



From
CDG-SMT/ESM2

Our Reference
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Schwieberdingen
30 October 2015
No. 1.5

Report

Issue GHS Incident 62980

Topic **Specification of Compiler Options Sets and Patches for
Certification of GHS Compiler
REL v2015.1.7 (Final Release)
for Business Unit CC-AS**

Description

1 Intention

The document describes the configuration and version of the Green Hills compiler as input for the certification process of the Green Hills Compiler to be qualified to build software for systems with ASIL D level classification according to ISO 26262.

The certificate shall cover also the target specific compiler libraries (ASIL-C). The use case linking any code from these libraries shall be covered by the certificate.

The use case of linking object files compiled with different compiler option sets (each covered by the certificate) must be covered by the certificate.

The certificate or accompanying documentation shall provide a list of options (in addition to the ones listed below) that may be added or removed from the option set without violating the certificate.

Only the options in category IV and V – certified options – will be certified by GHS. However, it is completely safe to use all the remaining options from category I to III.

In addition to that, Changing -l -D and warnings/diagnostics are all allowed.

Basic options like -c, -o, -archive are also allowed.

The business unit is using the CC-Cube-Family: RH850/P1x-C

Single devices:

- D1 or P1L-C 512K
- D2 or P1L-C 1M
- D3 or P1M-C 2M
- D4 or P1H-C 4M
- D5 or P1H-C 8M

For all of the mentioned devices, the option -cpu=rh850g3m is recommended.

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2 Abbreviations

CC-AS	Chassis Systems Control – Active Safety
CDG-SMT	Cross Divisional Group – Software, Methods, Tools
ESM	Engineering Software, Methods, Tools

3 System Environment

Windows7 64bit
Windows8 64bit
Windows10 64bit
Windows 2012 Server 64bit

4 Compiler Version

Patched Compiler Version based on Green Hills Software, REL Compiler v2015.1.7 (Final Release)

4.1 Installed Patches

The following patches may or may not be installed during compiler qualification process as they do not change code generated. The content of the patches did not change between version 2015.1.5 and version 2015.1.7.

gadrcalc-v2015.1.4-P01
rle-v2015.1.5p-P03

5 Option Sets:

The order of the options on the command line is in every option set the same: category I, II, III, IV and V

5.1 Option Set1 - Ogeneral:

// category IV - optimization strategies (certified)
-Ogeneral

5.2 Option Set2 - Osize:

// category IV - optimization strategies (certified)
-Osize
-Omax
-Olink
--inline_tiny_functions

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```
// category IV - optimization strategies (certified)
-Ospeed
-Omax
-Olink
--inline_tiny_functions
```

5.4 Common Options in all used option sets (OS1 – OS3):

```
//category I - default options
-registermode=32
-preprocess_special_assembly_files
-ansi
--new_outside_of_constructor
-ignore_debug_references
-nofarcalls
-farcallpatch

// category II - error and warning options
-Wundef
--diag_remark=set_but_not_used--diag_error=undefined_preproc_id
--diag_warning=ghs_pointer_to_larger_alignment--misra_2004=8.1
--diag_warning=nonprototype_function_defined
--diag_suppress=ghs_static_nonprototype_function_defined
--diag_warning=ghs_not_enough_initializers--brief_diagnostics
--no_wrap_diagnostics
--prototype_errors
-Wshadow

// category III - options which do not change the code generated
-map
-MD
-Mn
-Mx
-Mu
-DNDEBUG
-symbol_blacklist_file=filename
-identifier_blacklist_file=filename
-globalcheck=normal
-globalcheck_qualifiers
-link_reject_duplicate_lib_syms
-link_allow_duplicate_ghs_syms
-link_allow_duplicate_ghs_syms
-duplicate_whitelist=whitelist
-mapfile_type=2
-Ml
-no_map_eofn_symbols
-Man
-version_info
-X5310 //extended list file
```

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```
// category V - common options (certified)
-g
-passsource
-preprocess_assembly_files
-asm3g
-cpu=rh850g3m
-dual_debug
--no_commons
-prepare_dispose
-no_callt
-reserve_r2
-ignore_callt_state_in_interrupts
-shorten_loads
-shorten_moves
-sda=all
-large_sda
--short_enum
-misalign_pack
-no_64bit_load_store
-list
-fhard
-delete
-strict_overlap_check
-nostartfiles
-no_rh850_1bit
-X5523
```

5.5 Option Set4 – Ogeneral without shorten loads, shorten_moves:**Option set removed as issue resolved with adding option -X5523 to common options.****5.6 Option Set5 – OS option set**

```
//category I - default options
-nofarcalls
-registermode=32
// category II - error and warning options
-Wshadow
-Wundef
--brief_diagnostics
--no_wrap_diagnostics
--prototype_errors
--quit_after_warnings
// category III - options which do not change the code generated
-c
// category IV - optimization strategies (certified)
-Ogeneral
-Onounroll
// category V - common options (OS5 only) (certified)
```



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```
-cpu=rh850g3m
-fhard
-ignore_callt_state_in_interrupts
-large_sda
-misalign_pack

-nofloatio
-no_callt
-prepare_dispose
-reserve_r2
-shorten_loads
-sda=0
--no_commons
--short_enum
-list
-G
-dual_debug
-dwarf
-X5523
```

6 Version History

Version	Date	Description
1.0	03.09.2015	1. Initial version
1.1	09.09.2015	2. Added sentence about basic options 3. Added name of CC-Cube devices 4. Added option set without shorten_loads (because of GHS DWARF problem) 5. Added OS option set.
1.2	15.09.2015	1. Changed title for common option sets 2. Moved -G -dual_debug -dwarf to category V 3. Added Bugfixpatch v800-v2015.1.5p-P02 4. Added several new 2015.1 features in option set
1.3	17.09.2015	1. Updated patch name: rle-v2015.1.5p-P03 2. Added -no_shorten_moves to OS4
1.4	21.09.2015	1. Updated patch name: mcs-v2015.1.5-P01
1.5	30.10.2015	1. Added option -X5523 to common options and OS5. 2. Removed option set 4 as this is resolved with -X5523. 3. Added chapter numbering