SSP v1.3.3

Renesas Synergy™ Platform
Synergy Software
Synergy Software Package
1. Descriptions of circuits, software and other related information in this document are provided only to illustrate the operation of semiconductor products and application examples. You are fully responsible for the incorporation or any other use of the circuits, software, and information in the design of your product or system. Renesas Electronics disclaims any and all liability for any losses and damages incurred by you or third parties arising from the use of these circuits, software, or information.

2. Renesas Electronics hereby expressly disclaims any warranties against and liability for infringement or any other claims involving patents, copyrights, or other intellectual property rights of third parties, by or arising from the use of Renesas Electronics products or technical information described in this document, including but not limited to, the product data, drawings, charts, programs, algorithms, and application examples.

3. No license, express, implied or otherwise, is granted hereby under any patents, copyrights or other intellectual property rights of Renesas Electronics or others.

4. You shall not alter, modify, copy, or reverse engineer any Renesas Electronics product, whether in whole or in part. Renesas Electronics disclaims any and all liability for any losses or damages incurred by you or third parties arising from such alteration, modification, copying or reverse engineering.

5. Renesas Electronics products are classified according to the following two quality grades: "Standard" and "High Quality". The intended applications for each Renesas Electronics product depends on the product’s quality grade, as indicated below.

   "Standard": Computers; office equipment; communications equipment; test and measurement equipment; home electronic appliances; machine tools; personal electronic equipment; industrial robots; etc.

   "High Quality": Transportation equipment (automobiles, trains, ships, etc.); traffic control (traffic lights); large-scale communication equipment; key financial terminal systems; safety control equipment; etc.

   Unless expressly designated as a high reliability product or a product for harsh environments in a Renesas Electronics data sheet or other Renesas Electronics document, Renesas Electronics products are not intended or authorized for use in products or systems that may pose a direct threat to human life or bodily injury (artificial life support devices or systems; surgical implants; etc.), or may cause serious property damage (space system; undersea repeaters; nuclear power control systems; aircraft control systems; key plant systems; military equipment; etc.). Renesas Electronics disclaims any and all liability for any damages or losses incurred by you or any third parties arising from the use of any Renesas Electronics product that is inconsistent with any Renesas Electronics data sheet, user’s manual or other Renesas Electronics document.

6. When using Renesas Electronics products, refer to the latest product information (data sheets, user’s manuals, application notes, "General Notes for Handling and Using Semiconductor Devices" in the reliability handbook, etc.), and ensure that usage conditions are within the ranges specified by Renesas Electronics with respect to maximum ratings, operating power supply voltage range, heat dissipation characteristics, installation, etc. Renesas Electronics disclaims any and all liability for any malfunctions, failure or accident arising out of the use of Renesas Electronics products outside of such specified ranges.

7. Although Renesas Electronics endeavors to improve the quality and reliability of Renesas Electronics products, semiconductor products have specific characteristics, such as the occurrence of failure at a certain rate and malfunctions under certain use conditions. Unless designated as a high reliability product or a product for harsh environments in a Renesas Electronics data sheet or other Renesas Electronics document, Renesas Electronics products are not subject to radiation resistance design. You are responsible for implementing safety measures to guard against the possibility of bodily injury, injury or damage caused by fire, and/or danger to the public in the event of a failure or malfunction of Renesas Electronics products, such as safety design for hardware and software, including but not limited to redundancy, fire control and malfunction prevention, appropriate treatment for aging degradation or any other appropriate measures. Because the evaluation of microcomputer software alone is very difficult and impractical, you are responsible for evaluating the safety of the final products or systems manufactured by you.

8. Please contact a Renesas Electronics sales office for details as to environmental matters such as the environmental compatibility of each Renesas Electronics product. You are responsible for carefully and sufficiently investigating applicable laws and regulations that regulate the inclusion or use of controlled substances, including without limitation, the EU RoHS Directive, and using Renesas Electronics products in compliance with all these applicable laws and regulations. Renesas Electronics disclaims any and all liability for damages or losses occurring as a result of your noncompliance with applicable laws and regulations.

9. Renesas Electronics products and technologies shall not be used for or incorporated into any products or systems whose manufacture, use, or sale is prohibited under any applicable domestic or foreign laws or regulations. You shall comply with any applicable export control laws and regulations promulgated and administered by the governments of any countries asserting jurisdiction over the parties or transactions.

10. It is the responsibility of the buyer or distributor of Renesas Electronics products, or any other party who distributes, disposes of, or otherwise sells or transfers the product to a third party, to notify such third party in advance of the contents and conditions set forth in this document.

11. This document shall not be reprinted, reproduced or duplicated in any form, in whole or in part, without prior written consent of Renesas Electronics.

12. Please contact a Renesas Electronics sales office if you have any questions regarding the information contained in this document or Renesas Electronics products.

(Note 1) "Renesas Electronics" as used in this document means Renesas Electronics Corporation and also includes its directly or indirectly controlled subsidiaries.

(Note 2) "Renesas Electronics product(s)" means any product developed or manufactured by or for Renesas Electronics.
Renesas Synergy™ Platform

SSP v1.3.3 Release Note

Contents

1. Introduction .............................................................................................................................. 4
2. Release information ...................................................................................................................... 4
3. Synergy MCU groups supported .............................................................................................. 4
4. Software Tools and Hardware Kits used for SSP Testing ........................................................ 4
   4.1 Version Information for Express Logic, Inc. ........................................................................... 5
5. SSP release package and installation information ...................................................................  5
6. Changes from SSP v1.3.2 to SSP v1.3.3 release ..................................................................... 6
   6.1 New or updated features ........................................................................................................... 6
   6.2 New Improvements .................................................................................................................. 6
       6.2.1 GUIX .................................................................................................................................. 6
       6.2.2 NetX .................................................................................................................................. 6
       6.2.3 r_can .................................................................................................................................. 6
       6.2.4 r_cgc .................................................................................................................................. 6
       6.2.5 r_gpt .................................................................................................................................. 6
       6.2.6 r_rspi .................................................................................................................................. 6
       6.2.7 r_sdmmc .............................................................................................................................. 7
       6.2.8 sf_ble .................................................................................................................................. 7
       6.2.9 sf_cellular .......................................................................................................................... 7
       6.2.10 sf_el_tx ............................................................................................................................... 7
       6.2.11 sf_el_ux ............................................................................................................................. 7
7. Summary of bug fixes made since SSP v1.3.2 ....................................................................... 8
   7.1 BSP for SSP Supported Platforms .......................................................................................... 8
   7.2 Crypto/r_sce ............................................................................................................................. 8
   7.3 GUIX integration ...................................................................................................................... 8
   7.4 NetX ....................................................................................................................................... 8
   7.5 r_can ....................................................................................................................................... 9
   7.6 r_cgc ....................................................................................................................................... 9
   7.7 r_flash_hp .............................................................................................................................. 9
   7.8 r_gpt ...................................................................................................................................... 10
   7.9 r_lvd ...................................................................................................................................... 10
   7.10 r_ric ..................................................................................................................................... 10
   7.11 r_rtc ..................................................................................................................................... 10
<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.12</td>
<td>r_sci_i2c</td>
<td>10</td>
</tr>
<tr>
<td>7.13</td>
<td>r_sci_uart</td>
<td>10</td>
</tr>
<tr>
<td>7.14</td>
<td>r_sdmmc</td>
<td>10</td>
</tr>
<tr>
<td>7.15</td>
<td>sf_ble</td>
<td>11</td>
</tr>
<tr>
<td>7.16</td>
<td>sf_cellular</td>
<td>11</td>
</tr>
<tr>
<td>7.17</td>
<td>sf_crypto</td>
<td>11</td>
</tr>
<tr>
<td>7.18</td>
<td>sf_el_gx</td>
<td>12</td>
</tr>
<tr>
<td>7.19</td>
<td>sf_el_ux</td>
<td>12</td>
</tr>
<tr>
<td>7.20</td>
<td>sf_uart_comms</td>
<td>12</td>
</tr>
<tr>
<td>7.21</td>
<td>sf_wifi</td>
<td>13</td>
</tr>
<tr>
<td>8.</td>
<td>Known issues and limitations in SSP v1.3.3 release</td>
<td>14</td>
</tr>
<tr>
<td>8.1</td>
<td>nxd_tls_secure</td>
<td>14</td>
</tr>
<tr>
<td>8.2</td>
<td>r_ric</td>
<td>14</td>
</tr>
<tr>
<td>8.3</td>
<td>r_sci_i2c</td>
<td>14</td>
</tr>
<tr>
<td>8.4</td>
<td>sf_touch_ctsu_slider</td>
<td>14</td>
</tr>
<tr>
<td>8.5</td>
<td>sf_wifi</td>
<td>15</td>
</tr>
<tr>
<td>9.</td>
<td>Known issues and limitations that also impacted SSP v1.3.2 release</td>
<td>15</td>
</tr>
<tr>
<td>9.1</td>
<td>BSP for SSP supported Platforms</td>
<td>15</td>
</tr>
<tr>
<td>9.2</td>
<td>NetX</td>
<td>15</td>
</tr>
<tr>
<td>9.3</td>
<td>nxd_mqtt_client</td>
<td>15</td>
</tr>
<tr>
<td>9.4</td>
<td>nxd_tls_secure</td>
<td>16</td>
</tr>
<tr>
<td>9.5</td>
<td>r_cgc</td>
<td>16</td>
</tr>
<tr>
<td>9.6</td>
<td>r_dac</td>
<td>16</td>
</tr>
<tr>
<td>9.7</td>
<td>r_dac8</td>
<td>16</td>
</tr>
<tr>
<td>9.8</td>
<td>r_flash_hp</td>
<td>17</td>
</tr>
<tr>
<td>9.9</td>
<td>r_sci_spi</td>
<td>17</td>
</tr>
<tr>
<td>9.10</td>
<td>sf_ble</td>
<td>17</td>
</tr>
<tr>
<td>9.11</td>
<td>sf_cellular</td>
<td>17</td>
</tr>
<tr>
<td>9.12</td>
<td>sf_console</td>
<td>18</td>
</tr>
<tr>
<td>9.13</td>
<td>sf_el_ux</td>
<td>18</td>
</tr>
<tr>
<td>9.14</td>
<td>sf_thread_monitor</td>
<td>18</td>
</tr>
<tr>
<td>9.15</td>
<td>sf_wifi</td>
<td>19</td>
</tr>
<tr>
<td>9.16</td>
<td>Synergy Tools</td>
<td>19</td>
</tr>
<tr>
<td>9.17</td>
<td>USBX development</td>
<td>20</td>
</tr>
<tr>
<td>9.18</td>
<td>USBX Device Development</td>
<td>20</td>
</tr>
<tr>
<td>9.19</td>
<td>USBX Host Development</td>
<td>20</td>
</tr>
<tr>
<td>10.</td>
<td>Additional usage notes for SSP v1.3.3</td>
<td>21</td>
</tr>
<tr>
<td>10.1</td>
<td>sf_cellular</td>
<td>21</td>
</tr>
<tr>
<td>10.2</td>
<td>sf_wifi</td>
<td>21</td>
</tr>
</tbody>
</table>
10.3  r_rspi...................................................................................................................................................... 21
10.4  sf_audio_record_adc............................................................................................................................. 21
10.5  sf_wifi..................................................................................................................................................... 22

11.  Complete list of modules available in this release.................................................................................22
12.  Additional technical notes.........................................................................................................................27
1. Introduction

This document describes the release notes for Synergy Software Package (SSP) version 1.3.3.

2. Release information

<table>
<thead>
<tr>
<th>SSP Release Version</th>
<th>v1.3.3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release Date</td>
<td>Jan 22, 2018</td>
</tr>
</tbody>
</table>

Important notices for this release:

The intended audience for this release is Renesas Synergy customers, prospective customers, partners, and support staff.

This release note describes the known issues in SSP v1.3.3 that were identified since the last minor and patch releases SSP v1.3.0 and SSP v1.3.2, respectively. For additional known issues, limitations and usage notes that were previously reported in SSP v1.3.0 and SSP v1.3.2; refer to the respective release notes for these earlier releases. This document is available from the Release Archive tab under the Synergy Gallery SSP section.

3. Synergy MCU groups supported

S7G2, S5D9, S5D5, S3A7, S3A6, S3A3, S124, and S128 groups.

4. Software Tools and Hardware Kits used for SSP Testing

<table>
<thead>
<tr>
<th>Tool</th>
<th>Version</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>e² studio</td>
<td>5.4.0.023</td>
<td>Software development environment. Link: <a href="https://synergygallery.renesas.com/">https://synergygallery.renesas.com/</a></td>
</tr>
<tr>
<td>IAR Embedded Workbench® for Renesas Synergy™</td>
<td>7.71.3</td>
<td>Software development environment. Link: <a href="https://synergygallery.renesas.com/">https://synergygallery.renesas.com/</a></td>
</tr>
<tr>
<td>SSC</td>
<td>5.4.0.023</td>
<td>Synergy Standalone Configurator. Used in combination with IAR EW for Synergy. Link: <a href="https://synergygallery.renesas.com">https://synergygallery.renesas.com</a></td>
</tr>
<tr>
<td>GNU Arm Compiler</td>
<td>eabi-4.9-2015q3-20150921-win32</td>
<td>GNU Arm® compiler GCC_4.9.3.20150529</td>
</tr>
<tr>
<td>IAR Compiler</td>
<td>7.71.1</td>
<td>IAR Arm® compiler toolchain</td>
</tr>
<tr>
<td>PE-HMI1</td>
<td>2.0</td>
<td>Product Example (PE) for Human Machine Interface to evaluate Renesas Synergy™ S7G2 Group MCU</td>
</tr>
<tr>
<td>DK-S124</td>
<td>3.0</td>
<td>Development Kit for Renesas Synergy™ S124 Group MCU</td>
</tr>
<tr>
<td>DK-S7G2</td>
<td>3.1</td>
<td>Development Kit for Renesas Synergy™ S7G2 Group MCU</td>
</tr>
<tr>
<td>SK-S7G2</td>
<td>3.1</td>
<td>Starter Kit for Renesas Synergy™ S7G2 Group MCU</td>
</tr>
<tr>
<td>DK-S3A7</td>
<td>2.0</td>
<td>Development Kit for Renesas Synergy™ S3A7 Group MCU</td>
</tr>
<tr>
<td>PK-S5D9</td>
<td>1.0</td>
<td>Promotion Kit for Renesas Synergy™ S5D9 Group MCU</td>
</tr>
<tr>
<td>DK-S128</td>
<td>1.1*</td>
<td>Development Kit for Renesas Synergy™ S128 Group MCU</td>
</tr>
<tr>
<td>TB-S3A6</td>
<td>1.0*</td>
<td>Kit for Renesas Synergy™ S3A6 Group MCU</td>
</tr>
<tr>
<td>TB-S5D5</td>
<td>1.0*</td>
<td>Kit for Renesas Synergy™ S5D5 Group MCU</td>
</tr>
<tr>
<td>TB-S3A3</td>
<td>1.0*</td>
<td>Kit for Renesas Synergy™ S3A3 Group MCU</td>
</tr>
<tr>
<td>J-Link Software</td>
<td>6.16f</td>
<td>SEGGER J-Link® debug probe is the quasi standard for Arm® Cortex®-M based MCUs.</td>
</tr>
</tbody>
</table>

Note: * Pre-production versions of these kits were used for SSP testing; results with production kits may vary slightly.
4.1 Version Information for Express Logic, Inc.

<table>
<thead>
<tr>
<th>Component</th>
<th>Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>ThreadX®</td>
<td>5.7 SP1</td>
</tr>
<tr>
<td>NetX™</td>
<td>5.9 SP2</td>
</tr>
<tr>
<td>NetX Duo™</td>
<td>5.10 SP2</td>
</tr>
<tr>
<td>NetX Application bundle</td>
<td>5.9 SP2</td>
</tr>
<tr>
<td>NetX Duo Application bundle</td>
<td>5.10 SP2</td>
</tr>
<tr>
<td>USBX™ Host</td>
<td>5.8 SP1</td>
</tr>
<tr>
<td>USBX™ Device</td>
<td>5.8</td>
</tr>
<tr>
<td>FileX®</td>
<td>5.5</td>
</tr>
<tr>
<td>GUIX™</td>
<td>5.4</td>
</tr>
<tr>
<td>TraceX®</td>
<td>5.2.0</td>
</tr>
<tr>
<td>GUIX Studio™</td>
<td>5.4.0</td>
</tr>
<tr>
<td>NetX Secure</td>
<td>5.10 SP3</td>
</tr>
<tr>
<td>NetX Duo MQTT</td>
<td>5.10 SP1</td>
</tr>
</tbody>
</table>

5. SSP release package and installation information

This package contains SSP v1.3.3 patch release.

Before installing SSP, ensure that the following items are installed on your PC:

- Renesas e² studio ISDE v5.4.0.023 (download from Renesas Gallery [https://synergygallery.renesas.com/](https://synergygallery.renesas.com/))
- GNU Arm Compiler (included in Renesas e² studio ISDE v5.4.0.023 installer)

To install the SSP, follow these steps:

1. Download the following items for the SSP Release from Synergy Gallery:
   - SSP_Distribution_1.3.3.zip (SSP Package Installer, including SSP Package)
   - Renesas Synergy Software Package (SSP) v1.3.3 Release Note (r11ut0029eu0100-synergy-sspv133-rel-note.pdf)
2. Unzip the package and run the SSP_Distribution_1.3.3.exe installer.
3. Install the SSP in the root folder of a compatible e² studio installation.

**Note:** The default installation folder for the SSP is C:\Renesas\e2_studio.

SSP documentation is available for download from the Synergy Gallery. Sign in the Synergy Gallery, select the Synergy Software Package section at the top of the page, and then the Documentation or Release Archive tabs to view the Documentation & Support Files available to download.
6. Changes from SSP v1.3.2 to SSP v1.3.3 release

6.1 New or updated features

There are no new features in this release.

6.2 New Improvements

6.2.1 GUIX

Issue ID: 10616

GUIX was upgraded to v5.4 in SSP v1.3.3. Corresponding to this, GUIX Studio has also been upgraded to v5.4. This requires regenerating all GUIX library elements using GUIX Studio v5.4 while upgrading the project to SSP v1.3.3.

Applies to: S7G2 and S5D9 MCU groups

6.2.2 NetX

Issue ID: 8133

NetX and NetX Duo SNTP Client source and destination port numbers can now be configured from the thread stack configuration window.

Applies to: S7G2, S5D9, S5D5

Issue ID: 7714

Default Gateway Address property is now added in the Netx IP. Users can now configure the gateway address from the configuration window.

Applies to: S7G2, S5D9, S5D5

6.2.3 r_can

Issue ID: 8447

If multiple channels have received an error event before a callback is issued, then the callback is only called for the lowest mailbox number. A Read call triggers the next pending callback, if any.

All transmit events call the callback as soon as possible: hence, all pending mailboxes are serviced.

Applies to: All MCUs

6.2.4 r_cgc

Issue ID: 3651

The CGC driver checks the clock parameter by checking both the initial clock configuration and the runtime clock modification.

ICLK ≥ PCLKA ≥ PCLKB, PCLKD ≥ PCLKA ≥ PCLKB, PCLKD ≥ PCLKB.

Applies to: All MCUs

6.2.5 r_gpt

Issue ID: 10124

Interrupt name for GPT now matches everywhere it is used.

Applies to: GPT

6.2.6 r_rspi

Issue ID: 8694

Configurator provides a warning if RSPI bit rate is greater than 30 MHz

Applies to: All MCUs
6.2.7  r_sdmmc  
**Issue ID**: 9586  
Not enabling the DMAC Interrupt when r_dmac is used with r_sdmmc now shows up as an error in the Synergy Configuration tool.

**Applies to**: All MCUs

6.2.8  sf_ble  
**Issue ID**: 10702  
The BLE Framework now uses RL78G1D v1.2.1 BLE stack that is BT 4.2 compliant

**Applies to**: RL78G1D on all Synergy MCUs

6.2.9  sf_cellular  
**Issue ID**: 9932  
Provides a registration check retry count as an ISDE property for Cellular framework. This retry count can be set, depending on the registration time required by the network. The default value is set to 5 retries.

**Applies to**: Cellular framework for NimbeLink CAT1 and CAT3 on all supported Synergy MCUs

**Issue ID**: 10155  
The operator list and operation mode are handled automatically when the modem is authenticated by the network. The user should not update these properties explicitly.

**Applies to**: Cellular Framework for NimbeLink CAT1 and CAT3 on DK-S7G2, DK-S3A7, PK-S5D9, TB-S5D5, TB-S3A6 (Only socket), ADK-S3A3; Synergy MCUs

6.2.10  sf_el_tx  
**Issue ID**: 9740  
The PendSV_Handler in ThreadX source (tx_src) module is written in assembly language to avoid the possibility of a hard fault exception.

**Applies to**: All MCUs

6.2.11  sf_el_ux  
**Issue ID**: 9479  
Only USBX Host CDC-ACM class is supported on S3A6. Other USBX Host classes are not supported due to RAM limitation (32KB) on this device. USBX host CDC-ACM requires a minimum of 29 KB for the USBX pool memory whereas other USBX host classes require more than 32 KB (for details, see USBX usage notes).

**Applies to**: S3A6
7. Summary of bug fixes made since SSP v1.3.2

7.1 BSP for SSP Supported Platforms

Issue ID: 10674
The DAC8 module was not functional on S3A3 due to an error in clearing the module stop bit.
Applies to: S3A3

Issue ID: 10333
The correct number of RAM and ROM wait states are now inserted across all supported ICLK frequencies.
Applies to: S7G2

7.2 Crypto/r_sce

Issue ID: 10746
Crypto HAL interfaceGet API documentation is fixed, it now has better explanation about how to pass the parameters.
Applies to: All supported Synergy MCU Groups.

Issue ID: 10546
interfaceGet() API can gracefully handle any NULL input parameters by returning the specified error code.
Applies to: All supported Synergy MCU Groups

Issue ID: 10392
API implementation documentation is now included in the SSP User’s Manual.
Applies to: S3, S5, S7 MCUs on which AES and RSA key generation functionality is supported.

7.3 GUIX integration

Issue ID: 9964
Whenever the user presses a button with auto-repeat, then moves their finger outside the button boundary, and releases, the button is then locked in an auto-repeat state. The issue was fixed in SSP v1.3.3/GUIX5.4.
Applies to: S7G2 and S5D9 MCU's

Issue ID: 9874
Previously, the gx_system_timer_stop() returned an error if the timer ID is set to zero; however, the API should accept zero to close all timers associated with the input widgets. The issue was addressed in SSP v1.3.3/GUIX5.4.
Applies to: S7G2 and S5D9 MCU groups.

Issue ID: 8195
Module Name: GUIX
Previously, the GUIX pixelmap rotation API, gx_canvas_pixelmap_rotate(), was not functional if 2DG rendering acceleration was enabled. The issue was fixed in SSP v1.3.3/GUIX v5.4.

7.4 NetX

Issue ID: 9982
NetX Duo NAT module in thread stack window now warns the user about required value of “Maximum Physical Interfaces” property.
The minimum value of maximum physical interface property is 2.
Applies to: S7G2, S5D9, S5D5
Issue ID: 8699
Netx and Netx Duo DNS_client internal packet pool size property can now be configured from thread stack configuration window.
Applies to: S7G2, S5D9, S5D5

Issue ID: 8544
NetX SNTP NX_SNTP_CLIENT_MAX_ROOT_DISPERSION option has been provided. Users can configure this option from the configuration window.
Applies to: S7G2, S5D9, S5D5

Issue ID: 9123
The incorrect footer description of Netx and Netx Duo properties for TCP layer has been fixed.
Applies to: S7G2, S5D9, S5D5

7.5 r_can
Issue ID: 9184
Corrected a timing issue in the CAN interrupt handlers that could result in the incorrect mailbox being reported for transmit and error interrupts.
Applies to: All MCUs.

7.6 r_cgc
Issue ID: 8678
System Clock source can now be 48 MHz HOCO. Previously this configuration would fail and the MCU would remain running at the MOCO clock rate.
Applies to: S3A3, S3A7 MCUs

7.7 r_flash_hp
Issue ID: 10736
Calling R_FLASH_HP_StartUpAreaSelect() with is_temporary set to false now returns SSP_SUCCESS as expected. The request to modify the startup block will be successful.
Applies to: S5 MCUs

Issue ID: 10839
If the generated FCLK being supplied is < 4 MHz, SSP_ERR_FCLK is returned as expected.
Applies to: S3A3 and S3A6 MCUs

Issue ID: 8098
Code flash and Data flash are in two separate regions of memory. Previously, the code only checked that the call only read data before the start of code flash and the end of data flash. Now, the code checks that the data is either all within code flash or all within data flash.
Applies to: S3A7, S124, S128
7.8  r_gpt

**Issue ID:** 9107

In GPT one shot mode, a second shorter pulse used to be generated since the ISR is not serviced fast enough to turn off the timer. This has been resolved. The driver has also been enhanced to support the GPT one-shot mode with compare match and buffer registers, without relying on ISR to stop the counter. This removes the minimum pulse width limitation imparted by ISR.

**Applies to:** All MCUs.

7.9  r_lvd

**Issue ID:** 9868

LVD Monitor 1 and 2 values of vdet1 and vdet2 are now included for S5D5 and S5D9 processors. These values are visible on the drop-down menu on the Configurations tab in e² studio and IAR EW for Synergy.

**Applies to:** S5D5 and S5D9

7.10  r_riic

**Issue ID:** 9911

Issue of Lockup in r_riic, due to the occurrence of timeout event, is addressed in this release.

**Applies to:** All MCUs.

7.11  r_RTC

**Issue ID:** 9679

The RTC configurator tab has a constraint, the Carry interrupt priority must be enabled and cannot be in 'disabled' state. Leaving this interrupt priority disabled causes the configurator window to show a red box warning.

**Applies to:** All MCUs

7.12  r_sci_i2c

**Issue ID:** 10635

Resolved the issue of hanging and unresponsive threads due to the disabling of interrupts and clearing flags before configuring the priority and vector_info of the interrupts in the sci_i2c.

**Applies to:** All MCUs.

7.13  r_sci_uart

**Issue ID:** 10175

FIFO Overrun issue at 921.6 Kbps is fixed.

**Applies to:** All MCUs.

7.14  r_sdmmc

**Issue ID:** 10313

The r_sdmmc driver no longer attempts to set high-speed mode in devices that do not support high-speed mode.

**Applies to:** S7G2, S5D9, S5D5, S3A7, S3A6, S3A3
7.15 sf_ble

**Issue ID:** 10007

BLE GAP Authorization is supported by the BLE Framework. With this support, the profile based security is also supported by the BLE framework.

**Applies to:** RL78G1D on all MCUs

7.16 sf_cellular

**Issue ID:** 10568

PPP configuration parameters in ISDE properties for NX PPP Common and NXD PPP common are now provided.

**Applies to:** NimbeLink CAT1 and CAT3 on DK-S7G2, DK-S3A7, PK-S5D9, TB-S5D5, TB-S3A6 (Only socket), ADK-S3A3, Synergy MCUs

**Issue ID:** 10029

The warning has been removed; users will not see any warning in compilation.

**Applies to:** Cellular Modules on all supported MCUs

**Issue ID:** 9878

Fixed the Cellular framework code to return gracefully if the transmit API is called without open.

**Applies to:** Cellular framework for NimbeLink CAT1 and CAT3 on all synergy MCUs

**Issue ID:** 9446

Cellular Framework implementation for NimbeLink CAT1 and CAT3 is now supported and tested on following Synergy kits

- DK-S7G2
- DK-S3A7
- PK-S5D9
- TB-S5D5
- TB-S3A6 (Only socket)

The following modems and networks are used for testing the Cellular framework in this release.

- North America (NL-SW-LTE-TSVG CAT3, Verizon SIM card)
- India (NL-SW-LTE-TEUG CAT3, TATA Docomo and JIO SIM)
- North America (NL-SW-LTE-GELS3-B and NL-SW-LTE-GELS3-C CAT1, Verizon SIM Card)

**Applies to:** NimbeLink CAT1 and CAT3 on DK-S7G2, DK-S3A7, PK-S5D9, TB-S5D5, TB-S3A6 (Only socket), ADK-S3A3 Synergy MCUs

7.17 sf_crypto

**Issue ID:** 10752

In SSP v1.3.2, if memory allocated for internal context buffers is not DWORD aligned, unpredictable behavior may occur. This issue has been addressed in this release.

**Applies to:** S5 and S7 MCUs where the SCE supports HASH functionality.

**Issue ID:** 10707

The "Byte pool name" property is removed from g_sf_crypto thread stack. The Pool name is defined as "g_sf_crypto0_memory_pool" in common declarations within the generated Synergy sources.

**Applies to:** All MCUs except S1 MCU series.
### Issue ID: 10628
A user was experiencing an inconsistent configurator error for RSA key_type for which the bytepool size configuration is not applicable.

This issue was fixed by moving bytepool size verification at compilation time against AES key_type.

**Applies to:** All MCUs except S1 MCU series.

#### 7.18 sf_el_gx

**Issue ID:** 10300

Displaying image with screen rotation angle 90 and 270 using Dave2D is possible now. Previously with the screen rotation angles 90 and 270 was causing artifacts on screen.

**Applies to:** S5D9, S7G2 MCU groups.

**Issue ID:** 10273

Previously, in a graphics application with GUIX and SF_EL_GX, users found that their screen image would collapse if following configurations were made.

- Rotating the screen 90 degrees or 270 degrees
- 2DG engine is not used
- RGB565 or ARGB8888 color format is used

This bug is now fixed in this release.

**Applies to:** S7G2, S5D9 MCUs

**Issue ID:** 8469

Issue of Screen tearing for high resolution images has been resolved.

Also Property, "D/AVE 2D Frame Buffer Cache (Valid if D/AVE 2D Drawing Engine is enabled)," has been added in "GUIX Port on sf_el_gx" component to provide two options: "Enable (Default)" and "Disable." This property provides the user with an option to enable or disable the D/AVE 2D cache.

**Applies to:** S7G2, S5D9

### 7.19 sf_el_ux

**Issue ID:** 9842

SF_EL_UX HCD would not assert the USB bus reset signal for a duration of at least 50 ms if the ThreadX tick time is configured to less than 10 ms per tick. The reset signal duration calculation is updated.

**Applies to:** S7G2, S5Dx and S3Ax MCU group.

**Issue ID:** 6468

Previously in the user application, the user was able to select unsupported USB port (USBHS) for the selected MCU in the Stacks View of XML configurator. The user application would then have compilation build errors. This issue has been fixed; the user is no longer able to select unsupported USB port (USBHS) in the XML configurator.

**Applies to:** All Synergy MCU’s.

### 7.20 sf_uart_comms

**Issue ID:** 9792

The SF_COMMS_LOCK_ALL option in the sf_uart_comms unlock() API did not work in previous releases in that it did not release the transmission or reception mutexes. This issue is now fixed.

**Applies to:** All Synergy MCU’s.
**Issue ID**: 7723
SF_UART_COMMS now aborts the lower level read and write operations when timeout occurs.

**Applies to**: All Synergy MCU’s.

**Issue ID**: 6272
When a timeout occurs before transmission completes the sf_uart_comms write API return value is now SSP_ERR_TIMEOUT instead of SSP_ERR_INTERNAL.

**Applies to**: All Synergy MCU’s.

### 7.21 sf_wifi

**Issue ID**: 10151
While using Synergy WiFi framework with GT202, if provisioningSet() API fails to provision the device in client mode, then provisioningGet() API returns channel number as zero in provisioning information. This issue is fixed.

**Applies to**: GT202 on DK-S7G2, DK-S3A7, PK-S5D9, TB-S5D5, TB-S3A6, ADK-S3A3 Synergy MCUs

**Issue ID**: 10106
GT202 driver scans other SSIDs when device is already connected with an AP.

**Applies to**: GT202 on DK-S7G2, DK-S3A7, PK-S5D9, TB-S5D5, TB-S3A6 (Only socket), ADK-S3A3 Synergy MCUs

**Issue ID**: 10084
Synergy WiFi framework's provisioningSet() API does not fail when SSID name with length 32 bytes is passed as an argument.

**Applies to**: GT202 on DK-S7G2, DK-S3A7, PK-S5D9, TB-S5D5, TB-S3A6 (Only socket), ADK-S3A3 Synergy MCUs

**Issue ID**: 10012
A project that has the sf_wifi on-chip stack component will now compile without any error.

**Applies to**: GT202 on DK-S7G2, DK-S3A7, PK-S5D9, TB-S5D5, TB-S3A6 (Only socket), ADK-S3A3 Synergy MCUs

**Issue ID**: 9885
Synergy WiFi framework provides notification when a client connects with the AP or disconnects from the AP; when the AP is running on the WiFi module.

**Applies to**: GT202 on DK-S7G2, DK-S3A7, PK-S5D9, TB-S5D5, TB-S3A6 (Only socket), ADK-S3A3 Synergy MCUs

**Issue ID**: 9503
WiFi Framework for GT202 is now supported and tested on DK-S7G2, DK-S3A7, PK-S5D9, TB-S5D5, TB-S3A6 (Only socket), ADK-S3A3 Synergy MCUs.

**Applies to**: GT202 on DK-S7G2, DK-S3A7, PK-S5D9, TB-S5D5, TB-S3A6 (Only socket), ADK-S3A3 Synergy MCUs

**Issue ID**: 9158
Projects using the GT202 Synergy WiFi framework, when compiled with GCC optimization level -O0, now function properly.

**Applies to**: GT202 on DK-S7G2, DK-S3A7, PK-S5D9, TB-S5D5, TB-S3A6 (Only socket), ADK-S3A3 Synergy MCUs
8. Known issues and limitations in SSP v1.3.3 release

8.1    nxd_tls_secure

Issue ID: 10639

Unable to establish a secure connection using the TLS protocol to server renesas.dweet.io. The client cannot establish secure connection due to the mismatch in the expected size of the public exponent field (in the root certificate received from the server). The client expects the size of the public exponent field to be 3 bytes; the server sends a 1-byte public exponent field in its certificate.

Applies to: S7G2, S5D9

Workaround: None

8.2    r_riic

Issue ID: 8894

Applications using multiple devices connected on the same channel need to define following macro in the pre-processor settings of your project; otherwise, the project may not build correctly.

SSP_SUPPRESS_ISR_<device_name>

where "device_name" is the name of the additional device connected to the same channel.

For example, if three I²C devices, g_i2c0, g_i2c1 and g_i2c2, are connected on the same channel, then define following two macros in the project pre-processor settings:

#define SSP_SUPPRESS_ISR_g_i2c1
#define SSP_SUPPRESS_ISR_g_i2c2

This issue applies to all peripherals like SPI, I²C, and so on, that use the shared bus between multiple devices and use the HAL driver in the application — sf_i2c, sf_spi, and r_ssi modules.

Applies to: All MCUs

Workaround: None

8.3    r_sci_i2c

Issue ID: 10146

SCI_I2C achieves I²C bit rates less than or equal to configured bit rates.

Applies to: All MCUs.

Workaround: I²C SDA delay (data set-up time) and SCI_I2C source PCLK values can be adjusted to optimize achievable I²C bit rates.

See the SCI section of MCU hardware manual for the relationship between bit rate and PCLK frequency. For details, see the respective slave data sheets regarding minimum SDA delay requirement.

8.4    sf_touch_ctsu_slider

Issue ID: 11190

When slider framework is added in the SSP Configurator, it is marked in red with the message "Requires Capacitive Touch Framework," even though this framework is already added. There is no impact to the project because of this issue. The code generation, build, and functionality are all unaffected by this issue.

Applies to: All MCUs

Workaround: None
8.5 **sf_wifi**

**Issue ID:** 9919

Synergy WiFi Framework Scan API for GT202 may fail intermittently.

**Applies to:** GT202 on DK-S7G2, DK-S3A7, PK-S5D9, TB-S5D5, TB-S3A6 (Only socket), ADK-S3A3 Synergy MCUs

**Workaround:** The application should invoke WiFi Framework Scan API again if it fails.

**Issue ID:** 9876

A project developed using the Synergy WiFi framework will not respond to NetX APIs (the NetX stack hangs) — if the WiFi module is not connected to target platform.

**Applies to:** GT202 on DK-S7G2, DK-S3A7, PK-S5D9, TB-S5D5, TB-S3A6 (Only socket), ADK-S3A3 Synergy MCUs

**Workaround:** Ensure the WiFi module is connected to target platform with the required IOPORT pins correctly configured.

9. **Known issues and limitations that also impacted SSP v1.3.2 release**

9.1 **BSP for SSP supported Platforms**

**Issue ID:** 10664

If a user is using the Trace buffer for debugging AND has data stored in RAM at addresses above 0x20004000, that data will be overwritten by the Trace Buffer when debugging.

**Applies to:** S128 MCU

**Workaround:** The S128 linker script currently allocates 1 kb for the Trace buffer at 0x2000000. This allocation could be removed, freeing up the 1K mistakenly reserved for the Trace Buffer. Using the e2 studio Trace Buffer function will store 1K of trace buffer data, beginning at 0x20004000, so that 1 K of RAM is not used by the application if the Trace Buffer is used for debugging.

9.2 **NetX**

**Issue ID:** 10152

As SNTP Client does not internally keep track of time, if polling interval time exceeds maximum time adjustment allowed, the time update only works the first time and fail thereafter.

**Applies to:** S7G2, S5D9, and S5D5.

**Workaround:** Configure polling interval time less than the maximum time adjustment allowed.

**Issue ID:** 9915

MQTT server closes the connection if the first message received by the server is PUBLISH or SUBSCRIBE, and the packet identifier field in the received message is zero.

**Applies to:** PK-S5D9, DK-S7G2, and Azure IoT hub.

**Workaround:** Ensure that the MQTT client sets the packet identifier to a non-zero value by setting the value of `nxd_mqtt_client_packet_identifier = 1` in the MQTT client code.

9.3 **nxd_mqtt_client**

**Issue ID:** 10581

MQTT API `nxd_mqtt_client_secure_connect()` hangs. This happens when the MQTT client tries to reconnect to a MQTT broker after performing standard MQTT operations, such as publish/subscribe.

**Applies to:** S7G2, S5D9

**Workaround:** None
9.4  **nxd_tls_secure**

**Issue ID:** 10640

Configurator for 'NetX Duo TLS Session' gives XML error.

**Applies to:** S7G2, S5D9

**Workaround:** Delete the 'NetX Duo TLS Session' and add it to the project again

**Issue ID:** 10626

An alert received from remote host is indicated by the return value NX_SECURE_TLS_ALERT_RECEIVED of
nx_secure_tls_session_receive() API. Whenever this API returns NX_SECURE_TLS_ALERT_RECEIVED, it causes
leakage of the packet pool.

Typically memory for packets are allocated from packet pool and freed after packet transmission. In this case, memory
for the packet is allocated from packet pool, but is not freed, leading to packet pool depletion (leakage).

**Applies to:** S7G2, S5D9

**Workaround:** None

9.5  **r_cgc**

**Issue ID:** 10641

The clocks HOCO, MOCO and LOCO are not checked for stabilization after calling the Stop API. This results in the
clocks running even after stopping.

**Applies to:** All MCUs.

**Workaround:** None

**Issue ID:** 10369

If the MCU system clock is configured to run off the HOCO, the MCU operates in high-speed mode resulting in higher
power consumption, regardless of the chosen ICLK frequency.

**Applies to:** All MCUs

**Workaround:** None

9.6  **r_dac**

**Issue ID:** 8749

Selecting voltage reference for D/A conversion has no effect on S7G2 MCU.
On S7G2, the default reference voltage is selected for D/A conversion and does not limit the normal operation of the
R_DAC driver.

**Applies to:** S7G2 MCU.

**Workaround:** None

9.7  **r_dac8**

**Issue ID:** 9895

R_DAC8_Write returns SSP_ERR_OVERFLOW on out-of-range data.

**Applies to:** DAC8, S3A3

**Workaround:** None
9.8  r_flash_hp

**Issue ID:** 8771

Flash HP module: If the module is unable to successfully enter Data Flash P/E mode — something that would only occur if there was a problem associated with the underlying hardware — the software would wait endlessly instead of returning an error code.

Additionally, should an error occur that results in a Flash error ISR being generated — and the error was something that did not set the Command Lock status bit (unlikely) — a callback (providing one was configured) would be generated for the user with an undefined callback event parameter supplied.

**Applies to:** S5 and S7 MCUs

**Workaround:** There is no workaround for the P/E mode failure. This situation, should it occur, indicates a problem with the underlying hardware (extremely unlikely to be encountered).

For the callback issue, the application should be expected to handle an error callback with a supplied event code that may not be accurate, or even a member of the list of possible Flash event codes. The callback is an accurate indication of a Flash Error with respect to the current operation and should be handled as such by the application.

9.9  r_sci_spi

**Issue ID:** 10171

SCI SPI slave functionality is not tested on S5D5 MCU.

**Applies to:** TB-S5D5

**Workaround:** It is recommended to use RSPI driver with TB-S5D5 board for using the SPI slave functionality.

9.10  sf_ble

**Issue ID:** 10859

TX power setting does not work on RL78G1D. Modules are only able to communicate when used in close proximity. This implies that the remote device and the RL78G1D module have to be close to each other to be able to effectively communicate with each other.

**Applies to:** RL78G1D BLE module on all Synergy MCUs

**Workaround:** None

9.11  sf_cellular

**Issue ID:** 10269

TCP connection is disconnected when downloading file sizes that are 5 MB or greater. Also, the download speed is reduced as the download size increases.

**Applies to:** Cellular Framework for NimbeLink CAT1/CAT3 modules on Verizon Network

**Workaround:** Update the ISDE properties to successfully download files above 5 MB (this will not improve the download rate) by using the following values:

- NetX IP instance pool packet size to 1500 bytes and pool size to 16
- NetX PPP instance pool packet size to 1500 bytes and pool size to 16
- HTTP pool packet size to 1500 bytes and pool size to 200
- HTTP Operation timeout: 60 sec
- TCP Socket window size (bytes) : 10240

**Issue ID:** 10156

Cellular framework for NimbeLink CAT3 and CAT1 with private network SIM for Verizon cannot connect to the cellular network.

**Applies to:** NimbeLink CAT3 and CAT1 on all Synergy MCUs with private network SIM for Verizon

**Workaround:** None
9.12 sf_console

Issue ID: 10386

Errors that occur during input character processing (the section of code that updates the read buffer after a character is received successfully) for sf_console are not returned correctly when echo is enabled.

Applies to: All MCUs

Workaround: None

Note: Any error that occurs during this section is likely due to a connection error. This error can cause another related error to be reported from another section of the same function.

Issue ID: 10017

Providing an up arrow key and then an enter key in the console command does not execute the previous command.

Applies to: All MCUs.

Workaround: None

Issue ID: 9443

SF_CONSOLE_Read API returns error value SSP_ERR_OVERFLOW if NULL value is passed for parameter p_dest.

Applies to: All MCUs.

Workaround: None

9.13 sf_el_ux

Issue ID: 10578

DTC interrupt priority has to always be higher than the USBX priority while configuring this setting in the XML configurator; otherwise, the USBX host or device functionality is unpredictable. In some scenarios, the constraint or warning message is missing for the incorrect Interrupt Priority setting of USB peripheral (in the USBX Port HCD/DCD on the sf_el_ux component), if the DTC transfer is used.

Applies to: All MCU's

Workaround: DTC Interrupt priority value should be always set higher than USB interrupt priority when configured in the xml configurator (interrupt priority value of 0 is the highest priority and a value of 15 is the lowest priority).

9.14 sf_thread_monitor

Issue ID: 9435

The framework does not check for error codes returned by the ThreadX API.

Applies to: All MCUs

Workaround: None
9.15 sf_wifi

**Issue ID:** 10883

Synergy WiFi framework provisioningSet() API for GT202 may fail intermittently if the peripheral and I/O pins’ drive capacity are not set to Medium.

**Applies to:** GT202 on DK-S7G2, DK-S3A7, PK-S5D9, TB-S5D5, TB-S3A6 (Only socket), ADK-S3A3 Synergy MCUs

**Workaround:**

When configuring GT202 with the SPI driver on r_rspi: Set the drive capacity of slave select pin, reset pin, and SPI pins (such as MISO, MOSI, RSPCK, and so on) to medium.

When configuring GT202 with the SPI driver on r_sci_spi: Set the drive capacity of slave select pin, reset pin, and SCI pins (such as TXD_MOSI and RXD_MISO, and so on) to medium. Do not change the drive capacity of SCK pin when r_sci_spi driver is used.

**Issue ID:** 10681

WiFi Framework supports only WiFi driver attached over interface 0 for an IP instance.

**Applies to:** All synergy MCUs

**Workaround:** None

9.16 Synergy Tools

**Issue ID:** 9845

e² studio ISDE allows importing projects with spaces (such as, blank characters) in the project name, and this may lead to build errors.

**Applies to:** All MCUs

**Workaround:** Do not rename an existing project with a project name that includes spaces. e² studio does not allow the creation of projects with spaces in the project name)

**Issue ID:** 9517

While debugging projects that include threads with large stack sizes, the RTOS Resources view may stop working when viewing the 'Stacks' tab in the 'RTOS Resources' view, and this stoppage may also cause e² studio to stop responding.

**Applies to:** All MCUs

**Workaround:** If you experience this issue, close and restart e² studio.

In your next debug session, avoid navigating to the 'Stacks' tab in the 'RTOS Resources' view.

**Issue ID:** 9315

In the e² studio I/O Registers view, the FCACHE registers are located at the wrong address for the S3A77C MCU.

**Applies to:** S3A77C MCU

**Workaround:** In the Expressions window, to view the flash cache registers, enter the following: (R_ROMC_Type *) 0x4001C000

**Issue ID:** 9007

When hovering over a keyword to get the context sensitive help, an error message shows up occasionally.

**Applies to:** All MCU

**Workaround:** None
When using high-definition displays, e² studio can have issues on some dialogs. In particular, when using the Synergy project wizard, the user cannot see the link to change the license file.

**Workaround:** To avoid this issue, use a lower resolution to set up this area initially; or, you may be able to tab to the hidden control.

### 9.17 USBX development

**Issue ID:** 10627

The tx_thread_sleep does not assert the desired delay as expected if the ThreadX tick time configuration is set less than 10 ms per tick. It is recommended NOT to change the ThreadX tick time configuration to other than 10 ms to avoid a mismatch in the timing calculation.

**Workaround:** Do not configure the ThreadX tick time to be less than 10 ms in the SSP Configurator.

**Applies to:** All MCU

**Issue ID:** 9166

Current SF_EL_UX - DCD (USBX Port - Device Controller Driver) does not support Transaction Abort.

**Applies to:** All the Synergy MCU groups.

**Workaround:** None.

### 9.18 USBX Device Development

**Issue ID:** 8647

The USB throughput for file read/write operation with USBX Device Class Mass Storage is not consistent and may vary for every measurement time.

**Applies to:** All the Synergy MCU groups

**Workaround:** None

### 9.19 USBX Host Development

**Issue ID:** 9975

In case of a system error (for example, UX_MEMORY_INSUFFICIENT) while the enumeration process is in progress, the USB stack is not clearing the device configuration/interface settings before retrying and this action can cause undesired behavior, like a device removal does not trigger the removal callback to an application.

**Applies to:** All MCUs

**Workaround:** Provide enough memory for the USB stack, as mentioned in the module Usage notes; else this error can result in undesired behavior from the USB stack.
10. Additional usage notes for SSP v1.3.3

10.1 sf_cellular

Issue ID: 9906

NimbeLink CAT1 and CAT3 modules over the Verizon network support a ping data size up to 1470 Bytes only.

Applies to: NimbeLink CAT1 and CAT3 on DK-S7G2, DK-S3A7, PK-S5D9, TB-S5D5, TB-S3A6 (Only socket), ADK-S3A3 Synergy MCUs

Workaround: None

10.2 sf_wifi

Issue ID: 10242

GT202 vendor driver code does not provide API for multicast filtering. The Synergy WiFi framework multicastListAdd() and multicastListDelete() APIs for GT202 module return an error code indicating the feature is not supported (such as, SSP_ERR_UNSUPPORTED).

Applies to: GT202 on DK-S7G2, DK-S3A7, PK-S5D9, TB-S5D5, TB-S3A6 (Only socket), ADK-S3A3 Synergy MCUs

Workaround: None

Issue ID: 9883

While creating a project using the Synergy WiFi framework, the ISDE configurator does not show all the configurable properties in properties window. The ISDE configurator shows only properties which are only configurable for the given WiFi module.

Applies to: GT202 on DK-S7G2, DK-S3A7, PK-S5D9, TB-S5D5, TB-S3A6 (Only socket), ADK-S3A3 Synergy MCUs

Workaround: None.

Issue ID: 8394

Projects using GT202 framework see compilation warnings. All the warnings are in the third-party GT202 driver code. The GT202 framework files do not have any warnings. The warnings should not impact the user applications.

Applies to: GT202 on DK-S7G2, DK-S3A7, PK-S5D9, TB-S5D5, TB-S3A6 (Only socket), ADK-S3A3 Synergy MCUs

Workaround: None.

10.3 r_rspl

Issue ID: 10133

With the GCC optimization level -O3, the RSPI driver shows undesired behavior.

Applies to: S128-DK board.

Workaround: It is recommended to use optimization level -O2 for compilation.

10.4 sf_audio_record_adc

Issue ID: 9471

The existing sf_audio_record_adc framework is not tested on DK-S128 board due to memory constraints.

Applies to: S128 boards.

Workaround: None
10.5  sf_wifi

**Issue ID:** 10855

The GT202 WiFi driver uses 8-bit transfers only. When DTC is used with RSPI driver, 32-bit transfers are required. Due to this issue, when RSPI is used for the WiFi module driver, the DTC components that are auto-filled for the dependencies must be removed.

**Applies to:** All MCUs

**Workaround:** None

11. Complete list of modules available in this release

These modules are available for respective MCUs based on the following criteria:

1. If the core functionality of the module has been tested and works on a MCU, even if they have known bugs, then the module is supported on the MCU.
2. If the core functionality is broken or not tested on a MCU then that module is not supported on the MCU.
3. If a Module has been tested on one of the Synergy MCUs, and it is independent of the underlying MCU hardware or HAL drivers, then the module is supported on all Synergy MCUs on which the underlying driver/framework/stack upon which the module depends on have been completely tested on that MCU.

<table>
<thead>
<tr>
<th>Module Name</th>
<th>SSP Feature</th>
<th>Supported Synergy MCU Groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>BSP</td>
<td>Board Support Package</td>
<td>S124, S128, S3A3, S3A6, S3A7, S5D5, S5D9, S7G2</td>
</tr>
<tr>
<td><strong>Driver</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>r_adc</td>
<td>A/D Converter</td>
<td>S124, S128, S3A3, S3A6, S3A7, S5D5, S5D9, S7G2</td>
</tr>
<tr>
<td>r_agt</td>
<td>Asynchronous General Purpose Timer</td>
<td>S124, S128, S3A3, S3A6, S3A7, S5D5, S5D9, S7G2</td>
</tr>
<tr>
<td>r_cac</td>
<td>Clock Frequency Accuracy Measurement Circuit</td>
<td>S124, S128, S3A3, S3A6, S3A7, S5D5, S5D9, S7G2</td>
</tr>
<tr>
<td>r_can</td>
<td>Controller Area Network</td>
<td>S124, S128, S3A3, S3A6, S3A7, S5D5, S5D9, S7G2</td>
</tr>
<tr>
<td>r_cgc</td>
<td>Clock Generation Circuit</td>
<td>S124, S128, S3A3, S3A6, S3A7, S5D5, S5D9, S7G2</td>
</tr>
<tr>
<td>r_crc</td>
<td>Cyclic Redundancy Check Calculator</td>
<td>S124, S128, S3A3, S3A6, S3A7, S5D5, S5D9, S7G2</td>
</tr>
<tr>
<td>r_ctsu</td>
<td>Capacitive Touch Sensing Unit</td>
<td>S124, S128, S3A3, S3A6, S3A7, S5D5, S5D9, S7G2</td>
</tr>
<tr>
<td>r_dac</td>
<td>Digital to Analog Converter</td>
<td>S124, S3A3, S3A6, S3A7, S5D5, S5D9, S7G2</td>
</tr>
<tr>
<td>r_dac8</td>
<td>8-bit Digital to Analog Converter</td>
<td>S128, S3A3</td>
</tr>
<tr>
<td>r_dmac</td>
<td>Direct Memory Access Controller</td>
<td>S3A3, S3A6, S3A7, S5D5, S5D9, S7G2</td>
</tr>
<tr>
<td>r_doc</td>
<td>Data Operation Circuit</td>
<td>S124, S128, S3A3, S3A6, S3A7, S5D5, S5D9, S7G2</td>
</tr>
<tr>
<td>r_dtc</td>
<td>Data Transfer Controller</td>
<td>S124, S128, S3A3, S3A6, S3A7, S5D5, S5D9, S7G2</td>
</tr>
<tr>
<td>r_elc</td>
<td>Event Link Controller</td>
<td>S124, S128, S3A3, S3A6, S3A7, S5D5, S5D9, S7G2</td>
</tr>
<tr>
<td>r_flash_hp</td>
<td>Flash Memory, High Performance</td>
<td>S5D5, S5D9, S7G2</td>
</tr>
<tr>
<td>r_flash_lp</td>
<td>Flash Memory, Low Power</td>
<td>S124, S128, S3A3, S3A6, S3A7</td>
</tr>
<tr>
<td>r_fmi</td>
<td>Factory Microcontroller Information</td>
<td>S124, S128, S3A3, S3A6, S3A7, S5D5, S5D9, S7G2</td>
</tr>
<tr>
<td>Identifier</td>
<td>Description</td>
<td>Devices</td>
</tr>
<tr>
<td>--------------</td>
<td>-----------------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>r_glcd</td>
<td>Graphics LCD Controller</td>
<td>S5D9, S7G2,</td>
</tr>
<tr>
<td>r_gpt</td>
<td>General Purpose Timer</td>
<td>S124, S128, S3A3, S3A6, S3A7, S5D5, S5D9, S7G2,</td>
</tr>
<tr>
<td>r_gpt_input_capture</td>
<td>General Input Capture</td>
<td>S124, S128, S3A3, S3A6, S3A7, S5D5, S5D9, S7G2</td>
</tr>
<tr>
<td>r_icu</td>
<td>Interrupt Controller Unit</td>
<td>S124, S128, S3A3, S3A6, S3A7, S5D5, S5D9, S7G2</td>
</tr>
<tr>
<td>r_ioint</td>
<td>General Purpose I/O Ports</td>
<td>S124, S128, S3A3, S3A6, S3A7, S5D5, S5D9, S7G2</td>
</tr>
<tr>
<td>r_iwrt</td>
<td>Independent Watchdog Timer</td>
<td>S124, S128, S3A3, S3A6, S3A7, S5D5, S5D9, S7G2</td>
</tr>
<tr>
<td>r_jpeg_decode</td>
<td>JPEG Decode</td>
<td>S5D9, S7G2</td>
</tr>
<tr>
<td>r_jkint</td>
<td>Keyboard Interrupt Interface</td>
<td>S124, S128, S3A3, S3A6, S3A7, S5D5, S5D9, S7G2</td>
</tr>
<tr>
<td>r_lpm†</td>
<td>Low Power Mode</td>
<td>S124, S3A7, S7G2</td>
</tr>
<tr>
<td>r_lpmv2_s124</td>
<td>Low Power Mode V2 for S124</td>
<td>S124</td>
</tr>
<tr>
<td>r_lpmv2_s128</td>
<td>Low Power Mode V2 for S128</td>
<td>S128</td>
</tr>
<tr>
<td>r_lpmv2_s3a7</td>
<td>Low Power Mode V2 for S3A7</td>
<td>S3A7</td>
</tr>
<tr>
<td>r_lpmv2_s5d9</td>
<td>Low Power Mode V2 for S5D9</td>
<td>S5D9</td>
</tr>
<tr>
<td>r_lpmv2_s7g2</td>
<td>Low Power Mode V2 for S7G2</td>
<td>S7G2</td>
</tr>
<tr>
<td>r_lpmv2_s5d5</td>
<td>Low Power Mode V2 for S5D5</td>
<td>S5D5</td>
</tr>
<tr>
<td>r_lpmv2_s3a6</td>
<td>Low Power Mode V2 for S3A6</td>
<td>S3A6</td>
</tr>
<tr>
<td>r_lpmv2_s3a3</td>
<td>Low Power Mode V2 for S3A3</td>
<td>S3A3</td>
</tr>
<tr>
<td>r_lvd</td>
<td>Low Voltage Detection Driver</td>
<td>S124, S128, S3A3, S3A6, S3A7, S5D5, S5D9, S7G2</td>
</tr>
<tr>
<td>r_pdc</td>
<td>Parallel Data Capture Unit</td>
<td>S5D5, S5D9, S7G2</td>
</tr>
<tr>
<td>r_qspi</td>
<td>Quad Serial Peripheral Interface</td>
<td>S3A3, S3A7, S5D5, S5D9, S7G2</td>
</tr>
<tr>
<td>r_rlic</td>
<td>IIC</td>
<td>S124, S128, S3A3, S3A6, S3A7, S5D5, S5D9, S7G2</td>
</tr>
<tr>
<td>r_rlic_slave</td>
<td>IIC Slave</td>
<td>S124, S128, S3A3, S3A6, S3A7, S5D5, S5D9, S7G2</td>
</tr>
<tr>
<td>r_rspi</td>
<td>Serial Peripheral Interface</td>
<td>S124, S128, S3A3, S3A6, S3A7, S5D5, S5D9, S7G2</td>
</tr>
<tr>
<td>r_rtc</td>
<td>Real-time Clock</td>
<td>S124, S128, S3A3, S3A6, S3A7, S5D5, S5D9, S7G2</td>
</tr>
<tr>
<td>r_sci_i2c</td>
<td>Serial Communication Interface I2C</td>
<td>S124, S128, S3A3, S3A6, S3A7, S5D5, S7G2</td>
</tr>
<tr>
<td>r_sci_spi</td>
<td>Serial Communication Interface SPI</td>
<td>S124, S128, S3A3, S3A6, S3A7, S5D5, S5D9, S7G2</td>
</tr>
<tr>
<td>r_sci_uart</td>
<td>Serial Communication Interface UART</td>
<td>S124, S128, S3A3, S3A6, S3A7, S5D5, S5D9, S7G2</td>
</tr>
<tr>
<td>r_sdmmc</td>
<td>SDHI Driver for SDIO and SD/MMC Memory Devices</td>
<td>S3A3, S3A7, S5D9, S7G2</td>
</tr>
<tr>
<td>r_slc1c</td>
<td>Segment LCD Controller</td>
<td>S3A3, S3A6, S3A7</td>
</tr>
<tr>
<td>r_ssi</td>
<td>(Inter-IC Sound) Interface [old: Serial Sound Interface] or r_i2s</td>
<td>S3A3,S3A6, S3A7, S5D5, S5D9, S7G2</td>
</tr>
<tr>
<td>r_wde</td>
<td>Watchdog Timer</td>
<td>S124, S128, S3A3, S3A6, S3A7, S5D5, S5D9, S7G2</td>
</tr>
<tr>
<td>r_sce#</td>
<td>Cryptographic Library (HAL interfaces)</td>
<td>See table note on Cryptographic Functions.</td>
</tr>
<tr>
<td>Framework</td>
<td>Description</td>
<td>Supported Device Codes</td>
</tr>
<tr>
<td>-----------------------------------</td>
<td>------------------------------------------</td>
<td>------------------------</td>
</tr>
<tr>
<td>sf_adc_periodic</td>
<td>Periodic Sampling ADC</td>
<td>S124, S128, S3A3, S3A6, S3A7, S5D5, S5D9, S7G2</td>
</tr>
<tr>
<td>sf_audio_playback</td>
<td>Audio Playback</td>
<td>S124, S3A3, S3A6, S3A7, S5D5, S5D9, S7G2</td>
</tr>
<tr>
<td>sf_audio_playback_hw_dac</td>
<td>Audio Playback HW DAC</td>
<td>S124, S3A3, S3A6, S3A7, S5D5, S5D9, S7G2</td>
</tr>
<tr>
<td>sf_audio_playback_hw_i2s</td>
<td>Audio Playback HW I2S</td>
<td>S3A3, S3A6, S3A7, S5D5, S5D9, S7G2</td>
</tr>
<tr>
<td>sf_audio_record</td>
<td>Audio Record</td>
<td>S3A3, S3A6, S3A7, S5D5, S5D9, S7G2</td>
</tr>
<tr>
<td>sf_ble_r78g1d</td>
<td>BLE Framework</td>
<td>S124, S128, S3A3, S3A6, S3A7, S5D5, S5D9, S7G2</td>
</tr>
<tr>
<td>sf_ble_r78g1d_onboard_profile</td>
<td>BLE Framework Onboard Profiles</td>
<td>S124, S128, S3A3, S3A6, S3A7, S5D5, S5D9, S7G2</td>
</tr>
<tr>
<td>sf_block_media_sdmmc</td>
<td>Block Media Interface for SD Multi Media Card</td>
<td>S3A3, S3A7, S5D9, S7G2</td>
</tr>
<tr>
<td>sf_console</td>
<td>Console</td>
<td>S124, S128, S3A3, S3A6, S3A7, S5D5, S5D9, S7G2</td>
</tr>
<tr>
<td>sf_el_fx</td>
<td>Synergy FileX interface</td>
<td>S3A3, S3A7, S5D5, S5D9, S7G2</td>
</tr>
<tr>
<td>sf_el_gx</td>
<td>Synergy GUIX Interface</td>
<td>S7G2, S5D9</td>
</tr>
<tr>
<td>sf_el_nx</td>
<td>Synergy NetX Interface</td>
<td>S5D5, S5D9, S7G2</td>
</tr>
<tr>
<td>sf_el_nx_comms</td>
<td>Synergy NetX Communication Interface</td>
<td>S5D5, S7G2</td>
</tr>
<tr>
<td>sf_el_ue</td>
<td>Synergy USBX Interface</td>
<td>S124, S128, S3A3, S3A7, S5D5, S5D9, S7G2</td>
</tr>
<tr>
<td>sf_el_ue_comms†</td>
<td>Synergy USBX Communication Interface</td>
<td>S124, S128, S3A3, S3A7, S5D5, S5D9, S7G2</td>
</tr>
<tr>
<td>sf_el_ue_comms_v2</td>
<td>Synergy USBX Communication Interface V2</td>
<td>S124, S128, S3A3, S3A6, S3A7, S5D5, S5D9, S7G2</td>
</tr>
<tr>
<td>sf_external_irq</td>
<td>External Interrupt</td>
<td>S124, S128, S3A3, S3A6, S3A7, S5D5, S5D9, S7G2</td>
</tr>
<tr>
<td>sf_i2c</td>
<td>I2C Framework</td>
<td>S124, S128, S3A3, S3A6, S3A7, S5D5, S5D9, S7G2</td>
</tr>
<tr>
<td>sf_jpeg_decode</td>
<td>JPEG Decode</td>
<td>S5D9, S7G2</td>
</tr>
<tr>
<td>sf_message</td>
<td>Inter-Thread Messaging</td>
<td>S3A3, S3A6, S3A7, S5D5, S5D9, S7G2</td>
</tr>
<tr>
<td>sf_power_profiles†</td>
<td>Power Mode Profile</td>
<td>S124, S3A7, S7G2</td>
</tr>
<tr>
<td>sf_power_profiles_v2</td>
<td>Power Mode Profile V2</td>
<td>S124, S128, S3A3, S3A6, S3A7, S5D5, S5D9, S7G2</td>
</tr>
<tr>
<td>sf_spi</td>
<td>SPI Framework</td>
<td>S124, S128, S3A3, S3A6, S3A7, S5D5, S5D9, S7G2</td>
</tr>
<tr>
<td>sf_tes_2d_drw</td>
<td>2D Drawing Engine Framework</td>
<td>S5D9, S7G2</td>
</tr>
<tr>
<td>sf_thread_monitor</td>
<td>Thread Monitor (Watchdog)</td>
<td>S124, S128, S3A3, S3A6, S3A7, S5D5, S5D9, S7G2</td>
</tr>
<tr>
<td>sf_touch_ctsu</td>
<td>Capacitive Touch Sensing Unit</td>
<td>S124, S128, S3A3, S3A7, S7G2</td>
</tr>
<tr>
<td>sf_touch_ctsu_button</td>
<td>Capacitive Touch Sensing Unit Button</td>
<td>S124, S128, S3A3, S3A7, S7G2</td>
</tr>
<tr>
<td>sf_touch_ctsu_slider</td>
<td>Capacitive Touch Sensing Unit Slider</td>
<td>S124, S128, S3A3, S3A7, S7G2</td>
</tr>
<tr>
<td>sf_touch_panel_i2c</td>
<td>Touch Panel I2C</td>
<td>S5D9, S7G2</td>
</tr>
<tr>
<td>sf_uart_comms</td>
<td>UART Framework</td>
<td>S124, S128, S3A3, S3A6, S3A7, S5D5, S5D9, S7G2</td>
</tr>
<tr>
<td>sf_wifi_gt202</td>
<td>WiFi Framework</td>
<td>S3A3, S3A7, S5D5, S5D9, S7G2</td>
</tr>
<tr>
<td>sf_wifi_gt202_onchip</td>
<td>WiFi framework on Chip Stack</td>
<td>S3A3, S3A7, S5D5, S5D9, S7G2</td>
</tr>
<tr>
<td>----------------------</td>
<td>-----------------------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td>sf_cellular_cat1</td>
<td>Cellular Framework CAT</td>
<td>S3A7, S5D9, S7G2</td>
</tr>
<tr>
<td>sf_cellular_cat1_socket</td>
<td>Cellular Framework CAT Socket</td>
<td>S5D9, S7G2</td>
</tr>
<tr>
<td>sf_cellular_cat3</td>
<td>Cellular Framework CAT</td>
<td>S3A7, S5D9, S7G2</td>
</tr>
<tr>
<td>sf_cellular_cat3_socket</td>
<td>Cellular Framework CAT Socket</td>
<td>S3A7, S5D9, S7G2</td>
</tr>
<tr>
<td>sf_crypto##</td>
<td>Cryptographic Framework</td>
<td>See table note on Framework Interfaces for Cryptographic Functions.</td>
</tr>
</tbody>
</table>

**X-Ware Stacks**

<table>
<thead>
<tr>
<th>fx</th>
<th>FileX</th>
<th>S124, S3A3, S3A6, S3A7, S5D9, S7G2</th>
</tr>
</thead>
<tbody>
<tr>
<td>gx</td>
<td>GUIX</td>
<td>S5D9, S7G2</td>
</tr>
<tr>
<td>nx</td>
<td>NetX</td>
<td>S5D9, S7G2</td>
</tr>
<tr>
<td>nx_auto_ip</td>
<td>NetX Auto IP</td>
<td>S5D9*, S7G2</td>
</tr>
<tr>
<td>nx_bsd</td>
<td>NetX BSD</td>
<td>S5D9*, S7G2</td>
</tr>
<tr>
<td>nx_dhcp_client</td>
<td>NetX DHCP Client</td>
<td>S5D9*, S7G2</td>
</tr>
<tr>
<td>nx_dhcp_server</td>
<td>NetX DHCP Server</td>
<td>S5D9*, S7G2</td>
</tr>
<tr>
<td>nx_dns_client</td>
<td>NetX DNS Client</td>
<td>S5D9*, S7G2</td>
</tr>
<tr>
<td>nx_ftp_client</td>
<td>NetX FTP Client</td>
<td>S5D9*, S7G2</td>
</tr>
<tr>
<td>nx_http_client</td>
<td>NetX HTTP Client</td>
<td>S5D9*, S7G2</td>
</tr>
<tr>
<td>nx_http_server</td>
<td>NetX HTTP Server</td>
<td>S5D9*, S7G2</td>
</tr>
<tr>
<td>nx_pop3</td>
<td>NetX POP3</td>
<td>S5D9*, S7G2</td>
</tr>
<tr>
<td>nx_ppp</td>
<td>NetX PPP</td>
<td>S5D9, S7G2*</td>
</tr>
<tr>
<td>nx_smtp_client</td>
<td>NetX SMTP Client</td>
<td>S5D9*, S7G2</td>
</tr>
<tr>
<td>nx_sntp_client</td>
<td>NetX SNTP Client</td>
<td>S5D9*, S7G2</td>
</tr>
<tr>
<td>nx_telnet_client</td>
<td>NetX Telnet Client</td>
<td>S5D9*, S7G2</td>
</tr>
<tr>
<td>nx_telnet_server</td>
<td>NetX Telnet Server</td>
<td>S5D9*, S7G2</td>
</tr>
<tr>
<td>nx_tftp_client</td>
<td>NetX TFTP Client</td>
<td>S5D9*, S7G2</td>
</tr>
<tr>
<td>nx_tftp_server</td>
<td>NetX TFTP Server</td>
<td>S5D9*, S7G2</td>
</tr>
<tr>
<td>nxd</td>
<td>NetX Duo Stack</td>
<td>S5D9, S7G2</td>
</tr>
<tr>
<td>nxd_auto_ip</td>
<td>NetX Duo Auto IP</td>
<td>S5D9*, S7G2</td>
</tr>
<tr>
<td>nxd_bsd</td>
<td>NetX Duo BSD</td>
<td>S5D9*, S7G2</td>
</tr>
<tr>
<td>nxd_dhcp</td>
<td>NetX Duo DHCP IPv4 Client</td>
<td>S5D9*, S7G2</td>
</tr>
<tr>
<td>nxd_dhcp</td>
<td>NetX Duo DHCP IPv6 Client</td>
<td>S5D9*, S7G2</td>
</tr>
<tr>
<td>nxd_dhcp_server</td>
<td>NetX Duo DHCP IPv4 Server</td>
<td>S5D9*, S7G2</td>
</tr>
<tr>
<td>nxd_dhcp_server</td>
<td>NetX Duo DHCP IPv6 Server</td>
<td>S5D9*, S7G2</td>
</tr>
<tr>
<td>nxd_dns</td>
<td>NetX Duo DNS Client</td>
<td>S5D9*, S7G2</td>
</tr>
<tr>
<td>nxd_ftp_client</td>
<td>NetX Duo FTP Client</td>
<td>S5D9*, S7G2</td>
</tr>
<tr>
<td>nxd_ftp_server</td>
<td>NetX Duo FTP Server</td>
<td>S5D9*, S7G2</td>
</tr>
<tr>
<td>nxd_http_client</td>
<td>NetX Duo HTTP Client</td>
<td>S5D9*, S7G2</td>
</tr>
<tr>
<td>nxd_http_server</td>
<td>NetX Duo HTTP Server</td>
<td>S5D9*, S7G2</td>
</tr>
<tr>
<td>nxd_nat</td>
<td>NetX Duo NAT</td>
<td>S5D9*, S7G2</td>
</tr>
<tr>
<td>nxd_pop3</td>
<td>NetX Duo POP3</td>
<td>S5D9*, S7G2</td>
</tr>
<tr>
<td>nxd_ppp</td>
<td>NetX Duo PPP</td>
<td>S5D9, S7G2*</td>
</tr>
<tr>
<td>nxd_smtp_client</td>
<td>NetX Duo SMTP Client</td>
<td>S5D9*, S7G2</td>
</tr>
<tr>
<td>nxd_sntp_client</td>
<td>NetX Duo SNTP Client</td>
<td>S5D9*, S7G2</td>
</tr>
<tr>
<td>nxd_telnet_client</td>
<td>NetX Duo Telnet Client</td>
<td>S5D9*, S7G2</td>
</tr>
<tr>
<td>nxd_telnet_server</td>
<td>NetX Duo Telnet Server</td>
<td>S5D9*, S7G2</td>
</tr>
<tr>
<td>nxd_tftp_client</td>
<td>NetX Duo TFTP Client</td>
<td>S5D9*, S7G2</td>
</tr>
</tbody>
</table>
## Cryptographic Functions

The following table lists cryptographic functions available for each MCU in this release; these functions are accessible as part of r_sce/cryptographic library.

<table>
<thead>
<tr>
<th>Function</th>
<th>S7G2, S5D9, S5D5</th>
<th>S3A3, S3A7, S3A6</th>
<th>S124, S128</th>
</tr>
</thead>
<tbody>
<tr>
<td>TRNG</td>
<td>Generate and read random number</td>
<td>Generate and read random number</td>
<td>Generate and read random number</td>
</tr>
<tr>
<td>AES</td>
<td>Encryption, decryption</td>
<td>Encryption, decryption</td>
<td>Encryption, decryption</td>
</tr>
<tr>
<td>AES Key Size</td>
<td>128-bit, 192-bit, 256-bit</td>
<td>128-bit, 256-bit</td>
<td>128-bit, 256-bit</td>
</tr>
<tr>
<td>AES Key Type</td>
<td>Plain text / raw key, Wrapped key</td>
<td>Plain text / raw key, Wrapped key</td>
<td>Plain text / raw key</td>
</tr>
<tr>
<td>AES Chaining Modes</td>
<td>ECB, CBC, CTR, GMC, XTS</td>
<td>ECB, CBC, CTR, GMC, XTS</td>
<td>ECB, CBC, CTR</td>
</tr>
<tr>
<td>ARC4</td>
<td>Encryption, decryption</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>TDES</td>
<td>Encryption, decryption</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>TDES Key Size</td>
<td>192-bit</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>TDES Chaining Modes</td>
<td>ECB, CBC, CTR</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>RSA</td>
<td>Signature Generation, Signature Verification, Public-key Encryption, Private-key Decryption</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>RSA Key Size</td>
<td>1024-bit, 2048-bit</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>RSA Key Type</td>
<td>Plain text / raw key, Wrapped key</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>DSA</td>
<td>Signature Generation, Signature Verification</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>DSA Key Size</td>
<td>(1024, 128)-bit, (2048, 224)-bit, (2048, 256)-bit</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>HASH</td>
<td>SHA1, SHA224, SHA256</td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>

* Framework Interfaces for Cryptographic Functions (sf_CRYPTO) available for this release include: HASH, TRNG, and Key Generation (RSA and AES).

† NetX and NetX Duo Applications are MCU-independent application layer protocols depend on the NetX and Ethernet drivers. All MCUs on which NetX has been tested and verified support these protocols.

‡ Indicates a module that is deprecated starting with SSP v1.3.0 and all subsequent versions. Deprecated modules will only be available to maintain compatibility with existing projects that may be using them. It is highly recommended that new projects use the recommended replacements and not use deprecated modules. For details, see the SSP User's Manual.
Experimental modules: Modules that are dependent on a SSP HAL driver module which has been tested and supported on a particular MCU, but the module in itself has not been tested on the MCU, have been identified as experimental module in the following table. These experimental modules are currently not supported by Synergy Configuration tools and use of these modules in customer projects is not supported by Renesas at this time.

<table>
<thead>
<tr>
<th>Experimental Modules</th>
<th>USBX Device Class</th>
<th>Supported MCUs</th>
</tr>
</thead>
<tbody>
<tr>
<td>ux_device_class_cdc_ecm</td>
<td>CDC-ECM</td>
<td>S124, S3A3, S3A7, S5D9, S7G2</td>
</tr>
<tr>
<td>ux_device_class_rndis</td>
<td>RNDIS</td>
<td>S124, S3A3, S3A7, S5D9, S7G2</td>
</tr>
<tr>
<td>ux_host_class_gser</td>
<td>Generic Serial</td>
<td>S3A3, S3A7, S5D9, S7G2</td>
</tr>
<tr>
<td>ux_host_class_printer</td>
<td>Printer</td>
<td>S3A3, S3A7, S5D9, S7G2</td>
</tr>
<tr>
<td>ux_host_class_prolific</td>
<td>Prolific</td>
<td>S3A7, S3A3, S5D9, S7G2</td>
</tr>
<tr>
<td>ux_host_class_swar</td>
<td>Swar</td>
<td>S3A7, S3A3, S5D9, S7G2</td>
</tr>
<tr>
<td>ux_network_driver</td>
<td>Network Driver</td>
<td>S124, S3A3, S3A7, S5D9, S7G2</td>
</tr>
</tbody>
</table>

12. Additional technical notes

All SSP modules are tested using the default configuration settings in the e² studio and IAR EW for Synergy compiler, operation of the modules with other configurations are not guaranteed.


- Additional technical information, including informative papers and articles on SSP and Synergy can be found at Synergy Knowledge Base, [https://en-us.knowledgebase.renesas.com/English_Content/Renesas_Synergy%E2%84%A2_Platform](https://en-us.knowledgebase.renesas.com/English_Content/Renesas_Synergy%E2%84%A2_Platform)
Website and Support

Support:  https://synergygallery.renesas.com/support

Technical Contact Details:

- America:  https://www.renesas.com/en-us/support/contact.html
- Europe:  https://www.renesas.com/en-eu/support/contact.html
- Japan:  https://www.renesas.com/ja-ja/support/contact.html

All trademarks and registered trademarks are the property of their respective owners.
## Revision History

<table>
<thead>
<tr>
<th>Rev.</th>
<th>Date</th>
<th>Description</th>
<th>Page</th>
<th>Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.00</td>
<td>Jan 22, 2018</td>
<td>—</td>
<td>—</td>
<td>Initial release</td>
</tr>
<tr>
<td>1.01</td>
<td>Jan 23, 2018</td>
<td>—</td>
<td>—</td>
<td>Minor corrections to layout</td>
</tr>
</tbody>
</table>
Renesas Synergy™ Platform
SSP v1.3.3 Release Note