# MP3 module Slave Mode Protocol V0.1

## Contents

# 1.....Packet Format

## 1.1 UART

In slave mode, UART is used for communication in 10bit asynchronous transfer mode, defaulting GPIOA0 as TX, GPIOA1 as RX and 57,600bps as baud rate. Format of each byte is as follows:

| Start bit | Data bits | Stop bit |
|---|---|---|
| 0 | bit0…..bit7 | 1 |

## 1.2 Packet Format

Any command is transmitted in packet to assure communication reliability and assure the consistency of transmitted data.

| 1Byte | 1Byte | 1Byte | 1Byte | 1Byte | Len Bytes | 1Byte |
|---|---|---|---|---|---|---|
| 0x55 | 0xAA | len | Cmd_H | Cmd_L | Data | CS |

- x55,0xAA: Packet guider is SOP and all packets start from 0x55,0xAA.
- Len: Total length of data domain.
- Cmd_H: High 8-bit of CommandID. The highest bit of Cmd_H is direction bit. 0 means that the packet is transmitted from the host to the slave, and 1 means that the packet is transmitted from the slave to the host.
- Cmd_L: Low 8-bit of CommandID.
- Data: For data in the packet, the length is 0-250 and contents are determined by Cmd.
- CS: Packet check and bytes are computed as follows:

  CS = 0 – (Len + Cmd_H + Cmd_L + Data[0] + … + Data[n-1]).

## 1.3 Communication

After the slave has been powered on and starts to send START..., it indicates that it starts to operate normally. Any command in this protocol will follow the following flow:

- First, the host sends out a command request packet.
- After having received this command request packet, the slave sends back a reply packet after having completed relevant operation and sends the operation results back to the host.The slave changes the highest bit of the command code sent by the host into 1 as the command code of the reply packet.
- After having sent a command, the host sets a time-out timer. If the slave fails to send back a reply within a certain period, the host will treat it as time-out.

## 1.4 Byte Order

In a packet, some fields are WORD type data consisting of multiple bytes or DWORD type data with high bytes in front and low bytes behind. For example, CommandID field is a two-byte WORD type data with high byte Cmd_H in front and low byte Cmd_L behind.

## 2 Command Table

# 2.1 Command Table

| | Command | Command code | Command packet | | Reply | |
|---|---|---|---|---|---|---|
| | | | Len | Data | Len | Data |
| Mode | Next mode | 0x0101 | 0 | | 1 | ModeID |
| | Select mode | 0x0102 | 1 | ModeID | 1 | ModeID |
| | Get mode | 0x0103 | 0 | | 1 | ModeID |
| | Get device link | 0x0104 | 0 | | 1 | LinkStatus |
| FS | Get folder sum | 0x0201 | 0 | | 4 | FolderSum<br>ValidFolderSum |
| | Get file sum | 0x0202 | 0 | | 2 | FileSum |
| | Get folder info | 0x0203 | 4 | ParentFolderNum<br>FolderNum | n | FolderNum<br>ValidFolderNum<br>StartFileNum<br>IncFileCnt<br>IncFolderCnt<br>RecFileCnt<br>RecFolderCnt<br>ShortName<br>LongFolderNameLen<br>LongFolderName |
| | Get file info | 0x0204 | 4 | ParentFolderNum<br>FileNum | n | FileNumInDisk<br>FileNumInFolder<br>FolderNum<br>ShortName<br>LongFileNameLen<br>LongFileName |
| PLAY | Play | 0x0301 | 0 | | 0 | |
| | Pause | 0x0302 | 0 | | 0 | |
| | Stop | 0x0303 | 0 | | 0 | |
| | Next | 0x0304 | 0 | | 0 | |
| | Pre | 0x0305 | 0 | | 0 | |
| | Play/Pause | 0x0306 | 0 | | 0 | |
| | FF | 0x0307 | 0 | | 0 | |
| | FB | 0x0308 | 0 | | 0 | |
| | Stop FF/FB | 0x0309 | 0 | | 0 | |
| | Seek play time | 0x030A | 4 | Seconds | 0 | |
| | Next folder | 0x030B | 0 | | 0 | |
| | Pre folder | 0x030C | 0 | | 0 | |
| | Select song | 0x030D | 4 | ValidFolderNum<br>FileNum | 1 | Result |
| | | | | | | |
| | Get play status | 0x0320 | 0 | | 12 | ModeID<br>PlayState<br>ValidFolderNum<br>FileNumInDisk<br>FileNumInFolder<br>CurPlayTime |
| | Get song info | 0x0321 | 0 | | 21 | SongType<br>ChannelNum |

| | Command | Command code | Command packet | | Reply | |
|---|---|---|---|---|---|---|
| | | | Len | Data | Len | Data |
| | | | | | | SamplesPerSecond<br>BytesPerSecond<br>TotalPlayTime<br>HeaderLen<br>IsVBR<br>MpegVersion<br>Layer |
| | Set repeat mode | 0x0322 | 1 | Repeat mode | 0 | |
| | Get repeat mode | 0x0323 | 0 | | 1 | Repeat mode |
| | Enable folder | 0x0324 | 0 | | 0 | |
| | Disable folder | 0x0325 | 0 | | 0 | |
| | Get title | 0x0330 | 0 | | n | TagType<br>CharSet<br>TitleLen: 0-30<br>Title |
| | Get artist | 0x0331 | 0 | | n | TagType<br>CharSet<br>ArtistLen: 0-30<br>Artist |
| | Get album | 0x0332 | 0 | | n | TagType<br>CharSet<br>AlbumLen: 0-30<br>Album |
| | Get comment | 0x0333 | 0 | | n | TagType<br>CharSet<br>CommentLen: 0-30<br>Comment |
| | Get year | 0x0334 | 0 | | n | TagType<br>CharSet<br>YearLen: 0-30<br>Year |
| AUDIO | VOL+ | 0x0401 | 0 | | 0 | |
| | VOL- | 0x0402 | 0 | | 0 | |
| | Set vol | 0x0403 | 1 | Volume:0-32 | 0 | |
| | Get vol | 0x0404 | 0 | | 1 | Volume: 0-32 |
| | Set EQ | 0x0405 | 1 | Eq: 0-10 | 0 | |
| | Get EQ | 0x0406 | 0 | | 1 | Eq:0-10 |
| | Mute | 0x0407 | 0 | | 0 | |
| | Unmute | 0x0408 | 0 | | 0 | |
| | Set linein gain | 0x0409 | 1 | Gain: 0-63 | 0 | |
| | Enable mic | 0x040A | 1 | Gain: 0-3 | 0 | |
| | Disable mic | 0x040B | 0 | | 0 | |
| | | | | | | |

# 3 System Mode

## 3.1 Next mode

- Host command:

| Byte | Value | Comment |
|---|---|---|
| 0 | 0x55 | SOP |
| 1 | 0xAA | SOP |
| 2 | 0x00 | PayloadLen |
| 3 | 0x01 | CommandID |
| 4 | 0x01 | |
| 5 | 0xFE | CheckSum |

- Slave reply:

| Byte | Value | Comment |
|---|---|---|
| 0 | 0x55 | SOP |
| 1 | 0xAA | SOP |
| 2 | 0x01 | PayloadLen |
| 3 | 0x81 | CommandID |
| 4 | 0x01 | |
| 5 | 0xNN | ModeID:<br>0: IDLE<br>1: USB<br>2: SD<br>3: AUX IN<br>4: USB AUDIO |
| 6 | 0xNN | CheckSum |

### 3.2 Select mode

- Host command:

| Byte | Value | Comment |
|---|---|---|
| 0 | 0x55 | SOP |
| 1 | 0xAA | SOP |
| 2 | 0x01 | PayloadLen |
| 3 | 0x01 | CommandID |
| 4 | 0x02 | |
| 5 | 0xNN | Mode ID:<br>0: IDLE<br>1: USB<br>2: SD<br>3: LINE IN<br>4: USB AUDIO |
| 6 | 0xNN | CheckSum |

- Slave reply:

| Byte | Value | Comment |
|---|---|---|
| 0 | 0x55 | SOP |
| 1 | 0xAA | SOP |
| 2 | 0x01 | PayloadLen |
| 3 | 0x81 | CommandID |
| 4 | 0x02 | |
| 5 | 0xNN | Mode ID: (1)<br>0: IDLE<br>1: USB<br>2: SD<br>3: LINE IN<br>4: USB AUDIO |
| 6 | 0xNN | CheckSum |

(1) Successfully switch the current mode to the designated mode; unsuccessfully hold in the current mode; ID number of current mode after back operation.

### 3.3 Get mode

- Host command:

| Byte | Value | Comment |
|---|---|---|
| 0 | 0x55 | SOP |
| 1 | 0xAA | SOP |
| 2 | 0x00 | PayloadLen |
| 3 | 0x01 | CommandID |
| 4 | 0x03 | |
| 5 | 0xFC | CheckSum |

- Slave reply:

| Byte | Value | Comment |
|---|---|---|
| 0 | 0x55 | SOP |
| 1 | 0xAA | SOP |
| 2 | 0x01 | PayloadLen |
| 3 | 0x81 | CommandID |
| 4 | 0x03 | |
| 5 | 0xNN | Mode ID:<br>0: IDLE<br>1: USB<br>2: SD<br>3: AUX IN<br>3: USB AUDIO |
| 6 | 0xNN | CheckSum |

### 3.4 Get device link

- Host command:

| Byte | Value | Comment |
|---|---|---|
| 0 | 0x55 | SOP |
| 1 | 0xAA | SOP |
| 2 | 0x00 | PayloadLen |
| 3 | 0x01 | CommandID |
| 4 | 0x04 | |
| 5 | 0xFB | CheckSum |

- Slave reply:

| Byte | Value | Comment |
|---|---|---|
| 0 | 0x55 | SOP |
| 1 | 0xAA | SOP |
| 2 | 0x01 | PayloadLen |
| 3 | 0x81 | CommandID |
| 4 | 0x04 | |
| 5 | 0xNN | Device link status: (0: no link, 1: link ok)<br>Bit0: usb link status.<br>Bit1: sd-card link status.<br>Bit2: AuxIn link status.<br>Bit3: PC link status. |
| 6 | 0xNN | CheckSum |

# 4 File System

## 4.1 Get folder sum

- Host command:

| Byte | Value | Comment |
|---|---|---|
| 0 | 0x55 | SOP |
| 1 | 0xAA | SOP |
| 2 | 0x00 | PayloadLen |
| 3 | 0x02 | CommandID |
| 4 | 0x01 | |
| 5 | 0xFD | CheckSum |

- Slave reply:

| Byte | Value | Comment |
|---|---|---|
| 0 | 0x55 | SOP |
| 1 | 0xAA | SOP |
| 2 | 0x04 | PayloadLen |
| 3 | 0x82 | CommandID |
| 4 | 0x01 | |
| 5 | 0xNN | FolderSum: Sum of all folders in the whole disk. |
| 6 | 0xNN | |
| 7 | 0xNN | ValidFolderSum: Sum of all valid folders in the whole disk. |
| 8 | 0xNN | |
| 9 | 0xNN | CheckSum |

### 4.2 Get file sum

- Host command:

| Byte | Value | Comment |
|---|---|---|
| 0 | 0x55 | SOP |
| 1 | 0xAA | SOP |
| 2 | 0x00 | PayloadLen |
| 3 | 0x02 | CommandID |
| 4 | 0x02 | |
| 5 | 0xFC | CheckSum |

- Slave reply:

| Byte | Value | Comment |
|---|---|---|
| 0 | 0x55 | SOP |
| 1 | 0xAA | SOP |
| 2 | 0x02 | PayloadLen |
| 3 | 0x82 | CommandID |
| 4 | 0x02 | |
| 5 | 0xNN | FileSum |
| 6 | 0xNN | |
| 7 | 0xNN | CheckSum |

### 4.3 Get folder info

- Host command:

| Byte | Value | Comment |
|---|---|---|
| 0 | 0x55 | SOP |
| 1 | 0xAA | SOP |
| 2 | 0x04 | PayloadLen |
| 3 | 0x02 | CommandID |
| 4 | 0x03 | |
| 5 | 0xNN | ParentFolderNum: As 0, return to FolderNum folder information in the whole disk. |
| 6 | 0xNN | Not as 0, return to FolderNum sub-folder information in ParentFolderNum folder in the whole disk. |
| 7 | 0xNN | FolderNum |
| 8 | 0xNN | |
| 9 | 0xNN | CheckSum |

- Slave reply:

| Byte | Value | Comment |
|---|---|---|
| 0 | 0x55 | SOP |
| 1 | 0xAA | SOP |
| 2 | 0xNN | PayloadLen: n |
| 3 | 0x82 | CommandID |
| 4 | 0x03 | |
| 5 | 0xNN | FolderNum: Number of folders when empty folders are not filtered. |
| 6 | 0xNN | |
| 7 | 0xNN | ValidFolderNum: Number of the folders after empty folders are filtered. |
| 8 | 0xNN | |
| 9 | 0xNN | StartFileNum: Number of the start song in the folder. |
| 10 | 0xNN | |
| 11 | 0xNN | IncFileCnt: Songs included (excluding sub-folders on the lower level). |
| 12 | 0xNN | |
| 13 | 0xNN | IncFolderCnt: Sub-folders included (excluding sub-folders on the lower level). |
| 14 | 0xNN | |
| 15 | 0xNN | RecFileCnt: Songs included (including sub-folders on the lower level). |
| 16 | 0xNN | |
| 17 | 0xNN | RecFolderCnt: Sub-folders included (including sub-folders on the lower level). |
| 18 | 0xNN | |
| 19 | 0xNN | ShortName: Name of short folder, totally 8 bytes. |
| ... | 0xNN | |
| 26 | 0xNN | |
| 27 | 0xNN | LongFolderNameLen: Length of a long file name, 0-64 bytes. |
| 28 | 0xNN | LongFolderName: Unicode code, each character occupies two bytes with the higher byte in front and the lower byte behind. |
| … | 0xNN | |
| n+3 | 0xNN | |
| n+4 | 0xNN | CheckSum |

### 4.4 Get file info

- Host command:

| Byte | Value | Comment |
|---|---|---|
| 0 | 0x55 | SOP |
| 1 | 0xAA | SOP |
| 2 | 0x04 | PayloadLen |
| 3 | 0x02 | CommandID |
| 4 | 0x04 | |
| 5 | 0xNN | ParentFolderNum: As 0, return to FileNum folder information in the whole disk.<br>Not as 0, return to FileNum file information in ParentFolderNum folder in the whole disk. |
| 6 | 0xNN | |
| 7 | 0xNN | FileNum |
| 8 | 0xNN | |
| 9 | 0xNN | CheckSum |

- Slave reply:

| Byte | Value | Comment |
|---|---|---|
| 0 | 0x55 | SOP |
| 1 | 0xAA | SOP |
| 2 | 0xNN | PayloadLen: n |
| 3 | 0x82 | CommandID |
| 4 | 0x04 | |
| 5 | 0xNN | FileNumInDisk: File number in the whole disk. |
| 6 | 0xNN | |
| 7 | 0xNN | FileNumInFolder: File number in the folder. |
| 8 | 0xNN | |
| 9 | 0xNN | FolderNum: Number of the folder. |
| 10 | 0xNN | |
| 11 | 0xNN | ShortName: Name of short file, totally 11 bytes and the last 3 as extension name. |
| ... | 0xNN | |
| 21 | 0xNN | |
| 22 | 0xNN | LongFileNameLen: Length of the long file name, 0-64 bytes. |
| 23 | 0xNN | LongFileName: Unicode code, each character occupies two bytes with the higher byte in front and lower byte behind. |
| … | 0xNN | |
| n+3 | 0xNN | |
| n+4 | 0xNN | CheckSum |

# 5 Play Control

## 5.1 Play

- Host command:

| Byte | Value | Comment |
|---|---|---|
| 0 | 0x55 | SOP |
| 1 | 0xAA | SOP |
| 2 | 0x00 | PayloadLen |
| 3 | 0x03 | CommandID |
| 4 | 0x01 | |
| 5 | 0xFC | CheckSum |

- Slave reply:

| Byte | Value | Comment |
|---|---|---|
| 0 | 0x55 | SOP |
| 1 | 0x55 | SOP |
| 2 | 0x00 | PayloadLen |
| 3 | 0x83 | CommandID |
| 4 | 0x01 | |
| 5 | 0x7C | CheckSum |

### 5.2 Pause

- Host command:

| Byte | Value | Comment |
|---|---|---|
| 0 | 0x55 | SOP |
| 1 | 0xAA | SOP |
| 2 | 0x00 | PayloadLen |
| 3 | 0x03 | CommandID |
| 4 | 0x02 | |
| 5 | 0xFB | CheckSum |

- Slave reply:

| Byte | Value | Comment |
|---|---|---|
| 0 | 0x55 | SOP |
| 1 | 0xAA | SOP |
| 2 | 0x00 | PayloadLen |
| 3 | 0x83 | CommandID |
| 4 | 0x02 | |
| 5 | 0x7B | CheckSum |

### 5.3 Stop

- Host command:

| Byte | Value | Comment |
|---|---|---|
| 0 | 0x55 | SOP |
| 1 | 0xAA | SOP |
| 2 | 0x00 | PayloadLen |
| 3 | 0x03 | CommandID |
| 4 | 0x03 | |
| 5 | 0xFA | CheckSum |

- Slave reply:

| Byte | Value | Comment |
|---|---|---|
| 0 | 0x55 | SOP |
| 1 | 0xAA | SOP |
| 2 | 0x00 | PayloadLen |
| 3 | 0x83 | CommandID |
| 4 | 0x03 | |
| 5 | 0x7A | CheckSum |

### 5.4 Next

- Host command:

| Byte | Value | Comment |
|---|---|---|
| 0 | 0x55 | SOP |
| 1 | 0xAA | SOP |
| 2 | 0x00 | PayloadLen |
| 3 | 0x03 | CommandID |
| 4 | 0x04 | |
| 5 | 0xF9 | CheckSum |

- Slave reply:

| Byte | Value | Comment |
|---|---|---|
| 0 | 0x55 | SOP |
| 1 | 0xAA | SOP |
| 2 | 0x00 | PayloadLen |
| 3 | 0x83 | CommandID |
| 4 | 0x04 | |
| 5 | 0x79 | CheckSum |

### 5.5 Pre

- Host command:

| Byte | Value | Comment |
|---|---|---|
| 0 | 0x55 | SOP |
| 1 | 0xAA | SOP |
| 2 | 0x00 | PayloadLen |
| 3 | 0x03 | CommandID |
| 4 | 0x05 | |
| 5 | 0xF8 | CheckSum |

- Slave reply:

| Byte | Value | Comment |
|---|---|---|
| 0 | 0x55 | SOP |
| 1 | 0xAA | SOP |
| 2 | 0x00 | PayloadLen |
| 3 | 0x83 | CommandID |
| 4 | 0x05 | |
| 5 | 0x78 | CheckSum |

### 5.6 Play/Pause

- Host command:

| Byte | Value | Comment |
|---|---|---|
| 0 | 0x55 | SOP |
| 1 | 0xAA | SOP |
| 2 | 0x00 | PayloadLen |
| 3 | 0x03 | CommandID |
| 4 | 0x06 | |
| 5 | 0xF7 | CheckSum |

- Slave reply:

| Byte | Value | Comment |
|---|---|---|
| 0 | 0x55 | SOP |
| 1 | 0xAA | SOP |
| 2 | 0x00 | PayloadLen |
| 3 | 0x83 | CommandID |
| 4 | 0x06 | |
| 5 | 0x77 | CheckSum |

### 5.7 FF

- Host command [2]:

| Byte | Value | Comment |
|---|---|---|
| 0 | 0x55 | SOP |
| 1 | 0xAA | SOP |
| 2 | 0x00 | PayloadLen |
| 3 | 0x03 | CommandID |
| 4 | 0x07 | |
| 5 | 0xF6 | CheckSum |

- Slave reply:

| Byte | Value | Comment |
|---|---|---|
| 0 | 0x55 | SOP |
| 1 | 0xAA | SOP |
| 2 | 0x00 | PayloadLen |
| 3 | 0x83 | CommandID |
| 4 | 0x07 | |
| 5 | 0x76 | CheckSum |

### 5.8 FB

- Host command [(2)]:

| Byte | Value | Comment |
|---|---|---|
| 0 | 0x55 | SOP |
| 1 | 0xAA | SOP |
| 2 | 0x00 | PayloadLen |
| 3 | 0x03 | CommandID |
| 4 | 0x08 | |
| 5 | 0xF5 | CheckSum |

- Slave reply:

| Byte | Value | Comment |
|---|---|---|
| 0 | 0x55 | SOP |
| 1 | 0xAA | SOP |
| 2 | 0x00 | PayloadLen |
| 3 | 0x83 | CommandID |
| 4 | 0x08 | |
| 5 | 0x75 | CheckSum |

(2) If it needs to enquire the current play time during fast forward/fast backward, it must be at the enquiry interval within 125ms.

### 5.9 Stop FF/FB

- Host command:

| Byte | Value | Comment |
|---|---|---|
| 0 | 0x55 | SOP |
| 1 | 0xAA | SOP |
| 2 | 0x00 | PayloadLen |
| 3 | 0x03 | CommandID |
| 4 | 0x09 | |
| 5 | 0xF4 | CheckSum |

- Slave reply:

| Byte | Value | Comment |
|---|---|---|
| 0 | 0x55 | SOP |
| 1 | 0xAA | SOP |
| 2 | 0x00 | PayloadLen |
| 3 | 0x83 | CommandID |
| 4 | 0x09 | |
| 5 | 0x74 | CheckSum |

### 5.10 Seek play time

Play by skipping to the designated time point of the current song.

- Host command:

| Byte | Value | Comment |
|---|---|---|
| 0 | 0x55 | SOP |
| 1 | 0xAA | SOP |
| 2 | 0x04 | PayloadLen |
| 3 | 0x03 | CommandID |
| 4 | 0x0A | |
| 5 | 0xNN | Seconds |
| 6 | 0xNN | |
| 7 | 0xNN | |
| 8 | 0xNN | |
| 9 | 0xNN | CheckSum |

- Slave reply:

| Byte | Value | Comment |
|---|---|---|
| 0 | 0x55 | SOP |
| 1 | 0xAA | SOP |
| 2 | 0x00 | PayloadLen |
| 3 | 0x83 | CommandID |
| 4 | 0x0A | |
| 5 | 0x73 | CheckSum |

### 5.11 Next folder

- Host command:

| Byte | Value | Comment |
|---|---|---|
| 0 | 0x55 | SOP |
| 1 | 0xAA | SOP |
| 2 | 0x00 | PayloadLen |
| 3 | 0x03 | CommandID |
| 4 | 0x0B | |
| 5 | 0xF2 | CheckSum |

- Slave reply:

| Byte | Value | Comment |
|---|---|---|
| 0 | 0x55 | SOP |
| 1 | 0xAA | SOP |
| 2 | 0x00 | PayloadLen |
| 3 | 0x83 | CommandID |
| 4 | 0x0B | |
| 5 | 0x72 | CheckSum |

### 5.12 Pre folder

- Host command:

| Byte | Value | Comment |
|---|---|---|
| 0 | 0x55 | SOP |
| 1 | 0xAA | SOP |
| 2 | 0x00 | PayloadLen |
| 3 | 0x03 | CommandID |
| 4 | 0x0C | |
| 5 | 0xF1 | CheckSum |

- Slave reply:

| Byte | Value | Comment |
|---|---|---|
| 0 | 0x55 | SOP |
| 1 | 0xAA | SOP |
| 2 | 0x00 | PayloadLen |
| 3 | 0x83 | CommandID |
| 4 | 0x0C | |
| 5 | 0x71 | CheckSum |

### 5.13 Select song

Select and play the designated song in the designated folder.

- Host command:

| Byte | Value | Comment |
|---|---|---|
| 0 | 0x55 | SOP |
| 1 | 0xAA | SOP |
| 2 | 0x04 | PayloadLen |
| 3 | 0x03 | CommandID |
| 4 | 0x0D | |
| 5 | 0xNN | ValidFolderNum: Number of valid folder. |
| 6 | 0xNN | As 0, return to FolderNum folder information in the whole disk. Not as 0, return to FolderNum sub-folder information in ParentFolderNum folder in the whole disk. |
| 7 | 0xNN | FileNum: File number. |
| 8 | 0xNN | |
| 9 | 0xNN | CheckSum |

- Slave reply:

| Byte | Value | Comment |
|---|---|---|
| 0 | 0x55 | SOP |
| 1 | 0xAA | SOP |
| 2 | 0x01 | PayloadLen |
| 3 | 0x83 | CommandID |
| 4 | 0x0D | |
| 5 | 0xNN | Result: 0x00: success, 0x01: fail |
| 6 | 0xNN | CheckSum |

### 5.14 Get play status

- Host command:

| Byte | Value | Comment |
|---|---|---|
| 0 | 0x55 | SOP |
| 1 | 0xAA | SOP |
| 2 | 0x00 | PayloadLen |
| 3 | 0x03 | CommandID |
| 4 | 0x20 | |
| 5 | 0xDD | CheckSum |

- Slave reply:

| Byte | Value | Comment |
|---|---|---|
| 0 | 0x55 | SOP |
| 1 | 0xAA | SOP |
| 2 | 0x0A | PayloadLen |
| 3 | 0x83 | CommandID |
| 4 | 0x20 | |
| 5 | 0xNN | ModeID:<br>0: IDLE<br>1: USB<br>2: SD<br>3: USB AUDIO<br>4: USB CARD READER<br>5: USB RECORD (only use u-disk)<br>6: SD RECORD (only use sd-card) |
| 6 | 0xNN | Play State:<br>0: SPIPLAY_STATE_IDLE<br>1: SPIPLAY_STATE_START<br>2: SPIPLAY_STATE_PLAY<br>3: SPIPLAY_STATE_PAUSE<br>4: SPIPLAY_STATE_MUTE<br>5: SPIPLAY_STATE_STOP |
| 7 | 0xNN | ValidFolderNum: Valid folder number of the current song. |
| 8 | 0xNN | |
| 9 | 0xNN | FileNumInDisk: Number of the current song in the whole disk. |
| 10 | 0xNN | |
| 11 | 0xNN | FileNumInFolder: Number of the current song in the folder. |
| 12 | 0xNN | |
| 13 | 0xNN | CurPlayTime: Play location of the current song in second. |
| 14 | 0xNN | |
| 15 | 0xNN | |
| 16 | 0xNN | |
| 17 | 0xNN | CheckSum |

### 5.15 Get song info

- Host command:

| Byte | Value | Comment |
|---|---|---|
| 0 | 0x55 | SOP |
| 1 | 0xAA | SOP |
| 2 | 0x00 | PayloadLen |
| 3 | 0x03 | CommandID |
| 4 | 0x21 | |
| 5 | 0xDC | CheckSum |

- Slave reply:

| Byte | Value | Comment |
|---|---|---|
| 0 | 0x55 | SOP |
| 1 | 0xAA | SOP |
| 2 | 0x15 | PayloadLen |
| 3 | 0x83 | CommandID |
| 4 | 0x21 | |
| 5 | 0xNN | SongType:<br>0: UNKOWN<br>1: MP3<br>2: WMA<br>3: PCM_1CH<br>4: PCM_2CH<br>5: IMA_ADPCM |
| 6 | 0xNN | ChannelNum: Number of channels. |
| 7 | 0xNN | SamplesPerSecond: Sample rate. |
| 8 | 0xNN | |
| 9 | 0xNN | |
| 10 | 0xNN | |
| 11 | 0xNN | BytesPerSecond:Bytes per second. |
| 12 | 0xNN | |
| 13 | 0xNN | |
| 14 | 0xNN | |
| 15 | 0xNN | TotalPlayTime: Total play time in second. |
| 16 | 0xNN | |
| 17 | 0xNN | |
| 18 | 0xNN | |
| 19 | 0xNN | HeaderLen:Length of file header. |
| 20 | 0xNN | |
| 21 | 0xNN | |
| 22 | 0xNN | |
| 23 | 0xNN | IsVBR: VBR song or not. |
| 24 | 0xNN | MpegVersion: (Only for MP3 songs).<br>0: MPEG_2_5<br>1: MPEG_2<br>2: MPEG_1<br>3: MPEG_UNKNOWN |
| 25 | 0xNN | Layer: (Only for MP3 songs).<br>0: LAYER_UNKNOWN<br>1: LAYER_3<br>2: LAYER_2<br>3: LAYER_1 |
| 26 | 0xNN | CheckSum |

### 5.16 Set repeat mode

- Host command:

| Byte | Value | Comment |
|---|---|---|
| 0 | 0x55 | SOP |
| 1 | 0xAA | SOP |
| 2 | 0x01 | PayloadLen |
| 3 | 0x03 | CommandID |
| 4 | 0x22 | |
| 5 | 0xNN | RepeatMode:<br>0: REPEAT_ALL<br>1: RANDOM<br>2: REPEAT_ONE<br>3: INTRO |
| 6 | 0xNN | CheckSum |

- Slave reply:

| Byte | Value | Comment |
|---|---|---|
| 0 | 0x55 | SOP |
| 1 | 0xAA | SOP |
| 2 | 0x00 | PayloadLen |
| 3 | 0x83 | CommandID |
| 4 | 0x22 | |
| 5 | 0x61 | CheckSum |

### 5.17 Get repeat mode

- Host command:

| Byte | Value | Comment |
|---|---|---|
| 0 | 0x55 | SOP |
| 1 | 0xAA | SOP |
| 2 | 0x00 | PayloadLen |
| 3 | 0x03 | CommandID |
| 4 | 0x23 | |
| 5 | 0xDA | CheckSum |

- Slave reply:

| Byte | Value | Comment |
|---|---|---|
| 0 | 0x55 | SOP |
| 1 | 0xAA | SOP |
| 2 | 0x01 | PayloadLen |
| 3 | 0x83 | CommandID |
| 4 | 0x23 | |
| 5 | 0xNN | RepeatMode:<br>0: REPEAT_ALL<br>1: RANDOM<br>2: REPEAT_ONE<br>3: INTRO |
| 6 | 0xNN | CheckSum |

### 5.18 Enable folder

- Host command:

| Byte | Value | Comment |
|---|---|---|
| 0 | 0x55 | SOP |
| 1 | 0xAA | SOP |
| 2 | 0x00 | PayloadLen |
| 3 | 0x03 | CommandID |
| 4 | 0x24 | |
| 5 | 0xD9 | CheckSum |

- Slave reply:

| Byte | Value | Comment |
|---|---|---|
| 0 | 0x55 | SOP |
| 1 | 0xAA | SOP |
| 2 | 0x00 | PayloadLen |
| 3 | 0x83 | CommandID |
| 4 | 0x24 | |
| 5 | 0x59 | CheckSum |

### 5.19 Disable folder

- Host command:

| Byte | Value | Comment |
|---|---|---|
| 0 | 0x55 | SOP |
| 1 | 0xAA | SOP |
| 2 | 0x00 | PayloadLen |
| 3 | 0x03 | CommandID |
| 4 | 0x25 | |
| 5 | 0xD8 | CheckSum |

- Slave reply:

| Byte | Value | Comment |
|---|---|---|
| 0 | 0x55 | SOP |
| 1 | 0xAA | SOP |
| 2 | 0x00 | PayloadLen |
| 3 | 0x83 | CommandID |
| 4 | 0x25 | |
| 5 | 0x58 | CheckSum |

### 5.20 Get title

- Host command:

| Byte | Value | Comment |
|---|---|---|
| 0 | 0x55 | SOP |
| 1 | 0xAA | SOP |
| 2 | 0x00 | PayloadLen |
| 3 | 0x03 | CommandID |
| 4 | 0x30 | |
| 5 | 0xCD | CheckSum |

- Slave reply:

| Byte | Value | Comment |
|---|---|---|
| 0 | 0x55 | SOP |
| 1 | 0xAA | SOP |
| 2 | 0xNN | PayloadLen: n |
| 3 | 0x83 | CommandID |
| 4 | 0x30 | |
| 5 | 0xNN | TagType:<br>0: NONE<br>1: ID3V1<br>2: ID3V2<br>3: WMA |
| 6 | 0xNN | CharSet:<br>0: UNKOWN<br>1: ISO_8859_1<br>2: UTF_16<br>3: UTF_8 |
| 7 | 0xNN | TitleLen: Title length, 0-30 bytes. |
| 8 | 0xNN | Title |
| … | 0xNN | |
| n+3 | 0xNN | |
| n+4 | 0xNN | CheckSum |

### 5.21 Get artist

- Host command:

| Byte | Value | Comment |
|---|---|---|
| 0 | 0x55 | SOP |
| 1 | 0xAA | SOP |
| 2 | 0x00 | PayloadLen |
| 3 | 0x03 | CommandID |
| 4 | 0x31 | |
| 5 | 0xCC | CheckSum |

- Slave reply:

| Byte | Value | Comment |
|---|---|---|
| 0 | 0x55 | SOP |
| 1 | 0xAA | SOP |
| 2 | 0xNN | PayloadLen: n |
| 3 | 0x83 | CommandID |
| 4 | 0x31 | |
| 5 | 0xNN | TagType:<br>0: NONE<br>1: ID3V1<br>2: ID3V2<br>3: WMA |
| 6 | 0xNN | CharSet:<br>0: UNKOWN<br>1: ISO_8859_1<br>2: UTF_16<br>3: UTF_8 |
| 7 | 0xNN | ArtistLen: Artist length, 0-30 bytes. |
| 8 | 0xNN | Artist |
| … | 0xNN | |
| n+3 | 0xNN | |
| n+4 | 0xNN | CheckSum |

### 5.22 Get album

- Host command:

| Byte | Value | Comment |
|---|---|---|
| 0 | 0x55 | SOP |
| 1 | 0xAA | SOP |
| 2 | 0x00 | PayloadLen |
| 3 | 0x03 | CommandID |
| 4 | 0x32 | |
| 5 | 0xCB | CheckSum |

- Slave reply:

| Byte | Value | Comment |
|---|---|---|
| 0 | 0x55 | SOP |
| 1 | 0xAA | SOP |
| 2 | 0xNN | PayloadLen: n |
| 3 | 0x83 | CommandID |
| 4 | 0x32 | |
| 5 | 0xNN | TagType:<br>0: NONE<br>1: ID3V1<br>2: ID3V2<br>3: WMA |
| 6 | 0xNN | CharSet:<br>0: UNKOWN<br>1: ISO_8859_1<br>2: UTF_16<br>3: UTF_8 |
| 7 | 0xNN | AlbumLen: Album length, 0-30 bytes. |
| 8 | 0xNN | Album |
| … | 0xNN | |
| n+3 | 0xNN | |
| n+4 | 0xNN | CheckSum |

### 5.23 Get comment

- Host command:

| Byte | Value | Comment |
|---|---|---|
| 0 | 0x55 | SOP |
| 1 | 0xAA | SOP |
| 2 | 0x00 | PayloadLen |
| 3 | 0x03 | CommandID |
| 4 | 0x33 | |
| 5 | 0xCA | CheckSum |

- Slave reply:

| Byte | Value | Comment |
|---|---|---|
| 0 | 0x55 | SOP |
| 1 | 0xAA | SOP |
| 2 | 0xNN | PayloadLen: n |
| 3 | 0x83 | CommandID |
| 4 | 0x33 | |
| 5 | 0xNN | TagType:<br>0: NONE<br>1: ID3V1<br>2: ID3V2<br>3: WMA |
| 6 | 0xNN | CharSet:<br>0: UNKOWN<br>1: ISO_8859_1<br>2: UTF_16<br>3: UTF_8 |
| 7 | 0xNN | CommentLen: Comment length, 0-30 bytes. |
| 8 | 0xNN | Comment |
| … | 0xNN | |
| n+3 | 0xNN | |
| n+4 | 0xNN | CheckSum |

### 5.24 Get year

- Host command:

| Byte | Value | Comment |
|---|---|---|
| 0 | 0x55 | SOP |
| 1 | 0xAA | SOP |
| 2 | 0x00 | PayloadLen |
| 3 | 0x03 | CommandID |
| 4 | 0x34 | |
| 5 | 0xC9 | CheckSum |

- Slave reply:

| Byte | Value | Comment |
|---|---|---|
| 0 | 0x55 | SOP |
| 1 | 0xAA | SOP |
| 1 | 0xNN | PayloadLen: n |
| 2 | 0x83 | CommandID |
| 3 | 0x34 | |
| 4 | 0xNN | TagType:<br>0: NONE<br>1: ID3V1<br>2: ID3V2<br>3: WMA |
| 5 | 0xNN | CharSet:<br>0: UNKOWN<br>1: ISO_8859_1<br>2: UTF_16<br>3: UTF_8 |
| 6 | 0xNN | YearLen: Year length, 0-30 bytes. |
| 7 | 0xNN | Year |
| … | 0xNN | |
| n+3 | 0xNN | |
| n+4 | 0xNN | CheckSum |

# 6 Audio

## 6.1 Volume add

- Host command:

| Byte | Value | Comment |
|---|---|---|
| 0 | 0x55 | SOP |
| 1 | 0xAA | SOP |
| 2 | 0x00 | PayloadLen |
| 3 | 0x04 | CommandID |
| 4 | 0x01 | |
| 5 | 0xFB | CheckSum |

- Slave reply:

| Byte | Value | Comment |
|---|---|---|
| 0 | 0x55 | SOP |
| 1 | 0x55 | SOP |
| 1 | 0x00 | PayloadLen |
| 2 | 0x84 | CommandID |
| 3 | 0x01 | |
| 4 | 0x7B | CheckSum |

### 6.2 Volume sub

- Host command:

| Byte | Value | Comment |
|---|---|---|
| 0 | 0x55 | SOP |
| 1 | 0xAA | SOP |
| 2 | 0x00 | PayloadLen |
| 3 | 0x04 | CommandID |
| 4 | 0x02 | |
| 5 | 0xFA | CheckSum |

- Slave reply:

| Byte | Value | Comment |
|---|---|---|
| 0 | 0x55 | SOP |
| 1 | 0x00 | PayloadLen |
| 2 | 0x84 | CommandID |
| 3 | 0x02 | |
| 4 | 0x7A | CheckSum |

### 6.3 Set volume

- Host command:

| Byte | Value | Comment |
|---|---|---|
| 0 | 0x55 | SOP |
| 1 | 0xAA | SOP |
| 2 | 0x01 | PayloadLen |
| 3 | 0x04 | CommandID |
| 4 | 0x03 | |
| 5 | 0xNN | Volume: 0-32 |
| 6 | 0xNN | CheckSum |

- Slave reply:

| Byte | Value | Comment |
|---|---|---|
| 0 | 0x55 | SOP |
| 1 | 0xAA | SOP |
| 2 | 0x00 | PayloadLen |
| 3 | 0x84 | CommandID |
| 4 | 0x03 | |
| 5 | 0x79 | CheckSum |

### 6.4 Get volume

- Host command:

| Byte | Value | Comment |
|---|---|---|
| 0 | 0x55 | SOP |
| 1 | 0xAA | SOP |
| 2 | 0x00 | PayloadLen |
| 3 | 0x04 | CommandID |
| 4 | 0x04 | |
| 5 | 0xF8 | CheckSum |

- Slave reply:

| Byte | Value | Comment |
|---|---|---|
| 0 | 0x55 | SOP |
| 1 | 0xAA | SOP |
| 2 | 0x01 | PayloadLen |
| 3 | 0x84 | CommandID |
| 4 | 0x04 | |
| 5 | 0xNN | Volume: 0-32 |
| 6 | 0xNN | CheckSum |

### 6.5 Set EQ

- Host command:

| Byte | Value | Comment |
|---|---|---|
| 0 | 0x55 | SOP |
| 1 | 0xAA | SOP |
| 2 | 0x01 | PayloadLen |
| 3 | 0x04 | CommandID |
| 4 | 0x05 | |
| 5 | 0xNN | EQ:<br>0: NORMAL<br>1: ROCK<br>2: POP<br>3: CLASSIC<br>4: JASS<br>5: BLUE<br>6: HALL<br>7: BASS<br>8: SOFT<br>9: COUNTRY<br>10: OPERA |
| 6 | 0xNN | CheckSum |

- Slave reply:

| Byte | Value | Comment |
|---|---|---|
| 0 | 0x55 | SOP |
| 1 | 0xAA | SOP |
| 2 | 0x00 | PayloadLen |
| 3 | 0x84 | CommandID |
| 4 | 0x05 | |
| 5 | 0x77 | CheckSum |

### 6.6 Get EQ

- Host command:

| Byte | Value | Comment |
|---|---|---|
| 0 | 0x55 | SOP |
| 1 | 0xAA | SOP |
| 2 | 0x00 | PayloadLen |
| 3 | 0x04 | CommandID |
| 4 | 0x06 | |
| 5 | 0xF6 | CheckSum |

- Slave reply:

| Byte | Value | Comment |
|---|---|---|
| 0 | 0x55 | SOP |
| 1 | 0xAA | SOP |
| 2 | 0x01 | PayloadLen |
| 3 | 0x84 | CommandID |
| 4 | 0x06 | |
| 5 | 0xNN | EQ:<br>0: NORMAL<br>1: ROCK<br>2: POP<br>3: CLASSIC<br>4: JASS<br>5: BLUE<br>6: HALL<br>7: BASS<br>8: SOFT<br>9: COUNTRY<br>10: OPERA |
| 6 | 0xNN | CheckSum |

### 6.7 Mute

- Host command:

| Byte | Value | Comment |
|---|---|---|
| 0 | 0x55 | SOP |
| 1 | 0xAA | SOP |
| 2 | 0x00 | PayloadLen |
| 3 | 0x04 | CommandID |
| 4 | 0x07 | |
| 5 | 0xF5 | CheckSum |

- Slave reply:

| Byte | Value | Comment |
|---|---|---|
| 0 | 0x55 | SOP |
| 1 | 0xAA | SOP |
| 2 | 0x00 | PayloadLen |
| 3 | 0x84 | CommandID |
| 4 | 0x07 | |
| 5 | 0x75 | CheckSum |

### 6.8 Unmute

- Host command:

| Byte | Value | Comment |
|---|---|---|
| 0 | 0x55 | SOP |
| 1 | 0xAA | SOP |
| 2 | 0x00 | PayloadLen |
| 3 | 0x04 | CommandID |
| 4 | 0x08 | |
| 5 | 0xF4 | CheckSum |

- Slave reply:

| Byte | Value | Comment |
|---|---|---|
| 0 | 0x55 | SOP |
| 1 | 0xAA | SOP |
| 2 | 0x00 | PayloadLen |
| 3 | 0x84 | CommandID |
| 4 | 0x08 | |
| 5 | 0x74 | CheckSum |

### 6.9 Set linein gain

- Host command:

| Byte | Value | Comment |
|---|---|---|
| 0 | 0x55 | SOP |
| 1 | 0xAA | SOP |
| 2 | 0x01 | PayloadLen |
| 3 | 0x04 | CommandID |
| 4 | 0x0A | |
| 5 | 0xNN | Gain: 0-63 |
| 6 | 0xNN | CheckSum |

- Slave reply: