



Release Notes for ADuCM4x50 EZ-KIT Board Support Pack 3.1.0

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1 Introduction

This document describes the changes for the ADuCM4x50 EZ-KIT Board Support Pack 3.1.0, a software product supported in both Keil uVision, CrossCore Embedded Studio® (CCES) and IAR Embedded Workbench. The main modification in this version is the addition of IAR Embedded Workbench support in a CMSIS Pack, with examples now available for this integrated development environment.

2 Differences between version 3.1.0 and prior versions

The main changes in version 3.1.0 is the extended support for IAR Embedded Workbench 8.x.

3 Required Software

3.1 Keil uVision

To use this ADuCM4x50 EZ-KIT Board Support Pack with Keil uVision, you must first obtain and install:

- Keil uVision MDK v5.22 or later with ARM Compiler version 1.1.0 or later,
- Segger J-Link LITE v5.10p or later,
- ADuCM4x50 Device Family Pack 3.1.0.

Install the Keil software first, then the Segger J-Link LITE software and finally the software packages.

3.2 CrossCore Embedded Studio

To use this ADuCM4x50 EZ-KIT Board Support Pack with CrossCore Embedded Studio, you must first obtain and install:

- CrossCore Embedded Studio 2.7.0 or later,
- ADuCM4x50 Device Family Pack 3.1.0.

Install the CrossCore Embedded Studio software first, then the software packages.

3.3 IAR Embedded Workbench

To use this ADuCM4x50 EZ-KIT Board Support Pack with IAR Embedded Workbench for ARM, we recommend that you first obtain and install:

- IAR Embedded Workbench for ARM 8.20.1 or later,
- Segger J-Link LITE v5.10p or later,
- ADuCM4x50 Device Family Pack 3.1.0.

Install the IAR Embedded Workbench software first, then the Segger J-Link LITE software and finally the software packages.

EZ-KIT	Emulator
ADuCM4050 WLCSP EZ-KIT version 1.0 BOM Rev 2.1	J-Link Lite

5 License Checking

Use of the ADuCM4x50 EZ-KIT Board Support Pack software is subject to the Software License Agreement presented during installation.

The details of this Software License Agreement can be found in the CMSIS pack installation directory, in AnalogDevices\ADuCM4x50_EZ_KIT_BSP\3.1.0\License.

6 Release Content

This release contains the following sets of components:

- Source files for the drivers for off-chip peripherals which are on the ADuCM4x50 EZ-Kit. These components are authored by Analog Devices, for use on the ADuCM4x50 processor.
- Examples for all the drivers, device family and off-chip. These components are authored by Analog Devices, and demonstrate the use of the device drivers. Some of the examples make use of the FreeRTOS products, so have a dependency on FreeRTOS, which must be obtained separately.
- Documentation.

6.1 Source files for off-chip peripherals drivers

adi_adxl363*.*	Acceleratometer ADXL363 driver
adi_w25q32*.*	W25Q32 SPI-flash driver

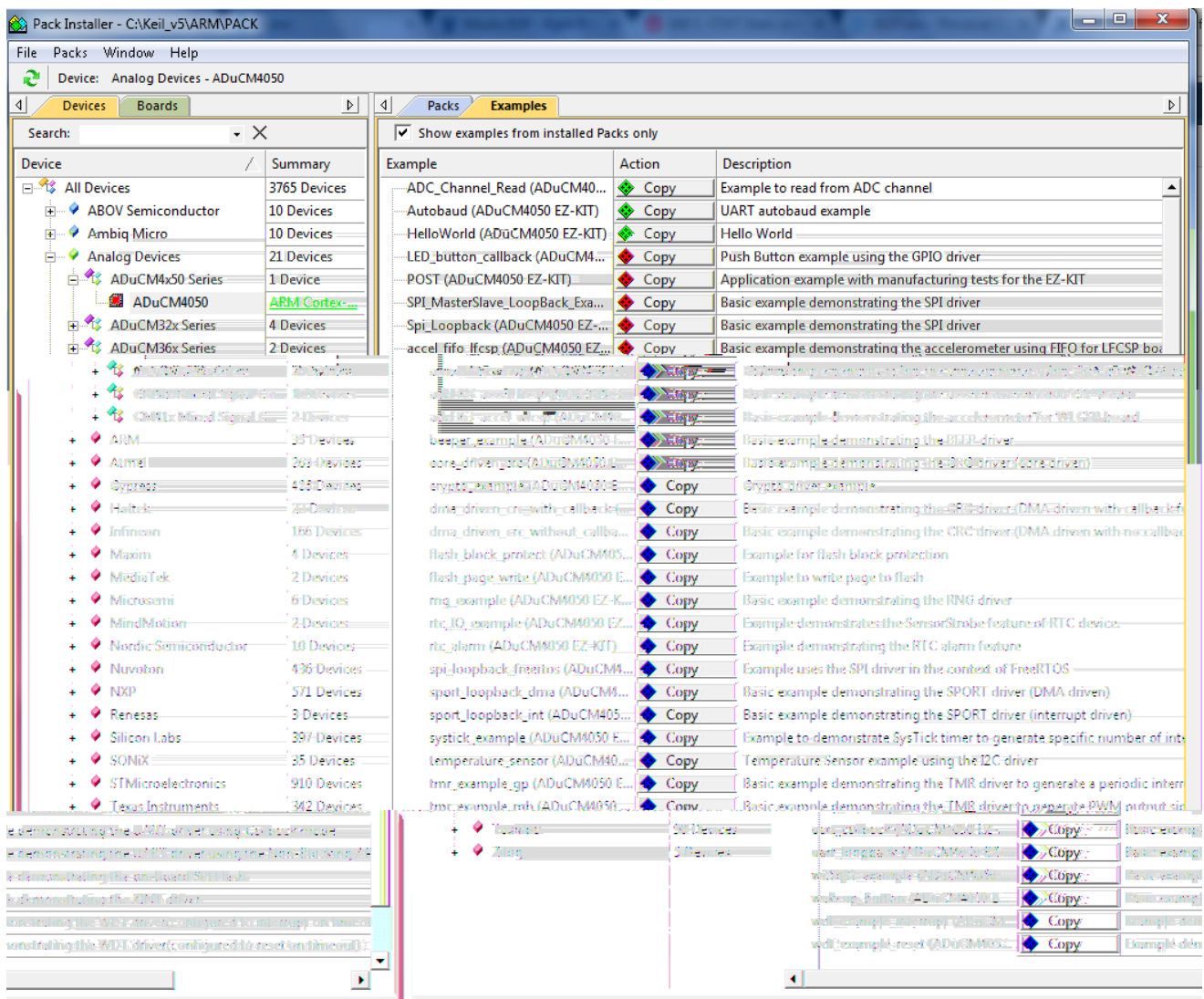
Various off-chip peripheral device driver sources and include files in “Source” and “Include” directories.

6.2 Examples

All the examples available in ADuCM4x50 3.1.0 EZ-Kit Board Support Pack can be viewed using the Pack Installer, CCES Examples Viewer or IAR Embedded Workbench Examples Browser.

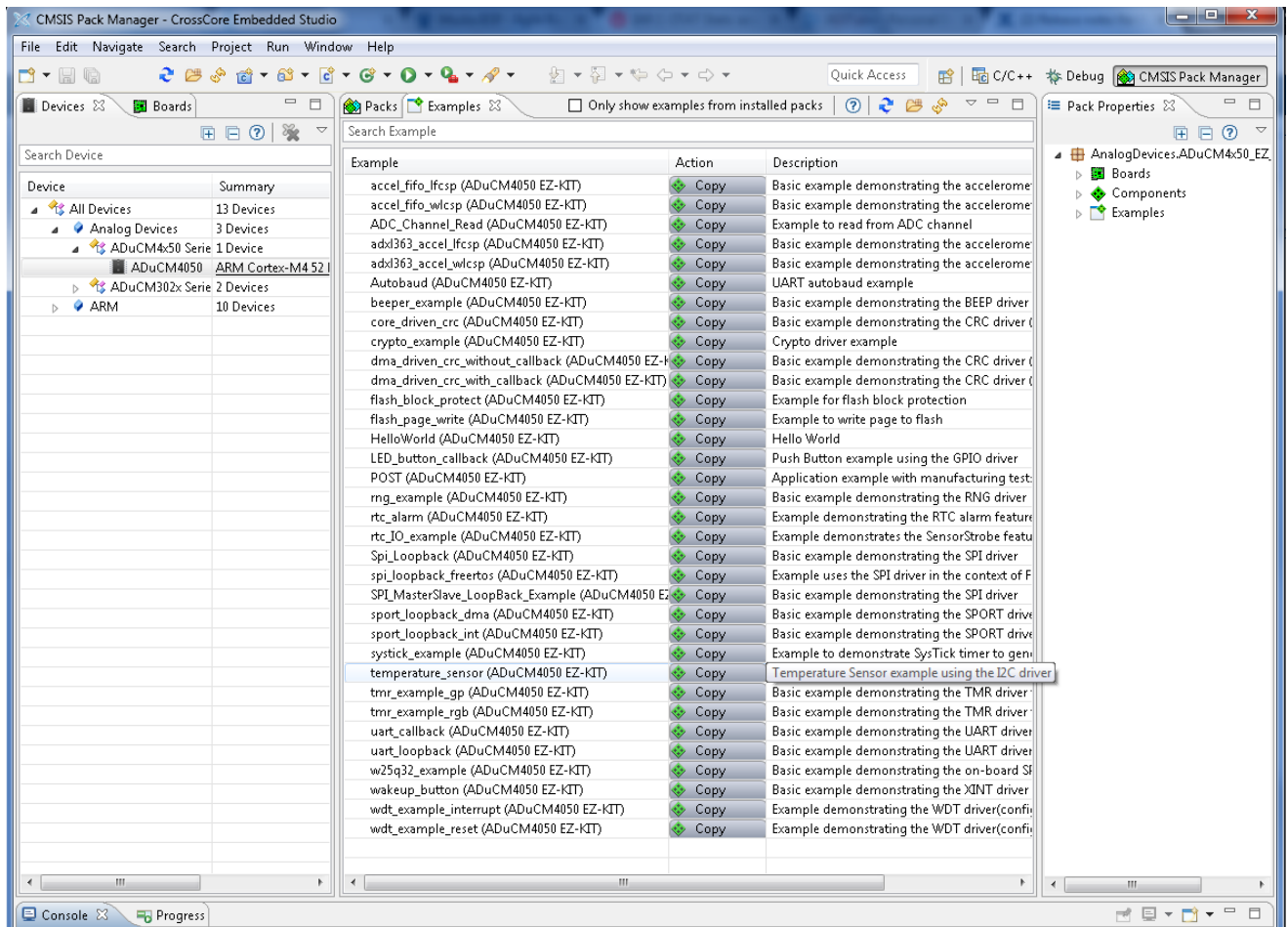
6.2.1 Keil Pack Installer

Using, Keil Pack Installer, simply select the Analog Devices-ADuCM4050 device, in the Devices panel on the left side, and then the Examples panel on the right side: the list of examples will appear on the right side as in the following figure. Simply press *Copy* for the chosen example and follow the instructions.



6.2.2 CCES Examples View

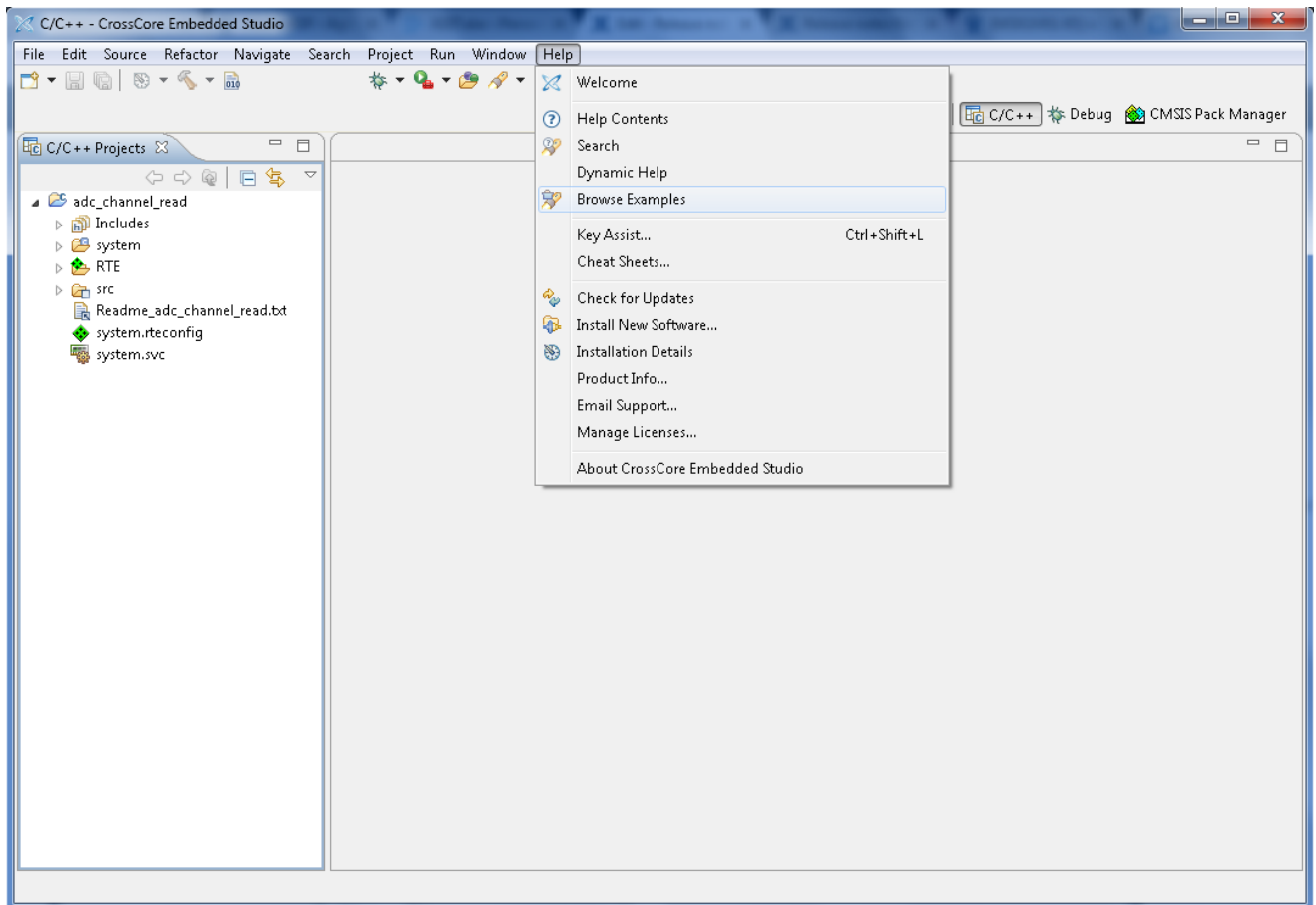
Similarly, using **CMSIS Pack Manager** in CCES, selecting the Analog Devices-ADuCM4050 device, in the Devices panel on the left side, and then the Examples panel on the right side, the list of examples will appear on the right side as shown in the following figure.



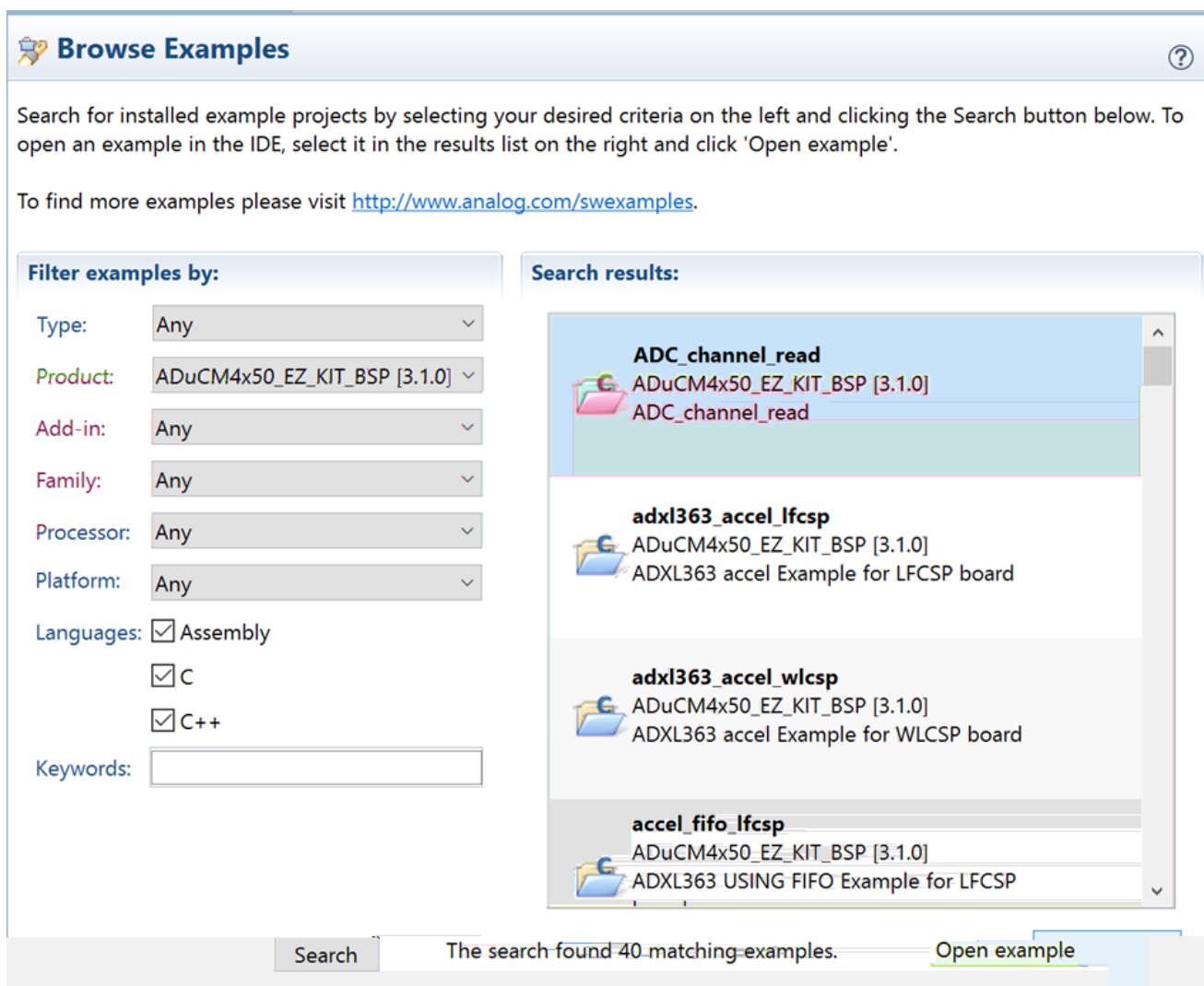
Using **CMSIS Pack Manager** to copy examples is not fully supported yet in CCES. Consequently, we recommend the use of the **Example Browser** feature for the time being.

6.2.3 CCES Examples Browser

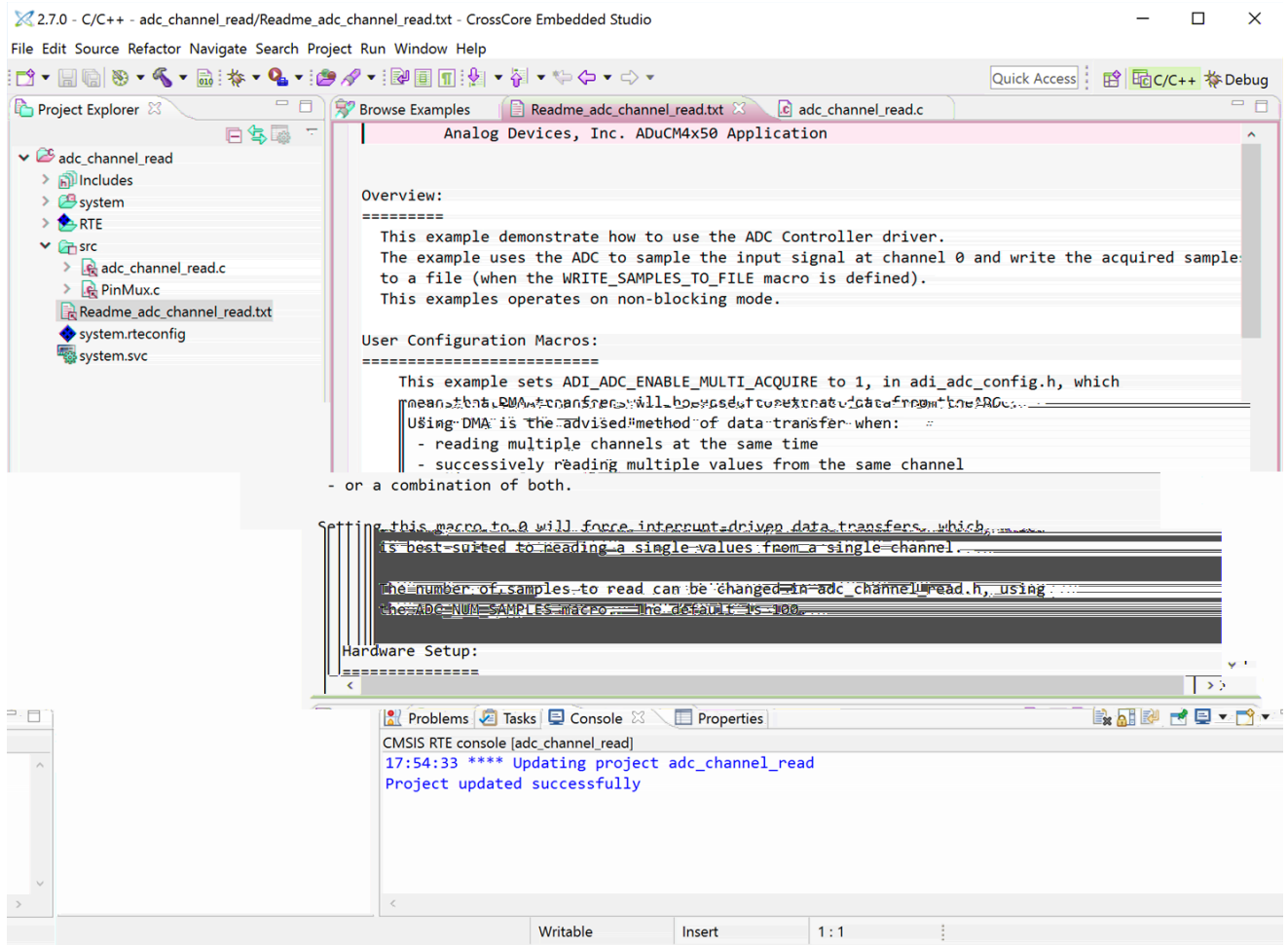
Accessing the **Example Browser** is achieved by selecting **Help/Browse Example**.



Then select the *Type* to **Example Project** and the *Product* to **ADuCM4x50_EZ_KIT_BSP [3.1.0]** as shown in the figure below. A list of examples is displayed in the right part of the window. Select the example to be used and click **Open example**.

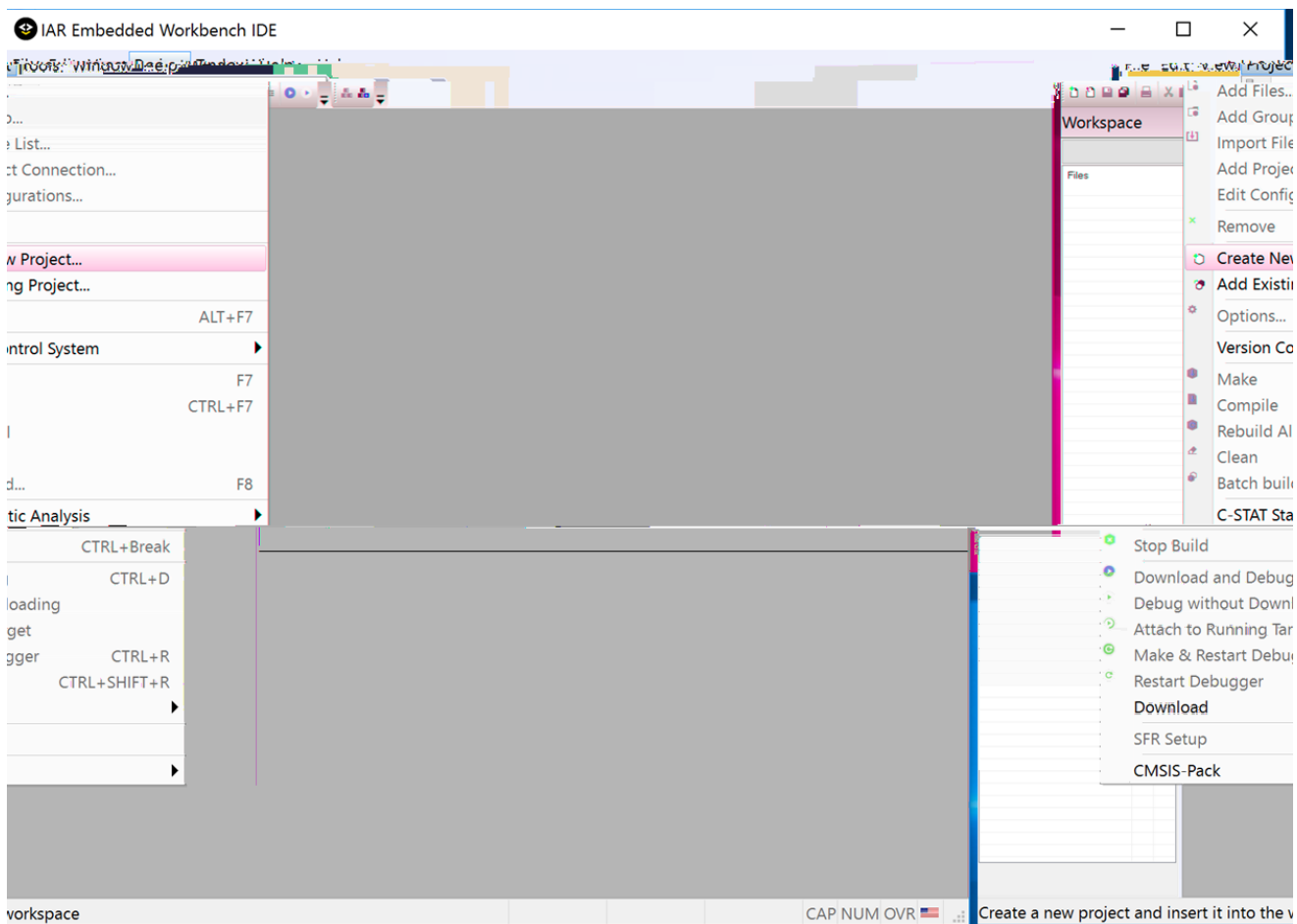


The example is loaded in CrossCore Embedded Studio and ready to be built and executed, as illustrated in the figure below.

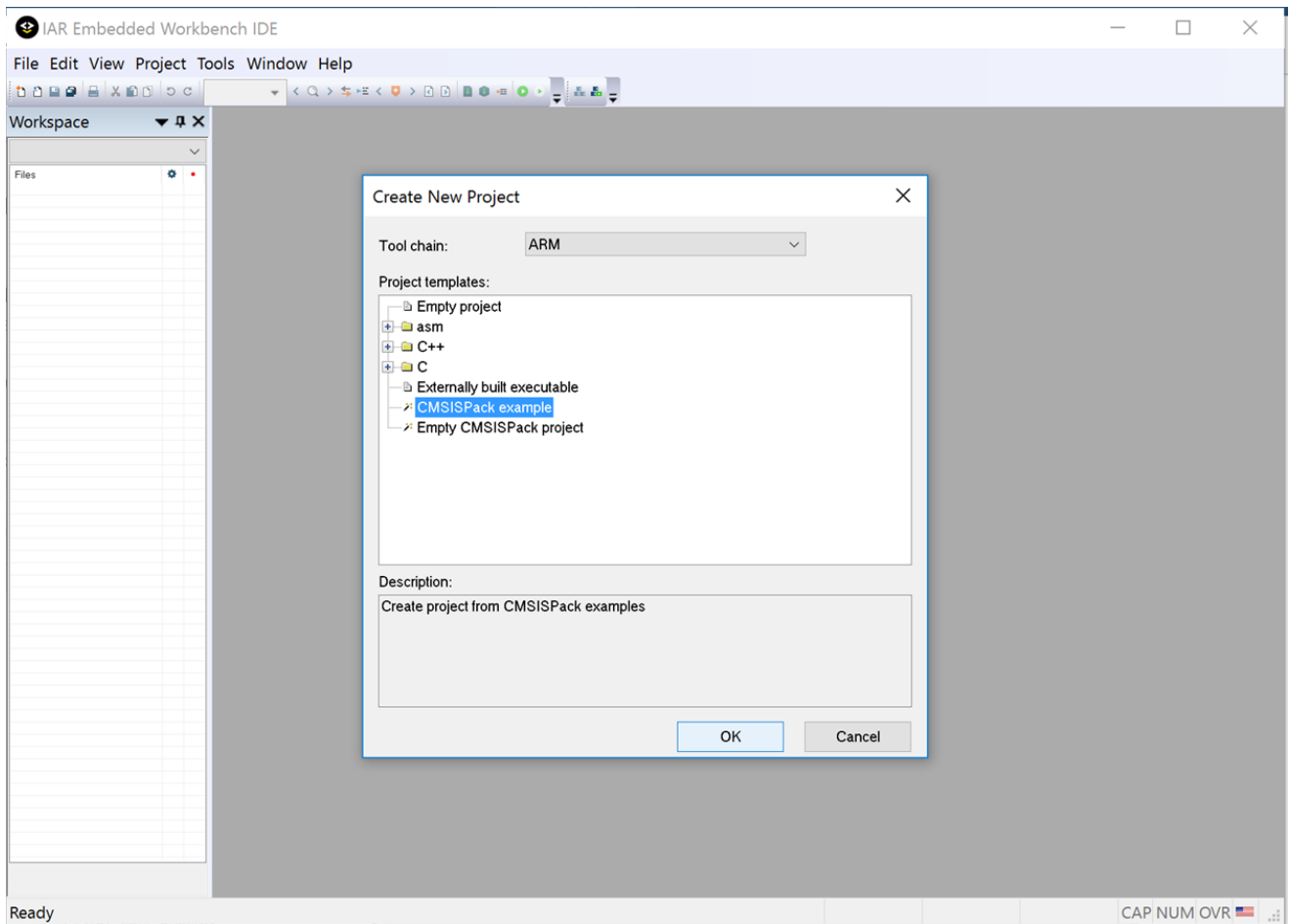


6.2.4 IAR Embedded Workbench Example Browser

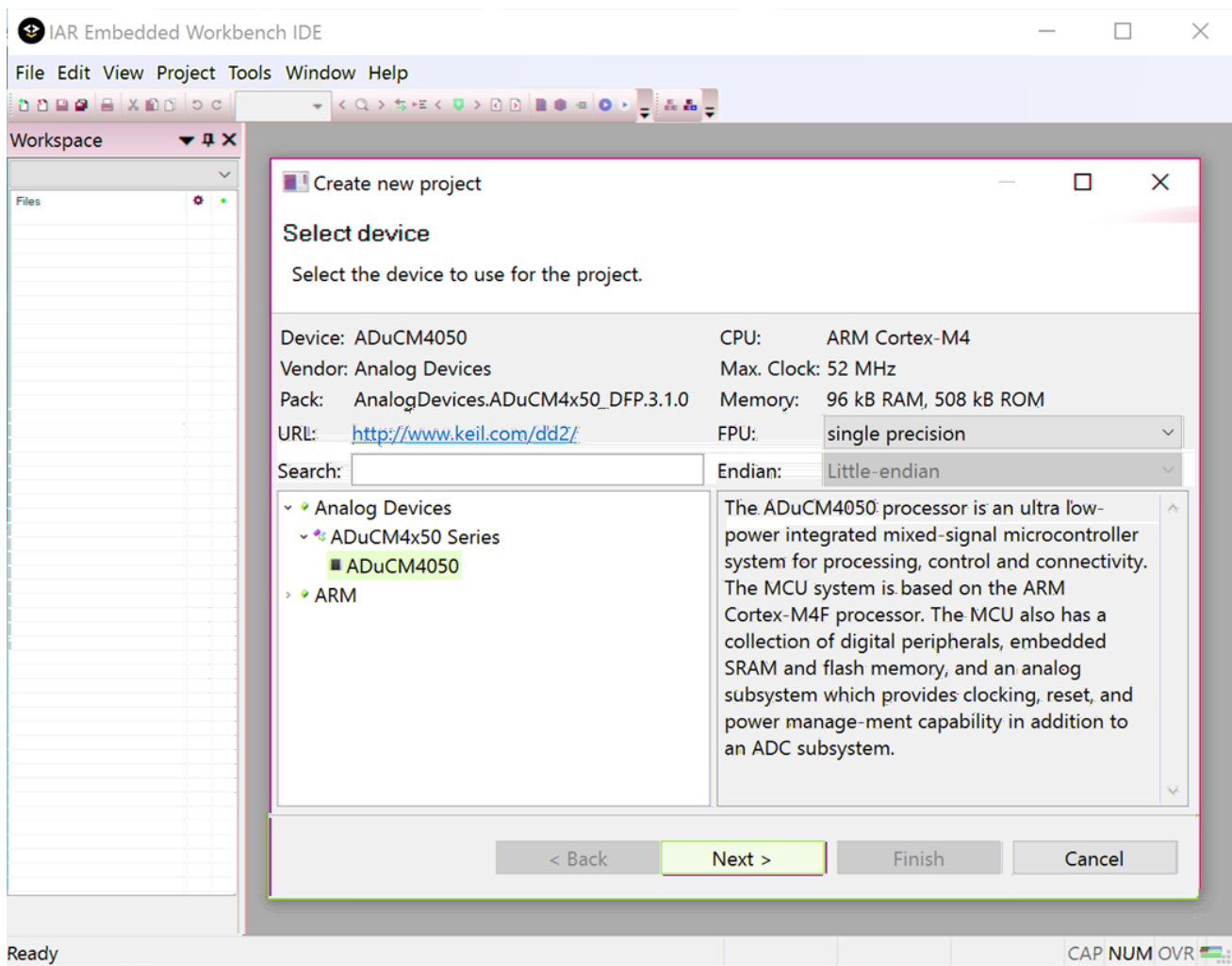
To see the list of examples with IAR 8.20.1, start with selecting **Project Create New Project** as illustrated in the figure below.



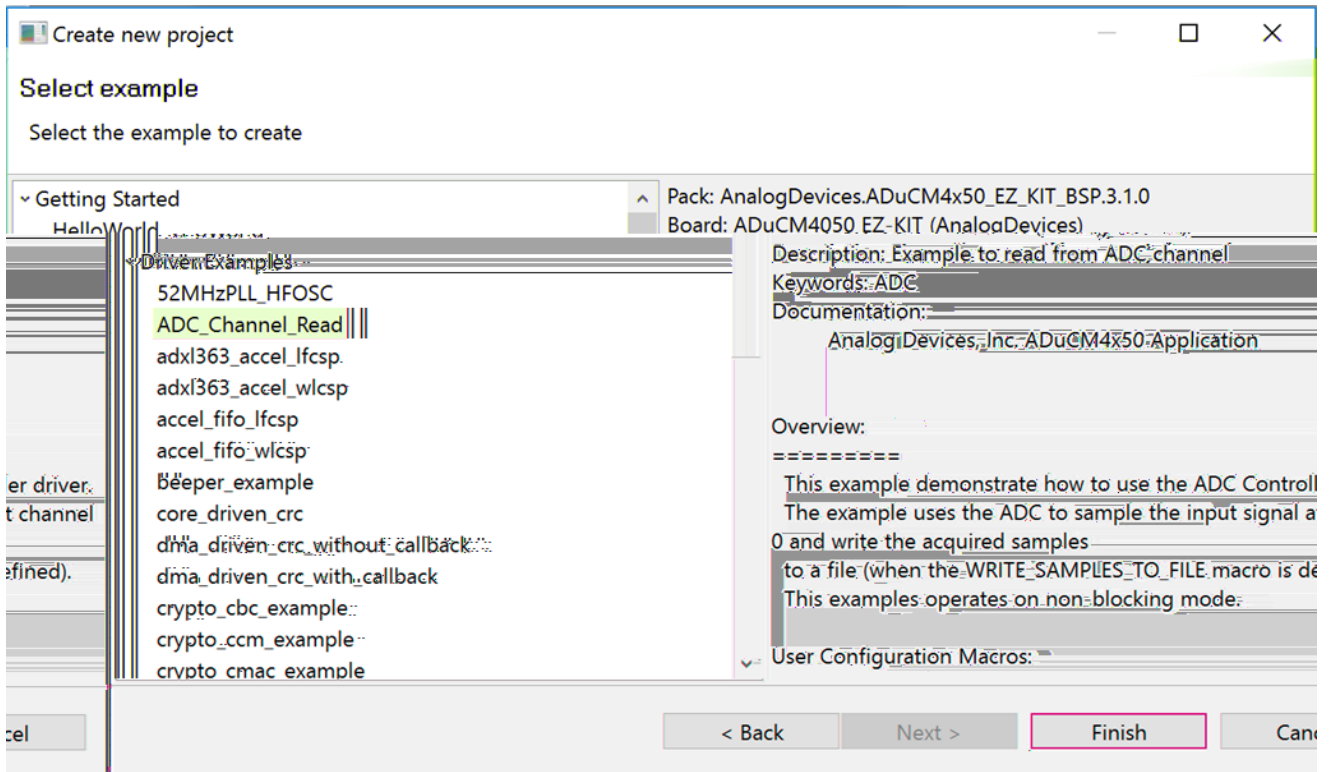
Then select **CMSIS Pack example** as shown in the figure below and click **OK**.



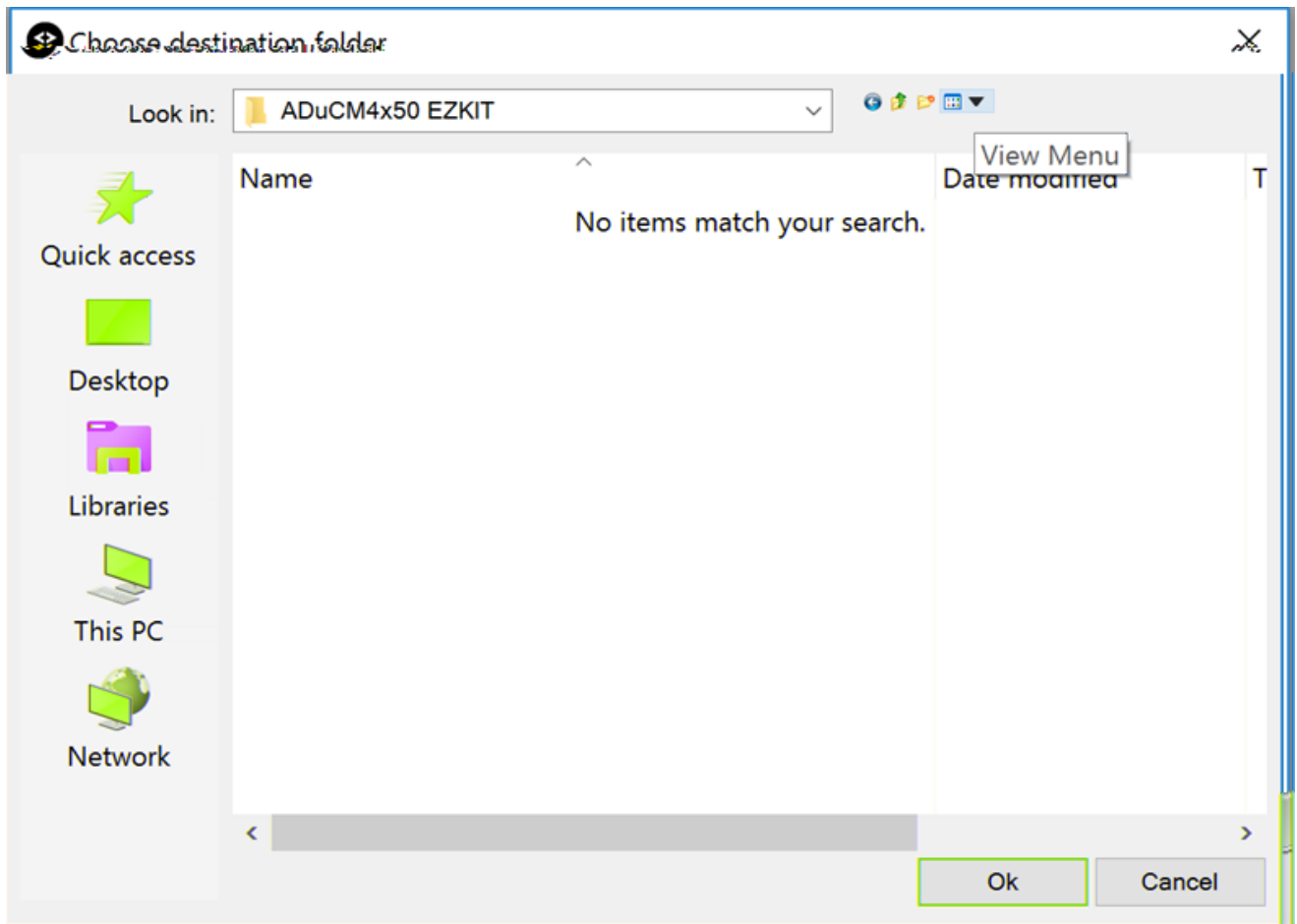
Select **Analog Devices ADuCM4x50 Series ADuCM4050**, and click **Next**.



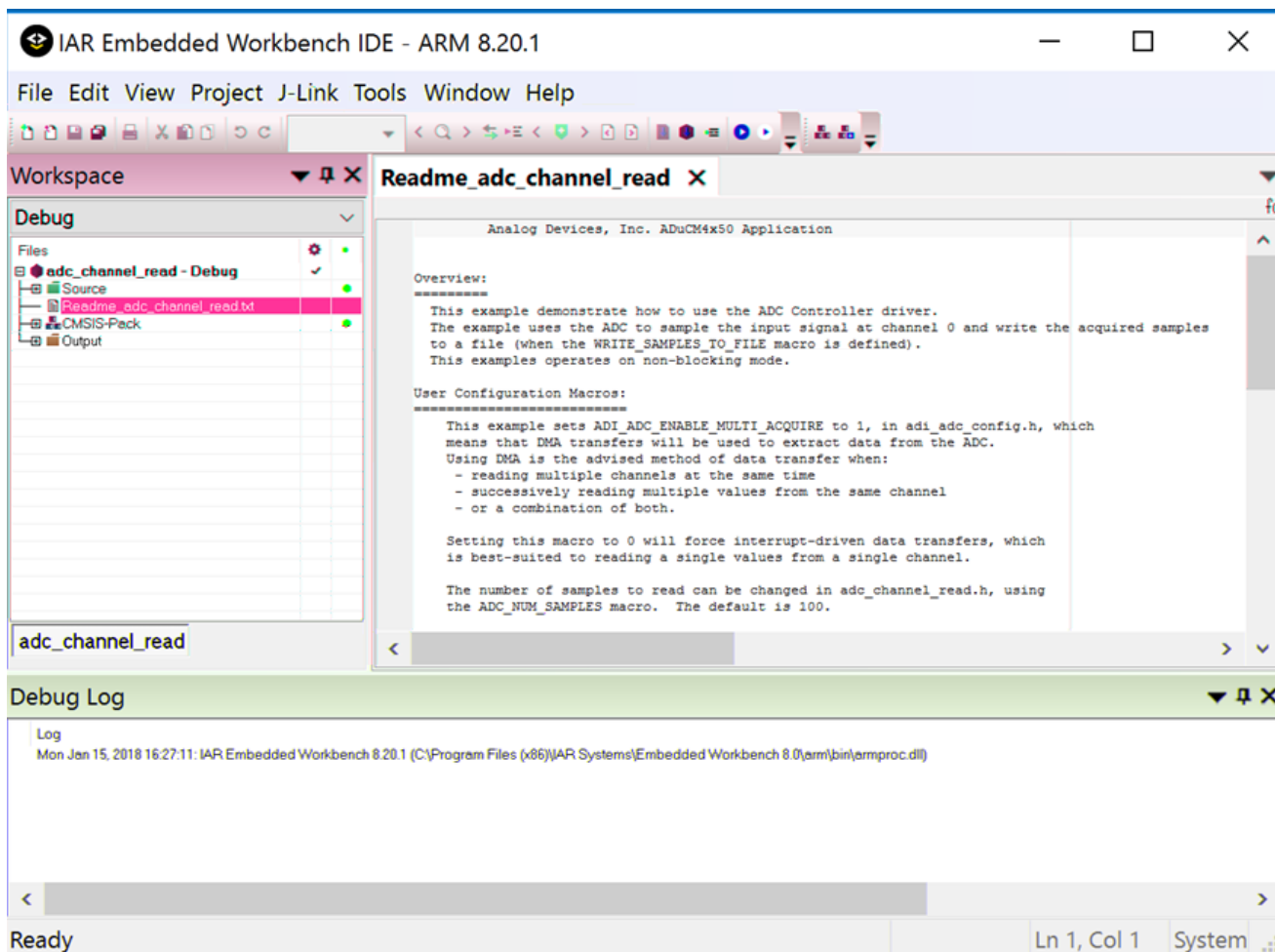
A list of examples is displayed, as illustrated in the next figure. Select the example to be used: its description can be read in the right part of the window. Click **Finish**,



A window pops up to select the location where the example will be copied, as shown in the following figure. Choose the destination and click **OK**.



The example is copied in the chosen destination and loaded in IAR Embedded Workbench, ready to be built and executed.



6.2.5 Examples for drivers

The following array details the examples found in ADuCM4x50 3.1.0 EZ-Kit Board Support.

52MHzPLL_HFOSC	<ul style="list-style-type: none"> <i>52MHzPLL_HFOSC</i> : Demonstrate how to program the ADuCM4050 to operate at 52 MHz
ADC	<ul style="list-style-type: none"> <i>ADC_Channel_Read</i> : Demonstrate use of ADC Controller driver to sample the input signal at channel 0 and write the acquired samples to a file.
ADXL363	<ul style="list-style-type: none"> <i>adxl363_accel_*</i> : Demonstrate how to use the ADXL363 driver to produce interrupts on activity events <i>accel_fifo_*</i> : Demonstrate how to use the ADXL363 driver, specifically using the on-chip FIFO to collect data
Beeper	<ul style="list-style-type: none"> <i>beeper_example</i> : Demonstrates the basic functionality of the beeper peripheral.

CRC	<ul style="list-style-type: none"> • <i>core_driven_crc</i> : Demonstrates how to use the CRC driver to compute the CRC, driven by the core. • <i>dma_driven_crc_with_callback</i> : Demonstrates how to use the CRC driver to compute the CRC driven by the DMA with a callback function registered. • <i>dma_driven_crc_without_callback</i> : Demonstrates how to use the CRC driver to compute the CRC driven by the DMA with no callback function registered.
Crypto	<ul style="list-style-type: none"> • <i>crypto_*</i> : Demonstrate how to use Crypto device driver in various cipher modes.
Cycle Counting	<ul style="list-style-type: none"> • <i>spi_cycle_counting</i>: Demonstrates how to obtain cycle counts for the SPI driver.
Flash	<ul style="list-style-type: none"> • <i>flash_block_protect</i> : Demonstrates the use of the Flash device driver flash memory block-protection feature. • <i>flash_page_write</i> : Demonstrates the use of the Flash device driver for flash memory data page write(s).
FreeRTOS	<ul style="list-style-type: none"> • <i>spi_loopback_freertos</i> : demonstrates how to integrate the ADuCM4x50 EZ-KIT Board Support Pack with the FreeRTOS V9.0.0 as well as how to use the SPI driver in the context of the FreeRTOS.
GPIO	<ul style="list-style-type: none"> • <i>LED_button_callback</i> : Demonstrates how to use the GPIO driver to Toggle LED's when the push buttons are pressed on the ADuCM4050 EZ-Kit.
I2C	<ul style="list-style-type: none"> • <i>temperature_sensor</i> : Demonstrates how to use I2C driver for reading the data from the temperature sensor.
Power_On_Self_Test	<ul style="list-style-type: none"> • <i>POST</i> : Allows users to test the many peripherals of the EZ-Kit with push buttons to select specific tests to run.
RNG	<ul style="list-style-type: none"> • <i>rng_example</i> : Demonstrates how to use and configure the RNG device for generating random numbers.
RTC	<ul style="list-style-type: none"> • <i>rtc_alarm</i> : Demonstrates how to use and configure the RTC device for generating the alarm periodically. • <i>rtc_IO_example</i> : Demonstrates how to configure an RTC device to use the input capture and output compare features of RTC device.

SPI	<ul style="list-style-type: none"> • <i>Spi_Loopback</i> : Demonstrates how to use the SPI driver in blocking mode and non-blocking mode with DMA and PIO. • <i>SPI_MasterSlave_LoopBack_Example</i> : Demonstrates how to use SPI device for transmitting/receiving the data both in master and slave mode.
SPI-flash	<ul style="list-style-type: none"> • <i>w25q32_example</i> : Demonstrate how to use the W25Q32 driver.
SPORT	<ul style="list-style-type: none"> • <i>sport_loopback_dma</i> : Demonstrates how to use the SPORT driver in DMA mode. • <i>sport_loopback_int</i> : Demonstrates how to use the SPORT driver in PIO mode.
SysTick	<ul style="list-style-type: none"> • <i>systick_example</i> : Demonstrates the use of SysTick timer to wait for a specific number of interrupts.
TMR	<ul style="list-style-type: none"> • <i>tmr_example_gp</i> : Demonstrates how to use the General Purpose (GP) timers to generate a periodic interrupt and capture events. • <i>tmr_example_rgb</i> : Demonstrates how to use the Red-Green-Blue (RGB) timer to generate 3 PWM output signals with the same period but different duty cycles
UART	<ul style="list-style-type: none"> • <i>Autobaud</i> : Demonstrates how to use UART device driver for baudrate detection. • <i>uart_callback</i> : Demonstrates how to use UART in DMA mode, PIO mode and register a callback. • <i>uart_loopback</i> : Demonstrates how to use the UART driver to loop back the data between the TX and RX.
WDT	<ul style="list-style-type: none"> • <i>wdt_example_interrupt</i> : Demonstrates how the Watchdog Timer (WDT) can be used to trigger an interrupt on timeout. • <i>wdt_example_reset</i> : Demonstrate how the Watchdog Timer (WDT) can be used both avoid and trigger a system reset.
XINT	<ul style="list-style-type: none"> • <i>wakeup_button</i> : Demonstrates the use of XINT driver to Toggle LED when the wakeup button is pressed on the ADuCM4x50 EZ-Kit.

6.2.6 Using Micrium RTOS

To make use of Micrium RTOS,

1. Obtain the uC/OS-III product from Micrium and install it.

2. Use the Run-Time Environment Manager for your application to select the Software Component "Device/Global Configuration"
3. In the `adi_global_config.h` header file, located in the Device group in your application, set the `ADI_CFG_RTOS` macro to `ADI_CFG_RTOS_MICRIUM_III`:

```
#define ADI_CFG_RTOS ADI_CFG_RTOS_MICRIUM_III
```

Please note that the Micrium components are licensed products, and you must obtain the necessary licenses directly from Micrium to use them.

6.2.7 Example for FreeRTOS Components

The example "SPI_Loopback" in the `examples\FreeRTOS` directory relies on FreeRTOS version 9.0.0 - refer to the example's README file for details.

To make use of this example:

1. Obtain FreeRTOS version 9.0.0 from <http://www.freertos.org>.
2. Follow the step describe in the `Readme_freertos_spi_loopback.txt` file for the targeted development environment.

6.3 Location

The ADuCM4x50 EZ-KIT Board Support Pack will be installed into the CMSIS pack directory for the targeted development environment:

Keil uVision	<code><keil_root>\ARM\PACK\AnalogDevices\ADuCM4x50_EZ_KIT_BSP\3.1.0</code>
CCES	<code><cces_root>\ARM\PACK\AnalogDevices\ADuCM4x50_EZ_KIT_BSP\3.1.0</code>
IAR Embedded Workbench	<code><iar_packrepo>\AnalogDevices\ADuCM4x50_EZ_KIT_BSP\3.1.0</code>

with

Symbol	Meaning	Example Value
<code><keil_root></code>	Keil installation path	<code>C:\Keil_v5</code>

Symbol	Meaning	Example Value
<cces_root>	CCES installation path	C:\Analog Devices\CrossCore Embedded Studio 2.7.0
<iar_packrepo>	IAR pack repository	C:\Users\<windows_username>\AppData\local\IAR Embedded Workbench\PackRepo

7 Contacting Technical Support

You can reach Analog Devices software and tools technical support in the following ways:

- Post your questions in the [software and development tools support community](#) at [EngineerZone®](#).
- E-mail your questions about processors and processor applications to processor.support@analog.com.
- For Greater China, Processors and DSP applications and processor questions can be sent to: processor.china@analog.com.
- Submit your questions to technical support directly via <http://www.analog.com/support>.
- Contact your [Analog Devices sales office](#) or authorized distributor.

8 Known Issues

For the latest anomalies please consult our [Software and Tools Anomalies Search](#) page.

8.1 RTC Example RTC_Alarm (MSKUV01-99)

When executing this example, it should be let to run till completion, until "All done!" is seen. **If the execution is stopped midway, then it will lock up the board.**

If this happens, the board can be unlocked with the following actions: Hold the Boot Button(SW1) and Toggle the Reset Button(SW2) twice and then release the Boot Button(SW1).

8.2 UCOS-III Example

The ucos-iii example located in Examples\rtos\ucos-III cannot be used with CCES. This example will be ported to CCES in a future release.