

# **Target for TI C2000™ Release Notes**

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<b>Summary by Version</b> .....	<b>1</b>
<b>Version 2.3 (R2007b) Target for TI C2000™</b> .....	<b>4</b>
<b>Version 2.2 (R2007a) Target for TI C2000™</b> .....	<b>6</b>
<b>Version 2.1 (R2006b)Target for TI C2000™</b> .....	<b>10</b>
<b>Version 2.0 (R2006a) Target for TI C2000™</b> .....	<b>15</b>
<b>Version 1.3 (R14SP3)Target for TI C2000™</b> .....	<b>20</b>
<b>Version 1.2.1 (R14SP2)Target for TI C2000™</b> .....	<b>23</b>
<b>Version 1.2 (R14SP1+) Target for TI C2000™</b> .....	<b>24</b>
<b>Version 1.1.1 (R14SP1) Target for TI C2000™</b> .....	<b>26</b>
<b>Version 1.1 (R14) Target for TI C2000™</b> .....	<b>28</b>
<b>Compatibility Summary for Target for TI C2000™</b> ....	<b>32</b>



## Summary by Version

This table provides quick access to what's new in each version. For clarification, see "About Release Notes" on page 2.

<b>Version (Release)</b>	<b>New Features and Changes</b>	<b>Version Compatibility Considerations</b>	<b>Fixed Bugs and Known Problems</b>	<b>Related Documentation at Web Site</b>
<b>Latest Version V2.3 (R2007b)</b>	Yes Details	Yes Summary	Bug Reports Includes fixes	Printable Release Notes: PDF  Current product documentation
V2.2 (R2007a)	Yes Details	Yes Summary	Bug Reports Includes fixes	No
V2.1 (R2006b)	Yes Details	No	Bug Reports Includes fixes	No
V2.0 (R2006a)	Yes Details	No	Bug Reports at Web site	No
V1.3 (R14SP3)	Yes Details	No	Bug Reports at Web site	No
V1.2.1 (R14SP2)	Yes Details	No	Bug Reports at Web site	No
V1.2 (R14SP1+)	Yes Details	No	Fixed bugs	No
V1.1.1 (R14SP1)	No	No	Fixed bugs	No

<b>Version (Release)</b>	<b>New Features and Changes</b>	<b>Version Compatibility Considerations</b>	<b>Fixed Bugs and Known Problems</b>	<b>Related Documentation at Web Site</b>
V1.1 (R14)	Yes Details	No	Fixed bugs	No
V1.0 (R13SP1+)	Yes See the V1.0 (R13SP1+) product documentation			V1.0 (R13SP1+) product documentation

## About Release Notes

Use release notes when upgrading to a newer version to learn about new features and changes, and the potential impact on your existing files and practices. Release notes are also beneficial if you use or support multiple versions.

If you are not upgrading from the most recent previous version, review release notes for all interim versions, not just for the version you are installing. For example, when upgrading from V1.0 to V1.2, review the New Features and Changes, Version Compatibility Considerations, and Bug Reports for V1.1 and V1.2.

## New Features and Changes

These include

- New functionality
- Changes to existing functionality
- Changes to system requirements (complete system requirements for the current version are at the MathWorks Web site)
- Any version compatibility considerations associated with each new feature or change

## Version Compatibility Considerations

When a new feature or change introduces a reported incompatibility between versions, its description includes a **Compatibility Considerations** subsection that details the impact. For a list of all new features and changes that have reported compatibility impact, see the “Compatibility Summary for Target for TI C2000™ ” on page 32.

Compatibility issues that are reported after the product has been released are added to Bug Reports at the MathWorks Web site. Because bug fixes can sometimes result in incompatibilities, also review fixed bugs in Bug Reports for any compatibility impact.

## Fixed Bugs and Known Problems

MathWorks Bug Reports is a user-searchable database of known problems, workarounds, and fixes. The MathWorks updates the Bug Reports database as new problems and resolutions become known, so check it as needed for the latest information.

Access Bug Reports at the MathWorks Web site using your MathWorks Account. If you are not logged in to your MathWorks Account when you link to Bug Reports, you are prompted to log in or create an account. You then can view bug fixes and known problems for R14SP2 and more recent releases.

The Bug Reports database was introduced for R14SP2 and does not include information for prior releases. You can access a list of bug fixes made in prior versions via the links in the summary table.

## Related Documentation at Web Site

**Printable Release Notes (PDF).** You can print release notes from the PDF version, located at the MathWorks Web site. The PDF version does not support links to other documents or to the Web site, such as to Bug Reports. Use the browser-based version of release notes for access to all information.

**Product Documentation.** At the MathWorks Web site, you can access complete product documentation for the current version and some previous versions, as noted in the summary table.

## Version 2.3 (R2007b) Target for TI C2000™

This table summarizes what's new in Version 2.2 (R2007b):

New Features and Changes	Version Compatibility Considerations	Fixed Bugs and Known Problems	Related Documentation at Web Site
Yes Details below	Yes — Details labeled as <b>Compatibility Considerations</b> , below. See also Summary.	Bug Reports Includes fixes	Printable Release Notes: PDF  Current product documentation

New features and changes introduced in this new version are:

- “Link and Target Products Regrouped in New Start, Help, and Demos Category” on page 4
- “Support for High Resolution PWM” on page 5
- “Support for CCP/ASAP2” on page 5
- “Interrupt Handling for 280x eQEP” on page 5
- “Compatibility Considerations” on page 5

### Link and Target Products Regrouped in New Start, Help, and Demos Category

A new product category, Links and Targets, now contains all MathWorks products that link, target, or cosimulate code.

### Compatibility Considerations

This change impacts you in the following ways:

- Finding and viewing these products through the MATLAB Desktop **Start** button and in the Help browser **Contents** and **Demos** panes.
- Using the demo command to access the product demos.



For more about this new product category, see “Demos and Help Browser Contents Now Include New Category for Links and Targets”, in the *MATLAB Release Notes*.

## **Support for High Resolution PWM**

High Resolution PWM support has been added to the ePWM block.

## **Support for CCP/ASAP2**

Support has been added for the CCP/ASAP2 protocols, including the ability to use external mode with these protocols.

## **Interrupt Handling for 280x eQEP**

Support for interrupt handling for the 280x eQEP has been added, along with a panel within the block parameters dialog where interrupts corresponding to specific events are enabled or disabled.

## **Compatibility Considerations**

- Support for the C24x family has been removed.
- The C280x ePWM block has been updated in such a way that it may not be compatible with models created in R2007a. In particular, when opening R2007a models containing the ePWM block in R2007b, several warning messages may be generated, and the settings for the C280x ePWM blocks may not be honored. This pertains specifically to settings that are made through the input port.

## Version 2.2 (R2007a) Target for TI C2000™

This table summarizes what's new in Version 2.2 (R2007a):

New Features and Changes	Version Compatibility Considerations	Fixed Bugs and Known Problems	Related Documentation at Web Site
Yes Details below	Yes — Details labeled as <b>Compatibility Considerations</b> , below. See also Summary.	Bug Reports Includes fixes	Printable Release Notes: PDF Current product documentation

New features and changes introduced in this new version are:

- “General Purpose I/O (GPIO) Blocks to Configure GPIO Registers for C280X Processors” on page 6
- “Software Triggered Interrupt Blocks for Interrupt-Driven Scheduling in Models” on page 7
- “C280x Enhanced CAP (eCAP) Block for C280x Processor Targets” on page 7
- “Product Name Change” on page 7
- “Code Generation Capability Moved to Link for Code Composer Studio™ Development Tools” on page 7

### General Purpose I/O (GPIO) Blocks to Configure GPIO Registers for C280X Processors

Four general-purpose I/O (GPIO) blocks have been added to configure GPIO registers for C280x processors:

- C280x GPIO Digital Input—Configure general purpose input pins
- C280x GPIO Digital Output—Configure general purpose output pins
- C281x GPOI Digital Input—Configure general purpose input pins
- C281x GPIO Digital Output—Configure general purpose output pins

These new blocks are similar to the existing blocks for C24x processors.

## Software Triggered Interrupt Blocks for Interrupt-Driven Scheduling in Models

Both the C280x and C281x block libraries have SW Triggered Interrupt blocks (C280x SW Triggered Interrupt and C281x SW Triggered Interrupt) for developing processes that use asynchronous scheduling.

## C280x Enhanced CAP (eCAP) Block for C280x Processor Targets

The C280x eCAP block enables your project to configure enhanced capture channels or the auxiliary pulse width modulator (PWM) capability in the capture and PWM modules.

## Product Name Change

Embedded Target for the Texas Instruments TMS320C2000™ DSP Platform is now Target for TI C2000™.

## Code Generation Capability Moved to Link for Code Composer Studio™ Development Tools

Moving the code generation features to the Project Generator component of Link for Code Composer Studio™ provides a number of benefits:

- Unifies code generation across all of the target products.
- Improves the product maintainability
- Accelerates adding new features across the target products
- Enables greater consistency of use, such as adding chips, or libraries, or source files, by making the interfaces the same across all target products.

## Compatibility Considerations

Relocating code generation from this product causes the following issues to occur:

- The system target files `ti_c2000_ert.tlc` and `ti_c2000_grt.tlc` have been removed. In the configuration parameters for your model, replace

the existing system target file with the Link for CCS system targets file `ccslink_ert.tlc` or `ccslink_grt.tlc`.

- Target Preferences blocks have changed. While the blocks are in the same libraries, the block parameters are different. You need to open the Target Preferences block in your model and reset the parameters.
- In earlier releases, Target Preferences blocks contained target-specific simulation parameters. Those parameters are now part of Link for CCS and are new or changed. You need to open the Configuration Parameters dialog box for your model and set the **Real-Time Workshop** and **Link for CCS** options to update your model to the new organization.

**Updating Older Simulink Models.** As noted in the Compatibility Considerations, moving the code generation function out of this product causes a number of issues with existing models. To help you migrate your current models to Version 2.2, Target for TI C2000 provides an automatic model update feature that operates the first time you open an existing model.

When you open an existing model after you install Version 2.2, you see a message that your model is not compatible with the new release and that asks you whether to update your model to the new configuration.

If you click **No**, the update process does not proceed and your model remains unchanged. The next time you open the model, the prompt appears again.

If you click **OK**, Target for TI C2000 makes a backup copy of your model (named `model.bak`) and then attempts to convert your model to the new configuration by making the following changes:

- Uses the target preferences in your model to configure the Target Preferences block in the new model, populating the new block options with the parameters from the existing target preferences and from the model configuration parameters. This includes build options, code generation options, and peripheral settings.
- Changes the system target file from `ti_c2000_ert.tlc` or `ti_c2000_grt.tlc` to `ccslink_ert.tlc` or `ccslink_grt.tlc`, as appropriate.

- Populates the new **Link for CCS** options in the Configuration Parameters dialog box with the parameters from the **Real-Time Workshop** options in your model.
- Populates the new **Peripherals** pane on the new Target Preferences block with many of the peripherals parameters from the original model.

Model updating cannot migrate all of the peripheral information you have defined in the original Target Preferences block in your model. For the processors shown in the following table, model update may not migrate all the options for the listed peripherals. You have to verify and set the peripheral options manually in the Target Preferences block:

Processor or Family	Peripheral
C2407	SCI
	SPI
C280x	SCIB
C281x	ADC
	SCI A
	SCI B
	SPI

When the model update does not migrate the options, it sets the new options to the default values.

As the model update process continues, it prints messages in the MATLAB command window about the changes it makes and about any changes you need to make manually.

## Version 2.1 (R2006b) Target for TI C2000™

This table summarizes what's new in Version 2.1 (R2006b):

New Features and Changes	Version Compatibility Considerations	Fixed Bugs and Known Problems	Related Documentation at Web Site
Yes Details below	No	Bug Reports Includes fixes	No

New features and changes introduced in this version are

- “Host-Side SCI Transmit and Receive Blocks Provide Real-Time Communication with Target” on page 10
- “c280x SCI Transmit and Receive Blocks Provide Real-Time Communication with Host” on page 11
- “c280x SPI Transmit and Receive Blocks Provide Serial Peripheral Communication with Host” on page 12
- “Custom Data Configuration for Serial Communications Interface on c281x SCI Transmit and Receive Blocks” on page 12
- “Optional Blocking Mode and Output Status Ports Added to c281x SPI Transmit and Receive Blocks” on page 12
- “SCI and SPI Module Configuration Available for Target Preferences Blocks” on page 13
- “TMS320C2802 and TMS320C2809 Chip Support Added to c280x DSP Chip Library” on page 13
- “New Demos and Demo Versions” on page 13

### Host-Side SCI Transmit and Receive Blocks Provide Real-Time Communication with Target

The new host-side SCI blocks communicate with the running target processor, thereby providing blocking mode for real-time synchronization. The new host-side SCI Library, `c2000scilib`, includes the following blocks:

- SCI Setup

Configure COM ports: Specify raw data or protocol mode, baud rate, character length bits, stop bits, parity mode, and time-out. Protocol mode provides the ability to block processes by requiring the transmitting side to transmit \$SND and the receiving side to respond \$RDY before any data is actually sent. While this handshake is being performed and data is being transmitted, all other processes are suspended.

- SCI Receive

Configure data: Specify additional package headers and terminators, data type and package length, what value to output on time-out, and sample time.

- SCI Transmit

Configure transmission: Specify COM port and additional package headers and terminators.

## **c280x SCI Transmit and Receive Blocks Provide Real-Time Communication with Host**

c280x SCI Transmit and Receive blocks communicate with the host via the serial communications interface. You can specify the following:

- Module (select A or B)
- c280x SCI Receive block parameters:
  - Data type and package length
  - Value to output on time-out
  - Sample time
  - Add status output port
  - Enable receive FIFO interrupt
- c280x SCI Transmit block parameters:
  - Additional package headers and/or terminators
  - 
  - Enable transmit FIFO interrupt

## **c280x SPI Transmit and Receive Blocks Provide Serial Peripheral Communication with Host**

c280x SPI Transmit and Receive blocks communicate with the host via the serial peripheral interface. You can specify the following:

- Module (select A, B, C, or D)
- c280x SPI Receive block parameters:
  - Data length
  - Add status output port
  - Enable blocking mode
  - Post interrupt when data is received
  - Sample time
- c280x SCI Transmit block parameters:
  - Add status output port
  - Enable blocking mode
  - Post interrupt when data is transmitted

## **Custom Data Configuration for Serial Communications Interface on c281x SCI Transmit and Receive Blocks**

c281x SCI Transmit and SCI Receive blocks now provide custom data configurations for transmit and receive. Specify module, data type, package length, value to output on time-out, sample time, status output port, and receive FIFO interrupt on the c281x SCI Receive block. Also specify additional package headers and terminators and enable transmit FIFO interrupt on the c281x SCI Transmit block.

## **Optional Blocking Mode and Output Status Ports Added to c281x SPI Transmit and Receive Blocks**

c281x SPI Transmit and SPI Receive now provide optional blocking mode and output transmit and receive error status ports.



## SCI and SPI Module Configuration Available for Target Preferences Blocks

SCI and SPI module configuration for specifying serial communication interface and serial peripheral interface parameters is now available for F2808, F2812, and Custom 281x blocks.

## TMS320C2802 and TMS320C2809 Chip Support Added to c280x DSP Chip Library

The TMS320C2802 and TMS320C2809 chips have been added to the list of supported c280x DSP chips.

## New Demos and Demo Versions

Several new demos, as well as new versions of existing demos, are included in this release:

- HIL Verification of IIR Filter Using SCI

Hardware-in-the loop (HIL) demo using SCI for Spectrum Digital F2812 and F2808 eZdsp(tm).

This demo is new. The following version is available:

Spectrum Digital F2812 eZdsp: c2000scitest.mdl

Spectrum Digital F2808 eZdsp: c2000scitest.mdl

- Permanent Magnet Synchronous Motor Field-Oriented Control

PMSM FOC demo using asynchronous scheduler with flash memory download for Spectrum Digital F2812, Spectrum Digital F2808 eZdsp(tm), and F2806 custom board.

This version is an enhancement of an existing demo. The following versions are available:

Spectrum Digital F2806 eZdsp: c2806pmsmfoc.mdl

Spectrum Digital F2806 eZdsp with flash-based memory map:  
c2806pmsmfocflash.mdl

Spectrum Digital F2808: c2808pmsmfoc.mdl

Spectrum Digital F2808 with flash-based memory map:  
c2808pmsmfocflash.mdl

Spectrum Digital F2812 eZdsp: c2812pmsmfoc.mdl

Spectrum Digital F2812 eZdsp with flash-based memory map:  
c2812pmsmfocflash.mdl

- Simulation of FOC Using PMSM Model

Simulation demo of FOC using PMSM model for Spectrum Digital F2812 and F2808 eZdsp(tm) .

This demo is new. The following versions are available:

Spectrum Digital F2808: c2808pmsmsim.mdl

Spectrum Digital F2812 eZdsp: c2812pmsmsim.mdl

## Version 2.0 (R2006a) Target for TI C2000™

This table summarizes what's new in Version 2.0 (R2006a):

New Features and Changes	Version Compatibility Considerations	Fixed Bugs and Known Problems	Related Documentation at Web Site
Yes Details below	No	Bug Reports at Web site	No

New features and changes introduced in this version are

- “Asynchronous Interrupt Scheduling Support for C280x and C281x” on page 15
- “Expanded Support for C2000 Targets” on page 16
- “C28x Blocks and Library Renamed” on page 16
- “Flash Memory Programming Support” on page 17
- “New C280x Chip Support Library” on page 17
- “New Demos and Demo Versions” on page 18
- “New Memory Management Features in Real-Time Workshop Embedded Coder” on page 18

### **Asynchronous Interrupt Scheduling Support for C280x and C281x**

Asynchronous interrupt scheduling is now supported for C280x and C281x-based boards. The following new blocks are the result of the implementation of this feature:

- C280x Hardware Interrupt
- C281x Hardware Interrupt
- C281x Timer
- Idle Task

Additionally, many existing C281x blocks and new C280x blocks include a check box that lets you trigger an asynchronous interrupt when a specific processing event occurs.

## **Expanded Support for C2000 Targets**

New Target Preferences blocks in the C2000 Target Preferences library provide support for an expanded range of boards. The new Target Preferences blocks include:

- F2808 eZdsp, which lets you target the F2808 eZdsp™ DSP board from Spectrum Digital.
- Custom C280x Board, which lets you target custom boards based on several members of the C280x chip family.
- Custom C281x Board, which lets you target custom boards based on several members of the C281x chip family.

## **C28x Blocks and Library Renamed**

With the introduction of support for C280x-based boards, the designations “C2800” and “C28x”, which in the past had been used to refer primarily to the F2812 eZdsp™ DSP board, became ambiguous.

To avoid confusion that might result from this ambiguity, the block library `c2800dspchiplib` has been superseded by a new (and expanded) block library named `c281xdspchiplib`. Also, all references to blocks in this library have been changed from “C28x...” to “C281x...”.

The `c281xdspchiplib` library features an improved layout with blocks organized into the following categories:

- Utilities
- Scheduling
- Control
- Communications

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**Note** The introduction of the c281xdspchiplib block library should have no effect on backward compatibility. The old c2800dspchiplib block library is no longer included in the product, but when you open an existing model, the Simulink block forwarding mechanism will automatically remap your C28x blocks to the new block library.

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## Flash Memory Programming Support

The Target Preferences blocks for F2812 eZdsp and F2808 eZdsp boards now let you choose to burn generated code into on-board flash memory.

## New C280x Chip Support Library

The new C280x Chip Support Library, c280xdspchiplib, includes the following blocks presented in functional categories as follows:

### Utilities

- From Memory
- To Memory

### Scheduling

- C280x Hardware Interrupt
- Idle Task

### Control

- C280x ADC
- C280x ePWM
- C280x eQEP

## Communications

- C280x eCAN Receive
- C280x eCAN Transmit

## New Demos and Demo Versions

Several new demos, as well as new versions of existing demos, are included in this release:

- Permanent Magnet Synchronous Motor Field-Oriented Control

This is a new demo. The following version is available:

Spectrum Digital F2812 eZdsp: `c2812pmsmfoc.mdl`

- Asynchronous Scheduling

This is a new demo. The following versions are available:

Spectrum Digital F2812 eZdsp: `c2812asyn scheduling.mdl`

Spectrum Digital F2808 eZdsp: `c2808asyn scheduling.mdl`

- PWM Duty Cycle Control via Period Change

The following new version of this existing demo is available:

Spectrum Digital F2808 eZdsp: `c2808pwmtest.mdl`

- ADC Control of PWM Duty Cycle

The following new version of this existing demo is available:

Spectrum Digital F2808 eZdsp: `c2808adcpwmtest.mdl`

- ADC-PWM Synchronization via ADC Interrupt

This is a new demo. The following versions are available:

Spectrum Digital F2812 eZdsp: `c2812adcpwmasynctest.mdl`

Spectrum Digital F2808 eZdsp: `c2808adcpwmasynctest.mdl`

## New Memory Management Features in Real-Time Workshop Embedded Coder

The Embedded Real-Time (ERT) target for the Target for TI C2000 (`ti_c2000_ert.tlc`) offers new memory management features that give you a

way manage the performance of your code while working with limited memory resources. This option requires Real-Time Workshop Embedded Coder.

For more information on this, see the chapter on Memory Sections in the *Real-Time Workshop Embedded Coder User's Guide*.

## Version 1.3 (R14SP3) Target for TI C2000™

This table summarizes what's new in Version 1.3 (R14SP3):

New Features and Changes	Version Compatibility Considerations	Fixed Bugs and Known Problems	Related Documentation at Web Site
Yes Details below	No	Bug Reports at Web site	No

New features and changes introduced in this version are

- “Free-Running Scheduler” on page 20
- “Support for the C2407 Internal Memory Map” on page 21
- “New SCI Blocks” on page 21
- “New SPI Blocks” on page 21
- “New Ramp Control Block” on page 21
- “New Ramp Generator Block” on page 21
- “ADC Enhancements” on page 21
- “CAN Enhancements” on page 21
- “PWM Enhancements” on page 22
- “Simulation Stop Time” on page 22

### Free-Running Scheduler

A new scheduler that does not use any interrupts has been added as an option to the L2407 and F2812 Target Preferences blocks under **CodeGeneration > Scheduler > Algorithm**. Tasks using this scheduler run in priority-based order and execution depends on how fast the task can run.



## **Support for the C2407 Internal Memory Map**

The Internal Memory Map option on the C2407 Target Preferences is now supported. Note that only very small programs will fit into the internal memory of the C2407.

## **New SCI Blocks**

The C24x and C28x libraries now include blocks for receiving and transmitting data via the serial communications interface. Note that, as of Version 2.0, the C28x library has been renamed to C281x.

## **New SPI Blocks**

The C24x and C28x libraries now include blocks for receiving and transmitting data via the serial peripheral interface. Note that, as of Version 2.0, the C28x library has been renamed to C281x.

## **New Ramp Control Block**

A new Ramp Control block for creating a ramp up or ramp down function has been added to the Digital Motor Control library.

## **New Ramp Generator Block**

A new Ramp Generator block for generating ramp output has been added to the Digital Motor Control library.

## **ADC Enhancements**

Support for the following has been added to the ADC blocks:

- Simultaneous sampling mode for c281x-based boards
- Oversampling mode for c281x- and c240x-based boards

## **CAN Enhancements**

Support for nonblocking transmit mode has been added to the CAN blocks.

## **PWM Enhancements**

Support for the following has been added to the PWM blocks:

- Ability to change PWM waveform control logic in real time
- Ability to change deadband period value in real time
- Ability to select units (CPU clock cycles, seconds, or percentages) for PWM period and duty cycle

## **Simulation Stop Time**

In generated code, the Simulink simulation stop time is no longer supported. A simulation stop via a Stop block, however, is honored in the generated code.

## Version 1.2.1 (R14SP2)Target for TI C2000™

This table summarizes what's new in Version 1.2.1 (R14SP2):

New Features and Changes	Version Compatibility Considerations	Fixed Bugs and Known Problems	Related Documentation at Web Site
Yes Details below	No	Bug Reports at Web site	No

New features and changes introduced in this version are described here:

### CAP Blocks

Two blocks for capturing transitions on the capture unit pins have been added  
— C24x CAP and C28x CAP.

## Version 1.2 (R14SP1+) Target for TI C2000™

This table summarizes what's new in Version 1.2 (R14SP1+):

New Features and Changes	Version Compatibility Considerations	Fixed Bugs and Known Problems	Related Documentation at Web Site
Yes Details below	No	Fixed bugs	No

New features and changes introduced in this version are

- “RTDX” on page 24
- “VectorCAN” on page 24
- “DC Motor Speed Control Demo” on page 24
- “Fixed Bugs” on page 25

### RTDX

Two blocks for real-time data exchange (RTDX) support in generated code have been added — From RTDX and To RTDX. RTDX enables data exchange between the host, which hosts TI Code Composer Studio and the target, which hosts your DSP program.

### VectorCAN

Blocks for VectorCAN and CAN message packing and unpacking have been added. VectorCAN blocks configure, read, and transmit CAN channels for use with Vector-Informatik drivers. CAN message packing blocks pack signals into CAN messages.

### DC Motor Speed Control Demo

The new 2812 eZdsp DC Motor Speed Control demo requires the Signal Processing Blockset.

## **Fixed Bugs**

The Target for TI OC2000 includes several bug fixes made since Version 1.1.1. This section describes a particularly important Version 1.2 bug fix.

### **To Memory Block and Contiguous Data**

The To Memory block now verifies that data at its input port is contiguous.

## Version 1.1.1 (R14SP1) Target for TI C2000™

This table summarizes what's new in Version 1.1.1 (R14SP1):

New Features and Changes	Version Compatibility Considerations	Fixed Bugs and Known Problems	Related Documentation at Web Site
No	No	Fixed bugs	No

New features and changes introduced in this version are described here:

### Fixed Bugs

The Target for TI C2000 includes several bug fixes made since Version 1.1. This section describes the particularly important Version 1.1.1 bug fixes.

### CCS Warnings About Custom Data Types

During code compilation for the C2400, Code Composer Studio now processes custom data types defined in the `tmwtypes.h` file correctly, without issuing warnings.

### Custom Code Options in Real-Time Workshop Configuration Parameters Now Supported

The Custom Code options in the Real-TimeWorkshop Configuration Parameters are now supported. This allows you to add additional files and paths to the build process. It also supports inserting custom C code into specific sections of your code.

### Deadband Theoretical Results Updated in TI Documentation

The deadband values (settable via the PWM Blocks) were not explained sufficiently in the Texas Instruments documentation. This information has been updated on page 2-4 of Texas Instruments document SPRU065B, TMS320F28x Event Manager (EV) Peripheral Reference Guide. This document can be downloaded from the Texas Instruments Web site <http://www.ti.com/>.

## **First Time Opening Target Preference Block Shows Correct Inspector GUI**

When you double-click the Target Preference block for the first time in a given model, the Inspector page now appears correctly.

## **Simulation Stop Times Match in Simulation and Generated Code**

When the simulation stop time is less than infinity, the effective stop time in simulation now matches the effective stop time in the generated code.

## **Upgrading from an Earlier Release**

This section describes an upgrade issue involved in moving from the Target for TI C2000 1.1 to Version 1.1.1.

## **Space Vector Generator Inputs Renamed**

The input parameters to the Space Vector Generator block have been renamed from Va and Vb to Ua and Ub, respectively. This change matches the terminology used in Texas Instruments documentation.

## Version 1.1 (R14) Target for TI C2000™

This table summarizes what's new in Version 1.1 (R14):

New Features and Changes	Version Compatibility Considerations	Fixed Bugs and Known Problems	Related Documentation at Web Site
Yes Details below	No	Fixed bugs	No

New features and changes introduced in this version are

- “New DMC Library” on page 28
- “New C28x Blocks” on page 29
- “New C24x Blocks” on page 29
- “Enhancements to Other Blocks” on page 29
- “Fixed Bugs” on page 29

### New DMC Library

A new digital motor control (DMC) library has been added to support C28x boards. This library contains these blocks:

- Clarke Transformation — transforms three-phase into two-phase quadrature quantities
- Inverse Park Transformation — transforms rotating reference frame vectors to two-phase stationary reference frame
- Park Transformation — transforms two-phase stationary system vectors to rotating system vectors
- PID Controller — creates a digital PID controller
- Space Vector Generator — calculates duty ratios to generate stator reference voltage
- Speed Measurement — calculates motor speed



## **New C28x Blocks**

The following new blocks have been added to support C28x boards:

- C28x GPIO Digital Input — configures the General Purpose I/O pin registers for digital input
- C28x GPIO Digital Output — configures the General Purpose I/O pin registers for digital output
- C28x QEP — configures the quadrature pulse encoder circuit

## **New C24x Blocks**

The following new blocks have been added to support C24x boards:

- C24x GPIO Digital Input — configures the General Purpose I/O pin registers for digital input
- C24x GPIO Digital Output — configures the General Purpose I/O pin registers for digital output
- C24x QEP — configures the quadrature pulse encoder circuit

## **Enhancements to Other Blocks**

The C24x and C28x ADC blocks have been enhanced by adding a triggering mode option which synchronizes the ADC with a PWM waveform generated by the same event manager module.

## **Fixed Bugs**

The Target for TI C2000 includes several bug fixes made since Version 1.0. This section describes the particularly important Version 1.1 bug fixes.

### **ADC Block Accuracy**

When the C28x ADC high-speed peripheral clock rate was equal to the system clock rate, A/D conversion results were not accurate. This has been fixed by setting the ADC core clock divider to 1 to halve the high-speed peripheral clock rate.

### **EMIF Setting Changed to Reduce Wait States**

When full memory map is used with the F2812 eZdsp, extra wait states were included for external memory banks. This did not allow for the fastest code execution speed possible with the external memory type used with the F2812 eZdsp. Unnecessary wait states have been removed to enable fastest code execution speed.

### **Multitasking Solver Mode Now Supported**

In the previous version, only single-tasking solver mode was supported because the generated code did not allow preemption. Multitasking solver mode is now fully supported in the code generated by this version of the Target for TI C2000 DSPs.

### **Previously Unsupported Blocks Now Supported**

The following Signal Processing Blockset blocks are now supported in this version:

- Digital Filter
- Discrete Impulse
- Dyadic Analysis Filter Bank
- Dyadic Synthesis Filter Bank
- FIR Decimation
- FIR Interpolation
- FIR Rate Conversion
- Median
- Multiphase Clock
- Multiport Selector
- Random Source
- Sort
- Two-Channel Analysis Subband Filter
- Two-Channel Synthesis Subband Filter

- Variable Fractional Delay
- Variable Integer Delay
- Wavelet Analysis
- Wavelet Synthesis

Previous versions of the above blocks are still not supported nor are these blocks:

- Integer Delay (available only in previous versions)
- Singular Value Decomposition (SVD) Solver

## Compatibility Summary for Target for TI C2000™

This table summarizes new features and changes that might cause incompatibilities when you upgrade from an earlier version, or when you use files on multiple versions. Details are provided in the description of the new feature or change.

Version (Release)	New Features and Changes with Version Compatibility Impact
<b>Latest Version V2.3 (R2007b)</b>	See the <b>Compatibility Considerations</b> subheading for this new feature or change: <ul style="list-style-type: none"> <li>• “Compatibility Considerations” on page 5</li> <li>• “Link and Target Products Regrouped in New Start, Help, and Demos Category” on page 4</li> </ul>
Version 2.2 (R2007a)	See the <b>Compatibility Considerations</b> subheading for this new feature or change: <ul style="list-style-type: none"> <li>• “Code Generation Capability Moved to Link for Code Composer Studio™ Development Tools” on page 7</li> </ul>
Version 2.1 (R2006b)	None
Version 2.0 (R2006a)	None
Version 1.3 (R14SP3)	None
Version 1.2.1 (R14SP2)	None
Version 1.2 (R14SP1+)	None

<b>Version (Release)</b>	<b>New Features and Changes with Version Compatibility Impact</b>
Version 1.1.1 (R14SP1)	None
Version 1.1 (R14)	None
Version 1.0 (R13SP1+)	None