CM002X1
Xear
HID Control Protocol Specification

Rev. 1.0
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Revision History

Revision	Date	Description	Create By
1.0	2024-05-07	First Released	Momo Chiang

Table of Contents

Overview

Report, input report and feature report. The application and FW can pass status data through this protocol.

Report ID

For Function Status communication protocol, we need to define a new report ID for identify it. The new report ID is defined as 0xED. If application detected HID report contains report ID with 0xED in C-Media chip it means it can support this protocol.

HID Output Report Definition

The total 2-bytes output report is defined below. The first byte is Report ID. The second byte is Feature ID, which application wants to set/get thru feature report. Each Feature ID will map to a unique feature that define in Function Table.

Offset	Field	Size	Value	Description
Byte 0	ReportID	1	0xED	Report ID
Byte 1	FeatureID	1	Number	Feature ID

HID Input Report Definition

The total 2-bytes input report is defined below. The first byte is Report ID. The second byte is Feature ID, which firmware want notify application, which feature status, has changed.
When receiving the device button message, firmware will return the data to the application according to the definition below, and the application can use output report and feature report to update the status.

Offset	Field	Size	Value	Description
Byte 0	ReportID	1	0xED	Report ID
Byte 1	FeatureID	1	Number	Feature ID

Feature function Table Define

Feature ID	Function Name
0x02	Xear Surround Headphone

Feature 0x02 (Xear Surround Headphone) Data Structure

Offset	Field	Size	Value	Description
0	ReportID	1	0xED	Report ID
1	Length	1	0x02	Length. Total 0x02
2	FeatureID	1	0x02	Feature ID
3	bOnOff	1	Boolean	Effect On/Off

Initial value example:
(0xED, 0x02, 0x02, 0x01)
When HID button is pressed, only Effect on/off will be toggled (offset 3). All other parameters will be updated by UI. If control is changed by UI, UI will use SetFeatureReport to update status. Firmware need to remember the status and provide current status update, if HID button is pressed in the next event.

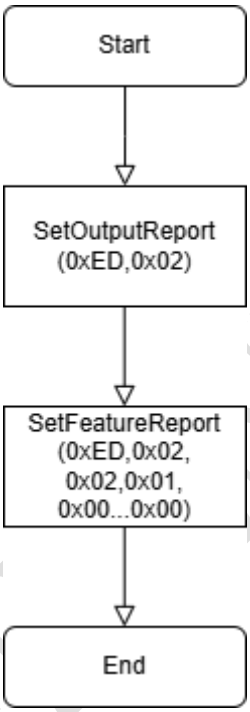
HID Feature Report Define

The total 32-bytes feature report is defined below. The first byte is Report ID. The second byte is data length of the valid data. The third byte is the Feature ID. And remain bytes are for the data structure of the Feature ID.
For example if application want to get the Surround Headphone, Application need to use set output report to set Feature ID SetOutputReport[2] = { 0xED, 0x02}, then use get feature report to get feature status. Device shall response get feature and transmit "0xED, 0x02, 0x02, 0x01, 0x00". If Device wants to notify Application to change status, it need send input report data thru interrupt pipe. Once Application gets input report data it sends output report to set what Feature ID application want to read then issue a get feature report to get data. If application want change status, it send output report to set what Feature ID application want to write then issue a set feature report to write data to device. FW will base on the changed function data return different lengths data structure

Application Update status data to FW flow chart

(Take Surround Headphone as an Example)

Set Surround Headphone function to “On”.



Firmware Update status to Application flow chart

(Take Surround Headphone as an Example)

Notify Surround Headphone change to “Off”.