SONY®

RS-232C PROTOCOL MANUAL

For Professional BRAVIA
EX/HX/W8/W6/X8/X9

1. Serial communication protocol

Serial communication protocol is designed to work in conjunction with external host by RS-232C

1.1 Sub microcomputer settings

The port used for RS-232C communication is the following terminal. Level is changed by RS-232C transceiver IC on small board for service. Hence communication to external host is achieved

Table 1-1 Hotel specification control pin

Item	Pin	Use	Function Description	Note
rs232_rxd	*	UART	Receiving data	
rs232_txd	*	UART	Sending data	

* Pin must be referred to Pin assign spec.

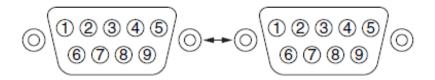## 1.2 RS-232C communication specification

1.2.1 Communication parameter

Communication related specification is defined as follows

Table 1-2-1 Communication parameter

Item	Specification
Communication Method	RS-232C
Synchronous Method	Asynchronous Communication
Bit Rate	9600bps
No. of character	8bits
parity	n/a
Start bit	1bit
Stop bit	1bit
Flow control	n/a

1.2.2 Pin Configuration

Display side (D-sub 9-pin male)   Host side (D-sub 9-pin)

① ② ③ ④ ⑤
⑥ ⑦ ⑧ ⑨

① ② ③ ④ ⑤
⑥ ⑦ ⑧ ⑨

– External view –   – External view –

Pin No.	Signal		Pin No.	Signal
1	NC		1	NC
2	RD		2	RD
3	TD		3	TD
4	NC		4	NC
5	GND		5	GND
6	NC		6	NC
7	NC		7	NC
8	NC		8	NC
9	NC		9	NC

1.2.3 Communication basis

1. Send control command after 20 seconds or more of power on.
2. Strictly keep to send next command after receiving answer response from Display.
3. Set the command interval to 500ms or more. (When you use CBX-H10/H11, please set it to 700ms or more)
4. Value range for direct command is same as user can change by menu.
5. When set is at standby mode, only receives Power ON or Power Enquiry command.
6. To turn on the set, first set standby command as Enable. After this, the set can receive Power ON command.

1.2.4 Communication data format

Communication data format related specification is defined as follows.
TV can support Enquiry Command for corresponding command.

(1) Control (write request from host to display)

Table 1-2-2 Write request for Control (host to display)

No.	Item	Value
1	Header	0x8C : Control
2	Category	0x00 (fixed)
3	Function	0xXX
4	Length	0xXX (= X + 1 byte)
5	Data1	0xXX
:	:	0xXX
:	:	0xXX
X+4	Data X	0xXX
X+5	Check Sum	0xXX

* Length : Total Length from Data1 to Check Sum.
* Check Sum : Total sum from #1 to #X+4. If it is over 255(1 byte), last 1 byte of data is used.

(2) Read request for Enquiry (host to display)

Table 1-2-3 Read request for Enquiry（host to display）

No.	Item	Value
1	Header	0x83 : Enquiry
2	Category	0x00 (fixed)
3	Function	0xXX
4	Data1	0xFF (fixed)
5	Data2	0xFF (fixed)
6	Check Sum	0xXX

* Check Sum : Total sum from #1 to #5. If it is over 255(1 byte), last 1 byte of data is used

(3) Reply to Answer (display to host)

(3)-1. Answer on control request

Table 1-2-4 Answer on Control request

No.	Item	Value
1	Header	0x70 : Answer
2	Answer*	0x00 : Completed (Normal End)
		0x01 : Limit Over (Abnormal End – over max value)
		0x02 : Limit Over (Abnormal End – under min value)
		0x03 : Command Canceled (Abnormal End)
		0x04 : Parse Error (Data Format Error)
3	Check Sum	0Xxx

* 0x00：Completed   packet is received normally and process is completed normally
  0x01：Limit Over   packet is received normally but the data value exceeds the upper limit
  0x02：Limit Over   packet is received normally but the data value exceeds the lower limit
  0x03：Command Canceled   packet is received normally but either the data is incorrect or
                              request is not acceptable in current host value
  0x04：Parse Error   Packet is not received properly (undefined format data) or Check sum error.
                              But it will be returned "Limit over"(0x01 or 0x02) in the case.
  * Check Sum： Total sum from #1 to #2. If it is over of 255(1 byte), last 1 byte of data is used

(3)-2. Answer on Enquiry request (Normal End)

Table 1-2-5 Answer on Enquiry request （Normal End）

No.	Item	Value
1	Header	0x70：Answer
2	Answer	0x00：Completed 0x01: Reserved 0x02: Reserved (0x03: Command Canceled) (0x04: Parse Error (Data Format Error))
3	Return Data Size	0xXX (= X + 1 byte)
4	Return Data1	0xXX
:	:	0xXX
:	:	0xXX
X+3	Return Data X	0xXX
X+4	Check Sum	0xXX

* 0x00：Completed   packet is received normally and processing is completed normally
* 0x03：Command Canceled
    The demand has not been permitted in a present host though the packet was normally received.
    (See (3)-3)
* 0x04：Parse Error
    The packet cannot be normally received or the data not defined is received or the CheckSum error. (See (3)-3)

*Return Data Size： Total Length between Return Data1 to Check Sum.
* Return Data returns the read value
* Check Sum：Total sum from #1 to #X+3. If it is over 255(1 byte), last 1 byte of data is used.

(3)-3. Answer on Enquiry (Abnormal End)

Table 1-2-6 Answer on Enquiry request (Abnormal End)

No.	Item	Value
1	Header	0x70：Answer
2	Answer*	0x03：Command Canceled 0x04：Parse Error (Data Format Error)
3	Check Sum	0xXX

* 0x03: Command Canceled   Packet is received normally but request is not allowed at current host
status.
* Check Sum： Total sum of #1 and #2. If it exceeds the value of 255(1 byte), last 1 byte of data is used.

2. Corresponding command

For corresponding commands, refer to the command list.

[a] Function			Command				[b]Length (Include CheckSum)	[c] Range/Switch Code						
	Syntax	Code	Control	Enquiry	Standby	Power On		byte0: Syntax	Code	byte1: Syntax	Code	byte2-n: Syntax&code		Detail
Mode Control	Power	0x00	yes	yes	Enable	Enable	0x02	OFF	0x00					OFF is always Enable ON is always Enable once after Standby Command(0x02) Enable(0x01) is issued
							0x02	ON	0x01					
	Standby Command	0x01	yes	no	Disable	Enable	0x02	Disable	0x00					Default
							0x02	Enable	0x01					**Please set Enable, when you use RS232C command.**
	Input Select	0x02	yes	Yes	Disable	Enable	0x02	Toggle	0x00					select input same as RC
							0x02	TV	0x01	Program No. (only used for	0xnn			select last TV channel
							0x03	Video / SCART	0x02					values which are supported is defined as for each regional spec.
										#1	0x01			
										#2	0x02			
										#3	0x03			
							0x03	Component	0x03					When shared terminal is used, Shared Input is chosen.
										#1	0x01			
										#2	0x02			
							0x03	HDMI	0x04					
										#1	0x01			
										#2	0x02			
										#3	0x03			
										#4	0x04			
							0x03	PC	0x05					
										#1	0x01			
							0x03	Shared Input	0x07					
										#1	0x01			
	Program Select	0x04	yes	yes	Disable	Enable	0x03	UpDown	0x00	Up	0x00			select program(channel) same as RC control.
										Down	0x01			
							0x0d	Direct	0x01	Terr Digital	0x01	byte2-byte11 (10 byte Fix length, include terminator) Channel number the following value can be set.: 0x00-0x09, 0x2c, 0xFF(terminator) In CATV (US) case, set 0x2c as "." In JP-DigitalTerr, set 0x2c before the branch number. If all values are fulled In DVB(AEP/GA) case set 3 or 4 digits and reminders are filled by 0xFF.		when Last channel is Selectted(all 0xff) ,last from all media. not relation with their input.
										Terr Analoue	0x02			
										CATV	0x03			
										BS Digital	0x04			
										CS Digital	0x05			
										DVB-S	0x06			
										DVB-S2	0x07			
										Cable Analog	0x0A			
										Cable Digital	0x0B			
	Volume Control	0x05	yes	yes	Disable	Enable	0x03	UpDown	0x00	Up	0x00			
										Down	0x01			
							0x03	Direct	0x01	values	0xnn			values which are supported is defined as for each regional spec.
	Muting	0x06	yes	yes	Disable	Enable	0x02	Toggle	0x00					values in cycle: Unmuting Muting
							0x03	Direct	0x01	Unmuting	0x00			
										Muting	0x01			
	Language	0x07					0x05	reserved	0x00	English	"eng"			

[a] Function		Command				[b]Length (Include CheckSum)	[c] Range/Switch Code						Detail
Syntax	Code	Control	Enquiry	Standby	Power On		byte0: Syntax	Code	byte1: Syntax	Code	byte2-n: Syntax&code		Detail
Off Timer(SLEEP)	0x0C	yes	no	Disable	Enable	0x02	Toggle	0x00					values in cycle are defined as each regional spec.
						0x03	Direct	0x01	timer offset	0xnn			0-255, values which are supported is defined as for each regional spec. supported values : OFF : 0x00 15min : 0x0F 30min : 0x1E 45min : 0x2D 60min : 0x3C 90min : 0x5A 120min : 0x78
Picture Off	0x0D	yes	no	Disable	Enable	0x02	Toggle	0x00					values in cycle are defined as each regional spec.
						0x03	Direct	0x01	OFF	0x00			
									ON	0x01			
Teletext	0x0E	yes	yes	Disable	Enable	0x02	Toggle	0x00					order is different by Model each
						0x03	Direct	0x01	OFF	0x00			Only can be enquired.
									Text	0x01			
									MIX-Text	0x02			some model
									Text and TV Picture	0x03			some model
Display	0x0F	yes	no	Disable	Enable	0x02	Toggle	0x00					same as display (info) key
Closed Caption	0x10	yes	no	Disable	Enable	0x02	Toggle Display	0x00					toggle between Off and On (only for US/Canada model)
						0x03	Direct Display	0x01	OFF	0x00			
									ON	0x01			
						0x04	Direct Setting	0x02	Analog	0x00	CC1	0x01	
											CC2	0x02	
											CC3	0x03	
											CC4	0x04	
											Text1	0x05	
											Text2	0x06	
											Text3	0x07	
											Text4	0x08	
									Digital	0x01	Service1	0x01	
											Service2	0x02	
											Service3	0x03	
											Service4	0x04	
											Service5	0x05	
											Service6	0x06	
											CC1	0x07	
											CC2	0x08	
											CC3	0x09	
											CC4	0x0a	
Picture Picture Mode	0x20	yes	no	Disable	Enable	0x02	Toggle	0x00					values in cycle are defined as for each regional spec.
						0x03	Direct	0x01	Vivid	0x00			
									Standard	0x01			
									Cinema	0x02			Depend on Scene Select
									Custom	0x03			
									Cine2	0x06			Depend on Scene Select
									Sports	0x07			Depend on Scene Select
									Game	0x08			Depend on Scene Select
									Graphics	0x09			Depend on Scene Select
Sound Sound Mode	0x30	yes	no	Disable	Enable	0x02	Toggle	0x00					values in cycle: Dynamic Standard Custom
						0x03	Direct	0x01	Dynamic	0x00			
									Standard	0x01			
									ClearVoice	0x03			
Treble	0x32	yes	no	Disable	Enable	0x03	UpDown	0x00	Up	0x00			values which are supported is defined as for each regional spec. (Min: -12 Max: +12)
									Down	0x01			
						0x04	Direct	0x01	plus	0x00	values	0xnn	
									minus	0x01			
Bass	0x33	yes	no	Disable	Enable	0x03	UpDown	0x00	Up	0x00			values which are supported is defined as for each regional spec. (Min: -12 Max: +12)
									Down	0x01			
						0x04	Direct	0x01	plus	0x00	values	0xnn	
									minus	0x01			
Speaker Off	0x36	yes	no	Disable	Enable	0x02	Toggle	0x00					
						0x03	Direct	0x01	OFF	0x00			
									ON	0x01			

	[a] Function		Command				[b]Length (Include CheckSum)	[c] Range/Switch Code						
	Syntax	Code	Control	Enquiry	Standby	Power On		byte0: Syntax	Code	byte1: Syntax	Code	byte2-n: Syntax&code		Detail
Size/Shift	H Size	0x40	yes	no	Disable	Enable	0x03	UpDown	0x00	Up	0x00			values which are supported is defined as for each regional spec.
										Down	0x01			
							0x04	Direct	0x01	plus	0x00	values	0xnn	
										minus	0x01			
	H Shift	0x41	yes	no	Disable	Enable	0x03	UpDown	0x00	Up	0x00			values which are supported is defined as for each regional spec.
										Down	0x01			
							0x04	Direct	0x01	plus	0x00	values	0xnn	
										minus	0x01			
	V Size	0x42	yes	no	Disable	Enable	0x03	UpDown	0x00	Up	0x00			values which are supported is defined as for each regional spec.
										Down	0x01			
							0x04	Direct	0x01	plus	0x00	values	0xnn	
										minus	0x01			
	V Shift	0x43	yes	no	Disable	Enable	0x03	UpDown	0x00	Up	0x00			values which are supported is defined as for each regional spec.
										Down	0x01			
							0x04	Direct	0x01	plus	0x00	values	0xnn	
										minus	0x01			
	Wide	0x44	yes	no	Disable	Enable	0x02	Toggle	0x00					values in cycle are defined as for each regional spec. depends on model
							0x03	Direct	0x01	Wide Zoom	0x00			depends on model
										Full	0x01			depends on model
										Zoom	0x02			depends on model
										Normal	0x03			depends on model
										Caption	0x04			depends on model
										PC_Normal	0x05			depends on model
										PC_Full1	0x06			depends on model
										PC_Full2	0x07			depends on model
	Auto Wide	0x45	yes	no	Disable	Enable	0x02	Toggle	0x00					depends on model
							0x03	Direct	0x01	OFF	0x00			depends on model
										ON	0x01			
Picture	Cine Motion (Cinema Drive)	0x2A	yes	no	Disable	Enable	0x02	Off	0x00					change only current Input values which are supported is defined as for each regional spec.
								Auto	0x01					
								Auto1	0x02					
								Auto2	0x03					
	Picture	0x23	yes	no	Disable	Enable	0x03	UpDown	0x00	Up	0x00			
										Down	0x01			
							0x03	Direct	0x01	values	0xXX			max / min values are defined as for each regional spec.
	Brightness	0x24	yes	no	Disable	Enable	0x03	UpDown	0x00	Up	0x00			
										Down	0x01			
							0x03	Direct	0x01	values	0xXX			max / min values are defined as for each regional spec.
	Color (Colour)	0x25	yes	no	Disable	Enable	0x03	UpDown	0x00	Up	0x00			
										Down	0x01			
							0x03	Direct	0x01	values	0xXX			max / min values are defined as for each regional spec.
	Hue	0x26	yes	no	Disable	Enable	0x04	UpDown	0x00	Red	0x00	Up	0x00	max / min values are defined as for each regional spec.
										Green	0x01	Down	0x01	
							0x04	Direct	0x01	Red	0x00	values	0xnn	
										Green	0x01			
	Sharpness	0x28	yes	no	Disable	Enable	0x03	UpDown	0x00	Up	0x00			
										Down	0x01			
							0x03	Direct	0x01	values	0xXX			max / min values are defined as for each regional spec.
Size/Shift	4 : 3 Mode	0x46	yes	no	Disable	Enable	0x02	Toggle	0x00					values in cycle are defined as for each regional spec. depends on model
							0x03	Direct	0x01	Normal	0x04			
										Wide Zoom	0x03			
										Full	0x02			
										Zoom	0x01			
										Off	0x00			

	[a] Function		Command				[b] Length (Include CheckSum)	[c] Range/Switch Code					Detail
	Syntax	Code	Control	Enquiry	Standby	Power On		byte0: Syntax	Code	byte1: Syntax	Code	byte2-n: Syntax&code	
Signage Command	ID Command	0x6F	no	yes	Disable	Enable	-	TV Model					Return 0xBA for Sony Bravia model.
	Product Info	0x6E	no	yes	Disable	Enable	-	Product Info1					Return top 6bytes string of product information (max 6bytes)
		0x6D	no	yes	Disable	Enable	-	Product Info2					Return string from byte#6 to byte#11 (max 6 bytes)
		0x6C	no	yes	Disable	Enable	-	Product info3					Return string from byte#12 to byte#17 (max 6 bytes)
SIRCS Support	Sircs emulation	0x67	yes	no	Disable	Enable	0x03	SIRCSs Category	0xnn	SIRCS Data	0xnn		
RS232C Control / Control 4 Special	Status change	0x66	no	yes	Disable	Enable	0x03	Status1 (reserved)	0xnn	Status2 Bit 　0 - Input 　1 - Channel 　2 - Volume 　3 - Mute 　4 - 15 - Reserved	0xnn		Select 'RS232C Control' or 'Control 4' "ON" in the setting menu.

BRAVIA SIRCS code list

No.	Key Display	CAT.	DATA
K1	INPUT	01	25
K2	POWER	01	15
K3	TrackID	1A	7E
K4	PREV	97	3C
K5	PAUSE	97	19
K6	NEXT	97	3D
K7	i-MANUAL	1A	7B
K8	REW	97	1B
K9	PLAY	97	1A
K10	FF	97	1C
K11	3D	77	4D
K12	WIDE MODE	A4	3D
K13	STOP	97	18
K14	SCENE	1A	78
K15	NETFLIX	1A	7C
K16	Internet Widgets	1A	7A
K17	Internet Video	1A	79
K18	SEN	1A	7D
K19	SYNC MENU (Not used w/o HDMI-CEC)	1A	58
K20	GUIDE	01	0E
K21	DISPLAY	01	3A
K22	RETURN	97	23
K23	OPTIONS	97	36
K24	HOME	01	60
K25	CURSOR UP	01	74
K26	CURSOR DOWN	01	75
K27	CURSOR LEFT	01	34
K28	CURSOR RIGHT	01	33
K29	SELECT	01	65
K30	YELLOW	97	27
K31	BLUE	97	24
K32	RED	97	25
K33	GREEN	97	26
K34	1	01	00
K35	2	01	01
K36	3	01	02
K37	4	01	03
K38	5	01	04
K39	6	01	05
K40	7	01	06
K41	8	01	07
K42	9	01	08
K43	dot	97	1D
K44	0	01	09
K45	CC(Only U/C/M/LA)	A4	10
K46	VOLUME UP	01	12
K47	VOLUME DOWN	01	13
K48	MUTING	01	14
K49	CH/PROG UP	01	10
K50	CH/PROG DOWN	01	11
K51	JUMP	01	3B

"NETFLIX" and "SEN" is not available for all models.

FAQ

- **RS232C command is not sometimes accepted.**
  - ➢ BRAVIA doesn't occasionally accept RS232C command. BRAVIA cannot accept it after about 20 seconds or more on power on.
  - ➢ BRAVIA cannot accept it while stand-by, if status of "Stand by Command" is not enable. The status can be changed by RS232C command. Please refer to Stand-by Command.