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## ADuCM320 Development Systems Getting Started Tutorial

### DEVELOPMENT SYSTEM KIT CONTENTS

**An evaluation board (EVAL-ADuCM320EBZ) that facilitates performance evaluation of the device with a minimum of external components**
**An Analog Devices, Inc., J-Link OB emulator (USB-SWD/UART-EMUZ)**
**1 USB cable**
**1 installation DVD**

### INTRODUCTION

The ADuCM320 is a dual-die stack system on-chip designed for diagnostic control on fixed wavelength laser optical module applications. It features a 16-bit (14-bit accurate) multichannel SAR ADC, an ARM® Cortex™-M3 processor, 8 voltage DACs, 4 current output DACs, and flash/EE memory packaged in a 6 mm × 6 mm 96 ball BGA package.

### GENERAL DESCRIPTION

The ADuCM320 development system allows evaluation of ADuCM320 silicon. This quick start guide introduces the support features and the tools supplied with the evaluation kit. In addition, it shows and describes how to connect the evaluation hardware.

This guide works as a tutorial by providing a step-by-step account of how to download evaluation versions of third-party software tools. Instructions are provided on how to load code examples that are supplied.

Working through this guide brings users to a stage whereby they can start to generate and download their own user code for use in their own unique end-system requirements.
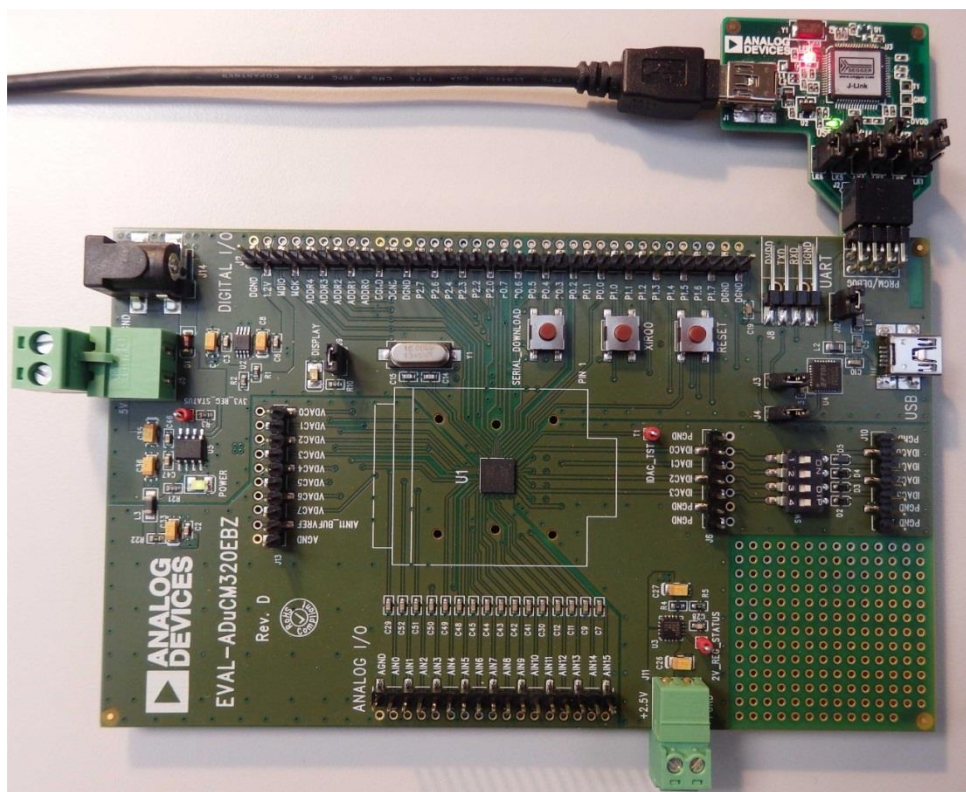
### TYPICAL SETUP



*Figure 1. EVAL-ADuCM320EBZ Evaluation Board and Analog Devices J-Link OB Emulator*

# GETTING STARTED

## SOFTWARE INSTALLATION PROCEDURES

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

1. Close all open applications.
2. Insert the installation DVD into your DVD drive.
3. Double-click **ADuCM320.exe** and follow the on-screen instructions. A menu displays installation options as shown in Figure 2.
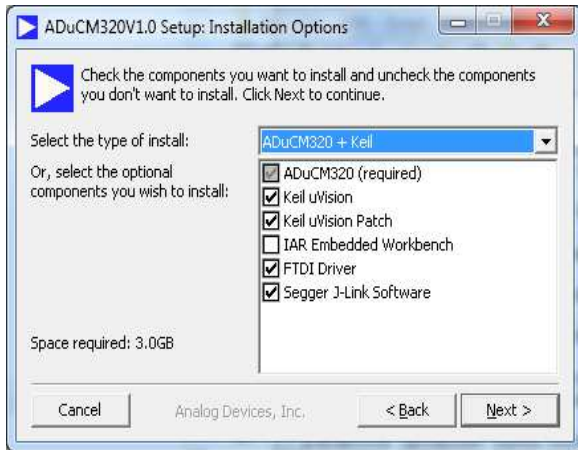


*Figure 2. Installation Options*

The following will be installed on your machine by default:

- FTDI drivers for the evaluation board.
- Example code and function sets for most peripherals.
- An **Elves.exe** application to easily choose functions from the provided function sets and then choose the function parameters.

The option will be presented to install the following:

- Keil development tools (compiler, debugger, programming tools). The revision used is V4.60. Analog Devices has added a patch to this revision of the MDK460 tools to support the ADuCM320.
- IAR development tools (compiler, debugger, programming tools).
- Segger drivers. These are the drivers for the emulator.

The Segger J-Link software is selected by default in the installation menu. It is advised to leave it selected. This automatically installs the J-Link serial port driver. Select **Install USB Driver for J-Link-OB with CDC** as shown in Figure 3. If that step is missed, run **JLinkCDCInstaller_V1.2b.exe** located in the **ADuCM320\Segger** folder.
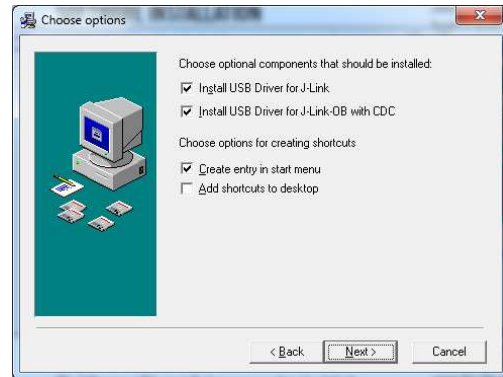


*Figure 3. Installing Link Software*

If the IAR tools are to be used, the entire contents of the supplied arm directory (for example, **C:\ADuCM320…\ IAR\IAR_M320_Patch0.2.zip\arm**) must be copied to the IAR tools directory (for example, **C:\Program Files\IAR Systems\ Embedded Workbench 6.5 Kickstart\arm**).

Future updates may be available from the Analog Devices FTP site.

## KEIL μVISION4

The μVision4 integrated development environment (IDE) integrates all the tools necessary to edit, assemble, and debug code. The fastest way to get up and running is to open an existing project by using the following steps:

1. In Keil μVision, select **Project** > **Open Project**.
2. Browse to the folder on the path where the ADuCM320 software was installed (such as, **C:\ADuCM320...**).
3. Open the file **DIO.uvproj** in the folder code\ADuCM320\examples\DIO. This will launch an example project.
4. Compile and download to the part.
5. To run the code press reset on the board or enter debug mode and then press **Run**.
6. When running, the red LED marked **DISPLAY** on the board will flash.

## IAR EWARM

The EWARM integrated development environment (IDE) integrates all the tools necessary to edit, assemble, and debug code. The fastest way to get up and running is to open an existing workspace by using the following steps:

1. Open the IAR tools (from **C:\Program Files (x86)\IAR Systems\Embedded Workbench 6.5\common\binIarIdePm.exe**).
2. Within the IAR IDE, click **File** > **Open** > **workspace** and open a workspace provided (for example, **C:\ADuCM320…\code\ADuCM320\examples\DIO\DIO .eww**).
3. Compile and download to the part using **Project** > **Rebuild** all and then to **Project** > **Download Active application**.
4. Click **No** if a pop-up window about an unknown device appears.
5. To run the code press reset on the board or enter debug mode and then press **Go**.
6. When running, the red LED marked DISPLAY on the board will flash.

## ELVES

Elves.exe is an application to easily choose functions from the provided function sets and then choose the function parameters. Elves can be integrated into the Keil and IAR tools under their tools menus. For instructions, run Elves.exe (for example, at **C:\ADuCM320…\Software Tools\Elves\Elves.exe**) and use the **F1** key or the **Help** button for further instructions.

## EVALUATION BOARD SETUP PROCEDURES

### Assembling the Hardware

Do not plug in the USB cable before the software is installed.

### Connecting the Hardware

Use the following steps to connect the hardware:

1. Insert the USB cable provided between the PC and the J-Link OB emulator.
2. The red LED (LED1) will flash briefly until initialization of drivers is complete.
3. Driver installation details may appear on your screen—allow the installation of these drivers to complete as these provide a virtual communication port on your PC allowing the evaluation board to appear as a virtual serial communication port to the UART port of the ADuCM320 device.

4. If the virtual serial communication port to the UART is to be used, then ensure Jumpers LK3 and LK5 are in place (see Figure 5). If the UART on J8 is to be used, then LK3 and LK5 must be removed to prevent contention.
5. Plug the 10-pin DIL connector of the J-Link OB emulator into the EVAL-ADuCM320EBZ.
6. To power up the evaluation board apply:
   - A voltage between 4 V and 5.5 V to J5
     or
   - A voltage between 4.7 V and 6.2 V to J14
   The green POWER LED will turn on.
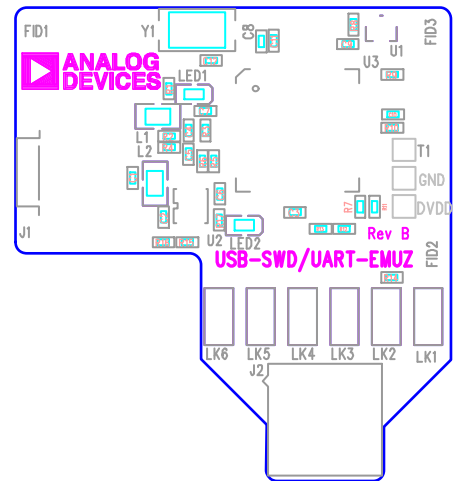


*Figure 4. Emulator, Top View*
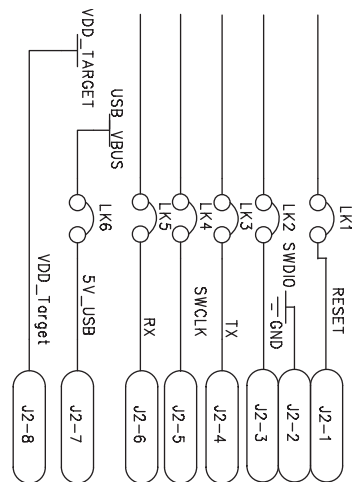


*Figure 5. J-Link OB Connection Details*

## REVISION HISTORY

**6/14—Revision 0: Initial Version**

**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.

**ANALOG DEVICES**

**w w w . a n a l o g . c o m**