HaLCoGen Release Notes

Contents

List of Tables

Trademarks

SafeTI is a trademark of Texas Instruments.
Cortex is a registered trademark of Arm Limited (or its subsidiaries) in the US and/or elsewhere.
All other trademarks are the property of their respective owners.

1 New in This Release

- Bug fix release. See fixed in this release.

NOTE: For all HALCoGen FreeRTOS-based projects used with CCS 5 or earlier, in the Compiler options under Advanced Options → Language Options → Enable support for GCC Extension (--gcc). For CCS6 or later, this option is ignored.

NOTE: For the TMS570LC43x and RM57x family of devices, safety functions are supported only in the SafeTI™ Diagnostic Library version 2.x.y, which can be installed along with HALCoGen 4.01.00 or later.

For using the SafeTI Diagnostic Library with HALCoGen, see the Examples → example_SafetyLib.c in the following Help file located at:
C:\ti\Hercules\HALCoGen\<vXX.YY.ZZ>\help\TMS570LC43x.chm (or)
C:\ti\Hercules\HALCoGen\<vXX.YY.ZZ>\help\RM57Lx.chm.

2 System Requirements

The system requirements for HALCoGen are as follows:

OS	– Windows XP, Windows 7, Windows 10
Memory	– 1GB
Disk Space	– 750 MB

3 Installing HALCoGen

The latest HALCoGen version can also be downloaded from the following link:
http://www.ti.com/tool/HALCoGen.

The tool gets installed in the directory named \HALCoGen\vXX.YY.ZZ where XX.YY is the version number and ZZ is the patch number, if released. Multiple versions can co-exist, although it is advised to use the latest version.

4 Uninstall HALCoGen

HALCoGen can be uninstalled one version at a time. ti → Hercules → HALCoGen → vXX.YY.ZZ → uninstall.exe.

5 Release Contents

This release supports the drivers for the following variants shown in Table 1.

Table 1. Supported Features

Modules	TMS570LS31x/ RM48x	TMS570LS12x/ RM46x	TMS570LS09x/07x/ RM44x	TMS570LS04x/ RM42x	TMS570LC4x/ RM57x
Cortex®-R4	√	√	√	√	√
Cortex-R5	-	-	-	-	√
Cortex-M3	-	-	-	-	-
freeRTOS	√	√	√	√	-
SYSTEM	√	√	√	√	√
PINMUX	√	√	√	√	√
MPU	√	√	√	√	√
PMU	√	√	√	√	√
VIM	√	√	√	√	√
ESM	√	√	√	√	√
Memory Map	√	√	√	√	√
RAM	√	√	√	√	√
FLASH	√	√	√	√	√
GCM/Oscillator	√	√	√	√	√
PLL	√	√	√	√	√
DCC	√	√	√	√	√
CCM	x	x	x	x	x
PMM	√	√	√	√	√
POM	√	√	-	-	√
EMIF	√	√	-	-	√
PBIST	√	√	√	√	x
LBIST(STC)	√	√	√	√	x
MBIST	√	√	√	√	x
EFUSE	√	√	√	√	x
RTP-IO	√	-	-	-	x
DMM-IO	√	-	-	-	x
ETPWM	-	√	√	-	√
ECAP	-	√	√	-	√
EQEP	-	√	√	√	√
RTI	√	√	√	√	√
GIO	√	√	√	√	√
SCI	√	√	√	√	√
LIN	√	√	√	√	√
SPI	√	√	√	√	√
SPI/MIBSPI	√	√	√	√	√
CAN	√	√	√	√	√
ADC	√	√	√	√	√
HET	√	√	√	√	√
HTU	x	x	x	x	x
I2C	√	√	√	x	√
EMAC	√	√	-	-	√
DMA	√	√	√	√	√
PCR	√	√	√	√	√
EPC	-	-	-	-	√

Table 1. Supported Features (continued)

Modules	TMS570LS31x/ RM48x	TMS570LS12x/ RM46x	TMS570LS09x/07x/ RM44x	TMS570LS04x/ RM42x	TMS570LC4x/ RM57x
NMPU	-	-	-	-	√
USB	- / √	- / √	-	-	-
FlexRay™	x / -	x / -	-	-	x
FTU	x / -	x / -	-	-	x
FEE	√	√	√	√	√

1. √ = Available (throughout the table)
2. x = Not Available (throughout the table)
3. - Not Applicable (throughout the table)

6 Fixed In This Release

Table 2 shows the list of issues fixed in version 04.07.01 from 4.07.00.

Table 2. Fixed in This Release

References	Description	Updates
[HERCULES_SW-5082]	TI_Fee_SuspendResumeErase function does not store and restore FEE_ModuleState	Fixed for this release.
[HERCULES_SW-5083]	FEE Block Header not skipped during CRC calculation	Fixed for this release.
[HERCULES_SW-5084]	No Protection for TI_Fee_MainFunction re-entrancy.	Fixed for this release.
[HERCULES_SW-5702]	vimParityErrorHandler might clear pending pulse interrupt(s)	This is a weak function, application must have their own implementation.
[HERCULES_SW-5703]	EMAC_MII_ENABLE is not set correctly based on RMII/MII Selection in GUI	This checkbox does not affect device pin muxing. Device pin mux should be handled in PINMUX tab.
[HERCULES_SW-5712]	EMAC: EOQ flag not cleared by driver.	EOQ Flag is handled correctly by the EMAC driver generated by HALCoGen.
[HERCULES_SW-5723]	Halcogen 4.06.01 function void trimLPO(voi) in system.c does not follow TRM recommendation	Fixed for this release.
[HERCULES_SW-5729]	HALCOGEN: Wrong version in about menu	Fixed for this release.
[HERCULES_SW-5730]	FREERTOS - link error while calling some FREERTOS APIs	Fixed for this release.
[HERCULES_SW-6008]	getResetSource GCC Naked Attribute should be removed	Fixed for this release.
[HERCULES_SW-6013]	Order of testing of reset causes in getResetSource(void) causes reset events to be lost	Fixed for this release.
[HERCULES_SW-6030]	AJSM unlocking key for TMS570LC43x is not correct	Fixed for this release.
[HERCULES_SW-6033]	HALCoGen: cannot change LIN to slave mode	Fixed for this release.
[HERCULES_SW-6040]	gioGetConfigValue function bug: two register values are swapped with each other.	Fixed for this release.
[HERCULES_SW-6045]	Include workaround for erratum SSWF021#45 related to PLL start-up	Added errata workaround. Fixed for this release.

7 Known Issues and Limitations

Table 3. Summary of Known Issues

7.1 Summary

HERCULES_SW-6074 *The EMAC loopback code generated by HALCoGen does not work.*

Issue details The EMAC loopback example code for TMS570LC43x and RM57Lx devices does not work as expected.

Devices TMS570LC43x, RM57Lx.

Workaround Disabling the cache or changing the SRAM MPU Region 3 setting from Write-Back to Write-Through will solve the problem.

HERCULES_SW-6076 *Include workaround for bug number GCM#60 related to the configuration of VCLK and VCLK2 domain frequencies.*

Issue details To include the workaround for bug number GCM#60. When using HCLK = VCLK2 = VCLK, set the VCLK2R field = 0 first, then set VCLKR = 0, then VCLKR = 1, and finally VCLKR = 0 again. The sequence should be done with a read of CLKCNTL between each write to allow additional clocks for synchronization.

Expected Behavior When using a clock configuration of HCLK = VCLK2 = VCLK, a write to VCLK2R field of CLKCNTL to zero, then a read of CLKCNTL and a write of the VCLKR field to zero will set the proper clock ratios.

Observed Behavior Sometimes, the VCLKR field of CLKCNTL changes to zero, but the VCLK frequency remains HCLK/2. This happens only after an externally asserted nRST. It does not occur after an nPORRST or an internally generated nRST such as from a software reset, internal watchdog reset or oscillator fault reset. It is not an issue when the final VCLK ratio is VCLK = HCLK/2.

Devices TMS570LC43x, RM57Lx, TMS570LS09x/07x and RM44x

Workaround The workaround requires the VCLKx frequencies to be configured in the following sequence only in case of VCLK = VCLK2 = HCLK/1:

```
systemREG1->CLKCNTL = (systemREG1->CLKCNTL & 0xF0FFFFFFU) |
(uint32)((uint32)0U << 24U);

systemREG1->CLKCNTL = (systemREG1->CLKCNTL & 0xFFF0FFFFU) |
(uint32)((uint32)0U << 16U);

systemREG1->CLKCNTL = (systemREG1->CLKCNTL & 0xFFF0FFFFU) |
(uint32)((uint32)1U <<16U);

systemREG1->CLKCNTL = (systemREG1->CLKCNTL & 0xFFF0FFFFU) |
(uint32)((uint32)0U << 16U);
```

HERCULES_SW-6101 *CPU pragma Cortex-R4 used in a Cortex-R5 device.*

Issue details In HL_ajsm.s generated for RM57Lx using HALCoGen, the cpu pragma Cortex-R4 is used, whereas, RM57 MCU has a Cortex-R5 processor.

Devices TMS570LC43x, RM57Lx.

Workaround Change .cpu cortex-r4 to .cpu cortex-r5.

HERCULES_SW-6102 *i2cInterrupt_Communication example code is not displayed in HALCoGen help window.*

Issue details In HALCoGen help window for TMS570LC43, navigate to examples -> example_i2cInterrupt_Communication.c, step 5 in the Help page should normally list the example source code, but it is missing here.

Devices TMS570LC43x, RM57Lx.

Workaround This example code is available in the example_i2cInterruptCommunication.c file present in the examples -> TMS570LC43x folder in the HALCoGen directory.

HERCULES_SW-6103 *Incorrect End of RAM Address in sys_link.ld with RAM size other than 256K using GCC Compiler.*

Issue details When generating HALCoGen drivers using GCC tools, in the sys_link,ld/HL_sys_link.ld (for TMS570LC43x and RM57 devices), the _estack value is set to 0x08040000. This is valid for devices with 256K RAM. But for devices with RAM size other than 256K, this value is incorrect.

Devices TMS570LC43x, TMS570LS12x, RM42x.

Workaround For devices with RAM size 512K, change the _estack value to 0x80800000.

HERCULES_SW-6117 *HALCoGen PINMUX RMII/MII does not generate MDIO/MDCLK.*

Issue details In HALCoGen PINMUX tab, when MII or RMII is selected, it does not generate MDIO or MDCLK and has to be done manually.

Devices TMS570LC43x, TMS570LS04x, TMS570LS12x, TMS570LS31x, RM48x, RM46x, RM57Lx.

Workaround Need to manually select and enable MDIO/MDCLK balls in pinmux tab.

HERCULES_SW-6118 *When one NHET event is checked, the other event should be cleared.*

Issue details In the HET1 and HET2 tab, for edge 0-7 function, there are three NHET events: rising edge, falling and both edges. If one of them is checked, the other should be cleared. The problem is when checking both edges, the rising edge or falling edge cannot be unchecked.

Devices All device platforms

Workaround None required as this is a GUI related issue. The code generated is correct as per the configuration selected.

HERCULES_SW-6131 *Fee_SuspendResume does not work as intended*

Issue details HERCULES_SW-5082 made changes to the store FEE module state and job result in a static variable when the API was called with Suspend_Erase and restored them when the API was called with Resume_Erase. When making this change, the API's behavior was unintentionally changed to only suspend resume if erase was already started. Expected behavior is to suspend resume when erase is ongoing but also to set a global variable to not start Erase until the api was called with Resume_erase.

Devices TMS570LS31x

Workaround It is recommended to not use the Fee_SuspendResumeErase API.

HERCULES_SW-6132 *Fee versions are not compatible*

Issue details HALCoGen FEE version 01.19.03, FEE3.x v01.23.05 and FEE4.x MCAL6.0.0 are not compatible with older versions of FEE driver.

If there is a block with StartProgramBlock(SPB) as status, then old and new FEE drivers process this block differently. Old version skips block size (if the block size was written)/24 bytes to find the next block, whereas, the new version skips 8 bytes and looks for a new block. Assume a sector has a block with StartProgramBlock(SPB) and also have ValidBlock/InvalidBlock after (SPB). Reading this data with new version can lead to loss of some blocks. This change was a part of HERCULES_SW-5715, which makes the above version incompatible with older versions of FEE driver.

Devices TMS570LS31x

Workaround None. Use the same version of FEE driver across all programs to be executed in an application.

8 User Notes

- 02.xx.xx HALCoGen Pjt cannot not be opened in 03.xx.xx or greater HALCoGen versions. You must redo the configuration with the latest HALCoGen.
- Any directory should no more than one HALCoGen project (.hcg and .dil files). Each project should be in an individual directory.
- From HALCoGen Version 3.00.00 onwards, the header files are generated in the include directory and the other driver files in the source directory. You need to set this include path in the 'project include settings' while building it. (In compiler (cl470) add option → "--include path (path)/include").
- When selecting HET2 – Advanced Configuration Mode/Disable Black box, you must make sure the "Select Header File and Source file" inputs are generated out of NHET assembler using option "–n1 –hc32".
- HALCoGen does not delete any files placed/generated under source or include folder generated by HALCoGen.
- To use USB drivers in RM48x and RM46x family of devices, enable support for GCC extensions (--gcc) in compiler options.
- If running CPU self test in debug mode, the debug info are lost immediately after the CPU self test. All breakpoints set before the CPU self test are lost.
- CCM self test cannot be run in debug mode.
- HALCoGen must be used with default 100% font size only.
  http://e2e.ti.com/support/micCrocontrollers/hercules/f/312/t/184660.aspx
- The following options must be selected under MULTI IDE project to use HALCoGen generated code for GHS.
  - -T < Generated code path >\source\sys_link.cmd
  - -I < Generated code path >\include
  - -no_auto_interrupt_table
  - -e resetEntry

IMPORTANT NOTICE AND DISCLAIMER

TI PROVIDES TECHNICAL AND RELIABILITY DATA (INCLUDING DATASHEETS), DESIGN RESOURCES (INCLUDING REFERENCE DESIGNS), APPLICATION OR OTHER DESIGN ADVICE, WEB TOOLS, SAFETY INFORMATION, AND OTHER RESOURCES “AS IS” AND WITH ALL FAULTS, AND DISCLAIMS ALL WARRANTIES, EXPRESS AND IMPLIED, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT OF THIRD PARTY INTELLECTUAL PROPERTY RIGHTS.

These resources are intended for skilled developers designing with TI products. You are solely responsible for (1) selecting the appropriate TI products for your application, (2) designing, validating and testing your application, and (3) ensuring your application meets applicable standards, and any other safety, security, or other requirements. These resources are subject to change without notice. TI grants you permission to use these resources only for development of an application that uses the TI products described in the resource. Other reproduction and display of these resources is prohibited. No license is granted to any other TI intellectual property right or to any third party intellectual property right. TI disclaims responsibility for, and you will fully indemnify TI and its representatives against, any claims, damages, costs, losses, and liabilities arising out of your use of these resources.

TI’s products are provided subject to TI’s Terms of Sale (www.ti.com/legal/termsofsale.html) or other applicable terms available either on ti.com or provided in conjunction with such TI products. TI’s provision of these resources does not expand or otherwise alter TI’s applicable warranties or warranty disclaimers for TI products.

Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265