



LCD

Projector

User Manual

X120

APPENDIX

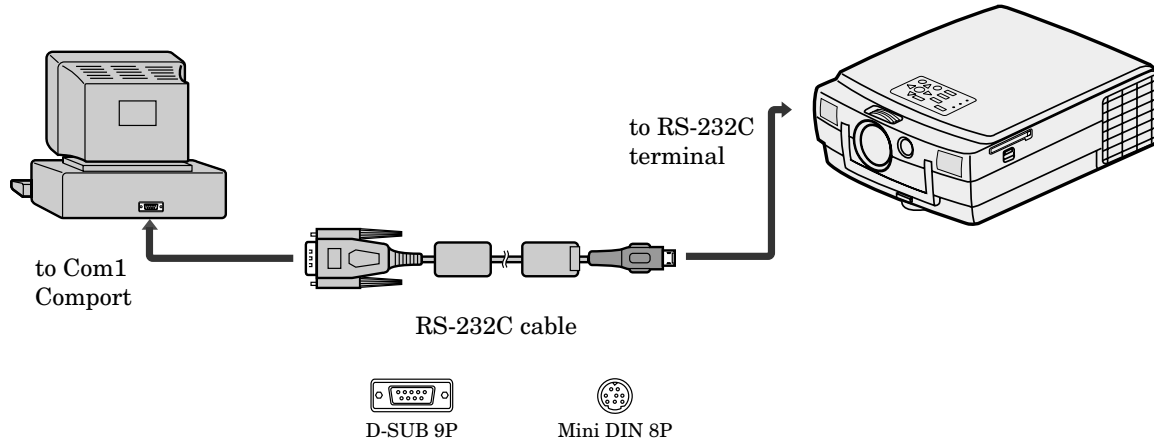
MODEL LVP-X120A

Control this projector by using a personal computer

This projector can be controlled by connecting a personal computer with RS-232C terminal.

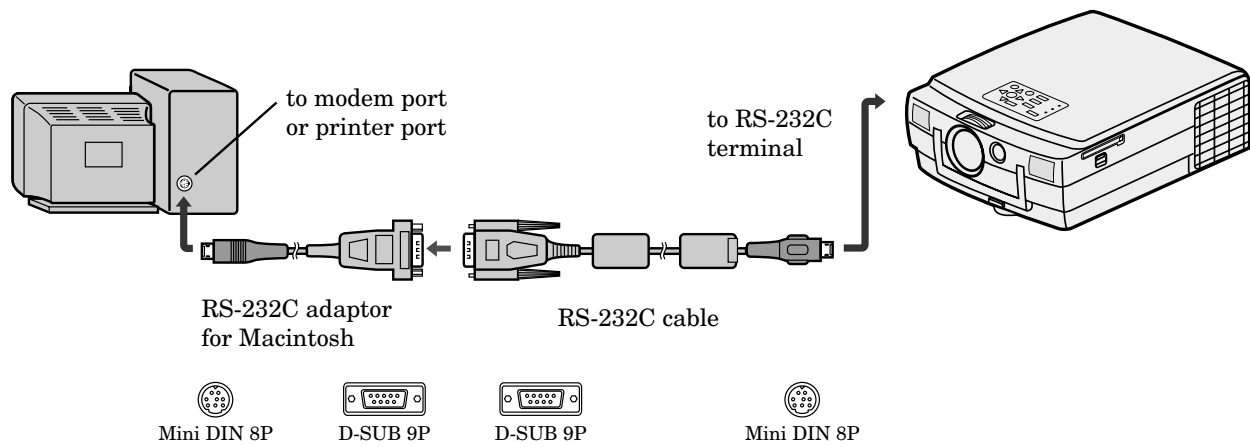
Connection

Projector + IBM PC or IBM PC compatibles



Note: If your PC (IBM or IBM compatible) is equipped only with a 25-pin serial port connector, a 25-pin serial port adapter is required. Contact your dealer for details.

Projector + Macintosh









Functions can be controlled by a personal computer:

- Turn the ON or OFF
- Changing input signals
- Button input by remote control
- Reading warning data
- Picture adjustment

By making a programme, you can also control this projector by a personal computer automatically.

[EXAMPLE]

| Time | Movement | Commands to be used (ASCII code) |
|-----------|-----------------------|---|
| 8:40 a.m. | Turn the power ON | 0 0 !  |
| | Change input to RGB | 0 0 _ r 1  |
| 0:20 p.m. | Turn the power OFF | 0 0 "  |
| 1:00 p.m. | Turn the power ON | 0 0 !  |
| 3:00 p.m. | Change input to VIDEO | 0 0 _ v 1  |
| 5:20 p.m. | Turn the power OFF | 0 0 "  |


1) Interface

| | |
|--------------|------------|
| PROTOCOL | RS-232C |
| BAUD RATE | 9600 [bps] |
| DATA LENGTH | 8 [bits] |
| PARITY BIT | NONE |
| STOP BIT | 1 [bits] |
| FLOW CONTROL | NONE |

This projector uses RXD, TXD and GND lines for RS-232C control.
For RS-232C cable, the reverse type cable should be used.

2) Control command diagram


The command is structured by the address code, function code, data code and end code. The length of the command is different by each function.

| | Address code | Function code | Data code | End code |
|-------|--------------|---------------|-----------|---|
| HEX | 30h 30h | Function | Data | 0Dh |
| ASCII | '0' '0' | Function | Data |  |

[Address code] 30h 30h (In ASCII code, '0' '0') fixed.

[Function code] A code of each fixed control move

[Data code] A code of each fixed control data (number) and not always indicated.

[End code] 0Dh (In ASCII code, ') fixed.

3) Control sequence

- (1) The command from a personal computer to the projector will be sent in 400ms.
 - (2) The projector will send a return command 400ms* after it has received an encode. if the command isn't received correctly, the projector will not send the return command.
 - (3) The personal computer checks the command and confirms that if the command which has been sent has been executed or not.
 - (4) This projector sends various codes, other than the return code. When having a control sequence by RS-232C, reject other codes from personal computer side.
- * : The sending time of return command may delay depending on the condition (during changing the input signal, playing back the PC card, etc.).

Control this projector by using a personal computer (Continue)

[Example] Turn the power ON (' is for ASCII code)

| Sending commands from the PC etc. | Status code from projector | Meaning |
|-----------------------------------|--------------------------------|---|
| 30 30 21 0D '0' '0' '!' '↵' | | Command for POWER ON |
| | 30 30 21 0D '0' '0' '!' '↵' | Command received (Command echo back) |

4) Operation commands

The operation commands execute the basic operation setting of this projector. It may not operate when changing the signal.

| | ASCII | HEX |
|-------------|-------|-------------|
| POWER ON | ! | 21h |
| POWER OFF | " | 22h |
| INPUT RGB | _r1 | 5Fh 72h 31h |
| INPUT VIDEO | _v1 | 5Fh 76h 31h |
| INPUT CARD | _c1 | 5Fh 63h 31h |

- POWER OFF command will not work for 1 minute after the power is turned on.
- POWER ON command will not work for 1 minute after the power is turned off.

[Example] Set the input signal to RGB (' is for ASCII code)

| Sending commands from the PC etc. | Status code from projector | Meaning |
|--|--|---|
| 30 30 5F 72 31 0D '0' '0' '_' 'r' '1' '↵' | | Command for setting the input signal to RGB |
| | 30 30 5F 72 31 0D '0' '0' '_' 'r' '1' '↵' | Command received (Command echo back) |

5) Remote commands

The some remote control operation can be done by remote command codes.

| Button's name on remote | ASCII | HEX |
|-------------------------|-------|-------------|
| + VOLUME | r06 | 72h 30h 36h |
| - VOLUME | r07 | 72h 30h 37h |
| EXPAND | r02 | 72h 30h 32h |
| ▲ | r53 | 72h 35h 33h |
| ▼ | r2b | 72h 32h 62h |
| ◀ | r4f | 72h 34h 66h |
| ▶ | r59 | 72h 35h 39h |
| MENU | r54 | 72h 35h 34h |
| ENTER | r10 | 72h 31h 30h |
| AUTO PLAY(PC CARD) | r32 | 72h 33h 32h |
| RELEASE(PC CARD) | r22 | 72h 32h 32h |
| AUTO POSITION | r09 | 72h 30h 39h |
| STILL | ra4 | 72h 61h 34h |

[Example] Display MENU selection bar. (' is for ASCII code)

| Sending commands from the PC etc. | Status code from projector | Meaning |
|--|--|---|
| 30 30 72 35 34 0D '0' '0' 'r' '5' '4' '↵' | | Command as same as MENU button |
| | 30 30 72 35 34 0D '0' '0' 'r' '5' '4' '↵' | Command received (Command echo back) |

6) Warning commands

Read the past warning data. The personal computer doesn't attach the data code onto the warning commands to send. On the other hand, the projector which has received a command, attach the warning data as the data code to reply.

| | ASCII | HEX |
|-----------------|-------|---------|
| past data | Ep | 45h 70h |
| clear past data | Ec | 45h 63h |

The past data

Ep* (* is 6 digits, hexadecimal notation)

*(MBS)b1,b2,b3,b4,b5,b6,b7,b8, b9, b10, b11, b12, b13, b14, b15, b16, b17, b18, b19, b20, b21, 000(LSB)

b1=Operation time (during boot up '0' / when the power is ON, '1')

b2=Standby power short

b3=Switch power short

b4=0

b5=0

b6=0

b7=The fan is stopped.

b8=The lamp cover is not closed.

b9=The filter cover is not closed.

b10=The temperature sensor is off (Exhausting fan)

b11=The temperature sensor is off (The lamp)

b12=Communication error between microcomputer

b13=Communication error between microcomputer (Parallel bus)

b14=Abnormal temperature (the lamp)

b15=Abnormal temperature (outside)

b16=Abnormal temperature (LCD)

b17=The lamp is not illuminating.

b18=Confirmation mode for the operating status

b19=0

b20=0

b21= The life of a lamp

[Example 1] The fan was down when the power was ON and the past data of the warning was confirmed.

| Sending commands from the PC etc. | Status code from projector | Meaning |
|---------------------------------------|--|---|
| 30 30 45 70 OD '0' '0' 'E' 'p' '␣' | | Commnd for confirm past data |
| | 30 30 45 70 38 32 30 30 30 0D '0' '0' 'E' 'p' '8' '2' '0' '0' '0' '0' '␣' | Warning command (Fan is stopped when the power is ON) carried out |

* : '8' '2' '0' '0' '0' '0' mean the numbers as shown below.

| Bit | b1 | b2 | b3 | b4 | b5 | b6 | b7 | b8 | b9 | b10 | b11 | b12 | b13 | b14 | b15 | b16 | b17 | b18 | b19 | b20 | b21 | 0 | 0 | 0 |
|-------|----|----|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|---|---|---|
| ASCII | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| HEX | 8 | | | | 2 | | | | 0 | | | | 0 | | | | 0 | | | | 0 | | | |

b1=1(The power is ON), b7=1(The fan is stopped), Other=0

7) Reading command diagram

Monitor projector operation status. The power ON, OFF and input terminal settings can be monitored.

| | ASCII | | HEX | |
|-------------|----------|----------------|----------|----------------|
| | Function | Data (Receive) | Function | Data (Receive) |
| POWER ON | vP | 1 | 76h 50h | 31h |
| POWER OFF | vP | 0 | 76h 50h | 30h |
| INPUT RGB | vI | r1 | 76h 49h | 72h 31h |
| INPUT VIDEO | vI | v1 | 76h 49h | 76h 31h |
| INPUT CARD | vI | c1 | 76h 49h | 63h31h |

Control this projector by using a personal computer (Continue)

When a personal computer sends the command, data code will not be attached. On the other hand, the projector which has received a command will attach the recent operating status then send.

[Example] Input was Video when the operating status of the input terminal was confirmed.

| Sending commands from the PC etc. | Status code from projector | Meaning |
|---------------------------------------|---|--------------------------------------|
| 30 30 76 49 OD '0' '0' 'v' 'I' '⏏' | | Command for confirm input |
| | 30 30 76 49 76 31 OD '0' '0' 'v' 'I' 'v' '1' '⏏' | Command (Input is Video) carried out |

8) Picture adjustment commands

The picture adjustment commands execute the picture adjustment setting of this projector. If the personal computer doesn't send the commands without attaching the data code, the projector which has received the command replays the setting data as data code.

| | ASCII | HEX |
|------------|-------|-----|
| CONTRAST | P | 50h |
| BRIGHTNESS | Q | 51h |
| SHARPNESS | R | 52h |
| TINT | S | 53h |
| COLOR | T | 54h |

How to set the grade

The data code of CONTRAST and BRIGHTNESS is structured by the difference data of R from G, the main data and the difference data of B from G. Use ASCII letters code to set the grade for setting data. Please refer to the table below for HEX code.

| ASCII | '+' | '-' | '0' | '1' | '2' | '3' | '4' | '5' | '6' | '7' | '8' | '9' |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| HEX | 2Bh | 2Dh | 30h | 31h | 32h | 33h | 34h | 35h | 36h | 37h | 38h | 39h |

[Example 1] Set the difference data of R from G to +10, the setting main data to 0 and the difference data of B from to -5.

| Sending commands from the PC etc. | Status code from projector | Meaning |
|---|---|---|
| 30 30 50 2B 31 30 2B 30 30 2D 30 35 OD '0' '0' 'P' '+' '1' '0' '+' '0' '0' '-' '0' '5' '⏏' | | Command for setting the picture control |
| | 30 30 50 2B 31 30 2B 30 30 2D 30 35 OD '0' '0' 'P' '+' '1' '0' '+' '0' '0' '-' '0' '5' '⏏' | Command received (Command echo back) |

[Example 2] The TINT was set to +10 when the setting status was confirmed.

| Sending commands from the PC etc. | Status code from projector | Meaning |
|-----------------------------------|---|--|
| 30 30 53 OD '0' '0' 'S' '⏏' | | Command for confirm setting of TINT |
| | 30 30 53 2B 31 30 OD '0' '0' 'S' '+' '1' '0' '⏏' | Command (setting of TINT is +10) carried out |

- When the command of CONTRAST or BRIGHTNESS is sent from the computer, the setting of the COLOR TEMP on the menu is set to "USER".
- For the same condition as "HIGH" or "LOW" of the COLOR TEMP, change the CONTRAST and BRIGHTNESS settings as shown below.

COLOR TEMP "HIGH"

| | difference data of R from G | difference data of B from G |
|------------|-----------------------------|-----------------------------|
| CONTRAST | -10 | +10 |
| BRIGHTNESS | +00 | +00 |

COLOR TEMP "LOW"

| | difference data of R from G | difference data of B from G |
|------------|-----------------------------|-----------------------------|
| CONTRAST | +10 | -10 |
| BRIGHTNESS | +00 | +00 |



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