – LED Blinky Project

3.6   Compiling LED_Blinky

Execute "Rebuild all target files" on the created uVision5 (LED Blinky Project).

1. Select Rebuild (①) to proceed with compilation.

2. Compile result can be checked in Build Output (②). Make sure there are no errors in the project.
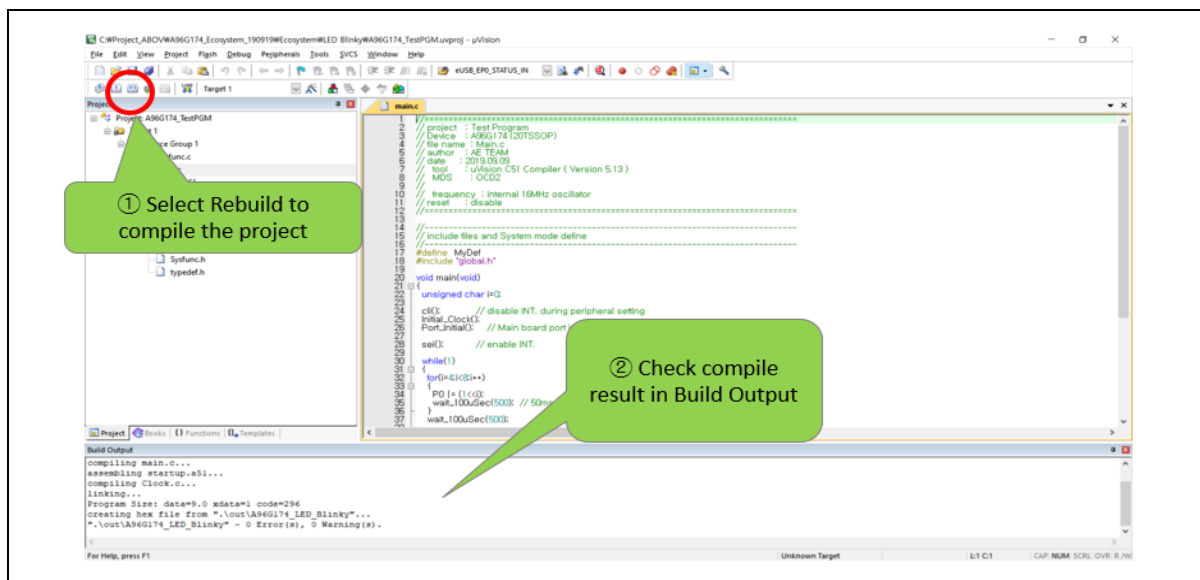

Figure 14. Compile result on uVision5 (LED Blinky Project)

3.7   Download Led_Blinky

3.7.1   OCD

If the compilation finishes without error, it is possible to download it with OCD debugger software (available only for 96 series).

1.   The OCD debugger (via USB) and the Starter Kit are connected and can be downloaded.

2.   Recognize the OCD and press a Download (①) button. If any error occurs, check the settings.

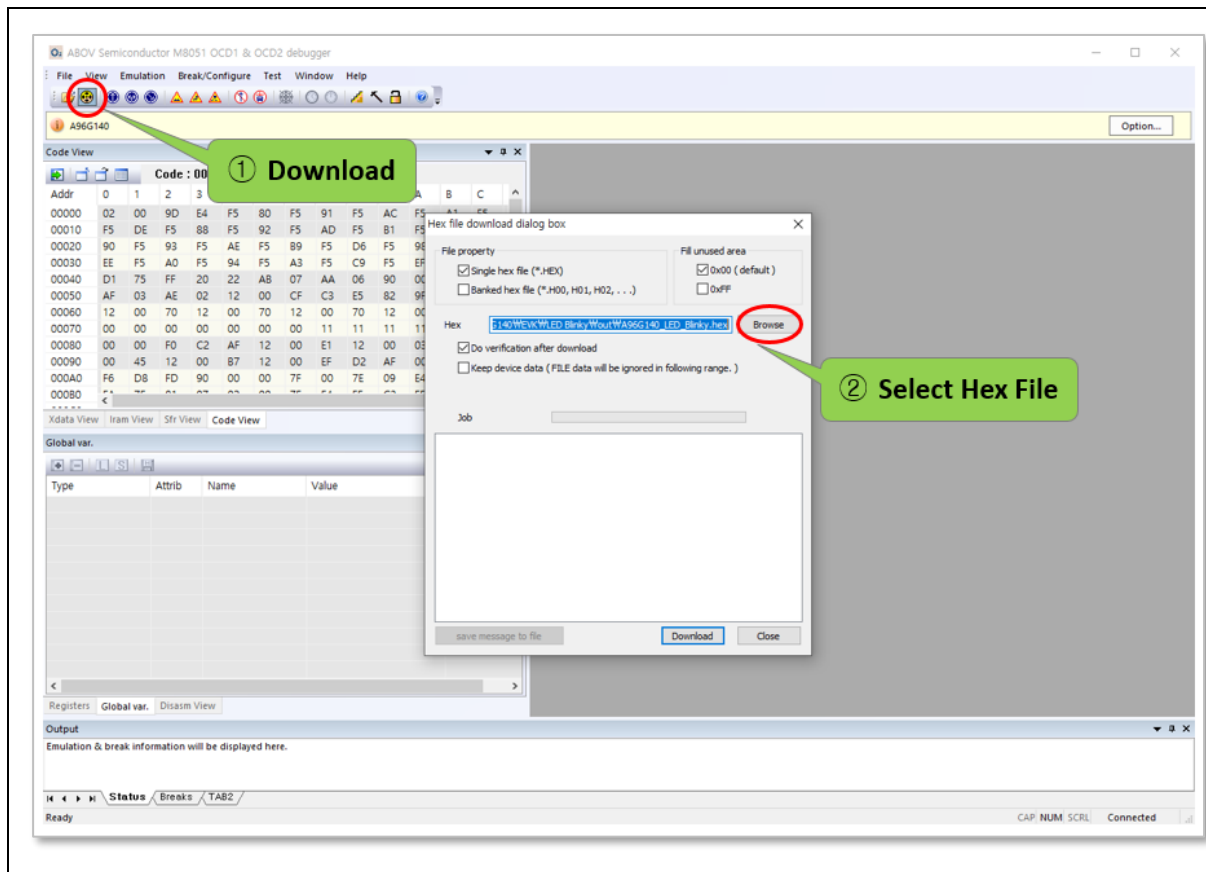3.   Press a Browse (②) button and select a Hex file.

Figure 15. Download LED Blink Project on OCD (Debugger)

3.8   Debugging Led_Blinky

Debugging in OCD debugger software

1. Enter into debugger mode by executing "Run/Step/Stop Debugger Session".

    A. It must be connected to the Stater Kit for real time debugging.

2. In OCD debugger mode, the program can be executed per Run/Step/Stop Debugger Session.
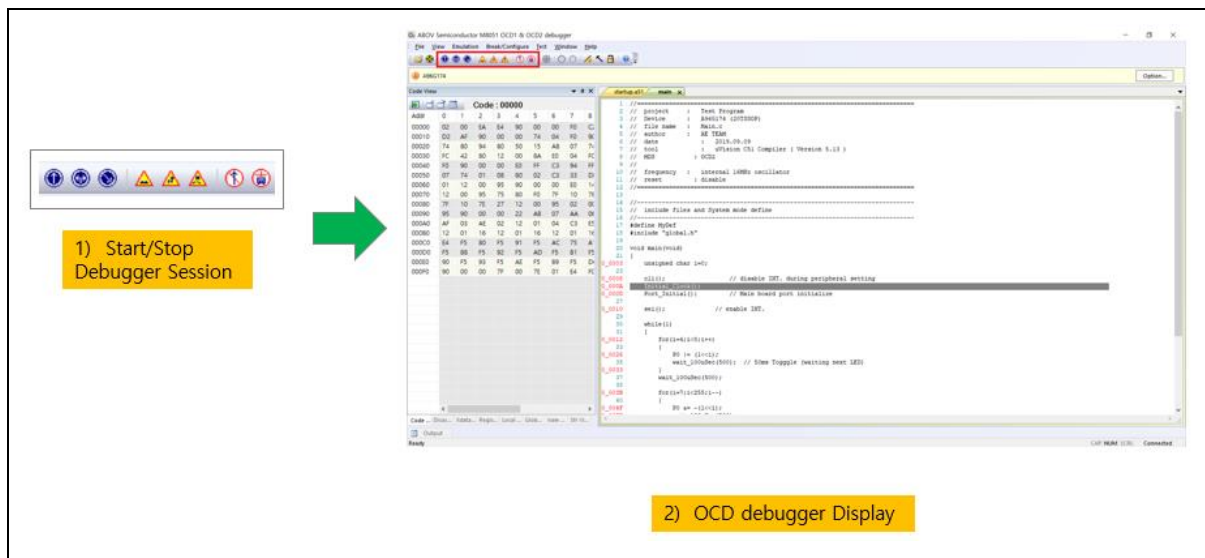

Figure 16. Debugging in OCD Debugger Software

3.9   Check the Led_Blinky operation

How to check the LED operation

1. After normal download of the Led Blinky program, re-apply the power (removing the USB cable) to check whether the LED is on or off.
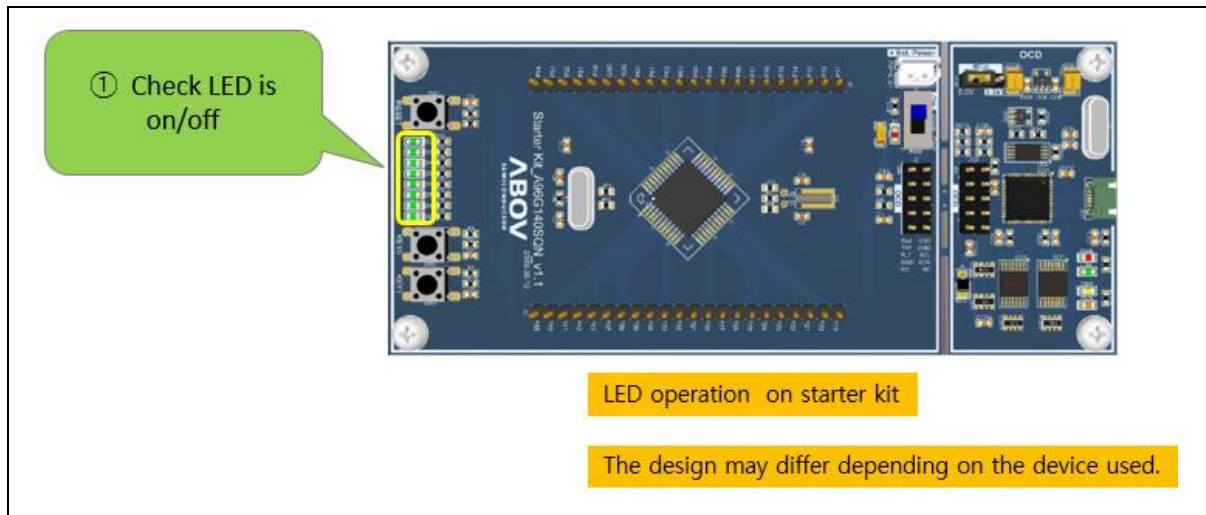

Figure 17. Check LED Operation

4   8-bit Writer (94, 97 Series)

4.1   Building and running LED_Blinky project (example A94B114)

Running application code (LED_Blinky) makes it easier to start the Starter Kit. When following the steps below, LEDs on the board turn on and off:

Step 1.   Prepare the Starter kit Board

Step 2.   Set up the Starter kit Board

Step 3.   Connect the Starter kit to your PC

Step 4.   Run the LED_Blinky Project

Step 5.   Compiling LED_Blinky

Step 6.   Download LED_Blinky

Step 7.   Debugging LED_Blinky

Step 8.   Check the LED_Blinky Operation

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4.2   Prepare the Starter Kit board

Hardware components of the Starter Kit

1. The Starter Kit consists of a device board and an 8-bit Writer board. It is possible to use them separately as needed.

2. Device board configuration

    A. ABOV 8-bit MCU, X-TAL (optional)

    B. Pin headers connected to MCU

    C. LED, switch and jumper to check input/output, reset, and debugger pin.

3. 8-bit Writer board configuration

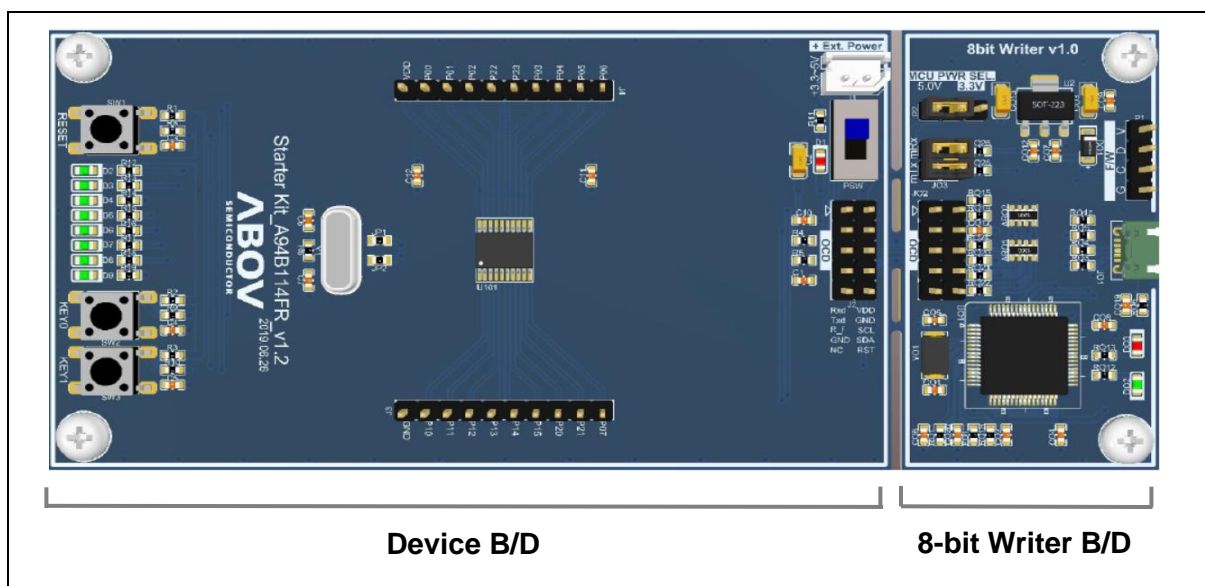   A. Only programmable 8-bit Writer (USB connection to PC) on ABOV 8-bit MCU

Device B/D   **8-bit Writer B/D**

Figure 18. Starter Kit B/D

4.3   Set up the Starter Kit board

Set jumpers to control the Starter Kit

1. The Starter Kit uses USB power-①

    A. Choose 3.3V and 5.0V (check the maximum operation voltage by referring to the specification sheet).
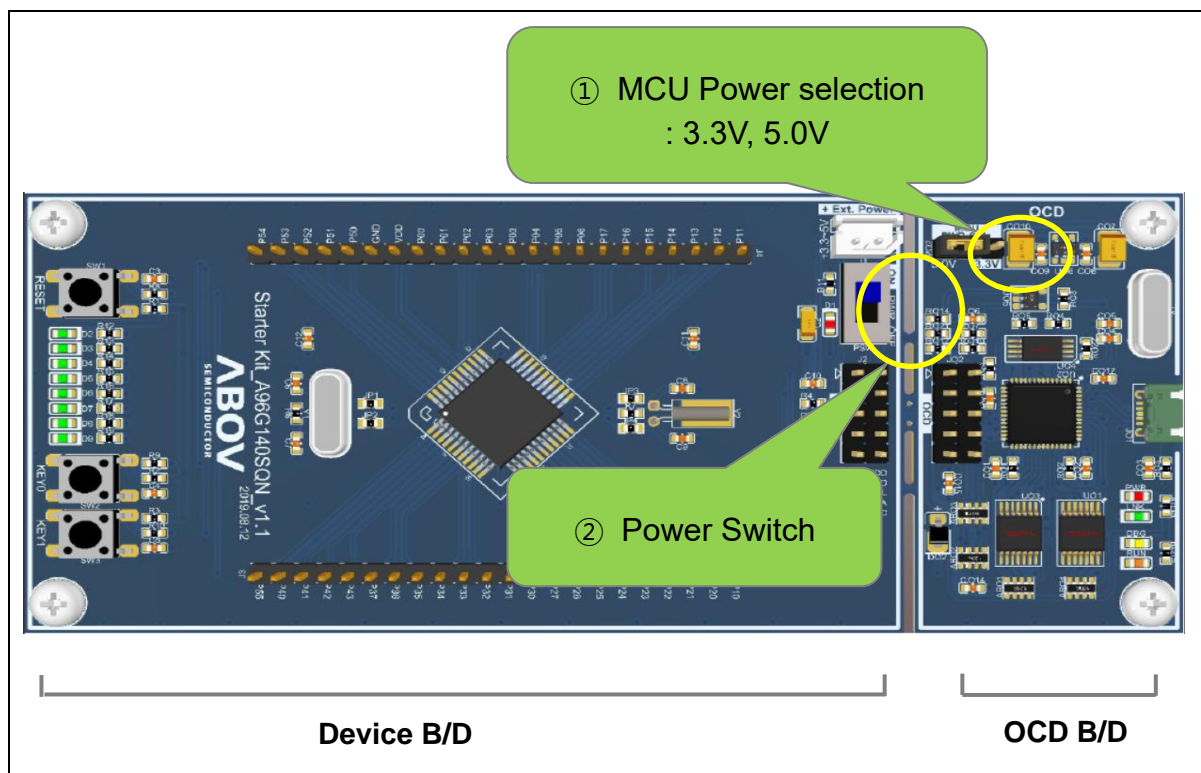
2. Power switch selection-②

Figure 19. Starter Kit Jumper & Switch

4.4 Connect the Starter Kit to your PC

PC connection via USB on the Starter Kit

Connect the USB (micro-B type) cable to the Starter Kit as shown in Figure 20.

1. If the PC is properly connected, the power LED on the device board will be turned on. -①

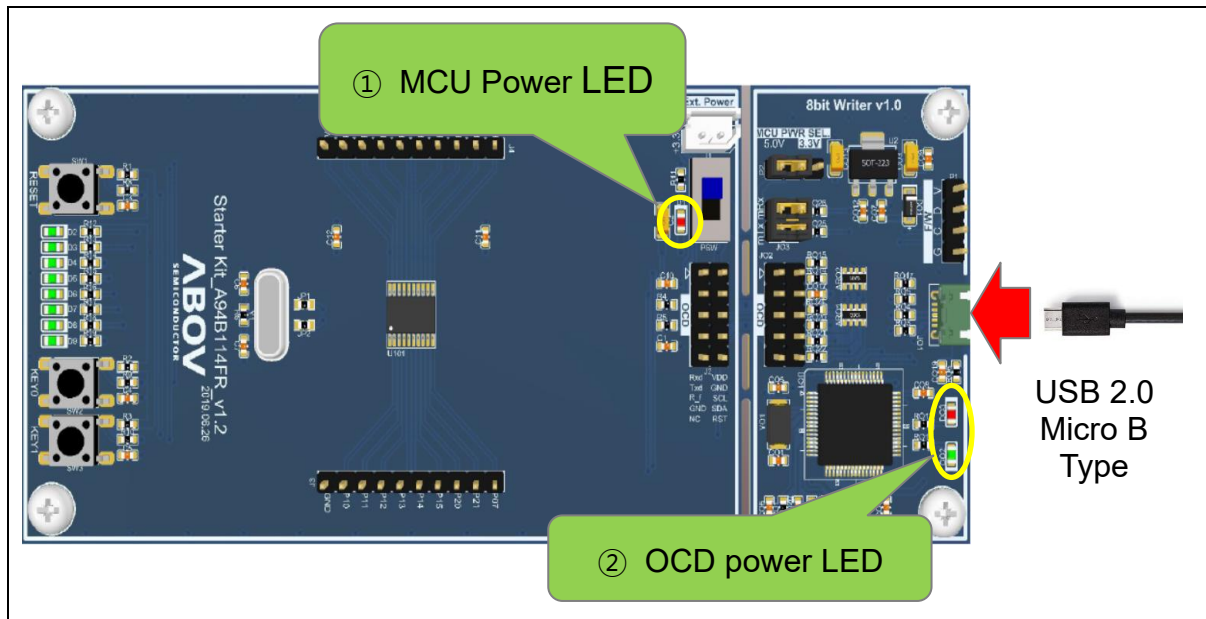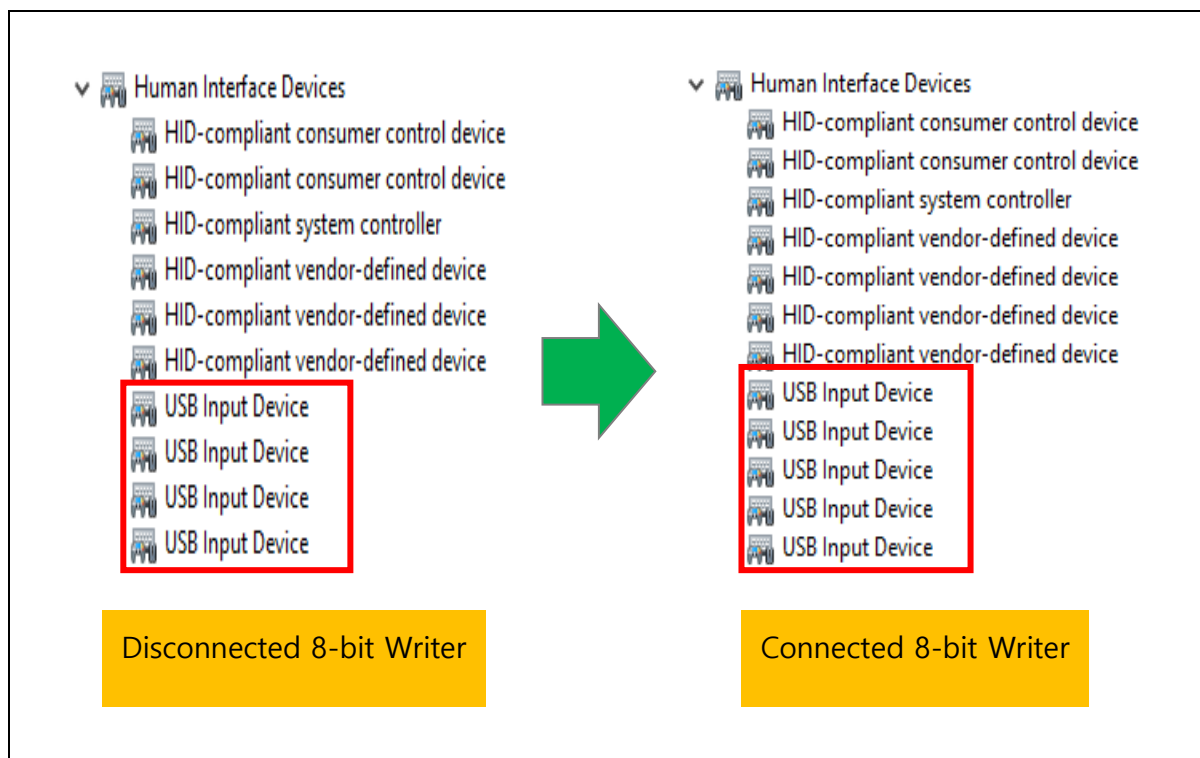2. The status LED on the 8-bit Writer board will be turned on -②

Figure 20. Starter Kit and USB Connection

Recognition of the hardware (device drivers) on your PC

8-bit Writer uses a USB interface. For 8-bit Writer, USB driver installation is not required (USB HID class).

Figure 21. 8-bit Writer on Device Manager

4.5   Run the LED_Blinky project

Before downloading the LED blinky example, Keil uVision5 for 8051 and OCD II Lite software must be installed on your PC.

1. Execute "Keil uVision5".

2. Execute OCD II Lite software.

     A. Download "OCD II Lite software" at MCU item of ABOV website.
        (https://www.abovsemi.com).
        OCD II Lite software only supports the writing function for 8-bit 94/97 series MCU developed by ABOV.

     B. For debugging, Use OCD II dongle and OCD II debugger program.
        Refer to 4.9 Debugging LED_Blink using OCD II Dongle.
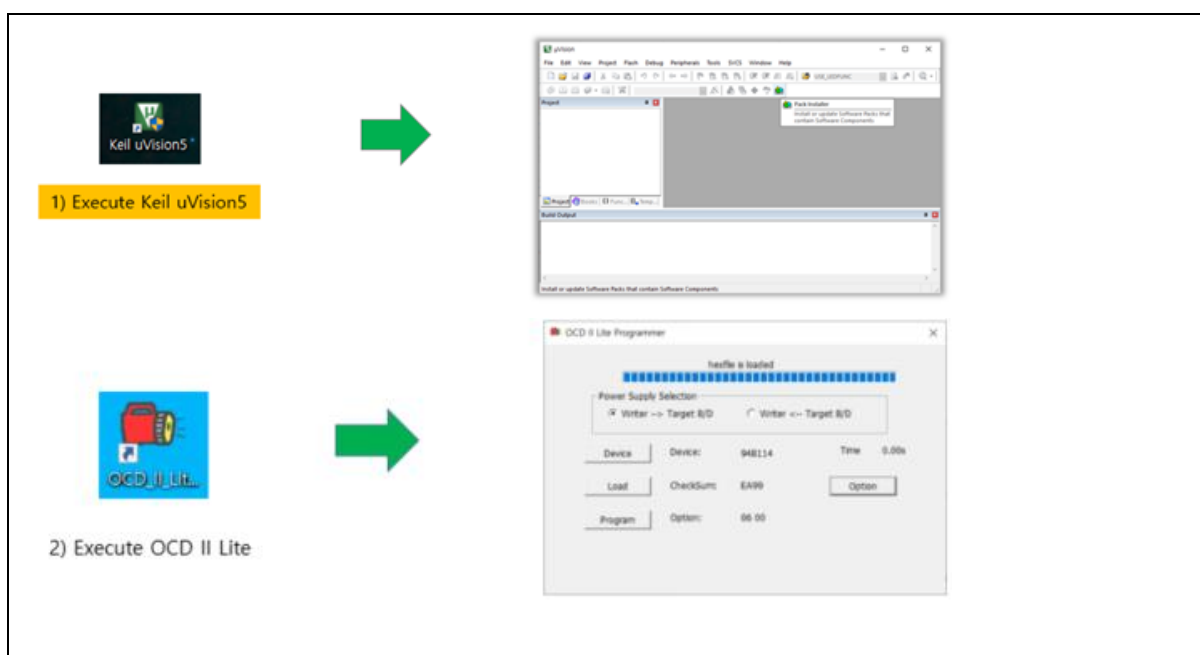

Figure 22. Execute Keil uVision5 & 8-bit Writer

3. Download the Evaluation Kit(Example source) from ABOV official website

    A. Decompress the file, select "LED Blinky" in the example sources.

    B. Execute "LED Blinky" example project.

Figure 23. Download Evaluation Kit (Example source)

4. The example will open in the location of the configured folder and run uVision5 as below

    A. The folder contains the Keil Project and the sample file of the selected example
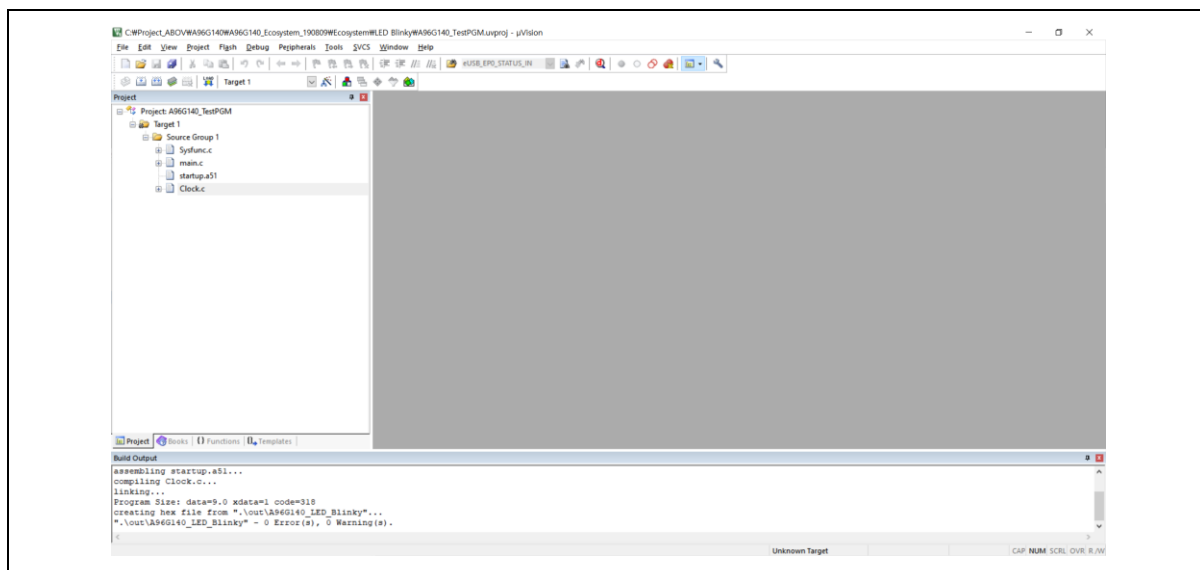

Figure 24. uVision5 – LED Blinky Project

4.6 Compiling LED_Blinky

Execute "Rebuild all target files" on the created uVision5 (LED Blinky Project).

1. Select Rebuild (①) to proceed with compilation.

2. Compile result can be checked in Build Output (②). Make sure there are no errors in the project.
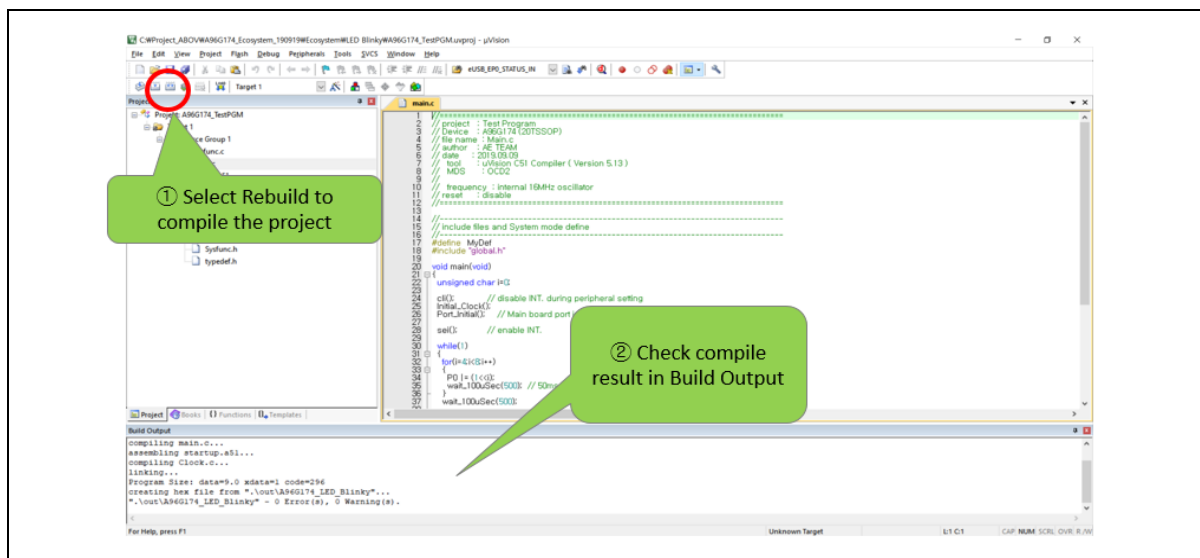

Figure 25. Compile result on uVision5 (LED Blinky Project)

4.7   Download Led_Blinky

4.7.1   8-bit Writer

If the compilation finishes without error, it is possible to download it with 8-bit Writer software (called OCD II Lite tool, available for 94/ 97 series)

1. Connect OCD II Lite software for 8-bit Writer (via USB) and the Starter Kit.

   - Confirm "connected" message at main window

2. Make Starter Kit board into the power OFF state while keeping connection.

   - Move Power switch to OFF State at Starter Kit

3. Recognize the 8-bit 94/97 series MCU pressing a Device (①) button at OCD II Lite software.

   3.1 In case of Starter Kit power

      - Select "Writer --> Target B/D" at Power Supply Selection

      - Push Device button

      - Select MCU and push OK button at Device Selection window

   3.2 In case of external power

      - Connect external power to "Ext Power" connector

      - Select "Writer <-- Target B/D" at Power Supply Selection

      - Push Device button

      - Select MCU and push OK button at Device Selection window

      - Conform "Please Target B/D Power ON" message

      - Move Power switch to ON State at Starter Kit

4. To specify the firmware to download, press a Load (②) button.

5. Finally, press a Program (③) button.

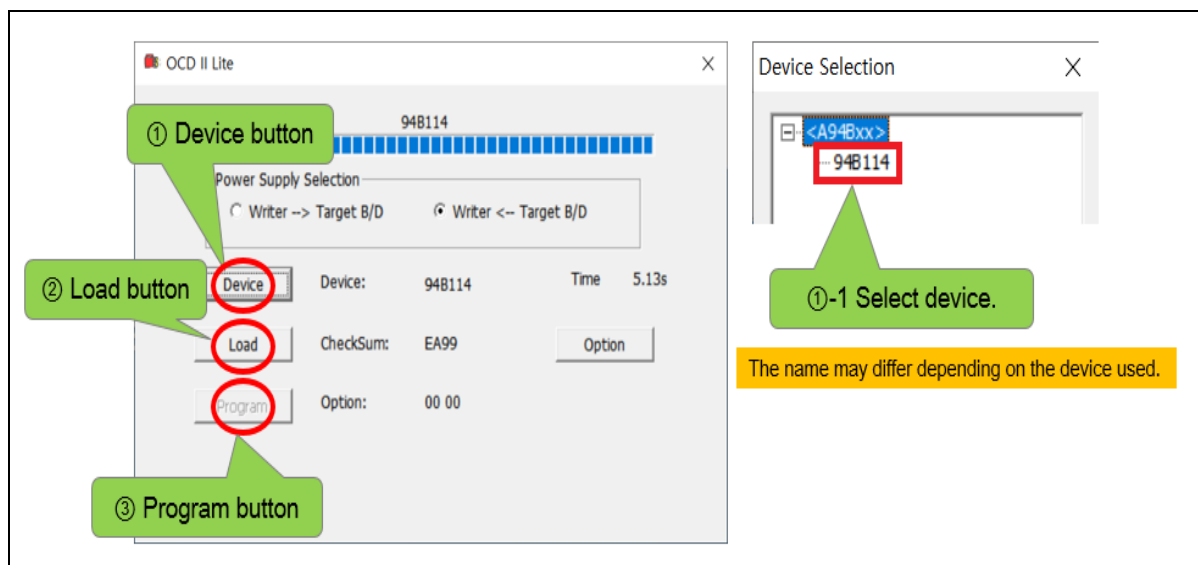6. Move Power switch to ON or OFF and ON State at Starter Kit

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Figure 26. Download LED Blink Project on 8-bit Writer software

4.8   Check the Led_Blinky operation

How to check the LED operation

1. After normal download of the Led Blinky program, re-apply the power (removing the USB cable) to check whether the LED is on or off.
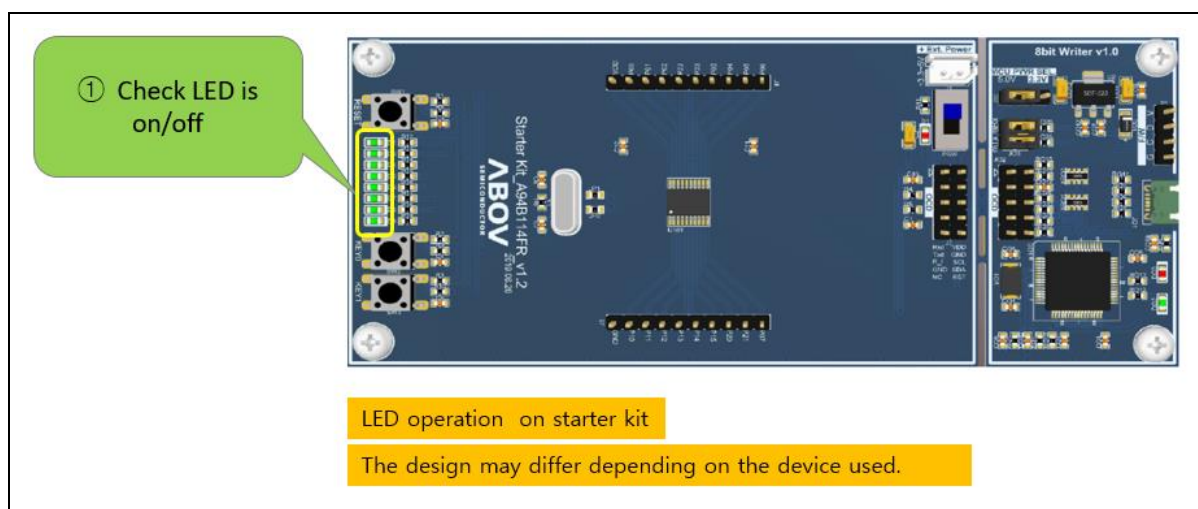

Figure 27. Check LED Operation

4.9   Debugging LED_Blink using OCD II Dongle

If the debugging for LED Blinky example is need, it is possible to connect OCD II dongle and OCD debugger program (available for 94/ 97 series) to Starter Kit board.

1. Connect the USB (mini type) cable to OCD II Dongle to use OCD II function.

2. Connect the 10 pin cable of OCD II to the Starter Kit

3. Connect the USB (micro-B type) cable to the Starter Kit to supply MCU Power.

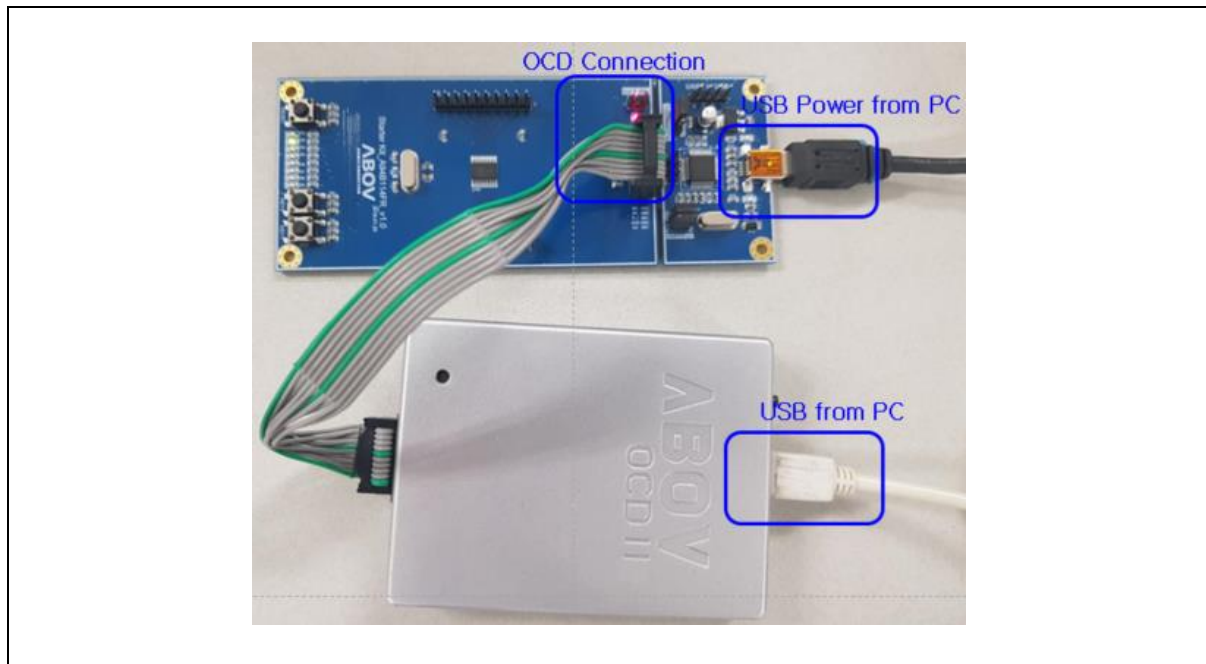4. About OCD and OCD II debugger, refer to "3 OCD debugger (96 series)" Chapter.

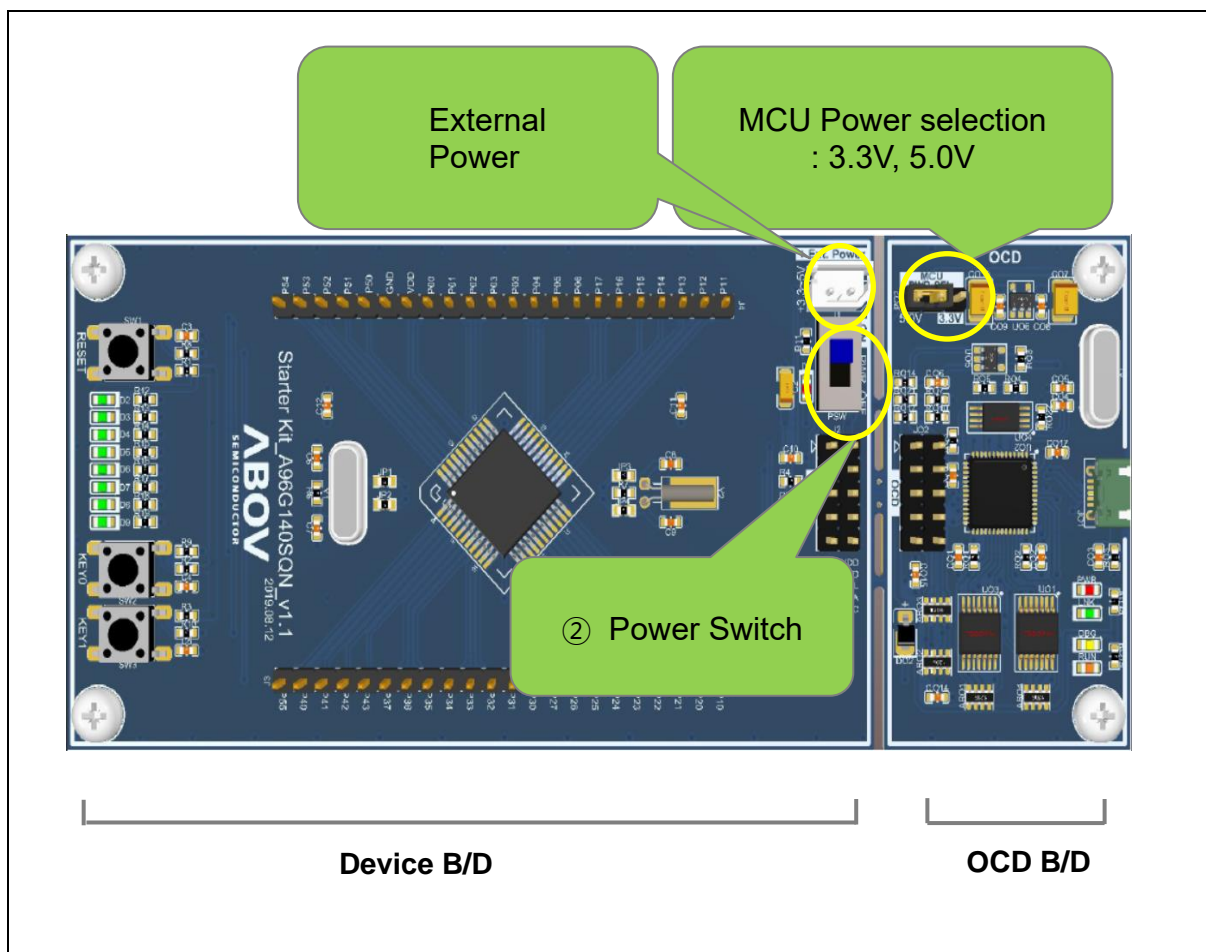**Figure 28 Connection of Starter Kit and OCD II Dongle**
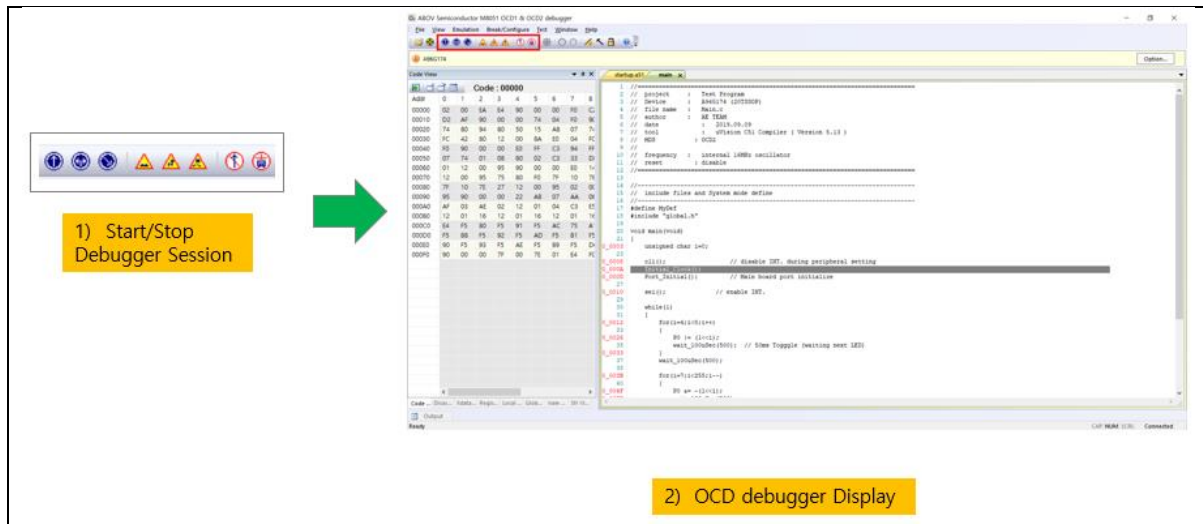

Figure 29 Starter Kit Jumper & Switch

Figure 30 Debugging in OCD II Debugger Software

Revision history

Date	Revision	Description
19.11.15	1.00	Document created
20.01.31	1.10	Add ABOV disclaimer
20.02.04	1.11	Changed ABOV website: www.abov.co.kr ➜ www.abovsemi.com
20.02.14	1.12	Separated OCD (96 Series) & 8-bit Writer (94, 97 Series)
20.05.22	1.13	Changed PC software name (94, 97 Series) for 8-bit writer to "OCD II Lite" at 4.5 Run the LED_Blinky project. Added 4.9 Debugging LED_Blink using OCD II Dongle.
20.05.24	1.14	Added description at 4.7.1 8-bit Writer
22.11.02	1.15	Revised the font of this document
24.12.02	1.16	Updated the disclaimer.

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