SONY

FLAT WIDE DISPLAY

FWD-40LX1
FWD-32LX1R

PROTOCOL MANUAL

1st Edition

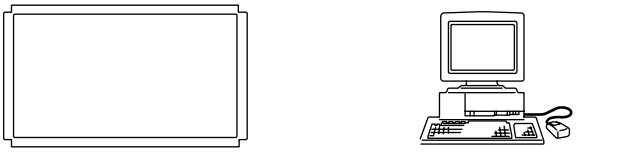
Table of Contents

1. Communication Parameter

Communication system	RS-232C
Synchronous system	Asynchronous communication
Baud rate	9600 bps
Character length	8 bit
Parity	None
Start bit	1 bit
Stop bit	1 bit
Flow control	None

2. Pin Configuration

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



FWD-40LX1
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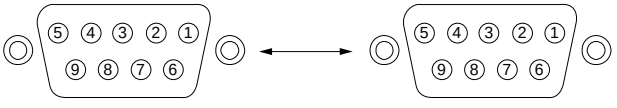
Personal computer



– External view – – External view –

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

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

3. Communication Data Format

(a) Control (Host → Request of Write to Display)

No.	Item	Value
1	Header	0x8C:Control
2	Category	0xXX
3	Function	0xXX
4	Data1 (Length)	0xXX
5	Data2 (Data1)	0xXX
:	:	0xXX
:	:	0xXX
X	Data (X-3)	0xXX
X+1	Check Sum	0xXX

∗ Check Sum: Sum total of 1 to X. Lower one-byte data is validated when a value exceeds 255 (1 byte).
∗ Set the command interval to 500 ms or more when transmitting the Control command continuously.
∗ Set the command interval to 500 ms or more when transmitting the same command (Enquiry) after the Control command.

(b) Enquiry (Host → Request of Read to Display)

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

∗ Check Sum: Sum total of 1 to 5. Lower one-byte data is validated when a value exceeds 255 (1 byte).

(c) Answer (Display → Response to Host)

① Answer at the time of Control request

No.	Item	Value
1	Header	0x70: Answer
2	Answer*	0x00: Completed (Normal completion)
		0x01: Limit Over (Abnormal completion: Over upper limit)
		0x02: Limit Under (Abnormal completion: Under lower limit)
		0x03: Command Canceled (Abnormal completion)
3	Check Sum	0xXX

∗ 0x00: Completed — Packet is correctly received and process is also correctly completed.
0x01: Limit Over — Packet is correctly received, but the data value is over the upper limit.
0x02: Limit Under — Packet is correctly received, but the data value is under the lower limit.
0x03: Command Canceled — Packet is correctly received, but the data value is not correct or the request cannot be accepted in the current host state.
∗ Check Sum: — If the value of a sum total of 1 and 2 exceeds 255 (1 byte), the data of 1 lower byte is effective.

② Answer at the time of Enquiry request (Normal completion)

No.	Item	Value
1	Header	0x70: Answer
2	Answer	0x00: Completed
3	Return Data Size	0xXX
4	Return Data1	0xXX
:	:	0xXX
:	:	0xXX
X	Return Data (X-3)	0xXX
X+1	Check Sum	0xXX

∗ 0x00: Completed — Completed packet is correctly received and process is also correctly completed.
∗ Return Data returns the read value.
∗ Check Sum: If the value of a sum total of 1 to X exceeds 255 (1 byte), the data of 1 lower byte is effective.

③ Answer at the time of Enquiry request (Abnormal completion)

No.	Item	Value
1	Header	0x70: Answer
2	Answer	0x03: Command Canceled (Abnormal completion)
3	Check Sum	0x73

∗ 0x03: Command Canceled — Packet is correctly received, but the data value is not correct or the request cannot be accepted in the current host state.

④ Error Answer

No.	Item	Value
1	Header	0xE0: Answer
2	Answer*	0x00: No Function Error
		0x01: Check Sum Error
		0x02: Data Length Error
3	Check Sum	0xXX

∗ 0x00: No Function Error — Packet header, category and function code are not included in this protocol.
0x01: Check Sum Error — Check sum value of received packet is not correct.
0x02: Data Length Error — Packet is correctly received, but the data size is over the upper limit.
∗ Check Sum: — If the value of a sum total of 1 and 2 exceeds 255 (1 byte), the data of 1 lower byte is effective.

4. General Function

(a) Mode control

Syntax	Header	Category	Function	Data1	Data2	Check Sum
Control	0x8C	0x00	Code Table(1-a)[a]	0x02	Code Table(1-a)[b]	0xXX
Enquiry	0x83			0xFF	0xFF	0xXX

Answer	Header	Answer	Check Sum	
Control	0x70	0x00	0x70	Completed
	0x70	0x01	0x71	Limit Over
	0x70	0x02	0x72	Limit Under
	0x70	0x03	0x73	Command Canceled

Answer	Header	Answer	Return to Data Size	Return Data1	Check Sum	
Enquiry	0x70	0x00	0x02	Code Table (1-a)[b]	0xXX	Completed

Code Table(1-a)

[a]Function		[b]Range/Switch Code		Command Control	Enquiry	Standby	Power On
0x00	Power*1	0x00	OFF	Yes	Yes	Enable	Enable
		0x01	ON				
0x01	Input Select*2	0x0A	INPUT2 RGB	Yes	Yes	Disable	Enable
		0x0B	INPUT2 COMPONENT				
		0x0C	OPTION1 VIDEO				
		0x0D	OPTION1 S VIDEO				
		0x0E	OPTION1 RGB				
		0x0F	OPTION1 COMPONENT				
		0x10	OPTION2 VIDEO				
		0x11	OPTION2 S VIDEO				
		0x12	OPTION2 RGB				
		0x13	OPTION2 COMPONENT				
		0x20	INPUT1 DVI				
0x02	Force Status Display	0x00	ON	Yes	Yes	Disable	Enable
		0x01	OFF				
0x03	Audio Mute	0x00	OFF	Yes	Yes	Disable	Enable
		0x01	ON				
0x04	Auto Status Display	0x00	ON	Yes	Yes	Enable	Enable
		0x01	OFF				
0x05	Closed Caption	0x00	OFF	Yes	Yes	Disable	Enable
		0x01	CC1				
		0x02	CC2				
		0x03	CC3				
		0x04	CC4				

Code Table(1-a)

[a]Function		[b]Range/Switch Code		Command Control	Enquiry	Standby	Power On
0x06	Color System	0x00	Auto	Yes	Yes	Disable	Enable
		0x01	NTSC				
		0x02	NTSC4.43				
		0x03	PAL				
		0x04	SECAM				
		0x05	PAL-M				
		0x06	PAL-N				
		0x07	PAL60				
0x0F	Language	0x00	Japanese	Yes	Yes	Disable	Enable
		0x01	English				
		0x02	Deutsch				
		0x03	Français				
		0x04	Español				
		0x05	Italiano				
0x10	Index Number	0x01 - 0xFF		Yes	Yes	Disable	Enable
0x13	Power Saving	0x00	Standard	Yes	Yes	Disable	Enable
		0x01	Reduce				
0x14	Speaker Out	0x00	ON	Yes	Yes	Disable	Enable
		0x01	OFF				
0x16	HD Mode	0x00	1080i	Yes	Yes	Disable	Enable
		0x01	1035i				
0x17	RGB Mode	0x00	DTV	Yes	Yes	Disable	Enable
		0x01	PC				
0x18	Sync Mode	0x00	H/Comp	Yes	Yes	Disable	Enable
		0x01	Video				
0x1B	Clock Display	0x00	OFF	Yes	Yes	Disable	Enable
		0x1B	ON				
0x24	Input Detect(Option1)	0x00	FW12(HD15)	No	Yes	Disable	Enable
		0x01	FW10(CVBS, Y/C)				
		0x02	FW11(BNC)				
		0x03	Reserved				
		0x04	FW31/32				
		0x05	FW50				
		0x06	Reserved				
		0x07	Reserved				
		0x08	Reserved				
		0x09	Reserved				
		0x0A	Reserved				
		0x0B	Reserved				
		0x0C	Reserved				
		0x0D	Reserved				
		0x0E	Reserved				

(Continued)

Code Table(1-a)

[a]Function		[b]Range/Switch Code		Command Control	Enquiry	Standby	Power On
0x24	Input Detect(Option1)	0x0F	Not Connect	No	Yes	Disable	Enable
0x25	Input Detect(Option2)	0x00	FW12(HD15)	No	Yes	Disable	Enable
		0x01	FW10(CVBS, Y/C)				
		0x02	FW11(BNC)				
		0x03	Reserved				
		0x04	FW31/32				
		0x05	FW50				
		0x06	Reserved				
		0x07	Reserved				
		0x08	Reserved				
		0x09	Reserved				
		0x0A	Reserved				
		0x0B	Reserved				
		0x0C	Reserved				
		0x0D	Reserved				
		0x0E	Reserved				
		0x0F	Not Connect				
0x26	Auto Shut OFF	0x00	OFF	Yes	Yes	Disable	Enable
		0x01	ON				
0x30	PAP*2	0x00	OFF	Yes	Yes	Disable	Enable
		0x01	P&P				
		0x02	PinP				
0x31	Active Picture	0x00	Left(P&P)/Main(PinP)	Yes	Yes	Disable	Enable
		0x01	Right(P&P)/Sub(PinP)				
		0x02	Swap*2				
0x32	Picture Size(P&P)	0x00 - 0x0E		Yes	Yes	Disable	Enable
0x33	Sub Picture Size (PinP)	0x00	Large	Yes	Yes	Disable	Enable
		0x01	Small				
0x34	Picture Position(PinP)*3	0x00	Position1	Yes	Yes	Disable	Enable
		0x01	Position2				
		0x02	Position3				
		0x03	Position4				
0x35	PAP Input Detect (Left/Main)	0x0A	INPUT2 RGB	No	Yes	Disable	Enable
		0x0B	INPUT2 COMPONENT				
		0x0C	OPTION1 VIDEO				
		0x0D	OPTION1 S VIDEO				
		0x0E	OPTION1 RGB				
		0x0F	OPTION1 COMPONENT				
		0x10	OPTION2 VIDEO				
		0x11	OPTION2 S VIDEO				
		0x12	OPTION2 RGB				
		0x13	OPTION2 COMPONENT				

(Continued)

Code Table(1-a)

[a]Function		[b]Range/Switch Code		Command Control	Enquiry	Standby	Power On
0x35	PAP Input Detect (Left/Main)	0x20	INPUT1 DVI	No	Yes	Disable	Enable
0x36	PAP Input Detect (Right/Sub)	0x0A	INPUT2 RGB	No	Yes	Disable	Enable
		0x0B	INPUT2 COMPONENT				
		0x0C	OPTION1 VIDEO				
		0x0D	OPTION1 S VIDEO				
		0x0E	OPTION1 RGB				
		0x0F	OPTION1 COMPONENT				
		0x10	OPTION2 VIDEO				
		0x11	OPTION2 S VIDEO				
		0x12	OPTION2 RGB				
		0x13	OPTION2 COMPONENT				
		0x20	INPUT1 DVI				

∗1: Transmit the next command 10 seconds after Power On and Power Off commands are transmitted. If not, correct data may not be able to be acquired.
∗2: For INPUT SELECT, PAP, and Active Picture (SWAP), check the busy state using a Busy to INPUT command.
∗3: The Picture Position arrangement is as shown below.

1	2
3	4

Code Table(1-a)

[a]Function		[b]Range/Switch code		Command Control	Enquiry	Standby	Power On
0x43	BackLight	0x00 - 0x64		Yes	Yes	Disable	Enable
0x44	Illumination	0x00	OFF	Yes	Yes	Disable	Enable
		0x01	Low				
		0x02	High				
0x45	Control Mode	0x00	Main+Remocon	Yes	Yes	Disable	Enable
		0x01	Main				
		0x02	Remocon				
0x46	On Off Timer Mode	0x00	Every Day	Yes	Yes	Enable	Enable
		0x01	Day Of Week				
0x47	On Timer Enable	bit0	Sunday 1:Enable, 0:Disable	Yes	Yes	Enable	Enable
		bit1	Monday 1:Enable, 0:Disable				
		bit2	Tuesday 1:Enable, 0:Disable				
		bit3	Wednesday 1:Enable, 0:Disable				
		bit4	Thursday 1:Enable, 0:Disable				
		bit5	Friday 1:Enable, 0:Disable				
		bit6	Saturday 1:Enable, 0:Disable				
		bit7	Every day 1:Enable, 0:Disable∗4				

Code Table(1-a)

[a]Function		[b]Range/Switch code		Command Control	Enquiry	Standby	Power On
0x48	Off Timer Enable	bit0	Sunday 1:Enable, 0:Disable	Yes	Yes	Enable	Enable
		bit1	Monday 1:Enable, 0:Disable				
		bit2	Tuesday 1:Enable, 0:Disable				
		bit3	Wednesday 1:Enable, 0:Disable				
		bit4	Thursday 1:Enable, 0:Disable				
		bit5	Friday 1:Enable, 0:Disable				
		bit6	Saturday 1:Enable, 0:Disable				
		bit7	Every day 1:Enable, 0:Disable*4				
0x65	IP Setting Mode	0x00	DHCP	Yes	Yes	Enable	Enable
		0x01	Manual				
		0x02	Speed				
0x66	IP Setting Execute	0x00	No	No	Yes	Enable	Enable
		0x01	Yes				
0x67	IP Setting Result	0x00	Done	Yes	No	Enable	Enable
		0x01	Error 1 (UART Commu.)				
		0x02	Error 2 (Duplication)				
		0x03	Error 3 (IP Add Setting)				
		0x04	Error 4 (GW Add Setting)				
		0x05	Error 5 (DNS1 Setting)				
		0x06	Error 6 (DNS2 Setting)				
		0x07	Error 7 (Sbnt Msk Setting)				
0x68	Speed Setting	0x00	100Mbps/Full Duplex	Yes	Yes	Enable	Enable
		0x01	100Mbps/Half Duplex				
		0x02	10Mbps/Full Duplex				
		0x03	10Mbps/Half Duplex				
		0x04	Auto				

*4: For every day, all bits should be put in the same state. (Enable:0xff, Disable:0x00)

(b) Color matrix

Syntax	Header	Category	Function	Data1	Data2	Data3	Data3	Check Sum
Control	0x8C	0x00	Code Table (1-b)[a]	0x04	Code Table (1-c)	Code Table (1-b)[b]	Code Table (1-d)	0xXX

Syntax	Header	Category	Function	Data1	Data2	Check Sum
Enquiry	0x83	0x00	Code Table(1-b)[a]	Code Table (1-c)	Code Table (1-d)	0xXX

Answer	Header	Answer	Check Sum	
Control	0x70	0x00	0x70	Completed
	0x70	0x03	0x73	Command Canceled

Answer	Header	Answer	Return to Data Size	Return Data1	Return Data2	Return Data3	Check Sum	
Enquiry	0x70	0x00	0x04	Code Table (1-c)	Code Table (1-b)[b]	Code Table(1-d)	0xXX	Completed

Code Table(1-b)

[a]Function	[b]Range/Switch code	Command Control	Enquiry	Standby	Power On
0x1D Color Matrix	0x00 YCbCr	Yes	Yes	Disable	Enable
	0x01 YPbPr				

Code Table(1-c)

Format Select	
0x00	480p
0x01	1080i
0x02	720p
0x03	480i

Code Table(1-d)

Input Select	
0x00	Input2
0x01	Option1
0x02	Option2 (Invalid for FWD-32LX1R)

(c) Time control

Clock Set (Hour, Minute)

Syntax	Header	Category	Function	Data1	Data2	Data3	Check Sum
Control	0x8C	0x00	0x22	0x03	Hour:0x00 - 0x17	Minute:0x00 - 0x3B	0xXX

Syntax	Header	Category	Function	Data1	Data2	Check Sum
Enquiry	0x83	0x00	0x22	0xFF	0xFF	0xA3

Answer	Header	Answer	Check Sum	
Control	0x70	0x00	0x70	Completed
	0x70	0x01	0x71	Limit Over
	0x70	0x02	0x72	Limit Under
	0x70	0x03	0x73	Command Canceled

Answer	Header	Answer	Return to Data Size	Return Data1	Return Data2	Check Sum	
Enquiry	0x70	0x00	0x03	Hour:0x00 - 0x17*	Minute:0x00 - 0x3B	0xXX	Completed

* Data of Hour: 0x80 and Minute: 0x00 is set as Return Data when a timer is not set after factory setting.

Clock Set (Week)

Syntax	Header	Category	Function	Data1	Data2	Check Sum
Control	0x8C	0x00	0x23	0x02	Week:Code Table(1-e)	0xXX

Syntax	Header	Category	Function	Data1	Data2	Check Sum
Enquiry	0x83	0x00	0x23	0xFF	0xFF	0xA4

Answer	Header	Answer	Check Sum	
Control	0x70	0x00	0x70	Completed
	0x70	0x01	0x71	Limit Over
	0x70	0x02	0x72	Limit Under
	0x70	0x03	0x73	Command Canceled

Answer	Header	Answer	Return to Data Size	Return Data1	Check Sum	
Enquiry	0x70	0x00	0x02	Week:Code Table(1-e)	0xXX	Completed

Code Table(1-e)

Week Select	
0x00	Sunday
0x01	Monday
0x02	Tuesday
0x03	Wednesday
0x04	Thursday
0x05	Friday
0x06	Saturday

On Timer, Off Timer

Syntax	Header	Category	Function	Data1	Data2	Data3	Check Sum
Control	0x8C	0x00	Code Table(1-f)[a]	0x03	Hour:0x00 - 0x17	Minute:0x00 - 0x3B	0xXX

Syntax	Header	Category	Function	Data1	Data2	Check Sum
Enquiry	0x83	0x00	Code Table(1-f)[a]	0xFF	0xFF	0xXX

Answer	Header	Answer	Check Sum	
Control	0x70	0x00	0x70	Completed
	0x70	0x01	0x71	Limit Over
	0x70	0x02	0x72	Limit Under
	0x70	0x03	0x73	Command Canceled

Answer	Header	Answer	Return to Data Size	Return Data1	Return Data2	Check Sum	
Enquiry	0x70	0x00	0x03	Hour:0x00 - 0x17	Minut:0x00 - 0x3B	0xXX	Completed

Code Table(1-f)

[a]Function		[b]Range/Switch code	Command Control	Enquiry	Standby	Power On
Clock Set						
0x22	Hour, Minute		Yes	Yes	Disable	Enable
0x23	Week					
On Timer						
0x50	Sunday		Yes	Yes	Disable	Enable
0x51	Monday					
0x52	Tuesday					
0x53	Wednesday					
0x54	Thursday					
0x55	Friday					
0x56	Saturday					
0x57	Every day					
Off Timer						
0x58	Sunday		Yes	Yes	Disable	Enable
0x59	Monday					
0x5A	Tuesday					
0x5B	Wednesday					
0x5C	Thursday					
0x5D	Friday					
0x5E	Saturday					
0x5F	Every day					

(d) IP Address Setting

IP Address

Syntax	Header	Category	Function	Data1	Data2	Data3	Data4	Data5	Check Sum
Control	0x8C	0x00	0x42	0x05	Address 0 0x00 - 0xFF	Address 1 0x00 - 0xFF	Address 2 0x00 - 0xFF	Address 3 0x00 - 0xFF	0xXX

Subnet Mask

Syntax	Header	Category	Function	Data1	Data2	Data3	Data4	Data5	Check Sum
Control	0x8C	0x00	0x61	0x05	Address 0 0x00 - 0xFF	Address 1 0x00 - 0xFF	Address 2 0x00 - 0xFF	Address 3 0x00 - 0xFF	0xXX

Gateway Address

Syntax	Header	Category	Function	Data1	Data2	Data3	Data4	Data5	Check Sum
Control	0x8C	0x00	0x62	0x05	Address 0 0x00 - 0xFF	Address 1 0x00 - 0xFF	Address 2 0x00 - 0xFF	Address 3 0x00 - 0xFF	0xXX

DNS Primary

Syntax	Header	Category	Function	Data1	Data2	Data3	Data4	Data5	Check Sum
Control	0x8C	0x00	0x63	0x05	Address 0 0x00 - 0xFF	Address 1 0x00 - 0xFF	Address 2 0x00 - 0xFF	Address 3 0x00 - 0xFF	0xXX

DNS Secondary

Syntax	Header	Category	Function	Data1	Data2	Data3	Data4	Data5	Check Sum
Control	0x8C	0x00	0x64	0x05	Address 0 0x00 - 0xFF	Address 1 0x00 - 0xFF	Address 2 0x00 - 0xFF	Address 3 0x00 - 0xFF	0xXX

Answer	Header	Answer	Check Sum	
Control	0x70	0x00	0x70	Completed
	0x70	0x03	0x73	Command Canceled

Example of IP Address
192.128.14.1 192 (0xC0) Address 0
128 (0x80) Address 1
14 (0x0E) Address 2
1 (0x01) Address 3
∗ IP Address command can be carried out even in the standby state.

Code Table(1-a)

[a]Function		[b]Range/Switch code	Command Control	Enquiry	Standby	Power On
0x42	IP Address		Yes	Yes	Enable	Enable
0x61	Subnet Mask					
0x62	Gateway Address					
0x63	DNS Primary					
0x64	DNS Secondary					

5. Picture/Sound

(a) Picture/Sound

Syntax	Header	Category	Function	Data1	Data2	Check Sum
Control	0x8C	0x10	Code Table(2-a)[a]	0x02	Code Table(2-a)[b]	0xXX
Enquiry	0x83			0xFF	0xFF	0xXX

Answer	Header	Answer	Check Sum	
Control	0x70	0x00	0x70	Completed
	0x70	0x01	0x71	Limit Over
	0x70	0x02	0x72	Limit Under
	0x70	0x03	0x73	Command Canceled

Answer	Header	Answer	Return to Data Size	Return Data1	Check Sum	
Enquiry	0x70	0x00	0x02	Code Table(2-a)[b]	0xXX	Completed

Code Table(2-a)

[a]Function		[b]Range/Switch code		Command Control	Enquiry	Standby	Power On
0x00	Contrast	0x00 - 0x64*		Yes	Yes	Disable	Enable
0x01	Brightness	0x00 - 0x64*		Yes	Yes	Disable	Enable
0x02	Chroma	0x00 - 0x64		Yes	Yes	Disable	Enable
0x03	Phase	0x00 - 0x64		Yes	Yes	Disable	Enable
0x04	Color Temp	0x00	Cool	Yes	Yes	Disable	Enable
		0x01	Neutral				
		0x02	Warm				
		0x03	Color1				
		0x04	Color2				
		0x05	Color3				
0x09	Sharpness	0x00 - 0x0A		Yes	Yes	Disable	Enable
0x0A	NR	0x00	OFF	Yes	Yes	Disable	Enable
		0x01	Low				
		0x02	Mid				
		0x03	High				
0x0B	Cinema Drive	0x00	Auto	Yes	Yes	Disable	Enable
		0x01	OFF				
0x0C	Dynamic Picture	0x00	OFF	Yes	Yes	Disable	Enable
		0x01	Low				
		0x02	High				
0x0D	Color Correct	0x00	ON	Yes	Yes	Disable	Enable
		0x01	OFF				
0x0E	Gamma Correct	0x00	High	Yes	Yes	Disable	Enable
		0x01	Mid				
		0x02	Low				
0x10	Picture Mode	0x00	Standard	Yes	Yes	Disable	Enable
		0x01	Vivid				
		0x02	User1				
		0x03	User2				
		0x04	User3				
0x30	Volume	0x00 - 0x64		Yes	Yes	Enable	Enable
0x31	Treble	0x00 - 0x64		Yes	Yes	Disable	Enable
0x32	Bass	0x00 - 0x64		Yes	Yes	Disable	Enable
0x33	Balance	0x00 - 0x64		Yes	Yes	Disable	Enable
0x34	Surround	0x00	OFF	Yes	Yes	Disable	Enable
		0x01	Hall				
		0x02	Simulate				

*: The setting value during two-screen display is as follows:
Contrast: Setting value ±12 during one-screen display
Brightness: Setting value ±24 during one-screen display

(b) Color temperature

Syntax	Header	Category	Function	Data1	Data2	Data3	Check Sum
Control	0x8C	0x10	Code Table(2-b)[a]	0x03	Code Table(2-c)	Code Table(2-b)[b]	0xXX

Syntax	Header	Category	Function	Data1	Data2	Check Sum
Enquiry	0x83	0x10	Code Table(2-b)[a]	Code Table(2-c)	0xFF	0xXX

Answer	Header	Answer	Check Sum	
Control	0x70	0x00	0x70	Completed
	0x70	0x03	0x73	Command Canceled

Answer	Header	Answer	Return to Data Size	Return Data1	Return Data2	Check Sum	
Enquiry	0x70	0x00	0x03	Code Table(2-c)	Code Table(2-b)[b]	0xXX	Completed

Code Table(2-b)

[a]Function		[b]Range/Switch code	Command Control	Enquiry	Standby	Power On
0x05	Red Gain	0x00 - 0x0A	Yes	Yes	Disable	Enable
0x06	Green Gain	0x00 - 0x0A				
0x07	Blue Gain	0x00 - 0x0A				

Code Table(2-c)

Format Select	
0x03	Color1
0x04	Color2
0x05	Color3

6. Size/Shift

(a) 8 bit register

Syntax	Header	Category	Function	Data1	Data2	Check Sum
Control	0x8C	0x20	Code Table(3-b)[a]	0x02	Code Table(3-b)[b]	0xXX
Enquiry	0x83			0xFF	0xFF	0xXX

Answer	Header	Answer	Check Sum	
Control	0x70	0x00	0x70	Completed
	0x70	0x01	0x71	Limit Over
	0x70	0x02	0x72	Limit Under
	0x70	0x03	0x73	Command Canceled

Answer	Header	Answer	Return to Data Size	Return Data1	Check Sum	
Enquiry	0x70	0x00	0x02	Code Table(3-b)[b]	0xXX	Completed

Code Table(3-b)

[a]Function		[b]Range/Switch code		Command Control	Enquiry	Standby	Power On
0x00	H Size	0x00 - 0x64		Yes	Yes	Disable	Enable
0x01	H Center	0x00 - 0x64		Yes	Yes	Disable	Enable
0x02	V Size	0x00 - 0x64		Yes	Yes	Disable	Enable
0x03	V Center	0x00 - 0x64		Yes	Yes	Disable	Enable
0x04	Aspect	0x00	Wide Zoom	Yes	Yes	Disable	Enable
		0x01	Zoom				
		0x02	Full				
		0x03	Sub Title				
		0x04	Normal				
0x05	Multi Display	0x00	OFF	Yes	Yes	Disable	Enable
		0x01	×2				
		0x02	×3				
		0x03	×4				
0x07	Dot Phase	0x00 - 0x1F		Yes	Yes	Disable	Enable
0x08	Auto Wide	0x00	OFF	Yes	Yes	Disable	Enable
		0x01	ON				
0x09	4:3 Mode	0x00	Normal	Yes	Yes	Disable	Enable
		0x01	Wide Zoom				
0x0B	Multi Position(×2)*	0x00	Position1	Yes	Yes	Disable	Enable
		0x01	Position2				
		0x02	Position3				
		0x03	Position4				
0x0C	Multi Position(×3)*	0x00	Position1	Yes	Yes	Disable	Enable
		0x01	Position2				
		0x02	Position3				
		0x03	Position4				
		0x04	Position5				
		0x05	Position6				
		0x06	Position7				
		0x07	Position8				
		0x08	Position9				
0x0D	Multi Position(×4)*	0x00	Position1	Yes	Yes	Disable	Enable
		0x01	Position2				
		0x02	Position3				
		0x03	Position4				
		0x04	Position5				
		0x05	Position6				
		0x06	Position7				

Code Table(3-b)

[a]Function		[b]Range/Switch code		Command Control	Enquiry	Standby	Power On
0x0D	Multi Position(×4)*	0x07	Position8	Yes	Yes	Disable	Enable
		0x08	Position9				
		0x09	Position10				
		0x0A	Position11				
		0x0B	Position12				
		0x0C	Position13				
		0x0D	Position14				
		0x0E	Position15				
		0x0F	Position16				

*: The Multi Position arrangement is as shown below.

Multi Position(×2)

1	2
3	4

Multi Position(×3)

1	2	3
4	5	6
7	8	9

Multi Position(×4)

1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16

7. Status Enquiry

(a) Model name enquiry

Syntax	Header	Category	Function	Data1	Data2	Check Sum
Enquiry	0x83	0x30	0x00 (Code Table(4-d)[a])	0xFF	0xFF	0xB1

Answer	Header	Answer	Return to Data Size	Return Data1	Check Sum	
Enquiry	0x70	0x00	0x02	Code Table(4-a)	0xXX	Completed

Code Table(4-a)

Format Select	
0x0A	FWD-40LX1
0x0B	FWD-32LX1R

(b) Serial number enquiry

Syntax	Header	Category	Function	Data1	Data2	Check Sum
Enquiry	0x83	0x30	0x01 (Code Table(4-d)[a])	0xFF	0xFF	0xB2

Answer	Header	Answer	Return to Data Size	Return Data1	Return Data2	Return Data3	Return Data4	Check Sum	
Enquiry	0x70	0x00	0x05	Upper 8bit Data	Middle Upper Data	Middle Lower Data	Lower 8bit Data	0xXX	Completed

Return Data1-Data4: 0x001E8480 - 0x002DC6BF(2,000,000 - 2,999,999)

(c) Operating time enquiry

Syntax	Header	Category	Function	Data1	Data2	Check Sum
Enquiry	0x83	0x30	0x02 (Code Table(4-d)[a])	0xFF	0xFF	0xB3

Answer	Header	Answer	Return to Data Size	Return Data1	Return Data2	Return Data3	Return Data4	Check Sum	
Enquiry	0x70	0x00	0x05	Upper 8bit Data	Middle Upper Data	Middle Lower Data	Lower 8bit Data	0xXX	Completed

Return Data1-Data4: 0x00000000 - 0xD693A3FF(0sec.–3,599,999,999sec.)

(d) Software version enquiry (Main CPU)

Syntax	Header	Category	Function	Data1	Data2	Check Sum
Enquiry	0x83	0x30	0x03 (Code Table(4-d)[a])	0xFF	0xFF	0xB4

Answer	Header	Answer	Return to Data Size	Return Data1	Return Data2	Check Sum	
Enquiry	0x70	0x00	0x03	Upper 8bit Data	Lower 8bit Data	0xXX	Completed

Return Data1-Data2: 0x0000 - 0xFFFF
Example)
For version 1.000, they become 10 and 00, respectively.

(e) 8 bit register enquiry

Syntax	Header	Category	Function	Data1	Data2	Check Sum
Enquiry	0x83	0x30	Code Table(4-b)[a]	0xFF	0xFF	0xXX

Answer	Header	Answer	Return to Data Size	Return Data1	Check Sum	
Enquiry	0x70	0x00	0x02	Code Table(4-b)[b]	0xXX	Completed

Code Table(4-b)

[a]Function		[b]Return Data	Unit
0x07	Digital 3.3 V	0x00 - 0xFF	
0x09	Digital 5 V	0x00 - 0xFF	
0x0A	Temp1	0x00 - 0xFF	
0x0D	Temp(P/S)	0x00 - 0xFF	
0x10	Analog5 V/9 V	0x00 - 0xFF	5 V power output
0x20	Busy to Input	0x00: Not Busy 0x01: Busy	

(f) Software version enquiry (Scaler)

Syntax	Header	Category	Function	Data1	Data2	Check Sum
Enquiry	0x83	0x30	0x0F (Code Table(4-d)[a])	0xFF	0xFF	0xC0

Answer	Header	Answer	Return to Data Size	Return Data1	Return Data2	Check Sum	
Enquiry	0x70	0x00	0x03	Upper 8bit Data	Lower 8bit Data	0xXX	Completed

Return Data1 - Data2: 0x0000 - 0xFFFF
Example)
For version 1.000, they become 10 and 00, respectively.

(g) Shutdown Log enquiry

Syntax	Header	Category	Function	Data1	Data2	Check Sum
Enquiry	0x83	0x30	0x11 (Code Table(4-d)[a])	0xFF	0xFF	0xC2

Answer	Header	Answer	Return to Data Size	Return Data1	Check Sum	
Enquiry	0x70	0x00	0x02	Code Table(4-c)	0xXX	Completed

Return Data1: 0x00 - 0xFF

Code Table(4-c)

Shutdown Information		
bit0	Reserved	
bit1	1: FAN operation is abnormal	0: Normal
bit2	1: Backlight is abnormal	0: Normal
bit3	1: Temperature sensor is abnormal	0: Normal
bit4	1: Main power supply is abnormal	0: Normal
bit5	1: Digital power supply is abnormal (3.3 V, 5 V)	0: Normal
bit6	1: Analog supply is abnormal (5 V/9 V)	0: Normal
bit7	1: Scaler is abnormal	0: Normal

Code Table(4-d)

[a]Function		[b]Range/Switch code	Command Control	Enquiry	Standby	Power On
0x00	Model Name	0x0A - 0x0B	No	Yes	Enable	Enable
0x01	Serial Number	0x001E8480 - 0x002DC6BF (2,000,000 - 2,999,999)	Yes	Yes	Enable	Enable
0x02	Operation Time	0x00000000 - 0xD693A3FF (0sec.–3,599,999,999sec.)				
0x03	Soft Version(Main)	0x0000 - 0xFFFF	No	Yes	Enable	Enable
0x07	Digital 3.3 V	0x00 - 0xFF				
0x09	Digital 5 V	0x00 - 0xFF				
0x0A	Temp1	0x00 - 0xFF				
0x0D	Temp(P/S)	0x00 - 0xFF				
0x0F	Soft Version(Scaler)	0x0000 - 0xFFFF				
0x10	Analog5 V/9 V	0x00 - 0xFF				(Continued)

Code Table(4-d)

[a]Function		[b]Range/Switch code	Command Control	Enquiry	Standby	Power On
0x11	Shutdown Log	0x00 - 0xFF	No	Yes	Enable	Enable
0x12	Digital 3.3 V(Failure)	0x00 - 0xFF				
0x13	Digital 5 V(Failure)	0x00 - 0xFF				
0x14	Analog5 V/9 V(Failure)	0x00 - 0xFF				
0x20	Busy to INPUT*	0x00 Non Busy				
		0x01 Busy				

* Busy to INPUT should be judged by Busy → Non Busy. Busy to INPUT may be incorrectly judged during start when it is judged by only Non Busy.

8. User Reset

Syntax	Header	Category	Function	Data1	Data2	Check Sum
Control	0x8C	0x50	Code Table(5)	0x02	0xFF	0xXX

Answer	Header	Answer	Check Sum	
Control	0x70	0x00	0x70	Completed
	0x70	0x03	0x73	Command Canceled

Code Table(5)

Function		Range/Switch code	Command Control	Enquiry	Standby	Power On
0x00	Picture Reset		Yes	No	Disable	Enable
0x01	Audio Reset					
0x03	Picture Reset2	Contrast, Brightness, Chroma, Phase				
0x04	All Reset					

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