



# Media Station RS-232/TCP Protocol Specification

Revision: 5.6.1

2023/03/08

## About This Document

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### Related Versions

The following table lists the product versions related to this document.

Product Name	Version
LS-2 / LS-200 / LS-300 / LS-400	v2.11.x.61 ~
KL-3W / KL-3WT	v2.11.x.61 ~
LS-110	v3.1.0.13 ~
LS-US2	v1.2.1.8 ~
MV-01	v7.6.3.6 ~
LS-410	v1.0.0.0 ~

# Contents

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<b>About This Document</b>	<b>2</b>
Related Versions	2
<b>Contents</b>	<b>3</b>
<b>Tables</b>	<b>6</b>
<b>History</b>	<b>7</b>
<b>1 Interface</b>	<b>11</b>
1.1 Hardware	11
• RS-232	11
• TCP	12
1.2 Connection	12
• RS-232	12
• TCP	13
1.3 Configuration	13
• RS-232	13
• TCP	13
<b>2 Control Protocol</b>	<b>14</b>
2.1 Description	14
2.2 Format	14
2.3 Cmd & Example	16
2.3.1 Cmd Power	16
2.3.1.1 Set Power	16
2.3.2 Cmd Record	17
2.3.2.1 Set Record Start	17
2.3.2.2 Set Record Pause	17
2.3.2.3 Set Record Stop	17
2.3.2.4 Get Record State	18
2.3.2.5 Ntfy Record State	18
2.3.3 Cmd Theme ( Scene )	19
2.3.3.1 Set Layout	19
2.3.3.2 Set Background	22
2.3.3.3 Set Overlay	22
2.3.3.4 Set Display Layout	23
2.3.3.5 Set Theme ( Scene )	24
2.3.3.6 Set Playback	24
2.3.3.7 Set GUI show / hide	25
2.3.3.8 Get Layout	25

2.3.3.9 Get Background	25
2.3.3.10 Get Overlay	26
2.3.3.11 Get Display Layout	26
2.3.3.12 Get Theme ( Scene )	26
2.3.3.13 Ntfy Layout	27
2.3.3.14 Ntfy Background	27
2.3.3.15 Ntfy Overlay	27
2.3.3.16 Ntfy Display Layout	28
2.3.4 Cmd Audio Vol	28
2.3.4.1 Set Audio Vol Input	30
2.3.4.2 Set Audio Vol Output	31
2.3.4.3 Get Audio Vol Input	31
2.3.4.4 Get Audio Vol Output	32
2.3.4.5 Ntfy Audio Vol Mute Input	33
2.3.4.6 Ntfy Audio Vol Mute Output	33
2.3.5 Cmd Audio Mute	34
2.3.5.1 Set Audio Mute Input	34
2.3.5.2 Set Audio Mute Output	35
2.3.5.3 Get Audio Mute Input	35
2.3.5.4 Get Audio Mute Output	36
2.3.5.5 Ntfy Audio Vol Mute Input	37
2.3.5.6 Ntfy Audio Vol Mute Output	37
2.3.6 Cmd Audio Type	37
2.3.6.1 Set Audio Type Input	37
2.3.6.2 Set Audio Type Output	37
2.3.6.3 Get Audio Type Input	37
2.3.6.4 Get Audio Type Output	37
2.3.6.5 Ntfy Audio Type Input	37
2.3.6.6 Ntfy Audio Type Output	37
2.3.7 Cmd Stream	37
2.3.7.1 Set Stream	37
2.3.7.2 Set Record Stream	38
2.3.7.3 Set Stream Source URL	39
2.3.7.4 Get Stream	40
2.3.7.5 Ntfy Stream Type	40
2.3.8 Cmd Camera	41
2.3.8.1 Set Camera Goto Preset	41
2.3.8.2 Set Camera Save Preset	41
2.3.8.3 Set Camera Move	42
2.3.8.4 Set Camera Zoom	42
2.3.9 Cmd Video Metadata	43
2.3.9.1 Set Video Metadata	43



	5
2.3.9.2 Get Video Metadata	44
2.3.10 Cmd System & Others	45
2.3.10.1 Set Snapshot	45
2.3.10.2 Set Bookmark	45
2.3.10.3 Set Backup to USB	45
2.3.10.4 Set Standby / Wake up	46
2.3.10.5 Get Model Name	46
2.3.10.6 Get Network Configuration	47
2.3.10.7 Ntfy USB Copy State	47
2.3.10.8 Ntfy USB Mount State	48
2.3.10.9 Ntfy USB Record State	48
<b>3 Key Pass-Through Protocol</b>	<b>49</b>
3.1 Description	49
3.2 Format	49
3.2.1 Cmd	49
3.2.2 Rsp	49
3.2.3 Key code	50
<b>4 Event Notification</b>	<b>51</b>
4.1 Description	51
4.2 Format	51
4.3 Event Code and Parameters	51
<b>5 Note</b>	<b>53</b>
5.1 Format ( Enable Checksum )	53

## Tables

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[Table 2-1 backside of hardware figure](#)

[Table 2-2 Format](#)

[Table 2.3 layout](#)

[Table 2.4 display layout](#)

[Table 2.5 audio vol input](#)

[Table 2.6 audio mute input](#)

[Table 2.7 audio vol & mute output](#)

[Table 2.8 stream](#)

[Table 2.9 channel support](#)

## History

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Version	Date	FW ver.	Comment
0.0	2019/11/22	2.6.x.39	Inherit from v2.6 series v1.2 file
2.0	2019/12/19	2.7.x.3	For v2.7 series 1st release <ul style="list-style-type: none"> <li>● new command <ul style="list-style-type: none"> <li>○ Set camera goto preset</li> <li>○ Set camera PTZ move</li> <li>○ Get / Set video content metadata</li> </ul> </li> </ul>
2.1	2019/12/30	2.7.x.4	<ul style="list-style-type: none"> <li>● New Event Notification: <ul style="list-style-type: none"> <li>○ USB Copy State</li> <li>○ USB Mount State</li> </ul> </li> </ul>
2.2	2020/01/13	2.7.x.6	
2.3	2020/01/17	2.7.x.7	<ul style="list-style-type: none"> <li>● New Event Notification: <ul style="list-style-type: none"> <li>○ USB Record State</li> </ul> </li> </ul>
2.4	2020/07/09	2.7.x.35	<ul style="list-style-type: none"> <li>● New command <ul style="list-style-type: none"> <li>○ Set GUI show / hide</li> </ul> </li> </ul>
3.1	2020/07/20	2.8.x.7	<ul style="list-style-type: none"> <li>● New <ul style="list-style-type: none"> <li>○ support TCP event notification</li> </ul> </li> <li>● Modify: <ul style="list-style-type: none"> <li>○ TCP connection procedure in 2.1 Description</li> </ul> </li> </ul>
3.1.1	2020/08/17		<ul style="list-style-type: none"> <li>● Modify: <ul style="list-style-type: none"> <li>○ Add Table of Contents</li> <li>○ Format remove checksum but still support</li> <li>○ Control Protocol command add example</li> <li>○ separate audio input / output description and add detail audio input / output</li> <li>○ Event Notification add example</li> </ul> </li> </ul>
3.1.2	2020/08/24		<ul style="list-style-type: none"> <li>● Fix: <ul style="list-style-type: none"> <li>○ 2.3.13 Set Audio Vol Output : Typo</li> </ul> </li> <li>● Modify: <ul style="list-style-type: none"> <li>○ 2.2 Format: clear checksum in extended header and length</li> </ul> </li> </ul>

<p>3.2</p>	<p>2020/09/03</p>	<p>2.8.x.16</p>	<ul style="list-style-type: none"> <li>● Fix <ul style="list-style-type: none"> <li>○ 2.4.1 Get State add Stopping state</li> <li>○ 4.3.1 Ntfy Media State add Stopping state</li> </ul> </li> <li>● Modify <ul style="list-style-type: none"> <li>○ 2.1 Description</li> <li>○ 2.2 Format &amp; 5.1 Format for using checksum and adding NTFY action</li> <li>○ 2.3.10 Set Display <ul style="list-style-type: none"> <li>■ Rename as 2.3.10 Set Display Layout</li> <li>■ Add display layout figure</li> <li>■ Modify parameter</li> </ul> </li> <li>○ 2.3.12 Set Audio Vol Input <ul style="list-style-type: none"> <li>■ Add USB Audio in parameter 2</li> <li>■ Add RTP/RTMP Encoder in parameter 2</li> <li>■ Description</li> </ul> </li> <li>○ 2.3.14 Set Audio Mute Input <ul style="list-style-type: none"> <li>■ Add USB Audio in parameter 2</li> <li>■ Add RTP/RTMP Encoder in parameter 2</li> <li>■ Description</li> </ul> </li> <li>○ 2.3.16 Set Audio Type Input <ul style="list-style-type: none"> <li>■ Add parameter to separate input/output</li> <li>■ Add 5.2 Set Audio Type Input</li> <li>■ Example</li> </ul> </li> <li>○ 2.4.5 Get Display <ul style="list-style-type: none"> <li>■ Rename as 2.4.5 Get Display Layout</li> <li>■ Modify parameter &amp; description</li> </ul> </li> <li>○ 2.4.6 Get Audio Vol Input <ul style="list-style-type: none"> <li>■ Add USB Audio in parameter 2</li> <li>■ Add RTP/RTMP Encoder in parameter 2</li> </ul> </li> <li>○ 2.4.8 Get Audio Mute Input <ul style="list-style-type: none"> <li>■ Add USB Audio in parameter 2</li> <li>■ Add RTP/RTMP Encoder in parameter 2</li> </ul> </li> <li>○ 2.4.10 Get Audio Type Input <ul style="list-style-type: none"> <li>■ Add parameter to separate input/output</li> <li>■ Add 5.3 Get Audio Type Input</li> <li>■ Example</li> </ul> </li> </ul> </li> <li>● New <ul style="list-style-type: none"> <li>○ 2.5 Cmd Notification and Parameters <ul style="list-style-type: none"> <li>■ 2.5.1 Ntfy State</li> <li>■ 2.5.2 Ntfy Layout</li> <li>■ 2.5.3 Ntfy Background</li> <li>■ 2.5.4 Ntfy Overlay</li> <li>■ 2.5.5 Ntfy Display Layout</li> <li>■ 2.5.6 Ntfy Audio Vol Mute Input</li> <li>■ 2.5.7 Ntfy Audio Vol Mute Output</li> <li>■ 2.5.8 Ntfy Audio Type Input</li> </ul> </li> </ul> </li> </ul>
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			<ul style="list-style-type: none"> <li>■ 2.5.9 Ntfy Audio Type Output</li> <li>■ 2.5.10 Ntfy Stream Type</li> <li>■ 2.5.11 Ntfy USB Copy State</li> <li>■ 2.5.12 Ntfy USB Mount State</li> <li>■ 2.5.13 Ntfy USB Record State</li> </ul>
3.3	2020/09/10	2.8.x.17	<ul style="list-style-type: none"> <li>● New <ul style="list-style-type: none"> <li>○ 2.4.13 Get Model Name</li> <li>○ 2.4.14 Get Network Configuration</li> </ul> </li> </ul>
3.4	2020/09/15	2.8.x.18	<ul style="list-style-type: none"> <li>● Modify <ul style="list-style-type: none"> <li>○ 2.3.20 Set Camera Preset <ul style="list-style-type: none"> <li>■ Available maximum PresetID change to 0xFF</li> </ul> </li> </ul> </li> <li>● New <ul style="list-style-type: none"> <li>○ 2.3.21 Set Save Camera Preset</li> </ul> </li> </ul>
4.1	2021/01	2.9.x.4	<ul style="list-style-type: none"> <li>● New <ul style="list-style-type: none"> <li>○ 2.3.7.3 Set Stream Source URL</li> </ul> </li> <li>● Modify <ul style="list-style-type: none"> <li>○ Typesetting of 2 Control Protocol &amp; add support table of command</li> </ul> </li> </ul>
5.1	2021/01/21	2.10.x.11	<ul style="list-style-type: none"> <li>● Modify <ul style="list-style-type: none"> <li>○ 1.1 Hardware</li> <li>○ 1.2 Connection <ul style="list-style-type: none"> <li>■ Update RS-232 port &amp; figure</li> </ul> </li> <li>○ 2.3.4.1 Set Audio Vol Input</li> <li>○ 2.3.4.3 Get Audio Vol Input</li> <li>○ 2.3.4.5 Ntfy Audio Vol Mute Input</li> <li>○ 2.3.5.1 Set Audio Mute Input</li> <li>○ 2.3.5.3 Get Audio Mute Input <ul style="list-style-type: none"> <li>■ Add param 2 : Mixer ( Line-in / Mic-in / Wireless Mic )</li> </ul> </li> <li>○ 2.3.6 Cmd Audio Type <ul style="list-style-type: none"> <li>■ Not support</li> </ul> </li> </ul> </li> </ul>
5.2	2021/06/25	2.10.x.27 3.0.0.9	<ul style="list-style-type: none"> <li>● New <ul style="list-style-type: none"> <li>○ Add LS-110 model</li> <li>○ 2.3.10.3 Set Backup to USB</li> </ul> </li> <li>● Modify <ul style="list-style-type: none"> <li>○ 2.1 Description</li> </ul> </li> </ul>
5.3	2021/07/09	2.10.x.27 3.0.0.9 1.0.1.14	<ul style="list-style-type: none"> <li>● New <ul style="list-style-type: none"> <li>○ Add LS-US2 model</li> </ul> </li> <li>● Fix <ul style="list-style-type: none"> <li>○ 5.1 Format wrong link</li> </ul> </li> </ul>

5.4	2021/10/20	Same as above	<ul style="list-style-type: none"> <li>● New <ul style="list-style-type: none"> <li>○ Add KS-AK model</li> </ul> </li> </ul>
5.5	2022/06/14	<a href="#">Related Version</a>	<ul style="list-style-type: none"> <li>● Modify <ul style="list-style-type: none"> <li>○ All of command <ul style="list-style-type: none"> <li>■ Example: category FAILED to NAK</li> </ul> </li> </ul> </li> <li>● New <ul style="list-style-type: none"> <li>○ 2.3.10.4 Set Standby / Wake up</li> </ul> </li> </ul>
5.6	2023/01/11	2.11.x.61 3.1.0.13 1.2.1.8	<ul style="list-style-type: none"> <li>● New <ul style="list-style-type: none"> <li>○ 2.3.3.12 Get Theme ( Scene )</li> </ul> </li> </ul>
5.6.1	2023/03/08	MV-01 LS-410	<ul style="list-style-type: none"> <li>● New <ul style="list-style-type: none"> <li>○ Add New Product LS-410 / MV-01</li> </ul> </li> <li>● Modify <ul style="list-style-type: none"> <li>○ <a href="#">Table 2.5 audio vol input</a></li> <li>○ <a href="#">Table 2.6 audio mute input</a></li> <li>○ <a href="#">Table 2.7 audio vol &amp; mute output</a></li> <li>○ 2.3.4 Cmd Audio Vol</li> <li>○ 2.3.5 Cmd Audio Mute <ul style="list-style-type: none"> <li>■ add index in parameter 2</li> </ul> </li> </ul> </li> </ul>

# 1 Interface

## 1.1 Hardware

- **RS-232**

Before using the RS232 port, it's recommended to check what type of media station is used. The support of hardware RS232 is based on the media station as below table.

Table 2-1 backside of Hardware figure

Model	Backside of Hardware figure
LS-2 LS-200 LS-300 LS-400 KL-3 KL-3WT	
LS-110	
LS-US2 KS-AK MV-01	<p>Unsupport RS-232</p>
LS-410	

Connect the RS-232 cable to the RS-232 port of the media station.  
The pin definition of the RS-232 port:



- 1: Ground ( GND )
- 2: Receive Data 1 ( RX\_1 )
- 3: Receive Data 2 ( RX\_2 )
- 4: Transmit Data 1 ( TX\_1 )
- 5: Transmit Data 2 ( TX\_2 )

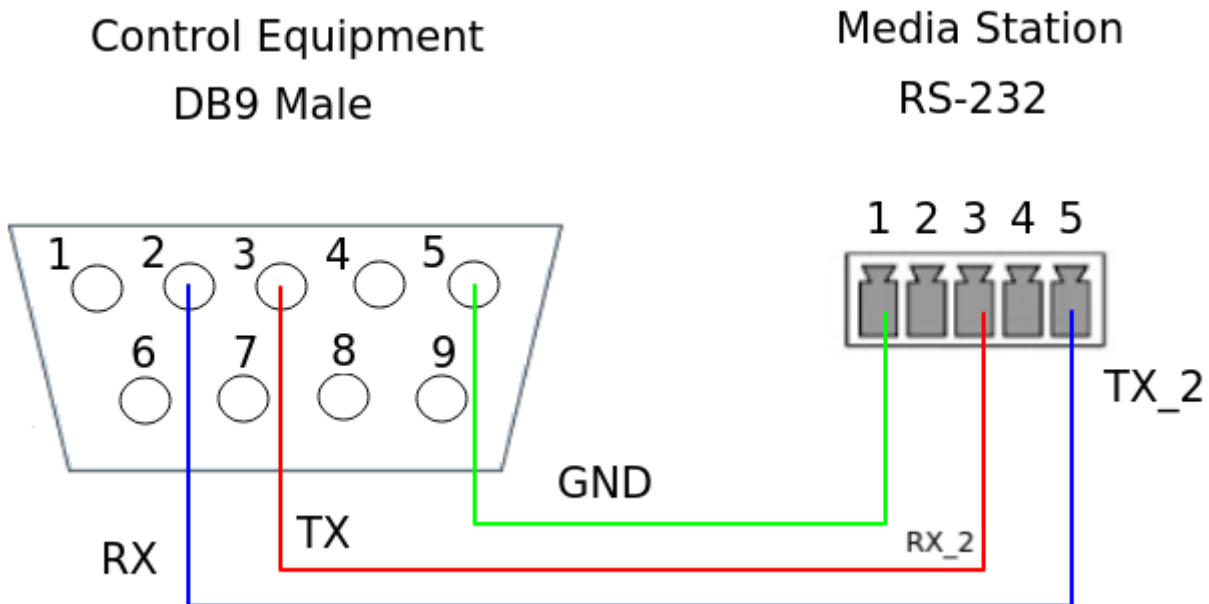
● **TCP**

Connect the CAT-5 (or greater) cable to WAN (or LAN) RJ-45 port of Media Station.

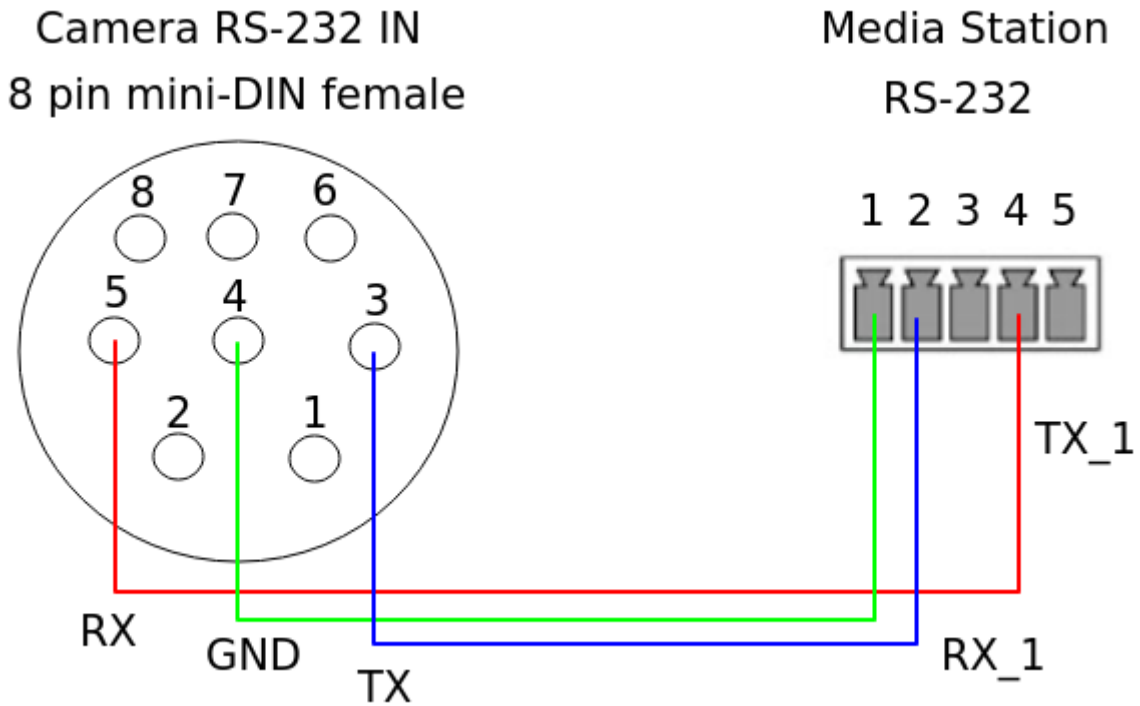
## 1.2 Connection

● **RS-232**

Connect the GND, RX\_2, TX\_2 pins of the RS-232 port with external control equipment. The media station will be controlled by RS-232 protocol. For example, use the standard 9 pin DB9 serial cable as follows:



The RX\_1 & TX\_1 of the media station RS232 port is used to be connected to the camera which contains RS-232 IN port. The media station will control the camera used webpage by RS-232 protocol. For example, use the mini din 8pin as follows:



- **TCP**

Connect the Media Station’s WAN port (or LAN port) and an external control equipment’s ethernet port with a CAT-5 (or greater) cable.

### 1.3 Configuration

- **RS-232**

- Baud rate : 9600
- Data length : 8
- Parity : none
- Stop bit : 1
- Flow control : none

- **TCP**

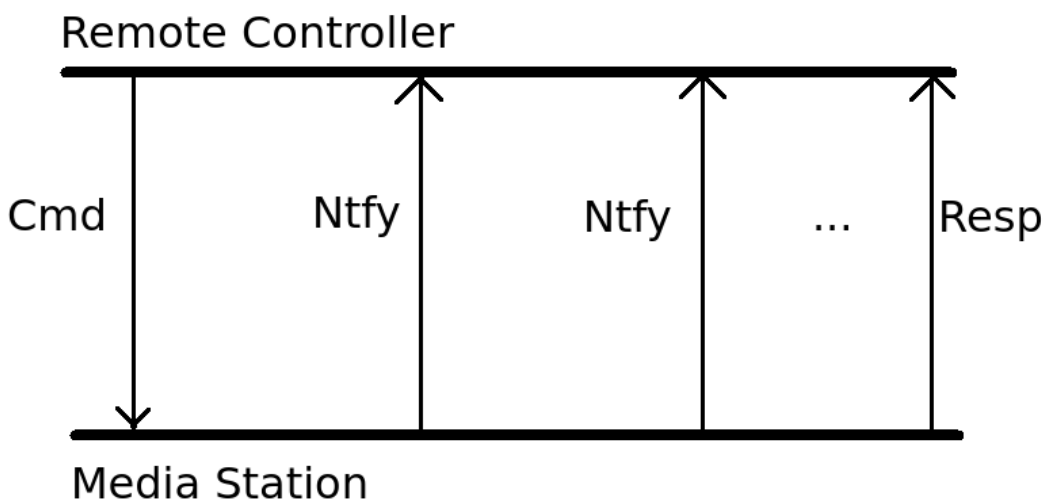
- IP address : Media Station’s WAN IP address / Media Station’s LAN IP address (static IP address: 192.168.11.254)
- Port : 5080

# 2 Control Protocol

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## 2.1 Description

- RS-232  
The media station can be controlled from an external controller through a serial RS-232 connection. Control protocol is used for the communication between the media station and controller.
- TCP  
When an external controller connects Media Station through network connection, the Media Station can be controlled by a command described in Control Protocol. If connection is not closed by client, connection will keep and get event notification until new connection established.
- Cmd Execution  
When the remote controller sends a command which is “set” type request to the media station. After the transmission, the remote controller must wait for the response coming from the media station. During the execution of command in the media station, the media state of e.g. [2.3.3.1 Set Layout](#). This results in the generation of update notifications, which are transmitted to the remote controller immediately. After the completion of command execution, the response of that command is sent back to the remote controller. This flow is shown as below. If the command type is “get”, the information is contained in response. So there’s no notification when the command type is “get”.



- Two kinds of Event Notification  
There are two different types of protocol for Event Notification [2.3 Cmd & Example Ntfy cmd](#) and [4 Event Notification](#) in the media station. The Chapter 4 Event Notification is for previous protocol. The Chapter 2.3 Cmd & Example is a new support protocol, which is more complete

and familiar with set and get commands. It is recommended to use Chapter 2.3 Cmd & Example for getting Event Notification.

## 2.2 Format

Table 2-2 Format

Name	Header	Extended Header	Length	Address	Action	Cmd	Parameters	End
Byte count	1	1	1	1	1	2	n	1

- **Header**  
**0x55** : Protocol header.
- **Extended header**  
**0xF0** : disable checksum  
**0xFF** : enable checksum, please reference to [5.1](#)
- **Length**  
 Length is a byte counter from **address to Parameters** field.

Example:

Name	Header	Extended Header	Length	Address	Action	Cmd	Parameters	End
Hex	0x55	0xF0	0x05	0x01	0x73	0x4C 0x4F	0x01	0x0D

Total length = address 1 byte+action 1 byte+command 2 bytes+parameter 1 byte = 5 bytes

- **Address**  
 Identification of device. Range is 0x01 ~ 0xFF.(0 is reserved)  
 \*Address is reserved for future use. Don't care

- **Action**  
**Get: 0x67**  
 "Query" operation for the media station.

**Set: 0x73**  
 "Set" operation for the media station.

**ACK: 0x06**

When the media station receives the protocol data correctly and executes the corresponding command successfully. It replaces the action field with ACK in the received protocol format and returns to the controller.

**NAK: 0x15**

When the media station receives the protocol data correctly but there is something wrong while the media station executes the corresponding command. It replaces the action field with NAK in the received protocol format and returns to the controller.

In addition, when the media station receives the invalid protocol data (ie. the protocol data that the media station can not understand). It returns NAK code and End code only.

**NTFY: 0x6E**

The event message sent to an external controller from the media station for notifying system state change such as entering recording state while recording. The system state is defined the same as the "State" command in Get Action Cmd List. Please refer to 4.3 Event Code and Parameters for more information.

- **Cmd**  
Two bytes. Please refer to 2.3 Cmd Set and Parameters for more information.
- **Parameters**  
Please refer to 2.3 Cmd Set and Parameters for more information.
- **End**  
**0x0d**  
Protocol end code

## 2.3 Cmd & Example

Change video compression or streaming settings or any action that will restart the media function, system will send event notification including state. layout. background. overlay. display layout.

### 2.3.1 Cmd Power

#### 2.3.1.1 Set Power

	ASCII	Hex	Description
Cmd code	PW	0x50 0x57	
Parameter 1	0 1	0x30 0x31	Power off Power on (NOT supported. Hardware limitation)

**Example**

Name	Header	Extended Header	Length	Address	Action	Cmd	Parameters	End
SET	0x55	0xF0	0x05	0x01	0x73	0x50 0x57	0x30	0x0D



ACK					0x06			
NAK					0x15			

### 2.3.2 Cmd Record

#### 2.3.2.1 Set Record Start

	ASCII	Hex	Description
Cmd code	RC	0x52 0x43	Start record process

**Example**

Name	Header	Extended Header	Length	Address	Action	Cmd	Parameters	End
SET	0x55	0xF0	0x04	0x01	0x73	0x52 0x43	None	0x0D
ACK					0x06			
NAK					0x15			

#### 2.3.2.2 Set Record Pause

	ASCII	Hex	Description
Cmd code	PS	0x50 0x53	Pause record process

**Example**

Name	Header	Extended Header	Length	Address	Action	Cmd	Parameters	End
SET	0x55	0xF0	0x04	0x01	0x73	0x50 0x53	None	0x0D
ACK					0x06			
NAK					0x15			

#### 2.3.2.3 Set Record Stop

	ASCII	Hex	Description
Cmd code	SP	0x53 0x50	Stop record process

**Example**

Name	Header	Extended Header	Length	Address	Action	Cmd	Parameters	End
SET	0x55	0xF0	0x04	0x01	0x73	0x53 0x50	None	0x0D

ACK					0x06			
NAK					0x15			

### 2.3.2.4 Get Record State

	ASCII	Hex	Description
Cmd code	ST	0x53 0x54	Get system state
Rsp Parameter 1	0	0x30	Uninitialize
	1	0x31	Ready
	2	0x32	Stopped
	3	0x33	Recording
	4	0x34	Paused
	5	0x35	Waiting
	6	0x36	Stopping

#### Example

Name	Header	Extended Header	Length	Address	Action	Cmd	Parameters	End
GET	0x55	0xF0	0x04	0x01	0x67	0x53 0x54	None	0x0D
ACK			0x05		0x06		0x31	
NAK			0x04		0x15		None	

### 2.3.2.5 Ntfy Record State

	ASCII	Hex	Description
Cmd code	ST	0x53 0x54	Notify system state
Parameter 1	0	0x30	Uninitialize
	1	0x31	Ready
	2	0x32	Stopped
	3	0x33	Recording
	4	0x34	Paused
	5	0x35	Waiting
	6	0x36	Stopping

#### Example

Name	Header	Extended Header	Length	Address	Action	Cmd	Parameters	End
NTFY	0x55	0xF0	0x05	0x01	0x6E	0x53 0x54	0x31	0x0D

### 2.3.3 Cmd Theme ( Scene )

#### 2.3.3.1 Set Layout

	ASCII	Hex	Description
Cmd code	LO	0x4C 0x4F	Set layout ID
Parameter 1		0x01~0xFF	Layout ID, default layout for reference only as below.

Table 2.3 layout

		<u>LS-400</u>	<u>LS-300</u> <u>KL-3WT</u> <u>KL-3</u>	<u>LS-200</u> <u>LS-2</u> <u>LS-110</u> <u>LS-US2</u> <u>KS-AK</u>
<b><i>Prm.1</i></b>	<b><u>0x01</u></b>			
	<b><u>0x02</u></b>			
	<b><u>0x03</u></b>			
	<b><u>0x04</u></b>			
	<b><u>0x05</u></b>			
	<b><u>0x06</u></b>			
	<b><u>0x07</u></b>			
	<b><u>0x08</u></b>			

<b><u>0x09</u></b>			
<b><u>0x0A</u></b>			
<b><u>0x0B</u></b>			
<b><u>0x0C</u></b>			
<b><u>0x0D</u></b>			
<b><u>0x0E</u></b>			
<b><u>0x0F</u></b>			
<b><u>0x10</u></b>			
<b><u>0x11</u></b>			
<b><u>0x12</u></b>			
<b><u>0x13</u></b>			
<b><u>0x14</u></b>			

<b><u>0x15</u></b>			
<b><u>0x16</u></b>			
<b><u>0x17</u></b>			
<b><u>0x18</u></b>			
<b><u>0x19</u></b>			
<b><u>0x1A</u></b>			
<b><u>0x1B</u></b>			
<b><u>0x1C</u></b>			
<b><u>0x1D</u></b>			
<b><u>0x1E</u></b>			
<b><u>0x1F</u></b>			
<b><u>0x20</u></b>			
<b><u>0x21</u></b>			

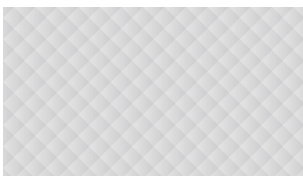

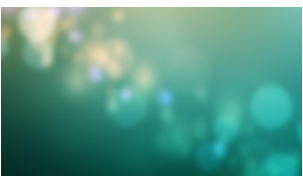


**Example**

Name	Header	Extended Header	Length	Address	Action	Cmd	Parameters	End
SET	0x55	0xF0	0x05	0x01	0x73	0x4C 0x4F	0x01	0x0D
ACK					0x06			
NAK					0x15			

**2.3.3.2 Set Background**

	ASCII	Hex	Description
Cmd code	BG	0x42 0x47	Set background ID
Parameter 1		0x00~0xFF	Background ID 0x00: Background off Default background for reference only as below

0x00	0x01	0x02	0x03
			

**Example**

Name	Header	Extended Header	Length	Address	Action	Cmd	Parameters	End
SET	0x55	0xF0	0x05	0x01	0x73	0x42 0x47	0x01	0x0D
ACK					0x06			
NAK					0x15			

**2.3.3.3 Set Overlay**

	ASCII	Hex	Description
Cmd code	OL	0x4F 0x4C	Set overlay ID
Parameter 1		0x00~0xFF	Overlay ID 0x00: Overlay off

**Example**

Name	Header	Extended Header	Length	Address	Action	Cmd	Parameters	End
SET	0x55	0xF0	0x05	0x01	0x73	0x4F 0x4C	0x01	0x0D
ACK					0x06			
NAK					0x15			

**2.3.3.4 Set Display Layout**

	ASCII	Hex	Description
Cmd code	DP	0x44 0x50	Set display layout ID
Parameter 1		0x01~0x05	Display layout ID, default display layout for reference only as below

Table 2.4 display layout

		<u>LS-400</u>	<u>LS-300</u>	<u>LS-2</u> <u>LS-200</u> <u>LS-110</u> <u>LS-US2</u> <u>KS-AK</u>	<u>KL-3WT</u> <u>KL-3</u>
<b>Prm.1</b>	<u>0x01</u>				
	<u>0x02</u>				
	<u>0x03</u>				
	<u>0x04</u>			<b>Record Layout</b>	
	<u>0x05</u>		<b>Record Layout</b>		<b>Record Layout</b>
	<u>0x06</u>	<b>Record Layout</b>			

**Example**

Name	Header	Extended Header	Length	Address	Action	Cmd	Parameters	End
SET	0x55	0xF0	0x05	0x01	0x73	0x44 0x50	0x01	0x0D
ACK					0x06			
NAK					0x15			

### 2.3.3.5 Set Theme ( Scene )

	ASCII	Hex	Description
Cmd code	TE	0x54 0x45	Set theme ID which can be set in the webpage. change layout.background.overlay Simultaneously.
Parameter 1		0x01~0xff	Theme ID

#### Example

Name	Header	Extended Header	Length	Address	Action	Cmd	Parameters	End
SET	0x55	0xF0	0x05	0x01	0x73	0x54 0x45	0x01	0x0D
ACK					0x06			
NAK					0x15			

### 2.3.3.6 Set Playback

	ASCII	Hex	Description
Cmd code	PB	0x50 0x42	Set Playback function
Parameter 1		0x01 0x02 0x03 0x04	Play latest movie Pause/Continue playback Stop playback Switch playback source

#### Example

Name	Header	Extended Header	Length	Address	Action	Cmd	Parameters	End
SET	0x55	0xF0	0x05	0x01	0x73	0x50 0x42	0x01	0x0D
ACK					0x06			
NAK					0x15			



### 2.3.3.7 Set GUI show / hide

	ASCII	Hex	Description
Cmd code	HG	0x48 0x47	Set GUI bar show / hide control
Parameter 1	1 2	0x31 0x32	Show GUI bar Hide GUI bar

#### Example

Name	Header	Extended Header	Length	Address	Action	Cmd	Parameters	End
SET	0x55	0xF0	0x05	0x01	0x73	0x48 0x47	0x31	0x0D
ACK					0x06			
NAK					0x15			

### 2.3.3.8 Get Layout

	ASCII	Hex	Description
Cmd code	LO	0x4C 0x4F	Get layout ID
Rsp Parameter 1		0x01~0xFF	Layout ID

#### Example

Name	Header	Extended Header	Length	Address	Action	Cmd	Parameters	End
GET	0x55	0xF0	0x04	0x01	0x67	0x4C 0x4F	None	0x0D
ACK			0x05		0x06		0x01	
NAK			0x04		0x15		None	

### 2.3.3.9 Get Background

	ASCII	Hex	Description
Cmd code	BG	0x42 0x47	Get background ID
Rsp Parameter 1		0x00~0xFF	Background ID 0x00: Background off

#### Example

Name	Header	Extended Header	Length	Address	Action	Cmd	Parameters	End
GET	0x55	0xF0	0x04	0x01	0x67	0x42 0x47	None	0x0D
ACK			0x05		0x06		0x01	
NAK			0x04		0x15		None	

### 2.3.3.10 Get Overlay

	ASCII	Hex	Description
Cmd code	OL	0x4F 0x4C	Get overlay ID
Rsp Parameter 1		0x00~0xFF	Overlay ID 0x00: Overlay off

#### Example

Name	Header	Extended Header	Length	Address	Action	Cmd	Parameters	End
GET	0x55	0xF0	0x04	0x01	0x67	0x4F 0x4C	None	0x0D
ACK			0x05		0x06		0x01	
NAK			0x04		0x15		None	

### 2.3.3.11 Get Display Layout

	ASCII	Hex	Description
Cmd code	DP	0x44 0x50	Get display layout ID
Rsp Parameter 1		0x01~0x05	Display ID, detail of parameter 1 please reference to <a href="#">2.3.3.4 Set Display Layout</a>

#### Example

Name	Header	Extended Header	Length	Address	Action	Cmd	Parameters	End
GET	0x55	0xF0	0x04	0x01	0x67	0x44 0x50	None	0x0D
ACK			0x05		0x06		0x01	
NAK			0x04		0x15		None	

### 2.3.3.12 Get Theme ( Scene )

	ASCII	Hex	Description
--	-------	-----	-------------

Cmd code	TE	0x54 0x45	Get theme ID
Parameter 1		0x01~0xff	Theme ID

**Example**

Name	Header	Extended Header	Length	Address	Action	Cmd	Parameters	End
GET	0x55	0xF0	0x04	0x01	0x67	0x54 0x45	None	0x0D
ACK			0x05		0x06		0x01	
NAK			0x04		0x15		None	

**2.3.3.13 Ntfy Layout**

	ASCII	Hex	Description
Cmd code	LO	0x4C 0x4F	Notify layout ID
Parameter 1		0x01~0xFF	Layout ID

**Example**

Name	Header	Extended Header	Length	Address	Action	Cmd	Parameters	End
NTFY	0x55	0xF0	0x05	0x01	0x6E	0x4C 0x4F	0x01	0x0D

**2.3.3.14 Ntfy Background**

	ASCII	Hex	Description
Cmd code	BG	0x42 0x47	Notify background ID
Parameter 1		0x00~0xFF	Background ID 0x00: Background off

**Example**

Name	Header	Extended Header	Length	Address	Action	Cmd	Parameters	End
NTFY	0x55	0xF0	0x05	0x01	0x6E	0x42 0x47	0x00	0x0D

**2.3.3.15 Ntfy Overlay**

	ASCII	Hex	Description
Cmd code	OL	0x4F 0x4C	Notify overlay ID

Parameter 1		0x00~0xFF	Overlay ID 0x00: Overlay off
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**Example**

Name	Header	Extended Header	Length	Address	Action	Cmd	Parameters	End
NTFY	0x55	0xF0	0x05	0x01	0x6E	0x4F 0x4C	0x01	0x0D

**2.3.3.16 Ntfy Display Layout**

	ASCII	Hex	Description
Cmd code	DP	0x44 0x50	Notify display LayoutID
Parameter 1		0x01~0x05	Display ID, detail of parameter 1 please reference to <a href="#">2.3.3.4 Set Display Layout</a>

**Example**

Name	Header	Extended Header	Length	Address	Action	Cmd	Parameters	End
NTFY	0x55	0xF0	0x05	0x01	0x6E	0x44 0x50	0x01	0x0D

**2.3.4 Cmd Audio Vol**

Before using the Audio cmd, it's recommended to check what type of media station is used. The support of parameter 2 in cmd is based on the media station as below table.

**BT MIC : Only available when BlueTooth MIC has been connected**

**Playback : Only available in playback mode**

**RTP/RTMP Encoder : Only available when video input set to RTP/RTMP**

**KS-AK : volume of HDMI cannot be get & set**

Table 2.5 audio vol input

	HEX	Description	LS-400	LS-300 KL-3WT KL-3	LS-200	LS-2 LS-110	LS-US2	KS-AK	MV-01	LS-410
Prm. 2	0x31	HDMI 1	○	○	○	○	X	X/O	X	○
	0x32	HDMI 2	○	○	○	X	X	○	X	○
	0x33	BT MIC	X	X	X	X	X	X	X	X
	0x34	Playback	○	○	○	○	○	○	○	○

	0x35	USB Audio	○	○	○	○	○	○	○	○
	0x36	RTP/RTMP Encoder 1	○	○	○	○	○	○	○	○
	0x37	RTP/RTMP Encoder 2	○	○	○	○	○	○	○	○
	0x38	RTP/RTMP Encoder 3	○	○	X	X	X	X	○	○
	0x39	RTP/RTMP Encoder 4	○	X	X	X	X	X	X	○
	0x40	Mixer (Line-in / Mic-in / Wireless Mic)	○	○	○	○	X	○	X	○

Table 2.6 audio mute input

	HEX	Description	LS-400	LS-300 KL-3WT KL-3	LS-200	LS-2 LS-110	LS-US2	KS-AK	MV-01	LS-410
Prm. 2	0x31	HDMI 1	○	○	○	○	X	X/O	X	○
	0x32	HDMI 2	○	○	○	X	X	○	X	○
	0x33	BT MIC	X	X	X	X	X	X	X	X
	0x34	Playback	○	○	○	○	○	○	○	○
	0x35	USB Audio	○	○	○	○	○	○	○	○
	0x36	RTP/RTMP Encoder 1	○	○	○	○	○	○	○	○
	0x37	RTP/RTMP Encoder 2	○	○	○	○	○	○	○	○
	0x38	RTP/RTMP Encoder 3	○	○	X	X	X	X	○	○
	0x39	RTP/RTMP Encoder 4	○	X	X	X	X	X	X	○
	0x40	Mixer (Line-in / Mic-in / Wireless Mic)	○	○	○	○	X	○	X	X
	0x41	Line-in	X	X	X	X	X	X	X	○
	0x42	Mic-in	X	X	X	X	X	X	X	○
0x43	Balanced Line (Line-in-diff)	X	X	X	X	X	X	X	○	

Table 2.7 audio vol & mute output

	HEX	Description	LS-2 LS-110 LS-200 LS-300 LS-400 KL-3 KL-3WT	LS-US2	KS-AK	MV-01	LS-410
Prm.	0x31	Line out	○	X	X	X	○

2	0x32	HDMI out	○	○	○	○	X
	0x33	Recording / Streaming-out	○	○	○	○	○
	0x34	display out	X	○	X	X	X
	0x35	usb-out	X	X	X	○	X
	0x36	conf-out	X	X	X	○	X
	0x37	dp-out	X	X	X	X	○
	0x40	hdmi1-out	X	X	X	X	○
	0x41	hdmi2-out	X	X	X	X	○

**2.3.4.1 Set Audio Vol Input**

	ASCII	Hex	Description
Cmd code	AV	0x41 0x56	Set audio volume, detail of parameter2 please check <a href="#">Table 2.5 audio vol input</a>
Parameter 1	I	0x49	Set input volume
Parameter 2	1 2 3 4 5 6 7 8 9 @	0x31 0x32 0x33 0x34 0x35 0x36 0x37 0x38 0x39 0x40	HDMI 1 HDMI 2 BT MIC Playback USB Audio RTP/RTMP Encoder 1 RTP/RTMP Encoder 2 RTP/RTMP Encoder 3 RTP/RTMP Encoder 4 Mixer ( Line-in / Mic-in / Wireless Mic )
Parameter 3		0x00~0x7D 0x00~0x0F	Audio volume(0~125) BT MIC volume(0~15)

**Example**

Name	Header	Extended Header	Length	Address	Action	Cmd	Parameters	End
SET	0x55	0xF0	0x07	0x01	0x73	0x41 0x56	0x49 0x31 0x00	0x0D
ACK					0x06			
NAK					0x15			

### 2.3.4.2 Set Audio Vol Output

	ASCII	Hex	Description
Cmd code	AV	0x41 0x56	Set audio volume, detail of parameter2 please check <a href="#">Table 2.7 audio vol &amp; mute output</a>
Parameter 1	O	0x4F	Set output volume
Parameter 2	1 2 3 4 5 6 7 @ A	0x31 0x32 0x33 0x34 0x35 0x36 0x37 0x40 0x41	Line out HDMI out Recording-Streaming-out display out usb out conference out dp out hdmi1-out hdmi2-out
Parameter 3		0x00~0x7D	Audio volume(0~125))

#### Example

Name	Header	Extended Header	Length	Address	Action	Cmd	Parameters	End
SET	0x55	0xF0	0x07	0x01	0x73	0x41 0x56	0x4F 0x31 0x00	0x0D
ACK					0x06			
NAK					0x15			

### 2.3.4.3 Get Audio Vol Input

	ASCII	Hex	Description
Cmd code	AV	0x41 0x56	Get audio volume, detail of parameter2 please check <a href="#">Table 2.5 audio vol input</a>
Cmd/Rsp Parameter 1	I	0x49	Get input volume
Cmd/Rsp Parameter 2	1 2 3 4 5 6 7 8 9 @	0x31 0x32 0x33 0x34 0x35 0x36 0x37 0x38 0x39 0x40	HDMI 1 HDMI 2 BT MIC Playback USB Audio RTP/RTMP Encoder 1 RTP/RTMP Encoder 2 RTP/RTMP Encoder 3 RTP/RTMP Encoder 4 Mixer ( Line-in / Mic-in / Wireless Mic )

Rsp Parameter 3		0x00~0x7D 0x00~0x0F	Audio volume(0~125) Bluetooth microphone volume(0~15)
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**Example**

Name	Header	Extended Header	Length	Address	Action	Cmd	Parameters	End
GET	0x55	0xF0	0x06	0x01	0x67	0x41 0x56	0x49 0x31	0x0D
ACK			0x07		0x06		0x49 0x31 0x00	
NAK			0x06		0x15		0x49 0x31	

**2.3.4.4 Get Audio Vol Output**

	ASCII	Hex	Description
Cmd code	AV	0x41 0x56	Get audio volume, detail of parameter2 please check <a href="#">Table 2.7 audio vol &amp; mute output</a>
Cmd/Rsp Parameter 1	O	0x4F	Get output volume
Cmd/Rsp Parameter 2	1 2 3 4 5 6 7 @ A	0x31 0x32 0x33 0x34 0x35 0x36 0x37 0x40 0x41	Line out HDMI out Recording-Streaming-out display out usb out conference out dp out hdmi1-out hdmi2-out
Rsp Parameter 3		0x00~0x7D	Audio volume(0~125)

**Example**

Name	Header	Extended Header	Length	Address	Action	Cmd	Parameters	End
GET	0x55	0xF0	0x06	0x01	0x67	0x41 0x56	0x4F 0x31	0x0D
ACK			0x07		0x06		0x4F 0x31 0x00	
NAK			0x06		0x15		0x4F 0x31	



### 2.3.4.5 Ntfy Audio Vol Mute Input

	ASCII	Hex	Description
Cmd code	AV	0x41 0x56	Notify audio input volume and mute
Parameter 1	I	0x49	Audio Input
Parameter 2	1 2 3 4 5 6 7 8 9 @	0x31 0x32 0x33 0x34 0x35 0x36 0x37 0x38 0x39 0x40	HDMI 1 HDMI 2 BT MIC Playback USB Audio RTP/RTMP Encoder 1 RTP/RTMP Encoder 2 RTP/RTMP Encoder 3 RTP/RTMP Encoder 4 Mixer ( Line-in / Mic-in / Wireless Mic )
Parameter 3		0x00~0x7D 0x00~0x0F	Audio volume(0~125) Bluetooth microphone volume(0~15)
Parameter 4	0 1	0x30 0x31	Audio unmute Audio mute

#### Example

Name	Header	Extended Header	Length	Address	Action	Cmd	Parameters	End
NTFY	0x55	0xF0	0x08	0x01	0x6E	0x41 0x56	0x49 0x31 0x7D 0x30	0x0D

### 2.3.4.6 Ntfy Audio Vol Mute Output

	ASCII	Hex	Description
Cmd code	AV	0x41 0x56	Notify audio output volume and mute
Parameter 1	O	0x4F	Get output volume
Parameter 2	1 2 3 4 5 6 7 @ A	0x31 0x32 0x33 0x34 0x35 0x36 0x37 0x40 0x41	Line out HDMI out Recording-Streaming-out display out usb out conference out dp out hdmi1-out hdmi2-out
Parameter 3		0x00~0x7D 0x00~0x0F	Audio volume(0~125) Bluetooth microphone volume(0~15)

Parameter 4	0	0x30	Audio unmute
	1	0x31	Audio mute

**Example**

Name	Header	Extended Header	Length	Address	Action	Cmd	Parameters	End
NTFY	0x55	0xF0	0x08	0x01	0x6E	0x41 0x56	0x4F 0x31 0x7D 0x30	0x0D

## 2.3.5 Cmd Audio Mute

### 2.3.5.1 Set Audio Mute Input

	ASCII	Hex	Description
Cmd code	AM	0x41 0x4D	Set audio mute/unmute, detail of parameter2 please check <a href="#">Table 2.6 audio mute input</a>
Parameter 1	I	0x49	Set input mute/unmute
Parameter 2	1 2 3 4 5 6 7 8 9 @ A B C	0x31 0x32 0x33 0x34 0x35 0x36 0x37 0x38 0x39 0x40 0x41 0x42 0x43	HDMI 1 HDMI 2 BT MIC Playback USB Audio RTP/RTMP Encoder 1 RTP/RTMP Encoder 2 RTP/RTMP Encoder 3 RTP/RTMP Encoder 4 Mixer ( Line-in / Mic-in / Wireless Mic ) Line-in Mic-in Balanced Line (Line-in-diff)
Parameter 3	0 1	0x30 0x31	Audio unmute Audio mute

**Example**

Name	Header	Extended Header	Length	Address	Action	Cmd	Parameters	End
SET	0x55	0xF0	0x07	0x01	0x73	0x41 0x4D	0x49 0x31 0x30	0x0D
ACK					0x06			
NAK					0x15			

### 2.3.5.2 Set Audio Mute Output

	ASCII	Hex	Description
Cmd code	AM	0x41 0x4D	Set audio mute/unmute, detail of parameter2 please check <a href="#">Table 2.7 audio vol &amp; mute output</a>
Parameter 1	O	0x4F	Set output mute/unmute
Parameter 2	1 2 3 4 5 6 7 @ A	0x31 0x32 0x33 0x34 0x35 0x36 0x37 0x40 0x41	Line out HDMI out Recording-Streaming-out display out usb out conference out dp out hdmi1-out hdmi2-out
Parameter 3	0 1	0x30 0x31	Audio unmute Audio mute

#### Example

Name	Header	Extended Header	Length	Address	Action	Cmd	Parameters	End
SET	0x55	0xF0	0x07	0x01	0x73	0x41 0x4D	0x4F 0x31 0x30	0x0D
ACK					0x06			
NAK					0x15			

### 2.3.5.3 Get Audio Mute Input

	ASCII	Hex	Description
Cmd code	AM	0x41 0x4D	Get audio mute/unmute, detail of parameter2 please check <a href="#">Table 2.6 audio mute input</a>
Cmd/Rsp Parameter 1	I	0x49	Get input mute/unmute
Cmd/Rsp Parameter 2	1 2 3 4 5 6 7 8 9 @	0x31 0x32 0x33 0x34 0x35 0x36 0x37 0x38 0x39 0x40	HDMI 1 HDMI 2 BT MIC Playback USB Audio RTP/RTMP Encoder 1 RTP/RTMP Encoder 2 RTP/RTMP Encoder 3 RTP/RTMP Encoder 4 Mixer ( Line-in / Mic-in / Wireless Mic )

	A	0x41	Line-in
	B	0x42	Mic-in
	C	0x43	Balanced Line (Line-in-diff)
Rsp Parameter 3	0	0x30	Audio unmute
	1	0x31	Audio mute

**Example**

Name	Header	Extended Header	Length	Address	Action	Cmd	Parameters	End
GET	0x55	0xF0	0x06	0x01	0x67	0x41 0x4D	0x49 0x31	0x0D
ACK			0x07		0x06		0x49 0x31 0x30	
NAK			0x06		0x15		0x49 0x31	

**2.3.5.4 Get Audio Mute Output**

	ASCII	Hex	Description
Cmd code	AM	0x41 0x4D	Get audio mute/unmute, detail of parameter2 please check <a href="#">Table 2.7 audio vol &amp; mute output</a>
Cmd/Rsp Parameter 1	O	0x4F	Get output mute/unmute
Cmd/Rsp Parameter 2	1 2 3 4 5 6 7 @ A	0x31 0x32 0x33 0x34 0x35 0x36 0x37 0x40 0x41	Line out HDMI out Recording-Streaming-out display out usb out conference out dp out hdmi1-out hdmi2-out
Rsp Parameter 3	0 1	0x30 0x31	Audio unmute Audio mute

**Example**

Name	Header	Extended Header	Length	Address	Action	Cmd	Parameters	End
GET	0x55	0xF0	0x06	0x01	0x67	0x41 0x4D	0x4F 0x31	0x0D
ACK			0x07		0x06		0x4F 0x31 0x30	
NAK			0x06		0x15		0x4F 0x31	

**2.3.5.5 Ntfy Audio Vol Mute Input**

please check [2.3.4.5 Ntfy Audio Vol Mute Input](#)

**2.3.5.6 Ntfy Audio Vol Mute Output**

please check [2.3.4.6 Ntfy Audio Vol Mute Output](#)

**2.3.6 Cmd Audio Type**

Before using the Audio type cmd, it's recommended to check what type of media station is used. The support of parameter 2 in cmd is based on the media station as below table. The version after v2.10 does not support this command any more.

**2.3.6.1 Set Audio Type Input**

Reserve

**2.3.6.2 Set Audio Type Output**

Reserve

**2.3.6.3 Get Audio Type Input**

Reserve

**2.3.6.4 Get Audio Type Output**

Reserve

**2.3.6.5 Ntfy Audio Type Input**

Reserve

**2.3.6.6 Ntfy Audio Type Output**

Reserve

**2.3.7 Cmd Stream**

**2.3.7.1 Set Stream**

Before using the Stream cmd, it's recommended to check what type of media station is used. The support of parameter 2 in cmd is based on the media station as below table.

Table 2.8 stream

	HEX	Description	LS-200 LS-300 LS-400 KL-3 KL-3WT	LS-2 LS-110

			LS-US2 KS-AK	
Prm. 2	0x31	Stream 1	○	○
	0x32	Stream 2	○	×

	ASCII	Hex	Description
Cmd code	SC	0x53 0x43	Set stream start/stop streaming, please check support <a href="#">Table 2.8 stream</a> Only work in “Enable streaming button”
Parameter 1	1 2	0x31 0x32	Stream 1 Stream 2
Parameter 2		0x01 0x02	Stop Streaming Start Streaming

**Example**

Name	Header	Extended Header	Length	Address	Action	Cmd	Parameters	End
SET	0x55	0xF0	0x06	0x01	0x73	0x53 0x43	0x31 0x01	0x0D
ACK					0x06			
NAK					0x15			

**2.3.7.2 Set Record Stream**

	ASCII	Hex	Description
Cmd code	RS	0x52 0x53	Set record stream start/stop Stream Only work in “Enable streaming button”
Parameter 1		0x01 0x02	Record and stream stop Record and stream start

**Example**

Name	Header	Extended Header	Length	Address	Action	Cmd	Parameters	End
SET	0x55	0xF0	0x05	0x01	0x73	0x52 0x53	0x01	0x0D
ACK					0x06			
NAK					0x15			

### 2.3.7.3 Set Stream Source URL

Before using the cmd which depends on channels, it's recommended to check what type of media station is used. The support of parameter 2 in cmd is based on the media station as below table.

Table 2.9 channel support

	HEX	Description	LS-400	LS-300 KL-3WT KL-3	LS-2 LS-110 LS-200 LS-US2 KS-AK
Prm. 2	0x31	Channel 1	○	○	○
	0x32	Channel 2	○	○	○
	0x33	Channle 3	○	○	×
	0x34	Channel 4	○	×	×

	ASCII	Hex	Description
Cmd code	SU	0x53 0x55	Set stream source URL and apply on channel, please check support <a href="#">Table 2.9 channel support</a>
Parameter 1	1	0x31	Set input channel
Parameter 2	1 2 3 4	0x31 0x32 0x33 0x34	Channel 1 Channel 2 Channel 3 Channel 4
String 3		0x00~0xFF	The URL string which will be set as stream source. The maximum length of string according to protocol is 255 bytes.

**This command is only effective when the Signal type of channel is “Encoder” and the Protocol of URL string in command is the same as Protocol in the web page. The Signal type and Protocol can be found in the web page -> Media I/O -> Video Inputs in each channel.**

#### Example

Name	ASCII
SET	U\xf0 \01sSU11rtsp://192.168.11.201/h264\r
ACK	U\xf0 \01\06SU11rtsp://192.168.11.201/h264\r

NAK	U\F0 \01\15SU11rtsp://192.168.11.201/h264\r
-----	---

Name	HEX
SET	55 f0 20 01 73 53 55 31 31 72 74 73 70 3a 2f 2f 31 39 32 2e 31 36 38 2e 31 31 2e 32 30 31 2f 68 32 36 34 0d
ACK	55 F0 20 01 06 53 55 31 31 72 74 73 70 3A 2F 2F 31 39 32 2E 31 36 38 2E 31 31 2E 32 30 31 2F 68 32 36 34 0D
NAK	55 F0 20 01 15 53 55 31 31 72 74 73 70 3A 2F 2F 31 39 32 2E 31 36 38 2E 31 31 2E 32 30 31 2F 68 32 36 34 0D

### 2.3.7.4 Get Stream

	ASCII	Hex	Description
Cmd code	SC	0x53 0x43	Get Stream type, please check support <a href="#">Table 2.7 stream</a>
Cmd/Rsp Parameter 1	1 2	0x31 0x32	Stream 1 Stream 2
Rsp Parameter 2		0x00 0x01 0x02 0x03 0x04	Together with recording Ready ( enable ) Streaming ( enable ) Streaming Always Off

#### Example

Name	Header	Extended Header	Length	Address	Action	Cmd	Parameters	End
GET	0x55	0xF0	0x05	0x01	0x67	0x53 0x43	0x31	0x0D
ACK			0x06		0x06		0x31 0x01	
NAK			0x05		0x15		0x31	

### 2.3.7.5 Ntfy Stream Type

	ASCII	Hex	Description
Cmd code	SC	0x53 0x43	Notify Stream type
Cmd/Rsp Parameter 1	1 2	0x31 0x32	Stream 1 Stream 2
Rsp Parameter 2		0x00 0x01	Together with recording Ready ( enable )



		0x02 0x03 0x04	Streaming ( enable ) Streaming Always Off
--	--	----------------------	---

**Example**

Name	Header	Extended Header	Length	Address	Action	Cmd	Parameters	End
NTFY	0x55	0xF0	0x06	0x01	0x6E	0x53 0x43	0x31 0x04	0x0D

## 2.3.8 Cmd Camera

### 2.3.8.1 Set Camera Goto Preset

	ASCII	Hex	Description
Cmd code	CP	0x43 0x50	Set camera of channel goto preset, please check support <a href="#">Table 2.9 channel support</a>
Parameter 1	1 2 3 4	0x31 0x32 0x33 0x34	Channel 1 Channel 2 Channel 3 Channel 4
Parameter 2		0x00~0xFF	Preset ID

The maximum value of parameter 2 is dependent on the camera and what kind of PTZ control protocol used connected with the camera from the media station.

**Example**

Name	Header	Extended Header	Length	Address	Action	Cmd	Parameters	End
SET	0x55	0xF0	0x06	0x01	0x73	0x43 0x50	0x31 0x00	0x0D
ACK					0x06			
NAK					0x15			

### 2.3.8.2 Set Camera Save Preset

	ASCII	Hex	Description
Cmd code	CS	0x43 0x53	Set camera of channel save preset, please check support <a href="#">Table 2.9 channel support</a>
Parameter 1	1 2	0x31 0x32	Channel 1 Channel 2

	3 4	0x33 0x34	Channel 3 Channel 4
Parameter 2		0x00~0xFF	Preset ID

**Example**

Name	Header	Extended Header	Length	Address	Action	Cmd	Parameters	End
SET	0x55	0xF0	0x06	0x01	0x73	0x43 0x53	0x31 0x00	0x0D
ACK					0x06			
NAK					0x15			

**2.3.8.3 Set Camera Move**

	ASCII	Hex	Description
Cmd code	CM	0x43 0x4D	Set camera move, please check support <a href="#">Table 2.9 channel support</a>
Parameter 1	S U D L R	0x53 0x55 0x44 0x4c 0x52	Camera stop move Camera move up Camera move down Camera move left Camera move right
Parameter 2	1 2 3 4	0x31 0x32 0x33 0x34	Channel 1 Channel 2 Channel 3 Channel 4
Parameter 3		0x01~0x18	Move speed , this parameter in stop command is dispensable

**Example**

Name	Header	Extended Header	Length	Address	Action	Cmd	Parameters	End
SET	0x55	0xF0	0x07	0x01	0x73	0x43 0x4D	0x55 0x31 0x01	0x0D
ACK					0x06			
NAK					0x15			

**2.3.8.4 Set Camera Zoom**

	ASCII	Hex	Description
--	-------	-----	-------------

Cmd code	CZ	0x43 0x5A	Set camera zoom, please check support <a href="#">Table 2.8 channel support</a>
Parameter 1	S I O	0x53 0x49 0x4f	Camera stop zoom Camera zoom in Camera zoom out
Parameter 2	1 2 3 4	0x31 0x32 0x33 0x34	Channel 1 Channel 2 Channel 3 Channel 4
Parameter 3		0x01~0x07	Zoom speed , this parameter in stop command is dispensable

**Example**

Name	Header	Extended Header	Length	Address	Action	Cmd	Parameters	End
SET	0x55	0xF0	0x07	0x01	0x73	0x43 0x5A	0x49 0x31 0x01	0x0D
ACK					0x06			
NAK					0x15			

## 2.3.9 Cmd Video Metadata

### 2.3.9.1 Set Video Metadata

	ASCII	Hex	Description
Cmd code	MT	0x4D 0x54	Set metadata of video content in webpage
Parameter 1		0x01 0x02 0x03 0x04 0x05 0x06 0x07 0x08 0x09 0x0a 0x0b 0x0c 0x0d	Title Organization Department Event_data Semester Topic Level Audience Room Category Presenter Section Description The above descriptions is default. The hex value is corresponding to sequence of

			metadata. Not corresponding to the name of metadata.
String 2		0x00~0xFF	The string which want to be set as metadata The maximum length of sting according to protocol is 255 bytes.

**Example**

Name	Header	Extended Header	Length	Address	Action	Cmd	Parameters	End
SET	0x55	0xF0	0x08	0x01	0x73	0x4D 0x54	0x01 0x31 0x32 0x33	0x0D
ACK					0x06			
NAK					0x15			

**2.3.9.2 Get Video Metadata**

	ASCII	Hex	Description
Cmd code	MT	0x4D 0x54	Get metadata of video content in webpage
Cmd/Rsp Parameter 1		0x01 0x02 0x03 0x04 0x05 0x06 0x07 0x08 0x09 0x0a 0x0b 0x0c 0x0d	Title Organization Department Event_data Semester Topic Level Audience Room Category Presenter Section Description The above descriptions is default. The hex value is corresponding to sequence of metadata. Not corresponding to the name of metadata.
Rsp String 2		0x00~0xFF	The string which get from metadata The maximum length of string according to protocol is 255 bytes. If string length exceeds the maximum length, return error.

**Example**

Name	Header	Extended Header	Length	Address	Action	Cmd	Parameters	End
------	--------	-----------------	--------	---------	--------	-----	------------	-----

GET	0x55	0xF0	0x05	0x01	0x67	0x4D 0x54	0x01	0x0D
ACK			0x08		0x06		0x01 0x31 0x32 0x33	
NAK			0x05		0x15		0x01	

### 2.3.10 Cmd System & Others

#### 2.3.10.1 Set Snapshot

	ASCII	Hex	Description
Cmd code	SS	0x53 0x53	Insert snapshot

##### Example

Name	Header	Extended Header	Length	Address	Action	Cmd	Parameters	End
SET	0x55	0xF0	0x04	0x01	0x73	0x53 0x53	None	0x0D
ACK					0x06			
NAK					0x15			

#### 2.3.10.2 Set Bookmark

	ASCII	Hex	Description
Cmd code	BM	0x42 0x4D	Insert bookmark

##### Example

Name	Header	Extended Header	Length	Address	Action	Cmd	Parameters	End
SET	0x55	0xF0	0x04	0x01	0x73	0x42 0x4D	None	0x0D
ACK					0x06			
NAK					0x15			

#### 2.3.10.3 Set Backup to USB

	ASCII	Hex	Description
Cmd code	BU	0x42 0x55	Copy latest record folder to USB
Parameter 1	1	0x30	Start backup to USB
	2	0x31	Stop backup to USB

**Example**

Name	Header	Extended Header	Length	Address	Action	Command	Parameters	End
SET	0x55	0xF0	0x05	0x01	0x73	0x42 0x55	0x31	0x0D
ACK					0x06			
NAK					0x15			

**2.3.10.4 Set Standby / Wake up**

	ASCII	Hex	Description
Command code	SR	0x53 0x52	Set power mode to Standby or Wake up When get in Standby mode, only accept command including "get status" and "set Standby/Wakeup"
Parameter 1	1 2	0x31 0x32	Set power mode to Standby Wake up, active only power mode was Standby
Note	This command only support LS-US2 v1.2.1.2 ~		

**Example**

Name	Header	Extended Header	Length	Address	Action	Command	Parameters	End
SET	0x55	0xF0	0x05	0x01	0x73	0x53 0x52	0x31	0x0D
ACK					0x06			
NAK					0x15			

**2.3.10.5 Get Model Name**

	ASCII	Hex	Description
Cmd code	GM	0x47 0x4D	Get model name

**Example**

Name	Header	Extended Header	Length	Address	Action	Cmd	Parameters	End
GET	0x55	0xF0	0x04	0x01	0x67	0x47 0x4D	0x4C 0x53 0x2D 0x33 0x30 0x30	0x0D
ACK			0x0A		0x06			
NAK			0x04		0x15			

The parameters of ACK change to ASCII is LS-300

### 2.3.10.6 Get Network Configuration

	ASCII	Hex	Description
Cmd code	NC	0x4E 0x43	Get network interface configuration ex:eth0 Each parameter is separate by comma
Cmd/Rsp Parameter 1	0 1	0x30 0x31	eth0 eth1
Rsp parameter 2	0 1	0x30 0x31	Static DHCP
Rsp string 3			IP address
Rsp string 4			netmask address
Rsp string 5			broadcast address

#### Example

Name	Header	Extended Header	Length	Address	Action	Cmd	Parameters ( ASCII )	End
GET			0x05		0x67		1	
ACK	0x55	0xF0	0x32	0x01	0x06	0x4E 0x43	10,192.168.11 .254,255.255. 255.0,192.168 .11.255	0x0D
NAK			0x05		0x15		1	

Since the ACK parameter for HEX is too long to read, so use the ASCII code for example.

The ACK parameter string can be separate by comma to 5 parts:

1. 1 : the network interface, here means eth1
2. 0 : the ip address is assigned by DHCP or static, here means static
3. 192.168.11.254 : the ip address
4. 255.255.255.0 : the netmask address
5. 192.168.11.255 : the broadcast address

### 2.3.10.7 Ntfy USB Copy State

	ASCII	Hex	Description
Cmd code	UC	0x55 0x43	USB copy event
Parameter 1	0	0x30	USB start copy

	1	0x31	USB copy finished
	2	0x32	USB copy error

**Example**

Name	Header	Extended Header	Length	Address	Action	Cmd	Parameters	End
NTFY	0x55	0xF0	0x05	0x01	0x6E	0x55 0x43	0x30	0x0D

**2.3.10.8 Ntfy USB Mount State**

	ASCII	Hex	Description
Cmd code	UM	0x55 0x4D	USB mount event
Parameter 1	0 1 2	0x30 0x31 0x32	Add USB Remove USB Unsupport

**Example**

Name	Header	Extended Header	Length	Address	Action	Cmd	Parameters	End
NTFY	0x55	0xF0	0x05	0x01	0x6E	0x55 0x4D	0x30	0x0D

**2.3.10.9 Ntfy USB Record State**

	ASCII	Hex	Description
Cmd code	UR	0x55 0x52	USB Record event
Parameter 1	0 1 2	0x30 0x31 0x32	USB start record USB record finished USB record error

**Example**

Name	Header	Extended Header	Length	Address	Action	Cmd	Parameters	End
NTFY	0x55	0xF0	0x05	0x01	0x6E	0x55 0x52	0x30	0x0D



# 3 Key Pass-Through Protocol

---

## 3.1 Description

Key pass-through protocol is used for an external device that want to simulate as the keypad button of the media station. The operation transition with Key data field of the protocol is the same as key code from the keypad button.

## 3.2 Format

### 3.2.1 Cmd

Name	Header	Length	Key data	End
Byte count	1	1	n	1

- **Header**  
0x36  
Key pass-through protocol.
- **Length**  
Length is a byte counter in Key data field.
- **Key data**  
Key code. Please refer to 3.3 Key code for more information.
- **End**  
0x0d  
End code of command.

### 3.2.2 Rsp

Name	ACK/NAK	End
Byte count	1	1

- **ACK**  
0x06  
The command is accepted in the media station.
- **NAK**  
0x15  
The command is not accepted in the media station.
- **End**  
0x0d  
End code of response.

### 3.2.3 Key code

The Key code in the data field will be passed to media station such as key code while keypad button pressed. The byte counts of the Key data field must record in length field. There is 1 second latency between two Key codes passed to media station.

The Key codes list as below:

Key code	Function
0x5c	Power
0x50	Record stop
0x51	Record pause
0x52	Record start
0x53	Display
0x54	Overlay
0x55	Layout
0x56	Background

Example:

1. Record:

**Controller send to Media station**

Name	Header	Length	Key Data	End
Hex	0x36	0x01	0x52	0x0d

**Media station response ACK to Controller**

Name	ACK/NAK	End
Hex	0x06	0x0d

# 4 Event Notification

## 4.1 Description

The event message sent to an external controller from media station for notifying system state change such as entering recording state while recording. The system state is defined same as the “State” command in Get Action Cmd List. Please refer to 4.3 Event Code and Parameters for more information.

This chapter of [4 Event Notification](#) is old format, it is recommended that use [2.3 Cmd & Example](#) for getting events cmd from the media station.

Unsupport model: LS-US2 & KS-AK.

## 4.2 Format

Name	Header	Event Code	Parameters	End
Byte count	1	2	n	1

- Header**  
**0x23 (ASCII code: #)**  
 Protocol header.
- Event Code**  
 Two bytes event code. Please refer to 4.3 Event Code and Parameters for more information.
- Parameters**  
 Please refer to 4.3 Event Code and Parameters for more information.
- End**  
**0x0d**  
 End code of event.

## 4.3 Event Code and Parameters

### 4.3.1 Ntfy Media State

	ASCII	Hex	Description
Event code	ST	0x53 0x54	System event
Event Parameter 1	0	0x30	Uninitialize
	1	0x31	Ready
	2	0x32	Stopped
	3	0x33	Recording
	4	0x34	Paused

	5	0x35	Waiting
	6	0x36	Stopping

**Example**

Name	Header	Event Code	Parameters	End
NTFY	0x23	0x53 0x54	0x31	0x0D

**4.3.2 Ntfy USB Copy State**

	ASCII	Hex	Description
Event code	UC	0x55 0x43	USB copy event
Event Parameter 1	0	0x30	USB start copy
	1	0x31	USB copy finished
	2	0x32	USB copy error

**Example**

Name	Header	Event Code	Parameters	End
NTFY	0x23	0x55 0x43	0x30	0x0D

**4.3.3 Ntfy USB Mount State**

	ASCII	Hex	Description
Event code	UM	0x55 0x4D	USB mount event
Event Parameter 1	0	0x30	Add USB
	1	0x31	Remove USB
	2	0x32	Unsupport

**Example**

Name	Header	Event Code	Parameters	End
NTFY	0x23	0x55 0x4D	0x30	0x0D

**4.3.4 Ntfy USB Record State**

	ASCII	Hex	Description
Event code	UR	0x55 0x52	USB Record event
Event Parameter 1	0	0x30	USB start record
	1	0x31	USB record finished
	2	0x32	USB record error

**Example**

Name	Header	Event Code	Parameters	End
NTFY	0x23	0x55 0x52	0x30	0x0D

## 5 Note

Cmds are not accepted during media station boot-up.

### 5.1 Format ( Enable Checksum )

System supports both checksum and non-checksum commands.

Name	Header	Extended Header	Length	Address	Action	Cmd	Parameters	Checksum	End
Byte count	1	1	1	1	1	2	n	1	1

- **Header**  
0x55 : Protocol header.
- **Extended header**  
0xF0 : disable checksum, please reference to [2.2](#)  
0xFF : enable checksum
- **Length**  
Length is a byte counter from **address to Checksum** field.

Example:

Name	Header	Extended Header	Length	Address	Action	Cmd	Parameters	Checksum	End
HEX	0x55	0xFF	0x06	0x01	0x73	0x4C 0x4F	0x01	0x16	0x0D

Total length = address 1 byte + action 1 byte + command 2 bytes + parameter 1 byte + checksum 1 byte = 6 bytes

- **Address**  
please reference to [2.2](#)
- **Action**  
please reference to [2.2](#)
- **Cmd**  
please reference to [2.2](#)

- **Parameters**

please reference to [2.2](#)

- **Checksum**

Checksum is a byte sum. Add the data that from **length to parameters** field as unsigned binary numbers, discarding any overflow bits.

Example:

Sum =  $0x06+0x01+0x73+0x4c+0x4f+0x01 = 0x116$

Discarding overflow bits. Checksum =  $0x16$

- **End**

**0x0d** : Protocol end code