Renesas Synergy™ Platform

USBX® Source Module Guide

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Introduction

The purpose of this document is to provide an easy reference for the USBX source component in e^2 studio. The properties are explained in greater detail than the footer comment supplied with each property. Context specific usage is included for **if** and **when** to change a default value. This document should make it easier to use the USBX source component without having to cross reference with the *Express Logic USBX User Guide*, and help you get familiarized more quickly with USBX features.

Contents

1. When to Include the USBX® Source Component

Adding the USBX source component enables you to customize the USBX library in the Synergy configurator environment, change values from default settings, and enable or disable certain features. Otherwise, you must use the prebuilt USBX library. In most projects beyond the simplest, you will typically want to customize your USBX environment. The ThreadX source component is automatically added when adding a higher-level source component (like FileX, NetX, NetX Duo, GUIX, USBX).

Without adding the USBX source component, the e² studio configurator will use a prebuilt library with the USBX default settings.

2. Adding the USBX® Source Component

In the e² studio configurator, you can add the USBX Source component by selecting any thread from the Threads list and pressing the **New Stack** button and navigating the menu to **X-Ware** > **USBX** > **Common** > **USBX Source**.

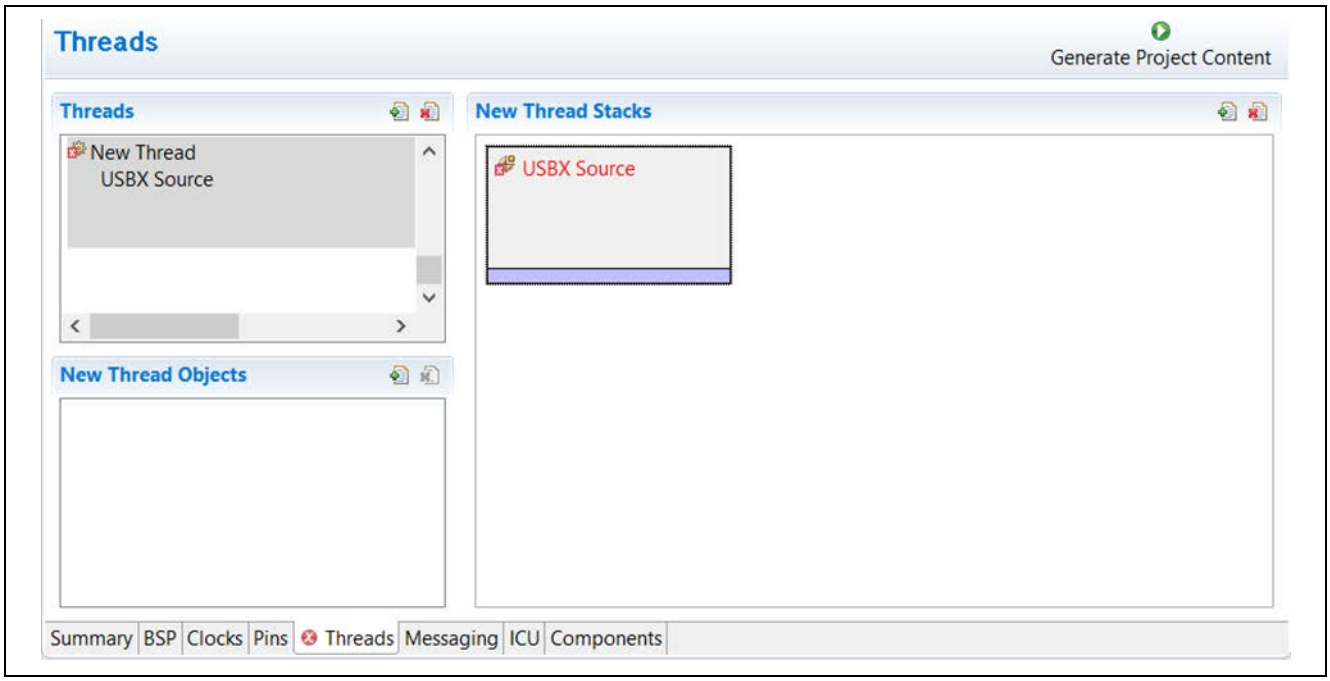

Figure 1 USBX Source Module Stack

3. Changing the USBX® Source Component Properties

After changing USBX property settings, you must click on the **Generate Project Content** button to update the project configurator in e² studio. Then the USBX library **must** be rebuilt and rebuild the project. Simply changing a property (or applying a #define in the preprocessor list) without rebuilding the project will not affect any change. e² studio will use the previously built library.

Default settings are based on use experience and are often the choice that will apply to the most common use cases.

4. USBX® Source Component Overview

The properties of the USBX Source component are given in the order they appear in the properties window of the Synergy configurator.

- **Ticks per second for USBX system – default value not displayed, the ThreadX value is used** – By default, USBX will use the value defined at ThreadX. You should not change this unless you have extensively modified the ThreadX tick timer mechanism.
- **Maximum Classes – default value not displayed, 8 used** – When defined, this value is the maximum number of classes that can be loaded by USBX. This value represents the class container and not the number of instances of a class. For instance, if a particular implementation of USBX needs the hub class, the printer class and the storage class, then the UX_MAX_CLASSES value can be set to 3 regardless of the number of devices that belong to these.
- **Maximum Slave Classes – default value not displayed, 3 used** – When defined, this value is the maximum number of classes in the device stack that can be loaded by USBX.
- **Maximum Slave Interfaces - default value not displayed, 16 used** – When defined, this value is the maximum number of interfaces in the device framework.
- **Maximum Host Class Containers - default value not displayed, no maximum set**.
- **Maximum Device Class Containers - default value not displayed, no maximum set**.
- **Maximum Host Controllers - default value not displayed, no maximum set -** This value represents the number of different host controllers that are available in the system. For USB 1.1 support, this value will mostly be 1. For USB 2.0 support, this value can be more than 1. This value represents the number of concurrent host controllers running at the same time. If, for instance, there are two instances of OHCI running or one EHCI and one OHCI controllers running, the UX_MAX_HCD should be set to 2.
- **Maximum Devices - default value not displayed, 8 used** – This value represents the maximum number of devices that can be attached to the USB. Normally, the theoretical maximum number on a single USB is 127 devices. This value can be scaled down to conserve memory. It should be noted that this value represents the total number of devices regardless of the number of USB buses in the system.
- **Maximum EDs - default value not displayed, 80 used** – This value represents the maximum number of EDs in the controller pool. This number is assigned to one controller only. If multiple instances of controllers are present, this value is used by each individual controller.
- **Maximum TDs - default value not displayed, 128 used** – This value represents the maximum number of regular TDs in the controller pool. This number is assigned to one controller only. If multiple instances of controllers are present, this value is used by each individual controller.
- **Maximum Isochronous TDs - default value not displayed, 128 used** – This value represents the maximum number of isochronous TDs in the controller pool. This number is assigned to one controller only. If multiple instances of controllers are present, this value is used by each individual controller.
- **Stack size for USBX threads - default value not displayed, 1024 bytes used on host and mixed controllers, 512 on device only controllers** – This value is the size of the stack in bytes for the USBX threads. It can be typically 1024 or 2048 bytes depending on the processor used and the host controller.
- **USBX Enumeration Thread Priority - default value not displayed, 20 used** – This is the ThreadX priority value for the USBX enumeration threads that monitors the bus topology.
- **USBX Standard Thread Priority - default value not displayed, 20 used** – This is the ThreadX priority value for the standard USBX threads.
- **USBX HID Keyboard Class Thread Priority - default value not displayed, 20 used** – This is the ThreadX priority value for the USBX HID keyboard class.
- **USBX HCD Thread Priority - default value not displayed, 2 used** – This is the ThreadX priority value for the host controller thread.
- **No use of time slice - default value disabled** – If enabled the ThreadX target port does not use time slicing.
- **Maximum Slave Logical Units - default value not displayed, 2 used** – This value represents the current number of SCSI logical units represented in the device storage class driver.
- **Maximum Host Logical Units - default value not displayed, 16 used** – This value represents the maximum number of SCSI logical units represented in the host storage class driver.
- **Slave Request Control Maximum Length - default value not displayed, 256 used** – This value represents the maximum number of bytes received on a control endpoint in the device stack. The default is 256 bytes, but can be reduced in memory constraint environments. **Slave Request Data Maximum Length - default value not displayed, 512 in device only controllers, 4096 otherwise** – This value represents the maximum number of bytes received on a bulk endpoint in the device stack. The default is 4096 bytes, but can be reduced in memory constraint environments.

- **Enforce Safe Alignment - default value is disabled** – When enabled, the memory allocation scheme enforces alignment. The default alignment value is UX_SAFE_ALIGN.
- **Show linkage warning - default value enabled** – By default, show linking warnings.

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	renesassynergy.com/software
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Revision History

Rev.	Date	Description	
		Page	Summary
1.00	Aug 6, 2018	—	Initial release

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Renesas Electronics America Inc.
1001 Murphy Ranch Road, Milpitas, CA 95035, U.S.A.
Tel: +1-408-432-8888, Fax: +1-408-434-5351

Renesas Electronics Canada Limited
9251 Yonge Street, Suite 8309 Richmond Hill, Ontario Canada L4C 9T3
Tel: +1-905-237-2004

Renesas Electronics Europe Limited
Dukes Meadow, Millboard Road, Bourne End, Buckinghamshire, SL8 5FH, U.K
Tel: +44-1628-651-700

Renesas Electronics Europe GmbH
Arcadiastrasse 10, 40472 Düsseldorf, Germany
Tel: +49-211-6503-0, Fax: +49-211-6503-1327

Renesas Electronics (China) Co., Ltd.
Room 1709 Quantum Plaza, No.27 ZhichunLu, Haidian District, Beijing, 100191 P. R. China
Tel: +86-10-8235-1155, Fax: +86-10-8235-7679

Renesas Electronics (Shanghai) Co., Ltd.
Unit 301, Tower A, Central Towers, 555 Langao Road, Putuo District, Shanghai, 200333 P. R. China
Tel: +86-21-2226-0888, Fax: +86-21-2226-0999

Renesas Electronics Hong Kong Limited
Unit 1601-1611, 16/F., Tower 2, Grand Century Place, 193 Prince Edward Road West, Mongkok, Kowloon, Hong Kong
Tel: +852-2265-6688, Fax: +852 2886-9022

Renesas Electronics Taiwan Co., Ltd.
13F, No. 363, Fu Shing North Road, Taipei 10543, Taiwan
Tel: +886-2-8175-9600, Fax: +886 2-8175-9670

Renesas Electronics Singapore Pte. Ltd.
80 Bendemeer Road, Unit #06-02 Hyflux Innovation Centre, Singapore 339949
Tel: +65-6213-0200, Fax: +65-6213-0300

Renesas Electronics Malaysia Sdn.Bhd.
Unit 1207, Block B, Menara Amcorp, Amcorp Trade Centre, No. 18, Jln Persiaran Barat, 46050 Petaling Jaya, Selangor Darul Ehsan, Malaysia
Tel: +60-3-7955-9390, Fax: +60-3-7955-9510

Renesas Electronics India Pvt. Ltd.
No.777C, 100 Feet Road, HAL 2nd Stage, Indiranagar, Bangalore 560 038, India
Tel: +91-80-67208700, Fax: +91-80-67208777

Renesas Electronics Korea Co., Ltd.
17F, KAMCO Yangjae Tower, 262, Gangnam-daero, Gangnam-gu, Seoul, 06265 Korea
Tel: +82-2-558-3737, Fax: +82-2-558-5338

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