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REVISION HISTORY

7/15—Revision 0: Initial Version

GETTING STARTED

SOFTWARE INSTALLATION PROCEDURE

Items required to get started are as follows:

- Keil μ Vision v5 or higher
- CMSIS pack for [ADuCM330/ADuCM331](#)
- Segger debugger interface driver and utilities

Complete the steps described in this section before plugging any of the USB devices into the PC.

Support files for Keil are provided at the [ADuCM33x Design Tools](#) page. For Keil v5 upwards, CMSIS packs are required and are available on the [ADuCM330/ADuCM331](#) product pages.

INSTALLING

To install the software, take the following steps:

1. Close all open applications.
2. Download and install Keil μ Vision v5 (or higher) from the Keil website.
3. From the Segger website, download and install the latest **J-Link software & documentation pack for Windows**.
4. From the [ADuCM330/ADuCM331](#) product page, download the CMSIS pack for the [ADuCM330/ADuCM331](#).

VERIFYING THE J-LINK DRIVER

Installing the J-Link driver is a three-step process.

1. Follow the sequence of instructions provided by Segger to download and install the J-Link driver.
2. When the software installation is complete, plug the debugger/programmer into the USB port of your PC using the USB cable supplied.
3. Verify that the emulator board appears in the Windows® **Device Manager** window (see Figure 2).

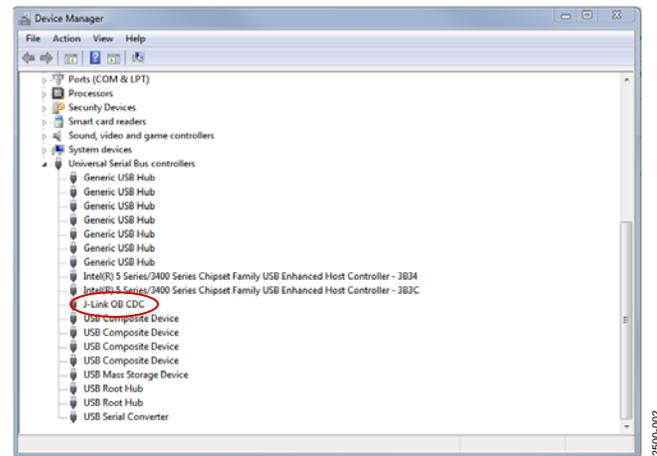


Figure 2. Device Manager

CONNECT THE DEVELOPMENT SYSTEM

To connect the development system, take the following steps:

1. Ensuring correct orientation, insert an [ADuCM330/ADuCM331](#) device. Note that Pin 1 of the device is indicated by a dot in the corner. The dot on the device must be orientated with the dot on the socket, as shown in Figure 1.
5. Ensure that the GPIO5 jumper is in place (beside the LIN jumper). The GPIO5 jumper is used by the on-board kernel to determine program flow after a reset. See the Kernel section in the [ADuCM330/ADuCM331 Hardware Reference Manual \(UG-716\)](#) for full details.
6. Press **RESET**.



Figure 3. ADuCM331 Device Orientation

2. Connect the debugger/programmer, noting the correct orientation as shown in Figure 4.
3. Connect a 12 V supply between VBAT and GND.
4. Ensure that the board jumpers are in position, as shown in Figure 1.

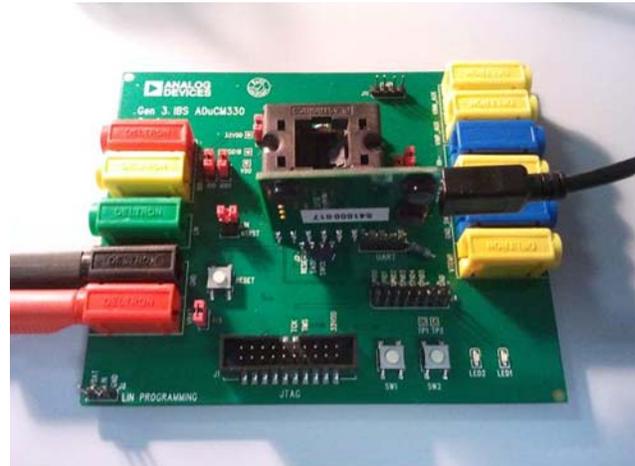


Figure 4. Mini-Link Debugger/Programmer Connection

JUMPER FUNCTIONALITY

Table 1.

Jumper	Functionality
J4, GPIO0, GPIO1	These jumpers connect the push buttons to GPIO0 and GPIO1 of the device.
J4, GPIO2, GPIO3	These jumpers connect the two LEDs to GPIO2 and GPIO3 of the device.
J4, GPIO4, GPIO5	No functionality.
GPIO5 (beside LIN)	This jumper ties the GPIO5 pin of the device to GND. This jumper must be connected when programming the device or when accessing via serial wire debug (SWD).
3V3_REG	This jumper enables the 3.3 V regulator on the underside of the PCB. It is used to power the LEDs or an additional 3.3 V source.
LIN	This jumper disconnects the LIN terminal (green banana socket) from the device.
IDD, IDD1	These jumpers allow the insertion of an ammeter in series with the VBAT supply through the I _{DD+} /I _{DD} sockets for current measurement.
VIN_AUX, IIN_AUX	These jumpers allow a direct connection to ground of the INN _x _AUX and VIN _x _AUX pins.
IGND	This jumper connects the INN ₋ pin of the IADC to GND.
IIN	This jumper shorts the inputs of the IADC.
NTC	This jumper allows an external temperature device to be connected between VTEMP and GND_SW of the device.
J2	J2 is the SWD programming interface. Check orientation with Figure 4.
J3	J3 allows a connection for LIN to operate in UART mode.
J4	J4 is a GPIO header.
J11	Ground header.

KEIL μ VISION5 INTEGRATED DEVELOPMENT ENVIRONMENT

INTRODUCTION

The Keil μ Vision5 integrated development environment (IDE) integrates all the tools necessary to edit, assemble, and debug code. The ADuCM330/ADuCM331 development system supports nonintrusive emulation limited to 32 kB code. This section describes the project setup steps to download and debug code on an ADuCM330/ADuCM331 development system. It is recommended to use the J-Link debugger driver.

QUICK START STEPS

Starting μ Vision5

First, ensure that the CMSIS pack for the ADuCM330/ADuCM331 has been installed (see the Getting Started section).

After installing Keil μ Vision5, a shortcut appears on the PC desktop. Double-click the shortcut to open Keil μ Vision5.

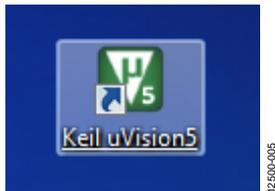


Figure 5. Keil μ Vision5 Desktop Shortcut

1. When Keil opens, click the **Pack Installer** button on the toolbar.



Figure 6. Pack Installer Button

2. The **Pack Installer** window opens.

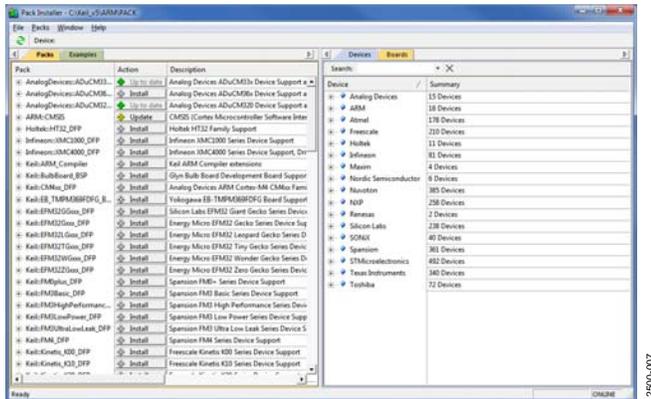


Figure 7. Pack Installer Window

3. Install the CMSIS pack. In the **Pack Installer** window, click **File > Import** and locate the downloaded CMSIS pack. Follow the on-screen prompts to install.
4. In the right-hand side of the window, under the **Devices** tab, click **Analog Devices > ADuCM33x Series > ADuCM330**.

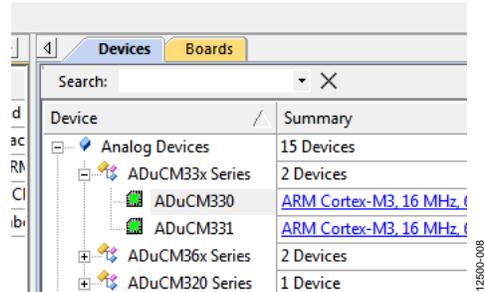


Figure 8. Devices Tab

5. In the left-hand side of the window, click the **Examples** tab.

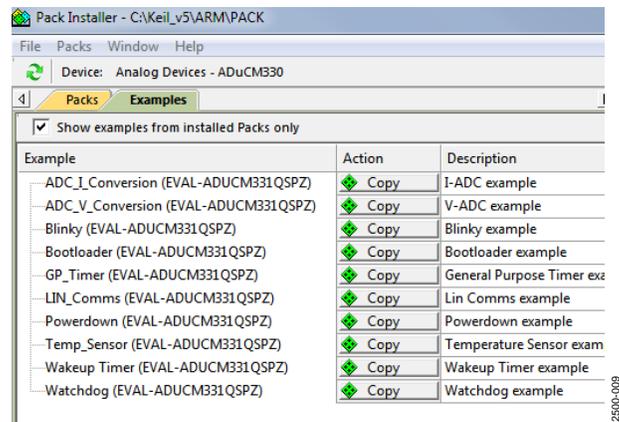


Figure 9. Examples Tab

6. Select the **Blinky** example and click **copy**.
7. Choose a destination folder and click **ok**. This installs the Blinky example and necessary startup files to your PC.

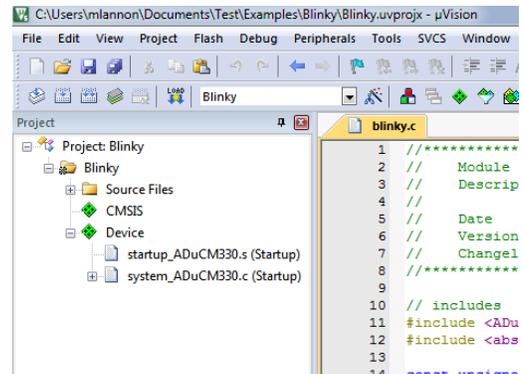


Figure 10. Blinky Example

8. The example must be compiled by clicking the **Rebuild** button on the toolbar.



Figure 11. **Rebuild** Button

9. When the build is complete, the message shown in Figure 12 appears.

```
Build Output
Rebuild target 'Blinky'
compiling blinky.c...
assembling startup_ADuCM330.s...
compiling system_ADuCM330.c...
linking...
Program Size: Code=564 RO-data=1484 RW-data=0 ZI-data=352
".\Objects\Blinky.axf" - 0 Error(s), 0 Warning(s).
Build Time Elapsed: 00:00:05
```

Figure 12. **Build Output**

10. To download the code to the [EVAL-ADUCM331QSPZ](#) board, click **Load**.

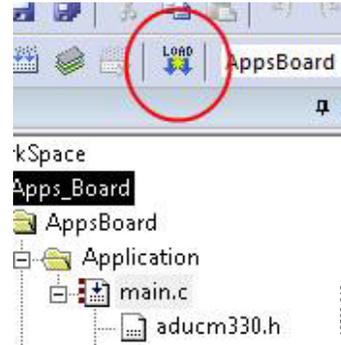


Figure 13. **Load** Button

11. When the code is downloaded to the applications board, the two LEDs blink repeatedly.



ESD Caution

ESD (electrostatic discharge) sensitive device. Charged devices and circuit boards can discharge without detection. Although this product features patented or proprietary protection circuitry, damage may occur on devices subjected to high energy ESD. Therefore, proper ESD precautions should be taken to avoid performance degradation or loss of functionality.

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