

Quick Start Guide

AM263x Control Card Quick Start Guide



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ABSTRACT

This guide is intended for first-time users of AM263x 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 AM263x Control Card Evaluation Module (EVM) is an evaluation and development board for the Texas Instruments Sitara™ AM263x series of microcontrollers (MCUs). This EVM provides an easy way to start developing on the AM263x 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.

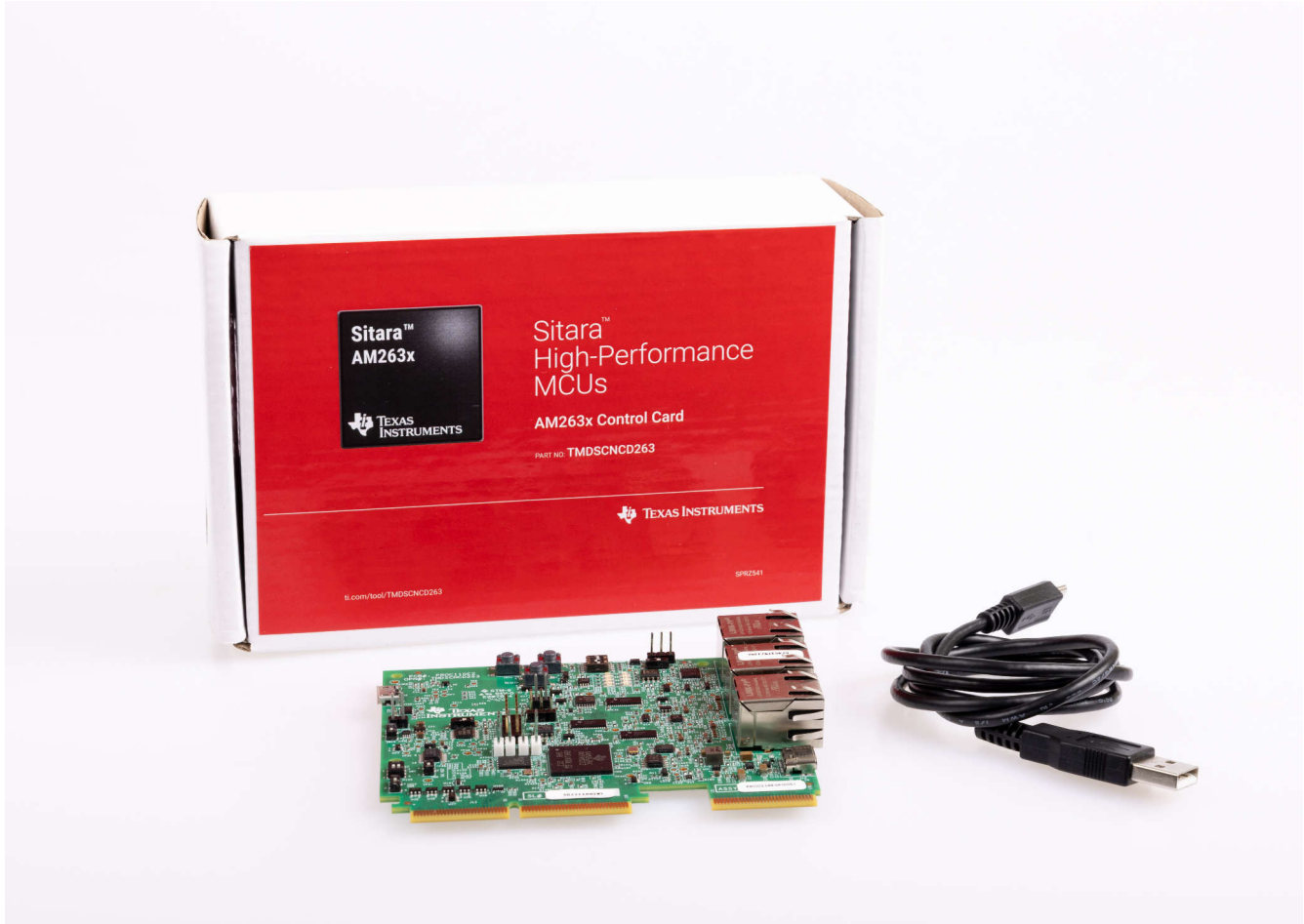


Figure 1-1. AM263x Control Card Box Contents

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

2 SDK and Dependencies

Applications are built using the AM263x Software Development Kit (SDK).

2.1 Software Development Kit

Below are the steps to install the AM263x SDK:

1. Locate the MCU-PLUS-SDK-AM263X installer: www.ti.com/tool/download/MCU-PLUS-SDK-AM263X.
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 below path on your PC:
 - For Windows: C:\ti
 - For Linux: \${HOME}/ti

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
 - 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 environment "Path" variables: C:/Program Files/OpenSSL-Win64/bin.

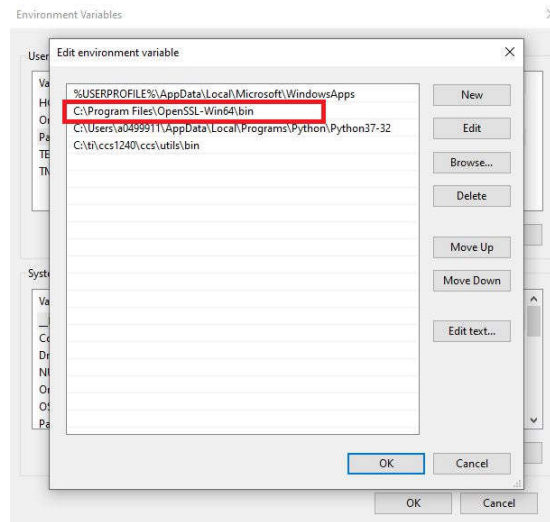


Figure 2-1. OpenSSL Path in System Environment Variables

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 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_X.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".

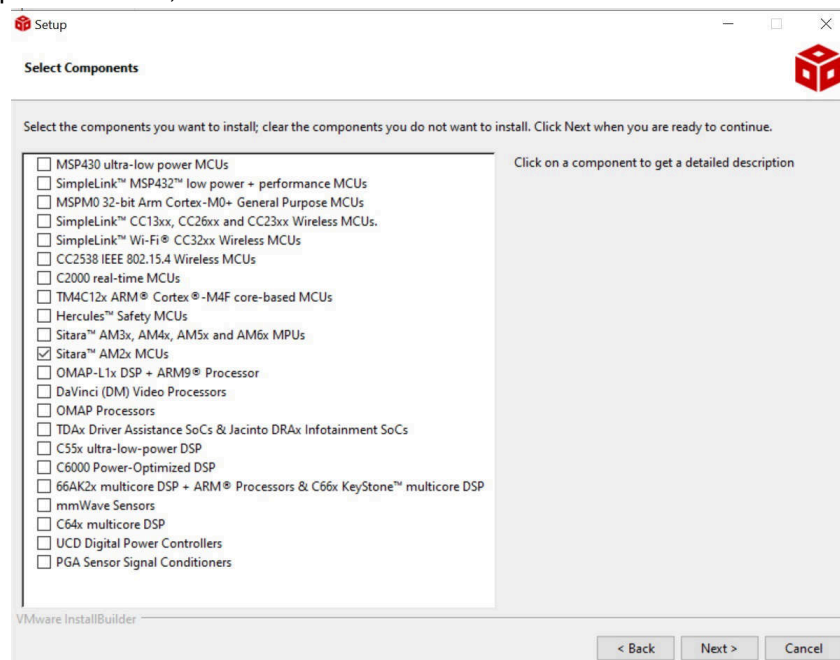


Figure 3-1. Code Composer Studio Setup: Install Device Components

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

4 Power Connections

The AM263x 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 15 W

4.1 System Power

1. Plug in a microUSB cable into the JTAG-UART connector (J2).
2. Plug in power based on the above choices.
3. Check the power status LEDs (LD14 and LD15).

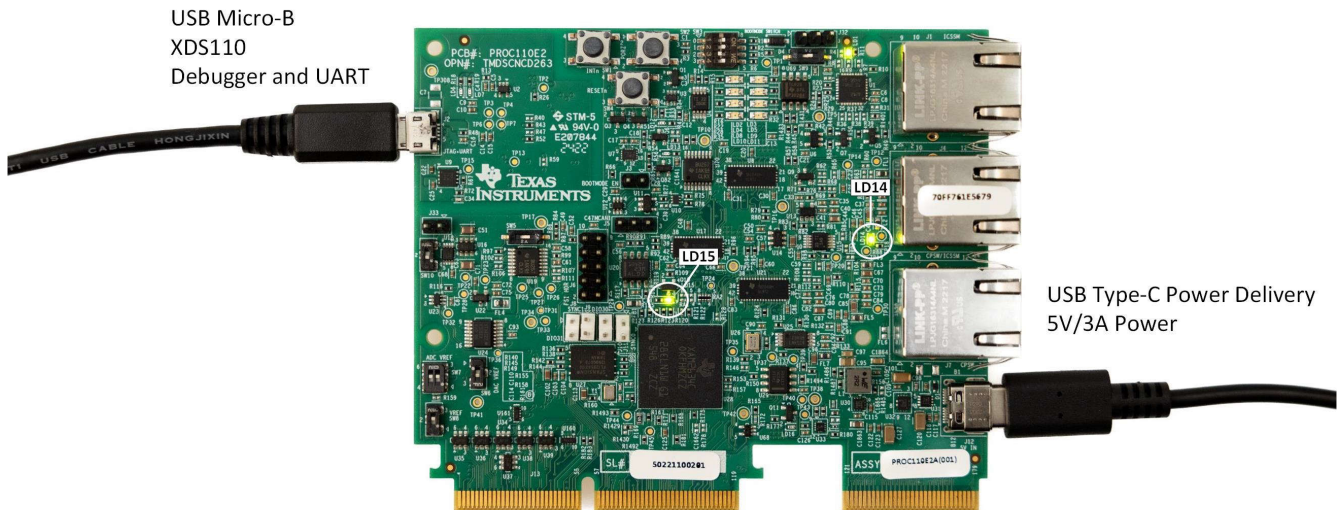


Figure 4-1. AM263x Control Card Status LEDs

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

- [AM263x Control Card User's Guide](#)
 - Navigate to Section 3.1: *Board Setup > Power Requirements*.
- [Sitara MCU EVM Power Supply Requirements" E2E FAQ](#)

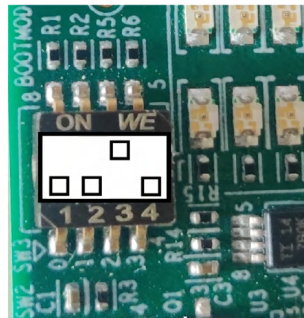
5 Build and Run Example

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

5.1 CCS Device Setup

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

1. Locate SW3 switches on the control card.
2. Change the switches to QSPI BOOTMODE [1 : 4] = 0 0 1 0:
 - a. Use [Figure 5-1](#) for reference.



BOOTMODE 1:4 (SW3)

Figure 5-1. QSPI BOOTMODE Switch

3. Press the PORz button (SW2) and hold for about 2 seconds.
 - a. Red LED (LD16) toggles when pressing button.

5.1.2 Setup UART Terminal

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

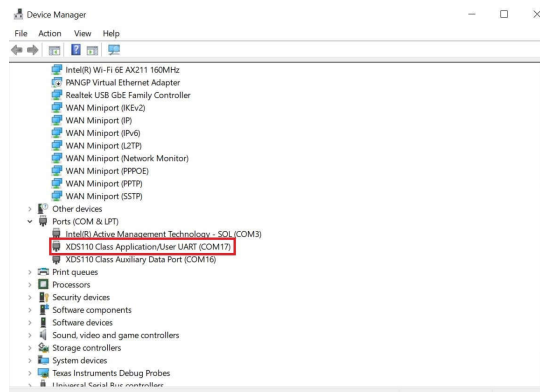


Figure 5-2. UART Port on Device Manager

2. In CCS, navigate to View > Terminal.
3. Open a new UART terminal:



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

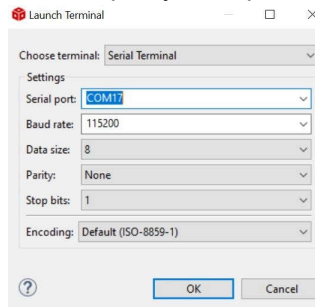


Figure 5-4. UART Terminal Setup

5. Click OK and the UART port is connected.

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_am263x_<latest_download_version>\examples\hello_world\am263x-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*

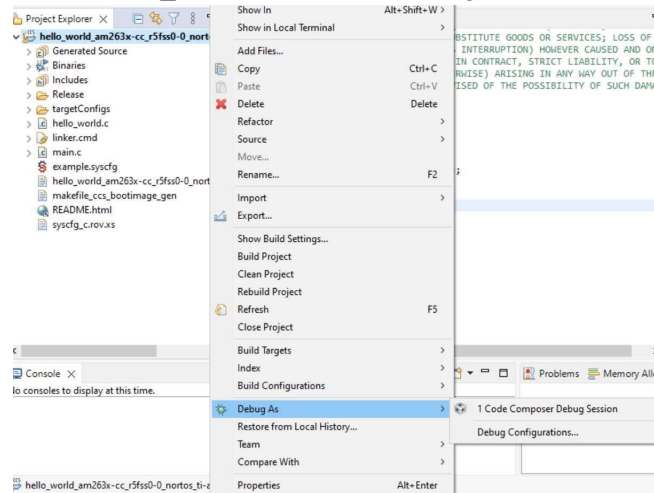


Figure 5-5. Debug CCS Project

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 or UART, if enabled.

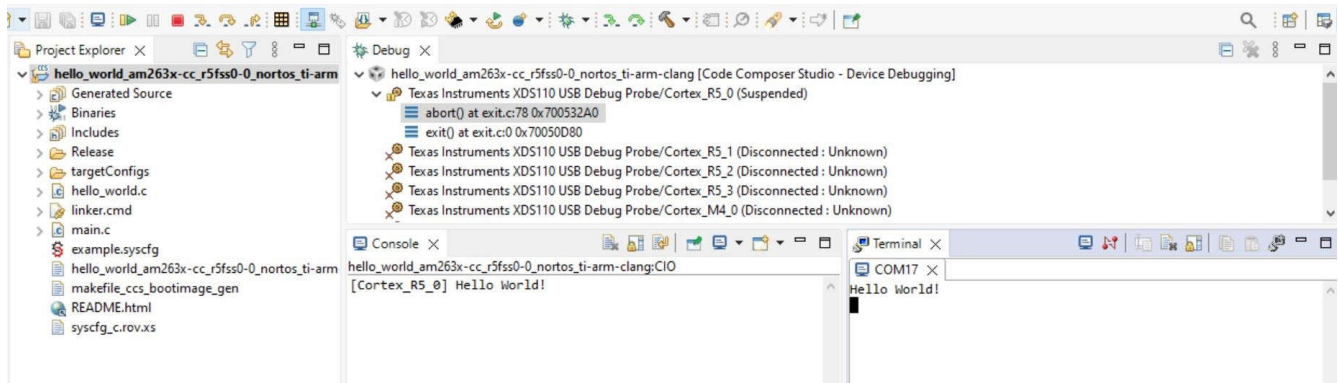


Figure 5-6. "Hello World" Output

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: [AM263x Control Card User's Guide](#)
 - Texas Instruments: [AM263x Sitara™ Microcontroller Data Sheet](#)
 - Texas Instruments: [AM263x Sitara™ Microcontroller Technical Reference Manual](#)
 - Texas Instruments: [AM263x Sitara Processors Technical Reference Manual Register Addendum](#)
- [Software Resources](#)
 - [AM263x MCU+ SDK User's Guide](#)
 - Texas Instruments: [Debugging Sitara AM2x Microcontrollers](#)
 - [AM263x Motor Control SDK](#)
 - [AM263x Motor Control SDK Documentation](#)
- [Hardware Resources](#)
 - Texas Instruments: [AM263x and AM263Px Hardware Design Guidelines](#)
 - Texas Instruments: [Sitara MCU Thermal Design](#)
 - Texas Instruments: [AM263x QSPI Flash Selection Guide](#)
 - Texas Instruments: [AM263x Power Estimation Tool](#)

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