

BASIC SERIAL COMMAND FUNCTIONAL

SPECIFICATIONS

32LM4R / 32LM4WPR
42LM4R / 42LM4WPR

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1. Overview

- 1.1 This specifications define TV control commands for 32LM4R / 32LM4WPR / 42LM4R / 42LM4WPR.
- 1.2 The TV control commands are used to control a TV through RS-232C from a computer.

2. Serial Interface Specification

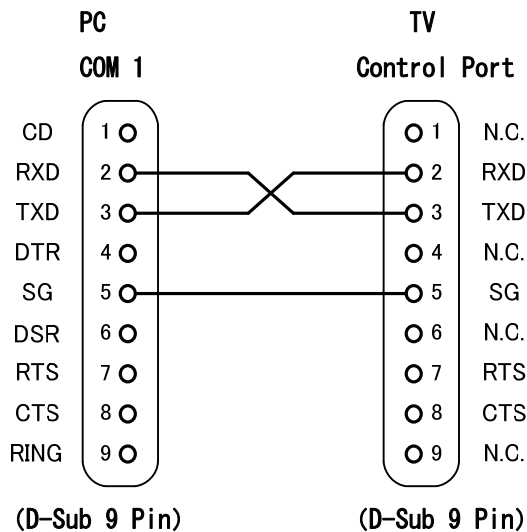
Transfer Specification

Item	Specification
Synchronous system	Asynchronous
Transmission Speed	9600 / 19200
Data Length	8 bit
Parity	None
Stop Bit	1
Flow Control	None

- ① Transmission speed: initial setting value is 19200.
- ② Transmission speed can be changed in hotel option menu.

Connection

Dedicated serial cable that comes with the TV must be used for a connection to a computer and TV.



3. Notes for Communication

3.1 The TV command is defined one command/one line that starts with "C" and ends with carriage return (0x0D).

3.2 There are two types of commands, Functional Execution Commands and Status Read Commands.

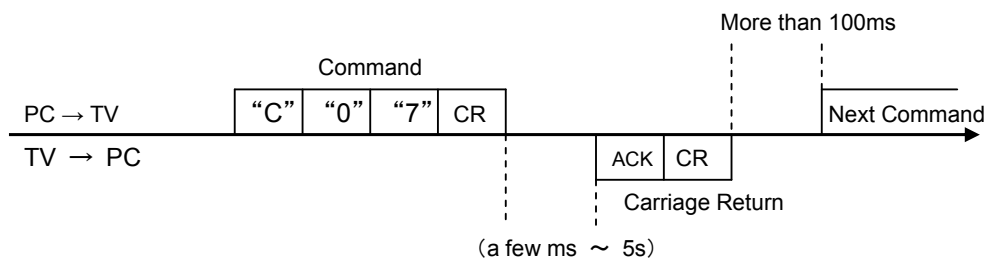
[Example]

Functional Execution Command: "C05" [CR]

Status Read Command: "CR0" [CR]

3.3 When it takes more than one second to receive one command, the function is not executed. When it takes more than one second until the TV receives carriage return since it has received the first data "C", it clears the information of buffer.

3.4 For the command pipelining, wait interval of 100 ms after the response.



3.4.1 When a command is issued before receiving response, the function is not executed properly.

3.4.2 Except when there is no response for 5 seconds.

3.5 It takes about 5 seconds for internal initialization after plugging in AC power. During this time, it cannot process commands. Do not issue any command.

3.6 The number of characters of response for Status Read Commands depends on commands. Please see [7. Status Read Command].

3.7 Characters for commands must be Capital (A - Z).

4. Functional Execution Command Table

Command	Item	Comment
C00	POWER ON	
C01	POWER OFF	
C23	Wide "Auto" direct	
C24	Wide "Natural" direct	
C25	Wide "Zoom 16:9" direct	
C26	Wide "Title in 16:9" direct	
C27	Wide "Zoom 14:9" direct	
C28	Wide "Title in 14:9" direct	
C29	Wide "Full" direct	
C0F	Wide "Normal" direct	
C30	Picture	Toggle (Dynamic, Standard, Eco, Personal)
C70	AV1 direct	
C71	RGB direct	
C72	AV2 RGBHV direct	
C73	AV2 YPbPr direct	
C74	AV3 direct	
C75	HDMI direct	
C76	PC direct	
C64	PC Auto adjust	
C92	Factory setting	
CF PSAVE ON	Power save ON	
CF PSAVE OFF	Power save OFF	
CF CLOK ON	Child lock ON	
CF CLOK OFF	Child lock OFF	
CF DEA RMCY	RC inhibition OFF	
CF DEA RMCN	RC inhibition ON	

"—" means "No Function".

5. Status Read Command Table

Command	Item	Note
CR0	Power	On , Standby , power error,...
CR1	Input Mode	AV1, AV2, ..., HDMI, PC
CR WIDE	Wide mode	Auto, Normal, Full, ...
CR PICTURE	Picture mode	Dynamic, Standard, ...
CR SIGNAL	Signal existence	Signal / No signal
CR CHILD	Child lock	On / Off
CR PSAVE	Power save	On / Off
CRTM	Panel usage time	
CR RMC	RC inhibition	On / Off

“———” means “No Function”.

6. Functional Execution Command

6.1 Format

6.1.1 PC issues a command in format as below.

“C” **Command** [CR] (PC → TV) or

“CF_” **Command** “_” **Parameter** [CR] (PC → TV)

Command / Parameter: See Functional Execution Command Table

“_” means space.

6.1.2 When received command is appropriate, the TV returns “ACK” to PC and decodes.

[ACK] [CR] (TV → PC)

6.1.3 When received command is not appropriate, the TV returns “?” to PC.

“?” [CR] (TV → PC)

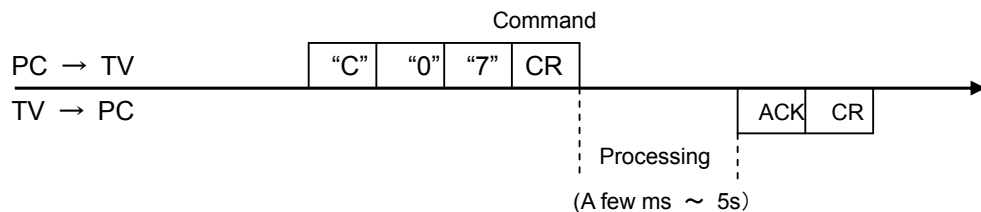
6.2 When the command pipelining is needed

When some functions need the command pipelining, the performance is the same as the remote control's performance.

- 1) System: issue any commands every 100 ms after receiving response
- 2) When receiving the appropriate command, the function is executed for 120 ms from the moment.
- 3) When receiving the same command continuously within 120 ms, the function is executed for another 120 ms from the moment.
- 4) When there is no incoming command after 120 ms, the execution of pipelining is stopped.
- 5) When the TV receives other incoming commands within 120ms, the execution of pipelining is stopped.

6.3 Transfer Example

Change to video mode with Basic Command.



6.4 Operation Requirements

When the TV's status in this below, Functional Execution Commands are limited.

TV Status	Available Functional Execution Commands
Standby Mode	POWER ON
Power Save Status	POWER ON

Note) When the status is above, even if the TV receives other command, it returns **[ACK] [CR]**.

6.5 POWER ON Command

Command	"C00" [CR]	
Detail	Power ON. When already Power ON, no operation is necessary.	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.6 POWER OFF Command

Command	"C01" [CR]	
Detail	Power OFF (Standby). When already standby mode, no operation is necessary.	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.7 Wide "Auto" direct Command

Command	"C23" [CR]	
Detail	Set wide mode to "Auto" directly. When PC mode or AV2 RGBHV mode, no operation is necessary	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.8 Wide "Natural" direct Command

Command	"C24" [CR]	
Detail	Set wide mode to "Natural" directly. When PC mode or AV2 RGBHV mode, no operation is necessary	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.9 Wide "Zoom 16:9" direct Command

Command	"C25" [CR]	
Detail	Set wide mode to "Zoom 16:9" directly. When PC mode or AV2 RGBHV mode, no operation is necessary	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.10 Wide "Title in 16:9" direct Command

Command	"C26" [CR]	
Detail	Set wide mode to "Title in 16:9" directly. When PC mode or AV2 RGBHV mode, no operation is necessary.	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.11 Wide "Zoom 14:9" direct Command

Command	"C27" [CR]	
Detail	Set wide mode to "Zoom 14:9" directly. When PC mode or AV2 RGBHV mode, no operation is necessary	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.12 Wide "Title in 14:9" direct Command

Command	"C28" [CR]	
Detail	Set wide mode to "Title in 14:9" directly. When PC mode or AV2 RGBHV mode, no operation is necessary	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.13 Wide "Full" direct Command

Command	"C29" [CR]	
Detail	Set wide mode to "Full" directly. This works even in PC or AV2 RGBHV mode.	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.14 Wide "Normal" direct Command

Command	"C0F" [CR]	
Detail	Set wide mode to "Normal" directly. This works even in PC or AV2 RGBHV mode.	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.15 Picture mode Command

Command	"C30" [CR]	
Detail	Toggle picture mode. (Dynamic -> Standard -> Personal -> Eco)	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.16 AV1 direct Command

Command	"C70" [CR]	
Detail	Select "AV1" mode directly.	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.17 RGB direct

Command	"C71" [CR]	
Detail	Select "RGB" mode directly.	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.18 AV2 RGBHV direct Command

Command	"C72" [CR]	
Detail	Select "AV2 RGBHV" mode directly.	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.19 AV2 YPbPr direct Command

Command	"C73" [CR]	
Detail	Select "AV2 YPbPr" mode directly.	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.20 AV3 direct Command

Command	"C74" [CR]	
Detail	Select "AV3" mode directly.	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.21 HDMI direct Command

Command	"C75" [CR]	
Detail	Select "HDMI" mode directly.	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.22 PC direct Command

Command	"C76" [CR]	
Detail	Select "PC" mode directly.	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.23 PC Auto adjust Command

Command	"C64" [CR]	
Detail	Execute PC Auto adjust function.	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.24 Factory setting Command

Command	"C92" [CR]	
Detail	Execute Shipping condition function.	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.25 POWER SAVE ON Command

Command	"CF PSAVE ON" [CR]	
Detail	Set PSAVE to "ON".	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.26 POWER SAVE OFF Command

Command	"CF PSAVE OFF" [CR]	
Detail	Set PSAVE to "OFF".	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.27 Child lock ON Command

Command	"CF CLOK ON" [CR]	
Detail	Set child lock to "ON".	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.28 Child lock OFF Command

Command	"CF CLOK OFF" [CR]	
Detail	Set child lock to "OFF".	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.29 RC Inhibition OFF Command

Command	"CF DEA RMCY" [CR]	
Detail	Set RC inhibition to "OFF".	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

6.30 RC Inhibition ON Command

Command	"CF DEA RMCN" [CR]	
Detail	Set RC inhibition to "ON".	
Response	Acceptable	[ACK] [CR]
	Unacceptable	"?" [CR]

7. Status Read Commands

7.1 Format

7.1.1 PC issues commands in format as below.

“CR” **Command** [CR] (PC → TV) or

“CR_” **Command** [CR] (PC → TV)

Command: See Status Read Command Table.

“_” means space.

7.1.2 When received command is appropriate, the TV returns a character line as the required data.

Required Data [CR] (TV → PC)

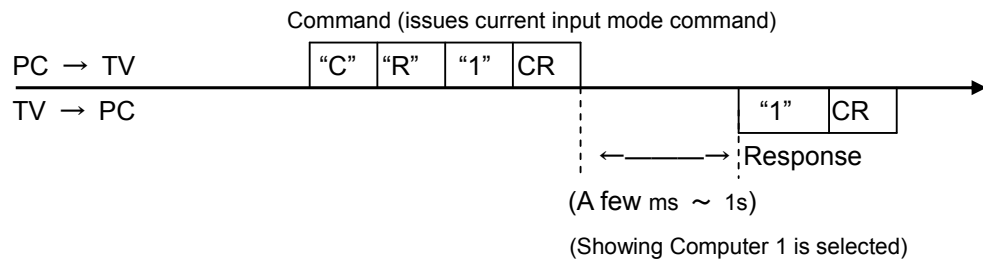
Required Data: A character line (See Status Read Command Table)

7.1.3 When the received command is not appropriate, the TV returns “?” to PC.

“?” [CR] (TV → PC)

7.2 Transfer Example

Get input mode for TV by Basic Commands.



7.3 Power status Read Command

Command	"CR0" [CR]	
Detail	Get selected Input No.	
Response	Acceptable	"%1" [CR]
	%1	"00" = Power ON. "10" = Power error. "20" = Standby. "40" = Power save. "80" = I2c error.
	Unacceptable	"?" [CR]

7.4 Input mode Read Command

Command	"CR1" [CR]	
Detail	Get selected Input mode.	
Response	Acceptable	"%1" [CR]
	%1	"AV1" = AV1 "RGB" = RGB "AV2 RGBHV" = AV2 RGBHV "AV2 YPbPr" = AV2 YPbPr "AV3" = AV3 "HDMI" = HDMI "PC" = PC "RF" = RF
	Unacceptable	"?" [CR]

7.5 Picture mode Read Command

Command	"CR PICTURE" [CR]	
Detail	Get the picture mode.	
Response	Acceptable	"%1" [CR]
	%1	"000 Personal" = Personal "000 Dynamic" = Dynamic "000 Eco" = Eco "000 Standard" = Standard
	Unacceptable	"%1" [CR]

7.6 Wide mode Read Command

Command	"CR WIDE" [CR]	
Detail	Get the wide mode.	
Response	Acceptable	"%1" [CR]
	%1	"000 Auto" = Auto "000 Natural" = Natural "000 Zoom 16:9" = Zoom 16:9 "000 Title in 16:9" = Title in 16:9 "000 Zoom 14:9" = Zoom 14:9 "000 Title in 14:9" = Title in 14:9 "000 Full" = Full "000 Normal" = Normal
	Unacceptable	"%1" [CR]

7.7 Signal status Read Command

Command	"CR SIGNAL" [CR]	
Detail	Get the signal status.	
Response	Acceptable	"%1" [CR]
	%1	"000 No signal" = No signal "000 Signal exists" = Signal exists.
	Unacceptable	"%1" [CR]

7.8 Child lock setting Read Command

Command	"CR CHILD" [CR]	
Detail	Get the child lock setting.	
Response	Acceptable	"%1" [CR]
	%1	"000 OFF" = OFF "000 ON" = ON
	Unacceptable	"%1" [CR]

7.9 Power save setting Read Command

Command	"CR PSAVE" [CR]	
Detail	Get the PSAVE setting .	
Response	Acceptable	"%1" [CR]
	%1	"000 OFF" = OFF "000 ON" = ON
	Unacceptable	"%1" [CR]

7.10 Panel usage time Read Command

Command	"CRTM" [CR]	
Detail	Get the Panel Usage Time	
Response	Acceptable	"%1" [CR]
	%1	Panel Usage Time in hour by 5 digits. Ex. "00123" This means 123 hours
	Unacceptable	"?" [CR]

7.11 RC inhibition Read Command

Command	"CR RMC" [CR]	
Detail	Get the Remote Control inhabitation state	
Response	Acceptable	"%1" [CR]
	%1	"000 OFF" = OFF : operable "000 ON" = ON : inoperable
	Unacceptable	"?" [CR]

8. Addressing Format command

overview

Addressing format command is used for operating multiple TV sets from one PC via RS232C control line.

Addressing format command is defined one command/one line that starts with "A" and ends with carriage return (0x0D).

When the TV receives carriage return (0x0D), the TV starts to decode.

Address is added at the top of control command as follows. (Control command is defined as same as command without address.)

[Example]

Functional execution command:

"A001C05" [CR] means address is "001" and control command is "C05".

Status read command:

"A001CR0" [CR] means address is "001" and control command is "CR0".

The TV can set its own address in hotel option menu. Address can be set in the range of "001" to "999". Default address is "001".

The TV clears the information of receiving buffer and the function is not executed when the following condition occurs.

- 1) When it takes more than one second until the TV receives carriage return since it has received the first data "C" and /or
- 2) When LF (0x0A) or EOF (0x1A) is received.

8.2 Functional execution command with address

8.2.1 Format

- 1) PC issues a command in format as below.

"A" **Address** "C" **Command** [CR] (PC (TV) or

"A" Address "CF_" Command "_" Parameter [CR] (PC (TV)

Address: 3 digit number (001 to 999)

Command / Parameter: See Functional Execution Command Table.

"_" means space.

- 2) Only TV with which address matches responds. The TV returns "ACK" and decode or returns "?" to PC.

[ACK] [CR] (0x06, 0x0D) When received command is appropriate.

"?" [CR] When received command is not appropriate.

[NOTE]

If received address is "FFF", all TVs execute the command but never respond to PC.

8.3 Status Read command with address

8.3.1 Format

- 1) PC issues a command in format as below.

“A” **Address** “CR” **Command** [CR] (PC → TV) or

“A” **Address** “CR_” **Command** [CR] (PC → TV)

Address: 3 digit number (001 to 999)

Command: See Status Read Command Table.

“_” means space.

- 2) Only TV with which address matches responds. The TV returns “required data” or “?” to PC.

Required Data [CR] (TV → PC)

Required Data: A character line (See Status Read Command Table)

“?” [CR] (TV → PC)

When received command is not appropriate.



PROTECTION SHEET