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| Title | ARCAM Radia AV Series Comm Protocol | Revision | F |
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# ARCAM Radia AV Series Comm Protocols

## Communications between Control devices

Rev F

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## Introduction

This document defines the communication protocol between the ARCAM Radia AV series products (see below) and compatible Control devices. It is split into two parts.

Part A is a specification of the IP/RS232 protocol.

Part B is a specification of the IR protocol.

## Definitions

Audio device – Downstream Audio amplification unit. In this case an ARCAM Radia AV Series product in the supported list of products

Control device – Upstream Control device that is compliant with the follow protocol

Primary device – Upstream device (control unit)

Secondary device - Downstream device (AVA/AVR Unit)

## Supported products

ARCAM AVA15

ARCAM AVA25

ARCAM AVA35

ARCAM AVP45

# ARCAM

## AVA/AVP

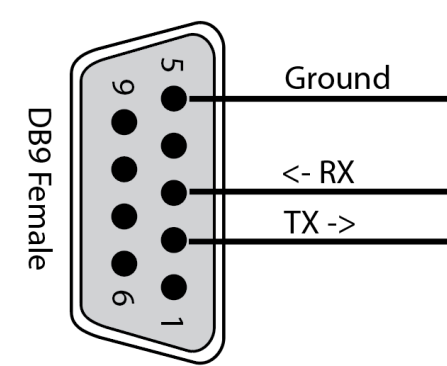
### Part A - IP/Serial control commands

This document describes the control protocol for controlling the ARCAM AVA/AVP range via RS232 or IP interface.

#### Conventions

- All hexadecimal numbers begin 0x.
- Any character in single quotes gives the ASCII equivalent of a hex value.
- <n> represents an unknown or variable number.

#### Serial connector specification



| Connector 1 pin | Function      |
|-----------------|---------------|
| 2               | Tx (From AVA) |
| 3               | Rx (To AVA)   |
| 5               | RS232 Ground  |

#### Data transfer format

| Parameter     | Value      |
|---------------|------------|
| Transfer Rate | 115,200bps |
| IP port       | 50000      |
| Data          | 8 bits     |
| Parity        | None       |
| Stop bits     | 1          |
| Control Flow  | None       |

## Commands

The general principle of operation here is that when a supported Control device and an Audio device are connected from an end user perspective the Audio device shall immediately receive, react and then respond to, request made by the Control device. It shall also send unsolicited indications to the Control device when certain actions are taken on the device

For example:

- Volume request commands sent by the Control device shall directly action on the Audio device
- Volume indication commands shall be sent by the Audio device if the action occurred from the Audio device side

Communication between the Control device and an Audio device takes the form of sequences of bytes, with all commands and responses having the same basic format.

## Command types

There are two types of commands that an Audio device sends and responds to:

- **Request / Response** pairs - One request elicits one response
  - Range of command code
- **Indications** – Fire and forget messages that do not expect responses

The Audio device shall always respond to a received request but will also send unsolicited indications commands at other times e.g. volume control updates.

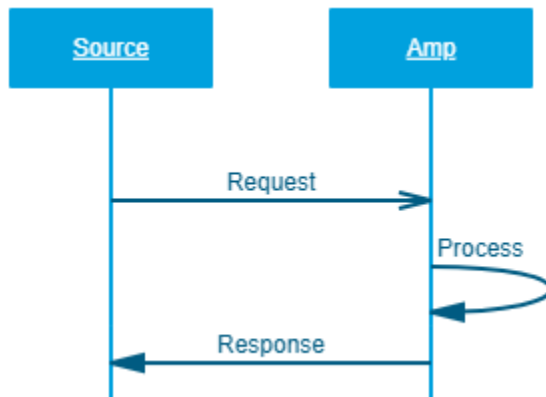


Figure 1 Request / Response Command

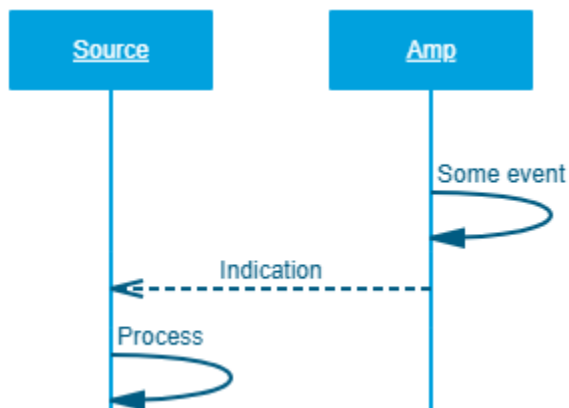


Figure 2 Indication Command

|       |                                     |          |   |
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## Command formats

Each Request and Indication has the following format:

`<St> <Cc> <Rs> <Fn> <DI> <Data> <Et>`

- St (Start transmission): 0x21
- Cc (Command code): the code for the command
- Rs (Reserved): A reserved byte
- Fn (Frame Number): Zero index, Max length = 255, 0xFF = End Frame
- DI (Data Length): Max length = 256 bytes
- Da (Data): the parameters for the command
- Et (End transmission): 0x0D

Each response has the following format:

`<St> <Cc> <Rs> <Rc> <Fn> <DI> <Data> <Et>`

- St (Start transmission): 0x21
- Cc (Command code): the code for the command
- Rs (Reserved): A reserved byte
- Rc (Response Code): see "Response codes" below
- Fn (Frame Number): Zero index, Max length = 255, 0xFF = End Frame
- DI (Data Length): Max length = 256 bytes
- Da (Data): the parameters for the command
- Et (End transmission): 0x0D

The Audio device responds to each command from the Control device within three seconds. The Control device may send further commands before a previous command response has been received.

## Response codes

The following answer codes are defined:

- 0x00 – Status update.
- 0x83 – Command not recognised.
- 0x84 – Parameter not recognised.
- 0x85 – Command invalid currently
- 0x86 – Invalid data length.

## State changes because of other inputs

It is possible that the state of the Audio device may be changed because of user input via front panel or remote. Any change resulting from these inputs is relayed to the Control device using the appropriate indication.

## Reserved Commands

Commands 0xF0 to 0xFF (inclusive) are reserved for test functions and should never be used.

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## Multi-frame commands

The standard protocol provides the ability to send multi-frame commands. This enables support for complex data to be shuttled between the Control device and Audio device. If the frame byte is not 0xFF this tells the receiver that there is more data associated with this command. Subsequent commands with the same command code and incremental frame numbers should thus be handled as a single block of data. This enables theoretically  $256 \times 255 = 65,280$  bytes in a single command if used in conjunction with variable data length. 0xFF is used as an end frame if number of frames = 0 as well as end frame therefore 0x00 represents the 1<sup>st</sup> of multiple frames (zero indexed).

| Multi-Frame Message Example |      |      |      |      |                             |    |         |      |      |      |      |                             |    |           |      |      |      |      |                             |    |
|-----------------------------|------|------|------|------|-----------------------------|----|---------|------|------|------|------|-----------------------------|----|-----------|------|------|------|------|-----------------------------|----|
| Frame 1                     |      |      |      |      |                             |    | Frame 2 |      |      |      |      |                             |    | End Frame |      |      |      |      |                             |    |
| St                          | Cc   | Rs   | Fn   | DI   | Da                          | Et | St      | Cc   | Rs   | Fn   | DI   | Da                          | Et | St        | Cc   | Rs   | Fn   | DI   | Da                          | Et |
| 0x21                        | 0x08 | 0x00 | 0x00 | 0xFF | [0x1C, 0xE4, 0x00, 0x10...] | Et | 0x21    | 0x08 | 0x00 | 0x01 | 0xFF | [0x1C, 0xE4, 0x00, 0x10...] | Et | 0x21      | 0x08 | 0x00 | 0xFF | 0xFF | [0x1C, 0xE4, 0x00, 0x10...] | Et |

## Zone specific commands

Zoned commands. Some commands use the reserved byte to identify the zone in which the command is applied to. Each command that uses **Rs** byte for zones is identified below. This means you must set the Rs byte to the correct zone value when sending/responding to these commands. If the zone is not set for these commands correctly the value **0x84 – Parameter not recognised** will be returned as the response code. Zone values are:

- 0x01 –Zone number 1. Zone 1 is the primary zone.
- 0x02 –Zone 2.

### Zone command

Each command (Request/Response and Indications) that use **Rs** byte for zones is identified below:

- Volume
- Mute
- Power
- Maximum volume
- Input

## JSON payloads

Some commands (software version, network info etc..) require complex payloads to be transmitted back. These use serialised JSON objects transmitted in the Da array block. If the data is > 256 a multi-frame command (see above) may be required. Design note: Keys names are kept short to try and fit as much into a single frame as possible.

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## System Request/Responses

### Power Req / Resp (0x00 / 0x01)

|                     |                                                                                                                                                                                                                                              |         |                               |       |   |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-------------------------------|-------|---|
| Req Command Code    | Power_REQ - 0x00                                                                                                                                                                                                                             | Length  | 1                             | Zoned | Y |
| Direction           | Control device <-> Audio device                                                                                                                                                                                                              | Trigger | Power event on Control device |       |   |
| Description         | Inform Audio device to enter/exit/toggle power standby mode (per standby mode selected on Audio device)<br>Inform Control device to enter its standby mode.<br><i>Only if current input matches on both Control device and Audio devices</i> |         |                               |       |   |
| Request Data Value  | 0x00 – Power off<br>0x01 – Power on<br>0x02 – Power toggle<br>0xF0 – Request power state                                                                                                                                                     |         |                               |       |   |
| Resp Command Code   | Power_RESP - 0x01                                                                                                                                                                                                                            | Length  | 1                             |       |   |
| Response Data Value | 0x00 – Unit is in standby<br>0x01 – Unit is powered on                                                                                                                                                                                       |         |                               |       |   |

### Reboot Req / Resp (0x02 / 0x03)

|                   |                                              |         |   |       |   |
|-------------------|----------------------------------------------|---------|---|-------|---|
| Req Command Code  | Reboot_REQ - 0x02                            | Length  | 1 | Zoned | N |
| Direction         | Control device -> Audio device               | Trigger |   |       |   |
| Description       | Requests a forced reboot of the audio device |         |   |       |   |
| Req Data Value    | 0xFE – Reboot requested                      |         |   |       |   |
| Resp Command Code | Reboot_RESP- 0x03                            | Length  | 1 |       |   |
| Resp Data Value   | 0x01 – Reboot started.                       |         |   |       |   |

### Factory Reset Req / Resp (0x04 / 0x05)

|                   |                                              |         |   |       |   |
|-------------------|----------------------------------------------|---------|---|-------|---|
| Req Command Code  | FactoryReset_REQ - 0x04                      | Length  | 1 | Zoned | N |
| Direction         | Control device -> Audio device               | Trigger |   |       |   |
| Description       | Requests a factory reset of the audio device |         |   |       |   |
| Req Data Value    | 0xFE – Factory reset                         |         |   |       |   |
| Resp Command Code | FactoryReset_RESP- 0x05                      | Length  | 1 |       |   |
| Resp Data Value   | 0x01 – Reset started.                        |         |   |       |   |

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### Save/Restore Settings Req / Resp (0x06 / 0x07)

|                          |                                                                                                                                                                                                                                                                                                                                            |                |   |              |   |
|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|---|--------------|---|
| <b>Req Command Code</b>  | SaveRestoreSettings_REQ - 0x06                                                                                                                                                                                                                                                                                                             | <b>Length</b>  | 1 | <b>Zoned</b> | N |
| <b>Direction</b>         | Control device -> Audio device                                                                                                                                                                                                                                                                                                             | <b>Trigger</b> |   |              |   |
| <b>Description</b>       | Force a restore of the secure copy of the settings. Note: If no secure copy has been made, this command will return an answer code of 0x85. If the system is currently doing a save and another save is requested. The second save will fail silently. If a command 0x1E is being processed this command will fail with a answer code 0x85 |                |   |              |   |
| <b>Req Data Value</b>    | 0x00 – Save secure backup<br>0x01 – Restore secure backup                                                                                                                                                                                                                                                                                  |                |   |              |   |
| <b>Resp Command Code</b> | SaveRestoreSettings_RESP - 0x07                                                                                                                                                                                                                                                                                                            | <b>Length</b>  | 1 |              |   |
| <b>Resp Data Value</b>   | 0x00 – Saved<br>0x01 - Restored                                                                                                                                                                                                                                                                                                            |                |   |              |   |

### System Model Req / Resp (0x08 / 0x09)

|                          |                                                                                      |                |   |              |   |
|--------------------------|--------------------------------------------------------------------------------------|----------------|---|--------------|---|
| <b>Req Command Code</b>  | SystemModel_REQ - 0x08                                                               | <b>Length</b>  | 1 | <b>Zoned</b> | N |
| <b>Direction</b>         | Control device -> Audio device                                                       | <b>Trigger</b> |   |              |   |
| <b>Description</b>       | Request the system model ID                                                          |                |   |              |   |
| <b>Req Data Value</b>    | 0xF0 – Request System model                                                          |                |   |              |   |
| <b>Resp Command Code</b> | SystemModel_RESP – 0x09                                                              | <b>Length</b>  | 1 |              |   |
| <b>Resp Data Value</b>   | Returned model name in ASCII chars AVA15, AVA25, AVA35, AVP45, SDR40, SDP60 or SDP70 |                |   |              |   |

### Input Name Req / Resp (0x0C / 0x0D )

|                          |                                                                                            |                |          |              |   |
|--------------------------|--------------------------------------------------------------------------------------------|----------------|----------|--------------|---|
| <b>Req Command Code</b>  | InputName_REQ - 0x0C                                                                       | <b>Length</b>  | Up to 10 | <b>Zoned</b> | N |
| <b>Direction</b>         | Control device -> Audio device                                                             | <b>Trigger</b> |          |              |   |
| <b>Description</b>       | Can request the current input name or set the current input name                           |                |          |              |   |
| <b>Req Data Value</b>    | 0xFE– Get current input name<br>[byte array <= 10] - Input name in ASCII chars             |                |          |              |   |
| <b>Resp Command Code</b> | InputName_RESP – 0x0D                                                                      | <b>Length</b>  | Up to 10 |              |   |
| <b>Resp Data Value</b>   | [byte array <= 10] – Returned Input name in ASCII chars (Get/Set will return the set name) |                |          |              |   |

### Heartbeat Req / Resp (0x0E / 0x0F)

|                          |                                                                                                                              |                |   |              |   |
|--------------------------|------------------------------------------------------------------------------------------------------------------------------|----------------|---|--------------|---|
| <b>Req Command Code</b>  | HeartBeat_REQ - 0x0E                                                                                                         | <b>Length</b>  | 1 | <b>Zoned</b> | N |
| <b>Direction</b>         | Control device -> Audio device                                                                                               | <b>Trigger</b> |   |              |   |
| <b>Description</b>       | Heartbeat command to verify connection to the AVA15/25/35/AVP45 is active.<br>Note: Also resets the automatic standby timer. |                |   |              |   |
| <b>Req Data Value</b>    | 0xFE - Heartbeat                                                                                                             |                |   |              |   |
| <b>Resp Command Code</b> | HeartBeat_Resp – 0x0F                                                                                                        | <b>Length</b>  | 1 |              |   |
| <b>Resp Data Value</b>   | 0xFE – Heartbeat                                                                                                             |                |   |              |   |

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### Simulate IR Remote Req / Resp (0x10 / 0x11)

|                   |                                                                                                                                                       |         |                            |       |   |
|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|---------|----------------------------|-------|---|
| Req Command Code  | SimulateIRRemote_REQ - 0x10                                                                                                                           | Length  | 2                          | Zoned | N |
| Direction         | Control device -> Audio device                                                                                                                        | Trigger | To check active connection |       |   |
| Description       | Simulate an BT remote command via the RS232 port. Note: An additional status message will be sent in most cases as a result of the BT remote command. |         |                            |       |   |
| Req Data Value    | Byte 1 – system code e.g 0x10<br>Byte 2 – command code. See <a href="#">RC Commands section</a> .                                                     |         |                            |       |   |
| Resp Command Code | SimulateBTRemote_Resp – 0x11                                                                                                                          | Length  | 1                          |       |   |
| Resp Data Value   | Mirror of the Req RC command code                                                                                                                     |         |                            |       |   |

### Display Brightness Req / Resp (0x12 / 0x13)

|                   |                                                           |         |   |       |   |
|-------------------|-----------------------------------------------------------|---------|---|-------|---|
| Req Command Code  | DispBrightness_REQ - 0x12                                 | Length  | 1 | Zoned | N |
| Direction         | Control device -> Audio device                            | Trigger |   |       |   |
| Description       | Set/request the display brightness                        |         |   |       |   |
| Req Data Value    | 0x00 – Display full                                       |         |   |       |   |
|                   | 0x01 – Display dim                                        |         |   |       |   |
|                   | 0x02 – Display dimmer                                     |         |   |       |   |
|                   | 0x03 – Display off                                        |         |   |       |   |
|                   | 0xF0 – Request display brightness                         |         |   |       |   |
| Resp Command Code | DispBrightness_RESP- 0x13                                 | Length  | 1 |       |   |
| Resp Data Value   | 0x00 – Display off 0x01 – Display dim 0x02 – Display full |         |   |       |   |

### HDMI Output Switching Req / Resp (0x16 / 0x17)

|                   |                                                                                                                                 |         |   |       |   |
|-------------------|---------------------------------------------------------------------------------------------------------------------------------|---------|---|-------|---|
| Req Command Code  | HDMIOutSwitch_REQ - 0x16                                                                                                        | Length  | 1 | Zoned | N |
| Direction         | Control device -> Audio device                                                                                                  | Trigger |   |       |   |
| Description       | Set/request the HDMI output configuration                                                                                       |         |   |       |   |
| Req Data Value    | 0x00 – HDMI output 1 & 2 active      0x02 – HDMI output 2 active<br>0x01 – HDMI output 1 active      0xFE – Request HDMI output |         |   |       |   |
| Resp Command Code | HDMIOutSwitch_Resp – 0x17                                                                                                       | Length  | 1 |       |   |
| Resp Data Value   | 0x00 – HDMI output 1 & 2 active      0x01 – HDMI output 1 active<br>0x02 – HDMI output 2 active                                 |         |   |       |   |

### Bluetooth Status Req / Resp (0x18 / 0x19)

|                   |                                               |         |                                         |       |   |
|-------------------|-----------------------------------------------|---------|-----------------------------------------|-------|---|
| Req Command Code  | BTStatus_REQ - 0x18                           | Length  | 1                                       | Zoned | N |
| Direction         | Control device -> Audio device                | Trigger |                                         |       |   |
| Description       | Request Bluetooth input status                |         |                                         |       |   |
| Req Data Value    | 0xFE – Request BT                             |         |                                         |       |   |
| Resp Command Code | BTStatus_Resp – 0x19                          | Length  | 1                                       |       |   |
| Resp Data Value   | 0x00 - Not connected                          |         | 0x01 - Connected, audio paused          |       |   |
|                   | 0x02 - Connected, audio playing SBC           |         | 0x03 - Connected, audio playing AAC     |       |   |
|                   | 0x04 - Connected, audio playing aptX          |         | 0x05 - Connected, audio playing aptX-HD |       |   |
|                   | 0x06 - Connected, audio playing aptX-Lossless |         |                                         |       |   |
|                   |                                               |         |                                         |       |   |

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### Now Playing Req / Resp (0x1A / 0x1B)

|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                |    |              |   |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----|--------------|---|
| <b>Req Command Code</b>  | NowPlaying_REQ - 0x1A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <b>Length</b>  | 1  | <b>Zoned</b> | N |
| <b>Direction</b>         | Control device -> Audio device                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <b>Trigger</b> |    |              |   |
| <b>Description</b>       | Request the various now playing track details. If the unit is currently playing from a source other than a streaming input the track name etc. will returned as "".                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                |    |              |   |
| <b>Req Data Value</b>    | 0xFE – Request now playing                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                |    |              |   |
| <b>Resp Command Code</b> | NowPlaying_Resp – 0x1B                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <b>Length</b>  | [] |              |   |
| <b>Resp Data Value</b>   | JSON payload where each [] type is maximum 255 ASCII chars <ul style="list-style-type: none"> <li>• Source               <ul style="list-style-type: none"> <li>○ <b>Key</b> = src</li> <li>○ <b>Value</b> = one of "Tidal", "Spotify", "Qobuz", "Amazon", "Radio", "Podcast", "Other" – Other represents a non-streaming or unknown streaming source</li> </ul> </li> <li>• Track Name               <ul style="list-style-type: none"> <li>○ <b>Key</b> = trn</li> <li>○ <b>Value</b> = [name of track]</li> </ul> </li> <li>• Artist Name               <ul style="list-style-type: none"> <li>○ <b>Key</b> = arn</li> <li>○ <b>Value</b> = [name of artist]</li> </ul> </li> <li>• Album Name               <ul style="list-style-type: none"> <li>○ <b>Key</b> = aln</li> <li>○ <b>Value</b> = [name of album]</li> </ul> </li> <li>• Sample Rate               <ul style="list-style-type: none"> <li>○ <b>Key</b> = spr</li> <li>○ <b>Value</b> = one of "32kHz", "44.1kHz", "48kHz", "88.2kHz", "96kHz", "176.4kHz", "192k Hz", "352.8kHz", "384kHz"</li> </ul> </li> <li>• Codec               <ul style="list-style-type: none"> <li>○ <b>Key</b> = cdc</li> <li>○ <b>Value</b> = one of "MP3", "AAC", "FLAC", "PCM", "MP3", "ALAC", "WMA", "OGG", "SBC", "aptX", "aptX-HD", "aptX-Lossless"</li> </ul> </li> <li>• Bit rate               <ul style="list-style-type: none"> <li>○ <b>Key</b> = btr</li> <li>○ <b>Value</b> = "32kbit/s", "96kbit/s", "128kbit/s", "160kbit/s", "192kbit/s", "256kbit/s", "320kbit/s"</li> </ul> </li> </ul> |                |    |              |   |

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## Network Information Req / Resp (0x1C / 0x1D)

|                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |         |    |       |   |
|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|----|-------|---|
| Req Command Code  | NetworkInfo_REQ - 0x1C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Length  | 1  | Zoned | N |
| Direction         | Control device -> Audio device                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Trigger |    |       |   |
| Description       | Request the network information                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |         |    |       |   |
| Req Data Value    | 0xFE – Request now playing                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |         |    |       |   |
| Resp Command Code | NetworkInfo_Resp – 0x1D                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Length  | [] |       |   |
| Resp Data Value   | JSON payload where each [] type is maximum 32 ASCII chars <ul style="list-style-type: none"><li>• Current IP Address<ul style="list-style-type: none"><li>○ <b>Key</b> = ipa</li><li>○ <b>Value</b> = ip address in format “xxx.xxx.xxx.xxx”</li></ul></li><li>• Wired (Ethernet) MAC address<ul style="list-style-type: none"><li>○ <b>Key</b> = ema</li><li>○ <b>Value</b> = MAC address in the format ““xx:xx:xx:xx:xx:xx”</li></ul></li><li>• Wireless (WiFi) MAC address<ul style="list-style-type: none"><li>○ <b>Key</b> = wma</li><li>○ <b>Value</b> = MAC address in the format “xx:xx:xx:xx:xx:xx”</li></ul></li><li>• Host name<ul style="list-style-type: none"><li>○ <b>Key</b> = hon</li><li>○ <b>Value</b> = [Name of host]</li></ul></li><li>• Friendly name<ul style="list-style-type: none"><li>○ <b>Key</b> = fnm</li><li>○ <b>Value</b> = [Name]</li></ul></li><li>• SSID<ul style="list-style-type: none"><li>○ <b>Key</b> = ssi</li><li>○ <b>Value</b> = [SSID Name]</li></ul></li></ul> |         |    |       |   |

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### Software Versions Req / Resp (0x1E / 0x1F)

|                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |         |    |       |   |
|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|----|-------|---|
| Req Command Code  | SoftwareVersions_REQ - 0x1E                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Length  | 1  | Zoned | N |
| Direction         | Control device -> Audio device                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Trigger |    |       |   |
| Description       | Request the various software versions.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |         |    |       |   |
| Req Data Value    | 0xFE – Request now playing                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |         |    |       |   |
| Resp Command Code | SoftwareVersions_Resp – 0x1F                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Length  | [] |       |   |
| Resp Data Value   | <div>JSON payload.</div> <div><ul style="list-style-type: none"><li>• MCU Version<ul style="list-style-type: none"><li>○ <b>Key</b> = mcu</li><li>○ <b>Value</b> = version in format “xxxx”</li></ul></li><li>• Net Version<ul style="list-style-type: none"><li>○ <b>Key</b> = net</li><li>○ <b>Value</b> = version in the format ““xxx_xxx_x”</li></ul></li><li>• DSP Version<ul style="list-style-type: none"><li>○ <b>Key</b> = dsp</li><li>○ <b>Value</b> = version in the format ““xx.xx”</li></ul></li><li>• BT Version<ul style="list-style-type: none"><li>○ <b>Key</b> = btv</li><li>○ <b>Value</b> = version in the format ““xx.xx”</li></ul></li><li>• HDMI Version<ul style="list-style-type: none"><li>○ <b>Key</b> = hdmi</li><li>○ <b>Value</b> = version in the format ““xxx-xx-xx-xx-xx”</li></ul></li><li>• LCD Version<ul style="list-style-type: none"><li>○ <b>Key</b> = lcd</li><li>○ <b>Value</b> = version in the format ““xxx.xx”</li></ul></li></ul></div> <div>Note “x” does not necessarily indicate the exact number of characters that will be received.</div> |         |    |       |   |

### Sample Rate Req / Resp (0x20 / 0x21)

|                   |                                                         |         |   |       |   |
|-------------------|---------------------------------------------------------|---------|---|-------|---|
| Req Command Code  | SampleRate_REQ - 0x20                                   | Length  | 1 | Zoned | N |
| Direction         | Control device -> Audio device                          | Trigger |   |       |   |
| Description       | Request incoming sample rate (for non-streaming inputs) |         |   |       |   |
| Req Data Value    | 0xFE – Request incoming sample rate                     |         |   |       |   |
| Resp Command Code | SampleRate_RESP - 0x21                                  | Length  | 1 |       |   |
| Resp Data Value   | 0x00 – 32 KHz                      0x09 – 176.4 KHz     |         |   |       |   |
|                   | 0x01 – 44.1 KHz                    0x0A – 192 KHz       |         |   |       |   |
|                   | 0x02 – 48 KHz                      0x07 – Unknown       |         |   |       |   |
|                   | 0x05 – 88.2 KHz                   0x08 – Undetected     |         |   |       |   |
|                   | 0x06 – 96 KHz                                           |         |   |       |   |

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### Incoming Audio Format Req / Resp (0x22 / 0x23)

|                   |                                                                                                                                                                                                                  |         |    |       |   |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|----|-------|---|
| Req Command Code  | IncomingAudioFormat_REQ - 0x22                                                                                                                                                                                   | Length  | 1  | Zoned | N |
| Direction         | Control device -> Audio device                                                                                                                                                                                   | Trigger |    |       |   |
| Description       | Request incoming sample rate (for non-streaming inputs)                                                                                                                                                          |         |    |       |   |
| Req Data Value    | 0xFE – Request for format                                                                                                                                                                                        |         |    |       |   |
| Resp Command Code | IncomingAudioFormat_RESP - 0x23                                                                                                                                                                                  | Length  | [] |       |   |
| Resp Data Value   | JSON payload. <ul style="list-style-type: none"><li>Incoming format<ul style="list-style-type: none"><li>Key = fmt</li><li>Value = Incoming audio stream format, for example “Dolby Digital”</li></ul></li></ul> |         |    |       |   |

### Volume Req / Resp (0x24 / 0x25)

|                   |                                                                                                                                                                                                                                                                                |         |                                |       |   |
|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|--------------------------------|-------|---|
| Req Command Code  | Volume_REQ - 0x24                                                                                                                                                                                                                                                              | Length  | 1                              | Zoned | Y |
| Direction         | Control device -> Audio device                                                                                                                                                                                                                                                 | Trigger | Volume event on Control device |       |   |
| Description       | Set Audio device volume (when in external volume mode).                                                                                                                                                                                                                        |         |                                |       |   |
| Req Data Value    | 0x00 (0) – 0x64 (100) – Set the volume<br>0xFE – Request the current volume<br>0xF1 – Increment volume by 1 step in the volume table<br>0xF2 – Decrement volume by 1 step in the volume table<br><i>Only if current input matches on both Control device and Audio devices</i> |         |                                |       |   |
| Resp Command Code | Volume_RESP - 0x25                                                                                                                                                                                                                                                             | Length  | 1                              |       |   |
| Resp Data Value   | Volume, integer value:<br>0x00 (0) – 0x64 (100)                                                                                                                                                                                                                                |         |                                |       |   |

### Max Volume Req / Resp (0x26 / 0x27)

|                   |                                                                                 |         |   |       |   |
|-------------------|---------------------------------------------------------------------------------|---------|---|-------|---|
| Req Command Code  | MaxVolume_REQ - 0x26                                                            | Length  | 1 | Zoned | Y |
| Direction         | Control device -> Audio device                                                  | Trigger |   |       |   |
| Description       | Set Audio device max volume (when in external volume mode).                     |         |   |       |   |
| Req Data Value    | 0x00 (0) – 0x64 (100) – Set the volume<br>0xFE – Request the current max volume |         |   |       |   |
| Resp Command Code | MaxVolume_RESP - 0x27                                                           | Length  | 1 |       |   |
| Resp Data Value   | Volume, integer value:<br>0x00 (0) – 0x64 (100) – Max volume value              |         |   |       |   |

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### Mute Control Req / Resp (0x28 / 0x29)

|                   |                                                                                                                                                                   |         |                              |       |   |
|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|------------------------------|-------|---|
| Req Command Code  | Mute_REQ - 0x28                                                                                                                                                   | Length  | 1                            | Zoned | Y |
| Direction         | Control device -> Audio device                                                                                                                                    | Trigger | Mute event on Control device |       |   |
| Description       | Set Mute state on Audio device (when in external volume mode)                                                                                                     |         |                              |       |   |
| Req Data Value    | 0x00 – Mute<br>0x01 – Unmute<br>0x02 – Mute toggle<br>0xF0 – Request mute status<br><i>Only if current input matches on both Control device and Audio devices</i> |         |                              |       |   |
| Resp Command Code | Mute_RESP- 0x29                                                                                                                                                   | Length  | 1                            |       |   |
| Resp Data Value   | 0x00 – Muted<br>0x01 – Unmuted                                                                                                                                    |         |                              |       |   |

### Input Req / Resp (0x2A / 0x2B)

|                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |         |                           |       |   |
|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|---------------------------|-------|---|
| Req Command Code  | InputSet_REQ – 0x2A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Length  | 1                         | Zoned | Y |
| Direction         | Control device -> Audio device                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Trigger | Control device sets input |       |   |
| Description       | Request the Audio device to set the input to the desired input                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |         |                           |       |   |
| Req Data Value    | <div>0x60 – Follow Zone 1 (zone 2 only)</div> <div>0x61 – HDMI1</div> <div>0x62 – HDMI2</div> <div>0x63 – HDMI3</div> <div>0x64 – HDMI4</div> <div>0x65 – HDMI5</div> <div>0x66 – HDMI6</div> <div>0x67 – HDMI7</div> <div>0x70 – Bluetooth (zone 1 only)</div> <div>0x72 – HDMI ARC/eARC (zone 1 only)</div> <div>0xFE – Request input</div> <div>0x68 – Digital 1</div> <div>0x69 – Digital 2</div> <div>0x6A – Digital 3</div> <div>0x6B – Digital 4</div> <div>0x6C – Analogue 1</div> <div>0x6D – Analogue 2</div> <div>0x6E – Analogue 3</div> <div>0x6F – Analogue 4 (AVP45 only)</div> <div>0x71 – Network/Streaming (zone 1 only)</div> <div>0x73 – Auracast (zone 1 only)</div> |         |                           |       |   |
| Resp Command Code | InputSet_RESP – 0x2B                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Length  | 1                         |       |   |
| Resp Data Value   | Value of set input (as requested)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |         |                           |       |   |

### Current Upmixer Req / Resp (0x2C / 0x2D)

|                   |                                 |                     |                       |       |   |
|-------------------|---------------------------------|---------------------|-----------------------|-------|---|
| Req Command Code  | CurrentUpmixer_REQ - 0x2C       | Length              | 1                     | Zoned | N |
| Direction         | Control device -> Audio device  | Trigger             |                       |       |   |
| Description       | Set/request the current Upmixer |                     |                       |       |   |
| Req Data Value    | 0xFE – Get current mode         |                     |                       |       |   |
| Resp Command Code | CurrentUpmixer_RESP – 0x2D      | Length              | 1                     |       |   |
| Resp Data Value   | 0x01 – Stereo                   | 0x02 – Native       | 0x03 – Native Upmixer |       |   |
|                   | 0x04 – Dolby Surround           | 0x05 – DTS Neural:X | 0x06 – DTS Virtual:X  |       |   |
|                   | 0x07 – Auro-3D                  | 0x08 – Auro-2D      | 0x09 – MCH Stereo     |       |   |
|                   | 0x0A – Stereo Downmix           |                     |                       |       |   |
|                   |                                 |                     |                       |       |   |

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### Bass Adjust Req / Resp (0x2E / 0x2F)

|                          |                                                                                                                                                                                      |                |   |              |   |
|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|---|--------------|---|
| <b>Req Command Code</b>  | BassAdjust_REQ - 0x2E                                                                                                                                                                | <b>Length</b>  | 1 | <b>Zoned</b> | N |
| <b>Direction</b>         | Control device -> Audio device                                                                                                                                                       | <b>Trigger</b> |   |              |   |
| <b>Description</b>       | Set/request the bass adjustment                                                                                                                                                      |                |   |              |   |
| <b>Req Data Value</b>    | 0x00 - 0x0C - Set bass to 0dB / +12dB<br>0x81 - 0x8C - Set bass to -1dB / -12dB<br>0xFE – Request current bass value<br>0xF1 – Increment bass by 1dB<br>0xF2 – Decrement bass by 1dB |                |   |              |   |
| <b>Resp Command Code</b> | BassAdjust_RESP – 0x2F                                                                                                                                                               | <b>Length</b>  | 1 |              |   |
| <b>Resp Data Value</b>   | 0x00 — 0x0C – Bass is 0dB — +12dB 0x81 — 0x8C – Bass is -1dB — -12dB                                                                                                                 |                |   |              |   |

### Treble Adjust Req / Resp (0x30 / 0x31)

|                          |                                                                                                                                                                                                |                |   |              |   |
|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|---|--------------|---|
| <b>Req Command Code</b>  | TrebleAdjust_REQ - 0x30                                                                                                                                                                        | <b>Length</b>  | 1 | <b>Zoned</b> | N |
| <b>Direction</b>         | Control device -> Audio device                                                                                                                                                                 | <b>Trigger</b> |   |              |   |
| <b>Description</b>       | Set/request the treble adjustment                                                                                                                                                              |                |   |              |   |
| <b>Req Data Value</b>    | 0x00 — 0x0C – Set treble to 0dB — +12dB<br>0x81 — 0x8C – Set treble to -1dB — -12dB<br>0xFE – Request current treble value<br>0xF1 – Increment treble by 1dB<br>0xF2 – Decrement treble by 1dB |                |   |              |   |
| <b>Resp Command Code</b> | TrebleAdjust_RESP – 0x31                                                                                                                                                                       | <b>Length</b>  | 1 |              |   |
| <b>Resp Data Value</b>   | 0x00 — 0x0C – Treble is 0dB — +12dB 0x81 — 0x8C – Treble is -1dB — -12dB                                                                                                                       |                |   |              |   |

### Room EQ (DIRAC) Req / Resp (0x34 / 0x35)

|                          |                                                                                                                                                           |                |   |              |   |
|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|---|--------------|---|
| <b>Req Command Code</b>  | RoomEQ_REQ - 0x34                                                                                                                                         | <b>Length</b>  | 1 | <b>Zoned</b> | N |
| <b>Direction</b>         | Control device -> Audio device                                                                                                                            | <b>Trigger</b> |   |              |   |
| <b>Description</b>       | Set/request the room equalisation for the current input.                                                                                                  |                |   |              |   |
| <b>Req Data Value</b>    | 0xFE – Request current room EQ status<br>0x00 – Room EQ off 0x01 – Room EQ1 curve on<br>0x02 – Room EQ2 curve on<br>0x03 – Room EQ3 curve on              |                |   |              |   |
| <b>Resp Command Code</b> | RoomEQ_RESP – 0x35                                                                                                                                        | <b>Length</b>  | 1 |              |   |
| <b>Resp Data Value</b>   | 0x00 – Room EQ off 0x01 – Room EQ1 curve on 0x02 – Room EQ2 curve on 0x03 – Room EQ3 curve on 0x0A – Room EQ has not been calculated and is therefore off |                |   |              |   |

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#### Upmixer mode - 2ch Req / Resp (0x36 / 0x37)

|                          |                                                                                                                                                                                                                                                                                                                               |                |   |              |   |
|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|---|--------------|---|
| <b>Req Command Code</b>  | DecodeModeStatus2CH_REQ - 0x36                                                                                                                                                                                                                                                                                                | <b>Length</b>  | 1 | <b>Zoned</b> | N |
| <b>Direction</b>         | Control device -> Audio device                                                                                                                                                                                                                                                                                                | <b>Trigger</b> |   |              |   |
| <b>Description</b>       | Set/Request the decode mode for the 2-channel material in zone 1                                                                                                                                                                                                                                                              |                |   |              |   |
| <b>Req Data Value</b>    | 0x00 – Last Mode                      0x01 – Stereo                      0x04 – Dolby Surround<br>0x05 – DTS Neural:X                  0x06 – DTS Virtual:X                  0x07 – Auro-3D<br>0x08 – Auro-2D                      0x09 – MCH Stereo                      0x0A – Stereo Downmix<br>0xFE – Request decode mode |                |   |              |   |
| <b>Resp Command Code</b> | UpmixerModeStatus2CH_RESP – 0x37                                                                                                                                                                                                                                                                                              | <b>Length</b>  | 1 |              |   |
| <b>Resp Data Value</b>   | Value of set input (as requested)                                                                                                                                                                                                                                                                                             |                |   |              |   |

#### Upmixer Mode - MCH Req / Resp (0x38 / 0x39)

|                          |                                                                                                                                                                                                                                                                                                                                                        |                |   |              |   |
|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|---|--------------|---|
| <b>Req Command Code</b>  | DecodeModeStatusMCH_REQ - 0x38                                                                                                                                                                                                                                                                                                                         | <b>Length</b>  | 1 | <b>Zoned</b> | N |
| <b>Direction</b>         | Control device -> Audio device                                                                                                                                                                                                                                                                                                                         | <b>Trigger</b> |   |              |   |
| <b>Description</b>       | Set/Request the decode mode for the multi-channel material in zone 1                                                                                                                                                                                                                                                                                   |                |   |              |   |
| <b>Req Data Value</b>    | 0x00 – Last Mode                      0x02 – Native                      0x03 – Native Upmixer<br>0x04 – Dolby Surround                  0x05 – DTS Neural:X                  0x06 – DTS Virtual:X<br>0x07 – Auro-3D                      0x08 – Auro-2D                      0x09 – MCH Stereo<br>0x0A – Stereo Downmix<br>0xFE – Request decode mode |                |   |              |   |
| <b>Resp Command Code</b> | UpmixerModeStatusMCH_RESP – 0x39                                                                                                                                                                                                                                                                                                                       | <b>Length</b>  | 1 |              |   |
| <b>Resp Data Value</b>   | Value of set input (as requested)                                                                                                                                                                                                                                                                                                                      |                |   |              |   |

#### Network Playback Status - MCH Req / Resp (0x3A / 0x3B)

|                          |                                                           |                |   |              |   |
|--------------------------|-----------------------------------------------------------|----------------|---|--------------|---|
| <b>Req Command Code</b>  | NetPlaybackStatus_REQ - 0x3A                              | <b>Length</b>  | 1 | <b>Zoned</b> | N |
| <b>Direction</b>         | Control device -> Audio device                            | <b>Trigger</b> |   |              |   |
| <b>Description</b>       | Network audio playback status.                            |                |   |              |   |
| <b>Req Data Value</b>    | 0xFE – Request playback status                            |                |   |              |   |
| <b>Resp Command Code</b> | NetPlayback_RESP – 0x3B                                   | <b>Length</b>  | 1 |              |   |
| <b>Resp Data Value</b>   | 0x00 – Playing, 0x01 - Stopped/not playing, 0x02 - Paused |                |   |              |   |

#### Lip Sync Req / Resp (0x3E / 0x3F)

|                          |                                                                                                                                                                                                          |                |   |              |   |
|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|---|--------------|---|
| <b>Req Command Code</b>  | LipSync_REQ - 0x3E                                                                                                                                                                                       | <b>Length</b>  | 1 | <b>Zoned</b> | N |
| <b>Direction</b>         | Control device -> Audio device                                                                                                                                                                           | <b>Trigger</b> |   |              |   |
| <b>Description</b>       | Set/request the lip sync delay                                                                                                                                                                           |                |   |              |   |
| <b>Req Data Value</b>    | 0x00 – 0x32 – set the lipsync delay in 5ms steps (e.g. 0x08 = 40ms)<br>0xF0 – Request current lipsync delay value<br>0xF1 – Increment the lipsync delay by 5ms 0xF2 – Decrement the lipsync delay by 5ms |                |   |              |   |
| <b>Resp Command Code</b> | LipSync_RESP – 0x3F                                                                                                                                                                                      | <b>Length</b>  | 1 |              |   |
| <b>Resp Data Value</b>   | 0x00 – 0x32 – the lipsync delay in 5ms steps (e.g. 0x08 = 40ms)                                                                                                                                          |                |   |              |   |

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### System Status Req / Resp (0x3C / 0x3D)

|                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |         |                                     |       |   |
|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-------------------------------------|-------|---|
| Req Command Code  | SystemStatus_REQ - 0x3C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Length  | 1                                   | Zoned | N |
| Direction         | Control device -> Audio device                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Trigger | Control Device requires system info |       |   |
| Description       | Request the system status. This request generates a set of IND commands sent to the Control device. These are: <ul style="list-style-type: none"><li>• System status response message</li><li>• Power state zone 1</li><li>• Software versions</li><li>• Volume zone 1</li><li>• Mute state zone 1</li><li>• Current input zone 1</li><li>• System model</li><li>• Network info</li><li>• Current input name</li><li>• Lip sync</li><li>• Power state zone 2</li><li>• Volume zone 2</li><li>• Mute state zone 2</li><li>• Current input zone 2</li></ul> |         |                                     |       |   |
| Req Data Value    | 0xFE – Request system status                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |         |                                     |       |   |
| Resp Command Code | SystemStatus_RESP – 0x3D                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Length  | 1                                   |       |   |
| Resp Data Value   | 0x01 – Response<br>Followed by separate response messages of the other parameters.                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |         |                                     |       |   |

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## System Indications

### Power Event Indication (0x80)

|                  |                                                                                                                  |         |                                             |       |   |
|------------------|------------------------------------------------------------------------------------------------------------------|---------|---------------------------------------------|-------|---|
| Ind Command Code | PowerEvent_IND- 0x80                                                                                             | Length  | 1                                           | Zoned | Y |
| Direction        | Audio device -> Control device                                                                                   | Trigger | Audio device has internal power event occur |       |   |
| Description      | Inform Control device the power status has changed                                                               |         |                                             |       |   |
| Ind Data Value   | 0x00 - Power off                      0x01 - Power on<br>0x02 - Power Enter Standby    0x02 - Power Exit Standby |         |                                             |       |   |

### Volume Indication (0x81)

|                  |                                                                        |         |                                              |       |   |
|------------------|------------------------------------------------------------------------|---------|----------------------------------------------|-------|---|
| Ind Command Code | Volume_IND- 0x81                                                       | Length  | 1                                            | Zoned | Y |
| Direction        | Audio device -> Control device                                         | Trigger | Audio device has internal volume event occur |       |   |
| Description      | Inform Control device the volume has been changed on the Audio device. |         |                                              |       |   |
| Ind Data Value   | Volume, integer value:<br>0x00 (0) – 0x64 (100)                        |         |                                              |       |   |

### Mute Indication (0x82)

|                  |                                                                 |         |                                            |       |   |
|------------------|-----------------------------------------------------------------|---------|--------------------------------------------|-------|---|
| Ind Command Code | Mute_IND- 0x82                                                  | Length  | 1                                          | Zoned | Y |
| Direction        | Audio device -> Control device                                  | Trigger | Audio device has internal mute event occur |       |   |
| Description      | Inform Control device a mute event occurred on the Audio device |         |                                            |       |   |
| Ind Data Value   | 0x00 – Muted<br>0x01 – Unmuted                                  |         |                                            |       |   |

### Max Volume Indication (0x83)

|                  |                                                                            |         |                                    |       |   |
|------------------|----------------------------------------------------------------------------|---------|------------------------------------|-------|---|
| Ind Command Code | MaxVolume_IND- 0x83                                                        | Length  |                                    | Zoned | Y |
| Direction        | Audio device -> Control device                                             | Trigger | Audio device max vol set on device |       |   |
| Description      | Max volume has changed on the audio device through menu or another trigger |         |                                    |       |   |
| Ind Data Value   | 0x00 (0) – 0x64 (100) – Max volume value                                   |         |                                    |       |   |

### Bass Adjust Indication (0x84)

|                  |                                                                                 |         |                                 |       |   |
|------------------|---------------------------------------------------------------------------------|---------|---------------------------------|-------|---|
| Ind Command Code | BassAdjust_IND- 0x84                                                            | Length  | 1                               | Zoned | N |
| Direction        | Audio device -> Control device                                                  | Trigger | Audio device bass set on device |       |   |
| Description      | Inform Control device a bass adjust event occurred on the Audio device          |         |                                 |       |   |
| Ind Data Value   | 0x00 — 0x0C – Bass set to 0dB — +12dB<br>0x81 — 0x8C – Bass set to -1dB — -12dB |         |                                 |       |   |

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### Treble Adjust Indication (0x85)

|                  |                                                                             |         |                                   |       |   |
|------------------|-----------------------------------------------------------------------------|---------|-----------------------------------|-------|---|
| Ind Command Code | TrebleAdjust_IND- 0x85                                                      | Length  | 1                                 | Zoned | N |
| Direction        | Audio device -> Control device                                              | Trigger | Audio device treble set on device |       |   |
| Description      | Inform Control device a treble adjust event occurred on the Audio device    |         |                                   |       |   |
| Ind Data Value   | 0x00 — 0x0C – Treble is 0dB — +12dB<br>0x81 — 0x8C – Treble is -1dB — -12dB |         |                                   |       |   |

### Current Upmixer Indication (0x87)

|                  |                                                        |                     |                                   |       |   |
|------------------|--------------------------------------------------------|---------------------|-----------------------------------|-------|---|
| Ind Command Code | CurrentUpmixer_IND- 0x87                               | Length              | 1                                 | Zoned | N |
| Direction        | Audio device -> Control device                         | Trigger             | Audio device up mixer set in menu |       |   |
| Description      | Inform Control device the up mixer setting has changed |                     |                                   |       |   |
| Ind Data Value   | 0x01 – Stereo                                          | 0x02 – Native       | 0x03 – Native Upmixer             |       |   |
|                  | 0x04 – Dolby Surround                                  | 0x05 – DTS Neural:X | 0x06 – DTS Virtual:X              |       |   |
|                  | 0x07 – Auro-3D                                         | 0x08 – Auro-2D      | 0x09 – MCH Stereo                 |       |   |
|                  | 0x0A – Stereo Downmix                                  |                     |                                   |       |   |

### Bluetooth Status Indication (0x88)

|                  |                                                        |         |                                          |       |   |
|------------------|--------------------------------------------------------|---------|------------------------------------------|-------|---|
| Ind Command Code | BTStatus_IND- 0x88                                     | Length  | 1                                        | Zoned | N |
| Direction        | Audio device -> Control device                         | Trigger | Bluetooth status on Audio device changes |       |   |
| Description      | Inform Control device the Bluetooth status has changed |         |                                          |       |   |
| Ind Data Value   | 0x00 - Not connected                                   |         | 0x01 - Connected, audio paused           |       |   |
|                  | 0x02 - Connected, audio playing SBC                    |         | 0x03 - Connected, audio playing AAC      |       |   |
|                  | 0x04 - Connected, audio playing aptX                   |         | 0x05 - Connected, audio playing aptX-HD  |       |   |
|                  | 0x06 - Connected, audio playing aptX-Lossless          |         |                                          |       |   |
|                  |                                                        |         |                                          |       |   |

### Sample Rate Indication (0x89)

|                  |                                                                            |                 |                                             |       |   |
|------------------|----------------------------------------------------------------------------|-----------------|---------------------------------------------|-------|---|
| Ind Command Code | SampleRate_IND- 0x89                                                       | Length          | 1                                           | Zoned | N |
| Direction        | Audio device -> Control device                                             | Trigger         | Non-streaming playback & sample rate change |       |   |
| Description      | Inform control device of the incoming sample rate for non-streaming inputs |                 |                                             |       |   |
| Ind Data Value   | 0x00 – 32 KHz                                                              | 0x01 – 44.1 KHz | 0x02 – 48 KHz                               |       |   |
|                  | 0x03 – 88.2 KHz                                                            | 0x04 – 96 KHz   | 0x05 – 176.4 KHz                            |       |   |
|                  | 0x06 – 192 KHz                                                             | 0x07 – Unknown  | 0x08 – Undetected                           |       |   |

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### Incoming Audio Format Indication (0x8A)

|                  |                                                                                                                                                                                                                  |         |                                                |       |   |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|------------------------------------------------|-------|---|
| Ind Command Code | IncomingAudioFormat_IND- 0x8A                                                                                                                                                                                    | Length  | 1                                              | Zoned | N |
| Direction        | Audio device -> Control device                                                                                                                                                                                   | Trigger | Audio format for incoming audio stream changes |       |   |
| Description      | Inform the control device of an audio format change                                                                                                                                                              |         |                                                |       |   |
| Ind Data Value   | JSON payload. <ul style="list-style-type: none"><li>Incoming format<ul style="list-style-type: none"><li>Key = fmt</li><li>Value = Incoming audio stream format, for example “Dolby Digital”</li></ul></li></ul> |         |                                                |       |   |

### Input Change Indication (0x8B)

|                  |                                                      |         |                                                                             |       |   |
|------------------|------------------------------------------------------|---------|-----------------------------------------------------------------------------|-------|---|
| Ind Command Code | InputChange_IND- 0x8B                                | Length  | 1                                                                           | Zoned | Y |
| Direction        | Audio device -> Control device                       | Trigger | Input on audio device has changed through menu or other event (auto switch) |       |   |
| Description      | Inform Control device the input selected has changed |         |                                                                             |       |   |
| Ind Data Value   | 0x60 – Follow Zone 1 (zone 2 only)                   |         | 0x68 – Digital 1                                                            |       |   |
|                  | 0x61 – HDMI1                                         |         | 0x69 – Digital 2                                                            |       |   |
|                  | 0x62 – HDMI2                                         |         | 0x6A – Digital 3                                                            |       |   |
|                  | 0x63 – HDMI3                                         |         | 0x6B – Digital 4                                                            |       |   |
|                  | 0x64 – HDMI4                                         |         | 0x6C – Analogue 1                                                           |       |   |
|                  | 0x65 – HDMI5                                         |         | 0x6D – Analogue 2                                                           |       |   |
|                  | 0x66 – HDMI6                                         |         | 0x6E – Analogue 3                                                           |       |   |
|                  | 0x67 – HDMI7                                         |         | 0x6F – Analogue 4 (AVP45 only)                                              |       |   |
|                  | 0x70 – Bluetooth                                     |         | 0x71 – Network/Streaming                                                    |       |   |
|                  | 0x72 – HDMI ARC/eARC                                 |         | 0x73 – Auracast                                                             |       |   |

### Input Name Change Indication (0x8C)

|                  |                                                                                         |         |                                                |       |   |
|------------------|-----------------------------------------------------------------------------------------|---------|------------------------------------------------|-------|---|
| Ind Command Code | InputNameChange_IND- 0x8C                                                               | Length  | 1                                              | Zoned | N |
| Direction        | Audio device -> Control device                                                          | Trigger | Current Input has been renamed via menu or app |       |   |
| Description      | Inform Control device the currently selected inputs name has changed. Provide new name. |         |                                                |       |   |
| Ind Data Value   | [byte array <= 10] – Returned Input name in ASCII chars                                 |         |                                                |       |   |

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## Now Playing Indication (0x8D)

|                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                |   |              |   |
|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|---|--------------|---|
| <b>Ind Command Code</b> | NowPlaying_IND - 0x1A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>Length</b>  | 1 | <b>Zoned</b> | N |
| <b>Direction</b>        | Audio device -> Control device                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <b>Trigger</b> |   |              |   |
| <b>Description</b>      | Inform Control device of the various now playing track details for Streaming input.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                |   |              |   |
| <b>Ind Data Value</b>   | JSON payload where each [] type is maximum 255 ASCII chars <ul style="list-style-type: none"> <li>Source               <ul style="list-style-type: none"> <li><b>Key</b> = src</li> <li><b>Value</b> = one of "Tidal", "Spotify", "Qobuz", "Amazon", "Radio", "Podcast", "Other" – Other represents a non-streaming or unknown streaming source</li> </ul> </li> <li>Track Name               <ul style="list-style-type: none"> <li><b>Key</b> = trn</li> <li><b>Value</b> = [name of track]</li> </ul> </li> <li>Artist Name               <ul style="list-style-type: none"> <li><b>Key</b> = arn</li> <li><b>Value</b> = [name of artist]</li> </ul> </li> <li>Album Name               <ul style="list-style-type: none"> <li><b>Key</b> = aln</li> <li><b>Value</b> = [name of album]</li> </ul> </li> <li>Sample Rate               <ul style="list-style-type: none"> <li><b>Key</b> = spr</li> <li><b>Value</b> = one of "32kHz", "44.1kHz", "48kHz", "88.2kHz", "96kHz", "176.4kHz", "192k Hz", "352.8kHz", "384kHz"</li> </ul> </li> <li>Codec               <ul style="list-style-type: none"> <li><b>Key</b> = cdc</li> <li><b>Value</b> = one of "MP3", "AAC", "FLAC", "PCM", "MP3", "ALAC", "WMA", "OGG", "SBC", "aptX", "aptX-HD", "aptX-Lossless"</li> </ul> </li> <li>Bit rate               <ul style="list-style-type: none"> <li><b>Key</b> = btr</li> <li><b>Value</b> = "32kbit/s", "96kbit/s", "128kbit/s", "160kbit/s", "192kbit/s", "256kbit/s", "320kbit/s"</li> </ul> </li> </ul> |                |   |              |   |

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## Examples

### Example 1

Audio device receives a zone 1 volume set (set volume to 30):

<St> <Cc> <Rs> <Fn> <DI> <Data> <Et>

0x21 0x24 0x01 0xFF 0x01 0x1E 0x0D

Subsequent Response sent to Control device (successful set to 30):

<St> <Cc> <Rs> <Rc> <Fn> <DI> <Data> <Et>

0x21 0x25 0x00 0x00 0xFF 0x01 0x1E 0x0D

### Example 2

Later indication from Audio device of volume update (set volume to 29):

<St> <Cc> <Rs> <Fn> <DI> <Data> <Et>

0x21 0x81 0x00 0xFF 0x01 0x1D 0x0D

## Remote Command Codes

These codes are to be used in conjunction with the “Simulate Remote Command” in Hex format, or the IR input in Decimal format. When using [Simulate Remote Commands](#), send the system code for the Zone you intend to respond, followed by the command byte.

### System Zone Codes

| Function | Key code<br>Hexadecimal Value | Key code<br>RC5 Decimal Value |
|----------|-------------------------------|-------------------------------|
| Zone 1   | 0x10                          | 16                            |
| Zone 2   | 0x18                          | 24                            |

### Zone 1 Function Command Codes

These codes mimic responses to buttons on the supplied remote control.

The Zone 1 System code byte is fixed to **0x10**:

| Function           | Key code<br>Hexadecimal Value | Key code<br>RC5 Decimal Value |
|--------------------|-------------------------------|-------------------------------|
| Standby            | 0x0C                          | 12                            |
| Navigate Up        | 0x56                          | 86                            |
| Navigate Left      | 0x51                          | 81                            |
| OK                 | 0x27                          | 57                            |
| Navigate Right     | 0x50                          | 80                            |
| Navigate Down      | 0x55                          | 85                            |
| Back               | 0x33                          | 51                            |
| OSD                | 0x2F                          | 47                            |
| Menu               | 0x52                          | 82                            |
| Input/Source       | 0xC0                          | 192                           |
| Volume +           | 0x10                          | 16                            |
| Volume -           | 0x11                          | 17                            |
| Decode             | 0x20                          | 32                            |
| Lip Sync           | 0x32                          | 50                            |
| Room EQ            | 0x1E                          | 30                            |
| Info               | 0x37                          | 55                            |
| Mute               | 0x0D                          | 13                            |
| Display Brightness | 0x3B                          | 59                            |
| Skip Back          | 0x21                          | 33                            |
| Play/Pause         | 0x35                          | 53                            |
| Skip Forward       | 0x0B                          | 11                            |

## Zone 1 Discrete IR Input Values

These codes are not present on the supplied remote control but have been created to meet discrete control requirements. These commands are only applicable to rear panel IR. RS232/IP input control is handled by dedicated commands.

| Function        | Key code<br>Hexadecimal Value | Key code<br>RC5 Decimal Value |
|-----------------|-------------------------------|-------------------------------|
| Input HDMI1     | 0x61                          | 97                            |
| Input HDMI2     | 0x62                          | 98                            |
| Input HDMI3     | 0x63                          | 99                            |
| Input HDMI4     | 0x64                          | 100                           |
| Input HDMI5     | 0x65                          | 101                           |
| Input HDMI6     | 0x66                          | 102                           |
| Input HDMI7     | 0x67                          | 103                           |
| Input DIG1      | 0x68                          | 104                           |
| Input DIG2      | 0x69                          | 105                           |
| Input DIG3      | 0x6A                          | 106                           |
| Input DIG4      | 0x6B                          | 107                           |
| Input AN1       | 0x6C                          | 108                           |
| Input AN2       | 0x6D                          | 109                           |
| Input AN3       | 0x6E                          | 110                           |
| Input AN4       | 0x6F                          | 111                           |
| Input Bluetooth | 0x70                          | 112                           |
| Input Stream    | 0x71                          | 113                           |
| Input ARC/eARC  | 0x72                          | 114                           |

## Zone 2 Function Command Codes

These codes are not present on the supplied remote control but have been created to meet discrete control requirements. These commands are only applicable to rear panel IR:

| Function | Key code<br>Hexadecimal Value<br>for Simulated Remote<br>Control over IP/RS232 | Key code<br>RC5 Decimal Value<br>for IR input control |
|----------|--------------------------------------------------------------------------------|-------------------------------------------------------|
| Standby  | 0x0C                                                                           | 12                                                    |
| Volume + |                                                                                | 16                                                    |
| Volume - |                                                                                | 17                                                    |
| Mute     | 0x0D                                                                           | 13                                                    |

## Zone 2 Discrete Functions

These codes are not present on the supplied remote control but have been created to meet discrete control requirements. These commands are only applicable to rear panel IR:

| Function           | Key code<br>Hexadecimal Value | Key code<br>RC5 Decimal Value |
|--------------------|-------------------------------|-------------------------------|
| Z2 input Follow Z1 | 0x60                          | 96                            |
| Input HDMI1        | 0x61                          | 97                            |
| Input HDMI2        | 0x62                          | 98                            |
| Input HDMI3        | 0x63                          | 99                            |
| Input HDMI4        | 0x64                          | 100                           |
| Input HDMI5        | 0x65                          | 101                           |
| Input HDMI6        | 0x66                          | 102                           |
| Input HDMI7        | 0x67                          | 103                           |
| Input DIG1         | 0x68                          | 104                           |
| Input DIG2         | 0x69                          | 105                           |
| Input DIG3         | 0x6A                          | 106                           |
| Input DIG4         | 0x6B                          | 107                           |
| Input AN1          | 0x6C                          | 108                           |
| Input AN2          | 0x6D                          | 109                           |
| Input AN3          | 0x6E                          | 110                           |
| Input AN4          | 0x6F                          | 111                           |

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## Revision Notes

| Rev | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Date     | Updated by |
|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|------------|
| A   | Initial draft                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 20/01/26 | P Kuell    |
| B   | <p>Add IP port number in <a href="#">Serial connector specification</a></p> <p>Change system model response to ASCII string see <a href="#">System Model Req / Resp (0x08 / 0x09)</a></p> <p>Correct display brightness data values see <a href="#">Display Brightness Req / Resp (0x12 / 0x13)</a></p> <p>Remove Sub stereo trim commands</p> <p>Correct external sample rate data values see <a href="#">Sample Rate Req / Resp (0x20 / 0x21)</a></p> <p>Change incoming audio format to JSON type see <a href="#">Incoming Audio Format Req / Resp (0x22 / 0x23)</a></p> <p>Correct net playback status values see <a href="#">Network Playback Status - MCH Req / Resp (0x3A / 0x3B)</a></p> <p>Add byte to simulated IR command (system + command) see <a href="#">Simulate IR Remote Req / Resp (0x10 / 0x11)</a></p> <p>Correct DIGITAL input response values see <a href="#">Input Req / Resp (0x2A / 0x2B)</a></p> <p>Correct current upmixer indication values see <a href="#">Current Upmixer Req / Resp (0x2C / 0x2D)</a></p> <p>Change current upmixer set/request to request only see <a href="#">Current Upmixer Req / Resp (0x2C / 0x2D)</a></p> <p>Remove sub trim</p> <p>Rename decode mode to upmixer mode (2ch and MCH)</p> <p>Correct data value for 2ch upmixer mode see <a href="#">Upmixer mode - 2ch Req / Resp (0x36 / 0x37)</a></p> <p>Correct data value for mch upmixer mode see <a href="#">Upmixer mode - MCH Req / Resp (0x38 / 0x39)</a></p> | 10/06/26 | P Kuell    |
| C   | <p>Correct IR commands for use with simulated IR see <a href="#">Zone 1</a> Function</p> <p>Add advanced IR commands see <a href="#">Zone 1</a> Discrete</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 12/06/26 | P Kuell    |

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|---|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|---------|
| D | <p>Correct IR "OK" command data value see <a href="#">Zone 1</a> Function</p> <p>Remove unused commands</p> <p>Correct software version responses see <a href="#">Software Versions Req / Resp (0x1E / 0x1F)</a></p> <p>Correct Sample rate request to not be zoned see <a href="#">Sample Rate Req / Resp (0x20 / 0x21)</a></p> <p>Correct Sample rate request to not be zoned see <a href="#">Incoming Audio Format Req / Resp (0x22 / 0x23)</a></p> <p>Correct now playing request to not be zoned see <a href="#">Now Playing Req / Resp (0x1A / 0x1B)</a></p> <p>Add notes for input selection command for zones and products see <a href="#">Input Req / Resp (0x2A / 0x2B)</a></p> <p>Correct order of responses, add zone 2 responses see <a href="#">System Status Req / Resp (0x3C / 0x3D)</a></p> <p>Make power indication zoned see <a href="#">System Indications Power Event</a> Indication (0x80)</p> <p>Add now playing indication message see <a href="#">Now Playing Indication</a> (0x8D)</p> <p>Correct response of audio format indication to JSON format see <a href="#">Incoming Audio Format Indication</a> (0x8A)</p> <p>Correct nav down simulated IR code see <a href="#">Zone 1</a> Function</p> <p>Add simulated IR codes for zone 2 see <b>Error! Reference source not found.</b></p> <p>Change input change notification to zoned see <a href="#">Input Change Indication</a> (0x8B)</p> <p>Add Auracast input see <a href="#">Input Req / Resp (0x2A / 0x2B)</a> and <a href="#">Input Change Indication</a> (0x8B)</p> | 23/06/26 | P Kuell |
| E | Update RS232 pin out and diagram                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 05/08/26 | P Kuell |
| F | <p>First version published</p> <p>Add IR Command Library</p> <p>Correct Bass and treble request byte</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 04/09/26 | J.Todd  |