Synergy Software Package (SSP) Release Notes

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1. **Introduction**

This document describes the release notes for **SSP software release version 1.1.0-alpha.1**. SSP software was tested on the hardware platforms DK-S3A7, DK-S7G2, DK-S124, SK-S7G2 and PE-HMI1.

2. **Release information**

<table>
<thead>
<tr>
<th>SSP Release Version</th>
<th>1.1.0-alpha.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release Date</td>
<td>22-Feb-2016</td>
</tr>
</tbody>
</table>

**Important notices for this release:**

- Intended audiences for this release are internal developers, AEs, and FAEs, and customers and Renesas partners that want an early preview of upcoming release 1.1.0.
- Support for DK-S124 is limited in this release. Please refer to the table in Section 12 for details.
- Existing projects may not migrate seamlessly to the newer e² studio 5.0 as there are substantial improvements in the way modules are added that may break compatibility. **Users are strongly advised to back up their existing projects before installing e² studio and SSP 1.1.0-alpha.1 preview versions.**
- SSP 1.1.0-alpha.1 is a Technology Preview Release and is not recommend for product development and production, since testing has not been completed and it is not covered by the SSP Warranty and Support. Users are advised to carefully review the information and notices for SSP Preview Releases provided on Synergy Gallery.

3. **MCUs supported**

S7G2 series, S3A7 series, and S124 series.

4. **Compatible and tested tools (software and hardware environment)**

<table>
<thead>
<tr>
<th>Tool</th>
<th>Version</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>e² studio</td>
<td>5.0.0.024</td>
<td>Software development and debugging tool</td>
</tr>
<tr>
<td>GNU ARM Compiler</td>
<td>eabi-4_9-2014q3-</td>
<td>GNU ARM® compiler GCC_4.9.3.20150529. <strong>Please refer to section Known issues and limitations in v1.1.0-alpha.1 release.</strong></td>
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<tr>
<td></td>
<td>20140805-win32</td>
<td></td>
</tr>
<tr>
<td>IAR Compiler</td>
<td>7.40</td>
<td>Software development tool. <strong>Please refer to section Known issues and limitations in v1.1.0-alpha.1 release.</strong></td>
</tr>
<tr>
<td>PE-HMI1</td>
<td>2.0</td>
<td>Product Example (PE) for Human Machine Interface to evaluate the Renesas Synergy™ S7G2 240 MHz ARM® Cortex®-M4 microcontroller. <strong>If you have an older version of this board please refer to section Known issues and limitations in v1.1.0-alpha.1 release.</strong></td>
</tr>
<tr>
<td>DK-S124</td>
<td>1.0</td>
<td>Development Kit for Renesas Synergy™ S124, 32 MHz ARM® Cortex®-M0+ microcontroller in a LQFP64 package</td>
</tr>
<tr>
<td>DK-S7G2</td>
<td>3.0 or higher</td>
<td>Development Kit for Renesas Synergy™ S7G2, 240 MHz ARM® Cortex®-M4 microcontroller in a BGA224 package. <strong>If you have an older version of this board please refer to section Known issues and limitations in v1.1.0-alpha.1 release.</strong></td>
</tr>
<tr>
<td>DK-S3A7</td>
<td>2.0</td>
<td>Development Kit for Renesas Synergy™ S3A7, 48 MHz ARM® Cortex®-M4 microcontroller in a LQFP144 package</td>
</tr>
<tr>
<td>J-Link Software</td>
<td>5.x</td>
<td>Segger J-Link™ debug probe is the quasi standard for ARM® Cortex®-M based MCUs.</td>
</tr>
</tbody>
</table>

Synergy Software Package (SSP) Release Notes
5. Express Logic, Inc. Component version information

<table>
<thead>
<tr>
<th>Component</th>
<th>Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>ThreadX®</td>
<td>5.7</td>
</tr>
<tr>
<td>NetX™</td>
<td>5.8</td>
</tr>
<tr>
<td>NetX Duo</td>
<td>5.9</td>
</tr>
<tr>
<td>USBX™ Host</td>
<td>5.7</td>
</tr>
<tr>
<td>USBX™ Device</td>
<td>5.7</td>
</tr>
<tr>
<td>FileX®</td>
<td>5.2</td>
</tr>
<tr>
<td>GUIX™</td>
<td>5.3.0</td>
</tr>
<tr>
<td>TraceX®</td>
<td>5.2.0</td>
</tr>
<tr>
<td>GUIX™ Studio</td>
<td>5.3.0 Beta2</td>
</tr>
</tbody>
</table>

6. Information for migrating existing projects

**IMPORTANT:** Users must read the “Project Migration Guide - SSP 1.0.0 to SSP 1.1.0-alpha.1” document before installation of e² studio 5.0 and/or SSP 1.1.0-alpha.1 and follow the instructions provided in the document.

Users are strongly advised to back up their existing projects before installing e2 studio and SSP 1.1.0-alpha preview versions.

7. Release package and installation information

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

- Renesas e² studio ISDE v5.0.0.024 (download from Synergy Gallery [https://synergygallery.renesas.com/](https://synergygallery.renesas.com/))
- GNU ARM Compiler (included in Renesas e² studio ISDE v5.0.0.024 installer)

To install the SSP, follow these steps:

1. Download the following items for the SSP Release from Synergy Gallery:
   - SSP_Distribution_1.1.0-alpha.1.zip (SSP Package Installer, including SSP Package, HTML User’s Manual and readme_SSP.txt); MD5 checksum = 28a49d7e70706eb37b21330ee9968f64
   - Release_Notes_SSP_ver1.1.0-alpha.1.pdf
   - Synergy Software Package 1.1.0-alpha.1 User's Manual r01us0171eu0093_synergy_ssp.pdf
   - Project Migration Guide - SSP 1.0.0 to SSP 1.1.0-alpha.1.pdf

2. Unzip the package and run the SSP_Distribution_1.1.0-alpha.1.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.

The SSP Documentation will install by default to ~Renesas\Synergy\SSP_Documentation. You can change the default location during the installation. The following documents will be installed:

- ssp-user-manual-html-v0.93-sspv1.1.0-alpha.zip (HTML version of the SSP user’s manual)
- readme_SSP.txt (critical information and last-minute updates)
- Renesas Synergy™ Software Package (SSP) Developer examples r11an0024eu0100_synergy_ssp.pdf
8. Changes from v1.0.0 to v1.1.0-alpha.1 release

8.1 New features

8.1.1 All modules

8.1.1.1 Description

The ISDE now supports using instance tokens in the module configurator. An instance token allows the configurator to give unique names to instantiated modules when in the past they would have been the same, giving a name duplication error. If you add two identical modules in the ISDE, the names will now be <default_name>0 and <default_name>1 avoiding a naming conflict.

 Applies to: e² studio

8.1.1.2 Description

The ISDE has been updated with a new stack representation view. In order to enable this new view, the module configurator was updated. If you are using an older pack, you must first update to this release to get the new stack view.

 Applies to: e² studio

8.1.2 nx (NetX HTTP, DXN, DHCP, FTP, TFTP, Telnet)

8.1.2.1 Description

NetX BSD Adaptation Layer functionality support provided. The user is advised to use the compiler flag _POSIX_SOURCE when building NetX module sources. No tests were performed on this component.

 Applies to: S7G2, S3A7

8.1.3 nxd (NetX Duo Dual IPv4/IPv6)

8.1.3.1 Description


You must generate and install an updated SSP Development and Production License from the Synergy Gallery in order to view the protected source code for NetX Duo.

 Applies to: S7G2, S3A7

8.1.3.2 Description

If you are using the webserver demo application with the NetX Duo stack and application bundle, you must manually update the files demo_nx_http_application.c and demo_nx_httpserver_query.c files to deselect the ‘nx’ and ‘nx_http_server’ components from the configuration tab and select ‘nxd’ and ‘nxd_http_server’ components in their place.

If you are using the webserver demo application with the NetX Duo stack and application bundle, you must manually update the files demo_nx_http_application.c and demo_nx_httpserver_query.c files.

Replace the following line in demo_nx_http_application.c and demo_nx_httpserver_query.c files:

```
#include "nx_http.h"
```

with

```
#ifdef __PRODUCT_NETXDUO__
#ifndef NX_HTTP_NO_FILEX
#include   "fx_api.h"
#else
#include   "fx_stub.h"
#endif
#endif
```


In the synergy configuration, on the components tab deselect the ‘nx’ and ‘nx_http_server’ components and select ‘nxd’ and ‘nxd_http_server’ components in their place.

** Applies to: ** S7G2, S3A7

### 8.1.4 r_can (Controller Area Network)

#### 8.1.4.1 Description

New module added. The Controller Area Network (CAN) Driver is a generic API for CAN networks. The CAN Driver is implemented on r_can and supports the CAN peripherals available on the Synergy microcontroller hardware.

The module supports the following functions:

- `R_CAN_Open()` - Open function for CAN device.
- `R_CAN_Read()` - Read function for CAN device, non-Blocking.
- `R_CAN_Write()` - Write function for CAN device.
- `R_CAN_Close()` - Close function for CAN device
- `R_CAN_Control()` - Control function for CAN device.
- `R_CAN_InfoGet()` - Get CAN channel info function.
- `R_CAN_VersionGet()` - Version get function for CAN device.

** Applies to: ** PE-HMI1, DK-S7G2, DK-S3A7

### 8.1.5 r_ctsu (Capacitive Touch Sensing Unit)

#### 8.1.5.1 Description

HAL driver for the Capacitive Touch Sensing Unit. The driver supports mutual and self-capacitance modes of operation. No Update to the driver except for adding test cases to test self mode operation. Until then self mode was not tested.

** Applies to: ** The DK-S3A7 and the DK-S7G2 boards do not support capacitive touch buttons.

This was tested by connecting a mutual mode matrix board and a self-mode board to the DK-S3A7. The mutual mode board and self-mode board were taken from the RX113 Capacitive Touch Kit.

#### 8.1.5.2 Description

HAL configuration module that allows the user to perform tuning for any capacitive touch board. This module creates definitions that are required by the Workbench tool to perform the tuning process.

** Applies to: ** The DK-S3A7 and the DK-S7G2 boards do not support capacitive touch buttons.

This was tested by connecting a mutual mode matrix board and a self-mode board to the DK-S3A7. The mutual mode board and self-mode board were taken from the RX113 Capacitive Touch Kit.

### 8.1.6 r_gpt_input_capture (General PWM Timer with Input Capture)

#### 8.1.6.1 Description

The GPT input capture module supports pulse width measurement from external GPT input pins. Callback events are triggered when a pulse is captured or a counter overflow occurs.
Applies to: DK-S7G2, SK-S7G2, PE-HMI1, DK-S3A7

8.1.7  r_lvd (Low Voltage Detection Driver)

8.1.7.1  Description

Low Voltage Detection driver. The LVD driver provides functions for configuring the LVD hardware peripheral. The process of configuring and enabling a Low Voltage Detection monitor has very specific timing constraints and register write ordering. Because of these constraints, the entire process of configuring and enabling a voltage monitor is most effectively performed by a single function. The API function performs configuration and enables the monitor to properly enforce the timing and register write ordering constraints. The LVD driver configures all settings for the available configurable LVD monitors.

Applies to: S3A7, S7G2

8.1.8  r_pdc (Parallel Data Capture Unit)

8.1.8.1  Description

New Module added. This module captures an image from an externally connected camera. This module makes use of the transfer interface.

The module supports the following functions:

- R_PDC_Open() - Power on and configure the PDC peripheral. The PDC PCLKO output is enabled which is required by some camera modules to be running before they can be configured.
- R_PDC_Close() - Power down the PDC peripheral, stop and close the transfer interface, disable interrupts and clear internal data.
- R_PDC_CaptureStart() - Start an image capture from a camera. This function enables interrupts, configures and starts the transfer interface and starts the capture. If a callback is provided then it will be called when the capture completes.
- R_PDC_StateGet() - Provide the current state of the VSYNC and HSYNC pins.
- R_PDC_VersionGet() - Return the version of the driver.

Applies to: DK-S7G2

8.1.9  r_sce (Secure Crypto Engine: TRNG, AES, RSA, TDES, HASH, DSA, ARC4)

8.1.9.1  Description

Added interface API hashUpdate() for HASH functions.

Applies to: PE-HMI1

8.1.9.2  Description

Added the following interface APIs: hashSign() and verifySign() for DSA functions.

Applies to: PE-HMI1

8.1.9.3  Description

Added the following interface APIs: zeroPaddingEncrypt() and zeroPaddingDecrypt() to the AES/GCM mode to process arbitrary sized authentication and encryption data.

Applies to: PE-HMI1, DK-S3A7

8.1.10  r_sci_spi (Serial Communications Interface SPI)

8.1.10.1  Description

Added support for SPI data transfer through DTC in SCI SPI driver. Now data can be transferred over SPI mode or over transfer mode through DTC.

Limitation: SCI SPI performs only 8-bit data transfer, both in DTC and SPI transfer modes.

Applies to: DK-S7G2, DK-S3A7
8.1.11  **r_sci_uart (Serial Communications Interface UART)**

8.1.11.1  **Description**

Added non-FIFO support in SCI UART driver module for S124 devices. The driver will use non-FIFO transfer when using channels 1 and 9 of S124 device, where MCU doesn’t support FIFO data transfer mode.

**Applies to:**  DK-S124

8.1.12  **r_spi (Serial Peripheral Interface)**

8.1.12.1  **Description**

Added support for SPI data transfer through DTC in RSPI driver. Now you can transfer the data over SPI mode or over transfer mode through DTC.

Limitation: Since RSPI transmit receive data registers are 32 bits, RSPI supports only 32-bit data transfer in DTC transfer mode.

**Applies to:**  DK-S7G2, DK-S3A7

8.1.13  **r_ssi (Serial Sound Interface)**

8.1.13.1  **Description**

I2S (Inter IC Sound) audio communication functionality is implemented on the SSI Synergy peripheral. Reading and writing over the I2S protocol in master mode are supported.

**Applies to:**  DK-S7G2, SK-S7G2, PE-HMI1, DK-S3A7

8.1.14  **sf_audio_playback_hw_i2s (Audio Playback HW I2S)**

8.1.14.1  **Description**

An audio framework port for I2S is provided. This allows the existing audio framework to be used with the new SSI driver.

**Applies to:**  DK-S7G2, SK-S7G2, PE-HMI1, DK-S3A7

8.1.15  **sf_touch_ctsu (Capacitive Touch Sensing Unit)**

8.1.15.1  **Description**

Framework support for the Capacitive Touch HAL driver. This module drives the HAL driver at the configured scan rate and allows the user to read touch data.

**Applies to:**  None of the S3 or S7 DK boards have capacitive touch buttons.

This was tested by connecting a mutual mode matrix board and a self-mode board to the DK-S3A7. The mutual mode board and self-mode board were taken from the RX113 Capacitive Touch Kit.

8.1.16  **sf_touch_ctsu_button (Capacitive Touch Sensing Unit Button)**

8.1.16.1  **Description**

Framework support for Capacitive Touch Buttons. This module uses the Capacitive Touch Framework to read the state of configured buttons, perform debouncing and invoke callbacks on button state change.

**Applies to:**  The DK-S3A7 and the DK-S7G2 boards do not support capacitive touch buttons.

This was tested by connecting a mutual mode matrix board and a self-mode board to the DK-S3A7. The mutual mode board and self-mode board were taken from the RX113 Capacitive Touch Kit.

8.1.17  **USBX**

8.1.17.1  **Description**

Added driver functionality to support S124 USB device controller.

**Applies to:**  Not tested in this release.
8.2 Updated features
8.2.1 All drivers
8.2.1.1 Description
Interrupt service routine (ISR) names were updated to reflect ELC event names. The ELC event names had been updated in a previous release, but the ISR names were not. If you have implemented your own ISR, not using an SSP module, then you must update the function’s name.

Applies to: All

8.2.2 bsp (Board Support Package)
8.2.2.1 Description
Added support for the S124 MCU and reorganized how ELC and IPOPORT MCU information is stored within the BSP.

Applies to: DK-S3A7, DK-S7G2, DK-S124

8.2.3 gx (GUIX)
8.2.3.1 Description
Express Logic GUIXTM is updated from v5.2.9 to v5.3.

Applies to: DK-S7G2, SK-S7G2, PE-HMI1, DK-S3A7

8.2.4 r_glcd (Graphics LCD Controller)
8.2.4.1 Description
Some enhancements are made in the module configuration on the Synergy Configuration tool:
- Make the name of frame buffers to be configurable.
- Automatically calculate size of frame buffers from horizontal memory stride, vertical pixel size and color format.

Applies to: DK-S7G2, SK-S7G2, PE-HMI1

8.2.5 r_iic (IIC)
8.2.5.1 Description
Renamed RIIC ISR event names based on the updated ELC event names.

Applies to: DK-S7G2, DK-S3A7

8.2.6 r_lpm (Low Power Mode)
8.2.6.1 Description
The function enterLowPowerMode was changed to lowPowerModeEnter to match coding guidelines.

Applies to: All

8.2.7 r_slcdc (Segment LCD Controller)
8.2.7.1 Description
Modified close function: Reset all segment register values to 0x00 in close function. This will clear the SLCD panel display when close function is called.

Applies to: DK-S3A7

8.2.8 r_spi (Serial Peripheral Interface)
8.2.8.1 Description
Renamed RSPI ISR event names based on the updated ELC event names.

Applies to: DK-S7G2, DK-S3A7
8.2.8.2 Description

Added SPI HAL module version data structure in RSPI driver code. This will help in providing the code and API versions of the driver to error return macro and VersionGet function.

Applies to: DK-S7G2, DK-S3A7

8.2.9 sf_audio_playback (Audio Playback)

8.2.9.1 Description

Audio Playback Framework XML provides Audio Playback Event Class and Events for Messaging Configurator on e² studio 5.0.

Applies to: e² studio

8.2.10 sf_console (Console)

8.2.10.1 Description

The maximum write length and maximum read length can now be configured from the Synergy Configuration Tool.

Applies to: DK-S7G2, SK-S7G2, PE-HMI1, DK-S3A7

8.2.11 sf_el_gx (Synergy GUIX Interface)

8.2.11.1 Description

GUIX Port module (sf_el_gx) is updated with GUIX library code changes.

Applies to: DK-S7G2, SK-S7G2, PE-HMI1

8.2.11.2 Description

Supported ARGB8888 and XRGB8888 color formats in addition to RGB564 format.

Applies to: DK-S7G2, SK-S7G2, PE-HMI1

8.2.12 sf_message (Inter-thread Messaging)

8.2.12.1 Description

Users no longer need to create ThreadX queues. The new Messaging Configurator in e² studio 5.0 and updated Messaging Framework XML generate the code to create and initialize ThreadX queues.

Applies to: e² studio

8.2.12.2 Description

Messaging Framework XML provides basic Event code for Messaging Configurator on e² studio 5.0.

Applies to: e² studio

8.2.12.3 Description

To support the new Messaging Configurator on e² studio 5.0, any existing projects which use the Messaging Framework must be updated. The Messaging Framework support tool named sf_message_configurator is no longer included in SSP. To convert an existing project based on e² studio 4.x and SSP v1.0.0 to e² studio 5.0 and SSP v1.1.0-alpha.1, see the “Project Migration Guide - SSP 1.0.0 to SSP 1.1.0-alpha.1” on the Synergy Gallery and Knowledge Base sites.

Applies to: Existing projects

8.2.13 sf_touch_panel_i2c (Touch Panel I2C)

8.2.13.1 Description

The Touch Panel I2C Framework XML provides Touch Event Class for Messaging Configurator on e² studio 5.0.

Applies to: e² studio
8.2.14 USBX

8.2.14.1 Description

Fixed driver issue where pipes mismatched endpoints.

Applies to: PE-HMI1, DK-S7G2, SK-S7G2

8.2.14.2 Description

Recoded driver to take USB controller as argument. Allows user to seamlessly switch between USB controllers.

Applies to: PE-HMI, DK-S7G2, SK-S7G2

8.3 Deprecated features

8.3.1 r_glcd (Graphics LCD Controller)

8.3.1.1 Description

Size of frame buffer is now calculated automatically, so this module configuration property is deprecated.

Function/API: Synergy Configuration, Input - Size of Graphics screen1 frame buffer, Input - Size of Graphics screen2 frame buffer

Applies to: DK-S7G2, SK-S7G2, PE-HMI1

8.3.2 r_sce (Secure Crypto Engine; TRNG, AES, RSA, TDES, HASH, DSA, ARC4)

8.3.2.1 Description

This function is deprecated. Replaced by hashUpdate().

Function/API: updateHash() for HASH

Applies to: PE-HMI1

8.3.2.2 Description

This function is deprecated. Replaced by hashSign().

Function/API: sign() for DSA

Applies to: PE-HMI1

8.3.2.3 Description

This function is deprecated. Replaced by hashVerify().

Function/API: verify() for DSA

Applies to: PE-HMI1

8.3.3 sf_console (Console)

The sf_console_cb_args_t typedef is deprecated and will be removed in the future. Please use sf_console_callback_args_t instead.

Function/API: sf_console_callback_args_t typedef

Applies to: DK-S7G2, SK-S7G2, PE-HMI1, DK-S3A7

8.3.4 sf_el_gx (Synergy GUIX Interface)

8.3.4.1 Description

These configuration properties are duplicated. The alternatives are defined in gx_src module:

- 2D Drawing Engine Support
- JPEG Codec Support

Function/API: Synergy Configuration
8.3.5  sf_el_ux (Synergy USBX Interface)

8.3.5.1  Description

In all USBX port filenames, function names, and macros, “_rx_” has been replaced with “_synergy_”. Translation header files “ux_dcd_rx.h” and “ux_hcd_rx.h” are provided to minimize compatibility issues. These translation files will be removed in a future release.

Function/API:  ux*_rx_*

Applies to:  DK-S7G2, SK-S7G2, PE-HMI1, DK-S3A7

8.3.5.2  Description

The base address of the USB registers used must now be passed into the dcd_io and hcd_io parameters respectively. Before these parameters were unused. An example of the correct format is

ux_dcd_synergy_initialize((ULONG) R_USBFS);

Function/API:  _ux_dcd_synergy_initialize, _ux_hcd_synergy_initialize

Applies to:  DK-S7G2, SK-S7G2, PE-HMI1, DK-S3A7

8.3.6  sf_message (Inter Thread Messaging)

8.3.6.1  Description

Because of the new Messaging Configurator in e² studio 5.0, the Messaging Framework support tool named sf_message_configurator is no longer included in SSP.

Applies to:  e² studio

8.3.7  USBX

8.3.7.1  Description

Any references to RX or other platforms (RZ, Atmel, ST) where removed from the code. Use ux_[h|d]cd_*() functions.

Function/API:  *_rx_*

Applies to:  All

9. Summary of bug fixes

9.1  All modules

9.1.1  Description

The ssp_version_t structure used in the versionGet API provided by all SSP modules had the API minor version in the most significant byte. Now it has the API major version in the most significant byte.

Applies to:  DK-S7G2, SK-S7G2, PE-HMI1, DK-S3A7

9.2  BSP, BSP XML, DMAC XML, DTC XML

9.2.1  Description

The event list was reviewed for each MCU and invalid events were removed as needed. Places of modification include BSP code, BSP XML, DMAC XML, and DTC XML.

Applies to:  All

9.2.2  Description

The LED enum for BSP_LEDS_LED2 on the SK-S7G2 board previously incorrectly corresponded to LED3.

The prior workaround was:  Use index 1 to index the BSP LEDs array in place of the enum BSP_LEDS_LED2.

Applies to:  SK-S7G2
9.2.3 Description
BSP XML files failed to do range checking and validation for user modifiable BSP properties. These fields are now validated and the valid range of values shown for each field.

 Applies to: S3A7, S7G2, S124

9.2.4 Description
Some S7G2 BSP files failed to meet the stated mandatory MISRA requirements. They now do.

 Applies to: S7G2

9.2.5 Description
LED enumeration for the SK-S7G2 board was incorrect for LED 2, which prevented the LED from being controlled when using the information returned by R_BSP_LedsGet(). This has been fixed.

 Applies to: SK-S7G2

9.3 r_agt (Asynchronous General Purpose Timer)

9.3.1 Description
The AGT open could fail if the timer_ctrl_t structure is allocated on the stack.

 Applies to: DK-S7G2, SK-S7G2, PE-HMI1, DK-S3A7

9.3.2 Description
Using the AGT timer module and the GPT input capture module in the same file causes a build error.

 Applies to: DK-S7G2, SK-S7G2, PE-HMI1, DK-S3A7

9.3.3 Description
The AGT cannot be reopened if the period is too large and open fails.

 Applies to: DK-S7G2, SK-S7G2, PE-HMI1, DK-S3A7

9.4 r_dmac (Direct Memory Access Controller)

9.4.1 Description
The reset API in repeat mode did not reset the number of times to repeat the transfer.

 Applies to: DK-S7G2, SK-S7G2, PE-HMI1, DK-S3A7

9.5 r_glcd (Graphics LCD Controller)

9.5.1 Description
Removed the limitation described in the SSP1.0.0 Release Notes, section 9.16.1. Now users are able to configure GLCDC parameters without violating AC timing settings against LCD panels, which have small number of horizontal cycles in a line.

 Applies to: DK-S7G2, SK-S7G2, PE-HMI1

9.5.2 Description
Corrected the SSP User’s Manual as described in the SSP1.0.0 Release Notes, section 9.16.3. Corrected the default setting values for “Output - Data Enable Signal Polarity” and “Output – Sync edge”.

 Applies to: DK-S7G2, SK-S7G2, PE-HMI1

9.6 r_gpt (General PWM Timer)

9.6.1 Description
An overflow could occur in the GPT duty cycle set calculation when the GPT is used in PWM mode.

 Applies to: DK-S7G2, SK-S7G2, PE-HMI1, DK-S3A7
9.7  r_jpeg_decode (JPEG Decode)

9.7.1 Description
Fixed the XML file to generate externed declaration for the configuration structured data instance. This is required to compile code without an error when you use the sf_jpeg_decode module.

Applies to: DK-S7G2, SK-S7G2, PE-HMI1

9.8  r_lpm (Low Power Mode)

9.8.1 Description
Back-to-back register writes can cause operating mode and low power mode transitions to fail. This only impacts operating mode transitions.

Applies to: All boards

9.9  r_sce (Secure Crypto Engine: TRNG, AES, RSA, TDES, HASH, DSA, ARC4)

9.9.1 Description
Fixed an issue where setGcmTag() and getGcmTag() APIs for 192-bit AES GCM mode may return an incorrect return value.

Applies to: PE-HMI1, DK-S7G2

9.9.2 Description
Fixed an issue where sign() and verify() functions for the RSA and DSA APIs may exhibit intermittent failures.

Applies to: PE-HMI1, DK-S7G2

9.10  r_sci_spi (Serial Communications Interface SPI)

9.10.1 Description
Corrected defect in the SCI SPI polarity and phase settings. Earlier polarity was set according to the register description instead of ISDE configuration. Polarity setting is now corrected to meet the required output as configured in the ISDE configuration.

Note: With this change certain configuration of polarity and phase of the existing applications (using SCI SPI) may need to be changed. Please refer to the hardware specification of the slave device to get the correct settings.

Applies to: DK-S7G2, DK-S3A7

9.11  r_slcdc (Segment LCD Controller)

9.11.1 Description
Fixed defect in the contrast adjustment functions of segment LCD driver. With this fix users will be able to adjust contrast of the segment LCD using R_SLCDC_ContrastIncrease and R_SLCDC_ContrastDecrease API functions, provided SLCDC panel supports this feature.

Applies to: DK-S3A7

9.12  sf_el_gx (Synergy GUIX Interface)

9.12.1 Description
Fixed the bug described in the SSP1.0.0 Release Notes, section 9.29.1. The issue caused a hard-fault error if D/AVE 2D driver failed in the initialization.

Applies to: DK-S7G2, SK-S7G2, PE-HMI1

9.12.2 Description
Fixed the bug described in the SSP1.0.0 Release Notes, section 9.29.2. Now you can perform vertical line drawing with a pattern using GUIX API gx_canvas_line_draw with 2D Drawing Engine (DRW) enabled.

Applies to: DK-S7G2, SK-S7G2, PE-HMI1
9.12.3 Description
GUIX Block move function was not functional if 2D Drawing Engine (DRW) support was enabled. Now you can perform block move.

 Applies to: DK-S7G2, SK-S7G2, PE-HMI1

9.12.4 Description
GUIX canvas copy and blend function were not functional if 2D Drawing Engine (DRW) support was enabled. Now GUIX is able to handle the canvas copy or blend to the composite canvas.

 Applies to: DK-S7G2, SK-S7G2

9.13 sf_el_nx (Synergy NetX Interface)

9.13.1 Description
The sf_el_nx module requires an interrupt named ETHER EINTx. This interrupt has been renamed to EDMACx EINT. Enable the EDMACx EINT interrupt to use this module.

 Applies to: DK-S7G2, SK-S7G2, PE-HMI1

9.14 sf_touch_panel_i2c (Touch Panel I2C)

9.14.1 Description
User defined touch chip driver instance could not be attached to the Touch Panel I2C Framework module. Now you can attach your own touch chip drivers to the framework.

 Applies to: DK-S7G2, SK-S7G2, PE-HMI1

9.15 tx (ThreadX)

9.15.1 Description
The trace buffer size and number of registries cannot be updated in the Synergy Configuration Tool for the ThreadX Source component.

 Applies to: DK-S7G2, SK-S7G2, PE-HMI1, DK-S3A7

9.16 USBX

9.16.1 Description
Fixed driver issue where pipes mismatched endpoints.

 Applies to: PE-HMI1, DK-S7G2

9.16.2 Description
Recoded driver to take USB controller as argument. Allows user to seamlessly switch between USB controllers.

 Applies to: PE-HMI1, DK-S7G2

10. Known backward compatibility issues in v1.1.0-alpha.1 release

10.1 Description
In sf_spi, sf_i2c and sf_audio_playback modules, the shared components were added to the HAL/Common thread in the earlier version. But from SSP 1.1.0-alpha.1 onwards these modules will be added to the user Threads. Therefore for porting an existing application (which uses the above modules) to the SSP 1.1.0, it is required to add the shared component to the Thread. These components will be present in the Thread module tree in Red color, and they need to be added manually (click on the box and add the component).

 For sf_spi, add SPI Framework Shared Bus to the thread. This can be done clicking on the Red box of "Add SPI Framework Shard Bus".

 For sf_i2c, add I2C Framework Shared Bus to the thread. This can be done clicking on the Red box of "Add I2C Framework Shard Bus".
For `sf_audio_playback`, add Audio Playback Shared Framework and similar missing component to the thread. This can be done by clicking on the corresponding Red boxes in the thread modules tree.

## 10.2 Description

Any projects using the messaging framework will need to be updated to use the new messaging framework configurator in the Messaging tab next to the Threads tab. Instructions will be provided in the Knowledge Base and on the Synergy Gallery. See document: Project Migration Guide - SSP 1.0.0 to SSP 1.1.0-alpha.1.

## 10.3 Description

If the Communications Framework on `sf_el_nx_comms` is used in a project migrated from version 1.0.0, the Communications Framework on `sf_el_nx_comms` component will be removed from the project after migration. It must be added back and reconfigured.

### 11. Known issues and limitations in v1.1.0-alpha.1 release

#### 11.1 Documentation

**11.1.1 Description**

Section e² studio ISDE User Guide in the SSP User’s Manual for this release does not describe the Threads tab functionality correctly. Multiple screen shots of the Synergy Project Editor do not reflect e² studio v5.0 with this SSP release.

Workaround: Threads tab is self-explanatory and fully functional without documentation.

*Applies to: SSP User’s Manual*

#### 11.2 SSP Distribution 1.1.0-alpha.1 installer

**11.2.1 Description**

In the Japanese version of Windows, some characters are corrupted in the SSP installer package.

Workaround: None

*Applies to: Installer package*

#### 11.3 SSP Smart Manual

**11.3.1 Description**

The SSP Smart Manual is not available.

Workaround: None

*Applies to: e² studio*

#### 11.4 gx (GUIX)

**11.4.1 Description**

Some Compiler Warnings were not resolved.

Workaround: None

*Applies to: DK-S7G2, SK-S7G2, PE-HMI, DK-S3A7*

#### 11.5 nx (NetX)

**11.5.1 Description**

Chained packet support in dual Ethernet driver. Issues when sending chained NetX packets to the driver: If the packet pool packet size is set to packet sizes lower than the transmit MTU, the driver will require chained packets to work. This would be an issue for systems with constrained resources, or for users who want to take advantage of creating packet pools with smaller packet sizes.

Workaround: None

*Applies to: PE-HMI, DK-7G2, DK-S3A7*
11.6 nxd (NetX Duo Stack)

11.6.1 Description
NetX Duo and NetX Duo application bundle protected sources have a build issue. A prebuilt library is provided for NetX Duo and NetX Duo http server application.

DHCP and DNS application demo projects and other NetX Duo application bundle services are not functional.

Workaround: None

Applies to: PE-HMI1

11.7 r_adc (A/D Converter)

11.7.1 Description
ADC HAL Unit 1 on S7G2 is not initialized properly by the driver. The user will not be able to use Unit 1 on the S7G2

Workaround: Don’t use Unit 1.

Applies to: DK-S3A7

11.8 r_agt (Asynchronous General Purpose Timer)

11.8.1 Description
Due to hardware limitations on S3A7 MCU, maximum clock input to AGT is dependent on the selection of power domains between Vcc and Vbatt. When Vcc is selected, both AGTs can operate with a maximum input clock of 32 MHz. When Vbatt is selected, both AGTs can only operate with a maximum input clock of 32 KHz. If Vbatt is selected as the AGT power domain, use 32 kHz oscillator as the input clock.

Due to hardware limitations on S3A7 MCU, when transitioning operating mode from Normal to Standby, Vbat can go out of regulation temporarily. In some cases the interrupt required for transitioning operating mode from Standby to Normal (wakeup) is not negated. The result of this condition is that the interrupt that should cause an operating mode transition from Standby to Normal (wakeup) is not detected and the MCU remains in Standby mode. Several workarounds are being tested.

Workaround: None

Applies to: DK-S3A7

11.9 r_ctsu (Capacitive Touch Sensing Unit)

11.9.1 Description
Manufacturing variations from MCU to MCU prevent tuning values generated for one device to work accurately with another. A minimal overhead software patch has been developed and is under testing to address this.

Workaround: None

Applies to: DK-S7G2, SK-S7G2, DK-S3A7

11.9.2 Description
Four Capacitive Touch Input channels on the S3A7 device have different characteristics from the rest of the peripheral and therefore are not supported for Capacitive Touch Sensing in this release. These channels are TS23, TS24, TS25 and TS28 for the S3A7 device in 144 pin, 121 pin, 100 pin and 64 pin (only 3 channels) versions.

Workaround: None

Applies to: DK-S3A7

11.9.3 Description
One Capacitive Touch Input channel on the S124 device has different characteristics from the rest of the peripheral and therefore is not supported for Capacitive Touch Sensing in this release. This channel is TS29 for the S124 device in 64 pin, 48 pin, 40 pin and 36 pin versions.

Applies to: DK-S124
11.9.4 Description
Dynamic allocation of memory for different configurations is not supported. This will only make a difference in cases where
the user is loading and unloading multiple configurations. In such cases the memory used at any time will be that required by
the largest configuration.

Workaround: When setting up the “maximum channels” entry in ISDE for the CTSU HAL, make sure that the largest
configuration size is used here.

Applies to: DK-S7G2, SK-S7G2, DK-S3A7

11.10 r_dac (Digital-to-Analog Converter)
11.10.1 Description
S3A7 MCU has a register to select one of four voltage references for the DAC. For now, only Vcc is supported.

Workaround: None

Applies to: DK-S3A7

11.11 r_fmi (Factory Microcontroller Information)
11.11.1 Description
Factory MCU Information consists of three record types: Product Information, Software Provisioning, and IP Information.

Product Information is the only record programmed into the S7G2 MCUs and is the only record fetched by the FMI driver.

Workaround: None

Applies to: PE-HMI1, DK-S7G2

11.12 r_gpt (General PWM Timer)
11.12.1 Description
The GPT close function does not power down the GPT peripheral. If powering down the GPT is desired, it must be done in
the application code by setting the appropriate bit in the R_MSTP register after calling the close API. Refer to the hardware
manual for details.

Applies to: DK-S7G2, SK-S7G2, PE-HMI1, DK-S3A7

11.13 r_ioport (General Purpose I/O Ports)
11.13.1 Description
Pins associated with the Vbatt domain are at risk of not being properly configured if they are changed at runtime using the
IOPORT pinCfg API. For example, if IOPORT_PORT_04_PIN_03 was configured as AGT by pin table on reset, and later
customer called ioport.pincfg() to change pin to GPT function at runtime, the GPT would not be connected to the port
pin.

Workaround: The workaround is to call the void bsp_vbatt_init(ioport_cfg_t const * const p_pin_cfg); function with the same pin table as used for ioport.pincfg() before calling ioport.pincfg().

Applies to: DK-S7G2, SK-S7G2, PE-HMI1, DK-S3A7

11.14 r_lpm (Low Power Mode)
11.14.1 Description
Flash stop and RAM power save is not yet supported.

Workaround: Workaround is not needed. The features may be supported in the future.

Applies to: All
11.15  r_pdc (Parallel Data Capture Unit)
11.15.1 Description
The r_pdc driver currently only supports the DMAC transfer interface. A high camera frame rate may exclude the use of the DTC. Investigation whether the DTC can be used is required.

Applies to: DK-S7G2

11.16  r_sce (Secure Crypto Engine: TRNG, AES, RSA, TDES, HASH, DSA, ARC4)
11.16.1 Description
Known limitation: AES GCM mode encrypt() and decrypt() functions currently only support 16-byte and multiples of 16-bytes of authentication data and plain-text/cipher-text data.

Workaround: None

Applies to: PE-HMI1, DK-S7G2, DK-S3A7

11.17  sf_el_gx (Synergy GUIX Interface)
11.17.1 Description
The following features do not work as expected when Synergy hardware acceleration is enabled:

- Ellipse draw with filling pixelmaps does not work.
- Circle draw filled with color fills out the color out of outline.
- Pie or Arc draw filled with color or pixelmap (PNG, compressed) do not work as expected.
- Polygon draw filled with color does not work as expected.
- JPEG h/w decoding requires the JPEG work buffer size with same size for a frame buffer. Otherwise decoded JPEG image may have partial corruption on it and GUIX may cause unpredicted behavior.

Workaround: None

Applies to: DK-S7G2, SK-S7G2, PE-HMI1

11.18  sf_el_ux_comms (Synergy USBX Communication Interface)
11.18.1 Description
The read API timeout will only return with a timeout error if the device is not plugged in. Read will not time out if the device is enumerated but no data arrives in the specified time.

Workaround: If a timeout is needed for reading data after the connection is established, we recommend buffering the data in a separate thread. We will consider doing this internally as a future enhancement to sf_el_ux_comms. For now, it can be done in a separate thread that pends on USB data by waiting forever then posts received data to a queue. Then the application thread can pend on the queue with a timeout.

Applies to: DK-S7G2, SK-S7G2, PE-HMI1, DK-S3A7

11.19  sf_el_nx_comms (Synergy NetX Communications Interface)
11.19.1 Description
The sf_el_nx_comms module calls nx_system_initialize(), which is a common function. This can clear initializations made for other USB code at the application level.

Workaround: Wait for sf_el_nx_comms initialization to complete prior to initializing any other USB code and do not call nx_system_initialize() in the application code.

Applies to: DK-S7G2, SK-S7G2, PE-HMI1, DK-S3A7

11.20  sf_el_ux (Synergy USBX Interface)
11.20.1 Description
USBX CDC read spins forever when receiving an actual length buffer that is a multiple of 64 bytes (wMaxPacketSize of the endpoint) but less than the maximum read length parameter.
Workaround: If you expect packets that are multiples of 64 bytes, give the exact expected length or read 64 bytes at a time.

**Applies to:** DK-S7G2, SK-S7G2, PE-HMI1, DK-S3A7

### 11.21 sf_el ux_comms (Synergy USBX Communication Interface)

#### 11.21.1 Description

The `close` API is not functional and should not be used. The USBX communications framework can only be configured once.

Workaround: There is no workaround at this time. The configuration parameters passed into `open` and the descriptors defined in `sf_el ux_comms_port.h` are permanent and cannot be updated at runtime after `open` is called.

**Applies to:** DK-S7G2, SK-S7G2, PE-HMI1, DK-S3A7

#### 11.21.2 Description

The `sf_el ux_comms` module calls `ux_system_initialize()`, which is a common function. This can clear initializations made for other USB code at the application level.

Workaround: Wait for `sf_el ux_comms` initialization to complete prior to initializing any other USB code and do not call `ux_system_initialize()` in the application code.

**Applies to:** DK-S7G2, SK-S7G2, PE-HMI1, DK-S3A7

### 11.22 tx (ThreadX)

#### 11.22.1 Description

EPK support missing from the ThreadX XML. The impact is that users cannot yet enable EL EPK support via the ISDE configurator.

Workaround: EPK support can be enabled by editing the `tx_port.h` header file.

**Applies to:** DK-S7G2 with Production Silicon

#### 11.22.2 Description

RTOS objects created in Threads in the Synergy Configuration tool will be created in the thread context. If an object is shared between multiple threads, the highest priority thread involved should own the object to ensure it is created before any thread tries to use it.

Workaround: None

**Applies to:** DK-S7G2, SK-S7G2, PE-HMI1, DK-S3A7

### 11.23 ux (USBX Host and Device)

#### 11.23.1 Description

UX_THREAD_STACK_SIZE is set to 1024, but should be set to 2048.

Workaround: Define `UX_THREAD_STACK_SIZE` to 2048 at the project level.

**Applies to:** DK-S7G2, SK-S7G2, PE-HMI1, DK-S3A7

#### 11.23.2 Description

USB host is currently only supported on the USBHS controller. USB device is currently only supported on the USBFS controller.

Workaround: None

**Applies to:** DK-S7G2, SK-S7G2, PE-HMI1, DK-S3A7

### 11.24 USBX

#### 11.24.1 Description

Various USBX issues: 32-bit FIFO writes, customer supported issues with reads and writes, and support of composite devices. The CDC ACM host example in the current SSP fails to operate properly.

Workaround: None
Applies to: DK-S7G2, SK-S7G2, PE-HMI1

11.25 BSP
11.25.1 Description
The ISDE now supports multiple pin configurations to support power profiles. While making this change some of the BSP code was missed and now all IAR projects will build with many warnings.

Workaround: None

Applies to: e² studio

11.25.2 Description
The S124 BSP does not transition the MCU out of low voltage mode even when a frequency is requested where the power mode must be changed. In low voltage mode the maximum ICLK frequency is 4 MHz.

Workaround: None

Applies to: DK-S124

11.26 XML Configuration
11.26.1 Description
The wrong XTAL frequency is shown for the DK-S124 in the ISDE.

Workaround: Users can click on clock frequency and change it.

Applies to: XML Configuration

11.27 MISRA Compliance
11.27.1 Description
SSP 1.1.0-alpha.1 complies with mandatory MISRA C:2012 rules with the exception of following non-conformance items:

- sf_el_ux_comms MISRA-C:2012 R.9.1
- sf_el_nx_comms MISRA-C:2012 R.9.1
- r_iwdt MISRA-C:2012 R.9.1
- r_wdt MISRA-C:2012 R.9.1
- sf_el_gx MISRA-C:2012 R.9.1
- sf_touch_ctsu MISRA-C:2012 R.9.1
- r_flash_lp MISRA-C:2012 R.8.3,R.8.4

During verification, these were deemed to have no material impact on functionality and operation of the module. As a matter of policy, Renesas will correct these issues in the next release.

Additionally, module r_sce does not conform to MISRA-C:2012 R.9.1 mandatory MISRA rule, and the impact of this non-compliance has been described in this release note.

12. Complete list of modules available in this release and their availability for S124 MCUs

<table>
<thead>
<tr>
<th>Module Name</th>
<th>SSP Feature</th>
<th>Release Status of Module for S124</th>
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</thead>
<tbody>
<tr>
<td>sf_adc_periodic</td>
<td>Periodic Sampling ADC</td>
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## Module Name

<table>
<thead>
<tr>
<th>Module Name</th>
<th>SSP Feature</th>
<th>Release Status of Module for S124</th>
</tr>
</thead>
<tbody>
<tr>
<td>sf_audio_playback</td>
<td>Audio Playback</td>
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<tr>
<td>sf_audio_playback_hw_dac</td>
<td>Audio Playback HW DAC</td>
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<tr>
<td>dave2d</td>
<td>2D Drawing Engine Driver</td>
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<tr>
<td>sf_block_media_sdmmc</td>
<td>Block Media Interface for SD Multi Media Card</td>
<td>No</td>
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<tr>
<td>sf_console</td>
<td>Console</td>
<td>No</td>
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<tr>
<td>sf_el_fx</td>
<td>Synergy FileX Interface</td>
<td>No</td>
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<tr>
<td>sf_el_gx</td>
<td>Synergy GUIX Interface</td>
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<td>sf_el_nx</td>
<td>Synergy NetX Interface</td>
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<td>No</td>
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<td>Synergy USBX Interface</td>
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<td>Synergy USBX Communication Interface</td>
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<tr>
<td>sf_external_irq</td>
<td>External Interrupt Framework</td>
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<td>sf_i2c</td>
<td>I2C Framework</td>
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<td>sf_jpeg_decode</td>
<td>JPEG Decode</td>
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<td>sf_message</td>
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<td>sf_power_profiles</td>
<td>Power Mode Profile</td>
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<td>sf_tes_2d_drw</td>
<td>2D Drawing Engine Framework</td>
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<td>sf_thread_monitor</td>
<td>Thread Monitor (Watchdog)</td>
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<td>sf_touch_ctsu</td>
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<td>sf_uart_comms</td>
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### Driver

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<th>Module Name</th>
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<td>r_cac</td>
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<td>r_dac</td>
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<td>r_doc</td>
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<td>r_iwdt</td>
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<td>r_sce</td>
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<td>r_sdmmc</td>
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<td>Module Name</td>
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Synergy Software Package (SSP) Release Notes

Website and Support

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

Technical Contact Details

America:  https://renesas.zendesk.com/anonymous_requests/new
Europe: http://www.renesas.eu/support/index.jsp
Japan:  http://japan.renesas.com/contact/index.jsp

Revision History

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<th>Document Revision</th>
<th>Date</th>
<th>Description</th>
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<td>1.0</td>
<td>February 19, 2016</td>
<td>-</td>
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<td>Initial version</td>
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<td>1.1</td>
<td>tbd</td>
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