

DUKANE

Portable LCD Projector

Model 8761A



Operation Guide

Important Information

Safety Cautions

Precautions

Please read this manual carefully before using your Projector and keep the manual handy for future reference. Your serial number is located on the bottom of your projector. Record it here:

CAUTION



To turn off main power, be sure to remove the plug from power outlet.
The power outlet socket should be installed as near to the equipment as possible, and should be easily accessible.

CAUTION



TO PREVENT SHOCK, DO NOT OPEN THE CABINET.
NO USER-SERVICEABLE PARTS INSIDE.
REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.



This symbol warns the user that uninsulated voltage within the unit may be sufficient to cause electrical shock. Therefore, it is dangerous to make any kind of contact with any part inside of the unit.



This symbol alerts the user that important information concerning the operation and maintenance of this unit has been provided.
The information should be read carefully to avoid problems.

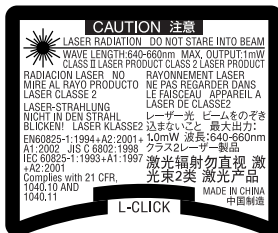
WARNING: TO PREVENT FIRE OR SHOCK, DO NOT EXPOSE THIS UNIT TO RAIN OR MOISTURE.
DO NOT USE THIS UNIT'S PLUG WITH AN EXTENSION CORD OR IN AN OUTLET UNLESS ALL THE PRONGS CAN BE FULLY INSERTED.
DO NOT OPEN THE CABINET. THERE ARE HIGH-VOLTAGE COMPONENTS INSIDE. ALL SERVICING MUST BE DONE BY QUALIFIED SERVICE PERSONNEL.

DOC Compliance Notice (for Canada only)

This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Acoustic Noise Information Ordinance-3. GSGV (for Germany only):

The sound pressure level is less than 70 dB (A) according to ISO 3744 or ISO 7779.



CAUTION

Do not look into the laser pointer while it is on and do not point the laser beam at a person. Serious injury could result.

This label is underneath the remote control.

WARNING TO CALIFORNIA RESIDENTS:

Handling the cables supplied with this product, will expose you to lead, a chemical known to the State of California to cause birth defects or other reproductive harm. Wash hands after handling.

RF Interference (for USA only)

WARNING

The Federal Communications Commission does not allow any modifications or changes to the unit EXCEPT those specified by Dukane Corporation. in this manual. Failure to comply with this government regulation could void your right to operate this equipment. This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio / TV technician for help.

For UK only: In UK, a BS approved power cable with moulded plug has a Black (five Amps) fuse installed for use with this equipment. If a power cable is not supplied with this equipment please contact your supplier.

Important Safeguards

These safety instructions are to ensure the long life of your projector and to prevent fire and shock. Please read them carefully and heed all warnings.

Installation

1. For best results, use your projector in a darkened room.
2. Place the projector on a flat, level surface in a dry area away from dust and moisture.
3. Do not place your projector in direct sunlight, near heaters or heat radiating appliances.
Exposure to direct sunlight, smoke or steam can harm internal components.
4. To avoid premature lamp failure, do not tilt the front of the projector up or down by more than 7° from level.
5. Handle your projector carefully. Dropping or jarring can damage internal components.
6. Do not place heavy objects on top of the projector.
7. If you wish to have the projector installed on the ceiling:
 - a. Do not attempt to install the projector yourself.
 - b. The projector must be installed by qualified technicians in order to ensure proper operation and reduce the risk of bodily injury.
 - c. In addition, the ceiling must be strong enough to support the projector and the installation must be in accordance with any local building codes.
 - d. Please consult your dealer for more information.

Fire and Shock Precautions

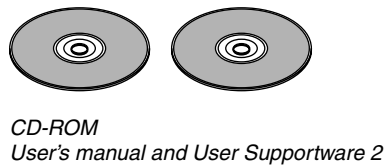
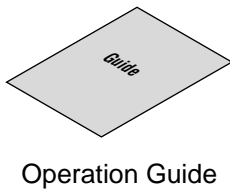
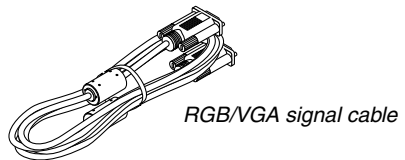
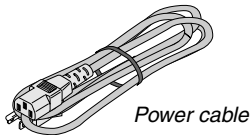
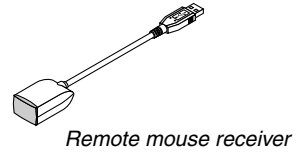
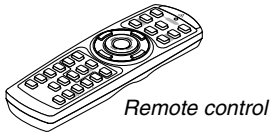
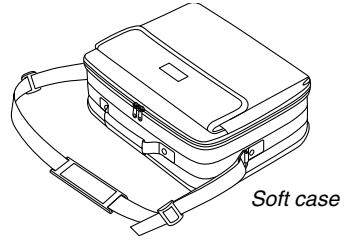
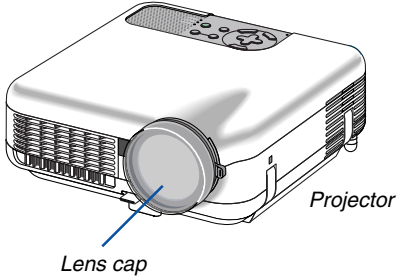
1. Ensure that there is sufficient ventilation and that vents are unobstructed to prevent the build-up of heat inside your projector. Allow at least 4 inches (10 cm) of space between your projector and a wall.
2. Prevent foreign objects such as paper clips and bits of paper from falling into your projector.
Do not attempt to retrieve any objects that might fall into your projector. Do not insert any metal objects such as a wire or screwdriver into your projector. If something should fall into your projector, disconnect it immediately and have the object removed by a qualified service personnel.
3. Do not place any liquids on top of your projector.
4. Do not look into the lens while the projector is on. Serious damage to your eyes could result.
5. Keep any items such as magnifying glass out of the light path of the projector. The light being projected from the lens is extensive, therefore any kind of abnormal objects that can redirect light coming out of the lens, can cause unpredictable outcome such as fire or injury to the eyes.
6. Do not cover the lens with the supplied lens cap or equivalent while the projector is on. Doing so can lead to melting of the cap and possibly burning your hands due to the heat emitted from the light output.
7. The projector is designed to operate on a power supply of 100-240V AC 50/60 Hz. Ensure that your power supply fits this requirement before attempting to use your projector.
8. Handle the power cable carefully and avoid excessive bending.
A damaged cord can cause electric shock or fire.
9. If the projector is not to be used for an extended period of time, disconnect the plug from the power outlet.
10. Do not touch the power plug during a thunderstorm. Doing so can cause electrical shock or fire.
11. Do not handle the power plug with wet hands.
12. When using a LAN cable:
For safety, do not connect to the connector for peripheral device wiring that might have excessive voltage.

CAUTION

- Do not try to touch the ventilation outlet on the front side as it can become heated while the projector is turned on.
- Do not use the tilt-foot for purposes other than originally intended. Misuses such as gripping the tilt-foot or hanging on the wall can cause damage to the projector.
- Before putting the projector in the soft case, be sure to retract the feet. Failure to do so may cause the damage to the projector.
- Do not send the projector in the soft case by parcel delivery service or cargo shipment. The projector inside the soft case could be damaged.
- Select [High] in Fan mode if you continue to use the projector for consecutive days. (From the menu, select [Setup] → [Options] → [Fan Mode] → [High].)
- Do not unplug the power cable from the wall outlet under any one of the following circumstances.
Doing so can cause damage to the projector:
 - * While the projector's lamp lights.
 - * While the cooling fans are running. (The cooling fans continue to work for 90 seconds after the projector is turned off).
 - * While the PC CARD Access Indicator lights. Doing so can damage your PC memory card.

1 What's in the Box?

Make sure your box contains everything listed. If any pieces are missing, contact your dealer. Please save the original box and packing materials if you ever need to ship your Projector.



② Introduction to the Projector

This section introduces you to the 8761A Projector and describes key features and controls.

Congratulations on Your Purchase of the 8761A Projector

The Projector is a sophisticated XGA projector that produces an enhanced display. With the model 8761A you will be able to project images up to 500" (measured diagonally). Enjoy crisp and sharp large screen display from your PC, workstation or Macintosh computer, DVD player, VCR, satellite hookup, HDTV source,) and images from your digital camera PC Card, compact flash memory or USB storage device. The 8761A provides for enhanced security options to help deter projector theft and provides for full projector control through the PC control port (mini DIN 8Pin) and LAN support. With input and output flexibility, long lamp life and a full function remote, the 8761A lets you enjoy larger than life viewing from a compact and easy to setup and use projector.

Features you'll enjoy on the 8761A:

- Automatic vertical keystone correction for fast and easy application setup.
- 3D Reform™ enhanced image technology for increased projector placement versatility that provides for horizontal, vertical and diagonal keystone correction.
- Built-in Wall Color Correction presets provide for adaptive color correction when projecting onto non-white screen material (or a wall).
- USB memory or PC card interfaces provide for computer-free presentations.
- Enhanced smart security settings for password protection, cabinet control panel lock, menu lock and PC card protection key to help prevent unauthorized access, adjustments and theft deterrence.
- High resolution display - up to UXGA compatible, XGA native resolution.
- Variable audio out control of external amplified speakers via the projector remote.
- Extensive user adjustable picture and color management settings.
- Display 16:9 or 4:3 aspect ratio sources and fill the screen.
- HDTV (1080i, 720p) and SDTV (480p/576p, 480i/576i) compatibility.
- Digital photo viewer to display larger than life images from your digital cameras PC card, compact flash card or USB storage device.
- Integrated RJ-45 connector for wired networking capability.
- Wireless networking capable.

Present from anywhere in the room when using as a wireless LAN projector, no physical signal cable connection to a PC is required.

* The optional wireless LAN card is required (NWL-100).

- Supplied User Supportware 2 CD-ROM containing five software utilities allowing you to make the most of your projector.
- The supplied wireless remote control and remote mouse receiver allows you to operate your PC mouse wireless from across the room. The remote mouse receiver supports most PCs with USB interface.
- Easy set up, use and operation.
- Eco-mode lamp technology for increased lamp life, reduced energy consumption and overall total cost of ownership savings.
- Built-in laser pointer on the supplied remote control allows you to draw your audience's attention in a presentation.

Introduction

A detailed "User's Manual" is available on the CD.

The projector is equipped with the following features so that you can give effective presentations.

- LAN port (RJ-45), USB port (type A), PC card slot (TYPE II) supplied as standard
- Viewer that displays images from a flash memory card*¹ and USB memory*¹

*¹ The projector is not supplied with a flash memory card or USB memory.

The projector is also supplied with User Supportware 2 CD-ROM in which five programs of software are stored for effective use of these features. The software stored on this CD-ROM are as follows.

Each program runs on Windows XP and Windows 2000.

- Image Express Utility 2.0
- Desktop Control Utility 1.0
- Ulead Photo Explorer 8.0 SE Basic
- Viewer PPT Converter 3.0
- PC Control Utility 3.0

This document explains the basic operations of the above equipment and functions. For details of operations, refer to help function of the software.

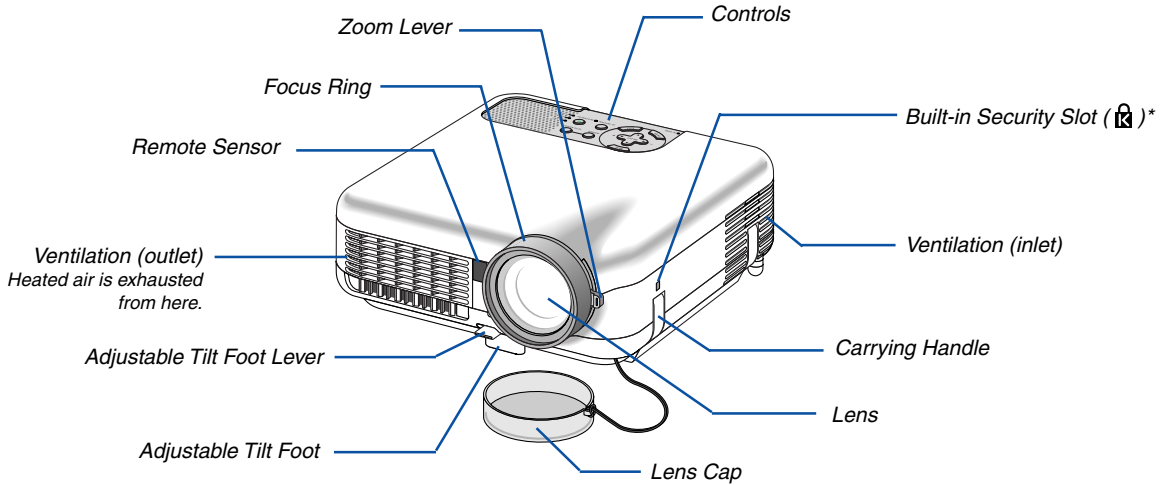
For the network settings on the personal computer, refer to the User's Manual for the personal computer or the peripheral equipment for the network.

Use a wireless LAN card conforming to the Wi-Fi standard for your personal computer.

NOTES

- (1) The contents of this guide may not be reprinted in part or whole without permission.
- (2) The contents of this guide are subject to change without notice.
- (3) Great care has been taken in the preparation of this guide; however, should you notice any questionable points, errors or omissions, please contact us.
- (4) Notwithstanding article (3), Dukane will not be responsible for any claims on loss of profit or other matters deemed to result from using the Projector.
- (5) Guides with incorrect collating or missing pages will be replaced.

3 Part Names of the Projector



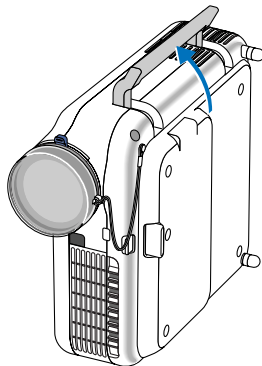
* This security slot supports the MicroSaver® Security System. MicroSaver® is a registered trademark of Kensington Microware Inc. The logo is trademarked and owned by Kensington Microware Inc.

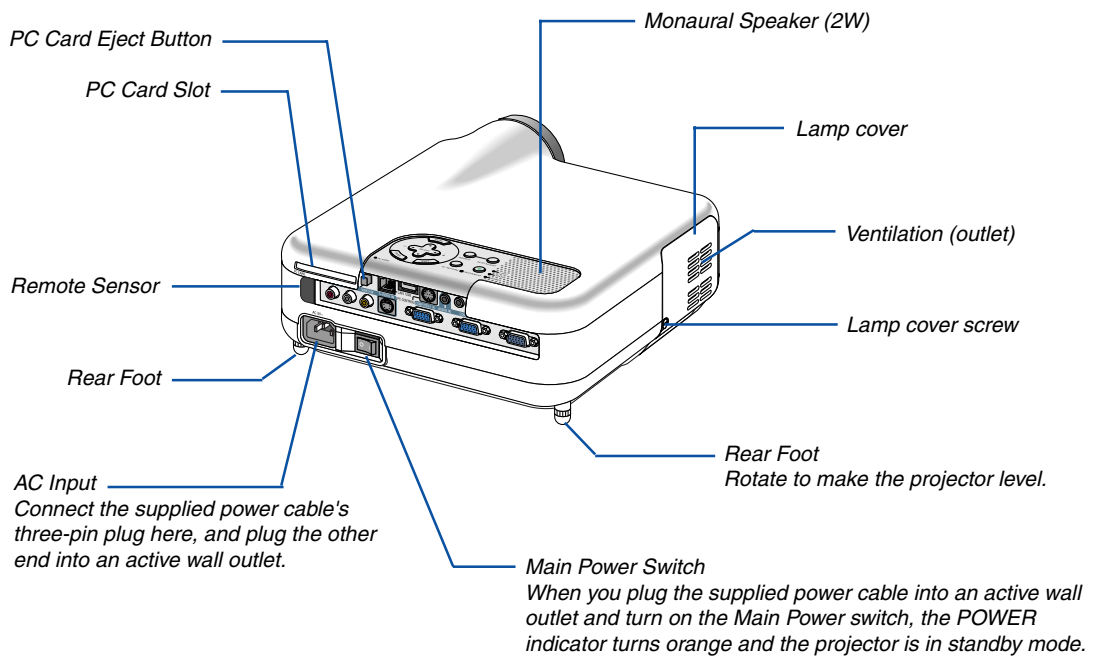
Carrying the Projector

Always carry your projector by the handle.

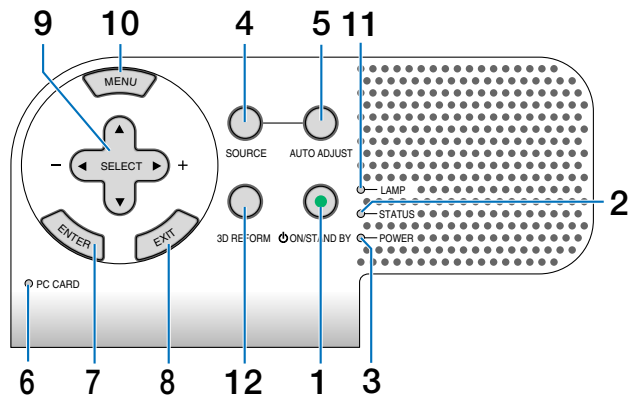
Ensure that the power cable and any other cables connecting to video sources are disconnected before moving the projector.

When moving the projector or when it is not in use, cover the lens with the lens cap.





Top Features



1. POWER Button (ON / STAND BY)

Use this button to turn the power on and off when the main power is supplied and the projector is in standby mode.

NOTE: To turn on the projector, press and hold this button for a minimum of two seconds. To turn off the projector, press this button twice.

2. STATUS Indicator

If this light blinks red rapidly, it indicates that an error has occurred, the lamp cover is not attached properly or the projector has overheated. If this light remains orange, it indicates that you have pressed a cabinet light while the Cabinet Button Lock is enabled.

3. POWER Indicator (⏻)

When this indicator is green, the projector is on; when this indicator is orange, it is in standby mode.

4. SOURCE Button

Use this button to select a video source such as a PC, VCR, DVD player or Viewer (PC card). Press and release this button quickly to display the Source List.

Each time this button is pressed for a minimum of ONE second, the input source will change as follows:

Computer1 → Computer2 → Video → S-Video → Viewer → Computer1 → ...

If no input signal is present, the input will be skipped.

5. AUTO ADJUST Button

Use this button to adjust an RGB source for an optimal picture.

6. PC CARD Access Indicator

Lights while accessing a PC card.

7. ENTER Button

Executes your menu selection and activates items selected from the menu.

8. EXIT Button

Pressing this button will return to the previous menu with saving changes.

While you are in the main menu, pressing this button will close the menu.

9. SELECT ▲▼◀▶ (+) (-) / Volume Buttons

▲▼ : Use these buttons to select the menu of the item you wish to adjust.

◀▶ : Use these buttons to change the level of a selected menu item. When no menus appear, these buttons work as a volume control.

When the pointer is displayed, these ▲▼◀▶ buttons move the pointer.

10. MENU Button

Displays the menu.

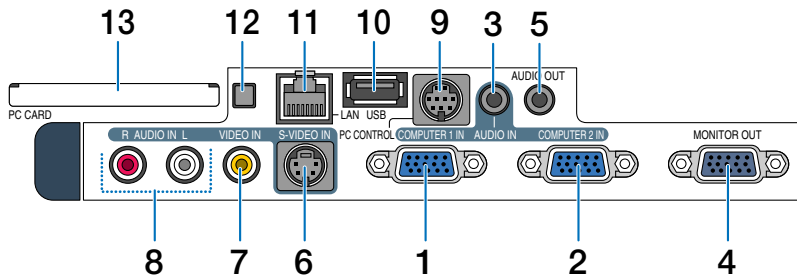
11. LAMP Indicator

If this light blinks red rapidly, it's warning you that the projection lamp has exceeded 2000 hours (up to 4000 hours in Eco mode) of service. After this light appears, replace the lamp as soon as possible. (See page 119). If this is lit green continually, it indicates that the lamp mode is set to Eco.

12. 3D REFORM Button

Press this button to enter 3D Reform mode to correct the keystone (trapezoidal) distortion, and make the image square.

Terminal Panel Features



1. COMPUTER 1 IN / Component Input Connector (Mini D-Sub 15 Pin)

Connect your computer or other analog RGB equipment such as IBM compatible or Macintosh computers. Use the supplied RGB/VGA signal cable to connect to your computer. This also serves as a component input connector that allows you to connect a component video output of component equipment such as a DVD player. This connector also supports SCART output signal.

2. COMPUTER 2 IN / Component Input Connector (Mini D-Sub 15 Pin)

This connector has the same function as the COMPUTER 1 IN connector.

NOTE: The COMPUTER 2 IN does not support SCART output signal and Plug & Play.

3. COMPUTER AUDIO IN Mini Jack (Stereo Mini)

This is where you connect audio output from your computer or DVD player. A commercially available audio cable is required.

4. MONITOR OUT Connector (Mini D-Sub 15 Pin)

You can use this connector to loop your computer image to an external monitor from the COMPUTER 1 or 2 input source.

The RGB analog signal set on "OUT Terminal" is output during Standby mode.

5. AUDIO OUT Mini Jack (Stereo Mini)

Connect an additional audio equipment here to listen to audio coming from your computer, Video or S-Video input.

- Output sound level can be adjusted in accordance with the sound level of the internal speaker.
- When audio equipment is connected, the projector speaker is disabled.
- This jack cannot be used as a headphone jack.

6. S-VIDEO IN Connector (Mini DIN 4 Pin)

Here is where you connect the S-Video input from an external source like a VCR.

NOTE: S-Video provides more vivid color and higher resolution than the traditional composite video format.

7. VIDEO IN Connector (RCA)

Connect a VCR, DVD player, laser disc player, or document camera here to project video.

8. VIDEO AUDIO IN Jacks (RCA)

L: This is your left channel audio input for stereo sound coming from the VIDEO source.

R: This is your right channel audio input for stereo sound from the VIDEO source.

9. PC CONTROL Port (Mini DIN 8 Pin)

Use this port to connect your PC or control system to control your projector via a serial cable. This enables you to control the projector using serial communication protocol. The optional serial cable (CA03D) is required to use this port. You can also control the projector by using PC Control Utility 3.0 contained on the supplied User Supportware 2 CD-ROM.

To do so you must first have PC Control Utility 3.0 installed on your PC.

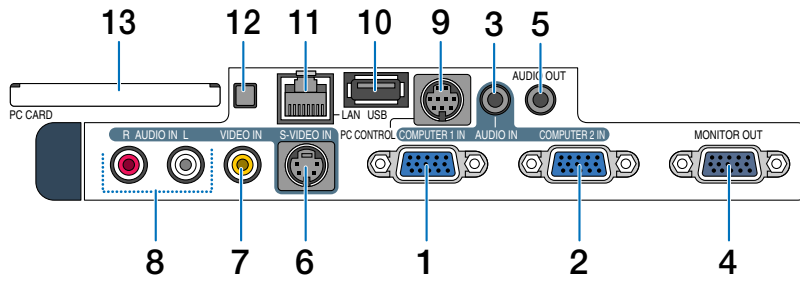
10. USB Port (Type A)

Connect a commercially available USB memory device or mouse that supports USB. You can operate the menu or Viewer with the USB mouse via this port. Note that this port should not be connected to a computer and that there may be some brands of USB mouse that the projector does not support.

11. LAN Port (RJ-45)

This port is typically used for UTP Ethernet/Fast Ethernet. Use this connector to control the projector on a LAN.

Terminal Panel Features



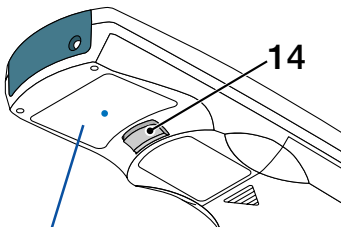
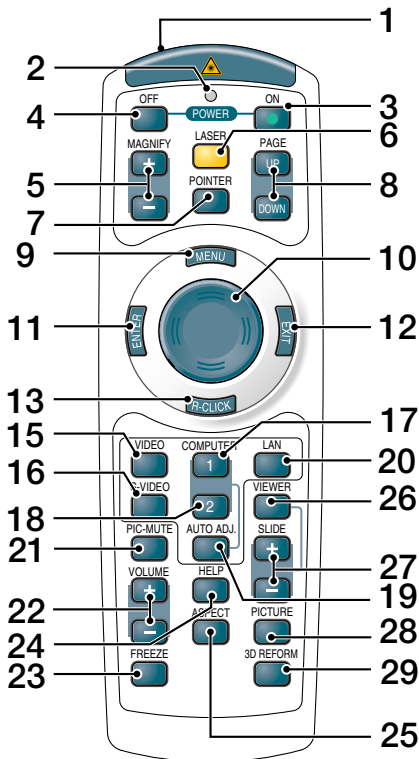
12. PC CARD Eject Button

Press to eject a PC card partially.

13. PC CARD Slot

Insert a PC memory card or optional wireless LAN card here.

4 Part Names of the Remote Control



1. Infrared Transmitter/Laser Pointer

Transmits an infrared signal when any button other than LASER is pressed.

Direct the remote control toward the remote sensor on the projector cabinet.

Beams a laser light when the Laser button is pressed.

CAUTION:

- * Do not look into the laser pointer while it is on.
- * Do not point the laser beam at a person.

2. LED

Flashes when any button is pressed.

3. POWER ON Button

When the main power is on, you can use this button to turn your projector on.

NOTE: To turn on the projector, press and hold the POWER ON button for a minimum of two seconds.

4. POWER OFF Button

You can use this button to turn your projector off.

NOTE: To turn off the projector, press the POWER OFF button twice.

5. MAGNIFY (+)(-) Buttons

Use these buttons to adjust the image size.

The image can be magnified about the center of the screen up to 400%.

6. LASER Button

Press and hold this button to activate the laser pointer. When lit, you can use the laser to draw your audience's attention to a red dot that you can place on any object.

7. POINTER Button

Press this button to display the projector pointer. You can move your pointer icon to the area you want on the screen using the Select button.

8. PAGE UP/DOWN Buttons

Use these buttons to operate your computer with the supplied remote mouse receiver. You can use these buttons to scroll the viewing area of the window or to move to the previous or next slide in PowerPoint on your computer.

9. MENU Button

Displays the menu for various settings and adjustments.

10. Select Button

This button is used for projector's menu operation and moving the magnified image.

This button also works as a computer mouse when the supplied remote mouse receiver is connected with your computer.

11. ENTER Button

Executes your menu selection and activates items selected from the menu.

12. EXIT Button

Returns to the previous menu.

While you are in the main menu, pressing this button will close the menu.

13. R-CLICK Button

Works as the mouse right button when the supplied remote mouse receiver is connected with your computer.

14. L-CLICK Button

Works as the mouse left button when the supplied remote mouse receiver is connected with your computer.

15. VIDEO Button

Press this button to select a video source from a VCR, DVD player, laser disc player or document camera.

16. S-VIDEO Button

Press this button to select an S-Video source from a VCR.

17. COMPUTER 1 Button

Press this button to select COMPUTER 1 input.

18. COMPUTER 2 Button

Press this button to select COMPUTER 2 input.

19. AUTO ADJ. Button

Use this button to adjust an RGB source (COMPUTER 1 or 2) for an optimal picture.

20. LAN Button

Press this button to select the LAN (Local Area Network) connection.

21. PIC-MUTE Button

This button turns off the image and sound for a short period of time. Press again to restore the image and sound.

22. VOLUME +/- Buttons

Press (+) to increase the volume and (-) to decrease it.

23. FREEZE Button

This button will freeze a picture. Press again to resume motion.

24. HELP Button

Provides the Information screen.

25. ASPECT Button

Press this button to display the Aspect Ratio select menu.

26. VIEWER Button

Press this button to select the Viewer source.

27. SLIDE +/- Buttons

Press (+) to select the next folder or slide and press (-) to select the previous folder or slide.

28. PICTURE Button

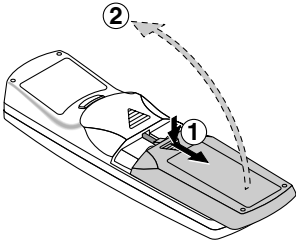
Press to display the picture adjustment screen. Pressing this button sequentially selects "Brightness" → "Contrast" → "Color" → "Hue" → "Sharpness" → "Wall Color".

29. 3D REFORM Button

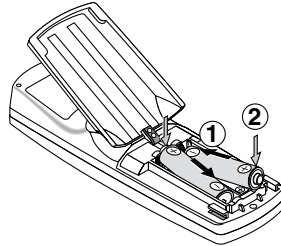
Press this button to enter 3D Reform to correct the keystone (trapezoidal) distortion, and make the image square.

Battery Installation

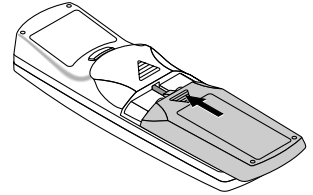
- 1** Remove the battery cover.
NOTE: Do not pull the battery cover by force. Doing so can result in it coming off.



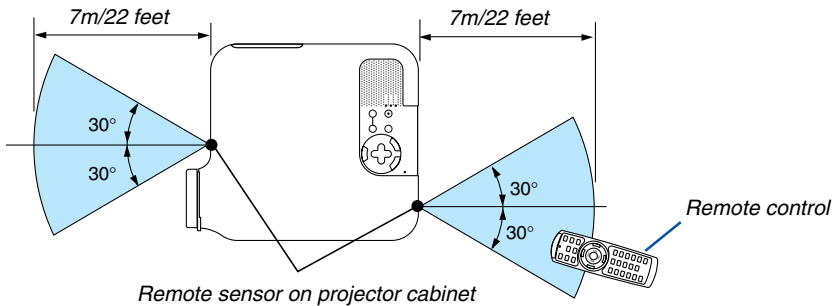
- 2** Remove both old batteries and install new ones (AAA). Ensure that you have the batteries' polarity (+/-) aligned correctly.



- 3** Slip the cover back over the batteries until it snaps into place.
NOTE: Do not mix different types of batteries or new and old batteries.



Operating Range for Wireless Remote Control

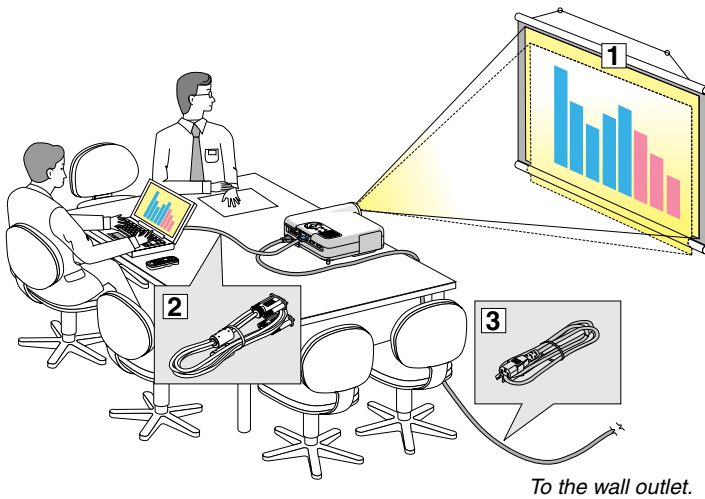


- The infrared signal operates by line-of-sight up to a distance of about 22 feet/7 m and within a 60-degree angle of the remote sensor on the projector cabinet.
 - The projector will not respond if there are objects between the remote control and the sensor, or if strong light falls on the sensor.
- Weak batteries will also prevent the remote control from properly operating the projector.

Remote Control Precautions

- Handle the remote control carefully.
- If the remote control gets wet, wipe it dry immediately.
- Avoid excessive heat and humidity.
- If you will not be using the remote control for a long time, remove the batteries.
- Do not place the batteries upside down.
- Do not use new and old batteries together, or use different types of batteries together.
- Dispose of used batteries according to your local regulations.

This section describes how to set up your projector and how to connect PCs, video and audio sources.



Your projector is simple to set up and use. But before you get started, you must first:

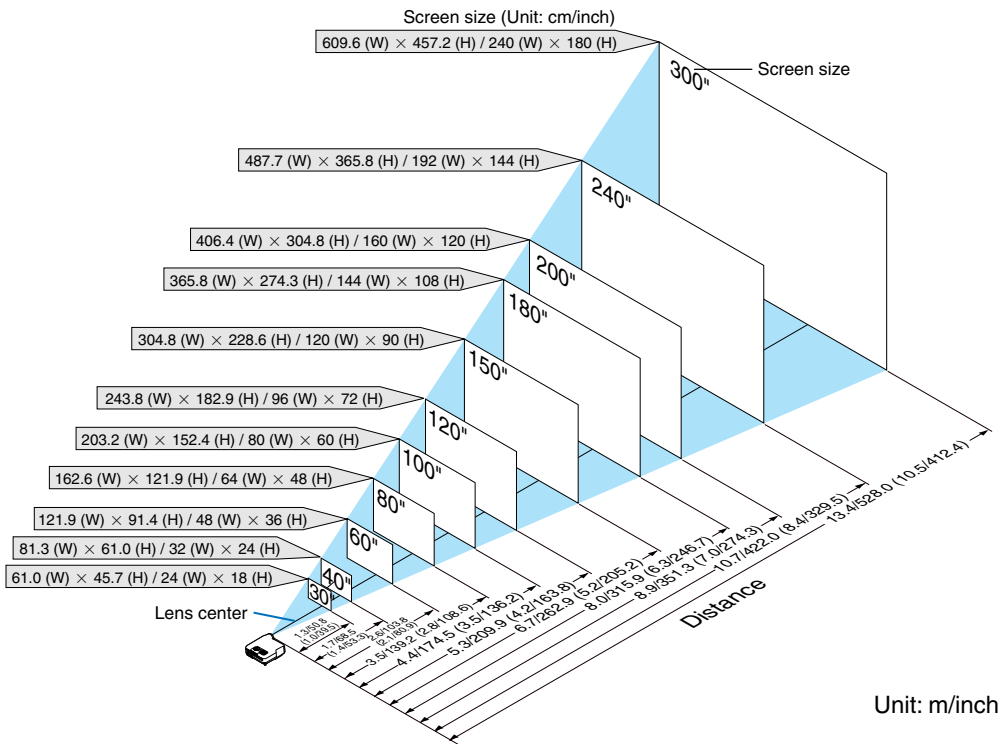
- 1 Set up a screen and the projector.
- 2 Connect your computer or video equipment to the projector.
- 3 Connect the supplied power cable.

NOTE: Ensure that the power cable and any other cables are disconnected before moving the projector. When moving the projector or when it is not in use, cover the lens with the lens cap.

1 Setting Up the Screen and the Projector

Selecting a Location

The further your projector is from the screen or wall, the larger the image. The minimum size the image can be is approximately 30 inches (0.8 m) measured diagonally when the projector is roughly 51.2 inches (1.3 m) from the wall or screen. The largest the image can be is 500 inches (12.7 m) when the projector is about 970 inches (24.6 m) from the wall or screen. Use the drawing below as a guide.



Unit: m/inch

NOTE:

- Values in parentheses for 8760A
- The screen sizes above are intermediate values between tele (minimum display area) and wide (maximum display area). Image size can be adjusted with the zoom adjustment up to a maximum of 10%.
- To avoid premature lamp failure, do not tilt the front of the projector up or down by more than 7° from level.

Throw Distance and Screen Size

The following shows the proper relative positions of the projector and screen. Refer to the table to determine the position of installation.

Distance Chart

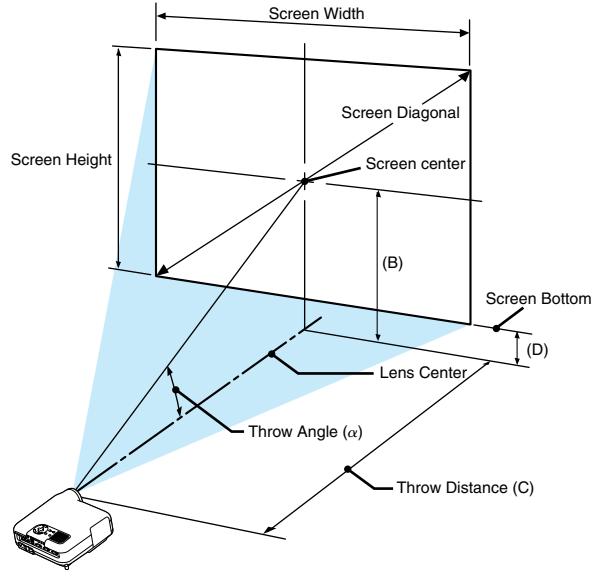
B = Vertical distance between lens center and screen center

C = Throw distance

D = Vertical distance between lens center and bottom of screen (top of screen for ceiling application)

α = Throw angle

NOTE: Distances may vary +/-5%.



8761A

Screen Size			B	C		D	α
Diagonal	Width	Height		Wide - Tele			
inch	inch	inch	inch	inch		inch	degree
30	24	18	12.6	45.6 - 56.0	3.6	15.4 - 12.7	
40	32	24	16.8	61.5 - 75.4	4.8	15.3 - 12.6	
60	48	36	25.2	93.5 - 114.1	7.2	15.1 - 12.5	
67	54	40	28.1	104.7 - 127.7	8.0	15.0 - 12.4	
72	58	43	30.2	112.7 - 137.4	8.6	15.0 - 12.4	
80	64	48	33.6	125.5 - 152.9	9.6	15.0 - 12.4	
84	67	50	35.3	131.9 - 160.6	10.1	15.0 - 12.4	
90	72	54	37.8	141.5 - 172.2	10.8	15.0 - 12.4	
100	80	60	42.0	157.4 - 191.6	12.0	14.9 - 12.4	
120	96	72	50.4	189.4 - 230.3	14.4	14.9 - 12.3	
150	120	90	63.0	237.3 - 288.4	18.0	14.9 - 12.3	
180	144	108	75.6	285.3 - 346.6	21.6	14.8 - 12.3	
200	160	120	84.0	317.2 - 385.3	24.0	14.8 - 12.3	
210	168	126	88.2	333.2 - 404.7	25.2	14.8 - 12.3	
240	192	144	100.8	381.2 - 462.8	28.8	14.8 - 12.3	
261	209	157	109.7	414.7 - 503.4	31.4	14.8 - 12.3	
270	216	162	113.5	429.1 - 520.9	32.5	14.8 - 12.3	
300	240	180	126.1	477.0 - 579.0	36.1	14.8 - 12.3	
350	280	210	147.1	557.0 - 675.8	42.1	14.8 - 12.3	
400	320	240	168.1	636.9 - 772.7	48.1	14.8 - 12.3	
450	360	270	189.1	716.8 - 869.5	54.1	14.8 - 12.3	
500	400	300	210.1	796.7 - 966.4	60.1	14.8 - 12.3	

Screen Size			B	C		D	α
Diagonal	Width	Height		Wide - Tele			
inch	mm	mm	mm	mm		mm	degree
30	762	610	457	320	1,157 - 1,423	91	15.4 - 12.7
40	1016	813	610	427	1,563 - 1,915	122	15.3 - 12.6
60	1524	1219	914	640	2,375 - 2,899	183	15.1 - 12.5
67	1702	1361	1021	714	2,659 - 3,243	204	15.0 - 12.4
72	1829	1463	1097	768	2,862 - 3,489	219	15.0 - 12.4
80	2032	1626	1219	853	3,187 - 3,883	244	15.0 - 12.4
84	2134	1707	1280	896	3,349 - 4,080	256	15.0 - 12.4
90	2286	1829	1372	960	3,593 - 4,375	274	15.0 - 12.4
100	2540	2032	1524	1067	3,999 - 4,867	305	14.9 - 12.4
120	3048	2438	1829	1280	4,811 - 5,851	366	14.9 - 12.3
150	3810	3048	2286	1601	6,028 - 7,327	458	14.9 - 12.3
180	4572	3658	2743	1921	7,246 - 8,802	549	14.8 - 12.3
200	5080	4064	3048	2134	8,058 - 9,786	610	14.8 - 12.3
210	5334	4267	3200	2241	8,464 - 10,278	641	14.8 - 12.3
240	6096	4877	3658	2562	9,682 - 11,754	733	14.8 - 12.3
261	6629	5304	3978	2786	10,534 - 12,787	797	14.8 - 12.3
270	6858	5486	4115	2882	10,899 - 13,230	824	14.8 - 12.3
300	7620	6096	4572	3202	12,117 - 14,706	916	14.8 - 12.3
350	8890	7112	5334	3736	14,147 - 17,166	1069	14.8 - 12.3
400	10160	8128	6096	4270	16,176 - 19,626	1222	14.8 - 12.3
450	11430	9144	6858	4804	18,206 - 22,086	1375	14.8 - 12.3
500	12700	10160	7620	5337	20,235 - 24,545	1527	14.8 - 12.3

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Screen Size			B	C		D	α
Diagonal	Width	Height		Wide - Tele			
inch	inch	inch	inch	inch		inch	degree
30	24	18	12.5	35.7 - 43.3	3.5	19.4 - 16.2	
40	32	24	16.7	48.2 - 58.4	4.7	19.1 - 16.0	
60	48	36	25.1	73.3 - 88.5	7.1	18.9 - 15.9	
67	54	40	28.1	82.1 - 99.1	8.0	18.9 - 15.8	
72	58	43	30.2	88.4 - 106.6	8.6	18.8 - 15.8	
80	64	48	33.5	98.5 - 118.7	9.5	18.8 - 15.8	
84	67	50	35.2	103.5 - 124.7	10.0	18.8 - 15.8	
90	72	54	37.7	111.0 - 133.7	10.7	18.8 - 15.8	
100	80	60	41.9	123.6 - 148.8	11.9	18.7 - 15.7	
120	96	72	50.3	148.7 - 178.9	14.3	18.7 - 15.7	
150	120	90	62.9	186.3 - 224.1	17.9	18.7 - 15.7	
180	144	108	75.5	224.0 - 269.3	21.5	18.6 - 15.7	
200	160	120	83.9	249.1 - 299.5	23.9	18.6 - 15.7	
210	168	126	88.1	261.7 - 314.5	25.1	18.6 - 15.7	
240	192	144	100.7	299.3 - 359.7	28.7	18.6 - 15.6	
261	209	157	109.5	325.7 - 391.4	31.2	18.6 - 15.6	
270	216	162	113.3	337.0 - 405.0	32.3	18.6 - 15.6	
300	240	180	125.9	374.6 - 450.2	35.9	18.6 - 15.6	
350	280	210	146.9	437.4 - 525.5	41.9	18.6 - 15.6	
400	320	240	167.9	500.2 - 600.8	47.9	18.6 - 15.6	
450	360	270	188.9	563.0 - 676.2	53.9	18.5 - 15.6	
500	400	300	209.9	625.7 - 751.5	59.9	18.5 - 15.6	

Screen Size			B	C		D	α
Diagonal	Width	Height		Wide - Tele			
inch	mm	mm	mm	mm		mm	degree
30	762	610	457	319	906 - 1,100	90	19.4 - 16.2
40	1016	813	610	425	1,225 - 1,483	120	19.1 - 16.0
60	1524	1219	914	639	1,863 - 2,248	181	18.9 - 15.9
67	1702	1361	1021	713	2,086 - 2,516	203	18.9 - 15.8
72	1829	1463	1097	766	2,246 - 2,707	218	18.8 - 15.8
80	2032	1626	1219	852	2,501 - 3,014	242	18.8 - 15.8
84	2134	1707	1280	894	2,628 - 3,167	254	18.8 - 15.8
90	2286	1829	1372	958	2,820 - 3,396	273	18.8 - 15.8
100	2540	2032	1524	1065	3,139 - 3,779	303	18.7 - 15.7
120	3048	2438	1829	1278	3,776 - 4,545	364	18.7 - 15.7
150	3810	3048	2286	1598	4,733 - 5,693	455	18.7 - 15.7
180	4572	3658	2743	1918	5,689 - 6,841	547	18.6 - 15.7
200	5080	4064	3048	2132	6,327 - 7,607	608	18.6 - 15.7
210	5334	4267	3200	2238	6,646 - 7,989	638	18.6 - 15.7
240	6096	4877	3658	2558	7,603 - 9,137	729	18.6 - 15.6
261	6629	5304	3978	2782	8,272 - 9,941	793	18.6 - 15.6
270	6858	5486	4115	2878	8,559 - 10,286	821	18.6 - 15.6
300	7620	6096	4572	3198	9,516 - 11,434	912	18.6 - 15.6
350	8890	7112	5334	3731	11,110 - 13,348	1064	18.6 - 15.6
400	10160	8128	6096	4264	12,705 - 15,261	1216	18.6 - 15.6
450	11430	9144	6858	4798	14,299 - 17,175	1369	18.5 - 15.6
500	12700	10160	7620	5331	15,893 - 19,089	1521	18.5 - 15.6

WARNING

- * Installing your projector on the ceiling must be done by a qualified technician. Contact your dealer for more information.
- * Do not attempt to install the projector yourself.
- Only use your projector on a solid, level surface. If the projector falls to the ground, you can be injured and the projector severely damaged.
- Do not use the projector where temperatures vary greatly. The projector must be used at temperatures between 41°F (5°C) and 95°F (35°C).
- Do not expose the projector to moisture, dust, or smoke. This will harm the screen image.

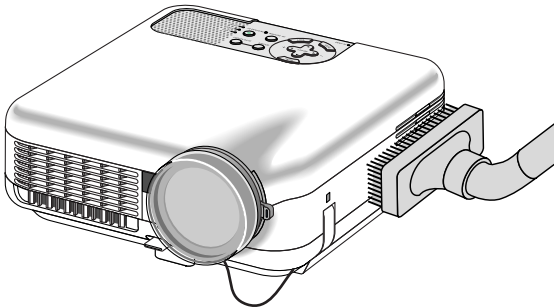
- Ensure that you have adequate ventilation around your projector so heat can dissipate. Do not cover the vents on the side or the front of the projector.

Reflecting the Image

Using a mirror to reflect your projector's image enables you to enjoy a much larger image. Contact your dealer if you need a mirror system. If you're using a mirror system and your image is inverted, use the MENU and SELECT buttons on your projector cabinet or your remote control to correct the orientation.

This section describes the simple maintenance procedures you should follow to replace the lamp, and to clean the cabinet and the lens.

① Cleaning the Cabinet



1. Turn off the projector before cleaning.
2. Clean the cabinet periodically with a damp cloth. If heavily soiled, use a mild detergent. Never use strong detergents or solvents such as alcohol or thinner.

② Cleaning the Lens

Use a blower or lens paper to clean the lens, and be careful not to scratch the lens.



Lens Protector

The lens barrel has threads on the outside for mounting a commercially available step-up ring ($\phi 77\text{mm} \rightarrow \phi 82\text{mm}$) and lens protector ($\phi 82\text{mm}$) to protect the lens from dirt, dust, scratches and damage. Note that both a lens protector and the supplied lens cap cannot be used at the same time.

CAUTION: Use only transparent lens protectors designed for lens protection. Use of filters for light reduction and special effects, such as ND (Neutral Density) filters and color filters, can absorb heat, resulting in damage to the filter and the projector.

③ Replacing the Lamp

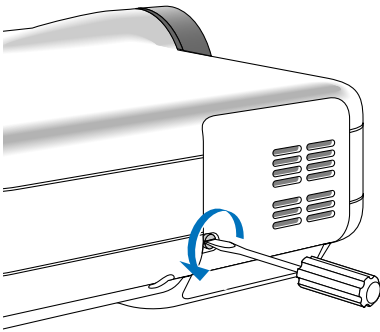
After your lamp has been operating for 2000 hours (up to 4000 hours : Eco mode) or longer, the "Lamp" indicator in the cabinet will blink red and the message will appear. Even though the lamp may still be working, replace it at 2000 hours (up to 4000 hours : Eco mode) to maintain optimal projector performance.

CAUTION

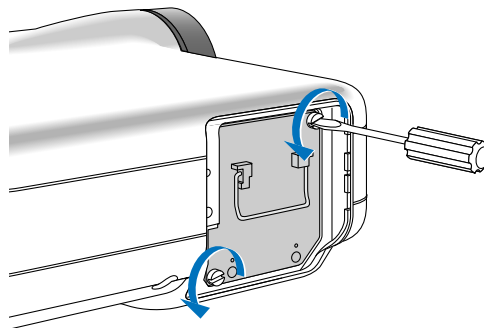
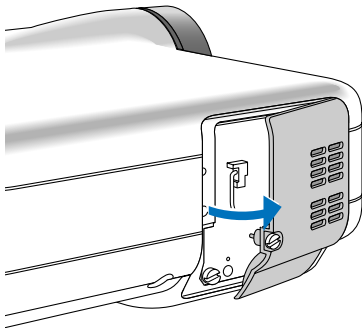
- DO NOT TOUCH THE LAMP immediately after it has been used. It will be extremely hot. Turn the projector off, wait 90 seconds, turn off the main power switch, and then disconnect the power cable. Allow at least one hour for the lamp to cool before handling.
- DO NOT REMOVE ANY SCREWS except the lamp cover screw and two lamp case screws. You could receive an electric shock.
- Do not break the glass on the lamp housing. Keep finger prints off the glass surface on the lamp housing. Leaving finger prints in the glass surface might cause an unwanted shadow and poor picture quality.
- The projector will turn off and go into stand by mode after 2100 hours (up to 4100 hours : Eco mode) of service. If this happens, be sure to replace the lamp. If you continue to use the lamp after 2000 hours (up to 4000 hours : Eco mode) of use, the lamp bulb may shatter, and pieces of glass may be scattered in the lamp housing. Do not touch them as the pieces of glass may cause injury.
If this happens, contact your dealer for lamp replacement.

To replace the lamp:

1. **Loosen the lamp cover screw until the screwdriver goes into a freewheeling condition and remove the lamp cover. The lamp cover screw is not removable.**

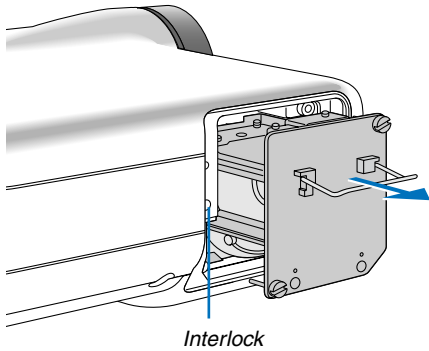


2. **Loosen the two screws securing the lamp housing until the screwdriver goes into a freewheeling condition. The two screws are not removable.**

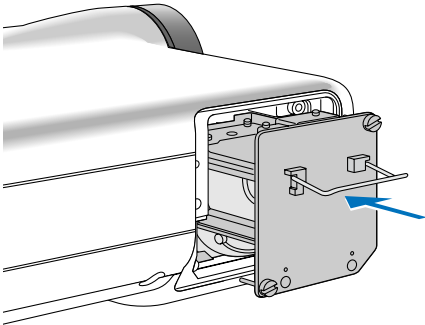


3. Remove the lamp housing by pulling out the handle.

NOTE: There is an interlock on this case to prevent the risk of electrical shock. Do not attempt to circumvent this interlock.



4. Insert a new lamp housing until the lamp housing is plugged into the socket.

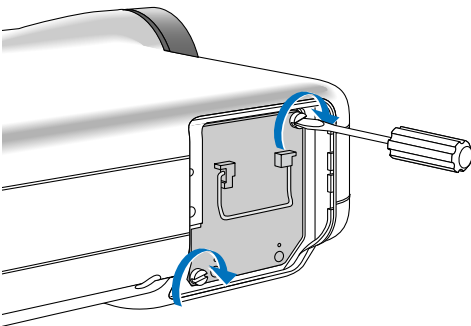


CAUTION

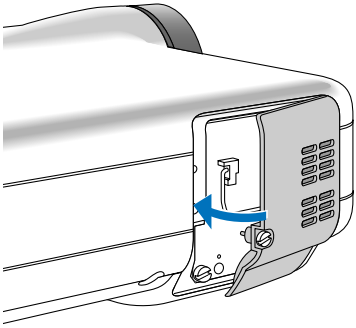
Do not use a lamp other than the specified replacement lamp (LT60LPK).

5. Secure it in place with the two screws.

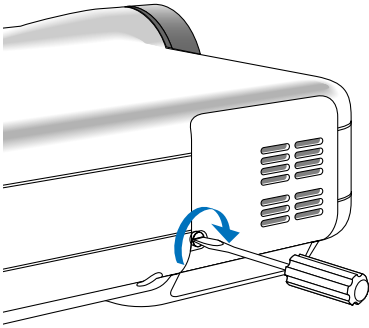
Be sure to tighten the screws.



6. Reattach the lamp cover.



7. Tighten the lamp cover screw.
Be sure to tighten the screw.



8. After you install a new lamp, select the menu [Reset] → [Clear Lamp Hour Meter] to clear the Remaining Lamp Time and the Lamp Hour Meter.

NOTE: When the lamp exceeds 2100 hours (up to 4100 hours in Eco mode) of service, the projector cannot turn on and the menu is not displayed. If this happens, press the HELP button on the remote control for a minimum of 10 seconds while in standby mode. When the lamp time clock is reset to zero, the LAMP indicator goes out.

1 Troubleshooting

This section helps you resolve problems you may encounter while setting up or using the projector.

Indicator Messages

Power Indicator

Indicator Condition			Projector Condition	Note
Off			The main power is off	–
Blinking light	Green	0.5 sec On, 0.5 sec Off	The projector is getting ready to turn on.	Wait for a moment.
		2.5 sec On, 0.5 sec Off	Off Timer is activated.	–
	Orange	0.5 sec On, 0.5 sec Off	The projector is cooling down.	Wait for a moment.
Steady light	Green		The projector is turned on.	–
	Orange		The projector is in Standby.	–

Status Indicator

Indicator Condition			Projector Condition	Note
Off			Normal	–
Blinking light	Red	1 cycle (0.5 sec On, 2.5 sec Off)	Lamp cover error	Replace the lamp cover correctly.
		2 cycle (0.5 sec On, 0.5 sec Of)	Temperature error	The projector is overheated. Move the projector to a cooler location.
		3 cycle (0.5 sec On, 0.5 sec Off)	Power error	Power unit will not work correctly.
		4 cycle (0.5 sec On, 0.5 sec Off)	Fan error	Fans will not work correctly.
		6 cycle (0.5 sec On, 0.5 sec Off)	Lamp error	Lamp fails to light. Wait a full minute and then turn on again.
	Green		Re-firing the lamp	The projector is re-firing.
	Orange	1 cycle(0.5 sec On, 2.5 sec Off)	Network conflict	Both the built-in LAN and the wireless LAN cannot be connected to the same network at the same time. To use both built-in LAN and wireless LAN at the same time, connect them to different networks.
Steady light	Orange		Cabinet button is locked	You have pressed cabinet button when Cabinet Button is locked.

Lamp Indicator

Indicator Condition			Projector Condition	Note
Off			Normal	–
Blinking light	Red		Lamp has reached its end of life. Lamp replacement message will be displayed.	Replace the lamp.
Steady light	Red		Lamp has been used beyond its limit. The projector will not turn on until the lamp is replaced.	Replace the lamp.
	Green		Lamp mode is set to Eco mode	–

Common Problems & Solutions

Problem	Check These Items
Does not turn on	<ul style="list-style-type: none"> • Check that the power cable is plugged in and that the power button on the projector cabinet or the remote control is on. • Ensure that the lamp cover is installed correctly. • Check to see if the projector has overheated or the lamp usage exceeds 2100 hours (up to 4100 hours : Eco mode). If there is insufficient ventilation around the projector or if the room where you're presenting is particularly warm, move the projector to a cooler location. • The lamp may fail to light. Wait a full minute and then turn on the power again. • The lamp has reached the end of its usable life. Replace the lamp.
Will turn off	<ul style="list-style-type: none"> • Ensure that the Power Management is off.
No picture	<ul style="list-style-type: none"> • Use the SOURCE button on the projector cabinet or the VIDEO, the S-VIDEO, the COMPUTER 1/2, the VIEWER or the LAN button on the remote control to select your source. • Ensure your cables are connected properly. • Use menus to adjust the brightness and contrast. • Remove the lens cap. • Reset the settings or adjustments to factory preset levels using the Reset in the Menu. • Enter your registered keyword if the Security function is enabled. • When using with a notebook PC, be sure to connect between the projector and the notebook PC before turning on the power to the notebook PC. In most cases signal cannot be output from RGB output unless the notebook PC is turned on after connecting with the projector. <ul style="list-style-type: none"> * If the screen goes blank while using your remote control, it may be the result of the computer's screen-saver or power management software. * If you accidentally hit the POWER button on the remote control, wait 90 seconds and then press the POWER button again to resume.
Color tone or hue is unusual	<ul style="list-style-type: none"> • Check if an appropriate color is selected in "Wall Color". If so, select an appropriate option. • Adjust "Hue" in "Adjust".
Image isn't square to the screen	<ul style="list-style-type: none"> • Reposition the projector to improve its angle to the screen. • Use the 3DReform function to correct the trapezoid distortion.
Picture is blurred	<ul style="list-style-type: none"> • Adjust the focus. • Reposition the projector to improve its angle to the screen. • Ensure that the distance between the projector and screen is within the adjustment range of the lens. • Condensation may form on the lens if the projector is cold, brought into a warm place and is then turned on. Should this happen, let the projector stand until there is no condensation on the lens.
Image is scrolling vertically, horizontally or both	<ul style="list-style-type: none"> • Use the SOURCE button on the projector cabinet or the VIDEO, the S-VIDEO, the COMPUTER 1/2, the VIEWER or the LAN button on the remote control to select your source (Video, S-Video, Computer, Viewer or LAN). • Adjust the computer image manually with the "Clock"/"Phase" in "Adjust" → "Image Options".
Remote control does not work	<ul style="list-style-type: none"> • Install new batteries. • Make sure there are no obstacles between you and the projector. • Stand within 22 feet (7 m) of the projector.
Indicator is lit or blinking	<ul style="list-style-type: none"> • See the POWER/STATUS/LAMP Indicator.
Vertical stripes in RGB mode	<ul style="list-style-type: none"> • Press the AUTO ADJUST button on the projector cabinet or the AUTO ADJ. button on the remote control. • Adjust the computer image manually with the "Clock"/"Phase" in "Adjust" → "Image Options".
USB mouse does not work	<ul style="list-style-type: none"> • Make sure that your USB mouse is properly connected to the projector. The projector may not support some brands of a USB mouse.
Capture function is not possible.	<ul style="list-style-type: none"> • The Capture function is not available on LAN.

For more information contact your dealer.

If there is no picture, or the picture is not displayed correctly.

- Power on process for the projector and the PC.

Be sure to connect the RGB cable between the projector and the computer before turning on the computer. There are some notebook PCs, which do not output signal unless there is a projector or monitor connected first.

NOTE: You can check the horizontal frequency of the current signal in the projector's menu under Information. If it reads "0kHz", this means there is no signal being output from the computer.

- Enabling the computer's external display.

Displaying an image on the notebook PC's screen does not necessarily mean it outputs a signal to the projector. When using a PC compatible laptop, a combination of function keys will enable/disable the external display. Usually, the combination of the 'Fn' key along with one of the 12 function keys gets the external display to come on or off. For example, laptops use Fn + F3, while Dell laptops use Fn + F8 key combinations to toggle through external display selections.

- Non-standard signal output from the computer

If the output signal from a notebook PC is not an industry standard, the projected image may not be displayed correctly. Should this happen, deactivate the notebook PC's LCD screen when the projector display is in use. Each notebook PC has a different way of deactivate/reactivate the local LCD screens as described in the previous step. Refer to your computer's documentation for detailed information.

- Image displayed is incorrect when using a Macintosh

When using a Macintosh with the projector, set the DIPswitch of the Mac adapter (not supplied with the projector) according to your resolution. After setting, restart your Macintosh for the changes to take affect.

For setting display modes other than those supported by your Macintosh and the projector, changing the DIP switch on a Mac adapter may bounce an image slightly or may display nothing. Should this happen, set the DIP switch to the 13" fixed mode and then restart your Macintosh. After that, restore the DIP switches to a displayable mode and then restart the Macintosh again.

NOTE: A Video Adapter cable manufactured by Apple Computer is needed for a PowerBook which does not have a mini D-Sub 15-pin connector.

- Mirroring on a PowerBook

* When using the projector with a Macintosh PowerBook, output may not be set to 1024 x 768 unless "mirroring" is off on your PowerBook. Refer to owner's manual supplied with your Macintosh computer for mirroring.

- Folders or icons are hidden on the Macintosh screen

Folders or icons may not be seen on the screen. Should this happen, select [View] ->[Arrange] from the Apple menu and arrange icons.

8 Troubleshooting Check List

Before contacting your dealer or service personnel, check the following list to be sure repairs are needed also by referring to the “Troubleshooting” section in your user’s manual. This checklist below will help us solve your problem more efficiently.

* Print the following pages.

Frequency of occurrence always sometimes (How often? _____) other (_____)

Power

- No power (POWER indicator does not light green) See also “Status Indicator (STATUS)”.
 - Power cable’s plug is fully inserted into the wall outlet.
 - Main power switch is pressed to the ON position.
 - Lamp cover is installed correctly .
 - Lamp Hour Meter (lamp operation hours) was cleared after lamp replacement.
 - No power even though you press and hold the POWER button for a minimum of 2 seconds.
- Shut down during operation.
 - Power cable’s plug is fully inserted into the wall outlet.
 - Lamp cover is installed correctly .
 - Power Management is turned off (only models with the Power Management function).
 - Sleep Timer is turned off (only models with the Sleep Timer function).

Video and Audio

- No image is displayed from your PC or video equipment to the projector.
 - Still no image even though you connect the projector to the PC first, then start the PC.
 - Enabling your notebook PC’s signal output to the projector.
 - *A combination of function keys will enable/disable the external display. Usually, the combination of the “Fn” key along with one of the 12 function keys turns the external display on or off.*
 - No image (blue background, logo, no display).
 - Still no image even though you press the AUTO ADJUST button.
 - Still no image even though you carry out “Reset” in the projector’s menu.
 - Signal cable’s plug is fully inserted into the input connector
 - A message appears on the screen.
(_____)
 - The source connected to the projector is active and available.
 - Still no image even though you adjust the brightness and/or the contrast.
 - Input source’s resolution and frequency are supported by the projector.
- Image is too dark.
 - Remains unchanged even though you adjust the brightness and/or the contrast.
- Image is distorted.
 - Image appears to be trapezoidal (unchanged even though you carry out the “Keystone” or “3D Reform” adjustment).
- Parts of the image are lost.
 - Still unchanged even though you press the AUTO ADJUST button.
 - Still unchanged even though you carry out “Reset” in the projector’s menu.
- Image is shifted in the vertical or horizontal direction.
 - Horizontal and vertical positions are correctly adjusted on a computer signal.
 - Input source’s resolution and frequency are supported by the projector.
 - Some pixels are lost.
- Image is flickering.
 - Still unchanged even though you press the AUTO ADJUST button.
 - Still unchanged even though you carry out “Reset” in the projector’s menu.
 - Image shows flickering or color drift on a computer signal.
- Image appears blurry or out of focus.
 - Still unchanged even though you checked the signal’s resolution on PC and changed it to projector’s native resolution.
 - Still unchanged even though you adjusted the focus.
- No sound.
 - Audio cable is correctly connected to the audio input of the projector.
 - Still unchanged even though you adjusted the volume level.
 - AUDIO OUT is connected to your audio equipment (only models with the AUDIO OUT connector).

Other

- Remote control does not work.
 - No obstacles between the sensor of the projector and the remote control.
 - Projector is placed near a fluorescent light that can disturb the infrared remote controls.
 - One or more remote sensors are enabled (only models with the Remote Sensor Selection function).
 - Batteries are new and are not reversed in installation.
 - If present on the remote control, projector selector switch is not used.
- Buttons on the projector cabinet do not work (only models with the Key Lock function).
 - Cabinet Button Lock is not turned on or is disabled in the menu.
 - Still unchanged even though you press and hold the EXIT button for a minimum of 10 seconds.

In the space below please describe your problem in detail.

Information on application and environment where your projector is used

Projector

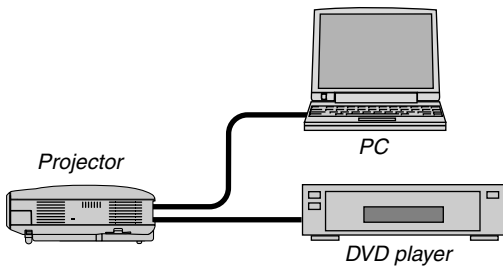
Model number:
Serial No.:
Date of purchase:
Lamp operating time (hours):
Lamp Mode: Normal Eco
Information on input signal:
Horizontal synch frequency [] kHz
Vertical synch frequency [] Hz
Synch polarity H (+) (-)
 V (+) (-)
Synch type Separate Composite
 Sync on Green
STATUS Indicator:
Steady light Orange Green
Flashing light [] cycles
Remote control model number:

Installation environment

Screen size: inch
Screen type: White matte Beads Polarization
 Wide angle High contrast
Throw distance: feet/inch/m
Orientation: Ceiling mount Desktop
Power outlet connection:
 Connected directly to wall outlet
 Connected to power cord extender or other (the number of connected equipment _____)
 Connected to a power cord reel or other (the number of connected equipment _____)

Computer

Manufacturer:
Model number:
Notebook PC / Desktop
Native resolution:
Refresh rate:
Video adapter:
Other:



Signal cable

standard or other manufacturer's cable?
Model number: Length: inch/m
Distribution amplifier
Model number:
Switcher
Model number:
Adapter
Model number:

Video equipment

VCR, DVD player, Video camera, Video game or other
Manufacturer:
Model number:

② Specifications

This section provides technical information about the 8761A/8760A Projector's performance.

Model Number	8761A/8760A
Optical	
DMD™	Single Chip Digital Micromirror Device (DMD™)
Resolution	1024 × 768 pixels* up to UXGA with Advanced AccuBlend
Lens	Manual zoom and focus: 8761A: F2.1 - 2.3 f=28.2mm - 33.6mm 8760A: F2.2 - 2.5 f=22.1mm - 26.5mm
Lamp	220 W DC standard
Image Size	30 inches - 500 inches (0.8 m - 12.7 m) diagonal
Projection Distance	8761A : 3.8ft - 80.7ft / 1.20m - 24.5m 8760A : 2.95ft - 62.3ft / 0.90m - 19.1m
Projection Angle	8761A : 14.8°-15.4°(wide) / 12.3°-12.7°(tele) 8760A : 18.5°-19.4°(wide) / 15.6°-16.2°(tele)
Electrical	
Inputs	2 RGB (Mini D-Sub 15p), 1 S-Video (Mini DIN 4p), 1 Video, 1 PC Card, 1 Stereo Mini Audio, 1 (L/R) RCA Audio, 1 PC Control (Mini DIN 8p)
Outputs	1 RGB (Mini D-Sub 15p), 1 Stereo Mini Audio
USB Port	1 A Type
LAN Port	RJ-45
Video Compatibility	NTSC, NTSC4.43, PAL, PAL-60, PAL-N, PAL-M, SECAM, 1080i, 720p, 576p, 576i, 480p, 480i (w/optional cable)
Scan Rate	Horizontal: 15 kHz to 100 kHz (RGB: 24 kHz or over) Vertical: 48 Hz to 120 Hz
Video Bandwidth	RGB: 100 MHz (-3dB)
Pixel Clock Freq	Less than 135 MHz
Color Reproduction	16.7 million colors simultaneously, Full color
Horizontal Resolution	NTSC / NTSC4.43/PAL / YCbCr: 540 TV lines SECAM: 300 TV lines RGB: 1024 dots (H) × 768 dots (V)
External Control	RS232, IR, LAN, USB
Sync Compatibility	Separate Sync / Composite Sync / Sync on G
Built-in Speakers	2W × 1 (monaural)
Power Requirement	100 - 240V AC, 50/60Hz
Input Current	3.1 - 1.4A
Power Consumption	290W in Lamp Normal mode 240W in Lamp Eco mode 12W in Standby mode

* Effective pixels are more than 99.99%.

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Audio Visual Products

DUKANE

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