RS-232C External Serial Control Specifications

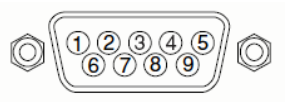
Applicable models: LT-37X898, LT-42X898, LT-47X898 and later models for North America

1. Connection

1.1. Terminal

D-SUB 9Pin Male terminal

Pin No.	Name	Pin No.	Name
1	NC	6	NC
2	RXD	7	NC
3	TXD	8	NC
4	NC	9	NC
5	GND		



1.2. Communication Line

This control system uses RXD(receive data), TXD(transmit data) and GND line.
You can use a D-SUB 9 pin cross cable that connects to the external controller like as PC.

2. Protocol

2.1. Communication Specifications

Communication System	Asynchronous
Interface	RS-232C
Baud rate	19200bps
Data length	8 bits
Parity	Odd parity
Stop bit	1 bit
Flow Control	None
Communication Code	ASCII character code

	ST	b0	b1	b2	b3	b4	b5	b6	b7	PT	SP

2.2 Data format

*The length of the control command varies according to function

1 byte	2 bytes		2 bytes		n+1 bytes			1 byte
Header	Unit ID		Command		Data[0]	...	data[n]	Termination

Header: Indicates the start of communication (see paragraph 3.3, Header table)
Unit ID: Specifies the device to be controlled
Command: See paragraph 3.5, Command table
Data [i]: Parameter corresponding to the command (data ii = 0, 1, ..., n)
End: Indicates the end of communication

2.3 Header table

HEX	ASCII	TYPE
0x21	'!'	Operation command
0x3F	'?'	Reference command
0x40	'@'	Response command
0x06	ACK	ACK
0x15	NAK	NAK

Operation command: Added when there is an operation command notification
Reference command: Added when there is a reference command notification
Response command: Added when there is a response command notice in response to a reference
ACK: ACK response is given if the command reception is normal
NAK: NAK response is given if the command cannot be accepted for some reason, such as an illegal command (see also paragraph 2.8, Error handling)

2.4 Unit ID table

The unit ID consists of two bytes, the machine code and the individual code.
The MSB [b7] is always set to "1" in machine code and individual code, to avoid duplication with reserved codes.
The machine code is a code for each place of business, and the display is set to "0x82".
The individual code may be uniquely prescribed for each place of business, but the default is set to "0x80", and it may be changed from an external controller as necessary (anticipating cases in which the same machine is multiply connected.
A changed individual code is last-memories on the machine side.

Machine code								
b7	b6	b5	b4	b3	b2	b1	b0	
X								1 fixed
	X	X	X	X	X	X	X	Assigned place of business *0: home storage* *1: AVC accessory* 2: display *3: mobile information* *4: pro system* *6: AVsystem* Cite classification according to VIS H 1500

Individual code								
b7	b6	b5	b4	b3	b2	b1	b0	
X								1 fixed
	X	X	X	X	X	X	X	0: Default

2.5 Command table

HEX		ASCII		Function	Operation	Reference
[illegible]						
0x00,	0x00	NUL,	NUL	NULL command	○	
0x50,	0x57	'P',	'W'	Power source [PoWer]	○	○
0x49,	0x50	'I',	'P'	Input [InPut]	○	○
0x56,	0x4C	'V',	'L'	Sound volume [VoLume]	○	○
0x41,	0x4D	'A',	'M'	Audio muting [Audio Muting]	○	○
0x43,	0x48	'C',	'H'	Channel [CHannel]	○	○
0x56,	0x53	'V',	'S'	Video status [Video Status]	○	○
0x41,	0x53	'A',	'S'	Aspect [ASpect]	○	○
Remote control command						
0x52,	0x43	'R',	'C'	Remote control code through [Remote Code]	○	
Setup						
0x53,	0x55	'S',	'U'	Initial setup [SetUp]	○	

2.6 Parameters

The parameters are generally interpreted with ASCII characters.
But some of the commands have a unique interpretation (for the details, see the section on Command sequences).

HEX	ASCII	Meaning	HEX	ASCII	Meaning
General Perspective			Independent Perspective		
0x2B	'+'	'+'	0x2B	'+'	UP
0x2D	'-'	'-'	0x2D	'-'	DOWN
0x30-39	'0'-'9'	'0'-'9'	0x30	'0'	OFF/NO/Disable
0x41-5A	'A'-'Z'	'A'-'Z'	0x31	'1'	ON/YES/Enable

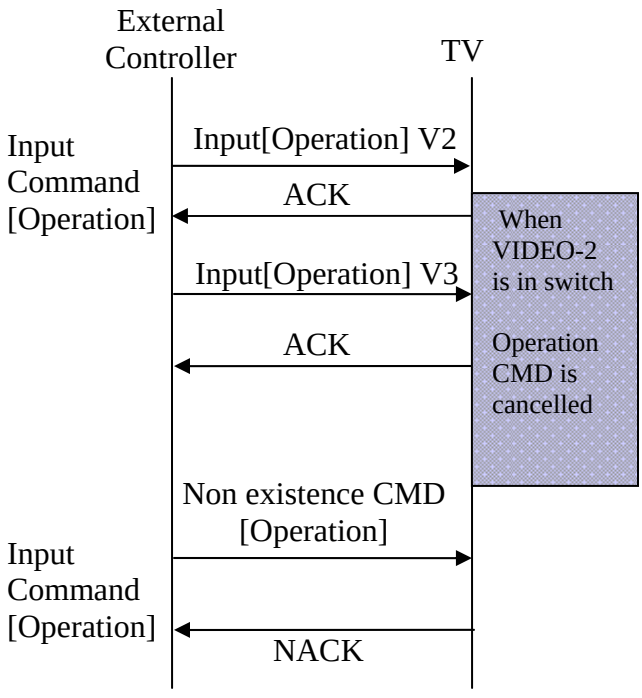
2.7 Termination code

0x0A (LineFeed) Fixed

2.8 Error handling

An external controller will not transmit the following commands until it receives an ACK (or NAK) that the transmitted unit ID and the command match.
The specifications for timeout and retry when an ACK (or NAK) response has not been received are not specified here; the specifications unique to the external controller may be used.
If the byte interval is blank for 50 ms or longer, initialize the transmit-receive sequence (the received data is discarded).
If a unit ID other than its own is received, it is ignored.
If the unit ID matches but includes a parity error, a NAK response is given.
If the unit ID matches but an undefined header/command is received, a NAK response is given.
If the command receipt is normal (ACK response) but the parameter is meaningless, it is ignored.
Even if the command receipt is normal (ACK response) and the parameter is meaningful, it may be ignored, depending on the state of the JVC machine. For the details, see the instruction manual for each JVC machine (for example, HD-ILA • TV, power ON operation in the power cooling state, etc.).

2.9 Communication sequence

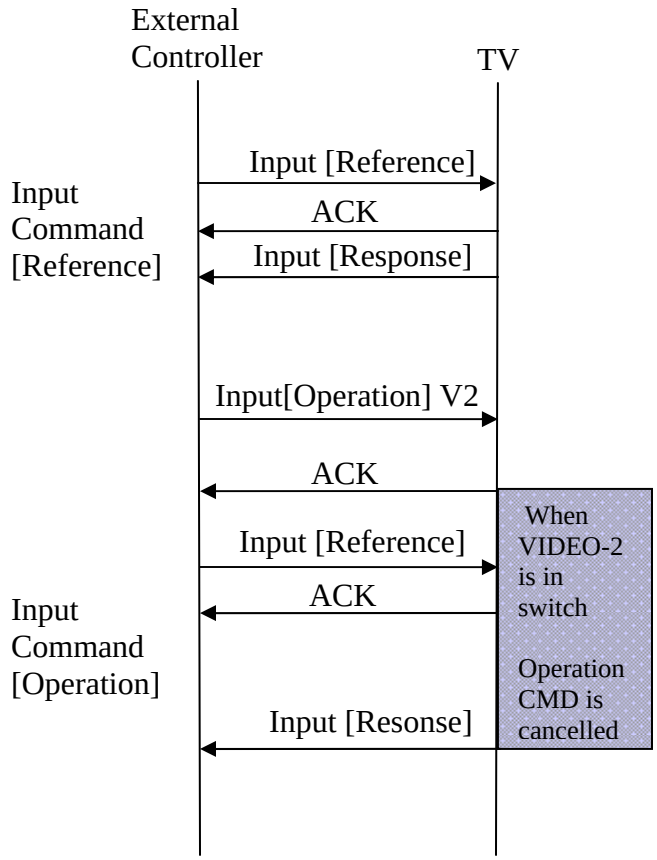


[ACK/NACK Concept]

When TV receives a command, TV side will return ACK immediately if the command is standard command.TV. If not, TV will return NACK

[Operation sequence]

When TV receives an operation command, TV will return the ACK immediately and perform the command operation.
However, if the TV receives the command while user operation is going on, the TV only returns ACK for the command but operation is cancelled.



[Reference Sequence]

When TV receives a reference command, TV will return ACK immediately, then transmit related information for command as response to external controller.
If the TV receives a reference command while in user operation, TV transmits ACK immediately, then it transmits response command after the completion of user operation.
This is because of conflict between TV information and the information passed to external controller via response command based on timing, if the reference command is approved while in user operation (Temporally)
Handling of NACK is same as operation sequence.

3. Command control

3.1 NULL command

In using CEDIA, it is used in order to confirm whether transmission is possible.
It is used when confirming that an external controller and a JVC machine are correctly connected, if a microprocessor on the JVC machine side is restored from power-saving mode, etc.

Command code

HEX		ASCII		Function	Operation	Reference
0x00	0x00	NULL	NULL	NULL command	○	NONE

Parameters: None

3.1.1 Operation

As a command, it can be used as follows. Examples of use are shown below.

Purpose: To confirm whether the external controller and the TV are properly connected.

(1) Data is transmitted from the external controller side to the TV side as follows.

1 : External controller→					
0x21	0x82	0x80	0x00	0x00	0x0A
'!' (operation)	DP	Individual: 0	NULL	NULL	end

(2) If the circuits are connected or the TV is operating normally, the TV side returns an ACK to the external controller as a NULL command response.

2: HD-ILA TV					
0x06	0x82	0x80	0x00	0x00	0x0A
ACK	DP	Individual: 0	NULL	NULL	end

By the above exchange, it can be confirmed whether the connection and communication are normal or abnormal.

3.1.2 References

None

3.2 Power source [PoWer]

Used for power ON/OFF operation and for referencing the power setting state of the JVC products.

Command code

HEX		ASCII		Function	Operation	Reference
0x50	0x57	'P'	'W'	Power source [POWER]	○	○

Parameters

HEX	ASCII	Operation
0x30	'0'	Power OFF
0x31	'1'	Power ON
0x2B	'+'	Power ON/OFF toggle switch
0x2D	'-'	Power ON/OFF toggle switch

3.2.1 Operation

As a command, it can be used as follows. Examples of use are shown below.

Purpose: Turning the TV's power OFF (TV is in power-ON state).

(1) Data is transmitted from the external controller side to the TV side as follows.

1: External controller						
0x21	0x82	0x80	0x50	0x57	0x30	0x0A
'!' (Operation)	DP	Individual: 0	'P'	'W'	OFF	End

(2) If TV receives data (1) and the command reception was normal, TV side returns an ACK as follows.

2: HD-ILA TV					
0x06	0x82	0x80	0x50	0x57	0x0A
ACK	DP	Individual: 0	'P'	'W'	end

(3) The TV turns power OFF

The power can be turned OFF by the above exchange.

- The power-OFF operation can be done by a sequence similar to that for power-ON.
- If the parameter data is toggles switching such as 0x2B or 0x2D, then ON/OFF operation is done according to the power state on the TV side. For example, if toggling data is sent with the TV in power-ON state, the TV side turns its power OFF.
- For data in the same state, the TV side ignores. For example, even if power-ON data is sent with the TV in power-ON mode, no TV operation is done.

3.2.2 Reference

As a command, it can be used as follows. Examples of use are shown below.

Purpose: To confirm the present TV power state. (TV is in power-ON state)

(1) Data is transmitted from the external controller side to the TV side as follows.

1: External controller					
0x3F	0x82	0x80	0x50	0x57	0x0A
'?'(Reference)	DP	Individual: 0	'P'	'W'	end

(2) If TV receives data (1) and the command reception was normal, TV side returns an ACK as follows.

2: HD-ILA ® TV					
0x06	0x82	0x80	0x50	0x57	0x0A
ACK	DP	Individual: 0	'P'	'W'	end

(3) Next, the TV transmits a report of the power setting to the external controller.

3: HD-ILA ® TV						
0x40	0x82	0x80	0x50	0x57	0x31	0x0A
'@'(Response)	DP	Individual: 0	'P'	'W'	ON	end

By the above exchange, it can be confirmed that the TV's power state is ON.

Operation on TV screen
None in particular

3.3 Input [InPut]

Used for input switching operation and referencing the input settings of a JVC products.
In the TV input, there are digital broadcast and analog broadcast, and when switching the input to TV, the last-memory network is selected, but by adding parameters, it is possible to override the last memory and select the network directly.

Command code

HEX		ASCII		Function	Operation	Reference
0x49	0x50	'I'	'P'	Input switching [INPUT]	○	○

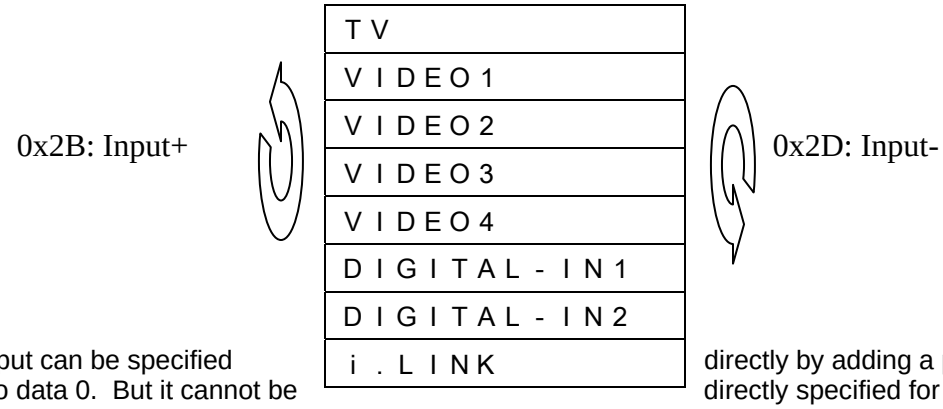
Parameters: Data length 1 or 2
[Data 0]

HEX	ASCII	Operation
0x30	'0'	TV input
0x31	'1'	VIDEO 1 input
0x32	'2'	VIDEO 2 input
0x33	'3'	VIDEO 3 input
0x34	'4'	VIDEO 4 input
0x35	'5'	DIGITAL-1 (DIGITAL-IN)
0x36	'6'	DIGITAL-2
0x37	'7'	i.Link
0x38	'8'	VIDEO 5 Input
0x2B	'+'	input + toggle switching
0x2D	'-'	input - toggle switching

- For a TV with only one HDMI terminal, only the parameter DIGITAL-IN (0x35) of data 0 is valid, and DIGITAL-IN2 (0x36) is ignored. For TV with two HDMI terminals, DIGITAL-IN1 (0x35) and DIGITAL-IN2 (0x36) are both valid.

- For TV models that have only one HDMI terminal, for the input operation, 0x35 is set to DIGITAL-IN, and DIGITAL-IN2 with 0x36 is invalid. For models that have two HDMI terminals, 0x35 is used for DIGITAL-IN1, and 0x36 is used for DIGITAL-IN2.
- The input switching operation is not done if the parameter data is sent to a terminal that is not provided on the TV or a terminal that is not valid. The same is true if nothing is hooked into an i.LINK terminal.
- The input toggle operation toggles in the same sequence as the INPUT switching operation of a TV set with its remote control. However, in the toggle operation, the pull down display will not be displayed, as with operation with a remote control.

If the TV has four video terminals, two HDMI terminals, and an i.LINK terminal, the input toggling switches in the following sequence. If nothing is hooked into the i.LINK terminal, i.LINK is skipped, and switching to the next input.



The output can be specified directly by adding a parameter of data 1 to data 0. But it cannot be directly specified for external input.

[Data 1] – In case of TV input (data 0: 0x30)

HEX	ASCII	Function
0x30	'0'	last memory
0x31	'1'	analog broadcast
0x32	'2'	digital broadcast
0x33	'3'	CableCARD

Table-1 INPUT CMD DATA1

- If data 1 is omitted, it becomes “last memory”.
- For CableCARD of 0x33, because it is seamless, it is used only for reference.

3.3.1 Operation

As a command, it can be used as follows. Examples of use are shown below.

Purpose: To switch the input to VIDEO2 (Current input is “TV”).

(1) Data is transmitted from the external controller side to the TV side as follows.

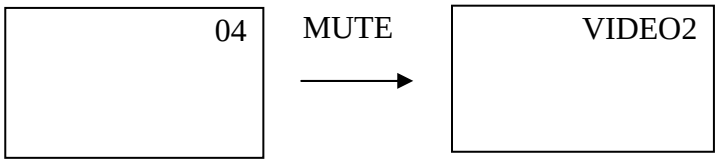
1: External controller						
0x21	0x82	0x80	0x49	0x50	0x32	0x0A
'!'(Operation)	DP	Individual: 0	'I'	'P'	VIDEO-2	end

(2) If TV receives data (1) and the command receipt was normal, an ACK is returned from the TV side as follows.

2: HD-ILA TV					
0x06	0x82	0x80	0x49	0x50	0x0A
ACK	DP	Individual: 0	'I'	'P'	end

(3) The TV side performs input switch to VIDEO2.
By the above exchange, input switching to VIDEO2 can be done.

Operation on the TV screen



Purpose: To switch the input of TV to a digital broadcast (Current input is "TV analog broadcast").

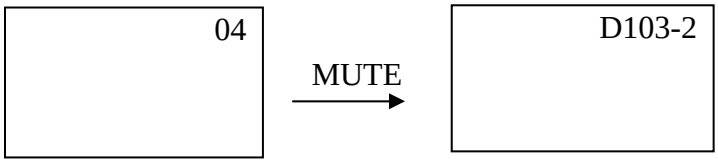
(1) Data is transmitted from the external controller side to the TV side as follows.

1: External controlle							
0x21	0x82	0x80	0x49	0x50	0x30	0x32	0x0A
'!'(Operation)	DP	Individual: 0	'I'	'P'	TV	digital broadcast	end

(2) If TV receives data (1) and the command receipt was normal, an ACK is returned from the TV side as follows.

2: HD-ILA TV					
0x06	0x82	0x80	0x49	0x50	0x0A
ACK	DP	Individual: 0	'I'	'P'	end

(3) The TV side switches to TV digital broadcast.
By the above exchange, switching to digital broadcast can be done.
Operation on the TV screen



Purpose: To switch the input with the input+ toggle (Current input is VIDEO2).

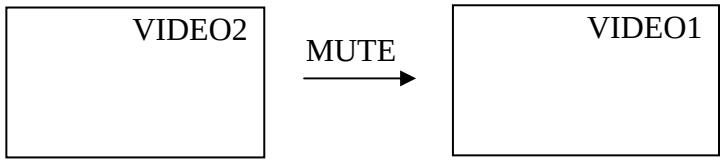
(1) Data is transmitted from the external controller side to the TV side as follows.

1: External controller						
0x21	0x82	0x80	0x49	0x50	0x2B	0x0A
'!'(Operation)	DP	Individual: 0	'I'	'P'	input +	end

(2) If TV receives data (1) and the command receipt was normal, an ACK is returned from the TV side as follows.

2: HD-ILA TV					
0x06	0x82	0x80	0x49	0x50	0x0A
ACK	DP	Individual: 0	'I'	'P'	end

The TV side switches the input to VIDEO1.
By the above exchange, the input can be switched to VIDEO1.
Operation on the TV screen



3.3.2 Reference

As a command, it can be used as follows. Examples of use are shown below.

Purpose: To confirm the current TV output (TV in CableCARD state).

(1) Data is transmitted as follows from the external controller side to the TV side.

1: External Controller					
0x3F	0x82	0x80	0x49	0x50	0x0A
'?'(Reference)	DP	Individual: 0	'I'	'P'	end

(2) If TV receives data (1) and the command receipt was normal, an ACK is returned from the TV side as follows.

2: HD-ILA TV					
0x06	0x82	0x80	0x49	0x50	0x0A
ACK	DP	Individual: 0	'I'	'P'	end

(3) Next, the TV transmits a report of input setting to the external controller.

3: HD-ILA TV							
0x40	0x82	0x80	0x49	0x50	0x30	0x33	0x0A
'@'(Response)	DP	Individual: 0	'I'	'P'	T V	CableCARD	end

By the above exchange, it can be confirmed that the TV output state is in the CableCARD state.

If the present TV input is external, the input reference report is as follows.
(For example, VIDEO3 component)

3: HD-ILA @ TV						
0x40	0x82	0x80	0x49	0x50	0x33	0x0A
'@'(Response)	DP	Individual: 0	'I'	'P'	VIDEO-3	end

Operation on the TV screen
None in particular

3.4 Sound volume [VoLume]

Command code

HEX		ASCII		Function	Operation	Reference
0x56	0x4C	'V'	'L'	Sound volume [VOLUME]	○	○

Parameters Data length 1 or 2

HEX	ASCII	Operation
0x30~0x39	'0'~'9'	Direct setting of the numerical value of the sound volume
0x2B	'+'	Sound volume UP
0x2D	'-'	Sound volume DOWN

- Maximum audio volume is 50
- If a value more than 51 is specified, the command is ignored.
- When the CENTER CH is ON, the Volume setting becomes its audio volume setting, or for the speaker if CENTER-CH is OFF.

3.4.1 Operation

As a command, it can be used as follows. Examples of use are shown below.

Purpose: To increase the TV audio volume (TV's audio volume is set in 2).

(1) Data is transmitted from the external controller side to the TV side as follows.

1: External controller						
0x21	0x82	0x80	0x56	0x4C	0x2B	0x0A
'!'(Operation)	DP	Individual: 0	'V'	'L'	audio volume UP	end

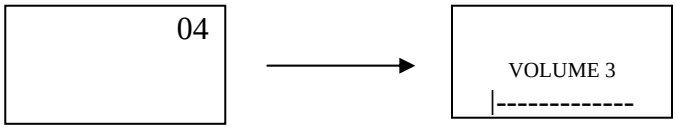
(2) If TV receives data (1) and the command receipt was normal, an ACK is returned from the TV side as follows.

2: HD-ILA TV					
0x06	0x82	0x80	0x56	0x4C	0x0A
ACK	DP	Individual: 0	'V'	'L'	end

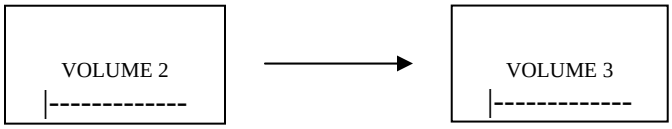
(3) The TV increases its audio volume.

By the above exchange, the audio volume can be increased.

Operation on the TV screen



Transmit a command



Transmit a command

Basically, OSD display operation for audio volume UP/DOWN is the same as operation from the user remote control.
It is released if in MUTING state.

Purpose: To set the TV audio volume to 5 (TV' audio volume is 2 state).

(1) Data is transmitted from the external controller side to the TV side as follows.

1: External controller							
0x21	0x82	0x80	0x56	0x4C	0x30	0x35	0x0A
'!'(Operation)	DP	Individual: 0	'V'	'L'	'0'	'5'	end

or

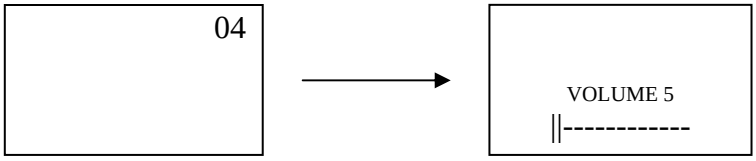
1: External controller						
0x21	0x82	0x80	0x56	0x4C	0x35	0x0A
'!'(Operation)	DP	Individual: 0	'V'	'L'	'5'	end

(2) If TV receives data (1) and the command receipt was normal, an ACK is returned from the TV side as follows.

2: HD-ILA TV					
0x06	0x82	0x80	0x56	0x4C	0x0A
ACK	DP	Individual: 0	'V'	'L'	end

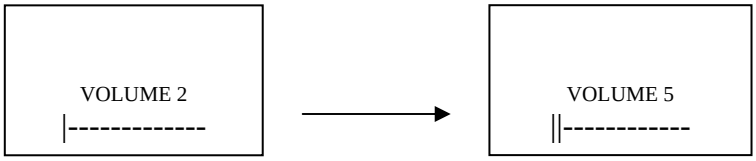
(4) The TV sets the audio volume to 5.

By the above exchange, the audio volume level can be set to 5.
Operation on the TV screen



Transmits a command

*When the command is transmitted with VOLUME OSD is on.



Transmits a command

3.4.2 Reference

As a command, it can be used as follows. Examples of use are shown below.

Purpose: To confirm the TV's present audio volume state (TV's audio volume is 5 state)

(1) Data is transmitted from the external controller side to the TV side as follows.

1: External Controller					
0x3F	0x82	0x80	0x56	0x4C	0x0A
'?'(Reference)	DP	individual: 0	'V'	'L'	end

(2) If TV receives data (1) and the command receipt was normal, an ACK is returned from the TV side as follows.

2: HD-ILA TV					
0x06	0x82	0x80	0x56	0x4C	0x0A
ACK	DP	individual: 0	'V'	'L'	end

(3) Next, the TV side transmits a report of the audio volume setting to the external controller side.

3: HD-ILA TV						
0x40	0x82	0x80	0x56	0x4C	0x35	0x0A
'@'(Response)	DP	individual: 0	'V'	'L'	'5'	end

By the above exchange, it can be confirmed that the TV audio volume setting is 5.
Operation on the TV screen
None in particular

3.5 Audio muting [Audio Muting]

Command code

HEX		ASCII		Function	Operation	
0x41	0x4D	'A'	'M'	Audio muting [Audio Muting]	○	

Parameters Data length 1

HEX	ASCII	Operation
0x30	'0'	Sound volume MUTE OFF
0x31	'1'	Sound volume MUTE ON
0x2B	'+'	ON/OFF toggle switching of audio MUTE
0x2D	'-'	ON/OFF toggle switching of audio MUTE

3.5.1 Operation

As a command, it can be used as follows. Examples of use are shown below..

Purpose: To turn MUTE ON (TV is in audio volume MUTE OFF state).

(1) Data is transmitted from the external controller side to the TV side as follows.

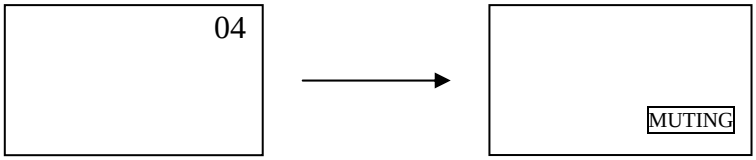
1: External Controller						
0x21	0x82	0x80	0x41	0x4D	0x31	0x0A
'!'(Operation)	DP	individual: 0	'A'	'M'	ON	end

(2) If TV receives data (1) and the command receipt was normal, an ACK is returned from the TV side as follows.

2: HD-ILA TV					
0x06	0x82	0x80	0x41	0x4D	0x0A
ACK	DP	individual: 0	'A'	'M'	end

(3) The TV side performs processing to MUTE the audio volume.

By the above exchange, the audio volume MUTE can be set to ON.
Operation on the TV screen



Transmits the command

- Basically, the OSD display operation for MUTE ON/OFF is the same as the operation from the user remote.
- If the parameter data is toggle switching of 0x2B or 0x2D, ON/OFF operation is done according to the setting state on the TV side. For example, if toggle switching data is sent with the TV in audio volume MUTE ON state, the TV side turns the audio volume MUTE OFF.
- Regarding data whose state is the same, the TV side ignores it. For example, even if audio volume MUTE ON data is sent to a TV in the audio volume MUTE ON state, nothing is done to the TV operation.

3.5.2 Reference

As a command, it can be used as follows. Examples of use are shown below..

Purpose: Confirm the present TV audio volume MUTE setting state. (TV is in setting OFF state)

(1) Data is transmitted from the external controller side to the TV side as follows.

1: External controller					
0x3F	0x82	0x80	0x41	0x4D	0x0A
'?'(Reference)	DP	individual: 0	'A'	'M'	end

(2) If TV receives data (1) and the command receipt was normal, an ACK is returned from the TV side as follows.

2: HD-ILA TV					
0x06	0x82	0x80	0x41	0x4D	0x0A
ACK	DP	individual: 0	'A'	'M'	end

(3) Next, the TV sends a report of the audio volume MUTE setting to the external controller side.

3: HD-ILA TV						
0x40	0x82	0x80	0x41	0x4D	0x30	0x0A
'@'(Response)	DP	individual: 0	'A'	'M'	OFF	end

By the above exchange, one can confirm that the TV audio volume MUTE setting state is OFF.
Operation on TV screen
None in particular

3.6 Channel [CHannel]

Command code

HEX		ASCII		Function	Operation	
0x43	0x48	'C'	'H'	Channel [CHANNEL]	○	

Parameters Data length 1-7

HEX	ASCII	Operation
0x30~0x39	'0'~'9'	Direct channel selection
0x2B	'+'	Channel UP
0x2D	'-'	Channel DOWN/sub channel

- Direct channel specification is done with decimal numbers.

- Only when referenced
  In the present US system, digital channels are not managed on the TV side, so an inquiry to the digital side is needed.
  When an inquiry is made, the result might be indeterminate if the communication fails or if there is no longer a channel map.
  To avoid this, with the above conditions, set it to CH 0 as non-existing channel, and transmit to the controller side.

3.6.1 Operation

As a command, it can be used as follows. Examples of use are shown below.

Purpose: Select a channel by channel DOWN. (with the TV outputting analog-broadcast CH 4)

(1) Data is transmitted from the external controller side to the TV side as follows.

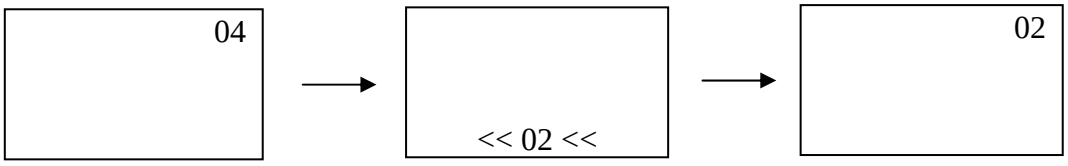
1: External controller						
0x21	0x82	0x80	0x43	0x48	0x2D	0x0A
'!'(Operation)	DP	individual: 0	'C'	'H'	CH DOWN	end

(2) If TV receives data (1) and the command receipt was normal, an ACK is returned from the TV side as follows.

2: HD-ILA TV					
0x06	0x82	0x80	0x43	0x48	0x0A
ACK	DP	individual: 0	'C'	'H'	end

(3) The TV side tunes to a smaller-number channel.

By the above exchange, channel selection can be done.
Operation on the TV screen



Transmit the command

Basically, the OSD display operation for channel UP/DOWN is the same as the operation from the user remote.
During channel selection, the audio volume is set to MUTE.
It does not handle Hyperscan (because it does not handle holding buttons in the CEDIA sequence).

Purpose: To tune the TV to CH 9 (with the TV outputting analog-broadcast CH 2).

(1) Data is transmitted from the external controller side to the TV side as follows.

1: External controller							
0x21	0x82	0x80	0x43	0x48	0x30	0x39	0x0A
'!'(Operation)	DP	individual: 0	'C'	'H'	'0'	'9'	end

or

1: External controller						
0x21	0x82	0x80	0x43	0x48	0x39	0x0A
'!'(Operation)	DP	individual: 0	'C'	'H'	'9'	end

(2) If TV receives data (1) and the command receipt was normal, an ACK is returned from the TV side as follows.

2: HD-ILA TV					
0x06	0x82	0x80	0x43	0x48	0x0A
ACK	DP	Individual: 0	'C'	'H'	End

(3) The TV side tunes to CH 9.

By the above exchange, one can tune directly to channel 9.
Operation on the TV screen

Transmits the command

Purpose: Want to tune to TV to CH 100-3 (TV is outputting digital-broadcast CH 90).

(1) Data is transmitted from the external controller side to the TV side as follows.

1: External controller										
0x21	0x82	0x80	0x43	0x48	0x31	0x30	0x30	0x2D	0x33	0x0A
'!'(Operation)	DP	individual: 0	'C'	'H'	'1'	'0'	'0'	'-'	'3'	end

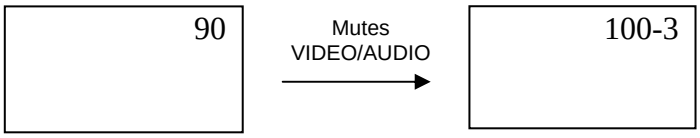
(2) If TV receives data (1) and the command receipt was normal, an ACK is returned from the TV side as follows.

2: HD-ILA TV					
0x06	0x82	0x80	0x43	0x48	0x0A
ACK	DP	individual : 0	'C'	'H'	end

(3) The TV side tunes to CH 100-3.

By the above exchange, one can tune directly to CH 100-3.

Operation on the TV screen



Transmit the command

3.6.2 Reference

As a command, it can be used as follows. Examples of use are shown below..

Purpose: Confirm the present TV output channel. (TV is in analog-broadcast CH 4)

(1) Data is transmitted from the external controller side to the TV side as follows.

1: External controller					
0x3F	0x82	0x80	0x43	0x48	0x0A
'?'(Reference)	DP	individual: 0	'C'	'H'	end

(2) If TV receives data (1) and the command receipt was normal, an ACK is returned from the TV side as follows.

2: HD-ILA TV					
0x06	0x82	0x80	0x43	0x48	0x0A
ACK	DP	individual: 0	'C'	'H'	end

(3) Next, the TV side transmits a report of the channel setting to the external controller side.

3: HD-ILA TV						
0x40	0x82	0x80	0x43	0x48	0x34	0x0A
'@' (Response)	DP	individual: 0	'C'	'H'	'4'	end

By the above exchange, one can confirm that the TV's present set channel is CH 4.

Operation on the TV screen
None in particular

Purpose: To confirm the present TV output channel (TV is in digital-broadcast CH 90-1).

(1) Data is transmitted from the external controller side to the TV side as follows.

1: External controller					
0x3F	0x82	0x80	0x43	0x48	0x0A
'?'(Reference)	DP	Individual: 0	'C'	'H'	end

(2) If TV receives data (1) and the command receipt was normal, an ACK is returned from the TV side as follows.

2: HD-ILA TV					
0x06	0x82	0x80	0x43	0x48	0x0A
ACK	DP	Individual: 0	'C'	'H'	end

(3) Next, the TV side transmits a report of the channel setting to the external controller side.

3: HD-ILA TV						
0x40	0x82	0x80	0x43	0x48	0x34	0x0A
'@'(Response)	DP	Individual: 0	'C'	'H'	'4'	end

By the above exchange, one can confirm that the TV's present set channel is CH 90-1.
Operation on the TV screen
None in particular

3.7 Video status [Video Status]

Command code

HEX		ASCII		Function	Operation	Reference
0x56	0x53	'V'	'S'	Video status [Video Status]	○	○

Parameters Data length 1

HEX	ASCII	Operation
0x30	'0'	Standard setting
0x31	'1'	Dynamic setting
0x32	'2'	Theater setting
0x33	'3'	Game setting
0x34	'4'	MEMORY-1 setting
0x35	'5'	MEMORY-2 setting
0x2B	'+'	Video status toggle switching
0x2D	'-'	Video status toggle switching

The input toggle operation toggles in the same sequence as the VIDEO STATUS switching operation of the TV set by user's remote. At the corresponding, the Pull-Down menu is displayed.

3.7.1 Operation

As a command, it can be used as follows. Examples of use are shown below..

Purpose: To set the VIDEO STATUS to THEATER (TV is in STANDARD mode).

(1) Data is transmitted from the external controller side to the TV side as follows.

1: External controller					
0x3F	0x82	0x80	0x43	0x48	0x0A
'?'f(Reference)	DP	Individual: 0	'C'	'H'	end

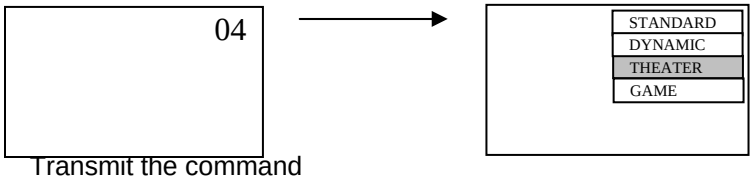
(2) If TV receives data (1) and the command receipt was normal, an ACK is returned from the TV side as follows.

2: HD-ILA TV					
0x06	0x82	0x80	0x43	0x48	0x0A
ACK	DP	Individual: 0	'C'	'H'	end

(3) The TV side sets the VIDEO STATUS to THEATER.

By the above exchange, the VIDEO STATUS can be set to THEATER.

Operation on the TV screen



Transmit the command

Purpose: To switch the VIDEO STATUS by toggling. (TV is in STANDARD)

(1) Data is transmitted from the external controller side to the TV side as follows.

1: External controller					
0x3F	0x82	0x80	0x43	0x48	0x0A
'?'(Reference)	DP	Individual: 0	'C'	'H'	end

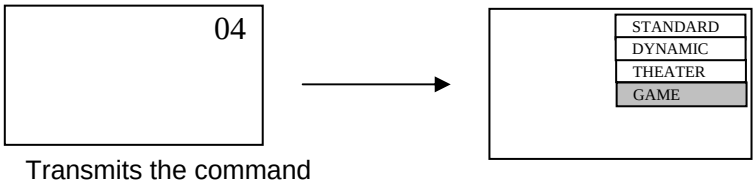
(2) If TV receives data (1) and the command receipt was normal, an ACK is returned from the TV side as follows.

2: HD-ILA TV					
0x06	0x82	0x80	0x43	0x48	0x0A
ACK	DP	Individual: 0	'C'	'H'	end

(3) The TV side sets the VIDEO STATUS to GAME by toggle operation.

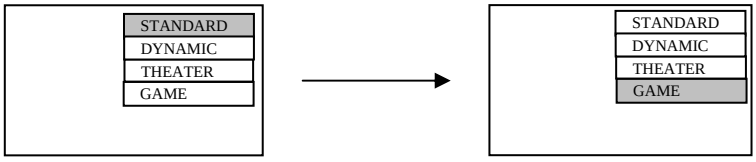
By the above exchange, the VIDEO STATUS can be switch by toggling.

Operation on the TV screen



Transmits the command

* The display if transmitted with the VIDEO STATUS channel selection OSD display are on.



Transmits the command

3.7.2 Reference

As a command, it can be used as follows. Examples of use are shown below...

Purpose: To confirm the present VIDEO STATUS setting of the TV (TV is in GAME mode).

(1) Data is transmitted from the external controller side to the TV side as follows.

1: External controller					
0x3F	0x82	0x80	0x43	0x48	0x0A
'?'(Reference)	DP	Individual: 0	'C'	'H'	end

(2) If TV receives data (1) and the command receipt was normal, an ACK is returned from the TV side as follows.

2: HD-ILA TV					
0x06	0x82	0x80	0x43	0x48	0x0A
ACK	DP	Individual: 0	'C'	'H'	end

(3) Next, the TV side transmits a report of the VIDEO status setting to the external controller side.

3 : ←HD-ILA ® TV						
0x40	0x82	0x80	0x56	0x53	0x33	0x0A
'@'(Response)	DP	Individual: 0	'V'	'S'	GAME	End

By the above exchange, it can be confirmed that the TV's present VIDEO STATUS setting is GAME.

Operation on the TV screen

None in particular

3.8 Aspect [ASpect]

Command code

HEX		ASCII		Function	Operation	Reference
0x41	0x53	'A'	'S'	Aspect [ASPECT]	○	○

Parameters Data length 1

HEX	ASCII	Operation
0x30	'0'	PANORAMA/ P. ZOOM setting
0x31	'1'	CINEMA/ C. ZOOM setting
0x32	'2'	FULL setting
0x33	'3'	REGULAR/SLIM setting
0x34	'4'	FULL NATIVE setting
0x2B	'+'	Aspect toggle switching
0x2D	'-'	Aspect toggle switching

- The input toggle operation toggles by the same sequence as ASPECT switching operation with the user remote. TV shows the PULL-DOWN menu.
- The aspect setting that is valid varies with the signal, so if an aspect setting is sent that does not exist with that signal state, it is ignored.

3.8.1 Operation

As a command, it can be used as follows. Examples of use are shown below...

Purpose: To set the aspect to FULL (TV is in PANORAMA setting).

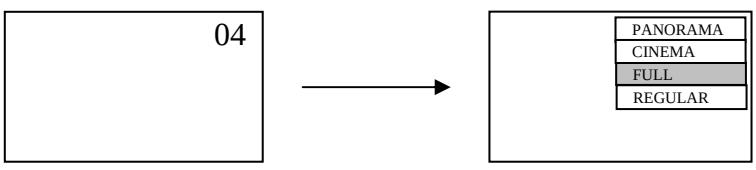
(1) Data is transmitted from the external controller side to the TV side as follows.

1: External controller					
0x3F	0x82	0x80	0x43	0x48	0x0A
'?'(Reference)	DP	Individual: 0	'C'	'H'	end

(2) If TV receives data (1) and the command receipt was normal, an ACK is returned from the TV side as follows.

2: HD-ILA TV					
0x06	0x82	0x80	0x43	0x48	0x0A
ACK	DP	Individual: 0	'C'	'H'	end

(3) The TV side sets the aspect to FULL.
By the above exchange, the aspect can be set to FULL.
Operation on the TV screen



Transmits the command

Purpose: To switch the aspect by toggling (TV Aspect is in FULL mode).

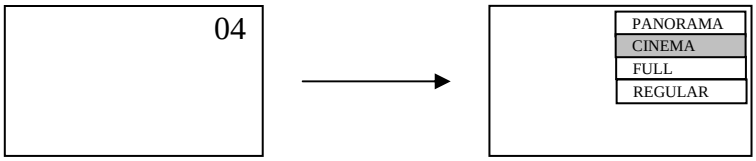
(1) Data is transmitted from the external controller side to the TV side as follows.

1: External controller					
0x3F	0x82	0x80	0x43	0x48	0x0A
'?'(Reference)	DP	Individual: 0	'C'	'H'	end

(2) If TV receives data (1) and the command receipt was normal, an ACK is returned from the TV side as follows.

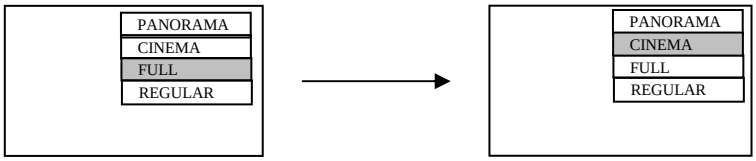
2: HD-ILA TV					
0x06	0x82	0x80	0x43	0x48	0x0A
ACK	DP	Individual: 0	'C'	'H'	end

(3) The TV side sets the aspect to CINEMA by toggling.
By the above exchange, the aspect can be switched by toggling.
Operation on the TV screen



Transmits the command

*When it is transmitted while aspect OSD are on screen



Transmits the command

3.8.2 Reference

As a command, it can be used as follows. Examples of use are shown below...

Purpose: To confirm the present aspect setting of the TV (TV Aspect is in CINEMA mode)

(1) Data is transmitted from the external controller side to the TV side as follows.

1: External controller					
0x3F	0x82	0x80	0x43	0x48	0x0A
'?'(Reference)	DP	Individual: 0	'C'	'H'	end

(2) If TV receives data (1) and the command receipt was normal, an ACK is returned from the TV side as follows.

2: HD-ILA TV					
0x06	0x82	0x80	0x43	0x48	0x0A
ACK	DP	Individual: 0	'C'	'H'	end

(3) Next, the TV side transmits to the external controller side a report of the aspect setting.

3 : ←HD-ILA ® TV						
0x40	0x82	0x80	0x41	0x53	0x31	0x0A
'@' (Response)	DP	Individual: 0	'A'	'S'	CINEMA	end

By the above exchange, it can be confirmed that the present aspect setting of the TV is CINEMA.

Operation on the TV screen
None in particular

3.9 Remote control pass-through

Command code

HEX		ASCII		Function	Operation
0x52	0x43	'R'	'C'	Remote control code pass through [Remote Code]	○

Parameters: Data length 4

HEX	ASCII	Operation
0x30~0x39	'0'~'9'	Remote control code setting
0x41~0x46	'A'~'F'	Remote control code setting

The remote control code specification is in hexadecimal digits
The operation transition with the remote control codes is the same as from the user remote control.
For the details of the remote control codes, see the key code specifications.

3.9.1 Operation

As a command, it can be used as follows. Examples of use are shown below...

Purpose: To display MENU screen by press the "MENU" of remote control code [0x037A].

(1) Data is transmitted from the external controller side to the TV side as follows.

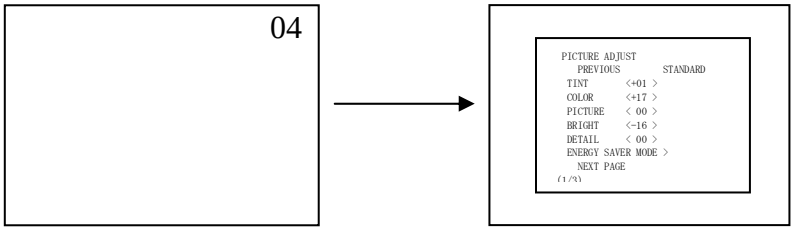
1: External controller					
0x3F	0x82	0x80	0x43	0x48	0x0A
'?' (Reference)	DP	Individual: 0	'C'	'H'	end

(2) If TV receives data (1) and the command receipt was normal, an ACK is returned from the TV side as follows.

2: HD-ILA TV					
0x06	0x82	0x80	0x43	0x48	0x0A
ACK	DP	Individual: 0	'C'	'H'	end

(3) The TV side produces a MENU screen.

By the above exchange, the MENU screen can be produced.
Operation on the TV screen



Transmits the command

3.10 Setup

Command code

HEX		ASCII		Function	Operation	
0x53	0x55	'S'	'U'	Initial setting [SetUp]	○	

Parameters: Data length unspecified
Subcommand table (mandatory commands only)

HEX		ASCII		Function	Last memory
0x49	0x43	'I'	'C'	Individual code [Individual Code]	yes
0x52	0x4D	'R'	'M'	Remote control operation [ReMote]	no
0x46	0x4B	'F'	'K'	Front key operation [FrontKey]	no

- Consists of "subcommand" + "setting", where the subcommand is two bytes of ASCII characters.
- There are no explicit rules for commands other than mandatory commands.

The parameters of the various subcommands are as follows.

Parameters when the subcommand is [0x49, 0x43] Data length 1

HEX	ASCII	Operation
0x80~0xFF	-	Individual code setting (Default: 0x80)

Parameters when the subcommand is [0x52, 0x4D] Data length 1

HEX	ASCII	Operation
0x30	'0'	Disable (invalid)
0x31	'1'	Enable (valid)

Parameters when the subcommand is [0x46, 0x48] Data length 1

HEX	ASCII	Operation
0x30	'0'	Disable (invalid)
0x31	'1'	Enable (valid)

- In front key valid/invalid setting, the FRONT PANEL LOCK of the MENU is also switched accordingly.

3.10.1 Operation

As a command, it can be used as follows. Examples of use are shown below...

Purpose: To change the individual code to 1.

(1) Data is transmitted from the external controller side to the TV side as follows.

1: External controller					
0x3F	0x82	0x80	0x43	0x48	0x0A
'?'(Reference)	DP	Individual: 0	'C'	'H'	end

(2) If TV receives data (1) and the command receipt was normal, an ACK is returned from the TV side as follows.

2: HD-ILA TV					
0x06	0x82	0x80	0x43	0x48	0x0A
ACK	DP	Individual: 0	'C'	'H'	end

(3) The TV side performs processing for recognition by individual code 1.

By the above exchange, the individual code can be set to 1.

Operation on the TV screen
None in particular

Purpose: From the above operation, set the remote control operation to invalid.

(1) Data is transmitted from the external controller side to the TV side as follows.

1: External controller					
0x3F	0x82	0x80	0x43	0x48	0x0A
'?'(Reference)	DP	Individual: 0	'C'	'H'	end

(2) If TV receives data (1) and the command receipt was normal, an ACK is returned from the TV side as follows.

2: HD-ILA TV					
0x06	0x82	0x80	0x43	0x48	0x0A
ACK	DP	Individual: 0	'C'	'H'	end

(3) The TV side does processing so as not to receive operations with the user remote control.

By the above exchange, remote control operation can be made invalid.

Operation on the TV screen
None in particular

Purpose: From the above operation, make front key operation valid.

(1) Data is transmitted from the external controller side to the TV side as follows.

1: External controller					
0x3F	0x82	0x80	0x43	0x48	0x0A
'?'(Reference)	DP	Individual: 0	'C'	'H'	end

(2) If TV receives data (1) and the command receipt was normal, an ACK is returned from the TV side as follows.

2: HD-ILA TV					
0x06	0x82	0x80	0x43	0x48	0x0A
ACK	DP	Individual: 0	'C'	'H'	end

(3) The TV side accepts operation with the front keys.

By the above exchange, front key operation can be made valid.

Operation on the TV screen
None in particular