Application Note

Development Tool Versions for C2000™ Support

ABSTRACT

Note

The content in this Application Note is no longer maintained in the PDF version of this document. Please refer to the *Development Tool Versions for C2000 Support* web page for the latest updates.

This application report lists the Code Composer Studio™ (CCS) and Compiler versions required to develop applications targeting different C2000 features and devices.

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1 Introduction

Note

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C2000 devices incorporate different features such as a floating-point unit (FPU), Trigonometric Math Unit (TMU) and Viterbi, Complex Math, CRC Unit (VCU) and Control Law Accelerator (CLA). These features impose their own requirements in terms of a specific Code Composer Studio (CCS) and Codegen tools versions. This application report lists the minimum tool versions required to develop applications targeting different features and devices. It also lists the device compatibility with DSP-BIOS and SYS/BIOS.

2 Code Composer Studio

Table 2-1 lists the versions of Code Composer Studio that support different C28x devices. TI always recommends the latest release that supports the device. The following table shows the minimum tool version and what versions have support. In addition to consulting this table, always check for critical updates and bug fixes.

Table 2-1. Required/Recommended CCS Support by Device

Device	CCS 3.3	CCS 4.x[1]	CCS 5.x	CCS 6.x	CCS 7.x	CCS 8.x	CCS9.x
240x	CCS 3.3 + SR12	Not Supported	Not Supported	Not Supported	Not Supported		
281x	CCS 3.3 + SR12	4.1.2 or later	5.1 or later	6.0 or later	7.0 or later	8.0 or later	9.0 or later
280x/2801x/28044	CCS 3.3 + SR12	4.1.2 or later	5.1 or later	6.0 or later	7.0 or later	8.0 or later	9.0 or later
2833x	CCS 3.3 + SR12	4.1.2 or later	5.1 or later	6.0 or later	7.0 or later	8.0 or later	9.0 or later
2834x	CCS 3.3 + SR12	4.1.2 or later	5.1 or later	6.0 or later	7.0 or later	8.0 or later	9.0 or later
2823x	CCS 3.3 + SR12	4.1.2 or later	5.1 or later	6.0 or later	7.0 or later	8.0 or later	9.0 or later
2802x	CCS 3.3 + SR12 + Chip Support Package	4.1.2 or later	5.1 or later	6.0 or later	7.0 or later	8.0 or later	9.0 or later
2802x0	Not Supported		CCS 5.2	6.0 or later	7.0 or later	8.0 or later	9.0 or later
2803x no Control Law Accelerator (CLA)	CCS 3.3 + SR12 + Chip Support Package	4.1.2 or later	5.1 or later	6.0 or later	7.0 or later	8.0 or later	9.0 or later
2803x with CLA	Requires Full install [2]	4.1.2 or later (CLA debug/ disassembly support added in v4.02)	5.1 or later	6.0 or later	7.0 or later	8.0 or later	9.0 or later
2805x	Not Supported	Not Supported	5.2 or later	6.0 or later	7.0 or later	8.0 or later	9.0 or later
2806x	Not Supported	CCS 4.2.3 or later	5.1 or later	6.0 or later	7.0 or later	8.0 or later	9.0 or later
F28M35x	Not Supported	Not Supported	CCS 5.5 or later	6.0 or later	7.0 or later	8.0 or later	9.0 or later
F28M36x	Not Supported	Not Supported	CCS 5.5 or later	6.0 or later	7.0 or later	8.0 or later	9.0 or later
2837xD, 2837xS, 2807x	Not Supported	Not Supported	CCS 5.5 + patch • XDS510USB, XDS100v2 and XDS200 are supported • Blackhawk USB2000 requires CCS 5.5 + patch • Spectrum Digital XDS510LC is not supported	6.0 or later	7.0 or later	Product Change Notice (PCN) 20180523001.1 and PCN 20200115000.2 require CCSv8.3.1 for 32-bit Windows systems	Product Change Notice (PCN) 20180523001.1 and PCN 20200115000.2 require CCSv9.0 or higher for 64-bit Windows systems

Table 2-1. Required/Recommended CCS Support by Device (continued)

Device	CCS 3.3	CCS 4.x[1]	CCS 5.x	CCS 6.x	CCS 7.x	CCS 8.x	CCS9.x
28004x	Not Supported	Not Supported	Not Supported	6.2.0.00050 + Patch or later • CCSv7.0 or newer is recommended!	7.0 + Patch or later • XDS100v2, XDS200, and XDS560 are supported • Spectrum Digital XDS510USB is not supported	8.0 or later	9.0 or later
2838x	Not Supported	Not Supported	Not Supported	Not Supported	Not Supported	Not Supported	9.0 or later

(1) While earlier versions of CCS 4 can have support for the device or feature, many improvements are made in revision 4.1.2. In general, using the latest revision is recommended. For more information, see the CCS V4 wiki.
(2) For CLA support information, click here.

3 Codegen Tools Versions

Table 3-1 lists the versions TI Codegen Tools that support different C28x devices. TI always recommends the latest release that supports the device. The following table shows the minimum tool version and what versions have support. In addition to consulting this table, always check for critical updates and bug fixes.

If you have CCS, the best method for obtaining new compiler releases is by checking for updates within CCS. With a CCS license, this method gives access to more compilers. For more information, see C2000 code generation tools - compiler.

Table 3-1. Required or Recommended Codegen Tools Versions by Device

Device	Codegen Tools
281x	Latest release is recommended(1)
280x/2801x/28044	Latest release is recommended(1)
2833x	The 32-bit floating-point unit (FPU) requires Codegen 5.0 or later with the compiler switch --float_support=fpu32
2834x	The 32-bit FPU requires Codegen 5.0 or later with the compiler switch --float_support=fpu32
2823x	Latest release is recommended(1)
2802x	Latest release is recommended(1)
2803x no CLA	Latest release is recommended(1)
2803x with CLA	• If the CLA code is in assembly only: requires Codegen V5.2.0 or later with the --cla_support=cla0 compiler switch • If the CLA code is in C or C & assembly: requires Codegen 6.1.0 or later with the --cla_support=cla0 compiler switch
2805x	Recommend 6.1.0 or later. Specific requirements are as follows: • If the CLA code is in assembly only: requires Codegen V5.2.0 or later with the --cla_support=cla0 compiler switch • If the CLA code is in C or C & assembly: requires Codegen 6.1.0 or later with the --cla_support=cla0 compiler switch
2806x	Recommend 6.1.0 or later. Specific requirements are as follows: • VCU type 0 requies Codegen V6.0.1 or later with the --vcu_support=vcu0 compiler switch • CLA type 0 assembly only: requires Codegen V5.2.0 or later with the --cla_support=cla0 compiler switch • CLA type 0 C or C & assembly: requires Codegen V6.1.0 or later with the --cla_support=cla0 compiler switch • 32-bit FPU requires Codegen V5.0 or later with the compiler switch --float_support=fpu32
F28M35x, F28M36x	C28x: Recommend 6.0.1 or later. Specific requirements are as follows: • VCU type 0 requies Codegen V6.0.1 or later with the --vcu_support=vcu0 compiler switch 32-bit • FPU requires Codegen V5.0 or later with the compiler switch --float_support=fpu32
2802x0	Latest release is recommended(1)
2837xD, 2837xS, 2807x	6.2.4 or later. Specific requirements are as follows: • VCU type 2 requires Codegen V6.2.4 or later with the --vcu_support=vcu2 compiler switch • CLA type 1 C or C and assembly: requires Codegen V6.2.4 or later with the --cla_support=cla1 compiler switch • 32-bit FPU requires Codegen V5.0 or later with the compiler switch --float_support=fpu32 • Trigonometric Math Unit (TMU) requires Codegen V6.2.4 or later with the compiler switch --tmu_support=tmu0 • Starting with C2000Ware v2.00.00, applications and libraries transitioned to EABI. All new features and enhancements moving forward are supported in EABI format only
28004x	16.9.1.LTS or later. Specific requirements are as follows: • CLA type 2 C or C and assembly: requires Codegen V16.9.1.LTS or later with the --cla_support=cla2 compiler switch • Driver Library Byte Peripheral intrinsic support • Starting with C2000Ware v2.00.00, applications and libraries transitioned to EABI. All new features and enhancements moving forward are supported in EABI format only

Table 3-1. Required or Recommended Codegen Tools Versions by Device (continued)

Device	Codegen Tools
2838xD/2838xS	Compiler version 18.12.1.LTS and later. Specific requirements are as follows: • FPU64: --float_support=fpu64 • Fast Integer Division: --idiv_support=idiv0 • Applications and libraries supported in EABI format only

(1) The Fixed-point 28x core is supported by all Codegen Tool versions. Checking for updates is recommended and, if the development cycle allows, using the latest version is also recommend. New features and bug fixes are continuously added.
Older compilers are more likely to not work well with new versions of Code Composer Studio.
Likewise, newer versions of the compiler are less likely to work well with CCS 3.3.
Codegen tool updates are separate from service releases or chip support packages.

4 SYS/BIOS and DSP/BIOS Versions

Table 4-1 lists the minimum versions of DSP/BIOS and SYS/BIOS that support different C28x devices. The recommended version is always the latest release that supports the device. In addition to consulting this table, always check for critical updates and bug fixes.

Table 4-1. Required/Recommended DSP/BIOS and SYS/BIOS Support by Device

Device	DSP/BIOS 5	SYS/BIOS 6
240x	Not Supported	Not Supported
281x	5.41.02.14 or later(4)	Recommend: 6.32 or later(5)
280x/2801x/28044	5.41.02.14 or later(4)	Recommend: 6.32 or later(5)
2833x	5.41.02.14 or later(1) (4)	Recommend: 6.32 or later(3) (5)
2834x	5.41.02.14 or later(1) (4)	Recommend: 6.32 or later(5)
2823x	5.41.02.14 or later(4)	Recommend: 6.32 or later(5)
2802x	5.41.02.14 or later(2) (4)	Recommend: 6.32 or later(5)
2803x	5.41.02.14 or later(2) (4)	Recommend: 6.32 or later(5)
2805x	5_41_12_40 or later	6_33_02_31 or later
2806x	5.41.10.36 or later	6.32 or later
28M35x	Not Supported	6.32.03.43 or later
2837xD	Not Supported	• If using the ROM image of SYS/BIOS then use SYS/BIOS 6.37.01.04 with XDCtools 3.25.05.94 • IPC for F2837xD are supported in TI-RTOS version 2.10.01, available by the end of November 2014
2837xS	Not Supported	• If using the ROM image of SYS/BIOS then use SYS/BIOS 6.37.05 • If not using the ROM image of SYS/BIOS, then use 6.41.00 or later
2807x	Not Supported	• If using the ROM image of SYS/BIOS then use SYS/BIOS 6.37.05 • If not using the ROM image of SYS/BIOS, then use 6.41.00 or later
28004x	Not Supported	• If using the ROM image of SYS/BIOS then use SYS/BIOS 6.42.01.10 • If not using the ROM image of SYS/BIOS, then use 6.45.00.20 or later
2838xD/2838xS	Not Supported	v6.76.01.12 or later

(1) There is a critical C28x fix for FPU code in 5.33.03. SDOCM00050676 dispatcher for 2833x saves 'RB' register with interrupts enabled -- can cause random app failure.
(2) 5.33.06 Fixed: SDOCM00059875 Kernel Object View results in message "DSP/BIOS not initialized" on 2802x and 2803x devices.
(3) ezdsp28335 users are recommended to use f28335dspbios.gel file supplied with CCSv4 to connect and load any BIOS example programs that require external memory.
(4) 5.41.02.14: Earlier versions have a critical NMI race condition that is fixed in this patch. SDOCM00064320 28x - NMI can cause race condition in BIOS 5 kernel (small code window where user can not return from NMI safely)
(5) Support was added in 6.20, but significant enhancements were made in SYS/BIOS 6.32 to better support 28x devices. See SYS/BIOS for the 28x for more information.

5 References

- Texas Instruments, Code Generation Tools for Texas Instruments Processors

6 Revision History

NOTE: Page numbers for previous revisions may differ from page numbers in the current version.

Changes from Revision * (August 2019) to Revision A (June 2024)	Page
• Added note at the beginning of the *Abstract* and *Introduction* section	1
• Updated the numbering format for tables, figures and cross-references throughout the document	2
• Updates are made in Section 2	3

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