

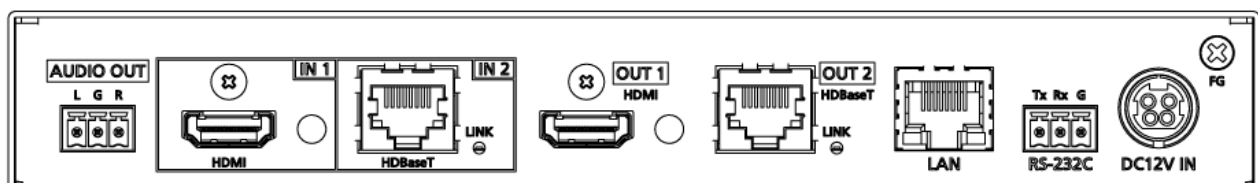
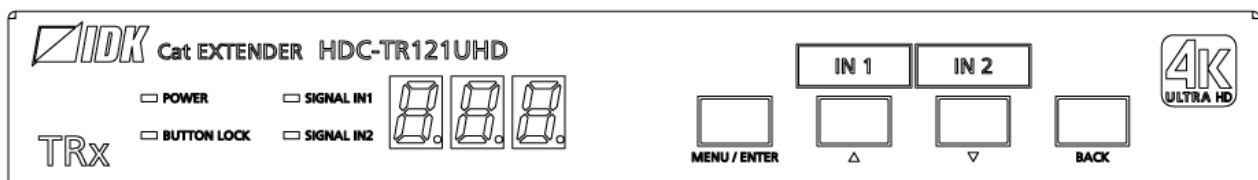
## 4K@60/HDCP 2.2 HDBaseT Extender with Distribution Amplifier

# HDC-UHD Series

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

<Command Reference Guide>

Ver.1.0.0



- 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.

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# Before reading this manual

- All rights reserved.
- 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: <http://www.idkav.com>

The reference manual consists of the following two volumes:

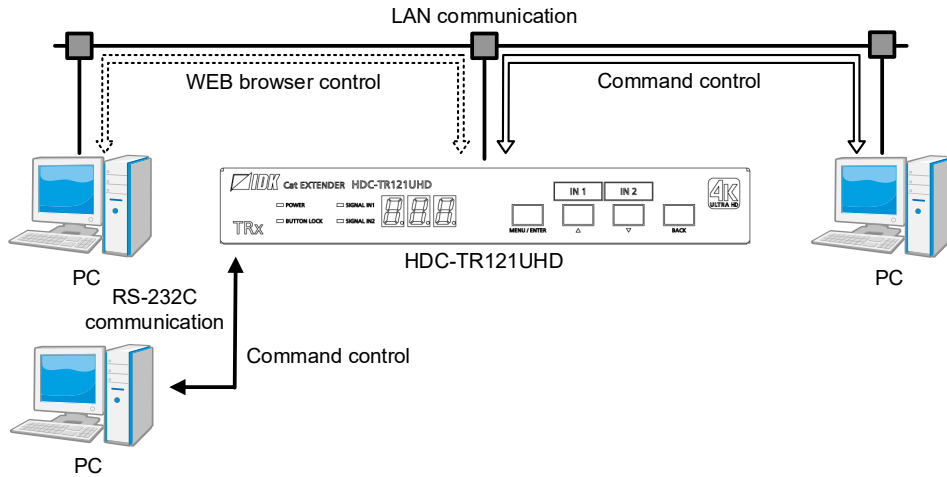
- User guide: Please download the User guide from the website above.  
Provides explanations and procedures for operations, installation, connections among devices, I/O adjustment and settings.
- Command guide (this document):  
Provides explanations and procedures for external control using RS-232C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

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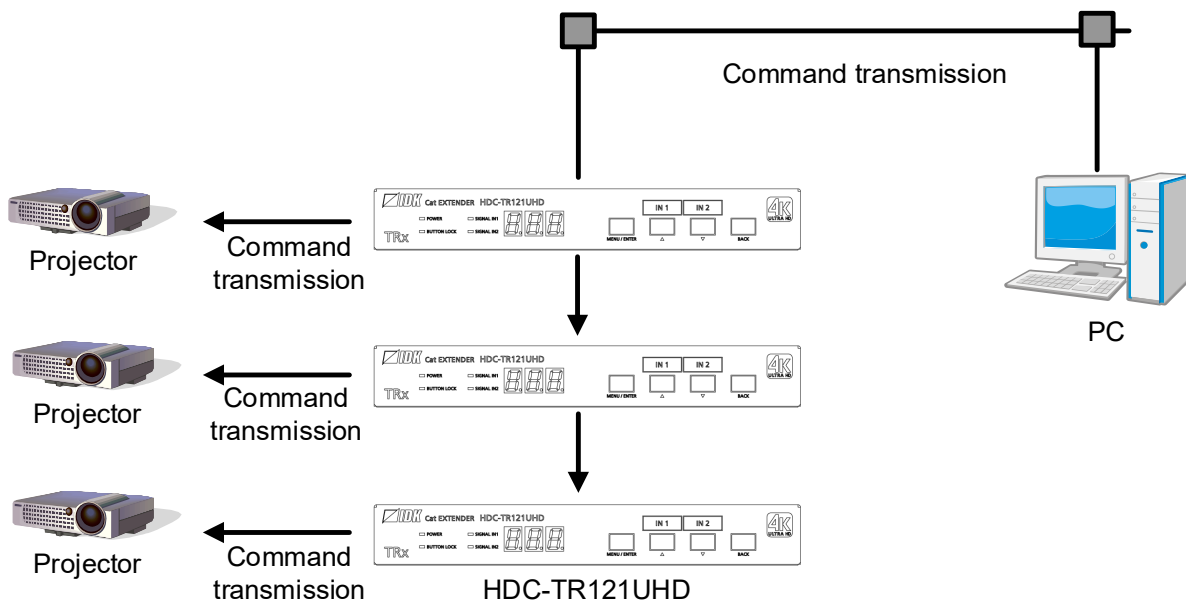
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# 1 About this Guide

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

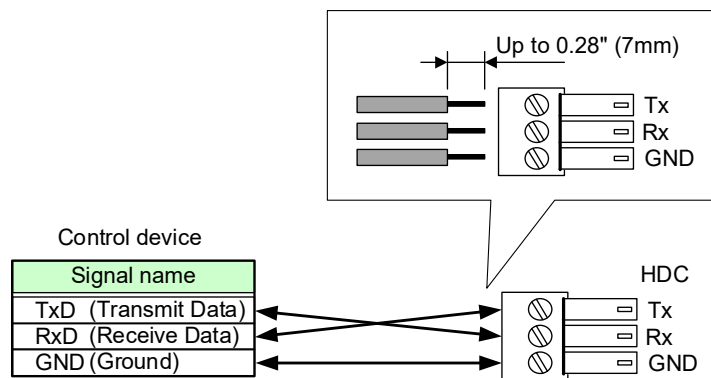
## 2 Communication configuration and Specifications

### 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:

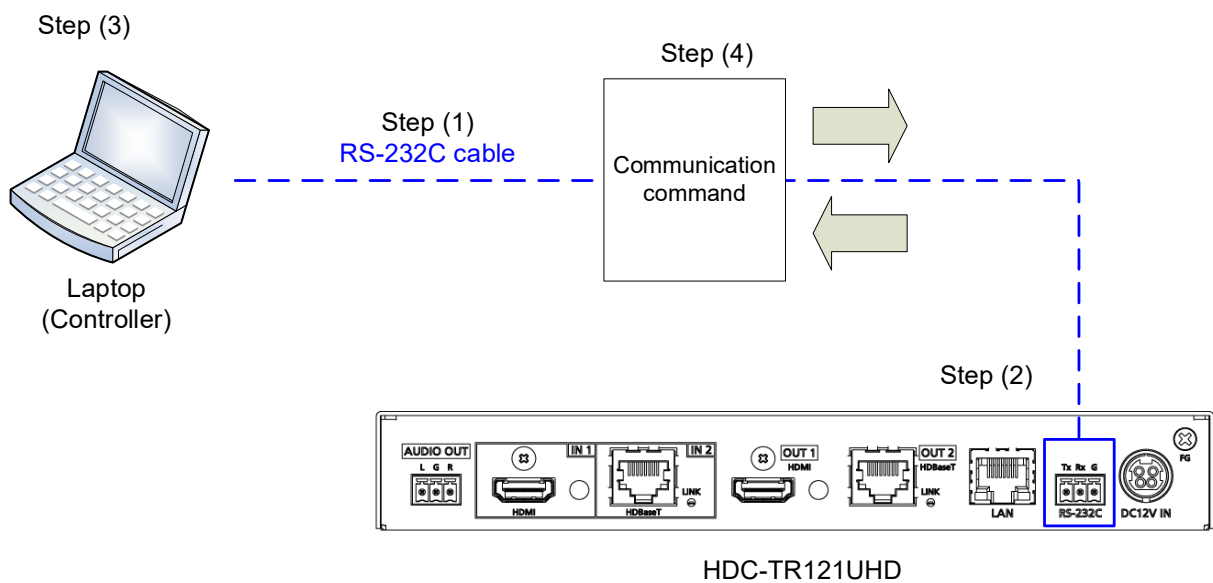
- RS-232C communication: Baud rate, data bit length, parity check, and stop bit
- Operation mode of RS-232C communication: Setting mode

【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.

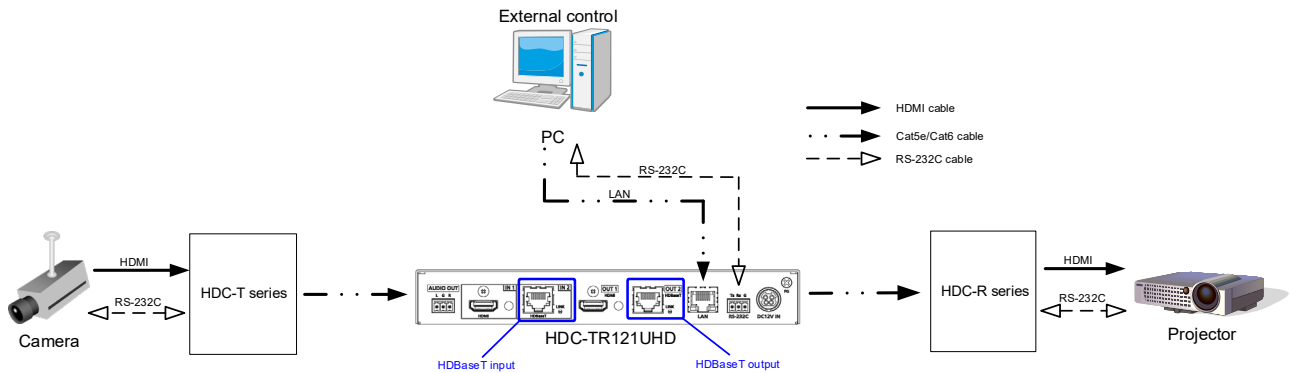


[Fig. 2.2] Setting RS-232C communication

### 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

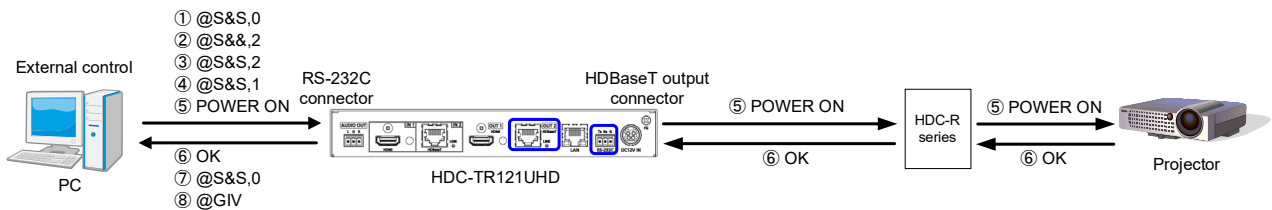
You can specify multiple sending channels.

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 <input type="checkbox"/>	Setting to "Command mode". After this, command can be sent to the HDC.	Command mode
②	@S&&,2 <input type="checkbox"/>	Setting RS-232C transmission sending channel, specifying OUT2	Command mode
③	@S&R,2 <input type="checkbox"/>	Setting RS-232C transmission receiving channel, specifying OUT2	Command mode
④	@S&S,1 <input type="checkbox"/>	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 <input type="checkbox"/>	Setting to "Command mode". After this, command can be sent to the HDC.	Command mode
⑧	@GIV <input type="checkbox"/>	Getting versions	Command mode



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



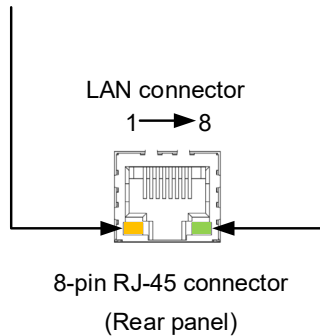
## 2.2 LAN communication

### 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.



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
Application layer	HTTP, TELNET

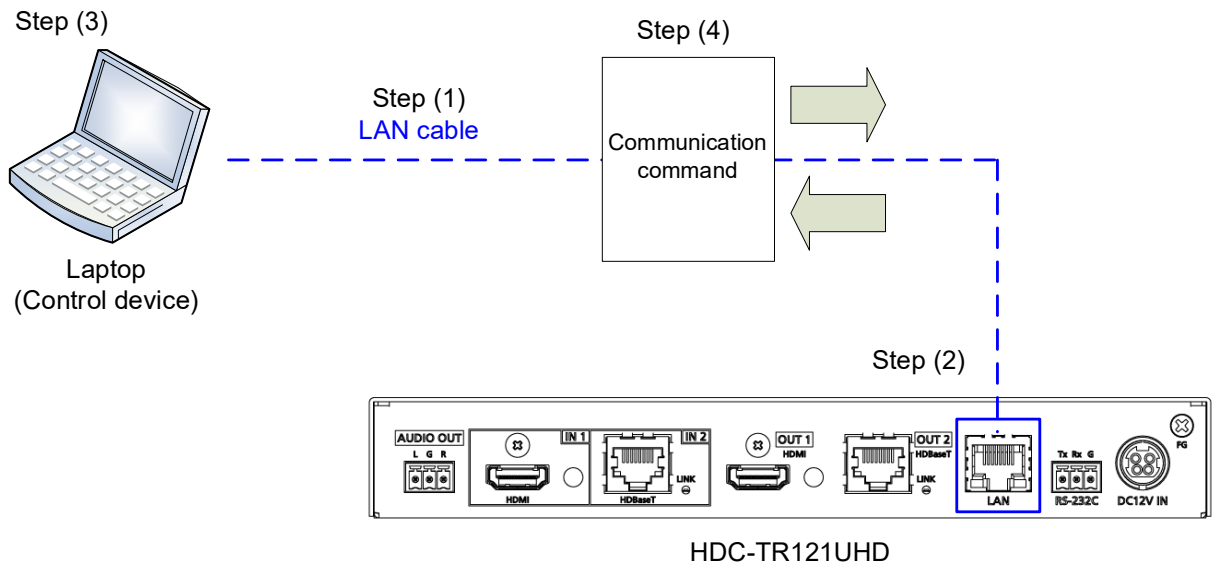
**Note:**

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 port 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

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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.

## 3 Command

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### 3.1 Summary

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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	15

### ■ Switching channel

Command	Function	Page
@GSW / @SSW	Switching channels	16
@GOF / @SOF	Automatic input channel switching	16
@GMT / @SMT	Ignoring duration after automatic switching	17

### ■ Setting input

Command	Function	Page
@GDT / @SDT	No-signal input monitoring	18
@GHE / @SHE	HDCP input enabled/disabled	18
@GIA / @SIA	HDBaseT input long reach mode	19

### ■ Setting output

Command	Function	Page
@GDM / @SDM	Output format	20
@GHM / @SHM	Sink device EDID check	21
@GMK / @SMK	Hot plug ignoring duration	21
@GOA / @SOA	HDBaseT output long reach mode	22
@GDN / @SDN	Downconversion output	22

### ■ Setting audio

Command	Function	Page
@GUC / @SUC	Outputting audio	23

### ■ Setting EDID

Command	Function	Page
@GED / @SED	Resolution	24
@RME	Copying EDID	25
@GEC / @SEC	External EDID	25
@GDI / @SDI	Deep Color	26
@GSP / @SSP	Speaker configuration	27
@GAF / @SAF	Audio format	28
@GHZ / @SHZ	Input video frequency	29

### ■ Setting RS-232C

Command	Function	Page
@GCT / @SCT	RS-232C communication	30
@G&S / @S&S	RS-232C transmission mode	31
@G&& / @S&&	RS-232C sending channel	31
@G&R / @S&R	RS-232C receiving channel	32

### ■ Setting LAN

Command	Function	Page
@GIP / @SIP	IP address	33
@GSB / @SSB	Subnet mask	33
@GLP / @SLP	TCP port number	34
@GMC	MAC address	34

### ■ Configuring HDC

Command	Function	Page
@GLM / @SLM	Grouping button security lockout	35
@GLS / @SLS	Button security lockout	35

### ■ Status indication

Command	Function	Page
@GIS	Input signal status (For each channel)	36
@GOS	Output signal status (For each channel)	38
@GES	Sink device EDID (For each channel)	40
@GHC	System status	43
@GPS	Power voltage	43
@GST	Internal temperature	43
@GIV	Version	44

### 3.3 Details of commands

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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

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


<b>@ERR</b>		<b>Error status</b>
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		—

@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		—



<b>@GMT / @SMT</b>		<b>Ignoring duration after automatic switching</b>
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

<b>@GDT / @SDT</b>		<b>No-signal input monitoring</b>
Getting	Command	@GDT <input type="checkbox"/>
	Response	@GDT, time_1, time_2 <input type="checkbox"/>
Setting	Command	@SDT, in_1, time_1 (, in_2, time_2) <input type="checkbox"/>
	Response	@SDT, in_1, time_1 (, in_2, time_2) <input type="checkbox"/>
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 <input type="checkbox"/>
	Response	@GDT,0,10 <input type="checkbox"/>
	Description	Getting the no-signal input monitoring time All input channels: 10 seconds
Setting example	Command	@SDT,0,4 <input type="checkbox"/>
	Response	@SDT,0,4 <input type="checkbox"/>
	Description	Setting the monitoring time of all input channels to 4 seconds Completed
Remarks		—

<b>@GHE / @SHE</b>		<b>HDCP input enabled/disabled</b>
Getting	Command	@GHE <input type="checkbox"/>
	Response	@GHE, hdcp_1, hdcp_2 <input type="checkbox"/>
Setting	Command	@SHE, in_1, hdcp_1 (, in_2, hdcp_2) <input type="checkbox"/>
	Response	@SHE, in_1, hdcp_1 (, in_2, hdcp_2) <input type="checkbox"/>
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 <input type="checkbox"/>
	Response	@GHE,0,1 <input type="checkbox"/>
	Description	Getting the HDCP input enabled/disabled All input channels: HDCP 1.4 enabled
Setting example	Command	@SHE,0,0 <input type="checkbox"/>
	Response	@SHE,0,0 <input type="checkbox"/>
	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	@GIA ↵
	Response	@GIA,0 ↵
	Description	Getting the HDBaseT input long reach mode IN2: OFF
Setting example	Command	@SIA,2,0 ↵
	Response	@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).

<b>@GHM / @SHM</b>		<b>Sink device EDID check</b>
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	@GHM [↵]
	Response	@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	@SHM,0,0 [↵]
	Response	@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		—

<b>@GMK / @SMK</b>		<b>Hot plug ignoring duration</b>
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	@GMK [↵]
	Response	@GMK,1,1,1,1,1 [↵]
	Description	Getting the hot plug ignoring duration All output channels: OFF
Setting example	Command	@SMK,0,1 [↵]
	Response	@SMK,0,1 [↵]
	Description	Setting the hot plug ignoring duration of all output channels to OFF Completed
Remarks		—

<b>@GOA / @SOA</b>		<b>HDBaseT output long reach mode</b>
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.

<b>@GDN / @SDN</b>		<b>Downconversion output</b>
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		—

### 3.3.5 Setting audio

@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” or “@RME” beforehand, respectively.



<b>@RME</b>		<b>Copying EDID</b>
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		—

<b>@GEC / @SEC</b>		<b>External EDID</b>
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		This command is valid only if " <b>Resolution</b> " is set to "1" (External EDID).

@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	@GDI [↵]
	Response	@GDI,0,0 [↵]
	Description	Getting the color depth All input channels: 24 bit/pixel (8 bit/component)
Setting example	Command	@SDI,0,0 [↵]
	Response	@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 " <b>Resolution</b> " is set to "3" to "46" (Built-in EDID).

@GSP / @SSP		Speaker configuration																														
Getting	Command	@GSP [↵]																														
	Response	@GSP, ch_1, ch_2 [↵]																														
Setting	Command	@SSP, in_1, ch_1 (, in_2, ch_2) [↵]																														
	Response	@SSP, in_1, ch_1 (, in_2, ch_2) [↵]																														
Parameter	<p>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</p> <p>FL : Front Left                      FC : Front Center                      FR : Front Right                      RL : Rear Left                      RR : Rear Right                      RLC : Rear Left Center                      RRC : Rear Right Center                      LFE : Low Frequency Effect</p> <table border="1"> <thead> <tr> <th>Sound type</th> <th>FL/FR</th> <th>LFE</th> <th>FC</th> <th>RL/RR</th> <th>RLC/RRC</th> </tr> </thead> <tbody> <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> </tbody> </table>		Sound type	FL/FR	LFE	FC	RL/RR	RLC/RRC	LR	ON	OFF	OFF	OFF	OFF	2.1 channel surround sound	ON	ON	OFF	OFF	OFF	5.1 channel surround sound	ON	ON	ON	ON	OFF	7.1 channel surround sound	ON	ON	ON	ON	ON
Sound type	FL/FR	LFE	FC	RL/RR	RLC/RRC																											
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5.1 channel surround sound	ON	ON	ON	ON	OFF																											
7.1 channel surround sound	ON	ON	ON	ON	ON																											
	<p>in_1-2: Input channel                      0 = All inputs, 1 = IN1, 2 = IN2</p>																															
Getting example	Command	@GSP [↵]																														
	Response	@GSP,0,0 [↵]																														
	Description	Getting the speaker configuration All input channels: LR																														
Setting example	Command	@SSP,0,0 [↵]																														
	Response	@SSP,0,0 [↵]																														
	Description	Setting the speaker configuration of all input channels to LR Completed																														
Remarks	This command is valid only if " <b>Resolution</b> " is set to "3" to "46" (Built-in EDID).																															

@GAF / @SAF		Audio format																								
Getting	Command	@GAF, in <input type="checkbox"/>																								
	Response	@GAF, in, format_1, frequency_1, ··· , format_7, frequency_7 <input type="checkbox"/>																								
Setting	Command	@SAF, in, format_1, frequency_1 (, format_2, frequency_2···) <input type="checkbox"/>																								
	Response	@SAF, in, format_1, frequency_1 (, format_2, frequency_2···) <input type="checkbox"/>																								
Parameter		<p>in: Input channel 1 = IN1, 2 = IN2</p> <p>format_1-7: Audio format 0 = LPCM,            1 = Dolby Digital, 2 = AAC, 3 = Dolby Digital+, 4 = DTS,            5 = DTS-HD, 6 = Dolby TrueHD</p> <p>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</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Audio format</th> <th>Maximum sampling frequency (kHz)</th> <th>Default</th> </tr> </thead> <tbody> <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> </tbody> </table>	Audio format	Maximum sampling frequency (kHz)	Default	LPCM	32/44.1/48/88.2/96/176.4/192	48	Dolby Digital	OFF/32/44.1/48	OFF	AAC	OFF/32/44.1/48/88.2/96	OFF	Dolby Digital +	OFF/32/44.1/48	OFF	DTS	OFF/32/44.1/48/96	OFF	DTS-HD	OFF/44.1/48/88.2/96/176.4/192	OFF	Dolby TrueHD	OFF/44.1/48/88.2/96/176.4/192	OFF
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DTS-HD	OFF/44.1/48/88.2/96/176.4/192	OFF																								
Dolby TrueHD	OFF/44.1/48/88.2/96/176.4/192	OFF																								
Getting example	Command	@GAF,1 <input type="checkbox"/>																								
	Response	@GAF,1,0,3,1,0,2,0,3,0,4,0,5,0,6,0 <input type="checkbox"/>																								
	Description	Getting the audio format and maximum sampling frequency of IN1 channel Maximum sampling frequency of LPCM: 48 kHz; other audio format: OFF																								
Setting example	Command	@SAF,1,0,7 <input type="checkbox"/>																								
	Response	@SAF,1,0,7 <input type="checkbox"/>																								
	Description	Setting the audio format and maximum sampling frequency of IN1 to LPCM and 192 kHz Completed																								
Remarks		<ul style="list-style-type: none"> <li>▪ Maximum settable sampling frequency depends on the audio format.</li> <li>▪ LPCM cannot be turned OFF.</li> <li>▪ This command is valid only if "<b>Resolution</b>" is set to "3" to "46" (Built-in EDID).</li> </ul>																								









@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 " <b>Resolution</b> " 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	@GCT ☐
	Response	@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	@SCT,1,1,0,0 ☐
	Response	@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.

<b>@G&amp;S / @S&amp;S</b>		<b>RS-232C transmission mode</b>
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	@G&S
	Response	@G&S,0
	Description	Getting the RS-232C transmission mode Command mode
Setting example	Command	@S&S,0
	Response	@S&S,0
	Description	Setting the RS-232C transmission mode to Command mode Completed
Remarks		-

<b>@G&amp;&amp; / @S&amp;&amp;</b>		<b>RS-232C sending channel</b>
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	@G&&
	Response	@G&&,2,102
	Description	Getting the RS-232C transmission channel OUT2 and IN2
Setting example	Command	@S&&,2,102
	Response	@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.

<b>@G&amp;R / @S&amp;R</b>		<b>RS-232C receiving channel</b>
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	@G&R 
	Response	@G&R,2,102 
	Description	Getting the RS-232C receiving channel OUT2 and IN2
Setting example	Command	@S&R,2,102 
	Response	@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

<b>@GIP / @SIP</b>		<b>IP address</b>
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.

<b>@GSB / @SSB</b>		<b>Subnet mask</b>
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.

<b>@GLP / @SLP</b>		<b>TCP port number</b>
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	@GLP
	Response	@GLP,1100,0
	Description	Getting the TCP port number 1100; 8 connection setting disabled
Setting example	Command	@SLP,1100,0
	Response	@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.

<b>@GMC</b>		<b>MAC address</b>
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	@GMC
	Response	@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		—

### 3.3.10 Status indication

@GIS		Input signal status (For each channel)																																																				
Getting	Command	@GIS, in, mode [ ]																																																				
	Response	@GIS, in, mode, status_1 (, status_2, status_3, status_4, status_5, status_6) [ ]																																																				
Parameter		<p>in: Input channel 1 to 2 = IN1 to IN2</p> <p>mode: Target status (selected channels only) 0 = All statuses of input signals, 1 = Input mode/Input color depth, 2 = Input resolution/vertical sync frequency, 3 = Input color space, 4 = Audio input/Audio input sampling frequency, 5 = Presence of input HDCP, 6 = Scrambling of input signal</p> <p>status_1: Input mode/Input color depth</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 15%;">Input mode</th> <th style="width: 45%;">Description</th> <th style="width: 15%;">Input color depth</th> <th style="width: 25%;">Description</th> </tr> </thead> <tbody> <tr> <td>d</td> <td>DVI signal, without HDCP</td> <td>24</td> <td>24bit/pixel (8bit/component)</td> </tr> <tr> <td>D</td> <td>DVI signal, with HDCP</td> <td>30</td> <td>30bit/pixel (10bit/component)</td> </tr> <tr> <td>h</td> <td>HDMI signal, without HDCP</td> <td>36</td> <td>36bit/pixel (12bit/component)</td> </tr> <tr> <td>H</td> <td>HDMI signal, with HDCP</td> <td></td> <td></td> </tr> <tr> <td>N</td> <td>No signal is input.</td> <td></td> <td></td> </tr> </tbody> </table> <p>status_2: Input resolution/vertical sync frequency</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 45%;">Example</th> <th style="width: 55%;">Description</th> </tr> </thead> <tbody> <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> </tbody> </table> <p>status_3: Input color space</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;">Value</th> <th style="width: 70%;">Description</th> </tr> </thead> <tbody> <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> </tbody> </table> <p>status_4: Audio input/Audio input sampling frequency</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 45%;">Example</th> <th style="width: 55%;">Description</th> </tr> </thead> <tbody> <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> </tbody> </table>	Input mode	Description	Input color depth	Description	d	DVI signal, without HDCP	24	24bit/pixel (8bit/component)	D	DVI signal, with HDCP	30	30bit/pixel (10bit/component)	h	HDMI signal, without HDCP	36	36bit/pixel (12bit/component)	H	HDMI signal, with HDCP			N	No signal is input.			Example	Description	1920x1080p 59.94Hz	1080p@59.94	1600x1200p 60Hz	UXGA@60	NO SIGNAL	No signal is input.	Value	Description	RGB	RGB input	YCbCr 4:2:2	YCbCr 4:2:2 input	YCbCr 4:4:4	YCbCr 4:4:4 input	YCbCr 4:2:0	YCbCr 4:2:0 input	Example	Description	L-PCM 48kHz	2-channel LPCM 48 kHz	L-PCM 48kHz M	Multi-channel LPCM 48 kHz	COMPRESSED AUDIO	Compressed audio	NO AUDIO	No audio is input
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H	HDMI signal, with HDCP																																																					
N	No signal is input.																																																					
Example	Description																																																					
1920x1080p 59.94Hz	1080p@59.94																																																					
1600x1200p 60Hz	UXGA@60																																																					
NO SIGNAL	No signal is input.																																																					
Value	Description																																																					
RGB	RGB input																																																					
YCbCr 4:2:2	YCbCr 4:2:2 input																																																					
YCbCr 4:4:4	YCbCr 4:4:4 input																																																					
YCbCr 4:2:0	YCbCr 4:2:0 input																																																					
Example	Description																																																					
L-PCM 48kHz	2-channel LPCM 48 kHz																																																					
L-PCM 48kHz M	Multi-channel LPCM 48 kHz																																																					
COMPRESSED AUDIO	Compressed audio																																																					
NO AUDIO	No audio is input																																																					

@GIS		Input signal status (For each channel) (Cont'd)												
Parameter		status_5: Presence of input HDCP												
		<table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <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> </tbody> </table>	Value	Description	HDCP 1.4	HDCP 1.4 signal	HDCP 2.2	HDCP 2.2 no stream type or undefined signal is input	HDCP 2.2 Type0	HDCP 2.2 stream Type0 signal	HDCP 2.2 Type1	HDCP 2.2 stream Type1 signal	HDCP OFF	No HDCP
Value	Description													
HDCP 1.4	HDCP 1.4 signal													
HDCP 2.2	HDCP 2.2 no stream type or undefined signal is input													
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HDCP 2.2 Type1	HDCP 2.2 stream Type1 signal													
HDCP OFF	No HDCP													
NO SIGNAL	No signal is input.													
		status_6: Scrambling of input signal												
		<table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>SCRAMBLE ON</td> <td>Scrambled</td> </tr> <tr> <td>SCRAMBLE OFF</td> <td>Not scrambled</td> </tr> </tbody> </table>	Value	Description	SCRAMBLE ON	Scrambled	SCRAMBLE OFF	Not scrambled						
Value	Description													
SCRAMBLE ON	Scrambled													
SCRAMBLE OFF	Not scrambled													
Getting example	Command Response	@GIS,1,0 <input type="checkbox"/> @GIS,1,0,H24,1920x1080p 59.94Hz,YCbCr 4:4:4,L-PCM 48kHz,HDCP1.4,SCRAMBLE OFF <input type="checkbox"/>												
	Description	Getting all input signal statuses of INPUT1 - Input mode : HDMI mode - Input color depth : 24bit/pixel (8bit/component) - Input resolution/vertical sync frequency : 1080p59.94Hz - Input color space : YCbCr 4:4:4 - Audio input/Audio input sampling frequency : 2-channel LPCM 48kHz - Presence of input HDCP : HDCP 1.4 - Scrambling of input signal : Not scrambled												
Remarks		—												

@GOS		Output signal status (For each channel)												
Getting	Command	@GOS, out, mode ☐												
	Response	@GOS, out, mode, status_1 (, status_2, status_3, status_4, status_5, status_6, status_7, status_8 ) ☐												
Parameter		out: Output channel 1 to 5 = OUT1 to OUT5												
		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												
		status_1: HDCP of sink device												
		<table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <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> </tbody> </table>	Value	Description	HDCP 2.2 SUPPORT	Device with HDCP 2.2 is connected.	HDCP 1.4 SUPPORT	Device with HDCP 1.4 is connected.	HDCP NOT SUPPORT	Device without HDCP is connected.	HDCP NOT CHECK	HDCP of sink device is not checked.	UNCONNECTED	Sink device is not connected.
		Value	Description											
HDCP 2.2 SUPPORT	Device with HDCP 2.2 is connected.													
HDCP 1.4 SUPPORT	Device with HDCP 1.4 is connected.													
HDCP NOT SUPPORT	Device without HDCP is connected.													
HDCP NOT CHECK	HDCP of sink device is not checked.													
UNCONNECTED	Sink device is not connected.													
status_2: HDCP authentication between the HDC and sink device														
Parameter		<table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <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> </tbody> </table>	Value	Description	HDCP OFF	Signal with HDCP is not input	HDCP OK	Authentication succeeded	HDCP ERROR	Authentication failed	HDCP CHECK NOW	Being encrypted		
		Value	Description											
		HDCP OFF	Signal with HDCP is not input											
		HDCP OK	Authentication succeeded											
		HDCP ERROR	Authentication failed											
HDCP CHECK NOW	Being encrypted													
status_3: HDCP output														
<table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <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> </tbody> </table>	Value	Description	HDCP NON	No HDCP	HDCP1.4	HDCP 1.4 output	HDCP2.2 Type0	HDCP 2.2 Type0 output	HDCP2.2 Type1	HDCP 2.2 Type1 output				
Value	Description													
HDCP NON	No HDCP													
HDCP1.4	HDCP 1.4 output													
HDCP2.2 Type0	HDCP 2.2 Type0 output													
HDCP2.2 Type1	HDCP 2.2 Type1 output													
status_4: HDMI/DVI output														
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Value	Description													
HDMI	HDMI output													
DVI	DVI output													

<b>@GOS</b>		<b>Output signal status (For each channel)</b>																														
Parameter		status_5: Color space output <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <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> </tbody> </table> status_6: Color range output <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>FULL RANGE</td> <td>Full range output</td> </tr> <tr> <td>LIMITED RANGE</td> <td>Limited range output</td> </tr> </tbody> </table> status_7: Color depth output <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <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> </tbody> </table> status_8: Scrambling output <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>SCRAMBLE ON</td> <td>Scrambled</td> </tr> <tr> <td>SCRAMBLE OFF</td> <td>Not scrambled</td> </tr> </tbody> </table>	Value	Description	RGB	RGB output	YCbCr 4:2:2	YCbCr 4:2:2 output	YCbCr 4:4:4	YCbCr 4:4:4 output	YCbCr 4:2:0	YCbCr 4:2:0 output	Value	Description	FULL RANGE	Full range output	LIMITED RANGE	Limited range output	Value	Description	24 BIT COLOR	24bit/pixel (8bit/component) output	30 BIT COLOR	30bit/pixel (10bit/component) output	36 BIT COLOR	36bit/pixel (12bit/component) output	Value	Description	SCRAMBLE ON	Scrambled	SCRAMBLE OFF	Not scrambled
Value	Description																															
RGB	RGB output																															
YCbCr 4:2:2	YCbCr 4:2:2 output																															
YCbCr 4:4:4	YCbCr 4:4:4 output																															
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Value	Description																															
SCRAMBLE ON	Scrambled																															
SCRAMBLE OFF	Not scrambled																															
Getting example	Command Response	@GOS,1,0 <input type="checkbox"/> @GOS,1,0,HDCP 1.4 SUPPORT,HDCP OK,HDCP1.4,HDMI, YCbCr 4:4:4, FULL RANGE,24 BIT COLOR,SCRAMBLE OFF <input type="checkbox"/>																														
	Description	Getting all statuses of OUTPUT1 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																														
Remarks		—																														

@GES		Sink device EDID (For each channel)									
Getting	Command	@GES, out, mode <input type="checkbox"/>									
	Response	@GES, out, mode, status_1 (, status_2, status_3, status_4, status_5, status_6, status_7) <input type="checkbox"/>									
Parameter	out : Output channel 1 to 5 = OUT1 to OUT5										
	mode: Target status 0 = All of 1 to 7, 1 = Monitor 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										
	status_1: Monitor name										
	<table border="1"> <thead> <tr> <th>Example</th> <th>Description</th> </tr> </thead> <tbody> <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> </tbody> </table>		Example	Description	HDC-TR121UHD	A sink device named "HDC-TR121UHD" is connected.	EDID READ ERROR	Sink device EDID recall error	UNCONNECTED	Sink device is not connected.	
Example	Description										
HDC-TR121UHD	A sink device named "HDC-TR121UHD" is connected.										
EDID READ ERROR	Sink device EDID recall error										
UNCONNECTED	Sink device is not connected.										
status_2: Resolution/Dot clock											
<table border="1"> <thead> <tr> <th>Example</th> <th>Description</th> </tr> </thead> <tbody> <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> </tbody> </table>		Example	Description	1920x1080p 148.50MHz	A sink device supporting 1920x1080 (resolution) and 148.50 MHz (dot clock) is connected.	EDID READ ERROR	Sink device EDID recall error	UNCONNECTED	Sink device is not connected.		
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1920x1080p 148.50MHz	A sink device supporting 1920x1080 (resolution) and 148.50 MHz (dot clock) is connected.										
EDID READ ERROR	Sink device EDID recall error										
UNCONNECTED	Sink device is not connected.										
status_3: HDMI mode/Color space/Color depth											
<table border="1"> <thead> <tr> <th>Example</th> <th>Description</th> </tr> </thead> <tbody> <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> </tbody> </table>		Example	Description	DVI	A sink device that does not support HDMI signal is connected.	HDMI- RGB/YCbCr422/ YCbCr444-24/30BIT COLOR	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.	EDID READ ERROR	Sink device EDID recall error	UNCONNECTED	Sink device is not connected.
Example	Description										
DVI	A sink device that does not support HDMI signal is connected.										
HDMI- RGB/YCbCr422/ YCbCr444-24/30BIT COLOR	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.										
EDID READ ERROR	Sink device EDID recall error										
UNCONNECTED	Sink device is not connected.										







@GES	Sink device EDID (For each channel) (Cont'd)										
Parameter	<p>status_4: Audio format/Sampling frequency/Bit length/ The number of channels/Compressed audio</p> <table border="1" data-bbox="416 347 1310 786"> <thead> <tr> <th>Example</th> <th>Description</th> </tr> </thead> <tbody> <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> </tbody> </table>	Example	Description	AUDIO NOT SUPPORT	A sink device that does not support audio signal is connected.	LINEAR PCM -32/44.1/48kHz -16/20/24BIT -8CHANNEL	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.	EDID READ ERROR	Sink device EDID recall error	UNCONNECTED	Sink device is not connected.
Example	Description										
AUDIO NOT SUPPORT	A sink device that does not support audio signal is connected.										
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EDID READ ERROR	Sink device EDID recall error										
UNCONNECTED	Sink device is not connected.										
	<p>status_5: SCDC</p> <table border="1" data-bbox="416 902 1310 1106"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <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> </tbody> </table>	Value	Description	SCDC SUPPORT	SCDC supported.	SCDC NOT SUPPORT	SCDC is not supported.	EDID READ ERROR	Sink device EDID recall error	UNCONNECTED	Sink device is not connected.
Value	Description										
SCDC SUPPORT	SCDC supported.										
SCDC NOT SUPPORT	SCDC is not supported.										
EDID READ ERROR	Sink device EDID recall error										
UNCONNECTED	Sink device is not connected.										
	<p>status_6: HDR</p> <table border="1" data-bbox="416 1225 1310 1429"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <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> </tbody> </table>	Value	Description	HDR SUPPORT	HDR supported.	HDR NOT SUPPORT	HDR is not supported.	EDID READ ERROR	Sink device EDID recall error	UNCONNECTED	Sink device is not connected.
Value	Description										
HDR SUPPORT	HDR supported.										
HDR NOT SUPPORT	HDR is not supported.										
EDID READ ERROR	Sink device EDID recall error										
UNCONNECTED	Sink device is not connected.										
	<p>status_7: 3D</p> <table border="1" data-bbox="416 1547 1310 1751"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <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> </tbody> </table>	Value	Description	3D SUPPORT	3D supported.	3D NOT SUPPORT	3D is not supported.	EDID READ ERROR	Sink device EDID recall error	UNCONNECTED	Sink device is not connected.
Value	Description										
3D SUPPORT	3D supported.										
3D NOT SUPPORT	3D is not supported.										
EDID READ ERROR	Sink device EDID recall error										
UNCONNECTED	Sink device is not connected.										

@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 - Monitor 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		—

<b>@GHC</b>		<b>System status</b>
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		—

<b>@GPS</b>		<b>Power voltage</b>
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	@GPS ↵
	Response	@GPS,12210,0 ↵
	Description	Getting the power voltage Voltage: 12.210 V; status: Normal
Remarks		—

<b>@GST</b>		<b>Internal temperature</b>
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	@GST ↵
	Response	@GST,3425,0 ↵
	Description	Getting the internal temperature Temperature: 34.25°C; status: Normal
Remarks		—

<b>@GIV</b>		<b>Version</b>
Getting	Command	@GIV 
	Response	@GIV, id, version 
Parameter		id : Model number
		version : Firmware version
Getting example	Command	@GIV 
	Response	@GIV,HDC-TR121UHD,1.00R0 
	Description	Getting the product information Model number: HDC-TR121UHD; Firmware version: 1.00R0
Remarks		—

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## User Guide (Command Guide) of HDC-UHD Series

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