

SONY[®]

FLAT WIDE DISPLAY

FWD-50PX1

PROTOCOL MANUAL (USER CONTROL ONLY)
1st Edition

Table of Contents

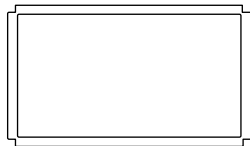
1. Communication Parameter	3
2. Pin Configuration	3
3. Communication Data Format	3
4. General Function	5
5. Picture/Sound	10
6. Size/Shift	12
7. Status Enquiry	14
8. User Reset	16

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)

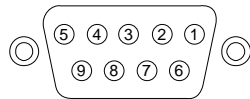


FWD-50PX1

Host side (D-sub 9-pin)



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	DataX	0xXX
X+1	Check Sum	0xXX

* 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.

(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: If the value of a sum total of 1 to 5 exceeds 255 (1 byte), the data of 1 lower byte is effective.

(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 DataX	0xXX
X+1	Check Sum	0xXX

- * 0x00: 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	0xXX

- * 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 to 2 exceeds 255 (1 byte), the data of 1 lower byte is effective.

④ Error Answer

No.	Item	Value
1	Header	0xE0: Answer
2	Answer*	0x00: No Function Error 0x01: Check Sum Error 0x02: Data Number Error 0x06: Mode Error 0x07: Time Out
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 Number Error Data value in "Data Number" area of the received packet is different from the data number of the function.
- 0x06: Mode Error Monitor is already in the service mode by the operation of remote commander. (IR remote commander precedes the serial remote commander.)
- 0x07: Time Out Packet communication is interrupted due to an error and does not return to the normal communication state within 2 seconds.

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	0x00 OFF	Yes	Yes	Enable	Enable
	0x01 ON				
0x01 Input Select	0x08 INPUT1 RGB	Yes	Yes	Disable	Enable
	0x09 INPUT1 COMPONENT				
	0x0A INPUT2 RGB				
	0x0B INPUT2 COMPONENT				
	0x0C OPTION VIDEO				
	0x0D OPTION S VIDEO				
	0x0E OPTION RGB				
	0x0F OPTION COMPONENT				
0x02 Force Status Display	0x00 ON1 (Signal)	Yes	Yes	Disable	Enable
	0x01 ON2 (Clock)*				
	0x02 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				
0x07	Auto Color System	0x00	NTSC/PAL/SECAM/NTSC4.43	Yes	Yes	Disable	Enable
		0x01	NTSC/PAL-M/PAL-N				
0x08	Power Saving	0x00	OFF	Yes	Yes	Disable	Enable
		0x01	5min.				
		0x02	10min.				
0x09	ON/OFF timer	0x00	OFF timer	Yes	Yes	Disable	Enable
		0x01	ON timer				
		0x02	ON/OFF timer				
		0x03	OFF				
0x0A	Timer Repeat	0x00	OFF	Yes	Yes	Disable	Enable
		0x01	ON				
0x0B	Picture Inversion	0x00	OFF	Yes	Yes	Disable	Enable
		0x01	Auto				
		0x02	ON				
0x0C	Picture Orbit	0x00	OFF	Yes	Yes	Disable	Enable
		0x01	ON				
0x0D	Orbit Range	0x00	Small	Yes	Yes	Disable	Enable
		0x01	Middle				
		0x02	Large				
0x0E	Orbit Cycle	0x00	10sec.	Yes	Yes	Disable	Enable
		0x01	30sec.				
		0x02	1min.				
		0x03	5min.				
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
0x11	Remote Mode	0x00	ON	Yes	Yes	Disable	Enable
		0x01	OFF				

Code Table (1-a)

[a]Function		[b]Range/Switch Code		Command Control	Enquiry	Standby	Power On
0x12	Remote Only	0x00	OFF	Yes	Yes	Disable	Enable
		0x01	ON				
0x13	Energy 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				
0x19	Menu Key	0x00	ON/OFF	Yes	Yes	Disable	Enable
		0x01	RETURN				
0x1B	Clock Display	0x00	OFF	Yes	Yes	Disable	Enable
		0x01	ON				
0x40	All White	0x00	OFF	Yes	Yes	Disable	Enable
		0x01	ON				
0x41	BackGround	0x00	Gray	Yes	Yes	Disable	Enable
		0x01	Dark Gray				
		0x02	Black				

* This is enabled when Clock Display is set to ON. When Display is set to OFF, Status Display is also set to OFF.

IP Address

Syntax	Header	Category	Function	Data1	Data2	Data3	Data4	Data5	Check Sum
Enquiry	0x83	0x00	0x42	0x05	Address 0 0x00-0xFF	Address 1 0x00-0xFF	Address 2 0x00-0xFF	Address 3 0x00-0xFF	0xXX

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

Example of IP Address setting

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.

(b) Color matrix

Syntax	Header	Category	Function	Data1	Data2	Data3	Check Sum
Control	0x8C	0x00	Code Table (1-b) [a]	0x03	Code Table (1-c)	Code Table (1-b) [b]	0xXX
Enquiry	0x83			Code Table (1-c)	0xFF	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 (1-c)	Code Table (1-b) [b]	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

(c) Time control

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

Syntax	Header	Category	Function	Data1	Data2	Check Sum
Enquiry	0x83	0x00	Code Table (1-d) [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	Minute: 0x00-0x3B	0xXX	Completed

Code Table (1-d)

[a]Function	[b]Range/Switch code	Command Control	Enquiry	Standby	Power On
ON/OFF Timer					
0x1E	Power ON Time	Yes	Yes	Disable	Enable
0x1F	Power OFF Time	Yes	Yes	Disable	Enable
Picture Inversion					
0x20	Invert Start Time	Yes	Yes	Disable	Enable
0x21	Invert End Time	Yes	Yes	Disable	Enable
Time Set					
0x22	Time Set	Yes	Yes	Disable	Enable

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	0x00-0xFF	Yes	Yes	Disable	Enable	
0x01	Brightness	0x00-0xFF	Yes	Yes	Disable	Enable	
0x02	Chroma	0x00-0xFF	Yes	Yes	Disable	Enable	
0x03	Phase	0x00-0xFF	Yes	Yes	Disable	Enable	
0x04	Color Temp	0x00	High	Yes	Yes	Disable	Enable
		0x01	Mid				
		0x02	Low				
		0x03	User1				
		0x04	User2				
		0x05	User3				
0x09	Sharpness	0x00-0xFF	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	ON	Yes	Yes	Disable	Enable
		0x01	OFF				
0x0D	Color Correct	0x02	ON	Yes	Yes	Disable	Enable
		0x03	OFF				
0x0E	Gamma Correct	0x00	High	Yes	Yes	Disable	Enable
		0x01	Mid				
		0x02	Low				

Code Table (2-a)

[a]Function		[b]Range/Switch Code		Command Control	Enquiry	Standby	Power On
0x0F	Window Mode	0x00	OFF	Yes	Yes	Disable	Enable
		0x01	Small				
		0x02	Large				
0x10	Picture Mode	0x00	Standard	Yes	Yes	Disable	Enable
		0x01	Dynamic				
		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				

(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]	0xFF	0xFF	0xXX

Answer	Header	Answer	Check Sum
Control	0x70	0x00	0x70
	0x70	0x03	0x73

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

Code Table (2-b)

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

Code Table (2-c)

Format Select	
0x03	User1
0x04	User2
0x05	User3

6. Size/Shift

(a) 16 bit register

Syntax	Header	Category	Function	Data1	Data2	Data3	Check Sum
Control	0x8C	0x20	Code Table (3-a) [a]	0x03	Code Table (3-a) [b]	Code Table (3-a) [b]	0xXX

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

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

Answer	Header	Answer	Return to Data Size	Return Data1	Return Data2	Check Sum
Enquiry	0x70	0x00	0x03	Code Table (3-a) [b]	Code Table (3-a) [b]	0xXX Completed

Code Table (3-a)

[a]Function	[b]Range/Switch code	Command Control	Enquiry	Standby	Power On
0x0A H Total Pixel	0x0190-0x09C4	Yes	Yes	Disable	Enable

(b) 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	0x00-0xFF		Yes	Yes	Disable	Enable
0x01	H Shift	0x00-0xFF		Yes	Yes	Disable	Enable
0x02	V Size	0x00-0xFF		Yes	Yes	Disable	Enable
0x03	V Shift	0x00-0xFF		Yes	Yes	Disable	Enable
0x04	Zoom Mode	0x00	Wide Zoom	Yes	Yes	Disable	Enable
		0x01	Zoom				
		0x02	Full				
		0x03	Sub Title				
		0x04	Normal				
0x05	Zoom Size	0x00	Standard	Yes	Yes	Disable	Enable
		0x01	×2				
		0x02	×3				
		0x03	×4				
0x06	Auto Pixel Adjust	0xFF	Execute	Yes	No	Disable	Enable
0x07	Dot Phase	0x00-0x3F		Yes	Yes	Disable	Enable
0x08	Auto Wide	0x00	OFF	Yes	Yes	Disable	Enable
		0x01	Auto				
0x09	4:3 Mode	0x00	Normal	Yes	Yes	Disable	Enable
		0x01	Wide Zoom				

7. Status Enquiry

(a) Model name enquiry

Syntax	Header	Category	Function	Data1	Data2	Check Sum
Enquiry	0x83	0x30	0x00	0xFF	0xFF	0xB1

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

Code Table (4-a)

Format Select
0x07 FWD-50PX1

(b) Serial number enquiry

Syntax	Header	Category	Function	Data1	Data2	Check Sum
Enquiry	0x83	0x30	0x01	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	0xFF 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	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	0xFF 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	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	Completed

Return Data1-Data2: 0x0000-0xFFFF

(e) H/V frequency enquiry

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

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

Return Data1-Data4: 0x0000-0xFFFF

Code Table (4-b)

Function
0x04 H Frequency
0x05 V Frequency

(f) Sync polarity enquiry

Syntax	Header	Category	Function	Data1	Data2	Check Sum
Enquiry	0x83	0x30	0x06	0xFF	0xFF	0xB7

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

Answer	Header	Answer	Check Sum
Enquiry	0x70	0x03	0x73 Command Canceled

Code Table (4-c)

Sync Polarity
0x00 H: Nega/V: Nega
0x01 H: Nega/V: Posi
0x02 H: Posi/V: Nega
0x03 H: Posi/V: Posi
0x04 SonG
0x05 No H/V Sync

(g) 8 bit register enquiry

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

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

Code Table (4-d)

Function	Return Data	Unit
0x07	Digital 3.3 V	0x00-0xFF
0x08	Analog 6 V	0x00-0xFF
0x09	Digital 5 V	0x00-0xFF /10 V
0x0A	Temp1	0x00-0xFF Degree
0x0B	Temp2	0x00-0xFF Degree
0x0C	Temp3	0x00-0xFF Degree
0x0D	Temp (P/S)	0x00-0xFF
0x0E	Fan Status	0=OK, 1=NG

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	Yes	No	Disable	Enable
0x02	Size Reset	Yes	No	Disable	Enable
0x03	PLL Reset	Yes	No	Disable	Enable