Quick Start Guide

AM263Px Control Card Quick Start Guide

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ABSTRACT

This application note is intended for first-time users of AM263Px Control Card EVM. The instructions walk through each step required to go from powering the EVM, setting up the environment, and building/running an example program.

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1 Control Card Overview

The AM263Px Control Card Evaluation Module (EVM) is an evaluation and development board for the Texas Instruments Sitara™ AM263Px series of microcontrollers (MCUs). This EVM provides an easy way to start developing on the AM263Px MCUs through a simple user interface consisting of buttons, LEDs, and on-board emulation for programming and debugging. Optionally, the control card can also enable header pin access to key signals through the use of a high speed edge connector (HSEC) baseboard docking station for rapid prototyping.

Figure 1-1. AM263Px Control Card Box Contents

To purchase the optional HSEC baseboard docking station: www.ti.com/tool/TMDSHSECDOCK

2 SDK and Dependencies

Build applications with the AM263Px Software Development Kit (SDK)

2.1 Software Development Kit

Below are the steps to install the AM263Px SDK:

1. Locate the MCU-PLUS-SDK-AM263PX installer: www.ti.com/tool/download/MCU-PLUS-SDK-AM263PX.
2. Download the executable file for Windows or Linux based on the host PC machine.
3. Double-click the downloaded file and follow the prompted steps.
4. Install the SDK at the default path on your PC.

2.2 Python

Python is only required for flashing files or booting applications to the on-board EVM Flash via UART in the SDK.

Below are the steps for installation:

For Windows

1. Download the latest version of Python: www.python.org/downloads/windows/.
2. Confirm Python is installed by running the below command in command prompt.

   ```
   C:\> python --version
   ```

   a. If the command does not return "Python 3.x", follow the link for more information: MCU+ SDK Python3
3. Check if the python package manager "pip" is installed by running the below command.

   ```
   C:\> python -m pip --version
   ```
4. Install below additional packages via "pip" that are needed for the flashing tools (If proxy not needed, leave blank).

   ```
   C:\> python -m pip install pyserial xmodem tqdm --proxy={your proxy server web-link and port}
   ```

For Linux

1. Run the below command in Linux bash shell.

   ```
   $ sudo apt install python3 python3-pip
   ```
2. Check that if python package manager "pip" is installed.

   ```
   $ pip3 --version
   ```
3. Install below additional packages via "pip" that are needed for flashing tools (If proxy not needed, leave blank).

   ```
   $ pip3 install pyserial xmodem tqdm --proxy={your proxy server web-link and port}
   ```

2.3 OpenSSL

OpenSSL is only needed for signing the bootloader and application images when booting using a bootloader.

Below are the steps for installing OpenSSL:

For Windows

1. Download OpenSSL v1.1.1w Light: OpenSSL Download
2. Install to the default path and follow the prompted steps
3. When prompted, select to install binaries to /bin folder instead of the Windows system path
4. Add path to OpenSSL in enviroment "Path" variables: C:/Program Files/OpenSSL-Win64/bin

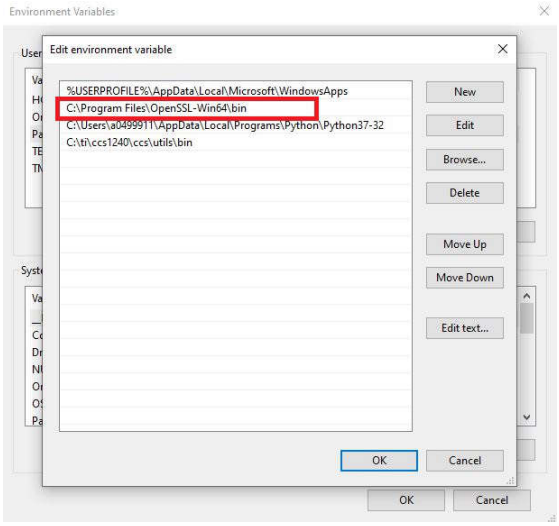

Figure 2-1. OpenSSL Path in System Enviroment Variables

For Linux

1. Run the following command in Linux Ubuntu shell to install

```
$ sudo apt install openssl
```

3 Code Composer Studio™

TI's integrated development environment (IDE) for microcontrollers and processors.

3.1 Download/Install

1. Download the 12.5.0 or later offline installer for Code Composer Studio (CCS): www.ti.com/tool/CCSTUDIO
   a. For Linux: Follow instructions: CCS Linux Host Support
2. Unzip the file (if needed) and double-click the installer file: ccs_setup_XX.X.X.exe
3. Follow the prompted steps and install to the default path
   a. For Windows: C:/ti/ccsXXX
   b. For Linux: ${HOME}/ti/ccsXXX
4. Once "Setup Type" is reached, choose "Custom" and select "Sitara AM2x MCUs"

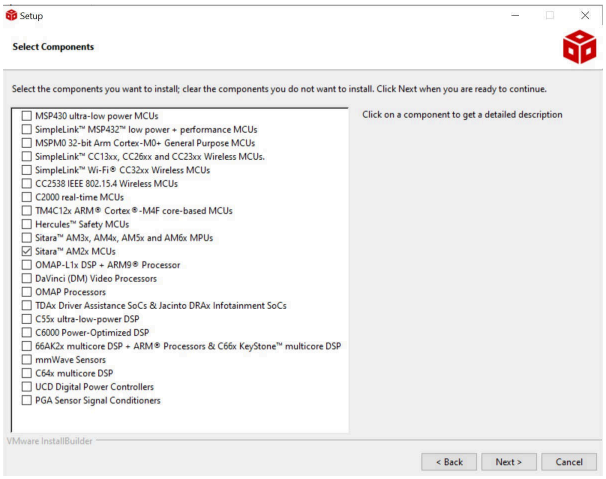

Figure 3-1. Code Composer Studio Setup: Install Device Components

5. Continue through the steps until installation complete
6. Open CCS, select a workspace, and click Launch

4 Power Connections

The AM263Px Control Card is powered from a 5V, 3A USB type-C input or from a 5V, 3A HSEC connection supplied by the docking station.

Options for using USB type-C:

- 5V, 3A power adapter with USB-C receptacle
- 5V, 3A power adapter with captive USB-C cable
- PC USB type-C port that has power delivery classification of a thunderbolt or battery behind USB logo

Note

Type-A to Type-C does not work

Options for using HSEC DOCK DC barrel jack power input:

- 5V, 3A power adapter that is at least 15W

4.1 Hardware Setup

1. Plug in power based on the above choices
2. Plug in a microUSB cable into the JTAG-UART connector (J2)
3. Check the power status LEDs (LD4 and LD5)

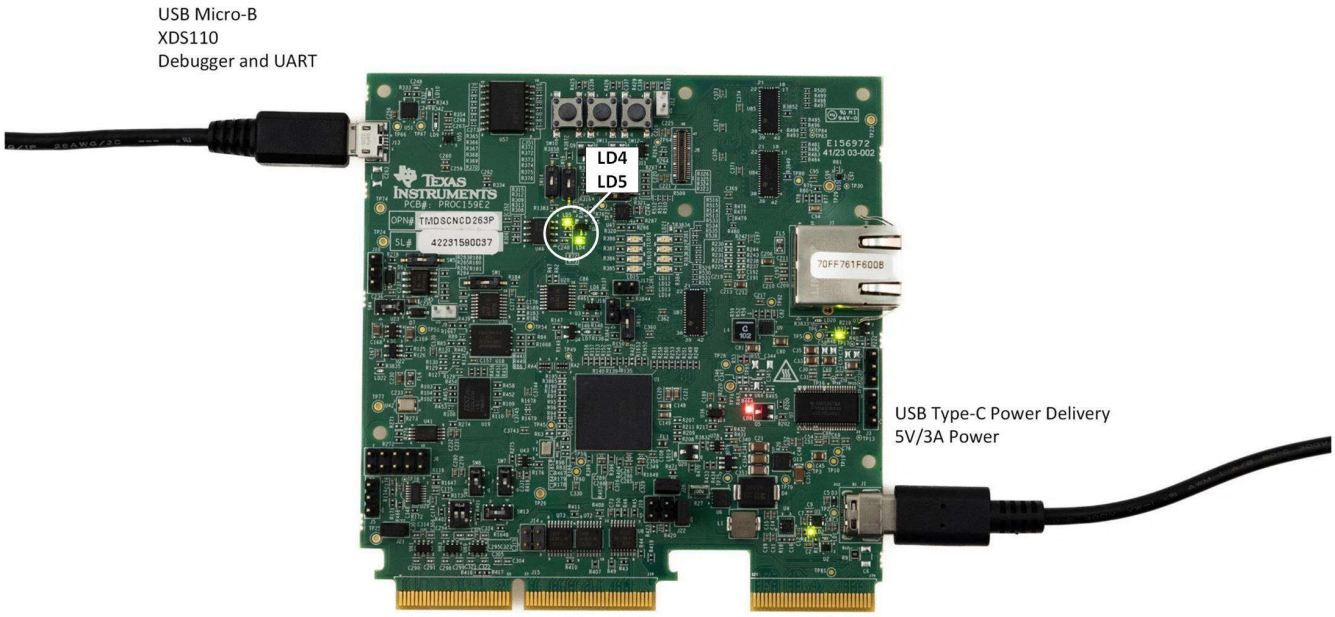

Figure 4-1. AM263Px Control Card Status LEDs

If the LEDs are not illuminated as shown above, check the below resources for more information

- AM263Px Control Card User's Guide
  - Navigate to Section 3.1: *Board Setup* > *Power Requirements*
- Sitara MCU EVM Power Supply Requirements" E2E FAQ

5 Build and Run Example

All SDK examples can be built using Code Composer Studio projects.

5.1 Device Setup

5.1.1 Configure the Device's BOOT Mode to be Used With CCS Scripting

1. Locate SW6 switches on the control card.
2. Change the switches to NO BOOTMODE [1 : 4] = 1 1 0 1:
   a. Use Figure 5-1 for reference.

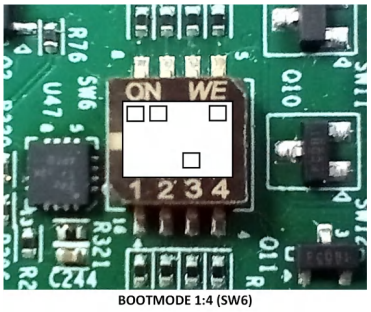

Figure 5-1. NO BOOTMODE Switch

3. Press SW10 (PORz) and see red LED (LD19) toggle.

5.1.2 Setup UART Terminal

1. On Windows: use the "Device Manager" application to see the detected UART port:
   a. Expand the "Ports (COM & LPT) tab.
   b. Locate "XDS110 Class Application/User UART" and that is the COM port associated with the device.

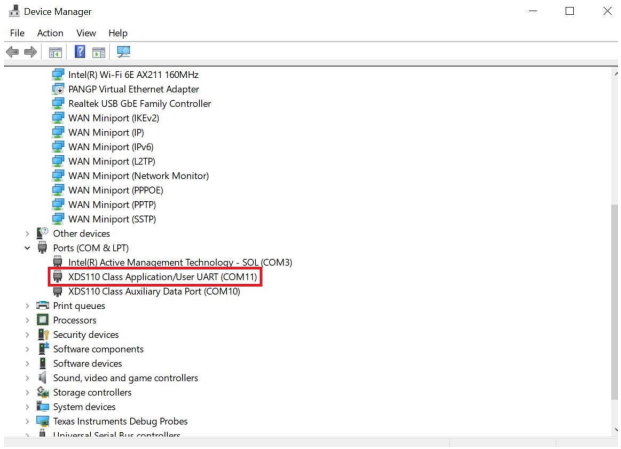

Figure 5-2. UART Port on Device Manager

2. In CCS, navigate to View > Terminal.
3. Open a new UART terminal, as shown in Figure 5-3.

Figure 5-3. UART Terminal in CCS

4. In the "Launch Terminal" pop-up, select the associated COM port and leave the other options default:
   a. Choose "Serial Terminal".
   b. Default: 115200 Baud Rate, 8 data bits, No parity, 1 stop bit.

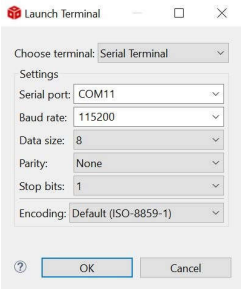

Figure 5-4. UART Terminal Setup

5. Click OK and the UART port is connected.
6. Check that "C" is being printed in the UART terminal to verify the device is connected.

Figure 5-5. UART Terminal Output

5.2 Example Project Setup

1. Navigate to *Project* > *Import CCS Projects...*
2. Click "Browse.." and navigate to the below path:
   a. **C:\ti\mcu_plus_sdk_am263px_09_01_00_20\examples\hello_world\am263px-cc\r5fss0-0_nortos\ti-arm-clang**

Build in 1-Click Debug Mode

1. Right-click on the project name "hello_world.." and select *Debug As* > *1 Code Composer Debug Session*.

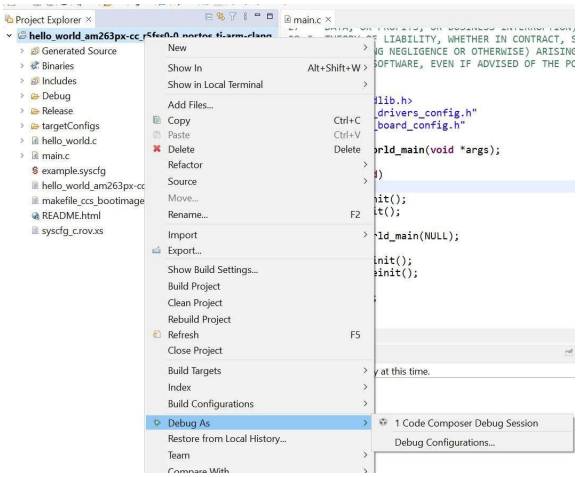

Figure 5-6. Debug CCS Project

2. Select "Texas Instruments XDS110 USB Debug Probe/Cortex_R5_0" as the core.
3. Wait for the "Build Finished" status in the console.
4. Navigate to *Run* > *Resume* and click to run the example.
5. Open the USB console again by navigating to *View* > *Terminal*.
6. The program is seen on CCS console and/or UART if enabled.

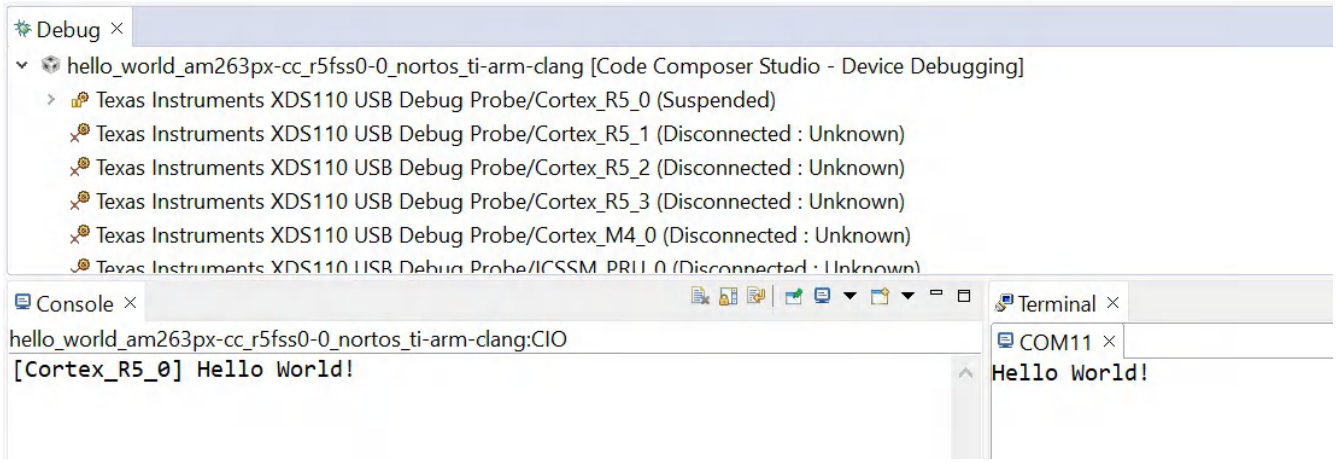

Figure 5-7. "Hello World" Output

6 References

Once *Hello World* has successfully ran, navigate through our additional resources to continue developing

- Flash a "Hello World" example: Flash the application built in CCS to the EVM flash to boot the application via JTAG without being connected to CCS
- General Information
  - AM26x Academy
  - Texas Instruments: *AM263Px Control Card User's Guide*
  - AM263Px Sitara™ Microcontrollers Data Sheet
  - Texas Instruments: *AM263Px Sitara Microcontrollers Technical Reference Manual*
  - Texas Instruments: *AM263Px Sitara Microcontrollers Register Addendum*
- Software Resources
  - AM263Px MCU+ SDK User's Guide
- Hardware Resources
  - Texas Instruments: *AM263 to AM263P Migration Guide*
  - *AM263x and AM263Px Hardware Design Guidelines*

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