SH-2 SHTP Reference Manual

Document Number: 1000-3600
Document Revision: 1.6
Date: 2017

Table of Contents

List of Figures

1.0   Introduction

The SH-2 has two high level variants – the chip executable and the library. Both variants of the SH-2 use the Sensor Hub Transport Protocol (SHTP) to communicate with the host. See [1] for details of SHTP. This document supplements the SH-2 Reference Manual [2] with details about the SHTP advertisement response and channel usage.

1.1   Intended Audience

This document is intended for application developers implementing products that use the SH-2.

1.2   Scope

This document describes how the SH-2 uses the SHTP.

1.3   Revision History

Revision	Date	Description
1.6		
1.5	02/16/2017	Deleted unused reference.
1.4	12/14/2016	Added legal notices.
1.3	11/17/2016	Defined version tag format. Add Gyro-Rotation vector channel.
1.2	07/13/2015	Add force-flush command/response.
1.1	03/30/2015	Minor updates following implementation.
1.0	02/25/2015	Initial issue

Figure 1: Document History

2.0   SH-2's Uses of SHTP

2.1   Host Interrupt and Timestamps

The SH-2 uses the SHTP timestamping feature.

2.2   SH-2 Channel Usage

The SH-2 cargoes consist of predefined messages identified by report ID's. See [2] for details of these messages. To make message handling and identification easier the SH-2 uses certain channels for specific purposes. The SH-2 channel usage is shown in Figure 2. The device channel is used only on the chip executable variants.

Channel	Use	Name	Direction
N	Device commands. The commands are one byte. The cargo for a command is one byte. Sending multiple commands in one cargo is not supported. The defined commands are: 0 – reserved 1 – reset 2 – on 3 – sleep 4-255 – reserved	device	Write
	Device responses. The responses are one byte. The cargo for a response is one byte. Sending multiple responses in one cargo is not supported. The defined responses are: 0 – reserved 1 – reset complete 2-255 – reserved		Read
N+1	All reports sent to the hub. Each report is identified by its report ID. Report lengths are fixed. Set feature reports are defined as report ID = 0xFD followed by the feature report. The full feature report, including its report ID as defined in [2], is sent. Get feature reports are defined as: report ID = 0xFE followed by the ID of the feature report to get. Force-flush reports are defined as: reportID=0xF0 followed by the ID of the sensor to be flushed.	control	Write
	All reports other than sensor data reports. Each report is identified by a report ID. Report lengths are fixed. Get feature responses are defined as: report ID = 0xF2 followed by the ID of the feature report to get. All other reports are sent as they are defined in [2].		Read
N+2	Unused	inputNormal	Write
	Input reports. The cargo consists of one or more input reports. Each report is identified by its report ID. Report lengths are fixed.		Read
N+3	Unused	inputWake	Write
	Input reports for wake sensors. The cargo consists of one or more input reports. Each report is identified by its report ID. Report lengths are fixed.		Read
N+4	Unused	inputGyroRv	Write
	Gyro Rotation Vector data. The cargo consists exclusively of compact Gyro + Rotation Vector reports. See [2] for report format. Gyro + RV reports are sent one at a time: a single SHTP transfer will never contain multiple Gyro + RV reports.		Read

Figure 2: SH-2 Write Channel Usage

2.3   Channel Advertisement

The SH-2 advertises the values listed in Figure 3.

Tag	Tag Name	Value
1	GUID	1
8	AppName	executable
6	NormalChannel	N
9	ChannelName	device
1	GUID	2
8	AppName	sensorhub
6	NormalChannel	N+1
9	ChannelName	control
6	NormalChannel	N+2
8	ChannelName	inputNormal
7	WakeChannel	N+3
9	ChannelName	inputWake
6	NormalChannel	N+4
9	ChannelName	inputGyroRv
0x80	Version	Varies
0x81	Report Lengths	Array of (report ID, length) pairs

Figure 3: SH-2 Advertisement

The value for N may be selected at compile time or run time depending on the specific implementation of SH-2.

The version tag uses the same format as the version tag used by SHTP [1].

The ReportLengths tag is provided to support compatibility between different versions of host and sensor hub. The array provided consists of pairs of unsigned 8 bit integers, in (report ID, length) order. Cargoes received from the hub may consist of multiple reports. The first byte will always be a report ID, and the next report will start a fixed number of bytes after that (the length indicated by the corresponding entry in ReportLengths). The length of a report always includes the report ID itself, as well as the report contents.

3.0   References

1. Hillcrest Laboratories, 1000-3535 Sensor Hub Transport Protocol Reference Manual.

2. Hillcrest Laboratories, 1000-3625 SH-2 Reference Manual.

4.0   Notices

© Copyright 08/2019 CEVA, Inc. and/or its subsidiaries ("CEVA") All rights reserved. All specifications are subject to change without notice.

Disclaimer: The information furnished herein is believed to be accurate and reliable. However, the information is provided "AS IS", without any express or implied warranty of any kind including warranties of merchantability, non-infringement of intellectual property, or fitness for any particular purpose.

In no event shall CEVA or its suppliers be liable for any claims and/or damages whatsoever arising out of the use of or inability to use the materials. CEVA and its suppliers further do not warrant the accuracy or completeness of the information, text, graphics or other items contained within these materials. CEVA may make changes to these materials, or to the products described within.

www.ceva-dsp.com

FOR MORE
INFORMATION: