RICOH

# Y033/Y034/Y036
# Service Training

## Soleil-PJ2

Slide 1

Version 1.0

**This training course provides service technician training for the Soleil-PJ series.**


**This section provides an overview of the machine, and the options that can be installed.**

## Changes from the predecessor model

- Brightness of the lamp increased from 2500lm to 3300lm.
- Position of the intake fan changed from the left side of the unit to the bottom of the unit.
- New speaker system (DiMAGIC) with 3 sound modes:
  - Normal mode
  - Music mode
  - Narration mode
- Supports wall/ceiling mount.
- Layout of the connection ports was changed and a new audio terminal was added.
- Optics engine needs to be removed to replace the fan.

* See the following slide for illustrations.

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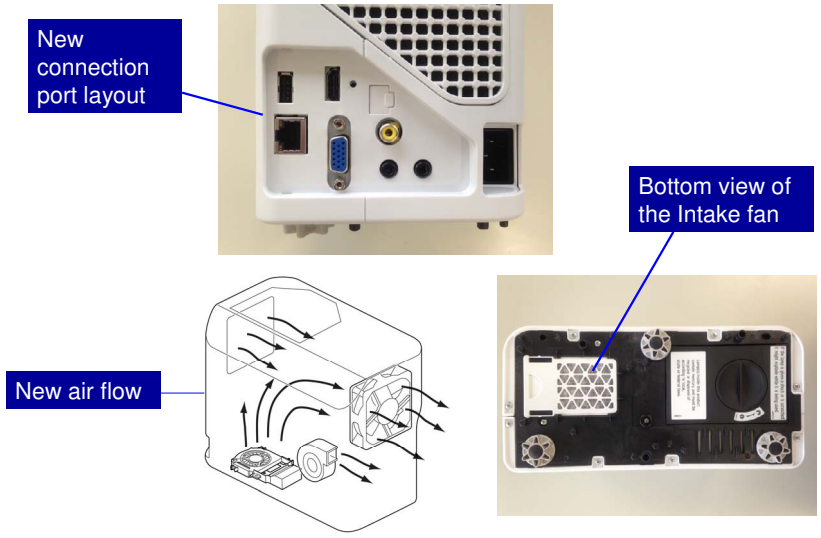
**No additional notes**

# Changes from the predecessor model




**No additional notes**


**This section provides an overview of the machine, and the options that can be installed.**

# What Models are there in the Series?

- **Soleil-PJ2a (Y033): PJ WX 4141**
  - 3300 lumens, WXGA resolution
- **Soleil-PJ2b (Y034): PJ WX 4141 N**
  - 3300 lumens, WXGA resolution, network capability
- **Soliel-PJ2d (Y036): PJ WX 4141 NI**
  - 3300 lumens, WXGA resolution, network and interactive capabilities
- **These are DLP projectors.**
- **These are 'very short-throw' models, for use in a tight space.**
  - 31.7 cm from the wall for 80-inch display
  - 18.8 cm from the wall for 48-inch display
- **The Y033 cannot be used as a network projector.**
  - This model does not work with 'Network Utility', 'Projector Management Utility', or @Remote.

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**No additional notes**

# Main Specifications

## Comparison with the Predecessor Model

| | Solel-PJ1a | Soleil-PJ1b | Soleil-PJ2a Y033 (PJWX4141) | Soleil-PJ2b Y034 (PJWX4141N) | Soleil-PJ2d Y036 (PJWX4141NI) |
|---|---|---|---|---|---|
| Type | DLP | | | | |
| Brightness | 2500 lm | | 3300 lm | | |
| Lamp type | High-pressure mercury lamp (Standard mode: 225 W, Eco mode: 170 W) | | High-pressure mercury lamp (Standard mode: 250 W, Eco mode: 170 W) | | |
| Resolution | WXGA | | | | |
| Dimensions (W × D × H) | 257 × 144 × 221 | | | | |
| Weight | Less than 3kg | 3.0 kg (6.7 lbs) | | | |
| Max. Power Consumption | 291W | 300W | 312W | | |
| Speaker | 2W x 1 | | | | |
| Wired LAN | No | Yes | No | Yes | |
| Wireless LAN | No | Yes | No | Yes | |
| PJLink | No | Yes | No | Yes | |
| @Remote | No | Yes | No | Yes | |
| USB | Service Use Only | Service Use, PC-Free Presentation Use | Service Use Only | Service Use, PC-Free Presentation Use | |
| HDMI | Yes | | | | |

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### Soleil-PJ2b / Soleil-PJ2d

- Additional USB port: Users can use this to display JPEG or MPEG2 files without PC or network connection.
- LAN: For use with PJLInk. Users can also use the LAN to project files that are stored on a PC or server on the network. @Remote will also be available.
- To enable projection of a file from a PC over a network, a network utility can be downloaded to the PC or installed from the CD that comes with the projector. No lengthy installation procedure is required.

## Features

- This product can be installed by users.
- This product is designed for user maintenance. Regular on-site maintenance is not needed.
- There is no display panel, but LEDs show the symptoms for troubleshooting (blinking/lit, number of times the LEDs blink, etc).
- A service mode is available.

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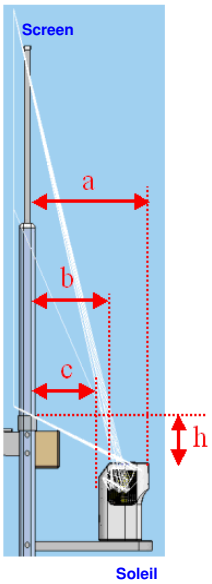
**No additional notes**

# Projection Distance




| | a | b | c | h |
|---|---|---|---|---|
| 48 inch | 261mm | 188mm | 117mm | 91mm |
| 60 inch | 310mm | 235mm | 166mm | 115mm |
| 80 inch | 393mm | 317mm | 249mm | 155mm |

a. From the screen to the front of the body
b. From the screen to the optical outlet
c. From the screen to the back of the body
h. From the top face of the body to the bottom of the projected image

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**No additional notes**

## Network Feature

- **Easy network setup**
  - For network projection, Soleil-PJ2 has an installation-free network utility. Just download the file from the Ricoh website to your PC or execute the program on the attached CD, and you are ready to project images.


Execute program on PC

No installation needed

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**No additional notes**

## Network Features

- **@Remote capability**
  - Remaining Lamp hour information
  - Power and status reporting
- **Projection server function**
  - JPEG files stored on a web server can be projected without a PC. Files can be uploaded onto the web server using the supplied software: JPEG conversion tool type A.

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**No additional notes**

## New Options - Interactive Function

- Soleil-PJ2d contains an electronic pen, adapters for the projector and computer, and a drawing software as accessories.

**Electronic pen**

**Adapters**

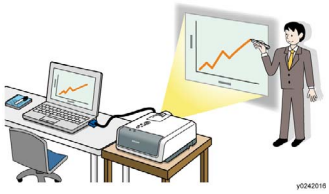
For Projector (Cartridge)

For PC (USB dongle)

**Drawing software**

* Support language :English/Chinese/ Japanese

The user can use the pen to manipulate and perform operations on the projected image and save the changes using the drawing software. Although the electronic pen can be used in place of a mouse to operate the PC projection screen, it is difficult to obtain the same level of positioning accuracy. The user should use a mouse connected to the PC if required.



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**The characteristics of the Interactive Tool Kit are as follows.**

**1.It allows you to interact on any surface**

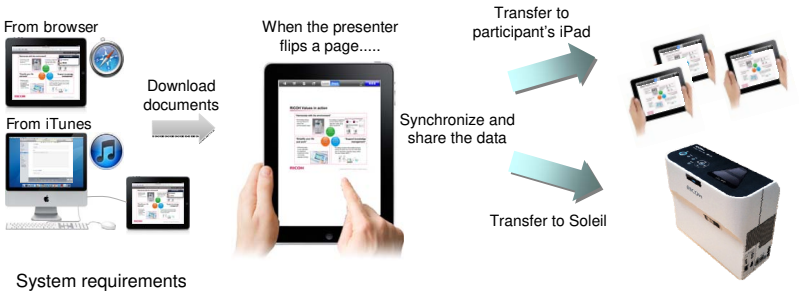
**2.It requires no calibration**

**3.The pen works from a distance or on the projected image surface**

**It allows flexible installation and interaction with large images**

# Interactivity with Other Digital Devices
## Ricoh TAMAGO Presenter for iPad

Ricoh TAMAGO Presenter was developed as free trial software.




System requirements

| | |
|---|---|
| **iPad version** | **Apple iPad/iPad2 (3G+Wi-Fi model, Wi-Fi model) / OS version: iOS 4.3.4** |
| **Wireless connection** | **Wireless LAN (Wi-Fi) IEEE 802.11a/b/g/n *In the same broadband area** |
| **Projector model** | **Soleil PJ1b (PJ WX4130N), Regulus (PJ X3241N, PJ WX3231N)** |
| **Connectivity** | **Connection with less than 10 units in a meeting is preferable** |

Free download from the iTunes store
*You need to install iTunes on your PC before searching for the Ricoh Smart presenter.
Operating instructions → http://www.ricoh.co.jp/software/other/rtp/

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**No additional notes**

## Low Energy Consumption

- 3,500 hour lamp life and lower power consumption in Eco mode
- 0.5W power consumption in standby mode

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- Note that in the service mode menu, Eco Mode is referred to as ‘Low Mode’.

# Consumables and Options

- **Replacement lamp (Y216)**
  - Mercury lamp
  - Life: 3500 hours (standard mode), 5000 hours (Eco mode)
    - » The lamp is regarded as having reached its yield when its maximum brightness has decreased to 50% of the original level.
    - » When this occurs, a message to this effect is projected.
- **Fan filter (Y217)**
- **3D glasses (Y107)**
  - DLP link is a technology that allows DLP projectors to transmit 3D data.
  - DLP link technology sends data seamlessly to the glasses between frames to create a 3D image.

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- For more about DLP link: http://www.dlp.com/projector/dlp-innovations/dlp-link.aspx

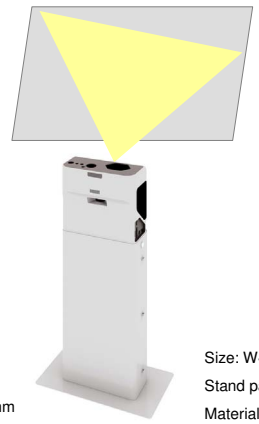
# Cabinet and Stand

Please note that these options will be locally procured or purchased from 3rd parties.

■ **Simple cabinet**

Size: W400xD404xH605 – 805mm, Top face: W350xD404mm
Material: Steel, Melamine coating
Elevating (between 200mm) with handle
Soleil can be fixed in the pocket. (W265xD404mm)

■ **Smart stand**



Size: W400xD230xH450mm
Stand part: W261xD148mm
Material: Steel, Powder coating
Supplied with screws x 2

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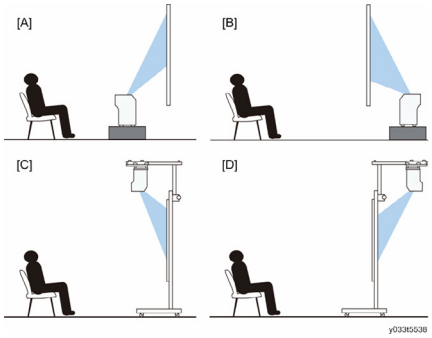
**No additional notes**

# Installation Patterns

| | |
|---|---|
| [A] Standard | The projector is placed in front of a screen onto which the images are projected. |
| [B] Rear | The projector is placed behind the screen onto which the images are projected. |
| [C] Ceiling | The projector is mounted on the ceiling in front of a screen onto which the images are projected. |
| [D] Rear Ceiling | The projector is mounted on the ceiling behind a screen onto which the images are projected. |

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**No additional notes**

## Reliability Information

- **Average monthly projection time: 58.3 hrs/month**
  - 2.65 hrs/day x 22 working days/month
- **Failure Rate**
  - 1st year: 0.00269 cases/unit/month
  - 2nd year: 0.0032 cases/unit/month
  - 3rd year: 0.00406 cases/unit/month
  - The failure rate of a projector increases with its total power-up time. This is due in part to the failure characteristics of optical engines in projectors.
- **Lamp Life**
  - Normal Mode: 3,500 hrs
  - Eco Mode: 5,000 hrs

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**No additional notes**

## Lamp Near-end/End Alerts

- **There is no near-end alert.**
  - The lamp end alert occurs when the machine calculates that the life time has expired.
  - If used in Normal Mode only, the alert appears after 3,500 hrs projection time
  - If used in Eco Mode only, the alert appears after 5,000 hrs projection time
  - If the user switches between modes, the machine calculates when to display the alert based on how long the lamp was used in each mode.

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**No additional notes**

## Disposal of Broken Lamps

- **Projector lamps normally contain mercury vapour.**
- **These lamps can rupture due to impact or being used longer than their life expectancy.**
  - The time that the breakage will occur differs widely for each lamp and its circumstances of use.
- **These lamps must be disposed of in accordance with local environmental regulations.**

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**No additional notes**

## Operation at High Altitude

- In a high-altitude location (higher than 1500 m above sea level) where air is thin, cooling efficiency is reduced so use the projector with [High Altitude Mode] turned [On].

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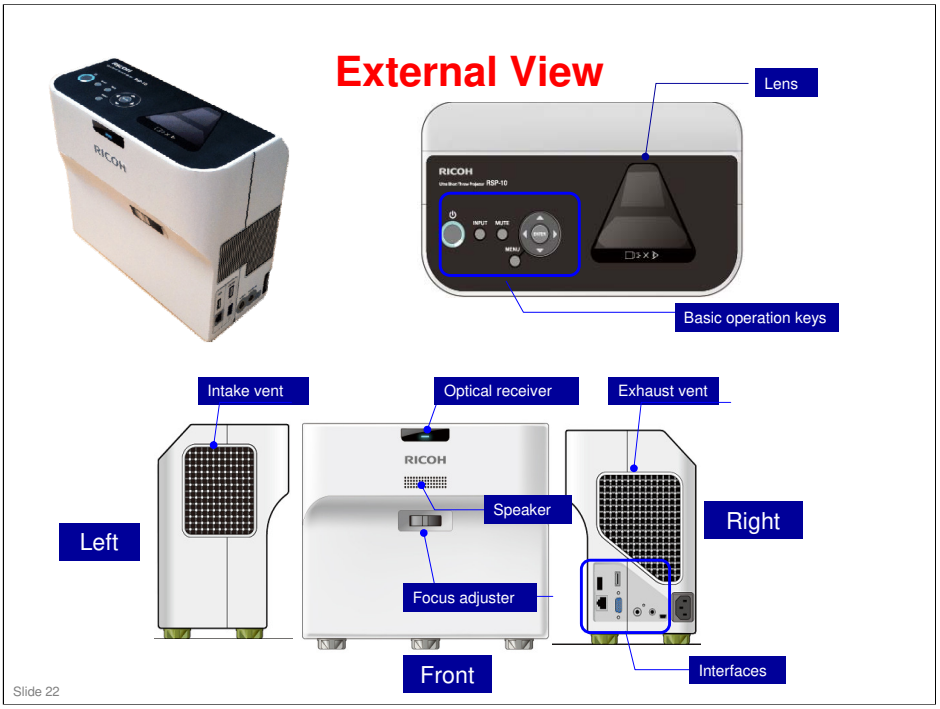
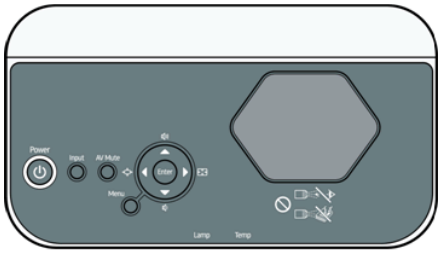
**No additional notes**




- Optical receiver: For the remote controller

# Operation Panel

- The three LEDs are used to show symptoms for troubleshooting.




Remote Controller

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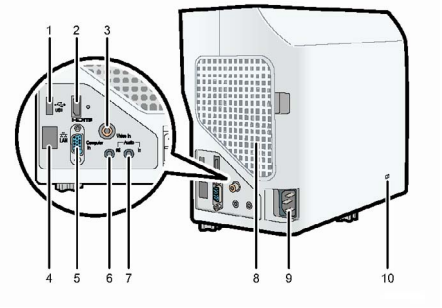
**No additional notes**

# Connection Ports




1. USB port: For connecting a USB memory device or USB device cable. Accepts JPEG and MPEG2 file formats.
2. HDMI port: For connecting an HDMI (High-Definition Multimedia Interface) cable.
3. Video In port: For inputting image signals from a video player.
4. LAN port (Y012 only): For connecting an Ethernet cable.
5. Computer In port (Y/Pb/Pr): For inputting RGB signals from a computer or component image signals (Y/Pb/Pr) from a video player.
6. Audio In port: For inputting audio signals from a computer or video player.
7. Audio Out port: For outputting audio signals to an external speaker.
8. Intake vents: For circulating air from the outside to cool the projector.
9. AC In socket: For connecting the power cord provided with the projector.
10. Security slot (Kensington slot): For connecting an anti-theft cable.

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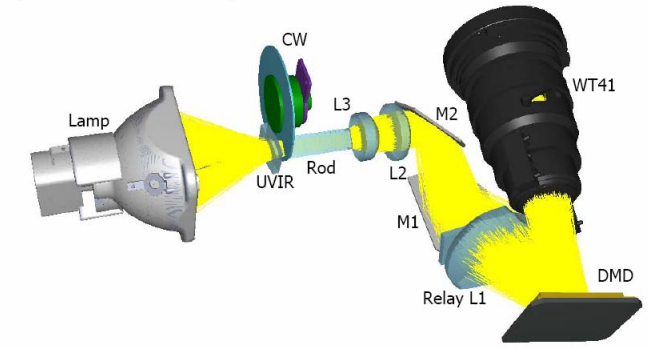
**No additional notes**

## Optical Components: DLP Projectors




- **The DMD chip is the central part of this type of projector.**
  - In this model, it is called the DLP chip, not the DMD chip.
- **A DMD chip consists of many small pixel-sized mirrors laid out on a semi-conductor chip. Light shone on the DMD chip is reflected by all these tiny mirrors. (For a chip with 1024 x 768 resolution, there are 786,432 small mirrors.)**
- **Light is shone onto the chip through a fast-spinning color wheel (CW in the diagram) that has a has cyan, yellow, and white sectors in addition to the usual red, green, and blue sector.**
- **This light is reflected off the chip and out through a lens onto a screen.**

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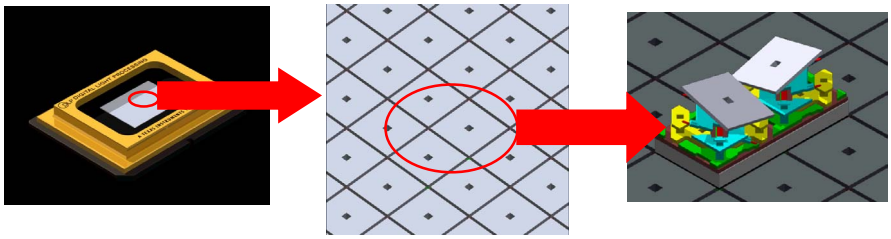
- This is a general description. The Soleil-PJ2 does not look exactly like this. See later in this presentation for the components of the Soleil-PJ2.
- Lamp: Light source
- UV-IR Filter: Lets visible light through (wavelengths between 380~780nm) and prevents UV and IR damage to other optical parts.
- CW (Color wheel): The wheel has a cyan, yellow, and white segment in addition to the usual red, green, and blue segment. The wheel rotates to provide red, green, and blue light (the color of the output beam changes from red, to green to blue)
- Integrating Rod: Gives the light a uniform luminous flux.
- L3: Condensing lens. Condenses divergent light.
- L2: Condensing lens. Works with L3 to condense divergent light.
- M1: Mirror 1. Changes the light direction.
- M2: Mirror 2. Changes the light direction.
- Relay L1: Condenses and magnifies divergent light before it goes to the DMD.
- DMD Chip: Contains micro mirrors to generate the image
- Projection Lens (WT41 in the diagram): Projects the image onto the screen.

## DLP Chip

- R, G, and B signals from the image generating device are sent to the DLP chip, and timed so that the red signal arrives at the same time that the red part of the wheel is in the beam path, and similarly for the green and blue signals.
- The DLP chip generates the R, G, and B images by re-positioning the micromirrors using micromachined hinges to make different pixelated images for each colour (meaning that each micromirror has an ON and an OFF position).
- For SVGA resolution, the mirrors are 16-micrometer squares, with a gap of about 0.8 micrometers between each mirror.



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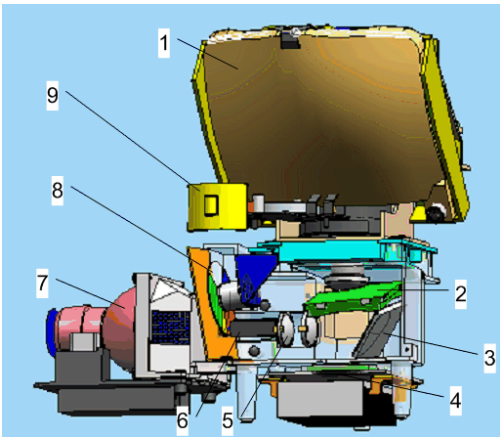
- The mirrors can switch over every 15 microseconds, so moving images can be projected.

# Optical Components of this Series




1. Free-form surface mirror: Allows this to be an ultra short throw projector
2. Concave Mirror
3. Cylinder Mirror
4. DMD (Digital Microo-mirror Device)
5. Relay lens
6. Light Pipe (also known as the Rod)
7. Mercury Lamp
8. Color Wheel
9. Focus Lever

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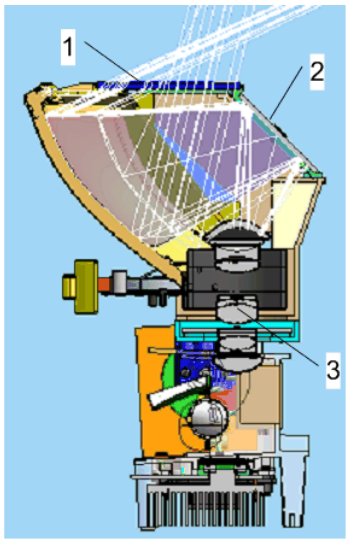
**No additional notes**

## Optical Components of this Series




1. Dust Shield Glass
2. Mirror
3. Projection Lens

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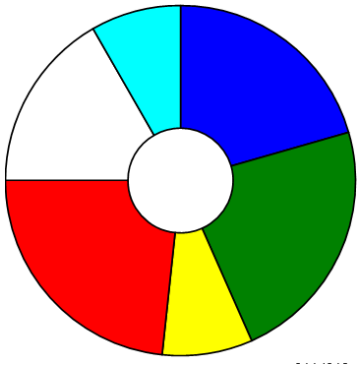
**No additional notes**

## Color Wheel



- In this series, the color wheel has cyan, yellow, and white sectors in addition to the usual red, green, and blue.

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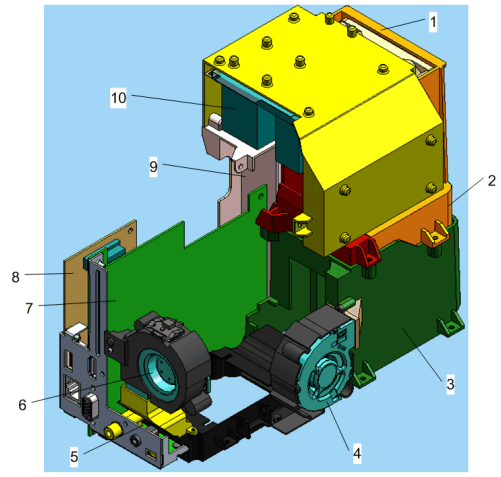
**No additional notes**

# Component Layout




1. Exhaust fan
2. Exhaust duct
3. Lamp housing
4. Lamp fan
5. Interface board
6. Intake fan (for cooling the DMD)
7. Main board
8. Network board (for Y034/Y036)
9. Lamp ballast
10. PSU

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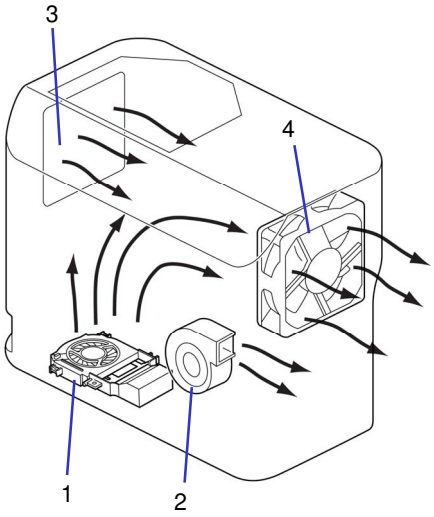
**No additional notes**

## Air Flow




1. Intake fan
2. Lamp fan
3. Intake vent
4. Exhaust fan

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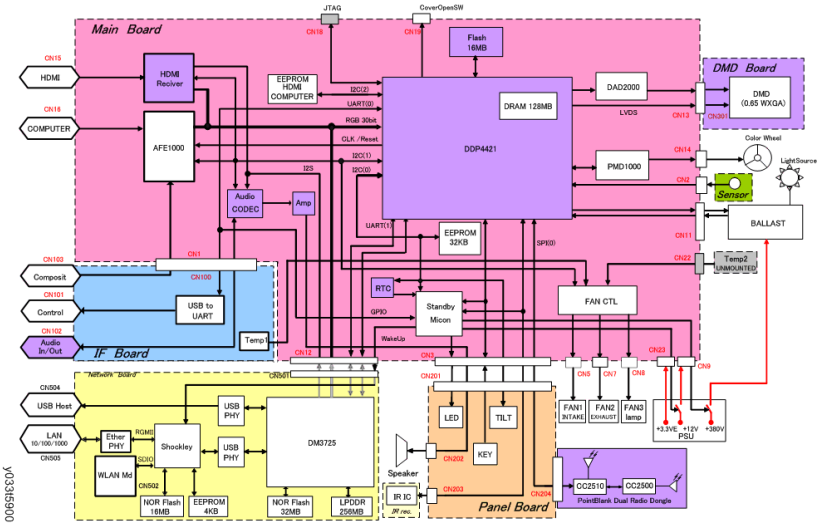
**No additional notes**

# System Block Diagram

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- Network board: Y034/Y036

## Boards

- **Main board (MB): Power/signal control and processing**
- **DMD board (DMD BD): Image signal processing and DMD control**
- **Network board (for Y034/Y036): Network connection**
- **Lamp driver (Ballast): Starts the lamp**
  - When the lamp is being lit, the voltage is over 10,000V.

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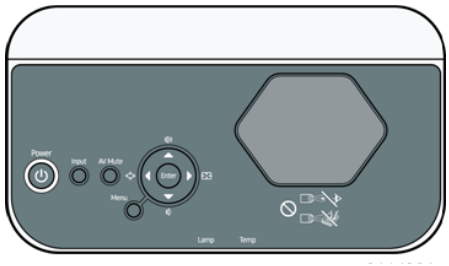
**No additional notes**


**This section explains the basic points about servicing the machine.**

## Entering Service Mode



- **Hold down “Enter" and "Menu" simultaneously for 2 seconds.**
- **Then press the left button, then the down button, then the up button.**
- **Then press and hold the [Enter] button on the projector for longer than 2 seconds.**
- **When the projector enters the Service Mode, the buzzer beeps for 3 seconds.**
  - If it doesn’t beep, repeat from the beginning.
- **The projector remains in this mode until you disconnect the power cord.**

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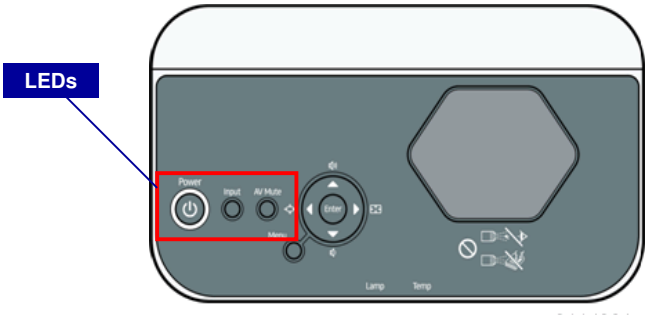
### Service Mode features

- Service status display
- Keystone calibration
- Sub contrast adjustment
- Color wheel index delay adjustment
- Fan control
- Test pattern projection

# LED Display




- **The status of the three LEDs on the front panel indicate the machine's condition.**
  - See the table 'LED Display' in the Troubleshooting section of the service manual.

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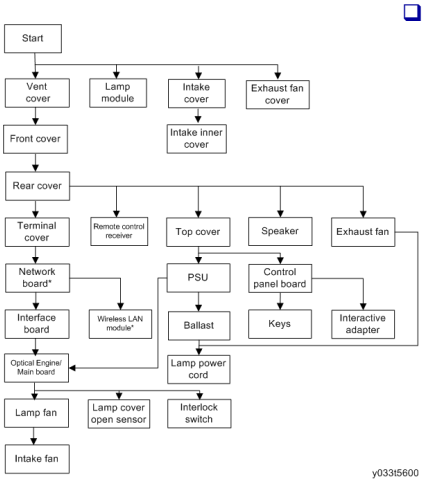
**No additional notes**


- This section shows the main points about replacing parts, and how to calibrate the machine after installing new parts.

# Replacement Flow Chart

- **This shows which parts must be removed to access the various components of the machine.**

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- See the service manual for details of the procedures. The next few slides will cover the main points.

## Adjustments Required after Replacement

| | Keystone | Sub Contrast | Color Wheel Index Delay |
|---|---|---|---|
| Main Board | Yes | Yes | Yes |
| Operation Panel Board | Yes | No | No |
| Optical Engine | Yes | No | Yes |

- The above table shows which adjustments are needed after replacing the Main Board or Optics Engine.
- The adjustments are in the service manual.

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**Keystone**

- When you project an image onto a surface at an angle (because the projector is not quite centered on the screen), the image will be larger at the top than at the bottom (in the case when the projector is on a table pointing up at the screen).
- Modern projectors correct for this digitally, but calibration is needed.

**Sub-contrast**

- Inputs from both computer interfaces must be calibrated.

**VCOM, Gamma, Shading**

- These require the DPJ Adjustment Tool.

## Replacing the Lamp

- To replace the lamp, unplug the power cord and then wait for 60 minutes.

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**No additional notes**

## Replacing the Main Board

- **You must enter the color wheel index delay after installing the new board.**
  - Input the last 3 digits of the value printed on the label attached to the optics engine unit.
- **Also you must do keystone calibration and sub-contrast adjustment.**
- **These procedures are all explained in the following section of the service manual:**
  - Replacement and Adjustment - Electrical Adjustment - Projector Setup

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**No additional notes**

# Replacing the Optics Engine

- **After replacing the optics section, input the value of color wheel index delay that is specific to the new unit.**
  - The value is printed on the label attached to the unit.
  - You must input the last three digits on the label.
  - Make a note of these before you install the new optics engine.
- **When handling the optics engine, hold the metal parts shown in the figure.**
- **When installing the optics engine, make sure the cables are not trapped under the leg of the optics engine.**

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**No additional notes**

# Optics Engines

- **These are not the same for each model.**
  - The lenses are different, for a start.
- **Make sure that you have the correct assembly for the model that you are working on.**
- **The optics engine contains the DMD board, DMD chip, lens, and rod.**
- **These cannot be replaced as individual parts.**

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**No additional notes**

## Equipment Required for the Adjustments

- Personal computer (Windows PC, using Windows XP, Vista, 7, or 8)
- Cables: RGB Cable and Control (USB-A to Mini-B) Cable
- Protractor: Used to measure angles for the Keystone Calibration

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**No additional notes**

## Before you Start the Adjustments

- **Copy the current settings data to EEPROM: Press the [Up], [Down], [Left] and [Right] buttons simultaneously.**
- **Enter service mode.**
  - See the service manual for the procedure.
- **The buzzer beeps for 3 seconds if you enter service mode successfully.**
- **To exit service mode, disconnect the power cord.**

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- The EEPROM is a backup area to hold the old settings if the adjustments do not go well.

## Adjustments

- **Do the necessary adjustments as described in the service manual.**
  - Keystone Calibration
  - Sub Contrast
  - Color Wheel Index Delay

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**No additional notes**


**This section explains the basic points about updating the firmware.**

## Preparation

- **Before you begin firmware update, the SiLabs driver software must be installed on your computer.**

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- See the service manual for details.

## Procedure

- Unplug the projector power cord.
- Connect a USB cable to the control port, and to your computer.
- While holding down the Input and Mute buttons, plug in the power cord.
- Start DLP_FlashLoader on your computer.
- Click [browse…] and select the firmware data (*.img file).
- Click [Start Download].
- When update is complete, the projector beeps for 3 seconds.

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- See the service manual for details.

## Alternative Procedure for Y034/Y036

- Copy the firmware data onto a USB memory device.
- Check the power cord of the projector is disconnected.
- Connect the USB memory device to the projector.
- While holding down the [Power] and [Input] buttons, plug in the power cord.
- After checking the firmware data, the projector starts writing the firmware.
  - When the writing process starts, the power button, the lamp indicator and the temperature indicator flash sequentially.
- When the update is successfully completed, the [Power] button lights up blue and the lamp and temperature indicators light up red and the projector restarts in normal mode.

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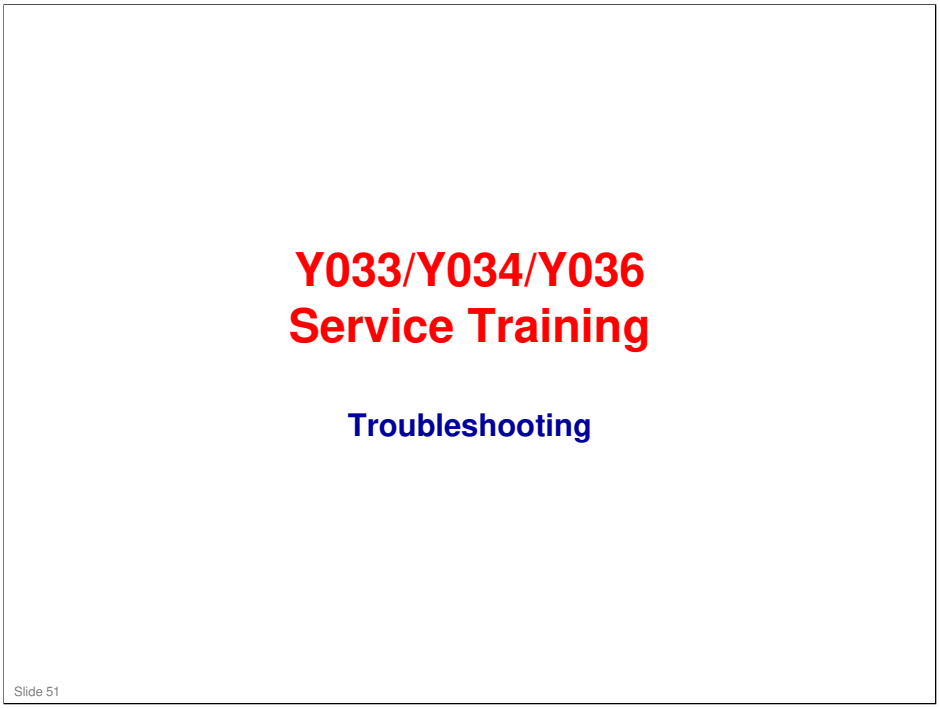
**No additional notes**




- For basic troubleshooting procedures, see the service manual.

## LED Display

- **The combination of LED indicators show if a problem has occurred.**
  - These are the Power, Input, and AV Mute indicators.

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**No additional notes**

## Symptom

- The Troubleshooting section of the service manual contains some notes on symptom troubleshooting.

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**No additional notes**


**No additional notes**