VM4K44H-VM4K88H RS232 ASCII Protocol

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| --- | --- |
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# Serial communication protocol format

Baud Rate: 9600

Data bits: 8

Parity: None

Stop bits: 1

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Operation type(3 byte) | Spacer(1 byte) | Target(N bytes) | Spacer(1 byte) | Command type(N bytes) | Command parameters(N bytes) | Command tail(1 byte) |
| SET/GET | Space | The target that handles this command. | Space | Command type | [Parameter1] [Parameter2] | ⮠This is ASCII carriage return 0x0d |

**Notes:**

Space is the ASCII character 0x20

⮠ Represents the ASCII character 0x0d

All Return messages are always terminated by CR/LF, the ASCII characters 0x0d 0x0a

All items shown in square brackets, [], are optional.

Any SET command that contains leading zeroes should not include the leading zeros in any response message.

**The value ranges for certain commands are not given, please state and minimum and maximum values for each command that uses a numerical value range.**

# Software Version (Read only)

Get the software version of input/output channels:

Send: GET IN1 VERSION⮠ Receive: GET IN1 VERSION 2019/01/01-12:00:00

Send: GET OUT1 VERSION⮠ Receive: OUT1 VERSION 2019/01/01-12:00:00

Send: GET SYS VERSION⮠ Receive: SYS VERSION 2019/01/01-12:00:00

# Input Channel Command

## Input Signal format (Read only)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Operation type(3 byte) | Spacer(1 byte) | Target(N bytes) | Spacer(1 byte) | Command type(N bytes) | Command parameters(0 or N bytes) | Command tail(1 byte) |
| GET | Space | INxx is the input port number | Space | IN-SIGNAL | Send: Null (0 byte) | ⮠ |

GET input signal format of input channel:

Send: GET IN1 IN-SIGNAL⮠ Receive: IN1 IN-SIGNAL UHD@3840x2160p60

## Input Channel Audio Select:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Operation type(3 byte) | Spacer(1 byte) | Target(N bytes) | Spacer(1 byte) | Command type | Command parameters(0 or 1/2/3 bytes) | Command tail(1 byte) |
| SET/GET | Space | INx | Space | AUDIO-SRCAUDIO | L/R EMBEDDED | ⮠ |

NOTE：The command type of 4K44H2 is different from 4K88H2.

The command of 4K44H2 is：

Send: GET IN1 AUDIO-SRC⮠ Receive: IN1 AUDIO-SRC EMBEDDED⮠

Send: SET IN1 AUDIO-SRC L/R⮠ Receive: IN1 AUDIO-SRC L/R⮠

The command of 4K88H2 is：

Send: GET IN1 AUDIO⮠ Receive: IN1 AUDIO EMBEDDED⮠

Send: SET IN1 AUDIO L/R⮠ Receive: IN1 AUDIO- L/R⮠

# Output Channel Command

## Output Type

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Operation type(3 byte) | Spacer(1 byte) | Target(N bytes) | Spacer(1 byte) | Command type(N bytes) | Command parameters(0 or N bytes) | Command tail(1 byte) |
| GET/SET | Space | OUTxx is the output port number | Space | OUT-TYPE |  | ⮠ |

1. GET output type of output channel:

Send: GET OUT1 OUT-TYPE⮠ Receive: OUT1 OUT-TYPE UHD-HDMI⮠

Send: GET OUT2 OUT-TYPE⮠ Receive: OUT2 OUT-TYPE UHD-DVI⮠

1. SET output type of output channel:

Send: SET OUT1 OUT-TYPE UHD-HDMI⮠ Receive: OUT1 OUT-TYPE UHD-HDMI⮠

Send: SET OUT2 OUT-TYPE UHD-DVI⮠ Receive: OUT01 OUT-TYPE UHD-DVI⮠

NOTE:

Support Types:

UHD-HDMI: HDMI without HDCP

UHD-DVI: DVI without HDCP

UHD-HDMI-1.4: HDMI, HDCP1.4

UHD-HDMI-2.2: HDMI, HDCP2.2

## Output Signal format

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Operation type(3 byte) | Spacer(1 byte) | Target(N bytes) | Spacer(1 byte) | Command type(N bytes) | Command parameters(0 or N bytes) | Command tail(1 byte) |
| GET/SET | Space | OUTx | Space | OUT-SIGNAL |  | ⮠ |

1. GET output signal format of output channel:

Send: GET OUT1 OUT-SIGNAL⮠ Receive: OUT1 OUT-SIGNAL UHD-HDMI@4K2Kp60⮠

1. SET output signal format of output channel:

Send: SET OUT1 OUT-SIGNAL 1920x1080p60⮠ Receive: OUT1 OUT-SIGNAL UHD-HDMI @1920x1080p60⮠

NOTE:

1. Supported output resolution:

3840x2160p60, 3840x2160p50, 3840x2160p30, 1920x1200p60, 1920x1080p60,

1920x1080p50, 1600x1200p60, 1400x1050p60, 1366x768p60, 1360x768p60,

1280x1024p60, 1280x768p60, 1280x720p50, 1280x720p60, 1024x768p60

## Brightness Setting

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Operation type(3 byte) | Spacer(1 byte) | Target(N bytes) | Spacer(1 byte) | Command type(10 bytes) | Command parameters(0 or N bytes) | Command tail(1 byte) |
| SET/GET | Space | OUTx | Space | BRIGHTNESS |  | ⮠ |

1. GET brightness of output channel:

Send: GET OUT1 BRIGHTNESS⮠ Receive: OUT1 BRIGHTNESS 50

1. SET brightness of output channel:

Send: SET OUT1 BRIGHTNESS 50⮠ Receive: OUT1 BRIGHTNESS 50

## Contrast Setting

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Operation type(3 byte) | Spacer(1 byte) | Target(N bytes) | Spacer(1 byte) | Command type(10 bytes) | Command parameters(0 or N bytes) | Command tail(1 byte) |
| SET/GET | Space | OUTx | Space | CONTRAST |  | ⮠ |

1. GET contrast of output channel:

Send: GET OUT1 CONTRAST⮠ Receive: OUT1 CONTRAST 50

1. SET contrast of input channel:

Send: SET OUT1 CONTRAST 50⮠ Receive: OUT1 CONTRAST 50

## Saturation Setting

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Operation type(3 byte) | Spacer(1 byte) | Target(N bytes) | Spacer(1 byte) | Command type(10 bytes) | Command parameters(0 or 1/2/3 bytes) | Command tail(1 byte) |
| SET/GET | Space | OUTx | Space | SATURATION |  | ⮠ |

1. GET saturation of output channel:

Send: GET OUT1 SATURATION⮠ Receive: OUT1 SATURATION 50

1. SET saturation of output channel:

Send: SET OUT1 SATURATION 50⮠ Receive: OUT1 SATURATION 50

## Sharpness Setting

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Operation type(3 byte) | Spacer(1 byte) | Target(N bytes) | Spacer(1 byte) | Command type(10 bytes) | Command parameters(0 or N bytes) | Command tail(1 byte) |
| SET/GET | Space | OUTx | Space | SHARPNESS |  | ⮠ |

1. GET sharpness of output channel:

Send: GET OUT1 SHARPNESS⮠ Receive: OUT1 SHARPNESS 50⮠

1. SET sharpness of output channel:

Send: SET OUT1 SHARPNESS 50⮠ Receive: OUT1 SHARPNESS 50⮠

## Picture Quality Reset

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Operation type(3 byte) | Spacer(1 byte) | Target(N bytes) | Spacer(1 byte) | Command type(10 bytes) | Command parameters(0 or N bytes) | Command tail(1 byte) |
| SET | Space | OUTx | Space | PQ-RESET | Null (0 byte) | ⮠ |

1. Reset the picture quality of output channel:

Send: SET OUT1 PQ-RESET⮠ Receive: OUT1 PQ-RESET⮠

## Test Pattern

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Operation type(3 byte) | Spacer(1 byte) | Target(N bytes) | Spacer(1 byte) | Command type(10 bytes) | Command parameters(0 or N bytes) | Command tail(1 byte) |
| GET/SET | Space | OUTx | Space | TSP |  | ⮠ |

Send: GET OUT1 TSP⮠ Receive: OUT1 TSP ON⮠

Send: SET OUT1 TSP OFF⮠ Receive: OUT1 TSP OFF⮠

## Mirror

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Operation type(3 byte) | Spacer(1 byte) | Target(N bytes) | Spacer(1 byte) | Command type(10 bytes) | Command parameters(0 or N bytes) | Command tail(1 byte) |
| GET/SET | Space | OUTx | Space | MIRROR |  | ⮠ |

Send: GET OUT1 MIRROR⮠ Receive: OUT1 MIRROR ON⮠

Send: SET OUT1 MIRROR OFF⮠ Receive: OUT1 MIRROR OFF⮠

# Routing command

## Set video routing

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Operation type(3 byte) | Spacer(1 byte) | Target(N bytes) | Spacer(1 byte) | Command type(10 bytes) | Command parameters(N bytes) | Command tail(1 byte) |
| SET | Space | INx | Space | VIDEO | OUTx or ALL | ⮠ |

1. Set video route: Input port-x/xx/xxx switch to output port-a/b/c… , or all output ports

For example, SET video route: Input port 1 switch to output port 1

Send: SET IN1 VIDEO OUT1⮠ Receive: IN1 VIDEO OUT1⮠

For example, SET video route: Input port 1 switch to all output ports

Send: SET IN1 VIDEO ALL⮠ Receive: IN1 VIDEO ALL⮠

## Get video routing

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Operation type(3 byte) | Spacer(1 byte) | Target(N bytes) | Spacer(1 byte) | Command type(10 bytes) | Command parameters(0 or N bytes) | Command tail(1 byte) |
| GET | Space | OUTx | Space | MIRROR |  | ⮠ |

Get the output’s input channel:

Send: GET OUT1 VIDEO⮠ Receive: OUT1VIDEO IN1⮠

## Set LR and Toslink Audio out (SMS44 only)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Operation type(3 byte) | Spacer(1 byte) | Target(N bytes) | Spacer(1 byte) | Command type(10 bytes) | Command parameters(N bytes) | Command tail(1 byte) |
| SET | Space | INx | Space | AUDIO-ROUTE | OUTx  | ⮠ |

Set the LR and Toslink Audio out’s audio input channel:

Send: SET IN1 AUDIO-ROUTE OUT2⮠ Receive: IN1 AUDIO-ROUTE OUT2⮠

## Get LR and Toslink Audio out (SMS44 only)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Operation type(3 byte) | Spacer(1 byte) | Target(N bytes) | Spacer(1 byte) | Command type(10 bytes) | Command parameters(N bytes) | Command tail(1 byte) |
| SET | Space | INx | Space | AUDIO-ROUTE | OUTx  | ⮠ |

Get the LR and Toslink Audio out’s audio input channel:

Send: GET OUT2 AUDIO-ROUTE ⮠ Receive: OUT2 AUDIO-ROUTE IN1⮠

## Recall/Save mode of route

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Operation type(3 byte) | Spacer(1 byte) | Target(N bytes) | Spacer(1 byte) | Command type(10 bytes) | Command parameters(N bytes) | Command tail(1 byte) |
| SET/GET | Space | SYS | Space | ROUTE-MODE | xxx is the mode value | ⮠ |

Send: GET SYS ROUTE-MODE 1⮠ Receive: SYS ROUTE-MODE 1⮠

Send: SET SYS ROUTE-MODE 1 ⮠ Receive: SYS ROUTE-MODE 1⮠

# TV-WALL

## Set/Get TV-WALL:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Operation type(3 byte) | Spacer(1 byte) | Target(N bytes) | Spacer(1 byte) | Command type(10 bytes) | Command parameters(N bytes) | Command tail(1 byte) |
| SET/GET | Space | OUTx | Space | TVWALL | Line, Column, P,Q,Margin-Left, Margin-Right,Margin-Top, Margin-Bottom,Input: | ⮠ |



Pitcture-1 for example: The entire TV wall consists of 16 screens, placed in 4 rows and 4 columns. Screens 6/7/10/11 make up a 2x2 splice.

The parameter of the splice which make up by Screens 6/7/10/11:

Line：How many rows of the Digital Information Display, picture-1 for example, 2

Column：How many columns of the Digital Information Display left picture for example, 2

P: The row number of the current output connected: Screen 6: 1, Screen 7: 1, Screen 10: 2, Screen 11: 2

Q: The column number of the current output connected: Screen 6: 1, Screen 7: 2, Screen 10: 1, Screen 11: 2

The border of each screen is 20 pixels for example:

Margin-Left: The width of the left margin (pixels): Screen 6: 0, Screen 7: 20, Screen 10: 0, Screen 11: 20

Margin-Right: The width of the right margin (pixels): Screen 6: 20, Screen 7: 0, Screen 10: 20, Screen 11: 0

Margin-Top: The width of the top margin (pixels): Screen 6: 0, Screen 7: 0, Screen 10: 20, Screen 11: 20

Margin-Bottom: The width of the bottom margin (pixels): Screen 6: 20, Screen 7: 20, Screen 10: 0, Screen 11: 0

Input: Which input route to the current panel

1. SET TV-WALL mode of one output port

Picture-1 Screen 6/7/10/11, and the source input is input 1 For example:

Send: SET OUT6 TVWALL 2 2 1 1 0 20 0 20 1⮠ Receive: OUT6 TVWALL 2 2 1 1 0 20 0 20 1

Send: SET OUT7 TVWALL 2 2 1 2 20 0 0 20 1⮠ Receive: OUT7 TVWALL 2 2 1 2 20 0 0 20 1

Send: SET OUT10 TVWALL 2 2 2 1 0 20 20 0 1⮠ Receive: OUT10 TVWALL 2 2 2 1 0 20 20 0 1

Send: SET OUT11 TVWALL 2 2 2 2 20 0 20 0 1⮠ Receive: OUT11 TVWALL 2 2 2 2 20 0 20 0 1

Sending these four commands will create a 2x2 splice

1. How to Exit TV wall mode:

For example Exit TV-WALL combination of output port 6,7,10,11

Send: SET OUT6 TVWALL 1 1 1 1 0 00 0 00 1⮠ Receive: OUT6 TVWALL 1 1 1 1 0 00 0 00 1⮠

Send: SET OUT7 TVWALL 1 1 1 1 0 00 0 00 1⮠ Receive: OUT7 TVWALL 1 1 1 1 0 00 0 00 1⮠

Send: SET OUT10 TVWALL 1 1 1 1 0 00 0 00 1⮠ Receive: OUT10 TVWALL 1 1 1 1 0 00 0 00 1⮠

Send: SET OUT11 TVWALL 1 1 1 1 0 00 0 00 1⮠ Receive: OUT11 TVWALL 1 1 1 1 0 00 0 00 1⮠

1. GET TV-WALL mode of one output port

Picture-1 Screen 6/7/10/11, and the source input is input 1 For example:

Send: GET OUT6 TVWALL ⮠ Receive: OUT6 TVWALL 2 2 1 1 0 20 0 20 1

# System command

## Device IP

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Operation type(3 byte) | Spacer(1 byte) | Target(N bytes) | Spacer(1 byte) | Command type(10 bytes) | Command parameters(N bytes) | Command tail(1 byte) |
| SET/GET | Space | SYS | Space | IP | AT+WANN=mode,address,mask,gateway | ⮠ |

1. GET the device size:

For example, GET the device IP (MAC: D8B04CB947DF )

Send: GET SYS IP⮠ Receive: SYS IP D8B04CB947DF DHCP,192.168.0.119,255.255.255.0,192.168.0.1⮠

Send: GET SYS IP⮠ Receive: SYS IP D8B04CB947DF STATIC,192.168.0.222,255.255.255.0,192.168.0.24⮠

1. SET the device IP:

For example, Set the device IP to STATIC 192.168.1.1

Send: SET SYS IP STATIC,192.168.0.222,255.255.255.0,192.168.0.1⮠

Receive: SYS IP STATIC,192.168.0.222,255.255.255.0,192.168.0.1⮠

For example, Set the device IP to HDCP (auto obtain)

Send: SET SYS IP DHCP⮠

Receive: SYS IP DHCP⮠

## System Reset

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Operation type(3 byte) | Spacer(1 byte) | Target(N bytes) | Spacer(1 byte) | Command type(10 bytes) | Command parameters(N bytes) | Command tail(1 byte) |
| SET | Space | SYS | Space | RESET | ALL | ⮠ |

1. SET (Reset) the device :

For example, Set (Reset) the device

Send: SET SYS RESET ALL⮠ Receive: SYS RESET ALL⮠

## Panel Lock

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Operation type(3 byte) | Spacer(1 byte) | Target(N bytes) | Spacer(1 byte) | Command type(10 bytes) | Command parameters(0orN bytes) | Command tail(1 byte) |
| GET/SET | Space | SYS | Space | PANEL-LOCK | ON,OFF | ⮠ |

Send: SET SYS PANEL-LOCK ON⮠ Receive: SYS PANEL-LOCK ON⮠

Send: SET SYS PANEL-LOCK OFF⮠ Receive: SYS PANEL-LOCK OFF⮠

Send: GET SYS PANEL-LOCK⮠ Receive: SYS PANEL-LOCK ON⮠

## Input Lock

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Operation type(3 byte) | Spacer(1 byte) | Target(N bytes) | Spacer(1 byte) | Command type(10 bytes) | Command parameters(0 or N bytes) | Command tail(1 byte) |
| GET/SET | Space | SYS | Space | INPUT-LOCK |  | ⮠ |

Send: SET SYS INPUT-LOCK 1-3-5---⮠ Receive: SYS INPUT-LOCK 1-3-5---⮠ //lock the input 1 3 5

Send: SET SYS INPUT-LOCK 12345678⮠ Receive: SYS INPUT-LOCK 12345678⮠ //lock the input 1 2 3 4 5 6 7 8

Send: SET SYS INPUT-LOCK --------⮠ Receive: SYS INPUT-LOCK --------⮠ //all inputs lock off

Send: GET SYS INPUT-LOCK⮠ Receive: SYS INPUT-LOCK 1-3-5---⮠

## 7.6 Output Lock

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Operation type(3 byte) | Spacer(1 byte) | Target(N bytes) | Spacer(1 byte) | Command type(10 bytes) | Command parameters(0 or N bytes) | Command tail(1 byte) |
| GET/SET | Space | SYS | Space | OUTPUT-LOCK |  | ⮠ |

Send: SET SYS OUTPUT-LOCK 1-3-5---⮠ Receive: SYS OUTPUT-LOCK 1-3-5---⮠ //lock outputs 1 3 5

Send: SET SYS OUTPUT-LOCK --------⮠ Receive: SYS OUTPUT-LOCK --------⮠ //all outputs lock off

Send: GET SYS OUTPUT-LOCK⮠ Receive: SYS OUTPUT-LOCK 1-3-5---⮠

## 7.7 Audio Only

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Operation type(3 byte) | Spacer(1 byte) | Target(N bytes) | Spacer(1 byte) | Command type(10 bytes) | Command parameters(N bytes) | Command tail(1 byte) |
| SET/GET | Space | SYS | Space | AUDIO-ONLY | ON,OFF | ⮠ |

Send: SET SYS AUDIO-ONLY ON⮠ Receive: SYS AUDIO-ONLY ON⮠

Send: GET SYS AUDIO-ONLY⮠ Receive: SYS AUDIO-ONLY ON⮠

## 7.8 Audio Switch Mode (SMS44 only)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Operation type(3 byte) | Spacer(1 byte) | Target(N bytes) | Spacer(1 byte) | Command type(10 bytes) | Command parameters(N bytes) | Command tail(1 byte) |
| SET/GET | Space | SYS | Space | AUDIO-SWMODE | MANUAL,AUTO | ⮠ |

MANUAL mode: User can switch the audio route separately

AUTO mode: The audio route is bonded video route

For example:

Send: SET SYS AUDIO-SWMODE MANUAL⮠ Receive: SYS AUDIO-SWMODE MANUAL

Send: GET SYS AUDIO-SWMODE⮠ Receive: SYS AUDIO-SWMODE MANUAL⮠

# CEC commands

## Auto Power on by CEC

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Operation type(3 byte) | Spacer(1 byte) | Target(N bytes) | Spacer(1 byte) | Command type(10 bytes) | Command parameters(N bytes) | Command tail(1 byte) |
| SET/GET | Space | SYS | Space | AUTO-POWERON | ON, OFF | ⮠ |

This command to Enable/Disable Auto Power function to control sources and displayers by CEC

Send: SET SYS AUTO-POWERON ON⮠ Receive: SYS AUTO-POWERON ON⮠

Send: GET SYS AUTO-POWERON⮠ Receive: SYS AUTO-POWERON ON⮠

## Power on/Off Displayer by CEC

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Operation type(3 byte) | Spacer(1 byte) | Target(N bytes) | Spacer(1 byte) | Command type(10 bytes) | Command parameters(N bytes) | Command tail(1 byte) |
| SET | Space | OUTx | Space | POWER | ON/OFF | ⮠ |

Send: SET OUT1 POWER ON⮠ Receive: OUT1 POWER ON⮠

## 8.3 Volume +/Volume-/Mute/Unmute with Displayer

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Operation type(3 byte) | Spacer(1 byte) | Target(N bytes) | Spacer(1 byte) | Command type(10 bytes) | Command parameters(N bytes) | Command tail(1 byte) |
| SET | Space | OUTx | Space | AUDIO | VOLUME+,VOLUME-,MUTE | ⮠ |

For example:

Send: SET OUT1 AUDIO VOLUME+⮠ Receive: OUT1 AUDIO VOLUME+⮠

Send: SET OUT1 AUDIO VOLUME-⮠ Receive: OUT1 AUDIO VOLUME-⮠

Send: SET OUT1 AUDIO MUTE⮠ Receive: OUT1 AUDIO MUTE//This command will toggle mute/unmue⮠