RW BLE Application Interface Specification

Interface Specification

RW-BLE-APP-IS

Version 8.01

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RivieraWaves
http://www.rivierawaves.com/

Revision History

Version	Date	Revision Description	Author
0.1	Oct 17th 2012	Initial release	VLE
0.2	Jan 8th 2013	Nebulizer channel 1st proposal	VLE
0.3	Jan 17th 2013	Nebulizer messages definition	VLE
0.4	Jan 25th 2013	Nebulizer messages definition update	VLE
0.5	Jan 30th 2013	Checksum added on Nebulizer channel	VLE
0.6	March 22nd 2013	Clarifications and update of Nebulizer interface	VLE
0.7	July 18th 2013	Nebulizer channel removed	VLE
8.00	June 29th 2015	BLE 4.2	FBE
8.01	October 26th 2015	New Logical channel for audio	FBE

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1 Overview

1.1 Document Overview

This document describes the RivieraWaves Bluetooth Low Energy non-standard Application interface.

Its purpose is to explain the format of the interface packets passed between the Application/Tool through the physical interface with the embedded platform running in “BLE Full stack” mode.

The application term means any system running outside the RivieraWaves Bluetooth Low Energy system; it can be an external application processor, a test tool or any other sub-system.

The RivieraWaves Bluetooth Low Energy system will be mentioned as RWBLE in this document.

1.2 Application Interface Overview

RWBLE application interface is a mean for any 3rd party system to control or exchange data with RivieraWaves Bluetooth Low Energy application processes that are running on top of the Bluetooth Low Energy (Bluetooth Smart) protocol stack composed by Controller, Host stack and profiles.

Following figure gives a global overview of the communication link between systems:

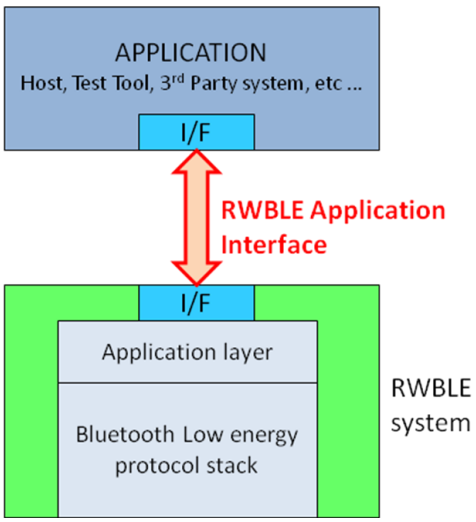

Figure 1: Application interface overview

The transport protocol used to interface RWBLE with application can be mapped onto any physical interface such as UART, USB, and so on, depending on the platform design.

For UART transport, the interface uses a single byte at the beginning of the packet to identify the type of the packet, as shown on figure below:

1 bytes	*N bytes*
ID	*PACKET DATA*

Figure 2: Packet format

Following table lists all supported packet identifiers:

Packet identifier	Used for
0x05	Test Tool (Application to Host Interface)
…	…
0x0A	Audio over Application to Host Interface
…	…

Table 1: List of supported packet identifiers

Each packet identifier defines a logical communication channel between application and RWBLE. The communication protocol and packets format for each logical channel are defined in the following sections of this document.

2 Test Tool (Application to Host Interface)

The Test tool communication channel is a full-duplex channel based on the RivieraWaves micro-Kernel inter-task communication entity, named kernel message. Using this communication channel allows addressing any task in the RWBLE system by sending or receiving a directly formatted Kernel message onto the physical interface.

Basically, kernel messages are composed with following format:

2 bytes	*2 bytes*	*2 bytes*	*2 bytes*	*N bytes*
MSG_ID	*DEST_ID*	*SRC_ID*	*PAR_LEN*	*PARAMS*

Figure 3: Kernel Message mapping onto Test Tool logical channel

Fields definition:

Size (in Byte)	Fields	Description
2	Msg_id	Message identifier
2	Dest_id	Destination task identifier
2	Src_id	Source task identifier
2	Par_len	Parameter length
N	Params	Message parameters

Table 2: List of parameters of Test Tool packet

Message identifier, destination task identifier, source task identifier, and parameter length fields compose the header.

The payload is composed of all message parameters depending on the message identifier.

Note: the parameters shall include any padding required by the RWBLE system CPU.

Each task has its own messages API. The messages that can be sent to a particular task, the responses from this task, or all other messages related to this task are described in a dedicated Interface Specification document. Please refer to corresponding documents for more details.

For example, see Generic Access Profile Interface Specification [1] or Generic Attribute Profile Interface Specification [2].

3 Audio over Application to Host Interface

See [3]

4 Abbreviations

Abbreviation	Original Terminology
API	Application Programming Interface
AHI	Application to Host Interface
AOAHI	Audio over AHI
BLE	Bluetooth Low Energy
RW	RivieraWaves

Table 3: List of abbreviations

References

[1]	**Title**	RW BLE GAP Interface Specification		
	Reference	RW-BLE-GAP-IS.pdf		
	Version	8.00	**Date**	June 29th 2015
	Source	RivieraWaves		

[2]	**Title**	RW BLE GATT Interface Specification		
	Reference	RW-BLE-GATT-IS.pdf		
	Version	8.00	**Date**	June 15th 2015
	Source	RivieraWaves		

[3]	**Title**	Audio Over Application to Host Interface – Interface Specification		
	Reference	RW-BLE-AOAHI-IS.pdf		
	Version	8.00	**Date**	October 26th 2015
	Source	RivieraWaves		