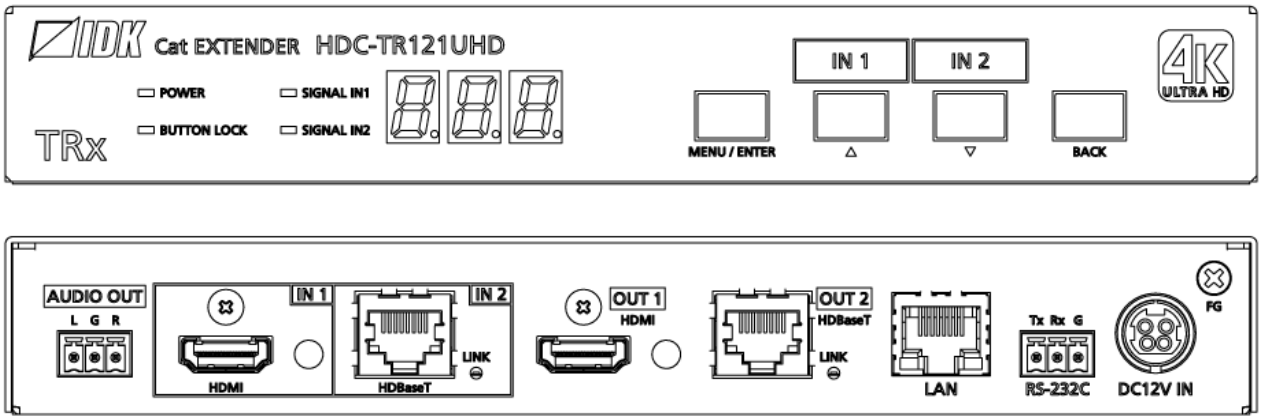
4K@60/HDCP 2.2 HDBaseT Extender with Distribution Amplifier

HDC-UHD Series

HDC-TR121UHD
HDC-TH221UHD/HDC-TH421UHD
HDC-RH221UHD/HDC-RH421UHD

<Command Reference Guide>

Ver.2.1.0



- Thank you for choosing our product.
- To ensure the best performance of this product, please read this user guide fully and carefully before using it and keep this manual together with the product for future reference as needed.

IDK Corporation

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Before reading this manual

- Some information contained in this Command guide such as exact product appearance, diagrams, communication commands, and so on may differ depending on the product version.
- This Command guide is subject to change without notice. You can download the latest version from IDK's website at: www.idkav.com

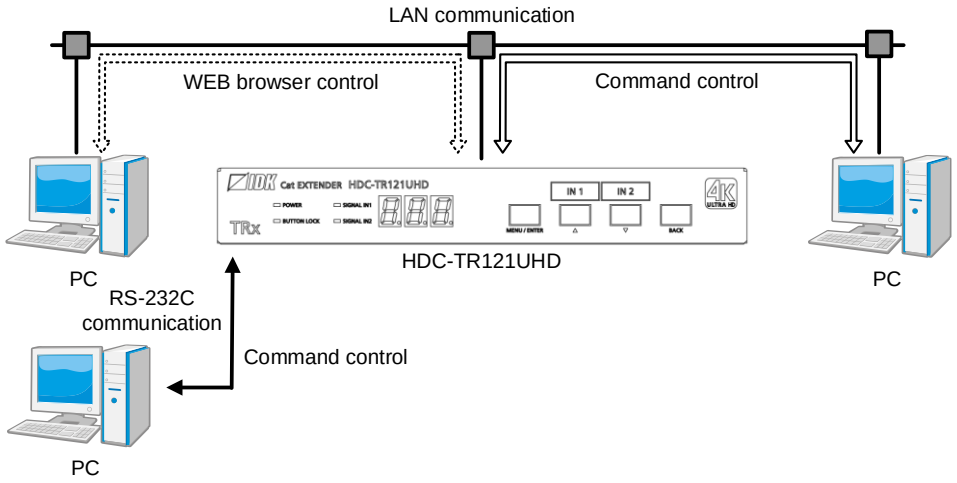
The reference manual consists of the following two volumes:

- User guide: Please download the User guide from the website above.
  Provides explanations and procedures for operations, installation, connections among devices, I/O adjustment and settings.
- Command guide (this document):
  Provides explanations and procedures for external control using RS-232C and LAN communications.

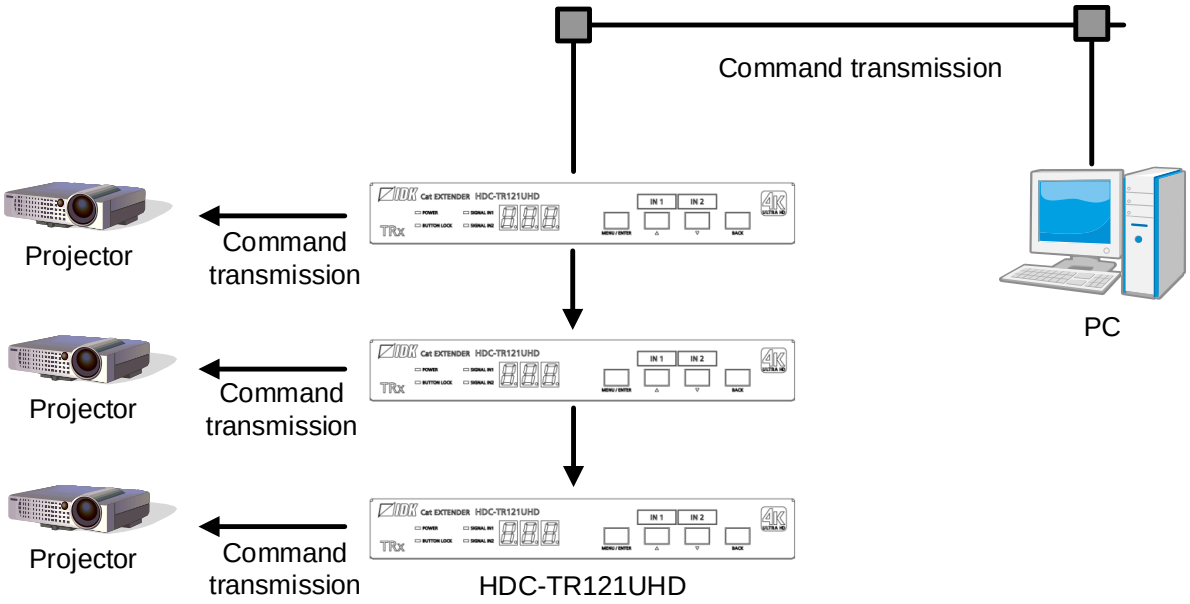
Table of Contents

1 About this Guide

This guide contains the procedure for controlling the HDC-UHD series (hereafter referred to as “HDC”) using commands via RS-232C communication or LAN communication.



[Fig. 1.1] Controlling HDC



[Fig. 1.2] RS232C transmission

■ **Communication commands enables the following main operations:**

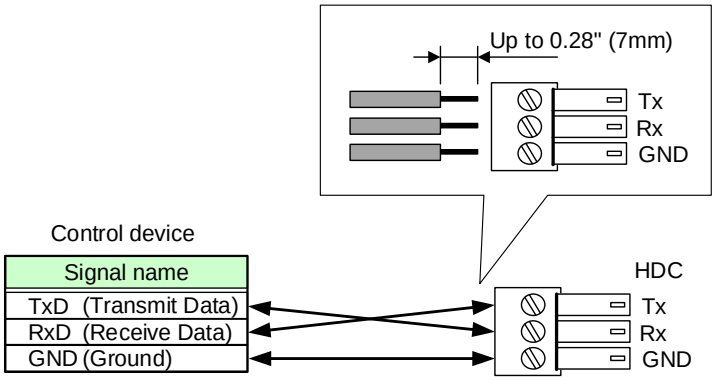
- Switching channel
- Setting I/O, audio, and EDID
- Setting RS-232C transmission mode and command mode

2 Communication configuration and Specifications

2.1 RS-232C communication

2.1.1 RS-232C connector specification

Insert and secure the wires from the RS-232C cable into the supplied 3-pin captive screw connector, and then insert the captive screw connector into the mating connector on the HDC.
28 AWG to 16 AWG conductor gauge is recommended. The recommended wire strip length is 0.28 in. (7 mm).
Short RTS/CTS and DTR/DSR as needed.



[Fig. 2.1] Connecting RS-232C cable to 3-pin captive screw connector

2.1.2 RS-232C communication specification

[Table 2.1] RS-232C specification

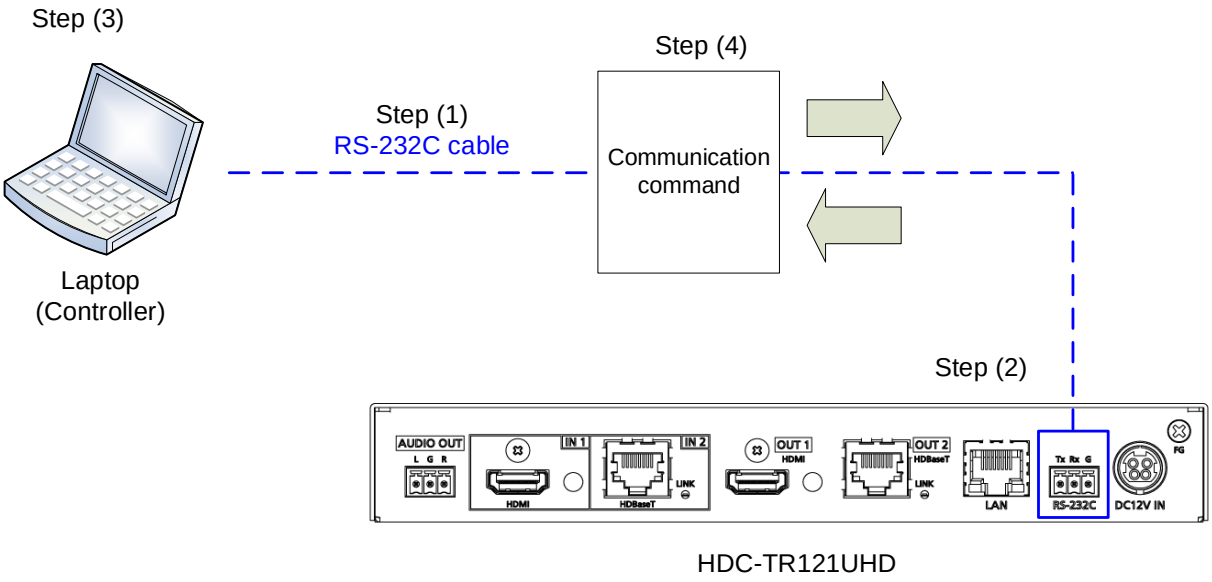
Compliant standard	RS-232C
Baud rate	4800/9600/14400/19200/38400 [bps]
Data bit length	7/8 [bit]
Parity check	NONE, EVEN, ODD
Stop bit	1/2 [bit]
X parameter	Invalid
Flow control	None
Delimiter	CR LF (Carriage return and line feed, 0D and 0A in hex)
Communication method	Full duplex

2.1.3 Setting up RS-232C communication

(1) Connect the HDC and the control device via an RS-232C cable.
(2) Set the RS-232C communication as follows:
- RS-232C communication: Baud rate, data bit length, parity check, and stop bit
- Operation mode of RS-232C communication: Setting mode

【Reference: User Guide】
【See: 2.1.4 RS-232C transmission mode】

(3) For the control device, set the same values in the same way as RS-232C communication (baud rate, data bit length, parity check, and stop bit) in step (2) above.
(4) Send a communication command from the control device to the HDC in order to check the control status of the HDC.

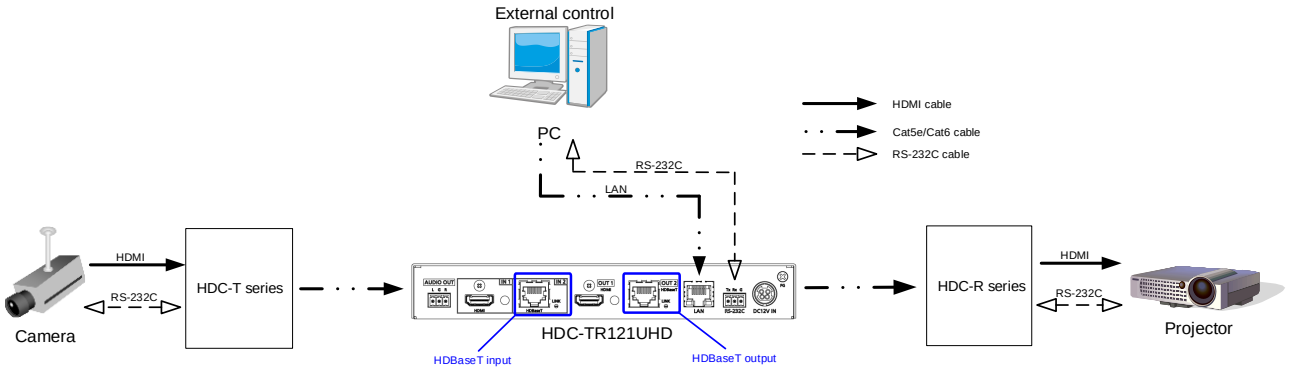


[Fig. 2.2] Setting RS-232C communication

2.1.4 RS-232C transmission mode

Devices that are connected to HDBaseT input/output connectors and RS-232C connector of the HDC can be controlled via RS-232C communication.

【See: RS-232C transmission mode】

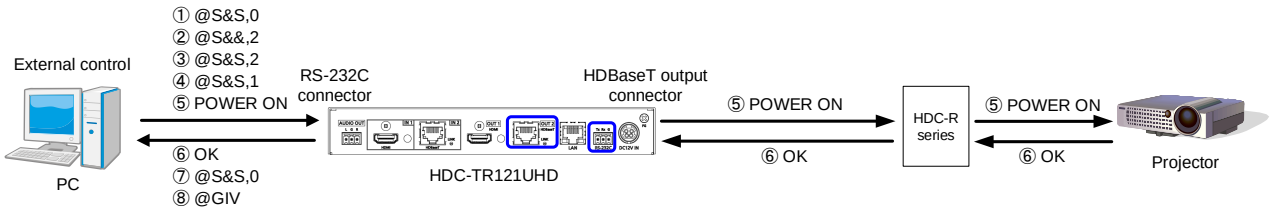


[Fig. 2.3] RS-232C transmission mode application example

You can specify multiple sending channels.
If setting multiple channels to be received, ensure that data is not duplicated in order to specify that each data is received from which connector.

Example: Sending data to OUT2 and receiving the response from OUT2
Setting RS-232C communication as follows: baud rate: 9600bps; data bit length: 8 bit; parity check: None; stop bit: 1 bit)

No.	Command	Description	Mode
①	@S&S,0 ↵	Setting to “Command mode”. After this, command can be sent to the HDC.	Command mode
②	@S&&,2 ↵	Setting RS-232C transmission sending channel, specifying OUT2	Command mode
③	@S&R,2 ↵	Setting RS-232C transmission receiving channel, specifying OUT2	Command mode
④	@S&S,1 ↵	Setting to “Transmission mode”. After this, received data is sent to OUT2 set by @S++.	Transmission mode
⑤	POWER ON	Sending projector powered ON command	Transmission mode
⑥	OK	Receiving projector powered ON command	Transmission mode
⑦	@S&S,0 ↵	Setting to “Command mode”. After this, command can be sent to the HDC.	Command mode
⑧	@GIV ↵	Getting versions	Command mode



[Fig. 2.4] RS-232C transmission mode communication example

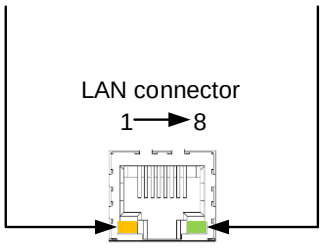
2.2 LAN communication

2.2.1 LAN connector specification

Pin assignment of the LAN connector is as follows.

Light in orange if the send/receive rate is 100 Mbps.
Goes off if it is 10 Mbps.

Light in green while link is established.
Blinks in green while data is being sent/received.



8-pin RJ-45 connector
(Rear panel)

Pin#	Signal Name	
	MDI	MDI-X
1	TX+ (Transmitted Data +)	RX+(Received Data +)
2	TX- (Transmitted Data -)	RX- (Received Data -)
3	RX+(Received Data +)	TX+ (Transmitted Data +)
4	N.C.(Not Connected)*	N.C.(Not Connected)*
5	N.C.(Not Connected)*	N.C.(Not Connected)*
6	RX- (Received Data -)	TX- (Transmitted Data -)
7	N.C.(Not Connected)*	N.C.(Not Connected)*
8	N.C.(Not Connected)*	N.C.(Not Connected)*

*Not used

[Fig. 2.5] LAN connector

Since Auto MDI/MDI-X that distinguishes and switches straight/cross cables automatically is supported, extra care is not necessary to connect the HDC to PC, HUB or the like.

2.2.2 LAN communication specification

[Table 2.2] Specification of LAN communication

Physical layer	10Base-T (IEEE802.3i)/100Base-TX (IEEE802.3u)
Network layer	ARP, IP, ICMP
Transport layer	TCP Port used for command control : 1100, 6000 to 6999 Port used for WEB browser control (HTTP) : 80

Note:

Up to 8 connections can be used simultaneously. (4 connections for WEB browser)

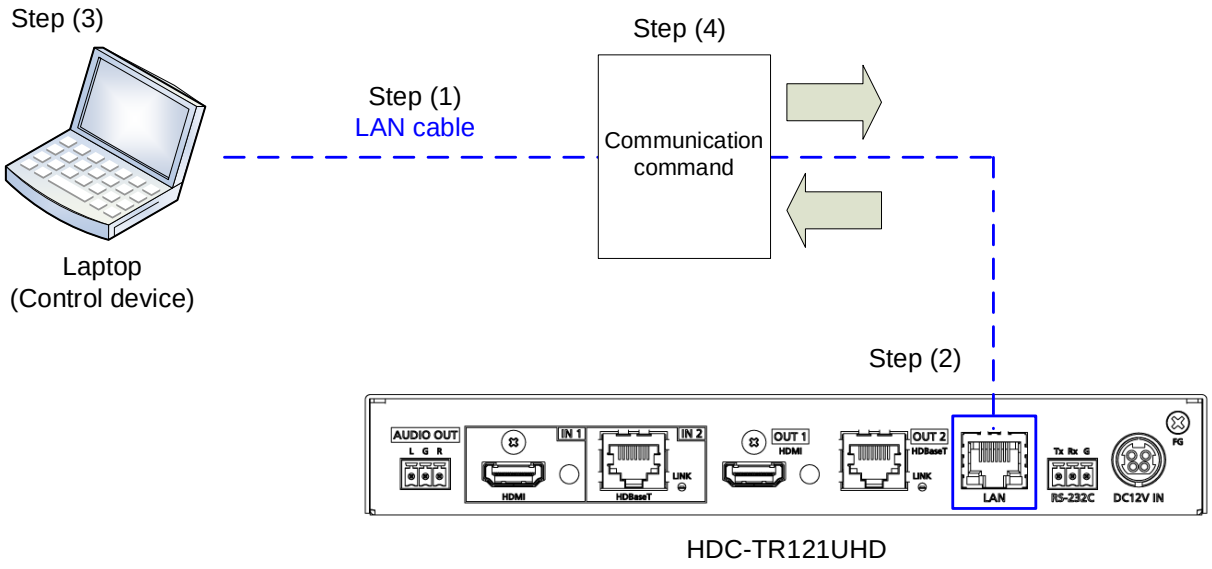
【See: 2.2.4 The number of TCP-IP connections】

2.2.3 Setting up LAN communication

(1) Connect the HDC and the control device via a LAN cable.
(2) Set up LAN communication as follows:
- Set IP address and subnet mask
- TCP pot number: 23, 1100, 6000 to 6999

【Reference: User guide】

(3) Establish the connection from the control device to the IP address and TCP port that are set to the HDC in step (2) above.
(4) Send a communication command from the control device to the HDC in order to check the control status of the HDC.



[Fig. 2.6] Setting LAN communication

2.2.4 The number of TCP-IP connections

The HDC supports up to eight simultaneous TCP-IP connections (eight logical ports).
To maintain optimal system accessibility, it is advisable to issue “port-open” and “port-close” commands before and after command or query strings are issued. This approach enables eight or more control devices to be effectively interfaced simultaneously and without concern for communication errors.

[Table 2.3] Increasing connections

Your PC software		HDC
Connecting TCP-IP	→	(Occupying 1 port)
Sending command (@xxx)	→	
	←	Replying command (@xxx)
Closing TCP-IP	→	(Releasing 1port)

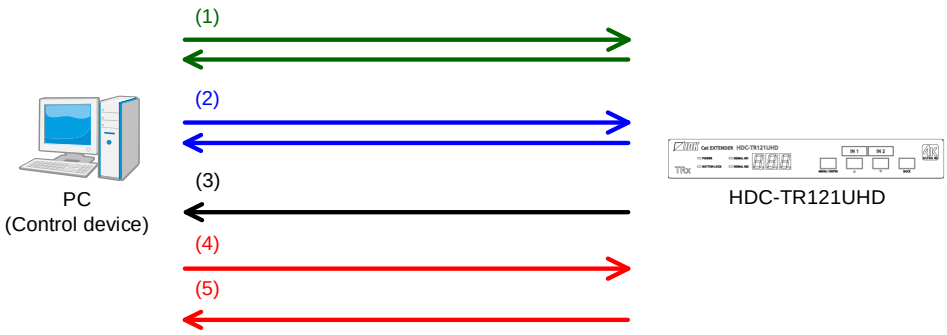
Note:
As a safeguard, the HDC incorporates a 30-second timeout window for each port. If any port is inactive for more than 30 seconds, it will be closed automatically.

2.3 Unsolicited status notification

The HDC can notify status changes and problems in a system through RS-232C or LAN communication.

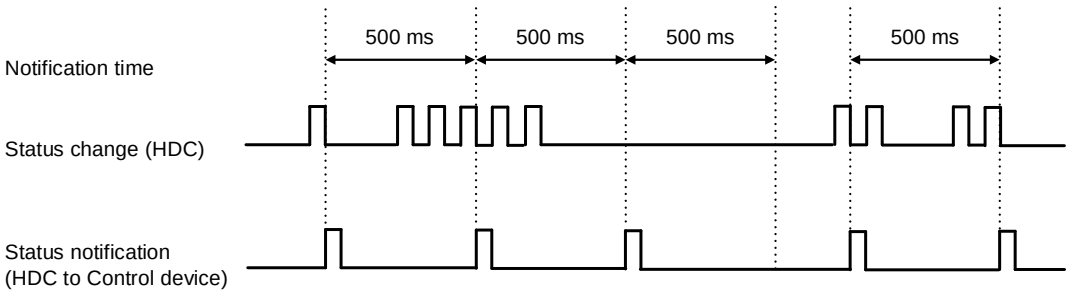
Unsolicited status notification:

(1) The unsolicited status notification feature is enabled using @SPH command.
(2) The control device periodically sends @GIV command (30 seconds or shorter) to keep the connection. This step can be skipped for RS0232C communication.
(3) The HDC notifies control device of changes in HDC.
(4) The control device sends @AIN command that is for getting input status.
(5) The HDC sends the control device current status.



[Fig. 2.7] Notifying status

Interval between a notification and the next notification
If no change is detected during the interval, status is sent immediately after detecting a change.



[Fig. 2.8] Notification interval

Notes:

- You need to set the time again after powering off the HDC.
- If "**@G&S / @S&S RS-232C transmission mode**" is set to "1" (transmission mode), this feature cannot be used.

3 Command

3.1 Summary

A command consists of “@” (“40” in hexadecimal), 3 one-byte alphabetical characters, followed by parameters (one-byte numbers). For some commands, multiple parameter values can be specified or parameters are not necessary. Processing is executed by sending a delimiter at the end of the command.

Example: @SPM,2↵

“,”(a comma, “2C” in hex) is indicated between a command and parameter and between two parameters.
“↵” is indicated as a delimiter CR LF (return+line feed, “0D” and “0A” in hex).

An error command is returned if an undefined command or wrong parameter is included.

Example: @SSW,1
@ERR,1

If only delimiter is sent, command list as the help command is returned.

Example: ↵
---------- HELP (1/10) ----------
(CHANNEL SELECT Command)
@GSW / @SSW Getting/Setting Switching channels
@GOF / @SOF Getting/Setting Automatic input channel switching

3.2 Command list

■ **Error status**

Command	Function	Page
@ERR	Error status	16

■ **Switching channel**

Command	Function	Page
@GSW / @SSW	Switching channels	17
@GOE / @SOE	Applying @SOO setting	17
@GOF / @SOF	Automatic input channel switching	18
@GMT / @SMT	Ignoring duration after automatic switching	18

■ **Setting input**

Command	Function	Page
@GDT / @SDT	No-signal input monitoring	19
@GHE / @SHE	HDCP input enabled/disabled	19
@GIA / @SIA	HDBaseT input long reach mode	20

■ **Setting output**

Command	Function	Page
@GDM / @SDM	Output format	21
@GHM / @SHM	Sink device EDID check	22
@GMK / @SMK	Hot plug ignoring duration	22
@GOA / @SOA	HDBaseT output long reach mode	23
@GDN / @SDN	Downconversion output	23
@GOO/ @SOO	Presence of output signal for when signal is input	24
@GDP / @SDP	Presence of output signal for when no signal is input	24

■ **Setting audio**

Command	Function	Page
@GAW / @SAW	Audio waiting duration	25
@GUC / @SUC	Outputting audio	25

■ **Setting EDID**

Command	Function	Page
@GED / @SED	Resolution	26
@RME	Copying EDID	27
@GEC / @SEC	External EDID	27
@GDI / @SDI	Deep Color	28
@GSP / @SSP	Speaker configuration	29
@GAF / @SAF	Audio format	30
@GHZ / @SHZ	Input video frequency	31

■ **Setting RS-232C**

■ **Setting LAN**

■ **Configuring HDC**

■ **Status indication**

■ **Status notification**

3.3 Details of commands

This section describes commands for the HDC-TH421UHD. Note that the numbers of outputs and output ports for other models are different from those of the HDC-TH421UHD.

3.3.1 Error status

@ERR		**Error status**
Description		Response in case the command is not executed
Response		@ERR, error ↵
Parameter		error: Error status 1 = Erroneous parameter format or value 2 = Undefined command or wrong format 3 = Currently cannot be used 4 = Loading EDID from the sink device failed
Getting example	Command	@IOS ↵
	Response	@ERR,2 ↵
	Description	@IOS is sent. Command format error
Remarks		―

3.3.2 Switching channel

@GSW / @SSW		**Switching channels**
Getting	Command	@GSW ↵
	Response	@GSW, in _1, ･･･ , in _5 ↵
Setting	Command	@SSW, in, out ↵
	Response	@SSW, in, out ↵
Parameter		in, in_1-5: Input channel 1 = IN1, 2 = IN2
		out: Output channel 0 [Fixed]
Getting example	Command	@GSW ↵
	Response	@GSW,1,1,1,1,1 ↵
	Description	Getting the input channel that is assigned to the output channel IN1
Setting example	Command	@SSW,1, 0 ↵
	Response	@SSW,1, 0 ↵
	Description	Setting IN1 to be output Completed
Remarks		―

@GOE / @SOE		**Applying @SOO setting**
Getting	Command	@GOE ↵
	Response	@GOE, mode ↵
Setting	Command	@SOE, mode ↵
	Response	@SOE, mode ↵
Parameter		mode: Switching output signal mode setting 0 = Disabled, 1 = Enabled [Default]
Getting example	Command	@GOE ↵
	Response	@GOE,1 ↵
	Description	Getting output signal settings Enabled
Setting example	Command	@SOE,1 ↵
	Response	@SOE,1 ↵
	Description	Enabling switching output signal settings Completed
Remarks		This command is valid only if "**@GOO/ @SOO Presence of output signal for when signal is input**" is set.

@GOF / @SOF		**Automatic input channel switching**
Getting	Command	@GOF ↵
	Response	@GOF, priority ↵
Setting	Command	@SOF, priority ↵
	Response	@SOF, priority ↵
Parameter		priority: Automatic input channel switching 0 = OFF [Default], 1 = AUTO, 2 = IN1 priority, 3 = IN2 priority, 4 = IN1 fixed, 5 = IN2 fixed
Getting example	Command	@GOF ↵
	Response	@GOF,1 ↵
	Description	Getting the automatic input channel switching AUTO
Setting example	Command	@SOF,1 ↵
	Response	@SOF,1 ↵
	Description	Setting the automatic input channel switching to AUTO Completed
Remarks		―

@GMT / @SMT		**Ignoring duration after automatic switching**
Getting	Command	@GMT ↵
	Response	@GMT, time ↵
Setting	Command	@SMT, time ↵
	Response	@SMT, time ↵
Parameter		time: Masking time 0 = OFF, 500 to 10000 = 0.5 sec. to 10 sec. by 0.5 sec. [Default] 1 sec.
Getting example	Command	@GMT ↵
	Response	@GMT,10000 ↵
	Description	Getting the masking time after automatic switching of input channel 10 seconds
Setting example	Command	@SMT,10000 ↵
	Response	@SMT,10000 ↵
	Description	Setting the masking time to 10 seconds Completed
Remarks		―

3.3.3 Setting input

@GDT / @SDT		**No-signal input monitoring**
Getting	Command	@GDT ↵
	Response	@GDT, time_1, time_2 ↵
Setting	Command	@SDT, in_1, time_1 (, in_2, time_2) ↵
	Response	@SDT, in_1, time_1 (, in_2, time_2) ↵
Parameter		time_1-2: No-signal input monitoring time 0 = OFF, 2 to 15 = 2 sec. to 15 sec. [Default] 10 sec.
		in_1-2: Input channel 0 = All inputs, 1 = IN1, 2 = IN2
Getting example	Command	@GDT ↵
	Response	@GDT,0,10 ↵
	Description	Getting the no-signal input monitoring time All input channels: 10 seconds
Setting example	Command	@SDT,0,4 ↵
	Response	@SDT,0,4 ↵
	Description	Setting the monitoring time of all input channels to 4 seconds Completed
Remarks		―

@GHE / @SHE		**HDCP input enabled/disabled**
Getting	Command	@GHE ↵
	Response	@GHE, hdcp_1, hdcp_2 ↵
Setting	Command	@SHE, in_1, hdcp_1 (, in_2, hdcp_2) ↵
	Response	@SHE, in_1, hdcp_1 (, in_2, hdcp_2) ↵
Parameter		hdcp_1-2: HDCP input enabled/disabled 0 = DISABLE (Disabled), 1 = HDCP 1.4 (Enabled), 2 = HDCP 2.2 (Enabled) [Default]
		in_1-2: Input channel 0 = All inputs, 1 = IN1, 2 = IN2
Getting example	Command	@GHE ↵
	Response	@GHE,0,1 ↵
	Description	Getting the HDCP input enabled/disabled All input channels: HDCP 1.4 enabled
Setting example	Command	@SHE,0,0 ↵
	Response	@SHE,0,0 ↵
	Description	Setting the HDCP input of all input channels to be disabled Completed
Remarks		―

@GIA / @SIA		**HDBaseT input long reach mode**
Getting	Command	@GIA ↵
	Response	@GIA,mode_2 ↵
Setting	Command	@SIA, in_2, mode_2 ↵
	Response	@SIA, in_2, mode_2 ↵
Parameter		mode_2: Long reach mode 0 =OFF [Default], 1 = ON
		in_2: HDBaseT input channel 2 = IN2 [Fixed]
Getting example	Command Response	@GIA ↵ @GIA,0 ↵
	Description	Getting the HDBaseT input long reach mode IN2: OFF
Setting example	Command Response	@SIA,2,0 ↵ @SIA,2,0 ↵
	Description	Setting the long reach mode of IN2 to OFF Completed
Remarks		If this menu is set to “ON”, resolutions up to 1080p (24 bit) or dot clock 148 MHz are supported. If it exceeds 1080p (24 bit) or 148 MHz, signals cannot be received.

3.3.4 Setting output

@GDM / @SDM		Output format
Getting	Command	@GDM ↵
	Response	@GDM, mode_1, ･･･ , mode_5 ↵
Setting	Command	@SDM, out_1, mode_1 (, out_2, mode_2･･･) ↵
	Response	@SDM, out_1, mode_1 (, out_2, mode_2･･･) ↵
Parameter		mode_1-5: Output format 0 = FOLLOW SINK DEVICE [Default] 1 = HDMI RGB MODE 2 = HDMI YCbCr 4:2:2 MODE 3 = HDMI YCbCr 4:4:4 MODE 4 = DVI MODE 5 = HDMI YCbCr 4:2:0 MODE Available only for 4K@50/59.94/60 output. Even if you select this mode for other resolution, “0” (“FOLLOW SINK DEVICE”) will be selected automatically.
		out_1-5: Output channel 0 = All outputs, 1 to 5 = OUT1 to OUT5
Getting example	Command	@GDM ↵
	Response	@GDM,0,0,0,0,0 ↵
	Description	Getting the output format All output channels: FOLLOW SINK DEVICE
Setting example	Command	@SDM,0,0 ↵
	Response	@SDM,0,0 ↵
	Description	Setting the output format of all output channels to FOLLOW SINK DEVICE Completed
Remarks		This setting is applied when HDMI signal is input. When 4K YCbCr 4:4:4 signal is input, the HDC outputs the signal at YCbCr 4:2:0 to the sink device supporting YCbCr 4:2:0 (not supporting YCbCr 4:4:4).

@GHM / @SHM		**Sink device EDID check**
Getting	Command	@GHM ↵
	Response	@GHM, mode_1, ･･･ , mode_5 ↵
Setting	Command	@SHM, out_1, mode_1 (, out_2, mode_2･･･) ↵
	Response	@SHM, out_1, mode_1 (, out_2, mode_2･･･) ↵
Parameter		mode_1-5: Sink device EDID check method 0 = In case of EDID load error, the sink device is treated as a DVI device [Default], 1 = In case of EDID load error, the sink device is treated as a HDMI device without SCDC, 2 = Always treats sink device as a HDMI device without SCDC, 3 = In case of EDID load error, the sink device is treated as a HDMI device with SCDC, 4 = Always treats sink device as a HDMI device with SCDC
		out_1-5: Output channel 0 = All outputs, 1 to 5 = OUT1 to OUT5
Getting example	Command Response	@GHM ↵ @GHM,0,0,0,0,0 ↵
	Description	Getting the sink device EDID check “0” (In case of EDID load error, the sink device is treated as a DVI device.)
Setting example	Command Response	@SHM,0,0 ↵ @SHM,0,0 ↵
	Description	Setting the sink device EDID check method of all output channels to “0” (In case of EDID load error, the sink device is treated as a DVI device.) Completed
Remarks		―

@GMK / @SMK		**Hot plug ignoring duration**
Getting	Command	@GMK ↵
	Response	@GMK, mask_1, ･･･ , mask_5 ↵
Setting	Command	@SMK, out_1, mask_1 (, out_2, mask_2･･･) ↵
	Response	@SMK, out_1, mask_1 (, out_2, mask_2･･･) ↵
Parameter		mask_1-5: Hot plug ignoring duration 1 = OFF [Default], 2 to 15 = 2 sec. to 15 sec.
		out_1-5: Output channel 0 = All outputs, 1 to 5 = OUT1 to OUT5
Getting example	Command Response	@GMK ↵ @GMK,1,1,1,1,1 ↵
	Description	Getting the hot plug ignoring duration All output channels: OFF
Setting example	Command Response	@SMK,0,1 ↵ @SMK,0,1 ↵
	Description	Setting the hot plug ignoring duration of all output channels to OFF Completed
Remarks		―

@GOA / @SOA		**HDBaseT output long reach mode**
Getting	Command	@GOA ↵
	Response	@GOA, mode_2 , ･･･ , mode_5↵
Setting	Command	@SOA, out_2, mode_2 (, out_3, mode_3･･･) ↵
	Response	@SOA, out_2, mode_2 (, out_3, mode_3･･･) ↵
Parameter		mode_2-5: Long reach mode 0 = OFF [Default], 1 = ON
		out_2-5: HDBaseT output channel 0 = All HDBaseT outputs (OUT2 to OUT5), 2 to 5 = OUT2 to OUT5
Getting example	Command	@GOA ↵
	Response	@GOA,0,0,0,0 ↵
	Description	Getting the HDBaseT output long reach mode OUT2 to OUT5: OFF
Setting example	Command	@SOA,0,0 ↵
	Response	@SOA,0,0 ↵
	Description	Disabling OUT2 to OUT5's long reach mode Completed
Remarks		If this menu is set to "ON", resolutions only up to 1080p (24 bit) or dot clock 148 MHz are supported. If it exceeds those limits, signal cannot be sent.

@GDN / @SDN		**Downconversion output**
Getting	Command	@GDN ↵
	Response	@GDN, down_1↵
Setting	Command	@SDN, out_1, down_1 ↵
	Response	@SDN, out_1, down_1 ↵
Parameter		down_1: Downconversion output 0 = FOLLOW SINK EDID [Default], 1 = OFF, 2 = 1080p
		out_1: Output channel 1 = OUT1 [Fixed]
Getting example	Command	@GDN ↵
	Response	@GDN,0 ↵
	Description	Getting the downconversion output OUT1: FOLLOW SINK EDID
Setting example	Command	@SDN,1,0 ↵
	Response	@SDN,1,0 ↵
	Description	Setting the downconversion output of OUT1 to FOLLOW SINK EDID Completed
Remarks		―

@GOO/ @SOO		**Presence of output signal for when signal is input**
Getting	Command	@GOO ↵
	Response	@GOO, mode_1, ･･･ , mode_5 ↵
Setting	Command	@SOO, out_1, mode_1 (, out_2, mode_2･･･) ↵
	Response	@SOO, out_1, mode_1 (, out_2, mode_2･･･) ↵
Parameter		mode_1-5: Output format 0 = Video output ON, Audio output ON [Default], 1 = Video output OFF, Audio output OFF, 2 = Black output ON, Audio output OFF, 3 = Black output ON, Audio output ON, 4 = Video output ON, Audio output OFF
		out_1-5: Output channel 0 = All outputs, 1 to 5 = OUT1 to OUT5
Getting example	Command Response	@GOO ↵ @GOO,0,0,0,0,0 ↵
	Description	Getting output signal setting All outputs: Video output ON, Audio output ON
Setting example	Command Response	@SOO,0,0 ↵ @SOO,0,0 ↵
	Description	Setting all output channels to “0” (Video output ON, Audio output ON) Completed
Remarks		This setting can be enabled or disabled by setting “**@GOE / @SOE Applying @SOO setting**”.

@GDP / @SDP		**Presence of output signal for when no signal is input**
Getting	Command	@GDP ↵
	Response	@GDP, power_1, ･･･ , power_5 ↵
Setting	Command	@SDP, out_1, power_1 (, out_2, power_2･･･) ↵
	Response	@SDP, out_1, power_1 (, out_2, power_2･･･) ↵
Parameter		power_1-5: Output format 0 = Not sending the presence of input signal (+5V signal ON) [Default], 1 = Sending the presence of input signal (+5V signal OFF)
		out_1-5: Output channel 0 = All outputs, 1 to 5 = OUT1 to OUT5
Getting example	Command Response	@GDP ↵ @GDP,0,0,0,0,0 ↵
	Description	Getting output setting for when no input video All outputs: “Not sending the presence of input signal”
Setting example	Command Response	@SDP,0,0 ↵ @SDP,0,0 ↵
	Description	Setting all output channels to be “Not sending the presence of input signal” for when no input video. Completed
Remarks		―

3.3.5 Setting audio

@GAW / @SAW		**Audio waiting duration**
Getting	Command	@GAW ↵
	Response	@GAW, mode_1, mode_2 ↵
Setting	Command	@SAW, in_1, mode_1 (, in_2, mode_2) ↵
	Response	@SAW, in_1, mode_1 (, in_2, mode_2) ↵
Parameter		mode_1-2: Audio output waiting time length 0 = No wait, 1 = Short, 2 = Middle [Default], 3 = Long
		in_1-2: Input channel 0 = All inputs, 1 = IN1, 2 = IN2
Getting example	Command	@GAW ↵
	Response	@GAW,1,1 ↵
	Description	Getting the audio output waiting time All inputs: Short
Setting example	Command	@SAW,0,0 ↵
	Response	@SAW,0,0 ↵
	Description	Disabling audio output waiting feature of all inputs Completed
Remarks		—

@GUC / @SUC		**Outputting audio**
Getting	Command	@GUC ↵
	Response	@GUC, mode_1, ･･･ , mode_5 ↵
Setting	Command	@SUC, out_1, mode_1 (, out_2, mode_2･･･) ↵
	Response	@SUC, out_1, mode_1 (, out_2, mode_2･･･) ↵
Parameter		mode_1-5: Outputting digital audio 0 = Not outputting audio, 1 = Outputting audio [Default]
		out_1-5: Output channel 0 = All outputs, 1 to 5 = OUT1 to OUT5
Getting example	Command	@GUC ↵
	Response	@GUC,1,1,1,1,1 ↵
	Description	Getting the digital audio setting All output channels: Outputting audio
Setting example	Command	@SUC,0,0 ↵
	Response	@SUC,0,0 ↵
	Description	Setting all outputs' digital audio to not output audio Completed
Remarks		—

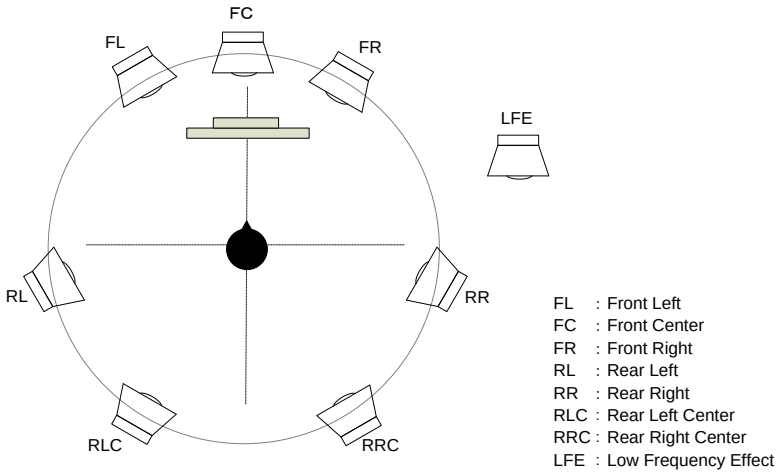
3.3.6 Setting EDID

@GED / @SED		**Resolution**
Getting	Command	@GED ↵
	Response	@GED, format_1, format_2 ↵
Setting	Command	@SED, in_1, format_1 (, in_2, format_2) ↵
	Response	@SED, in_1, format_1 (, in_2, format_2) ↵
Parameter		format_1-2: EDID resolution 1 = External EDID, 2 = Copied EDID, 3 = 1080p (59.94/60), 4 = 720p, 5 = 1080i, 6 = SVGA (800×600), 7 = XGA (1024×768), 8 = VESA720 (1280×720), 9 = WXGA (1280×768), 10 = WXGA (1280×800), 11 = Quad-VGA (1280×960), 12 = SXGA (1280×1024), 13 = WXGA (1360×768), 14 = WXGA (1366×768), 15 = SXGA+ (1400×1050), 16 = WXGA+ (1440×900), 17 = WXGA++ (1600×900) , 18 = UXGA (1600×1200), 19 = WSXGA+ (1680×1050), 20 = VESA1080 (1920×1080), 21 = WUXGA (1920×1200), 22 = QWXGA (2048×1152), 23 = WQHD (2560×1440), 24 = WQXGA (2560×1600), 41 = 2160p (24/25/30), 42 = 2160p (50/59.94/60, 4:2:0) [Default] (HDBaseT input connector), 43 = 2160p (50/59.94/60, 4:4:4) [Default] (HDMI input connector), 44 = 4096×2160 (24/25/30), 45 = 4096×2160 (50/59.94/60, 4:2:0), 46 = 4096×2160 (50/59.94/60, 4:4:4)
		in_1-2: Input channel 0 = All inputs, 1 = IN1, 2 = IN2
Getting example	Command	@GED ↵
	Response	@GED,3,3 ↵
	Description	Getting the EDID resolution All input channels: 1080p (59.94/60)
Setting example	Command	@SED,0,1 ↵
	Response	@SED,0,1 ↵
	Description	Setting the EDID resolution of all input channels to External EDID Completed
Remarks		If selecting “1” (External EDID) or “2” (Copied EDID), execute “**@SEC External EDID**” or “**@RME Copying EDID**” beforehand, respectively.

@RME		**Copying EDID**
Setting	Command	@RME, out, number ↵
	Response	@RME, out, number ↵
Parameter		Out: Channel to be read 1 to 5 = OUT1 to OUT5
		number: Destination to save copied EDID 1 to 3 = Destination 1 to Destination 3
Setting example	Command	@RME,1,1 ↵
	Response	@RME,1,1 ↵
	Description	Setting destination for saving sink device's EDID that is connected to OUT1 Completed
Remarks		―

@GEC / @SEC		**External EDID**
Getting	Command	@GEC ↵
	Response	@GEC, out_1, out_2 ↵
Setting	Command	@SEC, in_1, out_1 (, in_2, out_2) ↵
	Response	@SEC, in_1, out_1 (, in_2, out_2) ↵
Parameter		out_1-5: External EDID channel 1 to 5 = OUT1 to OUT5
		in_1-2: Input channel 0 = All inputs, 1 = IN1, 2 = IN2
Getting example	Command	@GEC ↵
	Response	@GEC,1,1 ↵
	Description	Getting the external EDID channels All input channels: EDID from OUT1
Setting example	Command	@SEC,0,1 ↵
	Response	@SEC,0,1 ↵
	Description	Setting all input channels' EDID to external EDID from OUT1 Completed
Remarks		―

@GDI / @SDI		**Deep Color**
Getting	Command	@GDI ↵
	Response	@GDI, color_1, color_2 ↵
Setting	Command	@SDI, in_1, color_1 (, in_2, color_2) ↵
	Response	@SDI, in_1, color_1 (, in_2, color_2) ↵
Parameter		color_1-2: Color depth 0 = 24 bit/pixel (8 bit/component) [Default], 1 = 30 bit/pixel (10 bit/component), 2 = 36 bit/pixel (12 bit/component)
		in_1-2: Input channel 0 = All inputs, 1 = IN1, 2 = IN2
Getting example	Command Response	@GDI ↵ @GDI,0,0 ↵
	Description	Getting the color depth All input channels: 24 bit/pixel (8 bit/component)
Setting example	Command Response	@SDI,0,0 ↵ @SDI,0,0 ↵
	Description	Setting the color depth of all input channels to 24 bit/pixel (8 bit/component) Completed
Remarks		This command is valid only if "**@GED / @SED Resolution**" is set to "3" to "46" (Built-in EDID).

<table>
<tr><td colspan="2">@GSP / @SSP</td><td>Speaker configuration</td></tr>
<tr><td rowspan="2">Getting</td><td>Command</td><td>@GSP ↵</td></tr>
<tr><td>Response</td><td>@GSP, ch_1, ch_2 ↵</td></tr>
<tr><td rowspan="2">Setting</td><td>Command</td><td>@SSP, in_1, ch_1 (, in_2, ch_2) ↵</td></tr>
<tr><td>Response</td><td>@SSP, in_1, ch_1 (, in_2, ch_2) ↵</td></tr>
<tr><td colspan="2" rowspan="2">Parameter</td><td>ch_1-2: Speaker configuration
0 = LR [Default], 1 = 2.1 channel surround sound,
2 = 5.1 channel surround sound, 3 = 7.1 channel surround sound
 

<table>
<tr><th>Sound type</th><th>FL/FR</th><th>LFE</th><th>FC</th><th>RL/RR</th><th>RLC/RRC</th></tr>
<tr><td>LR</td><td>ON</td><td>OFF</td><td>OFF</td><td>OFF</td><td>OFF</td></tr>
<tr><td>2.1 channel surround sound</td><td>ON</td><td>ON</td><td>OFF</td><td>OFF</td><td>OFF</td></tr>
<tr><td>5.1 channel surround sound</td><td>ON</td><td>ON</td><td>ON</td><td>ON</td><td>OFF</td></tr>
<tr><td>7.1 channel surround sound</td><td>ON</td><td>ON</td><td>ON</td><td>ON</td><td>ON</td></tr>
</table></td></tr>
<tr><td>in_1-2: Input channel
0 = All inputs, 1 = IN1, 2 = IN2</td></tr>
<tr><td rowspan="2">Getting example</td><td>Command
Response</td><td>@GSP ↵
@GSP,0,0 ↵</td></tr>
<tr><td>Description</td><td>Getting the speaker configuration
All input channels: LR</td></tr>
<tr><td rowspan="2">Setting example</td><td>Command
Response</td><td>@SSP,0,0 ↵
@SSP,0,0 ↵</td></tr>
<tr><td>Description</td><td>Setting the speaker configuration of all input channels to LR
Completed</td></tr>
<tr><td colspan="2">Remarks</td><td>This command is valid only if “@GED / @SED Resolution” is set to “3” to “46” (Built-in EDID).</td></tr>
</table>

<table>
<tr><td colspan="2">@GAF / @SAF</td><td>Audio format</td></tr>
<tr><td rowspan="2">Getting</td><td>Command</td><td>@GAF, in ↵</td></tr>
<tr><td>Response</td><td>@GAF, in, format_1, frequency_1, ･･･ , format_7, frequency_7 ↵</td></tr>
<tr><td rowspan="2">Setting</td><td>Command</td><td>@SAF, in, format_1, frequency_1 (, format_2, frequency_2･･･) ↵</td></tr>
<tr><td>Response</td><td>@SAF, in, format_1, frequency_1 (, format_2, frequency_2･･･) ↵</td></tr>
<tr><td colspan="2" rowspan="3">Parameter</td><td>in: Input channel
1 = IN1, 2 = IN2</td></tr>
<tr><td>format_1-7: Audio format
0 = LPCM, 1 = Dolby Digital, 2 = AAC,
3 = Dolby Digital+, 4 = DTS, 5 = DTS-HD,
6 = Dolby TrueHD</td></tr>
<tr><td>frequency_1-7: Maximum sampling frequency
0 = OFF (Not output), 1 = 32 kHz,2 = 44.1 kHz,
3 = 48 kHz, 4 = 88.2 kHz, 5 = 96 kHz,
6 = 176.4 kHz, 7 = 192 kHz

<table>
<tr><th>Audio format</th><th>Maximum sampling frequency (kHz)</th><th>Default</th></tr>
<tr><td>LPCM</td><td>32/44.1/48/88.2/96/176.4/192</td><td>48</td></tr>
<tr><td>Dolby Digital</td><td>OFF/32/44.1/48</td><td>OFF</td></tr>
<tr><td>AAC</td><td>OFF/32/44.1/48/88.2/96</td><td>OFF</td></tr>
<tr><td>Dolby Digital +</td><td>OFF/32/44.1/48</td><td>OFF</td></tr>
<tr><td>DTS</td><td>OFF/32/44.1/48/96</td><td>OFF</td></tr>
<tr><td>DTS-HD</td><td>OFF/44.1/48/88.2/96/176.4/192</td><td>OFF</td></tr>
<tr><td>Dolby TrueHD</td><td>OFF/44.1/48/88.2/96/176.4/192</td><td>OFF</td></tr>
</table>
</td></tr>
<tr><td rowspan="2">Getting example</td><td>Command
Response</td><td>@GAF,1 ↵
@GAF,1,0,3,1,0,2,0,3,0,4,0,5,0,6,0 ↵</td></tr>
<tr><td>Description</td><td>Getting the audio format and maximum sampling frequency of IN1 channel
Maximum sampling frequency of LPCM: 48 kHz; other audio format: OFF</td></tr>
<tr><td rowspan="2">Setting example</td><td>Command
Response</td><td>@SAF,1,0,7 ↵
@SAF,1,0,7 ↵</td></tr>
<tr><td>Description</td><td>Setting the audio format and maximum sampling frequency of IN1 to LPCM and 192 kH
Completed</td></tr>
<tr><td colspan="2">Remarks</td><td>・ Maximum settable sampling frequency depends on the audio format.
・ LPCM cannot be turned OFF.
・ This command is valid only if “@GED / @SED Resolution” is set to “3” to “46” (Built-in EDID).</td></tr>
</table>

@GHZ / @SHZ		**Input video frequency**
Getting	Command	@GHZ ↵
	Response	@GHZ, mode_1, mode_2 ↵
Setting	Command	@SHZ, in_1, mode_1 (, in_2, mode_2) ↵
	Response	@SHZ, in_1, mode_1 (, in_2, mode_2) ↵
Parameter		mode_1-2: Frame rate 0 = 60 Hz/30 Hz [Default], 1 = 50 Hz/25 Hz
		in_1-2: Input channel 0 = All inputs, 1 = IN1, 2 = IN2
Getting example	Command	@GHZ ↵
	Response	@GHZ,0,0↵
	Description	Getting the frame rate All input channels: 60 Hz/30 Hz
Setting example	Command	@SHZ,0,0 ↵
	Response	@SHZ,0,0 ↵
	Description	Setting the frame rate of all input channels to 60 Hz/30 Hz Completed
Remarks		This command is valid only if "**@GED / @SED Resolution**" is set to "2160p" or "4096×2160" (Built-in EDID).

3.3.7 Setting RS-232C

@GCT / @SCT		**RS-232C communication**
Getting	Command	@GCT ↵
	Response	@GCT, baudrate, length, parity, stop ↵
Setting	Command	@SCT, baudrate, length, parity, stop ↵
	Response	@SCT, baudrate, length, parity, stop ↵
Parameter		Baudrate: Baud rate 0 = 4800 bps, 1 = 9600 bps [Default], 2 = 14400 bps, 3 = 19200 bps, 4 = 38400 bps
		Length: Data bit length 0 = 7 bit, 1 = 8 bit [Default]
		Parity: Parity check 0 = NONE [Default], 1 = ODD, 2 = EVEN
		Stop: Stop bit 0 = 1 bit [Default], 1 = 2 bit
Getting example	Command Response	@GCT ↵ @GCT,1,1,0,0 ↵
	Description	Getting the RS-232C communication setting - Baud rate : 9600 bps - Data bit length : 8 bit - Parity check : NONE - Stop bit : 1 bit
Setting example	Command Response	@SCT,1,1,0,0 ↵ @SCT,1,1,0,0 ↵
	Description	Setting the RS-232C communication setting as follows: - Baud rate : 9600 bps - Data bit length : 8 bit - Parity check : NONE - Stop bit : 1 bit Completed
Remarks		RS-232C communication setting is changed, the communication may be disabled. Change the environmental settings based on the HDC settings.

@G&S / @S&S		**RS-232C transmission mode**
Getting	Command	@G&S ↵
	Response	@G&S, mode ↵
Setting	Command	@S&S, mode ↵
	Response	@S&S, mode ↵
Parameter		mode: RS-232C transmission mode 0 = Command mode [Default], 1 = Transmission mode
Getting example	Command Response	@G&S ↵ @G&S,0 ↵
	Description	Getting the RS-232C transmission mode Command mode
Setting example	Command Response	@S&S,0 ↵ @S&S,0 ↵
	Description	Setting the RS-232C transmission mode to Command mode Completed
Remarks		-

@G&& / @S&&		**RS-232C sending channel**
Getting	Command	@G&& ↵
	Response	@G&&, ch_1 (,･･･ , ch_4) ↵
Setting	Command	@S&&, ch_1 (, ch_2,･･･) ↵
	Response	@S&&, ch_1 (, ch_2,･･･) ↵
Parameter		ch_1 to ch_3: RS-232C sending channel 0 = ALL, 2 = OUT2, 3 = All outputs, 102 = IN2, 200 = RS-232C connector [Default]: All channels are disabled.
Getting example	Command Response	@G&& ↵ @G&&,2,102 ↵
	Description	Getting the RS-232C transmission channel OUT2 and IN2
Setting example	Command Response	@S&&,2,102 ↵ @S&&,2,102 ↵
	Description	Setting the OUT2 and IN2 to RS-232C transmission channel Completed
Remarks		If both “2” (OUT2) and “3” (All outputs) are set, “3” (All outputs) is applied.

@G&R / @S&R		**RS-232C receiving channel**
Getting	Command	@G&R ↵
	Response	@G&R, ch_1 (,･･･ , ch_3) ↵
Setting	Command	@S&R, ch_1 (, ch_2,･･･) ↵
	Response	@S&R, ch_1 (, ch_2,･･･) ↵
Parameter		ch_1 to ch_3: RS-232C receiving channel 0 = ALL, 2 = OUT2, 102 = IN2, 200 = RS-232C connector [Default]: All channels are disabled.
Getting example	Command Response	@G&R ↵ @G&R,2,102 ↵
	Description	Getting the RS-232C receiving channel OUT2 and IN2
Setting example	Command Response	@S&R,2,102 ↵ @S&R,2,102 ↵
	Description	Setting the OUT2 and IN2 to RS-232C receiving channel Completed
Remarks		If multiple receiving channels are specified and their receiving signal timing coincides with each other, commands are not sent correctly.

3.3.8 Setting LAN

@GIP / @SIP		**IP address**
Getting	Command	@GIP ↵
	Response	@GIP, unit_1, unit_2, unit_3, unit_4 ↵
Setting	Command	@SIP, unit_1, unit_2, unit_3, unit_4 ↵
	Response	@SIP, unit_1, unit_2, unit_3, unit_4 ↵
Parameter		unit_1 to unit_4: Upper bit of the IP address to Lower bit of the IP address 0 to 255 = 8 bit (Decimal notation) [Default]192.168.1.199
Getting example	Command	@GIP ↵
	Response	@GIP,192,168,1,200 ↵
	Description	Getting the IP address of the HDC 192.168.1.200
Setting example	Command	@SIP,192,168,1,200↵
	Response	@SIP,192,168,1,200↵
	Description	Setting the IP address to 192.168.1.200 Completed
Remarks		LAN communication setting is changed, the communication may be disabled. Change the environmental settings based on the HDC settings.

@GSB / @SSB		**Subnet mask**
Getting	Command	@GSB ↵
	Response	@GSB, unit_1, unit_2, unit_3, unit_4 ↵
Setting	Command	@SSB, unit_1, unit_2, unit_3, unit_4 ↵
	Response	@SSB, unit_1, unit_2, unit_3, unit_4 ↵
Parameter		unit_1 to unit_4: Upper bit of the subnet mask to Lower bit of the subnet mask 0 to 255 = 8 bit (Decimal notation) [Default] 255.255.255.0
Getting example	Command	@GSB ↵
	Response	@GSB,255,255,255,0 ↵
	Description	Getting the subnet mask of the HDC 255.255.255.0
Setting example	Command	@SSB,255,255,255,254 ↵
	Response	@SSB,255,255,255,254 ↵
	Description	Setting the subnet mask of the HDC to 255.255.255.254 Completed
Remarks		LAN communication setting is changed, the communication may be disabled. Change the environmental settings based on the HDC settings.

@GLP / @SLP		**TCP port number**
Getting	Command	@GLP ↵
	Response	@GLP, port, add ↵
Setting	Command	@SLP, port, add ↵
	Response	@SLP, port, add ↵
Parameter		port: Port number 1100 [Default], 6000 to 6999
		add: 8-connection setting 0 = 8-connection setting OFF [Default] (WEB browser 4 connections/communication command control 4 connections), 1 = 8-connection setting ON (Communication command control 8-connection)
Getting example	Command Response	@GLP ↵ @GLP,1100,0 ↵
	Description	Getting the TCP port number 1100; 8 connection setting disabled
Setting example	Command Response	@SLP,1100,0 ↵ @SLP,1100,0 ↵
	Description	Setting the port number and 8-connection setting to 1100 and OFF, respectively Completed
Remarks		LAN communication setting is changed, the communication may be disabled. Change the environmental settings based on the HDC settings.

@GMC		**MAC address**
Getting	Command	@GMC ↵
	Response	@GMC, unit_1, unit_2, unit_3, unit_4, unit_5, unit_6 ↵
Parameter		unit_1 to unit_6: Upper bit of the MAC address to Lower bit of the MAC address 00 to FF = 8 bit (in hexadecimal)
Getting example	Command Response	@GMC ↵ @GMC,00,08,E5,59,00,01 ↵
	Description	Getting the MAC address 00-08-E5-59-00-01
Remarks		—

3.3.9 Configuring HDC

@GLM / @SLM		**Grouping button security lockout**
Getting	Command	@GLM ↵
	Response	@GLM, channel , menu ↵
Setting	Command	@SLM, channel , menu ↵
	Response	@SLM, channel , menu ↵
Parameter		channel : Input channel selection button menu : Menu operation button 0 = Not locked, 1 = Locked [Default]
Getting example	Command	@GLM ↵
	Response	@GLM,1,1 ↵
	Description	Getting the button security lockout target Input channel selection buttons and menu operation buttons
Setting example	Command	@SLM,1,1 ↵
	Response	@SLM,1,1 ↵
	Description	Setting input channel selection buttons and menu operation buttons to be button security lockout target Completed
Remarks		This command cannot be set when buttons are locked.

@GLS / @SLS		**Button security lockout**
Getting	Command	@GLS ↵
	Response	@GLS, lock ↵
Setting	Command	@SLS, lock ↵
	Response	@SLS, lock ↵
Parameter		lock: Front panel security lockout 0 = Unlocking [Default], 1 = Locking
Getting example	Command	@GLS ↵
	Response	@GLS,1 ↵
	Description	Getting the lock status Locked
Setting example	Command	@SLS,1 ↵
	Response	@SLS,1 ↵
	Description	Enabling the front panel security lockout Completed
Remarks		—

@GPW / @SPW		**Power saving**
Getting	Command	@GPW ↵
	Response	@GPW, mode ↵
Setting	Command	@SPW, mode ↵
	Response	@SPW, mode ↵
Parameter		mode: Power saving 0 = Disabled [Default], 1 = Enabled
Getting example	Command	@GPW ↵
	Response	@GPW,1 ↵
	Description	Getting power saving mode Enabled
Setting example	Command	@SPW,1 ↵
	Response	@SPW,1 ↵
	Description	Enabling power saving Completed
Remarks		―

3.3.10 Status indication

<table>
<tr><td colspan="2">@GIS</td><td>Input signal status (For each channel)</td></tr>
<tr><td rowspan="2">Getting</td><td>Command</td><td>@GIS, in, mode ↵</td></tr>
<tr><td>Response</td><td>@GIS, in, mode, status_1 (, status_2, status_3, status_4, status_5, status_6) ↵</td></tr>
<tr><td colspan="2" rowspan="5">Parameter</td><td>in: Input channel
1 to 2 = IN1 to IN2</td></tr>
<tr><td>mode: Target status (selected channels only)
0 = All statuses of input signals,
1 = HDMI/DVI mode and color depth of input video,
2 = Input resolution/Input video frequency,
3 = Color space of input video,
4 = Audio input type/Audio input sampling frequency,
5 = Presence of HDCP,
6 = Scrambling of input signal</td></tr>
<tr><td>status_1: HDMI/DVI mode and color depth of input video

<table>
<tr><th>Input mode</th><th>Description</th></tr>
<tr><td>d</td><td>DVI signal, without HDCP</td></tr>
<tr><td>D</td><td>DVI signal, with HDCP</td></tr>
<tr><td>h</td><td>HDMI signal, without HDCP</td></tr>
<tr><td>H</td><td>HDMI signal, with HDCP</td></tr>
<tr><td>N</td><td>No signal is input.</td></tr>
</table>
<table>
<tr><th>Input color depth</th><th>Description</th></tr>
<tr><td>24</td><td>24bit/pixel (8bit/component)</td></tr>
<tr><td>30</td><td>30bit/pixel (10bit/component)</td></tr>
<tr><td>36</td><td>36bit/pixel (12bit/component)</td></tr>
</table>
</td></tr>
<tr><td>status_2: Input resolution/Input video frequency

<table>
<tr><th>Value</th><th>Description</th></tr>
<tr><td>1920x1080p 59.94Hz</td><td>1080p@59.94</td></tr>
<tr><td>1600x1200p 60Hz</td><td>UXGA@60</td></tr>
<tr><td>NO SIGNAL</td><td>No signal is input.</td></tr>
</table>
</td></tr>
<tr><td>status_3: Color space of input video

<table>
<tr><th>Value</th><th>Description</th></tr>
<tr><td>RGB</td><td>RGB input</td></tr>
<tr><td>YCbCr 4:2:2</td><td>YCbCr 4:2:2 input</td></tr>
<tr><td>YCbCr 4:4:4</td><td>YCbCr 4:4:4 input</td></tr>
<tr><td>YCbCr 4:2:0</td><td>YCbCr 4:2:0 input</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><td>@GIS</td><td colspan="2">Input signal status (For each channel) (Cont’d)</td></tr>
<tr><td>Parameter</td><td colspan="2">status_4: Audio input type/Audio input sampling frequency

<table>
<tr><th>Value</th><th>Description</th></tr>
<tr><td>L-PCM 48kHz</td><td>2-channel LPCM 48 kHz</td></tr>
<tr><td>L-PCM 48kHz M</td><td>Multi-channel LPCM 48 kHz</td></tr>
<tr><td>COMPRESSED AUDIO</td><td>Compressed audio</td></tr>
<tr><td>NO AUDIO</td><td>No audio is input</td></tr>
</table>
status_5: Presence of HDCP

<table>
<tr><th>Value</th><th>Description</th></tr>
<tr><td>HDCP 1.4</td><td>HDCP 1.4 signal</td></tr>
<tr><td>HDCP 2.2</td><td>HDCP 2.2 no stream type or undefined signal is input</td></tr>
<tr><td>HDCP 2.2 Type0</td><td>HDCP 2.2 stream Type0 signal</td></tr>
<tr><td>HDCP 2.2 Type1</td><td>HDCP 2.2 stream Type1 signal</td></tr>
<tr><td>HDCP OFF</td><td>No HDCP</td></tr>
<tr><td>NO SIGNAL</td><td>No signal is input.</td></tr>
</table>
status_6: Scrambling of input signal

<table>
<tr><th>Value</th><th>Description</th></tr>
<tr><td>SCRAMBLE ON</td><td>Scrambled</td></tr>
<tr><td>SCRAMBLE OFF</td><td>Not scrambled</td></tr>
</table></td></tr>
<tr><td rowspan="2">Getting example</td><td>Command
Response</td><td>@GIS,1,0 ↵
@GIS,1,0,H24,1920x1080p 59.94Hz,YCbCr 4:4:4,L-PCM 48kHz,HDCP1.4,SCRAMBLE OFF ↵</td></tr>
<tr><td>Description</td><td>Getting all input signal statuses of IN1
- HDMI/DVI mode of input video : HDMI mode
- Color depth of input video : 24bit/pixel (8bit/component)
- Input resolution/Input video frequency : 1080p59.94Hz
- Color space of input video : YCbCr 4:4:4
- Audio input type/Audio input sampling frequency : 2-channel LPCM 48kHz
- Presence of HDCP : HDCP 1.4
- Scrambling of input signal : Not scrambled</td></tr>
<tr><td>Remarks</td><td colspan="2">—</td></tr>
</table>

<table>
<tr><td colspan="2">@GOS</td><td>Output signal status (For each channel)</td></tr>
<tr><td rowspan="2">Getting</td><td>Command</td><td>@GOS, out, mode ↵</td></tr>
<tr><td>Response</td><td>@GOS, out, mode, status_1 (, status_2, status_3, status_4, status_5, status_6, status_7, status_8) ↵</td></tr>
<tr><td colspan="2" rowspan="5">Parameter</td><td>out: Output channel
1 to 5 = OUT1 to OUT5</td></tr>
<tr><td>mode: Target status
0 = All statuses of sink device, 1 = HDCP of sink device,
2 = HDCP authentication between the HDC and sink device,
3 = HDCP output, 4 = HDMI/DVI output,
5 = Color space output, 6 = Color range output,
7 = Color depth output, 8 = Scrambling output</td></tr>
<tr><td>status_1: HDCP of sink device

<table>
<tr><th>Value</th><th>Description</th></tr>
<tr><td>HDCP 2.2 SUPPORT</td><td>Device with HDCP 2.2 is connected.</td></tr>
<tr><td>HDCP 1.4 SUPPORT</td><td>Device with HDCP 1.4 is connected.</td></tr>
<tr><td>HDCP NOT SUPPORT</td><td>Device without HDCP is connected.</td></tr>
<tr><td>HDCP NOT CHECK</td><td>HDCP of sink device is not checked.</td></tr>
<tr><td>UNCONNECTED</td><td>Sink device is not connected.</td></tr>
</table></td></tr>
<tr><td>status_2: HDCP authentication between the HDC and sink device

<table>
<tr><th>Value</th><th>Description</th></tr>
<tr><td>HDCP OFF</td><td>Signal with HDCP is not input</td></tr>
<tr><td>HDCP OK</td><td>Authentication succeeded</td></tr>
<tr><td>HDCP ERROR</td><td>Authentication failed</td></tr>
<tr><td>HDCP CHECK NOW</td><td>Being encrypted</td></tr>
</table></td></tr>
<tr><td>status_3: HDCP output

<table>
<tr><th>Value</th><th>Description</th></tr>
<tr><td>HDCP NON</td><td>No HDCP</td></tr>
<tr><td>HDCP1.4</td><td>HDCP 1.4 output</td></tr>
<tr><td>HDCP2.2 Type0</td><td>HDCP 2.2 Type0 output</td></tr>
<tr><td>HDCP2.2 Type1</td><td>HDCP 2.2 Type1 output</td></tr>
</table></td></tr>
<tr><td>status_4: HDMI/DVI output

<table>
<tr><th>Value</th><th>Description</th></tr>
<tr><td>HDMI</td><td>HDMI output</td></tr>
<tr><td>DVI</td><td>DVI output</td></tr>
</table></td></tr>
</table>

<table>
<tr><td colspan="2">@GOS</td><td>Output signal status (For each channel)</td></tr>
<tr><td colspan="2">Parameter</td><td>status_5: Color space output

<table><tr><th>Value</th><th>Description</th></tr><tr><td>RGB</td><td>RGB output</td></tr><tr><td>YCbCr 4:2:2</td><td>YCbCr 4:2:2 output</td></tr><tr><td>YCbCr 4:4:4</td><td>YCbCr 4:4:4 output</td></tr><tr><td>YCbCr 4:2:0</td><td>YCbCr 4:2:0 output</td></tr></table>
status_6: Color range output

<table><tr><th>Value</th><th>Description</th></tr><tr><td>FULL RANGE</td><td>Full range output</td></tr><tr><td>LIMITED RANGE</td><td>Limited range output</td></tr></table>
status_7: Color depth output

<table><tr><th>Value</th><th>Description</th></tr><tr><td>24 BIT COLOR</td><td>24bit/pixel (8bit/component) output</td></tr><tr><td>30 BIT COLOR</td><td>30bit/pixel (10bit/component) output</td></tr><tr><td>36 BIT COLOR</td><td>36bit/pixel (12bit/component) output</td></tr></table>
status_8: Scrambling output

<table><tr><th>Value</th><th>Description</th></tr><tr><td>SCRAMBLE ON</td><td>Scrambled</td></tr><tr><td>SCRAMBLE OFF</td><td>Not scrambled</td></tr></table></td></tr>
<tr><td rowspan="2">Getting example</td><td>Command
Response</td><td>@GOS,1,0 ↵
@GOS,1,0,HDCP 1.4 SUPPORT,HDCP OK,HDCP1.4,HDMI, YCbCr 4:4:4,
FULL RANGE,24 BIT COLOR,SCRAMBLE OFF ↵</td></tr>
<tr><td>Description</td><td>Getting all statuses of OUT1 sink device
- HDCP : Device with HDCP 1.4 is connected.
- HDCP authentication : Completed
- HDCP output : HDCP 1.4 output
- HDMI/DVI output : HDMI output
- Color space output : YCbCr 4:4:4
- Color range output : Full range output
- Color depth output : 24bit/pixel (8bit/component) output
- Scrambling output : OFF</td></tr>
<tr><td colspan="2">Remarks</td><td>－</td></tr>
</table>

<table>
<tr><td colspan="2">@GES</td><td>Sink device EDID (For each channel)</td></tr>
<tr><td rowspan="2">Getting</td><td>Command</td><td>@GES, out, mode ↵</td></tr>
<tr><td>Response</td><td>@GES, out, mode, status_1 (, status_2, status_3, status_4, status_5, status_6, status_7) ↵</td></tr>
<tr><td colspan="2" rowspan="4">Parameter</td><td>out : Output channel
1 to 5 = OUT1 to OUT5</td></tr>
<tr><td>mode: Target status
0 = All of 1 to 7,
1 = Sink device name,
2 = Resolution/Dot clock,
3 = HDMI mode/Color space/Color depth,
4 = Audio format/Sampling frequency/Bit length/
The number of channels/Compressed audio,
5 = SCDC,
6 = HDR,
7= 3D</td></tr>
<tr><td>status_1: Sink device name

<table><tr><th>Value</th><th>Description</th></tr><tr><td>HDC-TR121UHD</td><td>A sink device named “HDC-TR121UHD” is connected.</td></tr><tr><td>EDID READ ERROR</td><td>Sink device EDID recall error</td></tr><tr><td>UNCONNECTED</td><td>Sink device is not connected.</td></tr></table></td></tr>
<tr><td>status_2: Resolution/Dot clock

<table><tr><th>Value</th><th>Description</th></tr><tr><td>1920x1080p 148.50MHz</td><td>A sink device supporting 1920x1080 (resolution) and 148.50 MHz (dot clock) is connected.</td></tr><tr><td>EDID READ ERROR</td><td>Sink device EDID recall error</td></tr><tr><td>UNCONNECTED</td><td>Sink device is not connected.</td></tr></table></td></tr>
<tr><td>status_3: HDMI mode/Color space/Color depth

<table><tr><th>Value</th><th>Description</th></tr><tr><td>DVI</td><td>A sink device that does not support HDMI signal is connected.</td></tr><tr><td>HDMI-RGB/YCbCr422/YCbCr444-24/30BIT COLOR</td><td>A sink device supporting HDMI signal is connected. Supported sampling structure (RGB, YCbCr 4:2:2, YCbCr 4:4:4) and color depth (24, 30, 36) are returned.</td></tr><tr><td>EDID READ ERROR</td><td>Sink device EDID recall error</td></tr><tr><td>UNCONNECTED</td><td>Sink device is not connected.</td></tr></table></td></tr>
</table>

<table>
<tr><th>@GES</th><th>Sink device EDID (For each channel) (Cont’d)</th></tr>
<tr><td>Parameter</td><td>
status_4: Audio format/Sampling frequency/Bit length/
The number of channels/Compressed audio
<table>
<tr><th>Value</th><th>Description</th></tr>
<tr><td>AUDIO NOT SUPPORT</td><td>A sink device that does not support audio signal is connected.</td></tr>
<tr><td>LINEAR PCM
-32/44.1/48kHz
-16/20/24BIT
-8CHANNEL</td><td>A sink devices supporting audio signal is connected. Supporting sampling frequency (32, 44.1, 48, 88.2, 96, 176.4, 192), the number of bits (16, 20, 24), the number of channels (1 to 8), and compressed audio support status are returned.</td></tr>
<tr><td>EDID READ ERROR</td><td>Sink device EDID recall error</td></tr>
<tr><td>UNCONNECTED</td><td>Sink device is not connected.</td></tr>
</table>
status_5: SCDC
<table>
<tr><th>Value</th><th>Description</th></tr>
<tr><td>SCDC SUPPORT</td><td>SCDC supported.</td></tr>
<tr><td>SCDC NOT SUPPORT</td><td>SCDC is not supported.</td></tr>
<tr><td>EDID READ ERROR</td><td>Sink device EDID recall error</td></tr>
<tr><td>UNCONNECTED</td><td>Sink device is not connected.</td></tr>
</table>
status_6: HDR
<table>
<tr><th>Value</th><th>Description</th></tr>
<tr><td>HDR SUPPORT</td><td>HDR supported.</td></tr>
<tr><td>HDR NOT SUPPORT</td><td>HDR is not supported.</td></tr>
<tr><td>EDID READ ERROR</td><td>Sink device EDID recall error</td></tr>
<tr><td>UNCONNECTED</td><td>Sink device is not connected.</td></tr>
</table>
status_7: 3D
<table>
<tr><th>Value</th><th>Description</th></tr>
<tr><td>3D SUPPORT</td><td>3D supported.</td></tr>
<tr><td>3D NOT SUPPORT</td><td>3D is not supported.</td></tr>
<tr><td>EDID READ ERROR</td><td>Sink device EDID recall error</td></tr>
<tr><td>UNCONNECTED</td><td>Sink device is not connected.</td></tr>
</table>
</td></tr>
</table>

@GES		**Sink device EDID (For each channel) (Cont'd)**
Getting example	Command	@GES,1,0 ↵
	Response	@GES,1,0, HDC-TR121UHD,1920x1080 148.50MHz,HDMI-RGB/YCbCr444/-24BIT COLOR,LINEAR PCM-32/44.1/48kHz-16/20/24BIT-2CHANNEL,SCDC SUPPORT,HDR SUPPORT,3D SUPPORT ↵
	Description	Getting the EDID of the sink device connected to OUT1 - Sink device name : HDC-TR121UHD - Resolution : 1920x1080 - Dot clock : 148.50 MHz - HDMI mode : Supported - Color space/Color depth : RGB/YCbCr444/-24BIT COLOR - Audio format : LINEAR PCM - Sampling frequency : -32/44.1/48kHz - Bit length : -16/20/24BIT - The number of channels : -2CHANNEL - SCDC : Supported - HDR : Supported - 3D : Supported
Remarks		―

@GHC		**System status**
Getting	Command	@GHC ↵
	Response	@GHC, temp, voltage ↵
Parameter		temp: Internal temperature status 0 = Normal, 1 = Abnormal
		voltage: Power voltage 0 = Normal, 1 = Abnormal
Getting example	Command	@GHC ↵
	Response	@GHC,0,0 ↵
	Description	No problem in internal temperature or power voltage status
Remarks		―

@GPS		**Power voltage**
Getting	Command	@GPS ↵
	Response	@GPS, voltage, status ↵
Parameter		voltage: Power voltage = Power voltage level x 1000 e.g.) 12.210 V: 12210
		status: Power voltage status 0 = Normal, 1 = Abnormal
Getting example	Command Response	@GPS ↵ @GPS,12210,0 ↵
	Description	Getting the power voltage Voltage: 12.210 V; status: Normal
Remarks		―

@GST		**Internal temperature**
Getting	Command	@GST ↵
	Response	@GST, temp, status ↵
Parameter		temp: Internal temperature value The value of temperature x 100 e.g.) 38.75°C: 3875
		status: Internal temperature status 0 = Normal, 1 = Abnormal
Getting example	Command Response	@GST ↵ @GST,3425,0 ↵
	Description	Getting the internal temperature Temperature: 34.25°C; status: Normal
Remarks		―

@GIV		**Version**
Getting	Command	@GIV ↵
	Response	@GIV, id, version ↵
Parameter		id : Model number
		version : Firmware version
Getting example	Command Response	@GIV ↵ @GIV,HDC-TR121UHD,1.00R0 ↵
	Description	Getting the product information Model number: HDC-TR121UHD; Firmware version: 1.00R0
Remarks		―

<table>
<tr><td colspan="2">@GHB</td><td>HDBaseT information (For each channel)</td></tr>
<tr><td rowspan="2">Getting</td><td>Command</td><td>@GHB, port, mode ↵</td></tr>
<tr><td>Response</td><td>@GHB, port, mode, status_1 (, status_2, status_3, status_4, status_5, status_6) ↵</td></tr>
<tr><td colspan="2">Parameter</td><td>port: I/O channels
2 = IN2
102 to 105 = OUT2 to OUT5</td></tr>
<tr><td colspan="2"></td><td>mode: Target status (selected channels only)
0 = All statuses, 1 = Video signal information,
2 = Link status,
3 = Connection between source and sink devices
4 = Device type, 5 = Version ID,
6 = Connected device type, 7 = Connected version ID,
8 = Operation mode, 9 = Category cable length,
10 = Bit error rate, 11 = Video signal quality,
12 = Maximum video signal quality (FMSEERR MAX VALUE),
13 = Video signal residual gap (FMAXERR CURRENT VALUE),
14 = Maximum video signal residual gap (FMAXERR MAX VALUE)</td></tr>
<tr><td colspan="2"></td><td>status_1: Video signal information

<table><tr><th>Value</th><th>Description</th></tr><tr><td>1920x1080p 59.94Hz</td><td>Resolution, frequency</td></tr><tr><td>YCbCr 4:4:4</td><td>Color space</td></tr><tr><td>24 BIT COLOR</td><td>Color depth</td></tr><tr><td>NO SIGNAL</td><td>No signal is input.</td></tr></table></td></tr>
<tr><td colspan="2"></td><td>status_2: Link status

<table><tr><th>Value</th><th>Description</th></tr><tr><td>LINK ON</td><td>Transmitter and receiver are connected.</td></tr><tr><td>LINK OFF</td><td>Not connected</td></tr></table></td></tr>
<tr><td colspan="2"></td><td>status_3: Connection between source and sink devices

<table><tr><th>Value</th><th>Description</th></tr><tr><td>ON</td><td>Connected</td></tr><tr><td>OFF</td><td>Not connected</td></tr></table></td></tr>
<tr><td colspan="2"></td><td>status_4: Device type

<table><tr><th>Value</th><th>Description</th></tr><tr><td>VS100RX</td><td>VS100RX</td></tr><tr><td>VS100TX</td><td>VS100TX</td></tr></table></td></tr>
</table>

@GHB	HDBaseT status (For each channel) (Cont'd)
Parameter	status_5: Version ID

Value	Description
13.07.21.10	13.07.21.10

status_6: Connected device type

Value	Description
VS100TX	VS100TX

status_7: Connected version ID

Value	Description
13.07.21.10	13.07.21.10

status_8: Operation mode

Value	Description
HDBASET MODE	HDBaseT mode
LONG REACH MODE	Long reach mode
LPPF1 MODE	LOW POWER mode 1
LPPF2 MODE	LOW POWER mode 2

status_9: Category cable length

Value	Description
85m	Category cable length
<20m	66 ft. (20 m) or shorter
100m<	328 ft. (100 m) or longer
UNCONNECTED	Not connected

status_10: Bit error rate

Value	Description
10e-11	Signal bit error rate
UNCONNECTED	Not connected

status_11: Video signal quality

Value	Description
A:-22 B:-20 C:-21 D:-22	Signal quality
UNCONNECTED	Not connected

<table>
<tr><td colspan="2">@GHB</td><td>HDBaseT status (For each channel) (Cont’d)</td></tr>
<tr><td colspan="2">Parameter</td><td>status_12: Maximum video signal quality (FMSEERR MAX VALUE)

<table><tr><th>Value</th><th>Description</th></tr><tr><td>A:-22 B:-20 C:-21 D:-22</td><td>Maximum signal quality</td></tr><tr><td>UNCONNECTED</td><td>Not connected</td></tr></table></td></tr>
<tr><td colspan="2"></td><td>status_13: Video signal residual gap (FMAXERR CURRENT VALUE)

<table><tr><th>Value</th><th>Description</th></tr><tr><td>A:0.34 B:0.35 C:0.32 D:0.33</td><td>Signal residual gap</td></tr><tr><td>UNCONNECTED</td><td>Not connected</td></tr></table></td></tr>
<tr><td colspan="2"></td><td>status_14: Maximum video signal residual gap (FMAXERR MAX VALUE)

<table><tr><th>Value</th><th>Description</th></tr><tr><td>A:0.34 B:0.35 C:0.32 D:0.33</td><td>Maximum signal residual gap</td></tr><tr><td>UNCONNECTED</td><td>Not connected</td></tr></table></td></tr>
<tr><td rowspan="2">Getting example</td><td>Command
Response</td><td>@GHB,2,0 ↵
@GHB,2,0,1920x1080p 59.99Hz YCbCr 4:4:4 24 BIT COLOR,LINK ON,ON,
VS100RX,13 07 21 00,VS100TX,13 07 21 10,HDBASET MODE,85m,10e-11,
A:-22 B:-20 C:-21 D:-22,A:-22 B:-20 C:-21 D:-22,A:0.34 B:0.35 C:0.32 D:0.33,
A:0.34 B:0.35 C:0.32 D:0.33 ↵</td></tr>
<tr><td>Description</td><td>Getting all input statuses of IN2
- Video signal information : 1920x1080p 59.99Hz YCbCr 4:4:4 24 BIT COLOR
- Link status : Connected
- Connection between source and sink devices
: Connected
- Device type : VS100RX
- Version ID : 13 07 21 00,
- Connected device type : VS100TX
- Connected version ID : 13 07 21 00
- Operation mode : HDBASET MODE
- Category cable length : 279 ft. (85 m)
- Bit error rate : 10e-11
- Video signal quality : A:-22 B:-20 C:-21 D:-22
- Maximum video signal quality (FMSEERR MAX VALUE)
: A:-22 B:-20 C:-21 D:-22
- Video signal residual gap (FMAXERR CURRENT VALUE)
: A:0.34 B:0.35 C:0.32 D:0.33
- Maximum video signal residual gap (FMAXERR MAX VALUE)
: A:0.34 B:0.35 C:0.32 D:0.33</td></tr>
<tr><td colspan="2">Remarks</td><td>—</td></tr>
</table>

3.3.11 Status notification

<table>
<tr><td colspan="2">@GPH / @SPH</td><td>Notification interval</td></tr>
<tr><td rowspan="2">Getting</td><td>Command</td><td>@GPH ↵</td></tr>
<tr><td>Response</td><td>@GPH, time ↵</td></tr>
<tr><td rowspan="2">Setting</td><td>Command</td><td>@SPH, time ↵</td></tr>
<tr><td>Response</td><td>@SPH, time ↵</td></tr>
<tr><td colspan="2">Parameter</td><td>time: Notification time
0 = OFF [Default], 1 to 50 = 100 ms. to 5000 ms.

<table>
<tr><th>time</th><th>ON/OFF</th><th>Time</th></tr>
<tr><td>0</td><td>OFF</td><td>ー</td></tr>
<tr><td>1</td><td>ON</td><td>100 ms.</td></tr>
<tr><td>2</td><td>ON</td><td>200 ms.</td></tr>
<tr><td>3</td><td>ON</td><td>300 ms.</td></tr>
<tr><td>4</td><td>ON</td><td>400 ms.</td></tr>
<tr><td>5</td><td>ON</td><td>500 ms.</td></tr>
<tr><td>6</td><td>ON</td><td>600 ms.</td></tr>
<tr><td>7</td><td>ON</td><td>700 ms.</td></tr>
<tr><td>8</td><td>ON</td><td>800 ms.</td></tr>
<tr><td>9</td><td>ON</td><td>900 ms.</td></tr>
<tr><td>10</td><td>ON</td><td>1000 ms.</td></tr>
</table>
to
<table>
<tr><th>time</th><th>ON/OFF</th><th>Time</th></tr>
<tr><td>40</td><td>ON</td><td>4000 ms.</td></tr>
<tr><td>41</td><td>ON</td><td>4100 ms.</td></tr>
<tr><td>42</td><td>ON</td><td>4200 ms.</td></tr>
<tr><td>43</td><td>ON</td><td>4300 ms.</td></tr>
<tr><td>44</td><td>ON</td><td>4400 ms.</td></tr>
<tr><td>45</td><td>ON</td><td>4500 ms.</td></tr>
<tr><td>46</td><td>ON</td><td>4600 ms.</td></tr>
<tr><td>47</td><td>ON</td><td>4700 ms.</td></tr>
<tr><td>48</td><td>ON</td><td>4800 ms.</td></tr>
<tr><td>49</td><td>ON</td><td>4900 ms.</td></tr>
<tr><td>50</td><td>ON</td><td>5000 ms.</td></tr>
</table>
</td></tr>
<tr><td rowspan="2">Getting example</td><td>Command
Response</td><td>@GPH ↵
@GPH,5 ↵</td></tr>
<tr><td>Description</td><td>Getting set notification time
500 ms.</td></tr>
<tr><td rowspan="2">Setting example</td><td>Command
Response</td><td>@SPH,50 ↵
@SPH,50 ↵</td></tr>
<tr><td>Description</td><td>Setting notification time to 5000 ms. (5 seconds)
Completed</td></tr>
<tr><td colspan="2">Remarks</td><td>You need to set the time again after powering off the HDC.</td></tr>
</table>

<table>
<tr><td colspan="2">@PSH</td><td>Unsolicited status notification</td></tr>
<tr><td>Getting</td><td>Response</td><td>@PSH, in, out, system ↵</td></tr>
<tr><td colspan="2" rowspan="3">Parameter</td><td>in: Checking if input status changes
0 = Not change, 1 to 2 = Changes
<table>
<tr><td>bit</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr>
<tr><td>in</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>IN2</td><td>IN1</td></tr>
</table>
“1” appears for detected channel, the value is displayed in hex.</td></tr>
<tr><td>out: Checking if output status changes
0 = Not change, 1 to 1F = Changes
<table>
<tr><td>bit</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr>
<tr><td>out</td><td>-</td><td>-</td><td>-</td><td>OUT5</td><td>OUT4</td><td>OUT3</td><td>OUT2</td><td>OUT1</td></tr>
</table>
“1” appears for detected channel, the value is displayed in hex.</td></tr>
<tr><td>system: Checking if system status changes
0 = Not change, 1 = Changes</td></tr>
<tr><td rowspan="2">Getting example</td><td>Response</td><td>@PSH,1,0,0 ↵</td></tr>
<tr><td>Description</td><td>Getting status change information
- Input status : Changes in IN1
- Output status : No changes
- System status: No changes</td></tr>
<tr><td colspan="2">Remarks</td><td>Only if “@GPH / @SPH Notification interval” is set, the HDC sends unsolicited command.
For input status changes, only selected channel is detected.</td></tr>
</table>

<table>
<tr><td colspan="2">@AIN</td><td>Input signal status (For each channel)</td></tr>
<tr><td rowspan="2">Getting</td><td>Command</td><td>@AIN, in ↵</td></tr>
<tr><td>Response</td><td>@AIN, status_1, status_2, status_3, status_4, status_5, status_6, status_7, status_8, status_9, status_10, status_11, status_12, status_13, status_14, status_15, status_16, status_17, status_18, status_19 ↵</td></tr>
<tr><td colspan="2" rowspan="8">Parameter</td><td>in: Input channel
1 to 2 = IN1 to IN2</td></tr>
<tr><td>status_1: Input channel

<table><tr><th>Value</th><th>Description</th></tr><tr><td>1</td><td>1: IN1
2: IN2</td></tr></table></td></tr>
<tr><td>status_2: Model number

<table><tr><th>Value</th><th>Description</th></tr><tr><td>HDC-TR121UHD</td><td>Model number</td></tr></table></td></tr>
<tr><td>status_3: Version

<table><tr><th>Value</th><th>Description</th></tr><tr><td>V1.00R0</td><td>Version</td></tr></table></td></tr>
<tr><td>status_4: The number of valid data

<table><tr><th>Value</th><th>Description</th></tr><tr><td>15</td><td>“15” (fixed)</td></tr></table></td></tr>
<tr><td>status_5: Reservation

<table><tr><th>Value</th><th>Description</th></tr><tr><td>1</td><td>“1” (fixed)</td></tr></table></td></tr>
<tr><td>status_6: Horizontal pixels of input video

<table><tr><th>Value</th><th>Description</th></tr><tr><td>0</td><td>No signal is input.</td></tr><tr><td>1920</td><td>1920 pixels</td></tr></table></td></tr>
<tr><td>status_7: Vertical pixels of input video

<table><tr><th>Value</th><th>Description</th></tr><tr><td>0</td><td>No signal is input.</td></tr><tr><td>1080</td><td>1080 lines</td></tr></table></td></tr>
</table>

@AIN — **Input signal status (For each channel) (Cont'd)**

Parameter

status_8: Input video frequency

Value	Description
0	No signal is input.
59.94	59.94 Hz

status_9: Progressive or interlace scan

Value	Description
1	0: No signal is input. 1: Progressive 2: Interlace

status_10: HDMI/DVI mode of input video

Value	Description
2	0: No signal is input. 1: DVI signal input 2: HDMI signal input

status_11: Color space of input video

Value	Description
1	0: No signal is input. 1: RGB input 2: YCbCr 4:2:2 input 3: YCbCr 4:4:4 input 4: YCbCr 4:2:0 input 255: Unknown

status_12: Color range of input video

Value	Description
2	0: No signal is input. 1: Limited range output 2: Full range output

status_13: Color depth of input video

Value	Description
1	0: No signal is input. 1: 24 bit/pixel (8 bit/component) 2: 30 bit/pixel (10 bit/component) 3: 36 bit/pixel (12 bit/component) 4: 48 bit/pixel (16 bit/component)

@AIN — **Input signal status (For each channel) (Cont'd)**

Parameter

status_14 : +5V input status

Value	Description
1	0: No +5V signal is input. 1: +5V signal is input.

status_15 : Presence of input video HDCP encryption (Encryption from source device)

Value	Description
2	0: No signal is input. 1: Without HDCP 2: HDCP 1.4 3: HDCP 2.2 Type0 4: HDCP 2.2 Type1

status_16 : Audio input type

Value	Description
1	0: No signal is input. 1: LPCM 2: Compressed audio

status_17 : Audio input sampling frequency

Value	Description
5	0: No signal is input. 1: 22.05 kHz 2: 24.0 kHz 3: 32 kHz 4: 44.1 kHz 5: 48 kHz 6: 88.2 kHz 7: 96 kHz 8: 176 kHz 9: 192 kHz 10: 768.0 kHz 255: Unknown

status_18 : The number of audio input bits

Value	Description
9	0: No signal is input. 3: 18 bit 4: 19 bit 5: 20 bit 6: 21 bit 7: 22 bit 8: 23 bit 9: 24 bit 255: Unknown

<table>
<tr><td colspan="2">@AIN</td><td>Input signal status (For each channel) (Cont’d)</td></tr>
<tr><td colspan="2">Parameter</td><td>status_19 : Audio input HBR mode

<table><tr><th>Value</th><th>Description</th></tr><tr><td>1</td><td>0: No signal is input.
1: Mode other than HBR
(PCM mode, other compressed audio)
2: HBR mode</td></tr></table></td></tr>
<tr><td rowspan="2">Getting example</td><td>Command</td><td>@AIN,1 ↵</td></tr>
<tr><td>Response</td><td>@AIN,1,HDC-TR121UHD,1.00R0,15,1,1920,1080,59.94,1,2,1,2,1,1,2,1,5,9,1 ↵</td></tr>
<tr><td></td><td>Description</td><td>Getting all statuses of IN1 input signal
- Input channel : IN1
- Model number : HDC-TR121UHD
- Version : 1.00R0
- The number of valid data : 15
- Reservation : 1
- Horizontal pixels of input video : 1920 pixels
- Vertical pixels of input video : 1080 lines
- Input video frequency : 59.94 Hz
- Progressive or interlace scan : Progressive
- HDMI/DVI mode of input video : HDMI signal input
- Color space of input video : RGB input
- Color range of input video : Full range output
- Color depth of input video : 24 bit/pixel (8bit/component)
- +5V input status : +5V signal is input.
- Presence of input video HDCP encryption : Without HDCP
- Audio input type : LPCM
- Audio input sampling frequency : 48 kHz
- The number of audio input bits : 24bit
- Audio input HBR mode : Mode other than HBR</td></tr>
<tr><td colspan="2">Remarks</td><td>—</td></tr>
</table>

<table>
<tr><td colspan="2">@AOT</td><td>Output signal status (For each channel)</td></tr>
<tr><td rowspan="2">Getting</td><td>Command</td><td>@AOT,out ↵</td></tr>
<tr><td>Response</td><td>@AOT, status_1, status_2, status_3, status_4, status_5, status_6, status_7, status_8, status_9, status_10, status_11, status_12, status_13, status_14, status_15, status_16, status_17, status_18, status_19, status_20, status_21, status_22, status_23, status_24, status_25 ↵</td></tr>
<tr><td colspan="2" rowspan="6">Parameter</td><td>out: Output channel
1 to 5 = OUT1 to OUT5</td></tr>
<tr><td>status_1: Output channel
<table><tr><th>Value</th><th>Description</th></tr><tr><td>1</td><td>1: OUT1
2: OUT2
3: OUT3
4: OUT4
5: OUT5</td></tr></table></td></tr>
<tr><td>status_2: Model number
<table><tr><th>Value</th><th>Description</th></tr><tr><td>HDC-TR121UHD</td><td>Model number</td></tr></table></td></tr>
<tr><td>status_3: Version
<table><tr><th>Value</th><th>Description</th></tr><tr><td>V1.00R0</td><td>Version</td></tr></table></td></tr>
<tr><td>status_4: The number of valid data
<table><tr><th>Value</th><th>Description</th></tr><tr><td>21</td><td>“21” (fixed)</td></tr></table></td></tr>
<tr><td>status_5: Reservation
<table><tr><th>Value</th><th>Description</th></tr><tr><td>1</td><td>“1” (fixed)</td></tr></table></td></tr>
<tr><td>status_6: Selected input
<table><tr><th>Value</th><th>Description</th></tr><tr><td>1</td><td>0: Source off (“@SOO” is set to “1”)
or No input signal
1: IN1
2: IN2</td></tr></table></td></tr>
</table>

<table>
<tr><th>@AOT</th><th>Output signal status (For each channel) (Cont’d)</th></tr>
<tr><td>Parameter</td><td>
status_7: Horizontal pixels of output video
<table>
<tr><th>Value</th><th>Description</th></tr>
<tr><td>0</td><td>No signal is output.</td></tr>
<tr><td>1920</td><td>1920 pixels</td></tr>
</table>
status_8: Vertical pixels of output video
<table>
<tr><th>Value</th><th>Description</th></tr>
<tr><td>0</td><td>No signal is output.</td></tr>
<tr><td>1080</td><td>1080 lines</td></tr>
</table>
status_9: Output video frequency
<table>
<tr><th>Value</th><th>Description</th></tr>
<tr><td>0</td><td>No signal is output.</td></tr>
<tr><td>59.94</td><td>59.94 Hz</td></tr>
</table>
status_10: Progressive or interlace scan
<table>
<tr><th>Value</th><th>Description</th></tr>
<tr><td>1</td><td>0: No signal is output.
1: Progressive
2: Interlace</td></tr>
</table>
status_11: HDMI/DVI mode of output video
<table>
<tr><th>Value</th><th>Description</th></tr>
<tr><td>2</td><td>0: No signal is output.
1: DVI signal output
2: HDMI signal output</td></tr>
</table>
status_12: Color space of output video
<table>
<tr><th>Value</th><th>Description</th></tr>
<tr><td>1</td><td>0: No signal is output.
1: RGB output
2: YCbCr 4:2:2 output
3: YCbCr 4:4:4 output
4: YCbCr 4:2:0 output</td></tr>
</table>
</td></tr>
</table>

@AOT — **Output signal status (For each channel) (Cont'd)**

Parameter

status_13: Color range of output video

Value	Description
2	0: No signal is output. 1: Limited range output 2: Full range output

status_14: Color depth of output video

Value	Description
1	0: No signal is output. 1: 24 bit/pixel (8 bit/component) 2: 30 bit/pixel (10 bit/component) 3: 36 bit/pixel (12 bit/component) 4: 48 bit/pixel (16 bit/component)

status_15: Hot plug detection

Value	Description
1	0: Hot plug is detected. 1: No hot plug is detected.

status_16: HDCP encryption

Value	Description
4	0: No HDCP encryption 1: HDCP is being encrypted. 2: HDCP is being encrypted. 3: HDCP is being encrypted. 4: HDCP encryption ends normally. 5: HDCP encryption ends abnormally.

status_17: HDCP output

Value	Description
1	0: No HDCP output 1: HDCP 1.4 output 2: HDCP 2.2 Type0 output 3: HDCP 2.2 Type1 output

<table>
<tr><td>@AOT</td><td>Output signal status (For each channel) (Cont’d)</td></tr>
<tr><td rowspan="2">Parameter</td><td>status_18: Audio output type

<table><tr><th>Value</th><th>Description</th></tr><tr><td>1</td><td>0: No signal is output.
1: LPCM
2: Compressed audio</td></tr></table></td></tr>
<tr><td>status_19: Reading EDID

<table><tr><th>Value</th><th>Description</th></tr><tr><td>2</td><td>0: Not connected
1: Failed
2: Completed</td></tr></table></td></tr>
<tr><td></td><td>status_20: HDMI/DVI mode (sink)

<table><tr><th>Value</th><th>Description</th></tr><tr><td>2</td><td>0: Not connected
1: DVI mode
2: HDMI mode (LPCM supported)
3: HDMI mode (Compressed audio supported)</td></tr></table></td></tr>
<tr><td></td><td>status_21: Color space (sink)

<table><tr><td>bit</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><td>Color</td><td>-</td><td>-</td><td>-</td><td>-</td><td>YCbCr 4:2:0</td><td>YCbCr 4:4:4</td><td>YCbCr 4:2:2</td><td>RGB</td></tr><tr><td colspan="9">“1” appears for supported color space, the value is displayed in hex.
“0”: Not connected.</td></tr></table></td></tr>
<tr><td></td><td>status_22: Color depth (sink)

<table><tr><th>Value</th><th>Description</th></tr><tr><td>1</td><td>0: Not connected
1: 24 bit/pixel (8 bit/component)
2: 30 bit/pixel (10 bit/component)
3: 36 bit/pixel (12 bit/component)
4: 48 bit/pixel (16 bit/component)</td></tr></table></td></tr>
</table>

<table>
<tr><th>@AOT</th><th>Output signal status (For each channel) (Cont’d)</th></tr>
<tr><td>Parameter</td><td>status_23: HDCP (sink)

<table><tr><th>Value</th><th>Description</th></tr><tr><td>2</td><td>0: Not connected
1: HDCP is not supported.
2: HDCP 1.4 supported
3: HDCP 2.2 supported</td></tr></table></td></tr>
<tr><td></td><td>status_24: SCDC (sink)

<table><tr><th>Value</th><th>Description</th></tr><tr><td>2</td><td>0: Not connected
1: SCDC is not supported.
2: SCDC supported</td></tr></table></td></tr>
<tr><td></td><td>status_25: HDR (sink)

<table><tr><th>Value</th><th>Description</th></tr><tr><td>2</td><td>0: Not connected
1: HDR is not supported.
2: HDR supported</td></tr></table></td></tr>
</table>

@AOT		**Output signal status (For each channel) (Cont'd)**
Getting example	Command Response	@AOT,1 ↵ @AOT,1,HDC-TR121UHD,1.00R0,21,1,1,1920,1080,59.94,1,2,1,2,1,1,4,1,1,2,2,7,1,2,2,2 ↵
	Description	Getting all statuses of OUT1 output signal - Output channel: OUT1 - Model number : HDC-TR121UHD - Version : 1.00R0 - The number of valid data : 21 - Reservation : 1 - Selected input : IN1 - Horizontal pixels of output video : 1920 pixels - Vertical pixels of output video : 1080 lines - Output video frequency : 59.94 Hz - Progressive or interlace scan : Progressive - HDMI/DVI mode of output video : HDMI signal output - Color space of output video : RGB output - Color range of output video : Full range output - Color depth of output video : 24 bit/pixel (8bit/component) - Hot plug detection : Hot plug is detected. - HDCP encryption : Encryption ends normally. - HDCP output : HDCP 1.4 output - Audio output type : LPCM - Reading EDID : Completed - HDMI/DVI mode (sink) : HDMI mode (LPCM supported) - Color space (sink) : RGB, YCbCr4:2:2, and YCbCr4:4:4 supported - Color depth (sink) : 24 bit/pixel (8bit/component) - HDCP (sink) : HDCP 1.4 supported - SCDC (sink) : SCDC supported - HDR (sink) : HDR supported
Remarks		―

<table>
<tr><td colspan="2">@GAA</td><td>Alarm status</td></tr>
<tr><td rowspan="2">Getting</td><td>Command</td><td>@GAA ↵</td></tr>
<tr><td>Response</td><td>@GAA, status_1, status_2, status_3, status_4, status_5 ↵</td></tr>
<tr><td colspan="2">Parameter</td><td>status_1: Model number

<table><tr><th>Value</th><th>Description</th></tr><tr><td>HDC-TR121UHD</td><td>Model number</td></tr></table>
status_2: Version

<table><tr><th>Value</th><th>Description</th></tr><tr><td>V1.00R0</td><td>Version</td></tr></table>
status_3: The number of valid data

<table><tr><th>Value</th><th>Description</th></tr><tr><td>2</td><td>“2” (fixed)</td></tr></table>
status_4: Power voltage status

<table><tr><th>Value</th><th>Description</th></tr><tr><td>0</td><td>0: Normal
1: Abnormal</td></tr></table>
status_5: Internal temperature status

<table><tr><th>Value</th><th>Description</th></tr><tr><td>0</td><td>0: Normal
1: Abnormal</td></tr></table></td></tr>
<tr><td rowspan="2">Getting example</td><td>Command
Response</td><td>@GAA ↵
@GAA,HDC-TH121UHD,1.00R0,2,0,0 ↵</td></tr>
<tr><td>Description</td><td>Getting all alarm statuses
- Model number : HDC-TR121UHD
- Version : 1.00R0
- The number of valid data : 2
- Power voltage status : Normal
- Internal temperature status: Normal</td></tr>
<tr><td colspan="2">Remarks</td><td>—</td></tr>
</table>

User Guide (Command Guide) of HDC-UHD Series

Ver.2.1.0

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