Bluetooth® Real-Time Locating Library 4.0.0.0 GA
Gecko SDK Suite 4.1
June 8, 2022

Silicon Labs is a leading vendor in Bluetooth hardware and software technologies, used in products such as sports and fitness, consumer electronics, beacons, and smart home applications.

The Real-Time Locating (RTL) library contains features for Angle of Arrival estimation and spatial positioning. The software library comes with a C-programming language API for Windows (x86_64) and Linux (ARM Cortex A, x86_64) hosts.

KEY FEATURES

- Support added for new dual-polarized antenna array board BRD4191A

The RTL Library is released with the Bluetooth SDK. These release notes cover the following version(s):

Real-Time Locating Library 4.0.0.0 in Bluetooth SDK 4.0.0.0 released on June 8, 2022

Contents

1 New Items

Added in release 4.0.0.0

Added support for new dual-polarized antenna array board BRD4191A

RTL library now supports the new dual-polarized antenna array BRD4191A with array type SL_RTL_AOX_ARRAY_TYPE_4x4_DP_URA. The dual-polarized antenna array estimates the polarization of the incoming signal and uses the polarization information for improving the angle accuracy.

Added support for compensating antenna array non-idealities by inputting the antenna radiation patterns into the algorithm

Antenna radiation patterns can be loaded into RAM by calling sl_rtl_aox_antenna_pattern_init and then the loaded pattern can be inputted to the estimator algorithm with the sl_rtl_aox_set_antenna_pattern command. The radiation pattern is used for compensation gain and phase errors in the antenna array. Currently the library contains radiation patterns only for the dual-polarized BRD4191A.

Added IQ sample quality analysis support for the BRD4191A

Support for IQ sample QA functionality was added for the dual-polarized antenna arrays.

2 Improvements

Changed in release 4.0.0.0

The build flags for the 32 bit ARM platform (Raspberry Pi) build are fine-tuned a little. This enables the library to be compliant for a greater range of target hardware without negatively affecting performance.

3 Fixed Issues

Fixed in release 4.0.0.0

ID #	Description
765723	RTL library's position calculation was incorrectly accepting zero standard deviation values for the angle measurements, which would cause undefined behavior. Those are now ignored by the library. The standard deviation values are used, if available, for increased accuracy in position calculations and to better estimate the position especially when the given angle measurements are less accurate.
844656	RTL library provided zero accuracy estimate values (standard deviation) for angle accuracy of brd4185a antenna array. This is now fixed.

4 Known Issues in the Current Release

Issues in bold were added since the previous release.

ID #	Description	Workaround
375152	In heavy multipath conditions, the line-of-sight signal is not always detected correctly. In some cases this may mean large errors in both azimuth and elevation readings.	None
845889	**BRD4191A sometimes shows elevation and azimuth "sticking" issues at 0-20 degrees elevation when using antenna pattern compensation. When sticking occurs, the angle estimate does not change until the true angle changes more than several degrees.**	**If issue occurs and degrades angle accuracy when compensation is enabled, disable compensation by calling sl_rtl_aox_set_antenna_pattern(&libitem, NULL);**

5 Deprecated Items

None

6 Removed Items

None

7 Using This Release

7.1 Installation and Use

For instructions on developing with the RTL library, see *AN1296: Application Development with Silicon Labs' RTL Library* and the API reference included with the documentation installed through Simplicity Studio in the Bluetooth SDK.

7.2 Support

Development Kit customers are eligible for training and technical support. Use the Silicon Labs Bluetooth LE web page to obtain information about all Silicon Labs Bluetooth products and services, and to sign up for product support.

Contact Silicon Laboratories support at http://www.silabs.com/support or through links on the Simplicity Studio Welcome page.

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