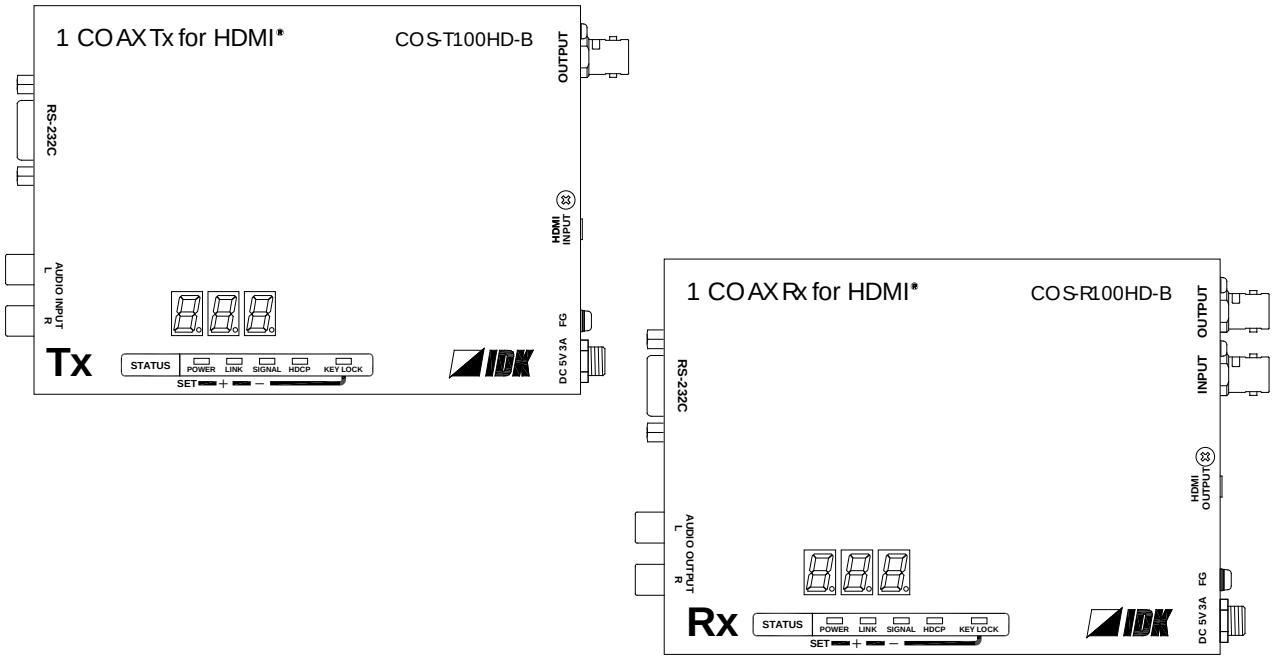
HDMI Coaxial Cable Extender

COS-100HD-B

<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 reference as needed.

IDK Corporation

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Before reading this manual

- Some of the contents in this Command guide such as appearance diagrams, menu operations, communication commands, and so on may differ depending on the version of the product.
- 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.

Table of Contents

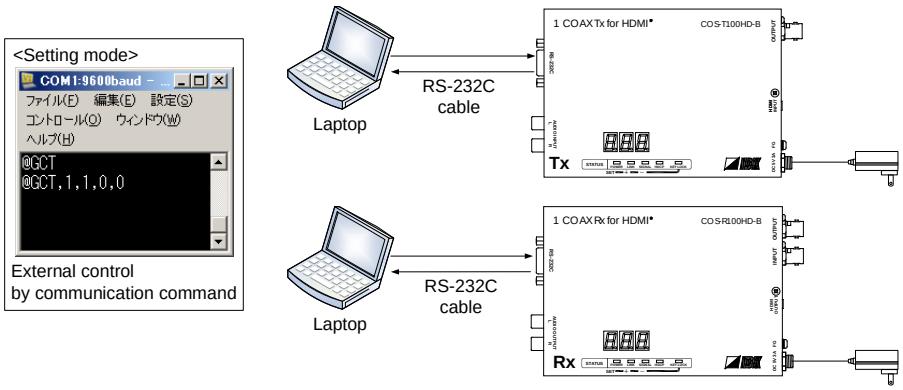
1 About this Guide

This guide explains how to control the COS using commands through RS-232C communication and transmit RS-232C data between TX and RX.

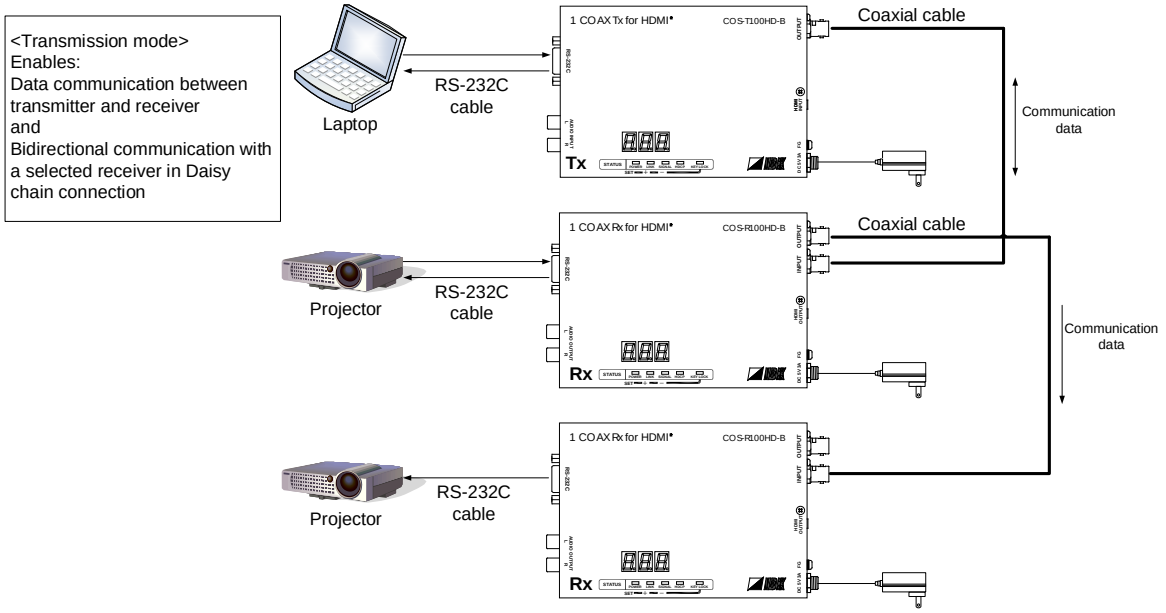
There are two modes
“Setting mode” : For controlling transmitter or receiver from external device
“Transmission mode” : For data communication between transmitter and receiver
The setting procedure is common to both transmitter and receiver.

Use appropriate RS-232C cable for connected devices.

【See: 5 Connecting RS-232C】



[Fig. 1.1] Setting mode



[Fig. 1.2] Transmission mode

2 Command outline

A command consists of “@” (“40” in hexadecimal), 3 one-byte alphabetical characters (upper and lower cases), and parameters (one-byte numbers*). For some commands, several parameters can be specified or no parameter is required. Processing is executed by sending a delimiter at the end of the command.

Example: @S*S, 1 ↵

“,”(a comma, “2C” in hexadecimal) is indicated between a command and parameter and between two parameters.

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

Example: @S*S, 10 ↵
@ERR, 1 ↵

If only delimiter ↵ is sent, the command list will be returned.

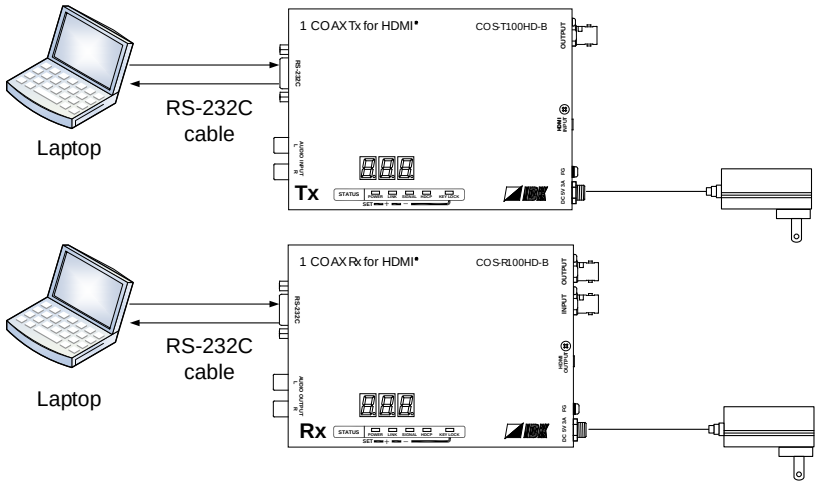
Example: ↵
---------- HELP (1/2) ----------
(Com Port Setting Command)
@SCT / @GCT: Set/Get RS-232C Interface

(OTHERS Command)
@GIV: Get ID & Version
@GIS: Get Input Status
---

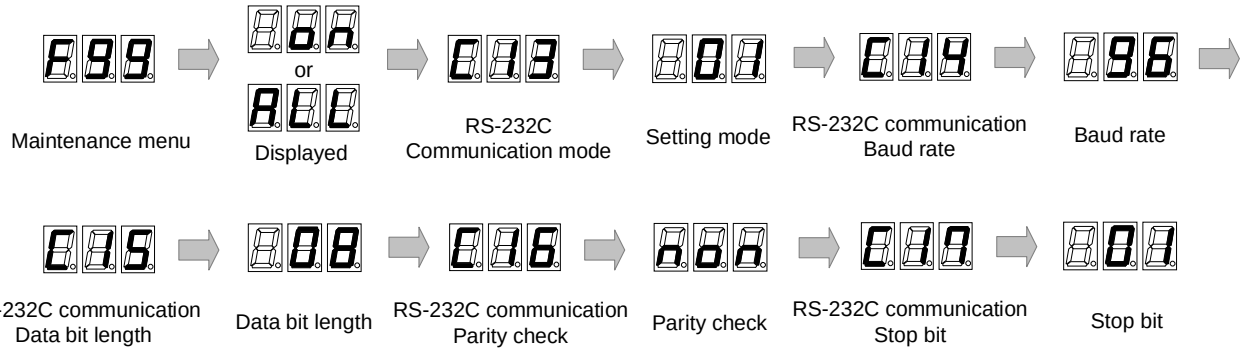
3 “Setting mode”

The “Setting mode” is for controlling the transmitter or receiver from external devices using RS-232C communication. You can set the transmitter or receiver and check the I/O status using commands.

3.1 Controlling transmitter or receiver



● “Setting mode” and RS-232C communication



[Fig. 3.1] Setting mode

■ **To enable “Setting mode”**

1	Place control device, transmitter or receiver, and then connect them using an RS-232C cable.
2	Power on each device.
3	Set the RS-232C communication mode of the transmitter and receiver to “Setting mode”.[*1] Set [F99] (Maintenance/Status display menu) to “on” or “ALL” (Always displayed). Set [C13] (RS-232C communication mode) to “01” (setting mode).
4	Set the RS-232C communication settings between transmitter and receiver.[*2] Set “[C14]” (RS-232C communication baud rate) depending on the control device. Set “[C15]” (RS-232C communication data bit) depending on the control device. Set “[C16]” (RS-232C communication parity check) depending on the control device. Set “[C17]” (RS-232C communication stop bit) depending on the control device.
5	Execute the desired command. 【See: 3.3 Detailed descriptions】
6	Set “[F99]” (Maintenance/Status display menu) to “oFF” (Not displayed) as needed.

[*1] If the RS-232C communication settings between control device and transmitter/receiver are set correctly, the RS-232C communication mode can be set using (@S*S) command.

【See: @S*S】

[*2] If the RS-232C communication settings between control device and transmitter/receiver are set correctly, the RS-232C communication can be set using (@SCT) command. If changing RS-232C communication setting, change the control device setting.

【See: @SCT / @GCT】

3.2 Command list

Command to transmitter and receiver

Transmitter

Receiver

3.3 Detailed descriptions

3.3.1 Command to transmitter and receiver

@ERR	**Error status**	
Function	Getting	
Format	Return value only	
Return value	@ERR, error ↵	
Parameter	error: Error status 1 = Erroneous parameter format or value 2 = Undefined command or wrong format	
Example	GIV ↵ @ERR, 2 ↵	@GIV is sent. Command format error
Remarks	―	

@GIV	**Version**	
Function	Getting	
Format	@GIV ↵	
Return value	@GIV, id, firm, hard ↵	
Parameter	id : Model number firm : Firmware version hard : Hardware version	
Example	@GIV↵ @GIV, COS-T100HD-B, 1.00, 1.00 ↵	Getting the version information Firmware version : 1.00 Hardware version : 1.00
Remarks	―	

@SCT / @GCT	**RS-232C communication**	
Function	Getting	Setting
Format	@GCT ↵	@SCT, bps, length, parity, stop ↵
Return value	@GCT, bps, length, parity, stop ↵	@SCT, bps, length, parity, stop ↵
Parameter	bps: baud rate 0 = 4800 bps, 1 = 9600 bps [Default], 2 = 19200 bps, 3 = 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	
Example	@GCT ↵ @GCT, 1, 1, 0, 0 ↵	Getting communication settings of RS-232Cs - Baud rate : 9600 [bps] - Data bit length : 8 [bit] - Parity check : NONE - Stop bit : 1 [bit] Completed
	@SCT, 1, 1, 0, 0 ↵ @SCT, 1, 1, 0, 0 ↵	Setting communication settings of RS-232Cs as follows: - Baud rate : 9600 [bps] - Data bit length : 8 [bit] - Parity check : NONE - Stop bit : 1 [bit] Completed
Remarks	If RS-232C communication setting is changed, the communication may be disabled. Change the environmental settings based on the transmitter or receiver settings. Common to transmission and setting modes	

@S*S	**RS-232C communication mode**	
Function	Setting	
Format	@S*S, mode ↵	
Return value	@S*S, mode ↵	
Parameter	mode: RS-232C communication mode setting 0 = Transmission mode [Default], 1 = Setting mode	
Example	@S*S, 1 ↵ @S*S, 1 ↵	Setting to the RS-232C setting mode Completed
	@S*S, 0 ↵ @S*S, 0 ↵	Setting to the RS-232C transmission mode Completed
Remarks		

3.3.2 Transmitter

<table>
<tr><td>@GIS</td><td colspan="2">Input signal status</td></tr>
<tr><td>Function</td><td colspan="2">Getting</td></tr>
<tr><td>Format</td><td colspan="2">@GIS, mode ↵</td></tr>
<tr><td>Return value</td><td colspan="2">@GIS, mode, status_1 (, status_2, status_3) ↵</td></tr>
<tr><td>Parameter</td><td colspan="2">mode: Getting status
0 = All statuses of input signals
1 = Input mode/Input color depth
2 = Input resolution/Input video frequency
3 = Digital audio input format/Digital audio input sampling frequency

status_1: Input mode/Input color depth
<table>
<tr><th>Input mode</th><th>Description</th></tr>
<tr><td>d</td><td>DVI mode, without HDCP</td></tr>
<tr><td>D</td><td>DVI mode, with HDCP</td></tr>
<tr><td>h</td><td>HDMI mode, without HDCP</td></tr>
<tr><td>H</td><td>HDMI mode, 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>08</td><td>24 bit/pixel (8 bit/component)</td></tr>
<tr><td>10</td><td>30 bit/pixel (10 bit/component)</td></tr>
<tr><td>12</td><td>36 bit/pixel (12 bit/component)</td></tr>
</table>

status_2: Input resolution/Input video frequency
<table>
<tr><th>Reply example</th><th>Description</th></tr>
<tr><td>1920x1080p 59.94Hz</td><td>1080p 59.94 Hz</td></tr>
<tr><td>1600x1200p 60.00Hz</td><td>UXGA 60 Hz</td></tr>
<tr><td>NO SIGNAL</td><td>No signal is input.</td></tr>
</table>

status_3: Digital audio input format/Digital audio input sampling frequency
<table>
<tr><th>Reply example</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. (e.g. DVI mode)</td></tr>
<tr><td>NO SIGNAL</td><td>No signal is input.</td></tr>
</table></td></tr>
<tr><td>Example</td><td>@GIS, 0 ↵
@GIS, 0, H08, 1920x1080p 59.94Hz, L-PCM 48kHz ↵</td><td>Getting all input statuses.
Input status: HDMI mode, with HDCP;
Color depth: 24 bit/pixel (8 bit/component);
Input resolution: 1080p 59.94 Hz;
Digital audio input status:
2-channel LPCM 48 kHz;
Digital audio input sampling frequency:
48 kHz</td></tr>
<tr><td>Remarks</td><td colspan="2">—</td></tr>
</table>

@S / @G****	**RS-232C communication: Destination ID**	
Function	Getting	Setting
Format	@G** ↵	@S**, ID1 (, ID2, ・・・ID15) ↵
Return value	@G**, ID1 (, ID2, ・・・ID15) ↵	@S**, ID1 (, ID2, ・・・ID15) ↵
Parameter	ID1 to ID15: Destination ID 0 = To all receivers [Default] 1 to 15 = To specified receivers	
Example	@G** ↵ @G**, 1, 2, 3 ↵	Getting Destination IDs “1”, “2”, and “3”
	@S**, 1, 2, 3 ↵ @S**, 1, 2, 3 ↵	Setting destination ID to “1”, “2”, and “3” Completed
Remarks	【See: RS-232C communication: Receiver ID】	

@S*R / @G*R	**RS-232C communication: Bidirectional enabled ID**	
Function	Getting	Setting
Format	@G*R ↵	@S*R, ID ↵
Return value	@G*R, ID ↵	@S*R, ID ↵
Parameter	ID: Bidirectional enabled ID 0 to 15 = From a specified receiver [Default] 0	
Example	@G*R ↵ @G*R, 0 ↵	Getting Bidirectional enabled ID Set Bidirectional enabled ID is “0”
	@S*R, 1 ↵ @S*R, 1 ↵	Setting Bidirectional enabled ID to “1” Completed
Remarks	“ID” is set to “0” by default. With the default setting, data can be received from the receiver that is closest to the transmitter. To transmit data to a specific receiver, set “ID” to a value other than “0”. 【See: RS-232C communication: Receiver ID】	

3.3.3 Receiver

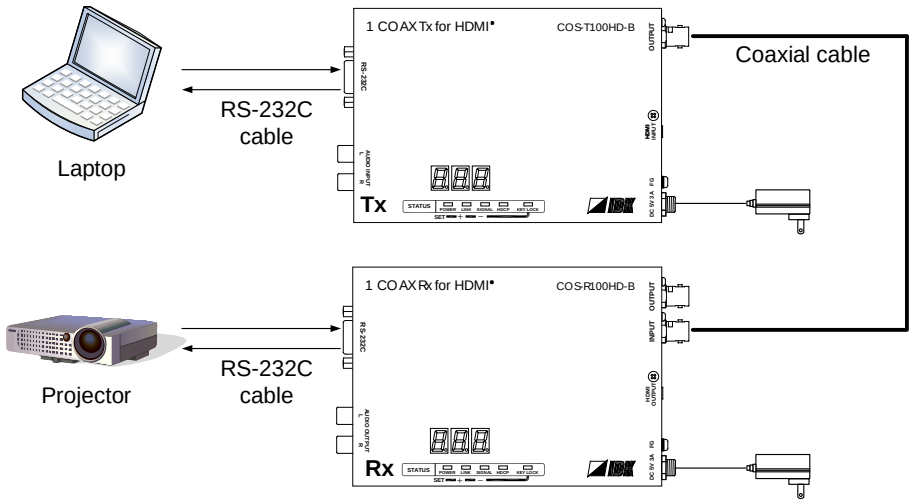
@GOS	**Sink device status**	
Function	Getting	
Format	@GOS, mode ↵	
Return value	@GOS, mode, status_1 (, status_2) ↵	
Parameter	mode: Getting status 0 = All statuses of sink device, 1 = HDCP of sink device, 2 = HDCP authentication between the COS and sink device status_1: HDCP of sink device Reply example / Description HDCP SUPPORT / Device with HDCP is connected. HDCP NOT SUPPORT / Device without HDCP is connected. UNCONNECTED / Sink device is not connected. status_2: HDCP authentication between the COS and sink device Reply example / Description HDCP OFF / Device with HDCP is not input or sink device without HDCP is connected. HDCP OK / Authentication succeeded HDCP ERROR / Authentication failed HDCP CHECK NOW / Being authentication processing	
Example	@GOS, 0 ↵ @GOS, 0, HDCP SUPPORT, HDCP OK ↵	Getting all statuses of sink device Sink device with HDCP is connected and HDCP authentication completed.
Remarks	—	

@S*I / @G*I	**RS-232C communication: Receiver ID**	
Function	Getting	Setting
Format	@G*I ↵	@S*I, ID ↵
Return value	@G*I, ID ↵	@S*I, ID ↵
Parameter	ID: Receiver ID 0 to 15 = Receiver ID [Default] 0	
Example	@G*I ↵ @G*I, 0 ↵	Getting the Receiver ID “0”
	@S*I, 0 ↵ @S*I, 0 ↵	Setting Receiver ID to “0” Completed
Remarks	“ID” is set to “0” by default. With the default setting, all receivers can receive data from the transmitter, and data can be received only from the receiver that is closest to the transmitter. To transmit data to a specific receiver, set the Receiver ID to a value other than “0” and set the Destination ID and Bidirectional enabled ID to the Receiver ID. 【See: RS-232C communication: Destination ID】 【See: RS-232C communication: Bidirectional enabled ID】	

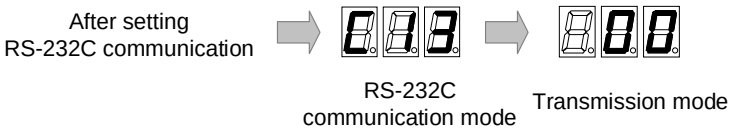
4 “Transmission mode”

The Daisy Chain connection enables simultaneous transmission to all receivers and bidirectional communication with a specific receiver.

4.1 Transmitting data between transmitter and receiver



● Setting transmission mode



[Fig. 4.1] Transmission mode

■ **To enable “Transmission mode”**

1	Place control device, transmitter and receiver, external device and then connect them using an RS-232C cable.
2	Power on each device.
3	Enable “Setting mode” of the transmitter and receiver and set the RS-232C communication. For RS-232C communication, see the “**3.1 Controlling transmitter or receiver**”.
4	Set the RS-232C communication mode of the transmitter and receiver to “Transmission mode”.* Set [F99] (Maintenance/Status display menu) to “on” or “ALL” (Always displayed). Set [C13] (RS-232C communication mode) to “00” (transmission mode).
5	Set “[F99]” (Maintenance/Status display menu) to “oFF” (Not displayed) as needed.

* If the RS-232C communication settings between control device and transmitter/receiver are set correctly, the RS-232C communication mode can be set using (@S*S) command.

【See: @S*S】

4.2 Command list

If transmitter or receiver is set to “Transmitter mode”, only (@S*S) is available.

Command to transmitter and receiver

Command	Function	Page
@S*S	RS-232C communication mode	17

4.3 Detailed descriptions

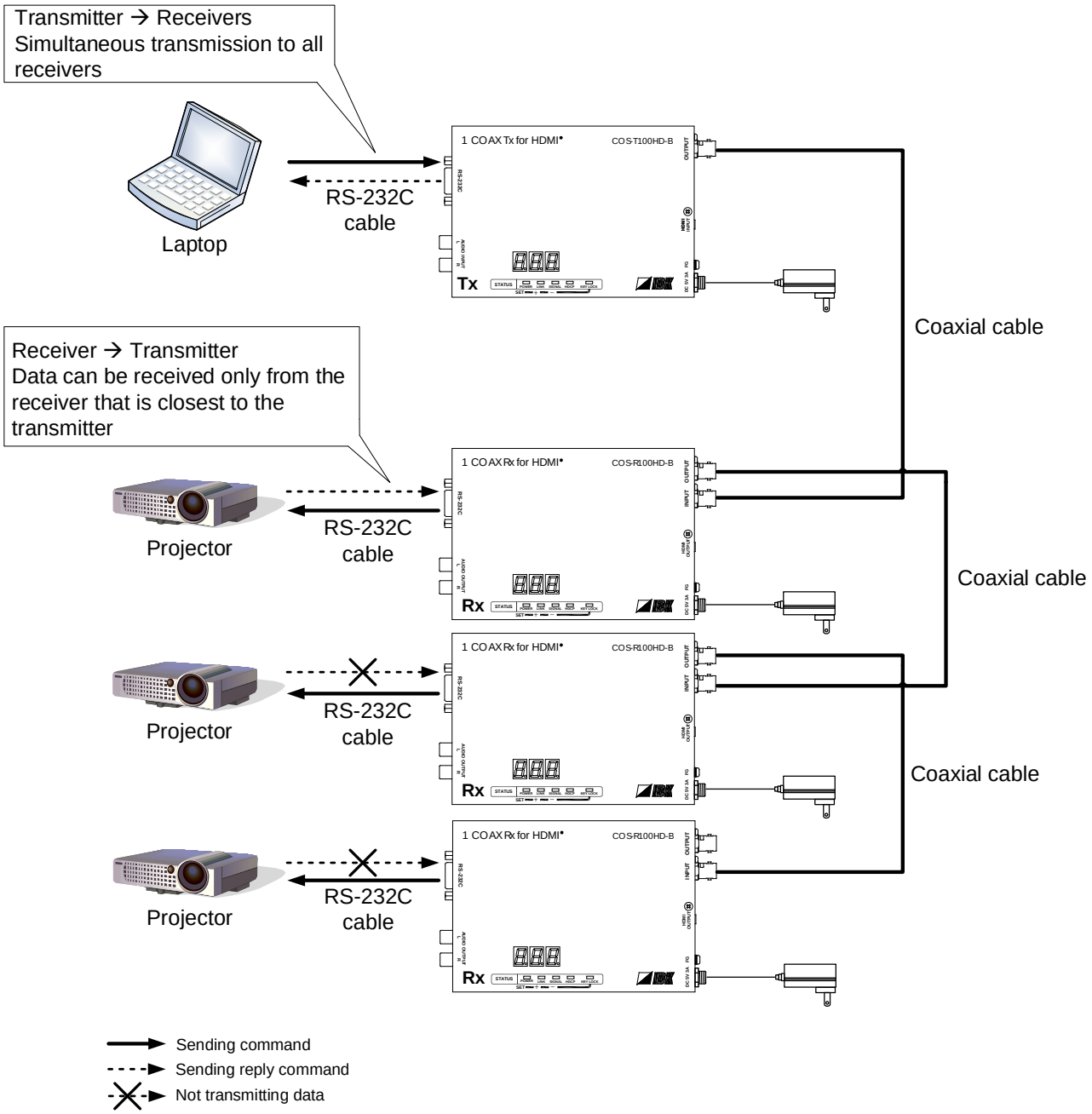
4.3.1 Command to transmitter and receiver

@S*S	**RS-232C communication mode**	
Function	Setting	
Format	@S*S, mode ↵	
Return value	@S*S, mode ↵	
Parameter	mode: RS-232C communication mode setting 0 = Transmission mode [Default], 1 = Setting mode	
Example	@S*S, 1 ↵ @S*S, 1 ↵	Setting to the RS-232C setting mode Completed
	@S*S, 0 ↵ @S*S, 0 ↵	Setting to the RS-232C transmission mode Completed
Remarks		

4.4 Daisy Chain connection

■ Default settings

The Destination ID, Bidirectional enabled ID, and Receiver ID are set to “0” by default.
Data can be transmitted from a transmitter to all receivers; data can be received only from the receiver that is closest to the transmitter.



[Fig. 4.2] Daisy Chain connection (by default)

Note:

Data cannot be transmitted from multiple receivers.

■ Data transmission with specific receiver

Enable “Setting mode” of the transmitter and receiver and set Destination ID, Bidirectional enabled ID, and Receiver ID.

【See: 3 “Setting mode】
【See: RS-232C communication: Destination ID】
【See: RS-232C communication: Bidirectional enabled ID】
【See: RS-232C communication: Receiver ID】

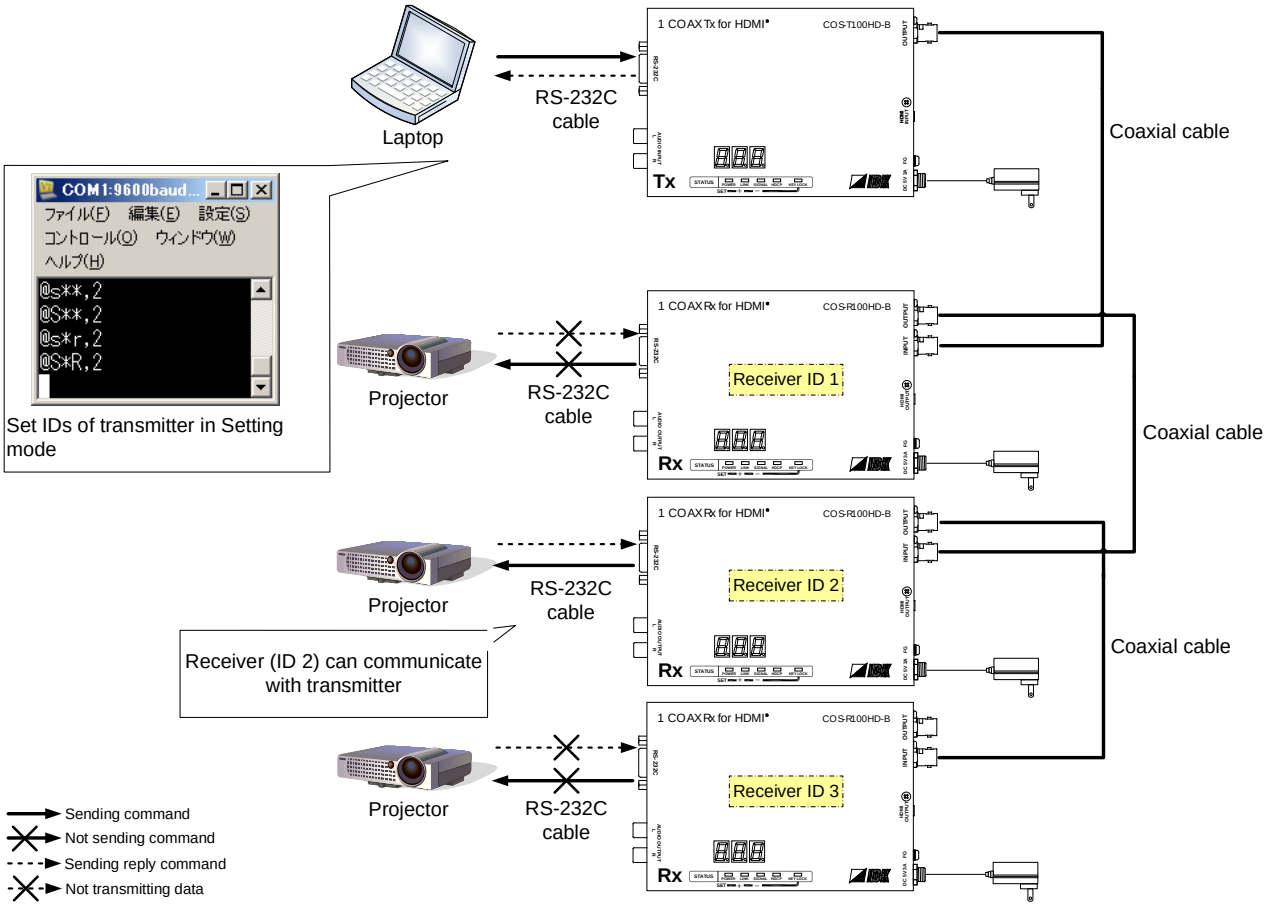
Application example for Daisy Chain connection

Destination ID: 2

Bidirectional enabled ID: 2

Receiver ID: 1, 2, 3 order of vicinity of transmitter

In this case, the transmitter and Receiver 2 can be communicated.



● COS-R100HD-B (Receiver)
Set Receiver ID in Setting mode

RS-232C Receiver ID → Receiver ID

[Fig. 4.3] Data transmission with specific receiver

■ **To enable "Data transmission with specific receiver"**

1	Connect a control device and the transmitter, the receiver and a peripheral device over an RS-232C cable, respectively.
2	Power on each device.
3	Set the RS-232C communication mode of the transmitter and receiver to "Setting mode" and set the RS-232C communication. For RS-232C communication, see the "**3.1 Controlling transmitter or receiver**"
4	Set the Receiver ID. [*1] Set "[C18]" (RS-232C communication Receiver ID setting) to "01 to 15". [*2]
5	Set the Destination ID and Bidirectional enabled ID. Set the Destination ID using (@S**) command from the transmitter and control device connected RS-232C. Set the Bidirectional enabled ID using (@S*R) command from the transmitter and control device connected RS-232C.
6	Set the RS-232C communication mode of the transmitter and receiver to "Transmission mode". [*3] Set [F99] (Maintenance/Status display menu) to "on" or "ALL" (Always displayed). Set [C13] (RS-232C communication mode) to "00" (transmission mode).
7	Set "[F99]" (Maintenance/Status display menu) to "oFF" (Not displayed) as needed.

[*1] If the RS-232C communication settings between control device and transmitter/receiver are set correctly, the Receiver ID can be set using (@S*I) command.

【See: @S*I / @G*I】

[*2] Receiver ID "0" cannot be used. Set all Receiver IDs to values other than "0".
If the same Receiver ID is set to multiple receivers, data can be sent from the transmitter to all specified receiver. Data can be received only from the receiver that is closest to the transmitter.

[*3] If the RS-232C communication settings between control device and transmitter/receiver are set correctly, the RS-232C communication mode can be set using (@S*S) command.

【See: @S*S】

4.5 Notes

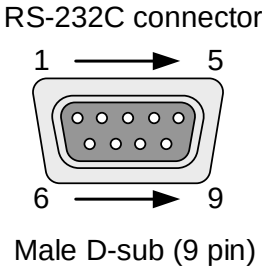
- Up to 4K-byte RS-232C data can be output at a time. The data is temporarily saved in the 4-byte memory in order to send the data even if baud rates of the transmitter and receiver are not the same.
  Ensure the data size that is sent at a time is less than 4K byte; otherwise the data may not be sent correctly.

- Transmission from receiver to transmitter takes 100 ms at maximum, and vice versa.

- For Daisy Chain connection, up to 10 ms time laps occurs between receivers.

5 Connecting RS-232C

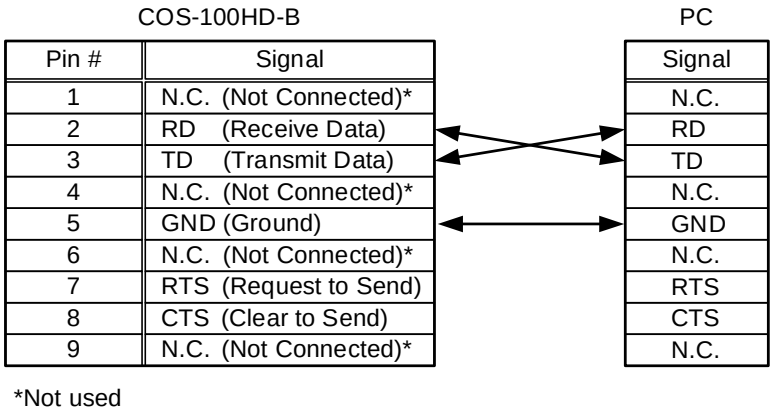
Pin assignment of the RS-232C connector is as follows.



[Fig. 5.1] Specification of RS-232C connector

■ Connecting COS-100HD-B to PC

Use a cross cable to connect the COS-100HD-B to a PC.

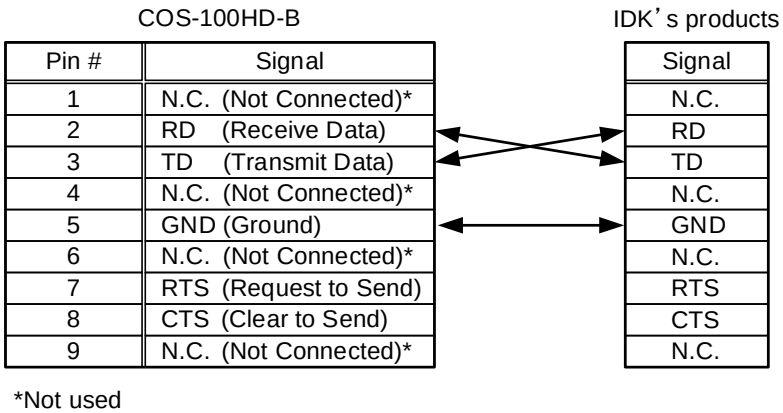


*Not used

[Fig. 5.2] RS-232C pin assignment (connecting to PC)

■ Connecting COS-100HD-B to IDK's products

Use a cross cable to connect the COS-100HD-B to an IDK's product.

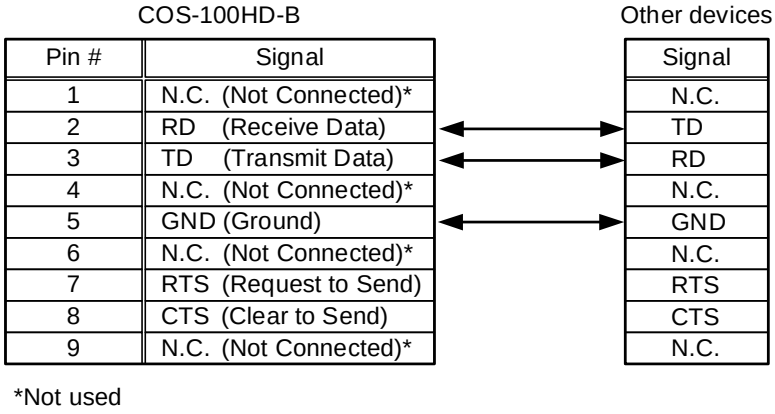


*Not used

[Fig. 5.3] RS-232C pin assignment (connecting to IDK's product)

■ **Connecting COS-100HD-B to another device requiring straight connection**

Use a straight cable to connect the COS-100HD-B to other devices requesting straight connection.



*Not used

[Fig. 5.4] RS-232C pin assignment (connecting to device requiring straight connection)

6 RS-232C communication specification

[Table 6.1] RS-232C specification

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

User Guide (Command Guide) of COS-100HD-B

Ver.1.0.0

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Headquarters IDK Corporation
7-9-1 Chuo, Yamato-shi, Kanagawa-pref.
242-0021 JAPAN
TEL: +81-46-200-0764 FAX: +81-46-200-0765
Email: idk_eng@idk.co.jp URL: http://www.idkav.com

USA IDK America Inc.
72 Grays Bridge Road Suite 1-C, Brookfield, CT 06804
TEL: +1-203-204-2445
Email: sales@idkav.com URL: http://www.idkav.com

Europe IDK Europe GmbH
Lise-Meitner-Str. 6, D-40878 Ratingen
TEL: +49-2102-578-301-0
Email: info@idkav.eu URL: http://www.idkav.com

Product information Arvanics Corporation
Support 7-9-1 Chuo, Yamato-shi, Kanagawa-pref.
242-0021 JAPAN
TEL: +81-46-259-6920 FAX: +81-46-259-6930
Email: info@arvanics.com URL: http://www.arvanics.com