Channel in a box

Device Control Protocol

Version 0.6

1. **Introduction**

Channel in a box (이하 CIB)에서 사용할 Device에 대한 Protocol을 정의한다.

CIB Device는 Video Encoder/Decoder, CG (Cut & Page), Sequence CG, Scroll CG, Logo, Closed Caption & Sub Title로 구성되며 이 문서에서 각 Device에 대한 제어 Protocol을 기술한다.

1. **Interface System Overview**

* Confirming to UDP & RS-422
* Data is transmitted asynchronously, bit serial, word serial with data exchange between devices.
* Standard transmission UDP port on see the below :

Video Encoder/Decoder : 1000 ~ 1099

CG (Cut & Page) : 1100 ~ 1199

Sequence CG : 1200 ~ 1299

Scroll CG : 1300 ~ 1399

Logo : 1400 ~ 1499

Closed Caption & Sub Title : 1500 ~ 1599

1. **Binary Protocol Format**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| STX | Byte Count 1 | Byte Count 2 | CMD 1 | CMD 2 | Data 1 | Data 2 | Data 3 | Data N | Check Sum |

* Start of transmission (STX) is 02h
* Byte Count indicates the number of bytes between and not including count byte and the check sum byte.
* CMD 1 is command type. Command type is one of following :  
  00h : System Control  
  10h : Immediate Control  
  20h : Preset/Select Control  
  30h : Sense Request  
  31h : Sense Response
* CMD 2 is actual command or query code.
* Data is the number of data bytes is determined by command.’
* Check Sum is the sum of the CMD1 between Data n.  
  Check Sum is used to verify data accuracy and reject communication sequence when contains the bit error.

All commands (CMD 1 type 0, 1, 2) will be response an ACK (04h), indicating that the command is valid, or NAK (05h), indicating that the all commands is invalid.

When a NAK returned, it will be followed by a byte specifying the nature of the error as show below. Undefined commands will be return an error byte of 1.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Timeout |  |  |  |  | Checksum error | Syntax error | Undefined error |

Query request command (CMD 1 type 3) will return the data requested in the binary protocol format previously described, and will set the most signification bit of CMD 2 to a 1 when returning data.

1. **Command**
2. **Command Table (Video Encoder/Decoder)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Command** | | | **Response** | |
| **Hex-Code** | | **Description** | **Hex-Code** | **Description** |
| **System Control** | | | | |
| 00.00 | Device Open | | 04 | ACK |
| 00.01 | Device Close | | 04 | ACK |
| **Immediate Control** | | | | |
| 10.00 | Stop | | 04 | ACK |
| 10.01 | Play or Record | | 04 | ACK |
| 10.02 | Pause | | 04 | ACK |
| 10.08 | Set Play Rate | | 04 | ACK |
| 10.09 | Set Timecode | | 04 | ACK |
| **Preset/Select Control** | | | | |
| 20.00 | Play Cue | | 04 | ACK |
| 20.01 | Play Cue With Data | | 04 | ACK |
| 20.10 | Record Cue | | 04 | ACK |
| 20.11 | Record Cue With Data | | 04 | ACK |
| **Sense Request** | | | | |
| 30.00 | Get Device Status | | 31.00 | Status Data |
| 30.01 | Get Timecode | | 31.01 | Timecode Data |

1. **Command Table (CG – Cut & Page)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Command** | | | **Response** | |
| **Hex-Code** | | **Description** | **Hex-Code** | **Description** |
| **System Control** | | | | |
| 00.00 | Device Open | | 04 | ACK |
| 00.01 | Device Close | | 04 | ACK |
| **Immediate Control** | | | | |
| 10.00 | Stop | | 04 | ACK |
| 10.01 | Play or Record | | 04 | ACK |
| 10.09 | Set CG Page | | 04 | ACK |
| **Preset/Select Control** | | | | |
| 20.00 | Play Cue - CG Template Name | | 04 | ACK |
| 20.10 | Set Template Data | | 04 | ACK |
| **Sense Request** | | | | |
| 30.00 | Get Device Status | | 31.00 | Status Data |

1. **Command Table (Sequence CG)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Command** | | | **Response** | |
| **Hex-Code** | | **Description** | **Hex-Code** | **Description** |
| **System Control** | | | | |
| 00.00 | Device Open | | 04 | ACK |
| 00.01 | Device Close | | 04 | ACK |
| **Immediate Control** | | | | |
| 10.00 | Stop | | 04 | ACK |
| 10.01 | Play | | 04 | ACK |
| 10.02 | Pause | | 04 | ACK |
| 10.08 | Set Play Rate | | 04 | ACK |
| 10.09 | Set Timecode | | 04 | ACK |
| **Preset/Select Control** | | | | |
| 20.00 | Play Cue – Sequence Name | | 04 | ACK |
| 20.01 | Play Cue With Data | | 04 | ACK |
| **Sense Request** | | | | |
| 30.00 | Get Device Status | | 31.00 | Status Data |
| 30.01 | Get Timecode | | 31.01 | Timecode Data |

1. **Command Table (Scroll CG)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Command** | | | **Response** | |
| **Hex-Code** | | **Description** | **Hex-Code** | **Description** |
| **System Control** | | | | |
| 00.00 | Device Open | | 04 | ACK |
| 00.01 | Device Close | | 04 | ACK |
| **Immediate Control** | | | | |
| 10.00 | Stop | | 04 | ACK |
| 10.01 | Play | | 04 | ACK |
| **Preset/Select Control** | | | | |
| 20.00 | Play Cue – Scroll Template Name | | 04 | ACK |
| 20.10 | Set Scroll Data | | 04 | ACK |
| **Sense Request** | | | | |
| 30.00 | Get Device Status | | 31.00 | Status Data |

1. **Command Table (Logo)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Command** | | | **Response** | |
| **Hex-Code** | | **Description** | **Hex-Code** | **Description** |
| **System Control** | | | | |
| 00.00 | Device Open | | 04 | ACK |
| 00.01 | Device Close | | 04 | ACK |
| **Immediate Control** | | | | |
| 10.00 | Stop | | 04 | ACK |
| 10.01 | Play | | 04 | ACK |
| **Preset/Select Control** | | | | |
| 20.00 | Play Cue – Logo Name | | 04 | ACK |
| **Sense Request** | | | | |
| 30.00 | Get Device Status | | 31.00 | Status Data |

1. **Command Table (Closed Caption & Sub Title)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Command** | | | **Response** | |
| **Hex-Code** | | **Description** | **Hex-Code** | **Description** |
| **System Control** | | | | |
| 00.00 | Device Open | | 04 | ACK |
| 00.01 | Device Close | | 04 | ACK |
| **Immediate Control** | | | | |
| 10.00 | Stop | | 04 | ACK |
| 10.01 | Play or Record | | 04 | ACK |
| 10.02 | Pause | | 04 | ACK |
| 10.08 | Set Screen On | | 04 | ACK |
| 10.09 | Set Screen Off | | 04 | ACK |
| **Preset/Select Control** | | | | |
| 20.00 | Play Cue – Preset or smi | | 04 | ACK |
| 20.01 | Play Cue With Data – Preset or smi | | 04 | ACK |
| **Sense Request** | | | | |
| 30.00 | Get Device Status | | 31.00 | Status Data |
| 30.01 | Get Timecode | | 31.01 | Timecode Data |

1. **Command Description**
2. **Video Encoder/Decoder**

**System Control**

00.00 : DEVICE OPEN

Open to use device.

No other commands can be executed before this command is executed.

00.01 : DEVICE CLOSE

No other commands can be executed after this command.

**Immediate Control**

10.00 : STOP

The STOP command stops playback or recording.

10.01 : PLAY OR RECORD

Start playback or recording.

* Play Cue before you start playback.
* Record Cue before you start record.

10.02 : PAUSE

The PAUSE command pause playback or recording.

If the decoder in PLAY or PLAY CUE state, the PAUSE command causes the currently playing ID to pause and display a still video frame.

If the encoder in RECORD or RECORD CUE state, the PAUSE command causes the currently recording ID to pause.

10.08 : SET PLAY RATE

Specifies the playback speed

If it is negative, it is rewind.

If it is 0, it is pause.

DATA1 ~ DATA4 is float.

10.09 : SET TIMECODE

If playback is in progress, position the video in timecode.

If the time code is larger than the video duration, it moves to the back of the video.

DATA1 ~ DATA4 is BCD timecode.

DATA1 : Frame

DATA2 : Second

DATA3 : Minute

DATA4 : Hour

**Preset/Select Control**

20.00 : PLAY CUE

The PLAY CUE command prepares for playback.

If the ID is not found, an error occurs and state returns STOP.

When the CUE is complete, the CUE-DONE flag is set in status.

You can PLAY CUE another ID during playback. In this case, the currently playing ID is not affected. When the PLAY command is given, the next CUE ID starts playing.

DATA1 : ID Length

DATA2 ~ DATA + ID Length : ID

20.01 : PLAY CUE WITH DATA

Performs similar to PLAY CUE.

In addition, you can specify playback start timecode and playback duration.

DATA1 : ID Length

DATA2 ~ DATA + ID LEN : ID

DATA + ID LEN + 1 ~ DATA + ID LEN + 4 : Start timecode is BCD.

DATA + ID LEN + 5 ~ DATA + ID LEN + 8 : Duration timecode is BCD.

20.10 : RECORD CUE

The RECORD CUE command prepares for record.

If there is an existing ID, it overwrites it, and immediately the ID has a length of 0.

When the CUE is complete, the CUE-DONE flag is set in status.

DATA1 : ID Length

DATA2 ~ DATA + ID Length : ID

20.11 : RECORD CUE WITH DATA

Performs similar to RECORD CUE.

In addition, you can specify record duration.

When recording is done for the specified duration, it stops automatically.

DATA1 : ID Length

DATA2 ~ DATA + ID LEN : ID

DATA + ID LEN + 1 ~ DATA + ID LEN + 4 : Duration timecode is BCD.

DATA + ID LEN + 5 ~ DATA + ID LEN + 8 : Duration timecode is BCD.

**Sense Request**

30.00 : GET STATUS