Panasonic ideas for life

S P E C   F I L E

Product Number : PT-**LB51NT**

Product Name : Micro-Portable Wireless LCD Projector

Micro-Portable Wireless LCD Projector

PT-**LB51NT**

Specifications

Power supply		100–240 V AC, 50/60 Hz
Power consumption		240 W (approx. 4 W in standby mode with fan stopped.)
Optical system		Dichroic mirror separation/prism synthesis system
LCD panel	Panel size	0.6″ (15.24 mm) diagonal, micro lens array (4:3 aspect ratio)
	Display method	Transparent LCD panel (x 3, R/G/B)
	Drive method	Active matrix
	Pixels	786,432 (1,024 x 768) x 3, total of 2,359,296 pixels
	Pixel configuration	Stripe
Lens		Manual zoom (1:1–1:1.2), manual focus
		F 1.6–1.9, f 18.8–22.6 mm
Lamp		165 W UHM lamp
Colors		Full color (16,777,216 colors)
Brightness		2,000 lumens
Center-to-corner uniformity ratio		85%
Contrast ratio		400:1[1] (full on/full off)
Resolution RGB		1,024 x 768 pixels (Input signals that exceed this resolution will be converted to 1,024 x 768 pixels.)
Scanning frequency	RGB	Horizontal: 15.00–91.00 kHz, Vertical: 50–85 Hz
	YP_BP_R	480i (525i): f_H 15.75 kHz; f_V 60 Hz
		576i (625i): f_H 15.63 kHz; f_V 50 Hz
		480p (525p): f_H 31.50 kHz; f_V 60 Hz
		576p (625p): f_H 31.25 kHz; f_V 50 Hz
		720/60p (750p): f_H 45.00 kHz; f_V 60 Hz
		1080/60i (1125i): f_H 33.75 kHz; f_V 60 Hz
		1080/50i (1125i): f_H 28.13 kHz; f_V 50 Hz
	S-Video/Video	NTSC, NTSC4.43, PAL-M, PAL60: f_H 15.75 kHz; f_V 60 Hz
		PAL, SECAM, PAL-N: f_H 15.63 kHz; f_V 50 Hz
Projection size		838–7,620 mm (33–300 inches) diagonally, 4:3 aspect ratio
Throw distance		1.1 m–11.1 m (3′7″–36′5″)
Optical axis shift		6:1 (fixed)
Keystone correction range		Vertical: approx. ±30°
On-screen menu		17 languages: English, French, German, Spanish, Italian, Korean, Russian, Chinese, Japanese, Swedish, Norwegian, Danish, Portuguese, Polish, Hungarian, Czech, and Thai
Installation		Front/rear, ceiling/desk (menu selection)
Built-in speakers	Size	4 x 2 cm x 1, oval
	Output power	1.0 W (monaural)
Terminals	COMPUTER (RGB) 1 IN	D-sub HD 15-pin x 1
	RGB signal	R, G, B: 0.7 Vp-p, 75 Ω, Sync on green: 1.0 V [p-p], 75 Ω, HD/SYNC, VD: TTL (positive/negative polarity compatible)
	YP_BP_R signal	Y: 1.0 V [p-p] (including sync signal), 75 Ω, P_B, P_R: 0.7 Vp-p, 75 Ω
	COMPUTER (RGB) 2 IN/1 OUT	
		D-sub HD 15-pin x 1 (input/output selectable using on-screen menu)
	RGB signal	R, G, B: 0.7 V [p-p], 75 Ω, Sync on green: 1.0 V [p-p], 75 Ω, HD/SYNC, VD: TTL (positive/negative polarity compatible)
	YP_BP_R signal	Y: 1.0 V [p-p] (including sync signal), 75 Ω, P_B, P_R: 0.7 V [p-p], 75 Ω
	VIDEO IN	RCA pin x 1, 1.0 Vp-p, 75 Ω
	S-VIDEO IN	Mini DIN 4-pin x 1, Y: 1.0 V [p-p], C: 0.286 V [p-p], 75 Ω
	COMPUTER AUDIO IN	M3 (L, R) x 1, 0.5 V [rms], for COMPUTER (RGB) 1 and 2
	AUDIO IN	RCA (L, R) x 1, 0.5 V [rms], for VIDEO and S-VIDEO
	AUDIO OUT	M3 (L, R) x 1, 0–2.0 V [rms] (variable)
	SERIAL	Mini DIN 8-pin x 1, for external control (RS-232C)
Power cord length		2 m/6.6′
Cabinet material		Moulded plastic (PC + ABS)

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Dimensions (W x H x D)		297 x 57 x 210 mm (11-11/16″ x 2-7/32″ x 8-1/4″)*²
Weight		1.9 kg (4.2 lbs.)
Operating environment	Temperature	0°–40°C (32°–104°F)
	Humidity	20%–80% (no condensation)
Remote control unit	Power supply	3 V DC (AA battery x 2)
	Operation range*³	Approx. 15 m (49′3″) when operated from directly in front of the signal receptor
	Dimensions (W x H x D)	48 x 163 x 24.5 mm (1-7/8″ x 6-13/32″ x 31/32″)
	Weight	117 g (4.1 oz) (including batteries)
Wireless LAN	Standard	IEEE 802.11b/g (ARIB STD-T66)
	Modulation	
	IEEE 802.11b	Direct sequence spread spectrum (DS-SS) system
	IEEE 802.11g	Orthogonal frequency division multiplex (OFDM) system
	Transmission system	
	IEEE 802.11b	CCK (11/5.5 Mbps), DQPSK (2 Mbps), DBPSK (1 Mbps)
	IEEE 802.11g	64-QAM (54/48 Mbps), 16-QAM (36/24 Mbps), QPSK (18/12 Mbps), BPSK (9/6 Mbps)
	Transmission speed	
	IEEE 802.11b	11 Mbps, 5.5 Mbps, 2 Mbps, 1 Mbps
	IEEE 802.11g	54 Mbps, 48 Mbps, 36 Mbps, 24 Mbps, 18 Mbps, 12 Mbps, 9 Mbps, 6 Mbps
	Operating range*²	Approx. 30 m (98′5″)
	Frequency range	PT-LB51NTE/LB51NTEA: 2,412 MHz–2,472 MHz
		PT-LB51NTU: 2,412 MHz–2,462 MHz
	Channels	PT-LB51NTE/LB51NTEA: 1–13 ch
		PT-LB51NTU: 1–11 ch
Supplied accessories		Power cord
		Wireless remote control
		Batteries for remote control
		VGA cable
		Carrying bag
		Wireless Manager ME 4.5 (CD-ROM)
Optional accessories		Replacement lamp unit: ET-LAB50
		Ceiling mount bracket: ET-PKB50
		Serial adapter (DIN 8-pin/D-sub 9-pin): ET-ADSER

*1: In AI mode. *2: Operation range differs depending on environments.

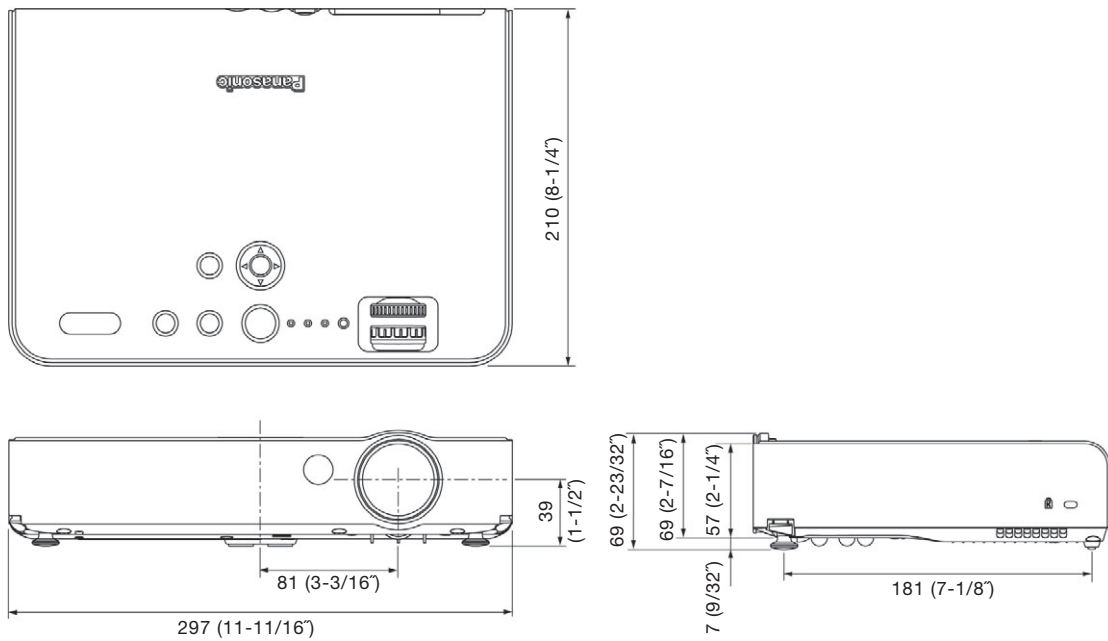**Weights and dimensions shown are approximate. Specifications subject to change without notice.**

To use wireless functions, a PC is required that meets the conditions given below:

OS:	Microsoft® Windows® 2000 Professional, Windows® XP Professional, Windows® XP Home Edition, Windows Vista™ Ultimate 32-bit, Windows Vista™ Business 32-bit, Windows Vista™ Home Premium 32-bit, Windows Vista™ Home Basic 32-bit, Apple Mac OS X 10.4
	NOTE: Some functions are not available with Windows Vista™ and Mac OS X.
Web browser:	Windows®: Internet Explorer 6.0 or later, or Netscape Communicator 7.0 or later.
	Macintosh: Safari 2.0 or later
CPU:	Windows®: Intel® Pentium® III or higher, or other compatible processor (800 MHz or higher is recommended).
	Macintosh: PowerPC G4 with 800 MHz or more, or Intel® Core™ Duo with 1.8 GHz or more.
Memory:	256 MB or more (Macintosh: 512 MB or more is recommended)
Free hard disk space:	60 MB or more
CD-ROM drive:	CD-ROM drive or DVD drive
Wireless LAN:	IEEE 802.11b/g compatible (built-in wireless LAN system or external IEEE 802.11b/g LAN card must be installed and running normally.)
	NOTE: Some IEEE 802.11g/b wireless LAN may not allow connection to the projector.

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Dimensions

unit : mm (inch)
NOTE: This illustration is not drawn to scale.

210 (8-1/4″)

39 (1-1/2″)

81 (3-3/16″)

297 (11-11/16″)

69 (2-23/32″)

69 (2-7/16″)

57 (2-1/4″)

7 (9/32″)

181 (7-1/8″)

Terminals

SERIAL   COMPUTER 1 IN   COMPUTER 2 IN   COMPUTER 1 OUT   S-VIDEO IN   VIDEO IN   COMPUTER AUDIO IN

AC IN ~

VIDEO IN

VARIABLE AUDIO OUT
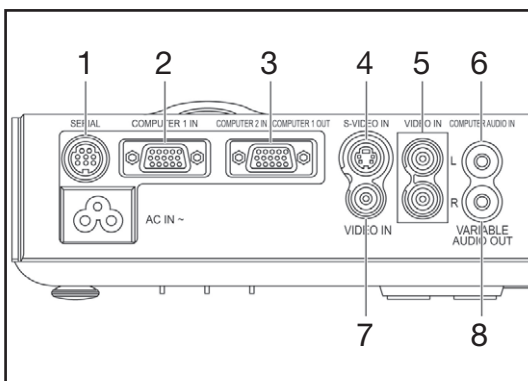
1   Serial

2   COMPUTER (RGB) 1 input

3   COMPUTER (RGB) 2 input/COMPUTER (RGB) 1 output

4   S-Video input

5   Audio input for Video/S-Video

6   Audio input for COMPUTER 1/2

7   Video input

8   Audio output

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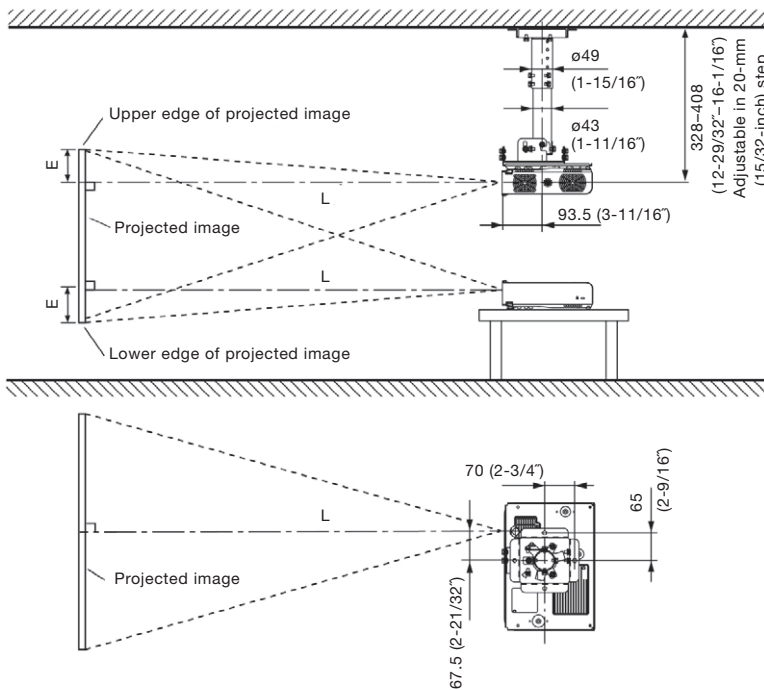## Standard setting-up positions

unit : mm (inch)

Upper edge of projected image

Projected image

Lower edge of projected image

ø49 (1-15/16″)
ø43 (1-11/16″)
328–408 (12-29/32″–16-1/16″) Adjustable in 20-mm (15/32-inch) step.
93.5 (3-11/16″)

70 (2-3/4″)
65 (2-9/16″)
67.5 (2-21/32″)

Projected image

L: Distance to screen
E: Height from the edge of screen to center of lens

NOTE:

Illustrations show the projector installed using optional ceiling bracket.

This illustration is not drawn to scale.

* **This distance is especially recommended for ceiling-mounted use and other permanent installations.**

Projection size (diagonal)	Projection distance (L) Min (wide)	Max (telephoto)	Height from the edge of screen to center of lens (H)
0.84 m / 33″	– / –	1.1 m / 3.9′	0 – 0.07 m / 0 – 0.2′
1.02 m / 40″	1.2 m / 4.0′	1.4 m / 4.7′	0 – 0.09 m / 0 – 0.3′
1.27 m / 50″	1.6 m / 5.0′	1.8 m / 5.9′	0 – 0.11 m / 0 – 0.4′
1.52 m / 60″	1.9 m / 6.0′	2.1 m / 7.2′	0 – 0.13 m / 0 – 0.4′
1.78 m / 70″	2.2 m / 7.0′	2.5 m / 8.4′	0 – 0.15 m / 0 – 0.5′
2.03 m / 80″	2.5 m / 8.0′	2.9 m / 9.6′	0 – 0.17 m / 0 – 0.6′
2.29 m / 90″	2.8 m / 9.0′	3.3 m / 10.8′	0 – 0.19 m / 0 – 0.6′
2.54 m / 100″	3.1 m / 10.0′	3.6 m / 12.0′	0 – 0.21 m / 0 – 0.7′
3.05 m / 120″	3.7 m / 12.0′	4.4 m / 14.5′	0 – 0.25 m / 0 – 0.9′
3.81 m / 150″	4.6 m / 15.1′	5.5 m / 18.1′	0 – 0.32 m / 0 – 1.1′
5.08 m / 200″	6.2 m / 20.1′	7.3 m / 24.2′	0 – 0.42 m / 0 – 1.4′
6.35 m / 250″	7.7 m / 25.1′	9.2 m / 30.3′	0 – 0.53 m / 0 – 1.8′
7.62 m / 300″	9.2 m / 30.2′	11.1 m / 36.4′	0 – 0.64 m / 0 – 2.1′

NOTE:

Values shown are approximate.

The value for L (distance to screen) varies slightly depending on the zoom lens characteristics.

When the shortest projection distance is used, a small amount of distortion may occur in the image due to the zoom lens characteristics.

Calculation of the projection distance

For a screen size different from the above, use the equation below to calculate the projection distance.

Aspect ratio 4 : 3
  minimum   L (m) = (diagonal screen size in inches) x 0.0307 - 0.0310
  maximum   L (m) = (diagonal screen size in inches) x 0.0371 - 0.0290
Aspect ratio 16 : 9
  minimum   L (m) = (diagonal screen size in inches) x 0.0335 - 0.0315
  maximum   L (m) = (diagonal screen size in inches) x 0.0405 - 0.0365

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Computer data compatibility

This projector accepts up to 91 kHz horizontal scanning frequency and 162 MHz dot clock.

NOTE: Pixel thinning is applied to signals that exceed a dot clock frequency of 100 MHz. The display resolution of this projector is 1,024 x 768
            pixels. Input signals that exceed this resolution will be converted to 1,024 x 768 pixels.

List of compatible signals

Display mode	Display resolution (dots)[1]	Scanning frequency H (kHz)	V (kHz)	Dot clock frequency (MHz)	Picture quality[2]	Format
NTSC/NTSC4.43/PAL-M/PAL60	720 x 480i	15.7	59.9	-	A	VIDEO/S-VIDEO
PAL/PAL-N/SECAM	720 x 576i	15.6	50.0	-	A	
525i (480i)	720 x 480i	15.7	59.9	13.5	A	COMPUTER/
625i (576i)	720 x 576i	15.6	50.0	13.5	A	COMPONENT
525p (480p)	720 x 480	31.5	59.9	27.0	A	
625p (576p)	720 x 576	31.3	50.0	27.0	A	
750 (720)/60p	1,280 x 720	45.0	60.0	74.3	A	
1125 (1080)/60i	1,920 x 1,080i	33.8	60.0	74.3	A	
1125 (1080)/50i		28.1	50.0	74.3	A	
VGA400	640 x 400	31.5	70.1	25.2	A	COMPUTER
		37.9	85.1	31.5	A	
VGA480	640 x 480	31.5	59.9	25.2	A	
		35.0	66.7	30.2	A	
		37.9	72.8	31.5	A	
		37.5	75.0	31.5	A	
		43.3	85.0	36.0	A	
SVGA	800 x 600	35.2	56.3	36.0	A	
		37.9	60.3	40.0	A	
		48.1	72.2	50.0	A	
		46.9	75.0	49.5	A	
		53.7	85.1	56.3	A	
MAC16	832 x 624	49.7	74.6	57.3	A	
XGA	1,024 x 768	48.4	60.0	65.0	AA	
		56.5	70.1	75.0	AA	
		60.0	75.0	78.8	AA	
		68.7	85.0	94.5	AA	
	1,280 x 768i	35.5	87.0	44.9	AA	
MXGA	1,152 x 864	64.0	71.2	94.2	B	
		67.5	74.9	108.0	B	
		76.7	85.0	121.5	B	
MAC21	1,152 x 870	68.7	75.1	100.0	B	
MSXGA	1,280 x 960	60.0	60.0	108.0	B	
SXGA	1,280 x 1,024	64.0	60.0	108.0	B	
		80.0	75.0	135.0	B	
		91.1	85.0	157.5	B	
SXGA+	1,400 x 1,050	64.0	60.0	108.0	B	
		65.1	60.0	122.4	B	
UXGA60	1,440 x 900	75.0	60.0	162.0	B	
WXGA	1,600 x 1,200	47.8	59.9	79.5	A	
		49.7	59.8	83.5	A	
WXGA+	1,440 x 900	55.9	59.9	106.5	A	

1. The "i" appearing after the resolution indicates an interlaced signal.
2. The following symbols are used to indicate picture quality.
   AA   Maximum picture quality can be obtained.
   A   Signals are converted by the image processing circuit before picture is projected.
   B   Signals are compressed by the image processing circuit before picture is projected.

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Serial connector

The serial connector complies with RS-232C. To control the projector from a personal computer, commands must be input through communication software, based on the format and satisfying the communication conditions shown below.

SERIAL

8-pin DIN (male)

Serial adapter
ET-ADSER

PC

Communication cable (RS-232C)

CAUTIION
Be sure to see that an optional serial adapter ET-ADSER and a RS-232C communication cable match the PC to be connected.
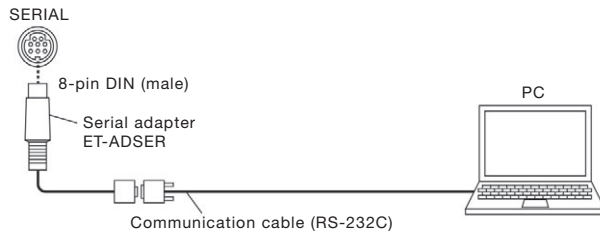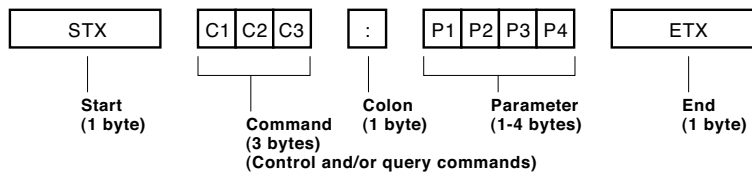
Pin assignments and signal names

2 1
5 3
8 6
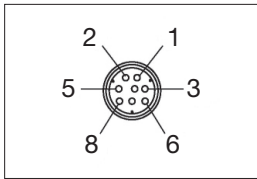
Mini DIN 8-pin

No.	Signal name	Description	No.	Signal name	Description
1	–	Connected internally	5	TXD	Send data
2	–	Connected internally	6	–	Connected internally
3	RXD	Receive data	7	–	NC
4	GND	Ground	8	–	NC

Communication conditions (factory setting)

Signal level	RS-232C-compliant
Synchronization method	Start-stop synchronization
Baud rate	9,600 bps
Parity	None
Character length	8 bits
Stop bit	1 bit
X parameter	None
S parameter	None

Basic format

Transmission from the computer begins with STX, then the ID, command, parameter, and ETX are sent in this order. Add parameters according to the details of control.

STX	C1 C2 C3	:	P1 P2 P3 P4	ETX

Start
(1 byte)

Command
(3 bytes)
(Control and/or query commands)

Colon
(1 byte)

Parameter
(1-4 bytes)

End
(1 byte)

CAUTIION
When sending multiple commands, be sure to send the next command after receiving a response from the projector.

Cable specifications

Serial adapter (ET-ADSER)

–	–
5	2
3	3
–	–
4	5
6	6
1	7
2	8
	–

Projector

1	**NC**	**NC**
2		
3		
4	**NC**	**NC**
5		
6	**DSR**	**NC**
7		
8		
9	**NC**	**NC**

PC (DTE)

1
2
3
4
5
6
7
8
9

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Control commands

Command: <Parameter>	Function	Callback: <Parameter>	Parameter value Min	Max
`PON`*1	Power on (standby mode on)	`PON`	–	–
`POF`*1	Power off (standby mode off)	`POF`	–	–
`AVL:<pl>`	Volume control	`AVL:<pl>`	0	63
`IIS:<input signal>`	Input signal selection	`IIS:<input signal>`	–	–
`OST`	The same function as "default" button	`OST`	–	–
`OFZ:<off on>`	Freeze	`OFZ:<off on>`	0	1
`OEN`	Enter	`OEN`	–	–
`VPM:<picture mode>`	Picture mode	`VPM:<picture mode>`	–	–
`:<NAT>`	Natural	`:<NAT>`	–	–
`:<STD>`	Standard	`:<STD>`	–	–
`:<DYN>>`	Dynamic	`:<DYN>`	–	–
`:<BBD>`	Blackboard	`:<BBD>`	–	–
`AUU`	Volume up	`AUU`	–	–
`AUD`	Volume down	`AUD`	–	–
`OMN`	Menu	`OMN`	–	–
`OCU`	Cursor up	`OCU`	–	–
`OCD`	Cursor down	`OCD`	–	–
`OCL`	Cursor left	`OCL`	–	–
`OCR`	Cursor right	`OCR`	–	–
`OAS`	Auto setup	`OAS`	–	–
`OSH`*1/*2	Shutter	`OSH`	–	–
`OIX`	Index window	`OIX`	–	–
`DZU`	Digital zoom: Enlargement	`DZU`	–	–
`DZD`	Digital zoom: Reduction	`DZD`	–	–

*1 Do not send PON, POF, or OSH commands continuously in a short period of time. Doing so may burst the lamp or shorten the lamp replacement cycle.
*2 When a command other than OSH is sent while the shutter function is operating, the projector will send an ER401 command in reply and release the shutter function.

Status asking commands

Command	Description		Callback <Parameter>
`QPW`	Standby power status		`<power condition>`
`Q$S`	Lamp status		`<lamp condition>`
`QIN`	Input signal status		`<input signal>`
`QAV`	Volume adjustment value		`<pl>`
`QVC`	Color adjustment value		`<pl>`
`QVT`	Tint adjustent value		`<pl>`
`QVB`	Brightness adjustment value		`<pl>`
`QVR`	Contrast adjustment value		`<pl>`
`QVS`	Sharpness adjustment value		`<pl>`
`QWR`	White balance: R adjustment value		`<pl>`
`QWG`	White balance: G adjustment value		`<pl>`
`QWB`	White balance: B adjustment value		`<pl>`
`QHP`	Horizontal position adjustment value		`<pl>`
`QVP`	Vertical position adjustment value		`<pl>`
`QCP`	Clock phase adjustment value		`<pl>`
`QDC`	Dot clock adjustment value		`<pl>`
`QSP`	Installation setting status		`<pl>`
`QLG`	On-screen menu language		`<pl>`
`QPM`	Picture mode status	Natural	`<NAT>`
		Standard	`<STD>`
		Dynamic	`<DYN>`
		Blackboard	`<BBD>`
`QFZ`	Freeze status		`<off_on>`
`Q$L`	Lamp run time		`<acctch>`
`QSH`	Shutter function status		`<off/on>`
`QKS`	Keystone correction status		`<pl>`
`QTE`	Color temperature adjustment status		`<color temp>`

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Parameter format

Parameter format	Size (Byte)	Difinition
<pl>	3 (1 or 2 bytes also possible when under control)	Dicimal without signs: 0-999 (000, 001, 002...999) Dicimal with signs: -99 to +99 (-99...-01, +00, +01, +02...+99) Callback from the projector is 3 Byte.
<off on>	1	0 = off, 1 = on
<input signal>	3	RG1 = computer 1, RG2 = computer 2, NWP = network, VID = video, SVD = S-Video
<installation>	1	0 = front, 1 = rear, 2 = ceiling and front, 3 = ceiling and rear
<language>	3	ENG = English, DEU = German, FRA = French, ESP = Spanish, ITL = Italian, JPN = Japanese, CHI = Chinese, POR = Portuguese, SVE = Swedish, NOR = Norwegian, DAN = Danish, POL = Polish, CES = Czech, MAG = Hungarian, RUS = Russian, THA = Thai, KOR = Korean
<power condition>	3	000 = power on (standby mode on), 001 = power off (standby mode off)
<lamp condition>	1	0 = standby, 1 = lamp on under control, 2 = lamp off, 3 = lamp off under control
<acctch>	4	Dicimal without signs: 0000-9999 hours
<lamp power>	1	0 = economy, 1 = normal
<color temp>	1	0 = low, 1 = standard, 2 = high

NOTE: If a wrong command is received, the projector will send an ER401 command to the computer.

Command example

To set the volume to +30, send the command as shown below.

STX   AVL   :   30   ETX

| | | | |
Start   **Command**   **Parameter**   **End**

NOTE: When sending commands without parameters, a colon (:) is not necessary.

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Notes on Projector Placement and Operation:

The projector uses a high-wattage lamp that becomes very hot during operation. Please observe the following precautions.

1. Never place objects on top of the projector while it is operating.
2. Make sure there is an unobstructed space of 150 mm (5-29/32″) or more around the projector's exhaust openings.
3. If the projector is placed in a box or enclosure, ensure the temperature of the air surrounding the projector is between 0°C/32°F and 35°C/95°F. Also make sure the projector's intake and exhaust openings are not blocked. Take particular care to ensure that hot air from the exhaust openings is not sucked into the intake openings.
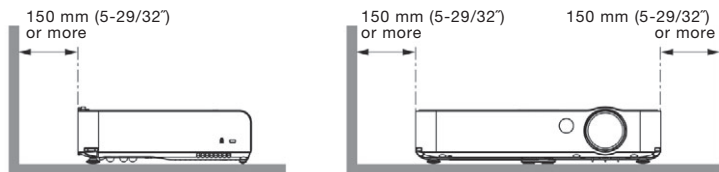
Direction of Air Intake and Exhaust
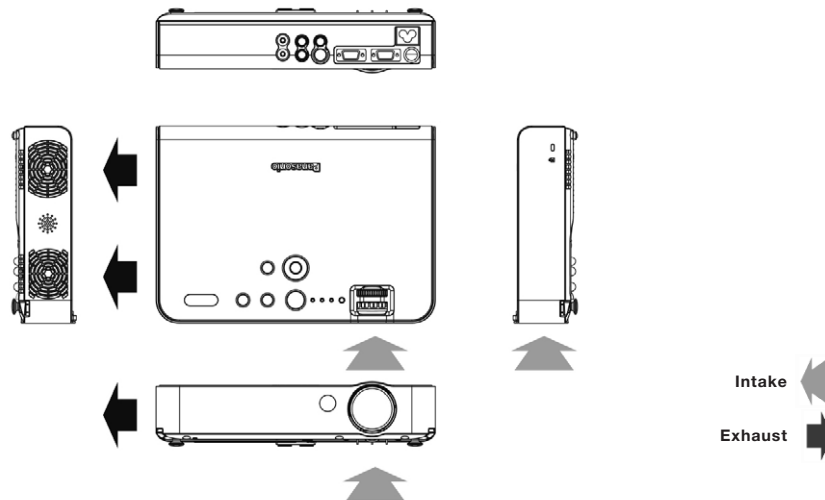
Operating the Projector Continuously

1. If the projector is to be operated continuously 10 hours or more, lamp replacement cycle duration becomes shorter.
2. The lamp replacement cycle duration becomes shorter if the projector is operated repeatedly for short periods.

As of October 2008   < 10 >

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