

Embedded Target for TI C6000 DSP Release Notes

The “Embedded Target for TI C6000 DSP 2.2 Release Notes” on page 1-1 describe Version 2.2 of the Embedded Target for TI TMS320C6000™ DSP Platform. These Release Notes discuss the following topics:

- “New Features” on page 1-2
- “Major Bug Fixes” on page 1-4
- “Upgrading from an Earlier Release” on page 1-5
- “Known Software and Documentation Problems” on page 1-7

If you are upgrading from Release 13 with Service Pack 1, you should also see “Embedded Target for TI C6000 DSP 2.1 Release Notes” on page 2-1.

Printing the Release Notes

If you would like to print the Release Notes, you can link to a PDF version.



Embedded Target for TI C6000 DSP 2.2 Release Notes

1

New Features	1-2
Support for DM642 Evaluation Module	1-2
Additional Demos for the DM642 and Other Hardware	1-2
Relocate the Stack to Internal RAM On Some Boards	1-3
Ability to Choose the CPU Clock Rate on Custom Boards	1-3
Ability to Specify the Stack Size in Bytes on Some Boards ...	1-3
Major Bug Fixes	1-4
Upgrading from an Earlier Release	1-5
Requirements for the DM642 EVM	1-5
Known Software and Documentation Problems	1-7

Embedded Target for TI C6000 DSP 2.1 Release Notes

2

New Features	2-2
Profiling for Multitasking Models	2-2
Support For Generating Code For Custom Targets	2-2
Support for Real-Time Workshop Embedded Coder	2-2
Major Bug Fixes	2-3
Upgrading from an Earlier Release	2-4
Known Software and Documentation Problems	2-5

Embedded Target for TI C6000 DSP

2.2 Release Notes

New Features	1-6
Support for DM642 Evaluation Module	1-6
Additional Demos for the DM642 and Other Hardware	1-6
Relocate the Stack to Internal RAM On Some Boards	1-7
Ability to Choose the CPU Clock Rate on Custom Boards	1-7
Ability to Specify the Stack Size in Bytes on Some Boards	1-7
Major Bug Fixes	1-8
Upgrading from an Earlier Release	1-9
Requirements for the DM642 EVM	1-9
Known Software and Documentation Problems	1-11

New Features

This section summarizes the new features and enhancements introduced in the Embedded Target for TI C6000 DSP 2.2.

If you are upgrading from Release 14 or earlier, you should also see “New Features” on page 2-2 of the Embedded Target for TI C6000 DSP 2.0 Release Notes.

Support for DM642 Evaluation Module

This release adds support for developing video applications on the DM642 Evaluation Module (DM642 EVM). The new blocks that support the DM642 EVM, found in a library named DM642 Board Support, include blocks for capturing and delivering video data, and a block to control the LEDs on the board:

- DM642 Video ADC—Configure video capture capability (video decoders) to capture analog video input on the DM642 Evaluation Module
- DM642 Video DAC—Configure the video display capability (video encoder) on the DM642 EVM
- DM642 LED—Control the eight light-emitting diodes (LED) on the DM642 Evaluation Module
- DM642 Reset—Reset the DM642 EVM to initial conditions

With the new blocks, you can capture NTSC video in a range of modes and formats, process the video in an application on your target, and output the processed video as NTSC compatible video data.

Additional Demos for the DM642 and Other Hardware

To help you develop applications on your DM642, this version of the software includes new demos in MATLAB:

- DM642 Video Stabilization—demonstrates active image stabilization in real time applied to streaming video data.

- DM642 Edge Detection—demonstrates the process of detecting edges in streaming video data.
- C6416 DSK Adaptive Noise Cancellation Using Fixed-Point Filtering—demonstrates and adaptive filtering application.
- C6416 DSK Edge Detection using High Speed RTDX—demonstrates edge detection in real time in streaming video data. Note that you need a high speed RTDX emulator, such as the XDS 560 to run this demo.

Relocate the Stack to Internal RAM On Some Boards

On the 6713, 6416 and DM642 boards, we now use internal RAM (ISRAM) to store the stack. This provides faster operation in many instances.

Ability to Choose the CPU Clock Rate on Custom Boards

Added an option for selecting the CPU clock rate in the Real-Time Workshop **TI C6000 target selection** dialog. There is also an option to specify whether the clock speed should be user-specified or automatically determined—the default setting. When you select the **Specify via dialog** setting, you enable the **CPU clock rate** option so you can enter the actual board clock rate for your generated code to use to run correctly on the target. On the C6713 DSK, you set the 225 MHz clock rate in the GEL file for the project. When you change the GEL file, the Embedded Target for TI C6000 software assumes the new clock rate by default. Setting the new clock rate in the Configuration Parameters dialog does not change the actual clock rate on the target.

Ability to Specify the Stack Size in Bytes on Some Boards

Added an option for selecting the stack size in the Real-Time Workshop **TI C6000 link** dialog. There is also an option to specify whether the stack size should be user-specified or automatically determined—the default setting. When you select the **Specify via dialog** setting, you enable the **Stack size (bytes)** option so you can enter your stack size in bytes.

Major Bug Fixes

The Embedded Target for TI C6000 DSP 2.2 includes several bug fixes made since Version 2.1. This section describes the particularly important Version 2.2 bug fixes.

If you are viewing these Release Notes in PDF form, please refer to the HTML form of the Release Notes, using either the Help browser or the MathWorks Web site and use the link provided.

If you are upgrading from Release 14 or earlier, then you should see Major Bug Fixes of the Embedded Target for TI C6000 DSP 2.1 Release Notes.

Upgrading from an Earlier Release

The only upgrade issue in this release is updating CCS for the DM642.

Requirements for the DM642 EVM

Certain requirements for the DM642 EVM differ from the other supported targets. This sections provides details about using both the DM642 EVM hardware target and the simulator. Using the DM642 requires the following:

- Separate CCS installation version 2.2
- DM642 EVM patch to upgrade CCS version to 2.20.18
- Device Driver Development Kit (DDK) patch

Installation procedures for the CCS software is provided in the Texas Instruments DM642 Quick Start Guide.

You can use any means you wish to connect to your DM642.

Optionally, to run the video surveillance demo, you need a high speed RTDX emulator like the XDS560 JTAG Scan-Based Emulator (High Speed RTDX emulator) or something similar.

Setting Up Code Composer Studio for the DM642 EVM

Your DM642 EVM requires a separate Code Composer Studio installation. To use the EVM when have more than one CCS installation, you need to install the CCS for the DM642 EVM in a separate location. You cannot merge your DM642 CCS installation with existing or other CCS installation. Follow the installation guidelines provided by Texas Instruments when you install CCS to use your DM642 EVM.

Install the patch C6000-2.20.00-FULL-to-C6000-2.20.18-FULL.EXE as directed by Texas Instruments.

Finally, install the Device Driver Development Kit patch `ddk-v1-10-00-23.exe`.

About the Device Driver Development Kit

To use the Embedded Target for TI C6000 DSP software with your DM642 you need to install the Device Driver Developer Kit (DDK) patch that you get from Texas Instruments. While the DDK is optional for some DM642 operations, the

Embedded Target for TI C6000 DSP requires the DDK for code generation. According to TI, the DDK is Texas Instruments' Device Driver Development Kit, and version 1.1 of the DDK contains device drivers for the DM642 EVM peripheral devices.

About the XDS560 JTAG Scan-Based Emulator

You need the XDS560 Emulator to use the DM642 with the Embedded Target for TI C6000 DSP. Either the PCI-bus or USB versions work. While the XDS510 Emulator may work, we have not tested it with the target software.

Known Software and Documentation Problems

This section includes a link to a description of known software and documentation problems in Version 2.2.

If you are viewing these Release Notes in PDF form, please refer to the HTML form of the Release Notes, using either the Help browser or the MathWorks Web site and use the link provided.

Embedded Target for TI C6000 DSP

2.1 Release Notes

New Features	1-2
Profiling for Multitasking Models	1-2
Support For Generating Code For Custom Targets	1-2
 Major Bug Fixes	 1-3
 Upgrading from an Earlier Release	 1-4
Known Software and Documentation Problems	1-5

New Features

This section summarizes the new features and enhancements introduced in the Embedded Target for TI C6000 DSP 2.1.

If you are upgrading from Release 13 with Service Pack 1 or earlier, you should also see “New Features” on page 2-2 of the Embedded Target for TI C6000 DSP 2.0 Release Notes.

Profiling for Multitasking Models

Updates to the profiling process in the product allow you to profile models that use multitasking. Refer to the profiling information for the product in the online Help system for more information.

Support For Generating Code For Custom Targets

By adding new targets to the target browser in the Real-Time Workshop options in Simulink, you can now target hardware that uses supported processors, even if the hardware is not on the specified hardware list.

As long as the processor on the board is from one of the supported processor families, you can generate code for the target. Note that the blocks for the peripherals, such as ADC or DAC blocks are specific to their hardware and will not work with your custom board.

Four targets are currently supported:

- `custom_6414`—target a board that uses the C6414 processor
- `custom_6701`—target a board that uses the C6701 processor
- `custom_6711`—target a board that uses the C6711 processor
- `custom_6713`—target a board that uses the C6713 processor

Support for Real-Time Workshop Embedded Coder

With this release you can use

Major Bug Fixes

The Embedded Target for TI C6000 DSP 2.1 includes several bug fixes made since Version 2.0.1. This section describes the particularly important Version 2.1 bug fixes.

If you are viewing these Release Notes in PDF form, please refer to the HTML form of the Release Notes, using either the Help browser or the MathWorks Web site and use the link provided.

If you are upgrading from Release 13 with Service Pack 1 or earlier, then you should see Major Bug Fixes of the Embedded Target for TI C6000 DSP 2.0 Release Notes.

Upgrading from an Earlier Release

This section describes the upgrade issues involved in upgrading to Version 2.1 from Version 2.0.

There are no issues involved in upgrading to 2.1 from version 2.0.

Known Software and Documentation Problems

This section includes a link to a description of known software and documentation problems in Version 2.1.

If you are viewing these Release Notes in PDF form, please refer to the HTML form of the Release Notes, using either the Help browser or the MathWorks Web site and use the link provided.

Additional Known Problems

Below are additional known software and documentation issues not included in the Open Bugs report linked to above.

Targeting

- For reasons related to the Texas Instruments C compiler, you cannot use certain Simulink blocks for targeting. They are
 - Singular Value Decomposition block in the library dspfactors
 - Pseudoinverse block in the library dspinverses
 - SVD Solver block in the library dspolvers

These blocks are not included in the run-time libraries and do not build when you generate code from your model.

- For this release of the Embedded Target, the LED overrun indicator has been removed.

Demos

In MATLAB Demos (select **Help**->**Demos** from the MATLAB menu bar), the Embedded Target demonstration program LMS Adaptive Filtering runs slowly on DSP Starter Kit (DSK) boards. Design features of the board cause the slow processing across the RTDX link. Using the Texas Instruments XDS 510 JTAG/PC Controller, or an equivalent emulator, to connect your host to the DSK can alleviate the problem.

Data Types

C5000 and C6000 family processors handle integer data types differently. On C5000 family processors, 8-bit values do not have unique addresses. The C5000 family processors use 16-bit addresses natively. When you read and write to

C5000 family processors, 8-bit integers in MATLAB are stored as 16-bit integers on the processor. In detail, the differences are

- When you write an 8-bit integer from MATLAB to a C5000 family processor, MATLAB pads the value to 16 bits and the processor stores the value as a 16-bit integer.
- When you read an 8-bit integer from the processor into MATLAB, the read function takes 16 bits from processor memory, discards the eight most significant bits, and returns the remaining eight bits to MATLAB as the integer value.

For these reasons, scripts that run on C6000 family processors may not run without modification on C5000 family processors.

General Target Operations

When your target digital signal processor is running, CCS uses up to 99% of the CPU cycles on your PC. Consequently, some other operations may be very slow, such as running the MATLAB help system or processing other applications.

LED Overrun Indicator

For this version of the product, the LED overrun indicator available in earlier product versions is not included.