Release Note

SSP v1.7.0

Additional Usage Note

Renesas Synergy™ Platform
Synergy Software
Synergy Software Package

Renesas Electronics
www.renesas.com

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Renesas Synergy™ Platform

SSP v1.7.0 Additional Usage Note

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1. Introduction

This document describes additional usage notes for **Synergy Software Package (SSP) version 1.7.0**.

2. Release Information

SSP Release Version	v1.7.0
Release Date	Sep 10, 2019

The intended audience for this release is Renesas Synergy™ customers, prospective customers, partners, and support staff. This document lists additional information on SSP v1.7.0 usage. See the *SSP v1.7.0 Release Note* for enhancements, bug fixes, and known issues that were identified since the last release for SSP v1.6.0.

3. SSP v1.7.0 Additional Usage Note

3.1 BSP for SSP Supported Platforms

Issue ID: 2625

Unaligned access across the memory map boundary 0x20000000 (between SRAMHS and SRAM0) results in a data read/write failure due to the Synergy hardware restriction. However, user applications might cause an unaligned access across the boundary, since linker script files for S7 or S5 MCU parts define the single 'RAM' section across SRAMHS and SRAM0. For details on this hardware restriction, see the *Arm® Cortex®-M4 Technical Reference Manual*, section 3.4.3 http://infocenter.arm.com/help/topic/com.arm.doc.100166_0001_00_en/arm_cortexm4_processor_trm_100166_0001_00_en.pdf.

Applies to: S7 and S5 MCU Series

Workaround: Users need to modify their linker script manually to ensure that objects do not cross the memory map boundary, 0x20000000.

Issue ID: 10664

If a user is using the trace buffer for debugging and has data stored in the RAM at addresses above 0x20004000, that data is overwritten by the trace buffer when debugging.

Applies to: S1JA and S128 MCU Groups

Workaround: The S128 linker script currently allocates 1K for the trace buffer at 0x20000000. This allocation could be removed, freeing up the 1K incorrectly reserved for the trace buffer. Using the e^2 studio trace buffer function will store 1K of the trace buffer data beginning at 0x20004000. Therefore, 1K of RAM must not be used by the application if the trace buffer is to be used for debugging.

3.2 Crypto/r_sce

Issue ID: 11147

Only data input lengths that are multiples of the AES block size are supported for AES encryption/decryption APIs for XTS chaining mode.

Applies to: S7, S5, and S3 MCU Series

Workaround: None

Issue ID: 15261

The key generation time for 1024-bit RSA varies from 170 milliseconds to 1.2 seconds, while for 2048-bit RSA, it varies from 1.65 seconds to 10 seconds. This results in a noticeable delay during RSA 2048-bit key generation, at times.

Applies to: S5 and S7 MCU Series

Workaround: None

3.3 GUIX Integration

Issue ID: 14456

Build warnings are being observed when compiling `gx_src` code with GCC 7.2.1.

Applies to: S7G2 and S5D9 MCU Groups

Workaround: None

3.4 ISDE User Experience Improvement

Issue ID: 12908

A multiple symbol definition error may occur during linkage if an X-Ware library component and the corresponding source component such as ux and ux_src are included. If this occurs, remove the library such as libux.a from the list of libraries used by the linker.

For GCC, this is in the Cross ARM C Linker > Libraries section of the C/C++ Build > Settings in the project Properties.

For IAR, this is in the IAR Linker for ARM > Library section of the C/C++ Build > Settings in the project Properties.

Module Names: ux (USBX), tx (ThreadX), nx (NetX), nxd (NetX Duo), fx (FileX), gx (GUIX), ux_host_class_XXX (USBX Host Classes), ux_device_class_XXX (USBX Device Classes).

Applies to: All supported Synergy MCU Groups

Issue ID: 13854

When debugging a project with a large number of threads (for example, 150 threads), with the RTOS Resource view open, e^2 studio might hang and become unresponsive.

Applies to: All MCUs

Workaround: Make the RTOS Resource View small and expand it once the Debug Tree view has finished updating.

3.5 LevelX Records

Issue ID: 14455

Build warnings are observed when compiling lx_nand_src with GCC 7.2.1.

Applies to: S3, S5, and S7 MCU Series

Workaround: None

3.6 MCU Implementation/ SW Architecture

Issue ID: 10864

The pin configuration tab in the configurator cannot be used to configure the opamp or analog comparators for every use case.

Applies to: S7G2, S5D9, S5D5, S5D3, S3A7, S3A3, S128, and S124 MCU Groups

Workaround: Configure the pins manually in the user-defined code.

3.7 NetX

Issue ID: 7745

The NetX/NetX Duo FTP Client requires FileX in Stack configuration. Due to dependencies, FileX cannot be removed from the configurator while using the FTP_Client application.

Applies to: S7G2, S5D9, and S5D5 MCU Groups

Workaround: None

Issue ID: 11994

The NetX/Duo FTP server does not support passive data transfer mode. Hence, only active mode FTP can be currently used.

Applies to: S7G2, S5D9, S5D5, and S5D3 MCU Groups

Workaround: None

Issue ID: 14293

Warnings will be observed on compiling nxd applications with GCC7.

Applies to: S7, S5, and S3 Series MCUs

Workaround: None

Issue ID: 15218

When multiple network interfaces are used in the application, since the IP Driver interface structure member is not initialized properly in the IP's helper thread function, this causes bus fault and the application goes into default handler for compiler optimization of -O0,-O2, and -O3.

Applies to: S7G2, S5D9, S5D5, and S5D3 MCUs

Workaround: Use compiler optimization -O1, -Og, and -Os during multiple network interfaces.

3.8 nxd_tls_secure

Issue ID: 15051

Warnings will be observed on compiling nxd applications with GCC7.

Applies to: S7 and S5 MCU Series

Workaround: None

3.9 r_adc

Issue ID: 14707

The S7G2, SS5D9, and S5D3 MCUs have features for setting the Programmable Gain Amplifier (PGA) for single inputs and differential inputs with multiple levels of gain setting for Amplifier_0, Amplifier_1, and Amplifier_2. This feature is not supported in the existing r_adc driver. Currently, this feature is disabled, and no options are provided in the configuration parameter properties to set the gain level.

Applies to: S7G2, S5D9, and S5D3 MCU Groups

Workaround: None

3.10 r_ctsu

Issue ID: 6927

`R_CTSU_Update_Parameters()` returns error. Not all return codes are described in the function header. Some return codes are as follows:

SSP_ERR_NOT_OPEN when mode is set to CTSU_MODE_UNCONFIGURED

SSP_ERR_IN_USE, when the Measurement Status Counter is set to non-zero value, or the CTSU Data Transfer Status flag is set

SSP_ERR_CTSU_RC_OVERFLOW, when CTSUROVF flag is set

SSP_ERR_CTSU_SC_OVERFLOW, when CTSUSOVF flag is set

SSP_ERR_CTSU_ICOMP, when TSCAP Voltage Error Monitor flag is set.

Applies to: All supported Synergy MCU Groups

Workaround: In cases where the returned error code is not described in the function header, see the return code description in the `ssp_common_api.h` file.

Issue ID: 6928

If the application calls `R_CTSU_Read()` while the driver is in an uninitialized state, then the documented return code is SSP_SUCCESS, but the actual return code is SSP_ERR_NOT_OPEN. When calling `R_CTSU_Read()` while the driver is uninitialized, the application should expect a return code of SSP_ERR_NOT_OPEN.
The `R_CTSU_Read()` function is not sufficiently tested with the CTSU_READ_FILTERED_REF_ICO_VALUES_SEL and CTSU_READ_FILTERED_REF_ICO_VALUES_ALL options.

Applies to: All supported MCU Groups

Workaround: None

Issue ID: 6929

Auto-calibration, auto-scan, and auto-drift compensation features are not available in the r_ctsu driver.

Applies to: All MCUs

Workaround: None

Issue ID: 6931

Parameter checking for NULL parameters is not implemented. Passing in a NULL parameter to the `r_ctsu` API will result in undefined system operation.

Applies to: S7G2, S5D9, S5D5, S3A7, S128, and S124 MCU Groups

Workaround: When using this driver, make sure that the control structure passed to the `r_ctsu` API is not NULL.

3.11 r_sci_spi

Issue ID: 10962

Each MCU supports a different range of bit rates and this depends on the speed of the clock provided to the SCI-SPI peripheral. For the maximum supported bit rate for a particular MCU, see the corresponding MCU User's Manual.

Applies to: All MCUs

Workaround: None

3.12 sf_audio_playback_hw_dac

Issue ID: 9308

sf_audio_playback is not tested with the DMAC module as a transfer driver.

Applies to: All boards except S1JA, S128, and S124 boards

Workaround: sf_audio_playback module can use DTC module as a transfer driver, instead of DMAC.

3.13 sf_ble

Issue ID: 9256

The projects using RL78G1D framework will see compilation warnings. All the warnings are in the 3rd party RL78G1D driver code and will not have impact on user applications. The RL78G1D framework file does not have any warnings.

Applies to: RL78G1D on all MCUs

Workaround: None

3.14 sf_cellular

Issue ID: 9475

Applications using the cellular framework will not be able to upgrade module firmware over the air (FOTA) since FOTA is not supported by the cellular framework.

Applies to: Cellular framework CAT3 and CAT1 implementation on all MCUs

Workaround: None

3.15 sf_ble

Issue ID: 9225

HID profile client mode is not supported by RL78G1D. As a result, the BLE framework implementation of the HID profile also does not support the HID profile client mode. Applications using the BLE framework for RL78G1D will not be able to use the HID profile in client mode.

Applies to: All MCUs

Workaround: None

3.16 sf_el_fx

Issue ID: 12753

The warning "control reaches end of non-void function" will be seen if code is configured to reach fx_fault_tolerant_transaction_fail().

Applies to: S7, S5, and S3 MCU Series

Workaround: None

Issue ID: 14281

The FileX update rate of the system time happens depending on the macro value of FX_UPDATE_RATE_IN_SECONDS and FX_UPDATE_RATE_IN_TICKS in `fx_api.h`. There is a FileX configurator option that controls FX_UPDATE_RATE_IN_SECONDS value, but there is no user configurator option to control the FX_UPDATE_RATE_IN_TICKS value, and therefore the FileX update rate of the system time cannot be effectively controlled.

Applies to: All MCUs

Workaround: Disable Synergy builder and update FX_UPDATE_RATE_IN_TICKS in `fx_api.h` as required.

3.17 sf_el_lx_nor

Issue ID: 12613

Build warnings are observed when compiling sf_el_lx_nor with GCC.

Applies to: S7, S5, and S3 MCU Series

Workaround: None

Issue ID: 15029

1. The current sf_el_lx_nor framework does not have the functionality to resize the flash memory out of the total memory available.
2. Even though the DK-S7G2, DK-S3A7, ADK-S3A3, TBB-S5D5, and ADK-S3A1 boards have over 16 MB of flash memory, only 16 MB is accessible.

Applies to: All MCUs

Workaround: There is no workaround because:

1. The feature is unsupported.
2. The current QSPI BSP is hard-coded to 3-byte addressing.

3.18 sf_el_nx

Issue ID: 7513

The current sf_el_nx (NetX Port driver) is hard-coded to use the RMII interface which is for a Micrel Ethernet PHY chip mounted on Renesas kits but does not support other PHY chips or MII interfaces. The customer defines an Ethernet PHY chip driver when using a different PHY chip than the one mounted on Renesas kits, or when using a PHY chip with a MII interface.

Workaround: There is no plan to provide support for additional Ethernet PHY chip drivers included in SSP; users are required to create their own PHY chip driver.

To create a PHY chip driver, users can use the sf_el_nx (NetX Port) module under **/ssp/src/framework/sf_el_nx/** as a template and modify it for the target Ethernet PHY chip. Source files under sf_el_nx are in plain text; you can copy the file to other directories, such as **/src/** directory, and exclude the original sf_el_nx module from being built to avoid 'multiple definition' compile-error.

The following steps give high-level guidance to work around the issue:

1.Copy the directory **/ssp/src/framework/sf_el_nx/** including all the files under the directory to **/src/**.
2.Exclude original sf_el_nx module in SSP from your build. Right click on the directory **/ssp/src/framework/sf_el_nx/** and select '**Exclude from build…**'. Then click the '**Select All**' button.
3.Modify **/src/sf_el_nx/nx_hw_init.c**. Modify nx_synergy_ethernet_init() as indicated below to select the MII interface. Change IOPORT_ETHERNET_MODE_RMII to **IOPORT_ETHERNET_MODE_MII**.
g_ioport_on_ioport.pinEthernetModeCfg(IOPORT_ETHERNET_CHANNEL_n, IOPORT_ETHERNET_MODE_RMII);
4.Modify **/src/sf_el_nx/phy/ether_phy.c** and **ether_phy.h**. Modify these files to match to your Ethernet PHY chip.
5.Be sure to select MII pins under the '**Pins**' tab in the Synergy Configurator. Check the pin configuration setting, **Peripherals** > **Connectivity:ETHERC**.

Notes: 1. Source files under /ssp/src/framework/sf_el_nx/ are overwritten by the tool when building a project. Be sure to copy the files before editing.
2. To exclude files from building, right-click on the files and select **Exclude from build** (as is the case for e^2 studio).

3.19 sf_el_ux

Issue ID: 8574

The current sf_el_ux HCD driver does not enable the Double Buffer feature for Bulk OUT PIPEs, which is supported by the USB hardware. Therefore, USB data throughput for Data Write through a Bulk OUT PIPE will be less than the value for Double Buffer-Enabled. This issue is only for Data Write (Bulk OUT). Double buffering is supported for Data Read (Bulk IN).

Applies to: S7, S5, and S3 MCU Series

Workaround: None

Issue ID: 13528

In USBX Device CDC class, in blocking mode, write/read calls made to the sf_el_ux DCD driver do not support the timeout feature, and this may result in indefinite waiting for the host transfer to get completed.

Note: **Option 1:** In order to use the non-blocking or callback mode in USBX CDC device class, call the `ux_device_class_cdc_acm_ioctl()` API in the application to use transmission with callback. See the latest *USBX Device Stack User Guide* for more information on Device class APIs.
Option 2: Call the `ux_device_stack_transfer_abort()` API from other threads in the application to abort the pending transfer requests.

Applies to: All MCUs

Workaround: None

Issue ID: 14447

DMA is not supported for composite device class due to which the composite device fails to work when DMA transfer mode is enabled.

Applies to: All MCUs

Workaround: Use CPU transfer mode instead of DMA

Issue ID: 15370

`ux_host_class_printer_status_get` function does not return the status of the printer, if the length sent by the device (printer) is 1 byte.

Applies to: S7G2 and S5D9 MCU Groups

Workaround: None

3.20 sf_el_ux_comms_v2

Issue ID: 15552

In USBX CDC Communications Framework, initialization fails when the DTC transfer driver is used.

Applies to: All MCUs

Workaround: Use the DMA transfer driver instead of the DTC transfer driver, or do not use any transfer driver (default)

3.21 sf_touch_ctsu

Issue ID: 6858

When channel is set to NULL, the `SF_TOUCH_CTSU_Read()` returns SSP_ERR_INTERNAL.

Return values from the ThreadX API calls are not checked in the framework, which can lead to functional issues in the framework when ThreadX APIs return errors. The framework may not work as expected in such cases, since errors are not handled.

With valid callback and context, if callback_index is set to SF_TOUCH_CTSU_CFG_MAX_WIDGET_TYPES (= 3), `SF_TOUCH_CTSU_Open()` returns SSP_ERR_OUT_OF_MEMORY.

Applies to: All MCUs

Workaround: None

Issue ID: 6859

`SF_TOUCH_CTSU_Read()` returns the error value SSP_ERR_INTERNAL if the semaphore **get** or **put** is not successful.

Applies to: All MCUs

Workaround: None

3.22 sf_touch_ctsu_button

Issue ID: 6882

1. Valid range for button_count is 0 to less than SF_TOUCH_CTSU_BUTTON_CFG_USER_SUPPORTED_BUTTONS (= 12).
2. For button_count values outside the range, `SF_TOUCH_CTSU_Button_Open()` returns error SSP_ERR_ASSERTION.

Applies to: All MCUs

Workaround: None

Issue ID: 6883

For button_count values outside the range, `SF_TOUCH_CTSU_Button_Open()` returns the error SSP_ERR_ASSERTION, and buttons outside the range cannot be operated.

Applies to: All MCUs

Workaround: The button_count values must be set to value 0 to less than SF_TOUCH_CTSU_BUTTON_CFG_USER_SUPPORTED_BUTTONS (= 12).

Issue ID: 9661

SF_TOUCH_CTSU_BUTTON module is not built for the S5D5_proto board. The build configuration needs to be updated.

Applies to: S5D5 MCU Group

Workaround: Add S5D5_proto board in the SF_TOUCH_CTSU_BUTTON build XML

Issue ID: 12742

The GT202 module supported by the WiFi Framework is affected by the WPA2 KRACK issue.

Applies to: GT202 module supported by the WiFi Framework

Workaround: None

3.23 sf_WiFi

Issue ID: 8394

The projects using GT202 framework will see compilation warnings. All the warnings are in the 3rd party GT202 driver code. The GT202 framework files do not have any warnings. The warnings should not impact the user applications.

Applies to: WiFi Framework for GT202 on DK-S7G2, DK-S3A7, PK-S5D9, TB-S5D5, TB-S3A6 (only socket), ADK-S3A3 MCUs

Workaround: None

Issue ID: 15379

Customers cannot build a project using WiFi and the NSAL layer without getting an error.

Compilation of the project will fail when you include `sf_wifi_nsal_nx` since the XML declaration section is missing an external reference definition.

Applies to: All MCUs supporting WiFi

Workaround: Update the Renesas##Framework Services##all##sf_wifi_nsal_nx####1.6.3.xml file with the needed change in the declaration section.

Issue ID: 14126

WiFi WPS functionality does not work with WPA security.

Applies to: WiFi Framework using GT202

Workaround: None

3.24 SSP IAR Support

Issue ID: 12972

C-RUN with bounds checking is not supported with Synergy project in EWSYN.

Applies to: All MCUs

Workaround: None

Issue ID: 15377

An error message pops up when selecting the device in Project Explorer, with the **Properties** view open. Synergy plugins have to be upgraded using the IAR Embedded workbench plugin manager to fix the error message when selecting the device with the **Properties** view open.

Applies to: All MCUs

Workaround: None

Issue ID: 14485

Library projects which use multiple or long include paths cause the compiler command line to exceed the system limit and fail to build the library.

Applies to: Projects created with IAR compiler in e^2 studio

Workaround: None

3.25 SSP XMLs for ISDE

Issue ID: 10695

The configurator does not warn about the limitation on the RSPI bit rate if the bit rate is less than or equal to 30 MHz.

Applies to: All MCUs

Workaround: The RSPI bit rate must be a positive integer that is less than or equal to 30 MHz or PCLK/2, whichever is the smaller value.

3.26 Synergy Software Configurator

Issue ID: 7665

When using the Synergy Software Configurator in e^2 studio/SSC, if you rename a thread on the Threads tab and generate code, a new `thread_entry.c` file is created with template content, and the old `thread_entry.c` file remains in the project. If you have edited the `thread_entry.c` file, your changes are not moved to the new file. The old file remains in the project. It will not be called; it causes a build error if not removed from the project manually.

Applies to: All MCUs

Workaround: Manually move any edits (if made) from the old `thread_entry.c` file to the new `thread_entry.c` file, then manually delete the old thread_entry.c file from your project.

3.27 Synergy Tools

Issue ID: 14436

Some of the old projects with customized stacks might fail after migrating to e^2 studio v7.3 because the default modules gets repopulated in the stack.

Applies to: All MCUs

Workaround: The user explicitly needs to delete the modules that are repopulated after migration.

Issue ID: 14636

The build fails when GCC 4.9 is used for the S1JA device as the S1JA device is not supported by GCC compiler version 4.9.

Applies to: S1JA MCU Group

Workaround: Do not select the GCC 4.9 toolchain for the S1JA device.

Issue ID: 15093

Using the option “Rename and import existing C/C++ project” causes intermittent failure in importing the project, and gives an error message.

Applies to: All MCUs

Workaround: None

Issue ID: 15104

e^2 studio v7.3.0 is sensitive to the casing of linker script file names. This is experienced only in the projects created with the previous version of e^2 studio where the linker script names do not exactly match in casing. In this case, the user would experience a build error saying that the linker script is not found.

Applies to: All MCUs

Workaround: If the build is failing with .ld not found error, go to the linker configuration in e^2 studio project properties and delete the linker script entry.

Issue ID: 15330

The project that has been created with SSP versions prior to SSP v1.6.3 and edited to remove default lower level module fails to build when migrating to SSP v1.6.3.

Applies to: Projects created in earlier versions that have been edited by removing the default lower level module in thread stacks.

Workaround: Open the threads tab before building the project.

Issue ID: 15339

Default property value of the IP address does not get picked up for existing projects after changes to the pack. Opening existing projects shows the previously saved value instead of the default value from the pack.

Applies to: Applies to projects only when using the packs with the change for IP address

Workaround: None

3.28 tes

Issue ID: 14095

The rendering of concave polygons is not supported when D/AVE 2D drawing engine is enabled.

Applies to: S7G2 and S5D9 MCU Groups

Workaround: Disable D/AVE 2D drawing engine to render concave polygons.

3.29 Tools Development

Issue ID: 15202

When TraceX standalone installer is used, TraceX fails to launch and gives a license error when the existing TraceX installation is overwritten by reinstalling TraceX.

Applies to: All MCUs

Workaround: Uninstall existing TraceX application and install it again

3.30 USBX

Issue ID: 6470

USBX Host Class Prolific (ux_host_class_prolific) is currently included in the SSP package as an experimental module but is yet to be tested, so the functionality is not guaranteed.

Applies to: All applicable MCUs

Workaround: Not applicable

Issue ID: 8505
Users need to set ‘requested_length’ of the USBX Device CDC API, `ux_device_class_cdc_acm_read` `large` enough compared to the expected reception data length. If the length of the reception data from a USB host is larger than the ‘requested_length,’ the API returns UX_SUCCESS but the reception data will not be stored in a user buffer and the actual length is set to ‘0’.

Applies to: All MCU Groups

Workaround: Set 'requested_length' of the USBX Device CDC API, `ux_device_class_cdc_acm_read` large enough compared to the expected reception data length.

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 MCU Groups

Workaround: None

Issue ID: 10027

USBX Device Class HID does not support Interrupt-Out endpoint. The use of Interrupt-Out endpoint is optional in the USB HID specification. It would not often be the case in embedded applications, but Synergy customers may require the feature for their production.

Applies to: All MCUs

Workaround: Ask Synergy customer support for a custom HID class example that enables Interrupt-In and Interrupt-Out endpoints.

Issue ID: 14100

Warnings for “this statement may fall through” will be observed when compiling the USBX Device class source code.

Applies to: All MCUs

Workaround: None

4. Additional Technical Notes

- Subscribe to the Synergy Technical Bulletin Board to receive the latest technical news and notifications about new features, known issues, workarounds, and release announcements. To subscribe, visit http://renesasrulz.com/synergy/synergy_tech_notes/f/214.aspx. Sign in to Renesas Rulz, and press **Email Subscribe to this forum**.
- Additional technical information, including informative papers and articles on SSP and Synergy can be found at Synergy Knowledge Base, www.renesassynergy.com/knowledgebase.

Website and Support

Visit the following vanity URLs to learn about key elements of the Synergy Platform, download components and related documentation, and get support.

Synergy Software	www.renesas.com/synergy/software
Synergy Software Package	www.renesas.com/synergy/ssp
Software add-ons	www.renesas.com/synergy/addons
Software glossary	www.renesas.com/synergy/softwareglossary
Development tools	www.renesas.com/synergy/tools
Synergy Hardware	www.renesas.com/synergy/hardware
Microcontrollers	www.renesas.com/synergy/mcus
MCU glossary	www.renesas.com/synergy/mcuglossary
Parametric search	www.renesas.com/synergy/parametric
Kits	www.renesas.com/synergy/kits
Synergy Solutions Gallery	www.renesas.com/synergy/solutionsgallery
Partner projects	www.renesas.com/synergy/partnerprojects
Application projects	www.renesas.com/synergy/applicationprojects
Self-service support resources:	
Documentation	www.renesas.com/synergy/docs
Knowledgebase	www.renesas.com/synergy/knowledgebase
Forums	www.renesas.com/synergy/forum
Training	www.renesas.com/synergy/training
Videos	www.renesas.com/synergy/videos
Chat and web ticket	www.renesas.com/synergy/resourcelibrary

5. Revision History

Rev.	Date	Description	
		Page	Summary
1.00	Aug.26.19	-	Initial release
1.01	Sep.10.19	-	Second release

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