

SERVICE MANUAL



HD33

| Date | Revise Version | Description |
|------------|----------------|---------------|
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Preface

This manual is applied to HD33 projection system. The manual gives you a brief description of basic technical information to help in service and maintain the product. Your customers will appreciate the quick response time when you immediately identify problems that occur with our products. We expect your customers will appreciate the service that you offer them.

This manual is for technicians and people who have an electronic background. Please send the product back to the distributor for repairing and do not attempt to do anything that is complex or not mentioned in the troubleshooting.

Notice:

The information found in this manual is subject to change without prior notice. Any subsequent changes made to the data herein will be incorporated in future edition.

HD33 Service Manual

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Manual Version 1.0

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Introduction

1-1 Highlight

| No | Item | Description |
|----|--------------------------------|---|
| 1 | Dimensions (WxDxH) | • 379x313x122 mm |
| 2 | Power Supply | • Universal AC 100V-240V±10%, 50-60Hz |
| 3 | Power Consumption | <ul style="list-style-type: none"> • Normal:TYP 375W MAX 385W @110/220VAC • ECO:TYP 315W MAX 325W@110/220VAC • Standby:ECO Mode (< 0.5 W) |
| 4 | Keystone correction | • +/-5 degree |
| 5 | Throw ratio | • 1.5~1.8 (1080P) |
| 6 | Projection lens | • YM40 |
| 7 | Lamp life | Normal Mode: <ul style="list-style-type: none"> • 3000 Hours Standard @280W, 50% Survival Rate ECO Mode: <ul style="list-style-type: none"> • 4000 Hours Typical @230W, 50% Survival Rate |
| 8 | Lamp | • 280W Lamp (Osram E20.8) |
| 9 | DMD Chip&Number of active dots | <ul style="list-style-type: none"> • 0.65" 1080P • Number of active dots: 1080P |
| 10 | Color wheel | • 6 segments (R62G64B54R62G64B54) |
| 11 | System controller | • TI DDP 3021 |
| 12 | Video compatibility | <ul style="list-style-type: none"> • NTSC: M, 3.58MHz, 4.43MHz • PAL: B, D, G, H, I, M, N, 4.43MHz • SECAM: B, D, G, K, K1, L, 4.25/4.4MHz • SDTV: 480i/p, 576i/p, • HDTV: 720p(50/60Hz), 1080i(50/60Hz), 1080p(24/50/60Hz) • 3D Timing: HDMI1.4A/1.3 |
| 13 | Input signal spec | <ul style="list-style-type: none"> • VGA (D-Sub 15pin) x1 • HDMI x 2 (Version1.4A) • YPbPr (3 RCA) x 1 |
| 14 | Altitude&Temperature | <ul style="list-style-type: none"> • Operating: 0~2,500 ft 5°C~35°C 2,500~5,000 ft 5°C~30°C 5,000~10,000 ft 5°C~25°C |

1-2 Compatible Mode

Computer Compatibility

| Compatibility | Resolution | H-Sync [KHz] | V-Sync [Hz] | Digital | Analog |
|---------------|------------|--------------|-------------|---------|--------|
| PAL/SECAM | 720 x 400 | 31.5 | 70 | ○ | ○ |
| PAL/SECAM | 720 x 400 | 37.9 | 85 | ○ | ○ |
| PAL/SECAM | 720 x 576 | | 50 | ○ | ○ |
| VGA | 640 x 480 | 31.5 | 60 | ○ | ○ |
| VGA | 640 x 480 | | 67 | ○ | ○ |
| VGA | 640 x 480 | 37.9 | 72.8 | ○ | ○ |
| VGA | 640 x 480 | 37.5 | 75 | ○ | ○ |
| VGA | 640 x 480 | 43.3 | 85 | ○ | ○ |
| SVGA | 800 x 600 | 35.2 | 56.3 | ○ | ○ |
| SVGA | 800 x 600 | 37.9 | 60.3 | ○ | ○ |
| SVGA | 800 x 600 | 46.9 | 75 | ○ | ○ |
| SVGA | 800 x 600 | 48.1 | 72.2 | ○ | ○ |
| SVGA | 800 x 600 | 53.7 | 85.1 | ○ | ○ |
| SVGA | 832 x 624 | | 75 | ○ | ○ |
| XGA | 1024 x 768 | 48.4 | 60 | ○ | ○ |
| XGA | 1024 x 768 | 56.5 | 70.1 | ○ | ○ |
| XGA | 1024 x 768 | 60 | 75 | ○ | ○ |
| XGA | 1024 x 768 | 68.7 | 85 | ○ | ○ |
| XGA | 1024 x 768 | 68.7 | 120 | ○ | ○ |
| XGA | 1152 x 864 | | 75 | ○ | ○ |
| HD720 | 1280 x 720 | | 50 | ○ | ○ |
| HD720 | 1280 x 720 | | 60 | ○ | ○ |
| HD720 | 1280 x 720 | | 120 | ○ | ○ |
| WXGA | 1280 x 768 | 47.4 | 60 | ○ | ○ |
| WXGA | 1280 x 768 | | 75 | ○ | ○ |

| Compatibility | Resolution | H-Sync [KHz] | V-Sync [Hz] | Digital | Analog |
|---------------|--------------|--------------|-------------|---------|--------|
| WXGA | 1280 x 768 | | 85 | ○ | ○ |
| WXGA-800 | 1280 x 800 | | 60 | ○ | ○ |
| SXGA | 1280 x 1024 | 64 | 60 | ○ | ○ |
| SXGA | 1280 x 1024 | 80 | 75 | ○ | ○ |
| SXGA | 1280 x 1024 | 91.1 | 85 | ○ | ○ |
| SXGA+ | 1400 x 1050 | | 60 | ○ | — |
| UXGA | 1600 x 1200 | 75 | 60 | ○ | ○ |
| HD1080 | 1920 x 1080 | | 24 | ○ | ○ |
| HD1080 | 1920 x 1080 | | 50 | ○ | ○ |
| HD1080 | 1920 x 1080 | | 60 | ○ | ○ |
| WUXGA | 1920 x 1200 | | 60 | ○ | ○ |
| HDTV | 1920 x 1080i | | 50 | ○ | ○ |
| HDTV | 1920 x 1080i | | 60 | ○ | ○ |
| HDTV | 1920 x 1080p | | 24 | ○ | ○ |
| HDTV | 1920 x 1080p | | 50 | ○ | ○ |
| HDTV | 1920 x 1080p | | 60 | ○ | ○ |
| HDTV | 1280 x 720 | 45 | 60 | — | — |
| HDTV | 1280 x 720p | | 50 | ○ | ○ |
| HDTV | 1280 x 720p | | 60 | ○ | ○ |
| SDTV | 720 x 576 | 31.3 | 50 | — | — |
| SDTV | 720 x 576i | | 50 | ○ | ○ |
| SDTV | 720 x 576p | | 50 | ○ | ○ |
| SDTV | 720 x 480 | 31.5 | 60 | — | — |
| SDTV | 720 x 480i | | 60 | ○ | ○ |
| SDTV | 720 x 480p | | 60 | ○ | ○ |

Note: If the Computer Compatibility supportive signal is different from User's Manual, please refer to User's Manual.

Disassembly Process

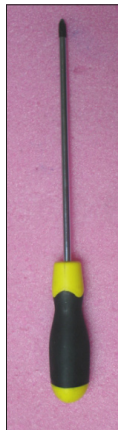
2-1 Equipment Needed & Product Overview

1. Screw Bit (+): 105
2. Screw Bit (+): 107
3. Screw Bit (-): 107
4. Hex Sleeves: 5 mm
5. Tweezers
6. Projector

** Before you start: This process is protective level II. Operators should wear electrostatic chains.*

** Note: - If you need to replace the main board, you have to record the lamp usage hour.*

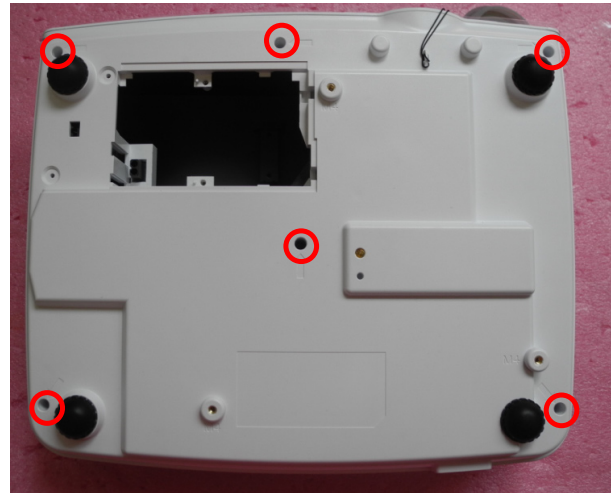
- Some related contents please refer to common SM chapter 2.



2-1 Repair notice

2-1-1 Disassemble Top Cover Module

1. Unscrew 6 screws (as red circle) from the Bottom Cover.



2. Press two sides of the projector and push them as the blue arrow.

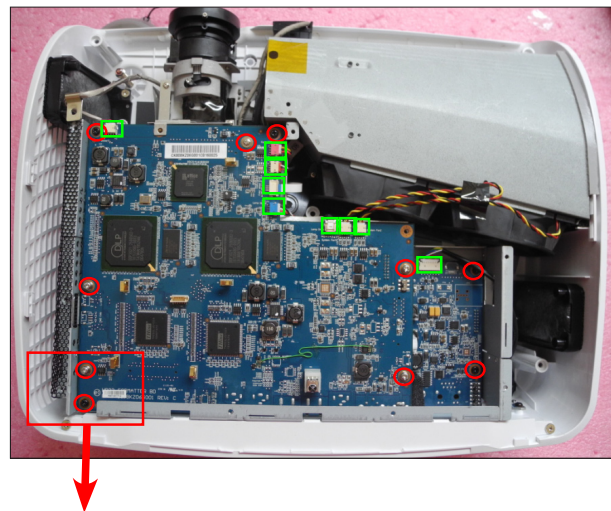
3. Remove the Top Cover Module.



2-1-2 Disassemble Main Board

1. Unscrew 11 screws (as red circle).

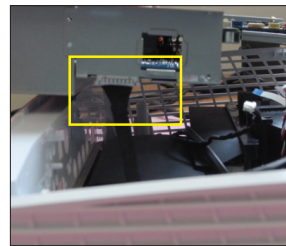
2. Unplug 9 connector (as green square).



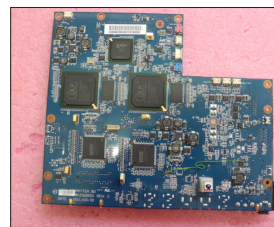
3. Unscrew 6 screws (as blue circle).



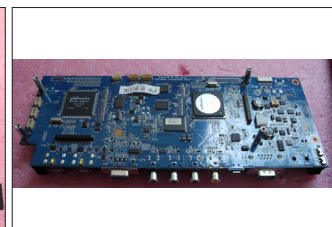
4. Unplug 1 connector (as yellow square).



5. Disassemble Main Board,Scaler Board and Main Board Shielding.



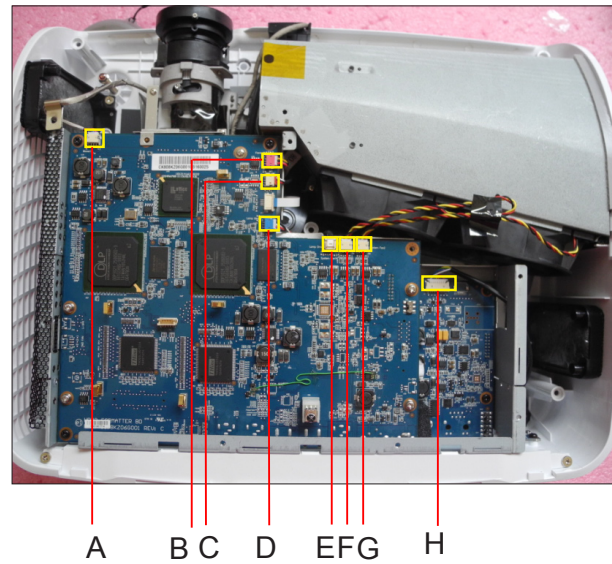
Main BD

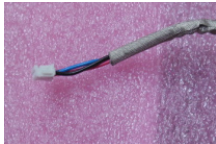






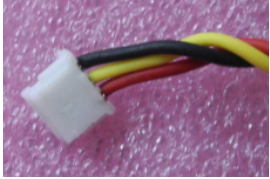
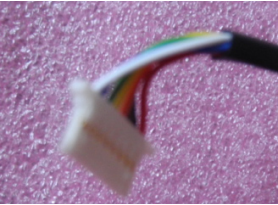
Formatter BD

Note: - Make sure cables plug into the correct ports when assembling the unit.

Please refer to the below table details of each connector on Main Board.



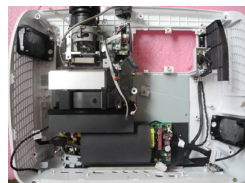
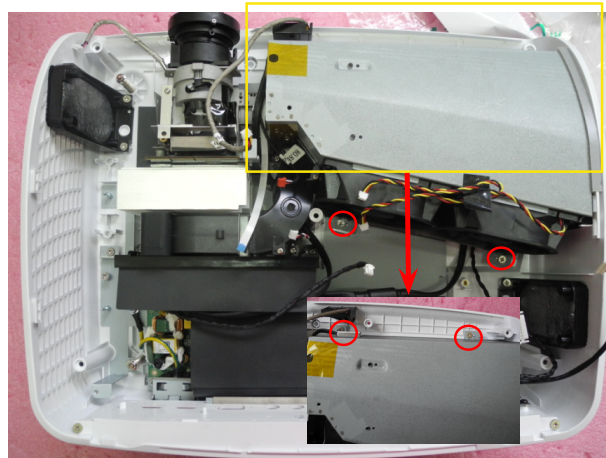
| Item | Male Connector on Main Board | The key feature | Figure |
|------|------------------------------|---|---|
| A | Blower | Compose of Black/ Blue/Red Wire and Gray tube(3 pin) |  |
| B | Front IR | Compose of Black/ Yellow/Red Wire and Gray tube(3 pin) |  |
| C | Photo Sensor BD | Compose of Black/ White/Red Wire, Red Connector and Black tube(3 pin) |  |
| D | Lamp Blower | Compose of Black/ White/Red Wire, White Connector (3 pin) |  |
| E | Lamp driver | Black wire tube (5 pin) |  |

| Item | Male Connector on Main Board | The key feature | Figure |
|------|--------------------------------|--|---|
| F&G | System Fan | Compose of Red/Yellow/Black Wire (3 pin) |  |
| H | Wire Power Board to Main Board | Black wire tube (8 pin) |  |

2-1-3 Disassemble System Fan Module

1. Unscrew 4 screws (as red circle) to disassemble the System Fan Module.

Note: You should disassemble the System Fan Module first before the Engine Module disassembly.



2-2 Rod Adjustment

1. Environment Adjustment

- The distance between the engine and the screen is 1.8M.
- This process should be done at a dark environment (under 10 Lux).

2. Procedure Adjustment

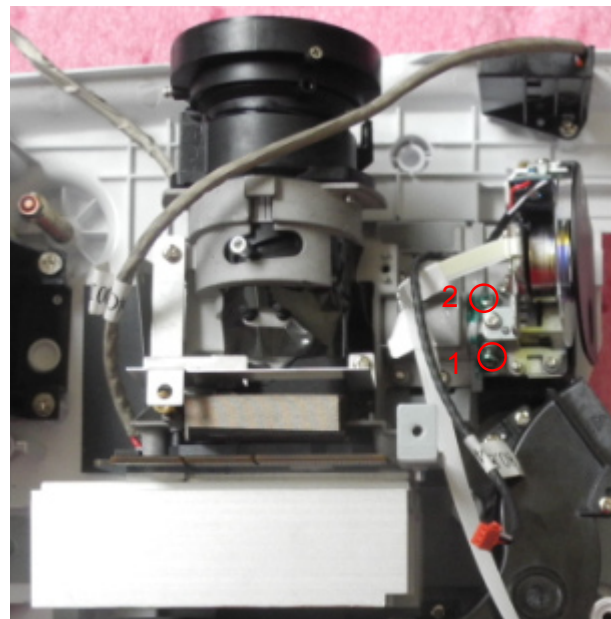
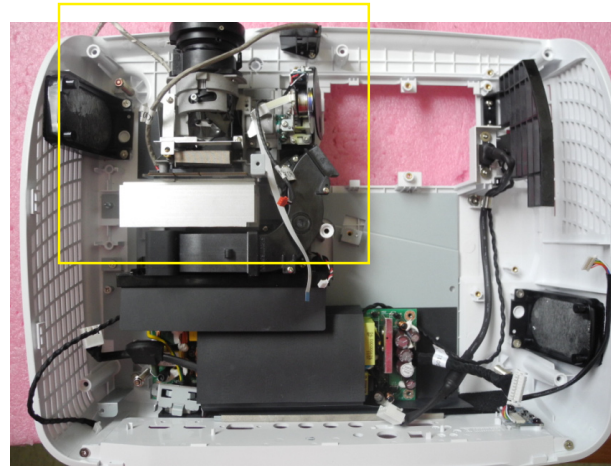
- Change the screen to "white screen".
- Adjust the screws by using the rod on the engine module to readjust the image.
(*"screw 1"* should be adjusted first, and then *"screw 2"*. Adjust until the yellowish or bluish parts disappeared.)

3. Abnormal image inspection

- It should not have any abnormal color at the rim of the image by estimating through the eyes.

Note: - To avoid over adjusting the rod.

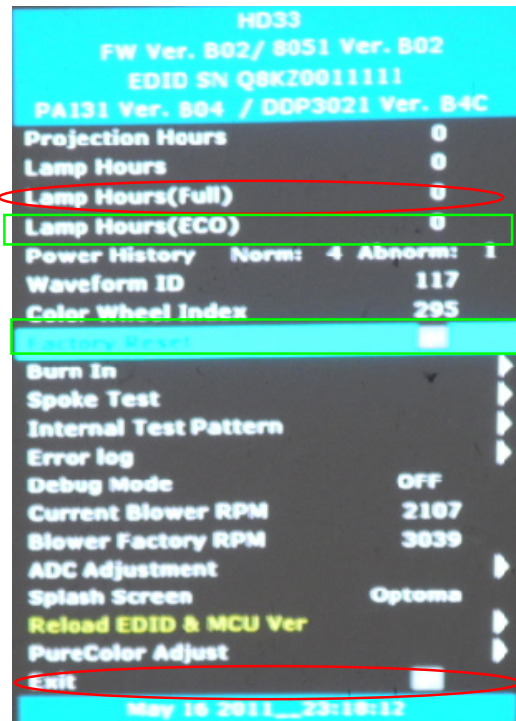
- *After the operation, please use the glue to fix the screws.*



2-3 Re-write Lamp Usage Hour

1. Get into service mode
 - Press (power off→left→left→up) to get into service mode.
2. Re-write Lamp Hours(Full)
 - Use “up” or “down” buttons to select “Exit”,then use “left” or “right” buttons to re-write the lamp hours(Full).
3. Re-write Lamp Hours(ECO)
 - Use “up” or “down” buttons to select “Factory reset”,then use “left” or “right” buttons to re-write the lamp hour(ECO).
4. Choose “Exit”, press “Enter” to exit

*Note: left key = decrease lamp hour
right key =increase lamp hour*



2-5 Repair Action

| Repair action | Change parts | | | | | | | Software | | Description page |
|-----------------------------|--------------|-------------|---------------|-------------|--------|-------------|-----------|----------|------|------------------|
| | Main Board | Lamp Module | Engine Module | Lamp Driver | Blower | Color Wheel | I/O Board | Firmware | EDID | |
| Firmware Update | v | | | | | | | v | v | chapter 5 |
| Color Wheel Index | v | | | | | v | | | | Chapter 4-3-1.7 |
| OSD Reset | v | | | | | | | v | v | Chapter 4-5.2 |
| Video Calibration | v | | v | | | | | v | v | Chapter 4-6 |
| VGA Calibration | v | | v | | | | | v | v | Chapter 4-6 |
| EDID | v | | | | | | | | | Chapter 6 |
| Re-write Lamp Hours Usage | v | | | | | | | | | Chapter 2-3 |
| Video Performance | v | | | | | v | v | | | chapter 4-3-2 |
| Restore Blower Speed | v | | | | v | | | v | v | Chapter 4-7 |
| Optical Performance Measure | | | v | | | | | | | Chapter 4-3-1 |

Troubleshooting

3-1 LED Lighting Message For Projector

| Message | Power LED (Red) | Power LED (Green) | Temp LED (Red) | Lamp Led (Orange) |
|----------------------------------|-----------------|-------------------|----------------|-------------------|
| Standby State (input power cord) | * | O | O | O |
| Power on (Warming) | O | Flashing | O | O |
| Power on and Lamp lighting | O | * | O | O |
| Power off (Cooling) | O | Flashing | O | O |
| Error (Lamp failed) | Flashing | O | O | * |
| Error (Fan failed) | Flashing | O | Flashing | O |
| Error (Over Temp.) | Flashing | O | * | O |

Note: Steady light * No light O

3-2 Main Procedure

The other troubleshooting procedures please refer to common service manual 3-1(Main Procedure).

| No | Symptom | Procedure |
|----|-------------------|---|
| 1 | Auto Shut Down | <ul style="list-style-type: none">- Check LED Statusa. Power LED flashes red, Lamp LED light on orange<ul style="list-style-type: none">- Check Lamp- Check Thermal Switch- Check Lamp Driver- Check Main Board- Check Formatter Board- Check Color Wheelb. Power LED and Temp LED flash red<ul style="list-style-type: none">- Check Fan- Check Main Board- Check Photo Sensor Boardc. Power LED flashes red, Temp LED light on red<ul style="list-style-type: none">- Check Thermal Switch- Check Main Board |
| 2 | 3D Image Abnormal | <ul style="list-style-type: none">- Ensure the using 3D glasses is good and you must face the projection.- Ensure the CD in DVD is HQFS format or the graphic card from PC can support 3D format.- Ensure your standing distance is less than 6m from screen.- Ensure the 3D function is on and execute "3D sync invert" in OSD menu.- Check main board. |

Function Test & Alignment Procedure

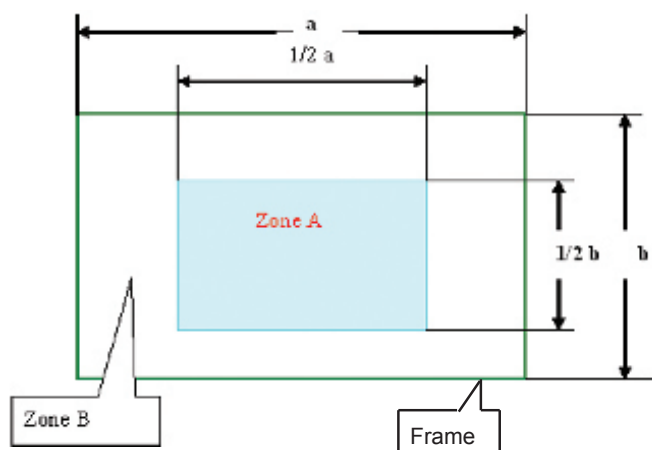
4-1 Test Equipment Needed

- IBM PC with HDTV resolution
- DVD player with Multi-system, equipped "Component", "Composite", "S-Video" and "HDMI".
- HDTV Source (720P,1080P,1080i)
- Minolta CL-100
- Quantum Data 802B or CHROMA2327 (Color Video Signal & Pattern Generator)

4-2 Test Condition

- Circumstance brightness: Dark room less than 2 lux.
- Product must be warmed up for 3 minutes.
- Screen size: 60 inches diagonal.

Zone Definition



< Figure: Zone A, Zone B & Frame (as green line) Definition, Active area=Zone A+ Zone B >

4-3 I/O Port Test

4-3-1 VGA Port Test

Note: HD33 the native resolution of test signal is 1920 x 1080@60HZ.

1. Frequency and tracking boundary

Procedure

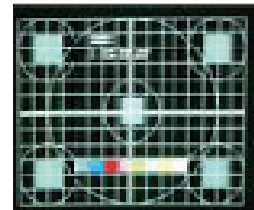
- Test equipment: video generator.
- Test signal: analog 1920 x 1080@60Hz
- Test Pattern: general-1 or master
- Check and see if the image sharpness is well performed.
- If not, re-adjust by the following steps:
 - (1) Select "Frequency" function to adjust the total pixel number of pixel clock in one line period.
 - (2) Select "Tracking" function and use right or left arrow key to adjust the value to minimize video flicker.
- Adjust Resync or Frequency/Tracking/H. Position/V. Position to the inner screen.

Inspection item

- Eliminate visual wavy noise by Resync, Frequency or Tracking selection.
- Check if there is noise on the screen.
- Horizontal and vertical position of the video should be adjustable to the screen frame.

Criteria

- If there is noise on the screen, the product is considered as failure product.
- If there is noise on the screen, use auto or manual "frequency" function or "tracking" function to adjust the screen.
- The PC mode functionally sure be workable include support format with frequency and auto detected functional will be workable.



General-1



Master

2. Bright Pixel

Procedure

- Test equipment: video generator.
- Test signal: analog 1920 x 1080@60Hz
- Test Pattern: gray 10

Inspection item

- Bright pixel check.

Criteria

- Bright pixel is unacceptable in the active zone;
1 pixel is allowed on the frame.
- Ref. Defect specification table



Gray 10

3. Dark Pixel

Procedure

- Test equipment: video generator.
- Test signal: analog 1920 x 1080@60Hz
- Test Pattern: full white

Inspection item

- Dead pixels check.
- White pattern (IRE=100)

Criteria

- The dead pixel is unacceptable on full white pattern in zone A and no more than 2 dark pixels in zone B
- Adjacent pixels are unacceptable.
- Ref. Defect specification table



Full white

4. Bright Blemish

Procedure

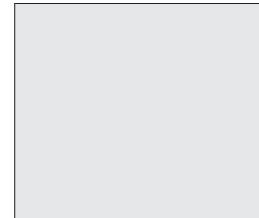
- Test equipment: video generator.
- Test signal: analog 1920 x 1080@60Hz
- Test Pattern: gray 10

Inspection item

- Bright blemish check.

Criteria

- The bright blemish is unacceptable under gray 10 pattern in zone A and no more than 4 bright blemish in zone B.
- Ref. Defect specification table



Gray 10

5. Dark Blemish

Procedure

- Test equipment: video generator.
- Test signal: analog 1920 x 1080@60Hz



Blue 60

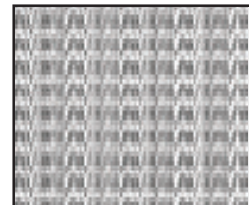
| | |
|-----------------|---|
| Inspection item | - Test Pattern: blue 60 |
| Criteria | - Dark blemish check |
| | - The bright blemish is unacceptable under blue 60 pattern in zone A and no more than 4 bright blemish in zone B. |
| | - Ref. Defect specification table |

Pixel specification

| Order | Symptom | Pattern | Criteria |
|-------|------------------------|-----------------|---------------------------------|
| 1 | Bright pixel (dots) | Gray 10 pattern | A+B=0 |
| 2 | Dark pixel(dots) | White pattern | A=0 B≤2 |
| 3 | Unstable pixel (dots) | Any pattern | A+B=0 |
| 4 | Adjacent pixel (dots) | Any pattern | A+B=0 |
| 5 | Bright blemish (Dirty) | Gray 10 pattern | A=0 B≤4 (diameter<1 inch) |
| 6 | Dark Blemish(Dirty) | Blue 60 pattern | A=0 B≤4 (diameter<1 inch) |
| 7 | Bright pixel on frame | Gray 10 pattern | ≤1 |

6. Focus Test

| | |
|-----------------|--|
| Procedure | - Test equipment: video generator. |
| | - Test signal: analog 1920 x 1080@60Hz |
| | - Test Pattern: full screen |
| Inspection item | - Focus check |
| Criteria | - From screen 1.8 M via visual to check the focus, look at the entire screen, focus shall be clear, crisp, and sharp over the entire surface of the display pattern. (Blur word on one of the corner after adjustment is acceptable. However, the word should at least be recognizable.) |



Full screen

7. Color Performance

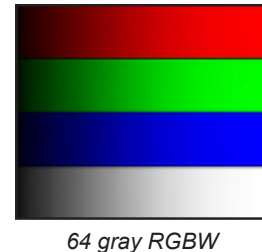
| | |
|-----------|--|
| Procedure | - Test equipment: video generator. |
| | - Test signal: 1920 x 1080@60Hz, 1080i |
| | - Test Pattern: Master, 64 gray RGBW |



Master

| | | | |
|--|------|--------------|-----|
| | HD33 | Confidential | 4-4 |
|--|------|--------------|-----|

| | |
|-----------------|--|
| Inspection item | Please get into service mode. Use 720p & 1080p signal, master pattern to do HDTV test. Color cannot discolor to purple and blue. |
| | - Check if each color level is well-functioned. |
| Criteria | - Color saturation |
| | - Screen appears normal. It should not have any abnormal condition, such as lines appear on the screen and so on. |
| | - Color appears normal. |
| | - It is unacceptable to have few lines flashing. |
| | - RGBW should all appear normal on the screen and sort from R -G-B-W. |
| | - Color levels should be sufficient and normal. (The unidentified color levels on both left and right sides should not over 4 color levels.) |
| | - Gray level should not have abnormal color or heavy lines. |
| | - If color appears abnormal, please get into service mode to do color wheel index adjustment. |



8. Optical Performance

| Inspection Condition |
|---|
| - Environment luminance: 2 Lux |
| - Product must be warmed up for 5 minutes |
| - Distances from the screen: 1.8M |
| - Screen Size: 60 inches diagonal |

a. Test equipment

| | |
|-----------|---|
| Procedure | - Please get into OSD menu, select "Lamp Setting" under "Options", press "Enter" button, then select "Bright" of "Bright mode". |
| | - Press "Power off→ Left→ Left→ UP" to get into service mode. |
| | - Test equipment: Select "Spoke Test" |

- Test signal: analog 1920 x 1080@60Hz

b. Brightness

Procedure

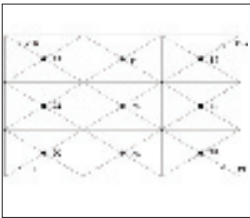
- Full white pattern
- Use CL100 to measure brightness values of P1~P9.
- Follow the brightness formula to calculate brightness values.

☼ Brightness Formula

$$\text{Avg. (P1~P9)} \times 1.1\text{m}^2$$

Criteria

- 520 ANSI lumen



Full white pattern

c. Full On/Full Off Contrast

Procedure

- Full white pattern & Full black pattern
- Use CL100 to measure brightness values of full white pattern P5 & full black pattern B5 (see image: full white)
- Follow Contrast formula to calculate contrast values.

☼ Contrast Formula

$$P5/B5$$

Note: P5 = Lux of center in full white pattern

B5 = Lux of center in full black pattern

Criteria

- 1300:1

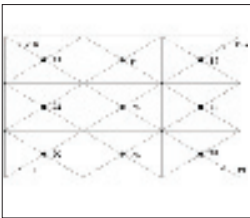


Full black pattern

d. Uniformity

Procedure

- Full white pattern
- Use CL100 to measure brightness values of P1~P9 (see image: full white).
- Follow the Uniformity formula to calculate



Full white pattern

average values.

☼ Uniformity Formula

$$\text{JBMA Uniformity} = \frac{\text{Avg. (P1, P3, P7, P9)}}{\text{P5}} \times 100\%$$

Criteria • 70%

4-3-2 Video Port Test

- Procedure
- Test equipment: DVD player
 - Test signal: Video
- Inspection item
- Video performance test
- Inspection Distance
- 1.4M ~1.5M
- Criteria
- Check any abnormal color, line distortion or any noise on the screen.
 - Check the sound from speaker.



Motion video

4-3-3 Component Port Test

- Procedure
- Test equipment: DVD player
 - Test signal: Ycbcr/YPbPr
- Inspection item
- HDTV performance test
- Inspection Distance
- 1.4M ~1.5M
- Criteria
- Check any abnormal color, line distortion or any noise on the screen.

4-3-4 HDMI Port Test

- Procedure
- Test equipment: DVD Player with HDMI output.
 - Test signal: 720p, 1080p, 1080i
- Inspection item
- HDMI performance test.
- Inspection Distance
- 1.4 M ~1.5 M.
- Criteria
- Ensure the image is well performed and the color can not discolor.
 - Check whether "mute" is normal.

4-3-5 3D Test

| | |
|---------------------|--|
| Procedure | - Test equipment: 1. DVD Player & PS3 & HQFS format CD or 2. PC with 3D Graphic card - Test signal: 1080p@24Hz(HDMI 1 for 3D movie) 720p@60HZ(HDMI 2 for 3D game) |
| Inspection item | - 3D test |
| Inspection Distance | - 3~5 M |
| Criteria | - The image should not appear noise, flicker shadow, shocking, abnormal color. |

4-4 Run In Test

- Temperature: 15°C~35°C
- Circumstance brightness: Normal environment
- Screen size: No concern
- Display mode: ECO mode

After repairing each unit, a Run-in test is necessary (refer to the below table).

| Symptom | Run-in Time |
|---------------|-------------|
| Normal repair | 2 hours |
| NFF | 4 hours |
| Auto shutdown | 6 hours |

- Get into Burn-In Mode

* Cycle setting is based on the defect symptoms. ie: If it is NFF, the run-in time is 4 hours. You have to set the lamp on for 50 min. and lamp off for 10 min for 4 cycles.

| | |
|---|---|
| Press power off > Left > Left > Up buttons sequentially on remote controller to get into service mode | |
| Choose Burn-In Test > enter | |
| Lamp On | Press right key to adjust the time (50) |
| Lamp Off | Press right key to adjust the time (10) |
| Set burn in cycle | Press right key to adjust the cycle |
| After setting up the time, choose "Get into Burn-In Mode" and press enter | |

4-5 Test Inspection Procedure

1. Check Points

| Check item | Check point |
|-------------------|---|
| Firmware version | All firmware version must be the latest version |
| TB implementation | Related TB must be implement |
| Cosmetic | Cosmetic can not be broken |
| Logo | Missing logo, missing prints and blurry prints are unacceptable |
| Lamp cover | It should be locked in the correct place. |
| Zoom in/out | The function should work smoothly |
| Keypad | All keypad buttons must operate smoothly |

2. OSD Reset

After final QC step, we have to erase all saved change again and restore the OSD default setting. The following actions will allow you to erase all end-users' settings and restore the default setting:

- (1) Please enter OSD menu.
- (2) Choose "SetUp" and then execute "Reset" function

4-6 ADC Calibration

1. VGA Calibration

Note: After replacing main board or upgrading firmware, the VGA calibration should be done.

| | |
|-----------------|---|
| Procedure | <ul style="list-style-type: none">- Test equipment: video generator<ul style="list-style-type: none">(1) Test signal: 1920 x 1080@60Hz(2) Test Pattern: Gray 16- Note<ul style="list-style-type: none">(1) Calibration pattern should be in full screen mode.(2) Please get into service mode, then get into "ADC Adjustment", and choose "VGA Calibration". |
| Inspection item | <ul style="list-style-type: none">- Check if there is lines or noise on the screen.- Horizontal and vertical position of the video should be adjustable to the screen frame. |
| Criteria | <ul style="list-style-type: none">- If there is noise on the screen, the product is considered as failure product.- The screen appears normal, it shouldn't appear any abnormal condition, such as lines and so on.- Check if the projection is same as monitor displayed. |

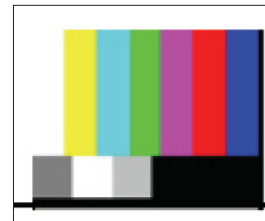


Gray 16

2. Video Calibration

Note: After replacing main board or upgrading firmware, the Video calibration should be done.

| | |
|-----------------|--|
| Procedure | <ul style="list-style-type: none">- Test equipment: video generator.<ul style="list-style-type: none">(1) Test signal: 480i(2) Test Pattern: SMPTE BAR- Note<ul style="list-style-type: none">(1) Calibration pattern should be in full screen mode.(2) Please get into Service Mode select "ADC Adjustment", and choose "YUV Calibration". |
| Inspection item | <ul style="list-style-type: none">- Color saturations |
| Criteria | <ul style="list-style-type: none">- There should not have any lack of SMPTE BAR. Color levels should be sufficient and normal.- There is not any abnormal lines on the image. |



SMPTE BAR

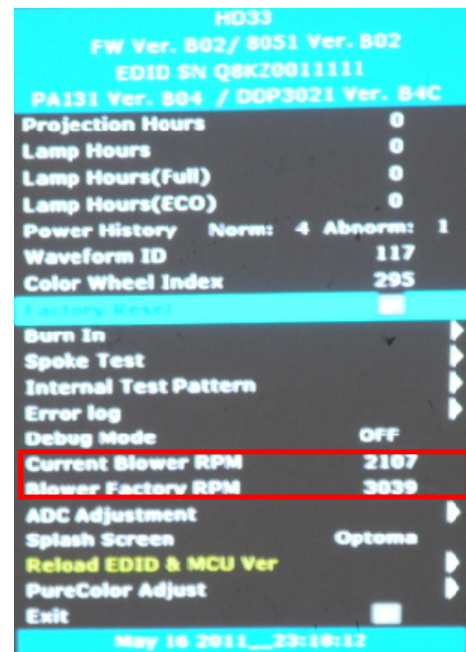
4-7 Restore Blower Speed

After replacing main board, blower or upgrading the firmware, please follow steps as below:

1. Plug in the power cord and press “power” button, then hold “Power” button quickly, then the “Power LED” light blue, “Temp LED” and “Lamp LED” light red, until the Power LED” flash blue, release the “Power” button.
2. Wait a moment, please get into service mode to check the “Blower Factory RPM” (as Picture A shown).

Note:

- If the Factory FAN RPM Value doesn't show in service mode, please repeat the step again.
- Make sure the “Blower Factory RPM” is 4204-4836.



Picture A

Firmware Upgrade

Section 1: PW980 for FW Upgrade (USB)

5-1-1 Equipment Needed

Software: (PW980)

- HD33_PW980 FW_xxx

Hardware:

- Projector
- Power Cord: 42.50115G001
- USB Cable mini USB to USB (A) (42.00284G001)
- PC or Laptop



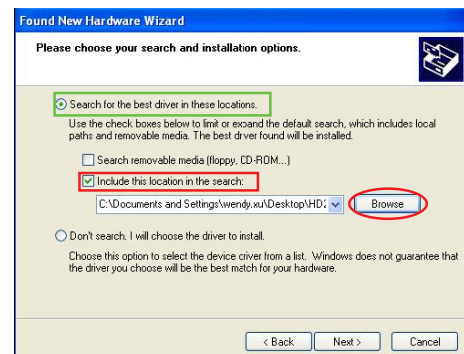
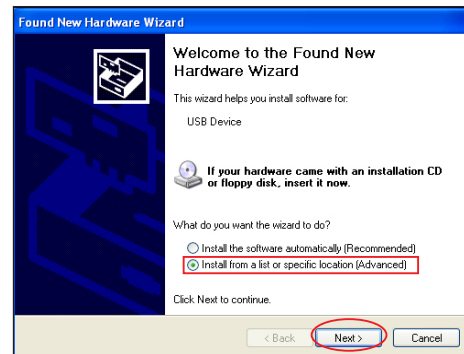
5-1-2 Setup Procedure

1. Plug in the power cord, connect the Projector and PC by USB cable.
 2. Hold "Power" button when the "Power" "Lamp" and "Temp" LED lights on, loosen "Power" button.
- The PC will ask to install USB driver (only for the first time).
Please refer to 5-1-3 for the installation of USB driver.

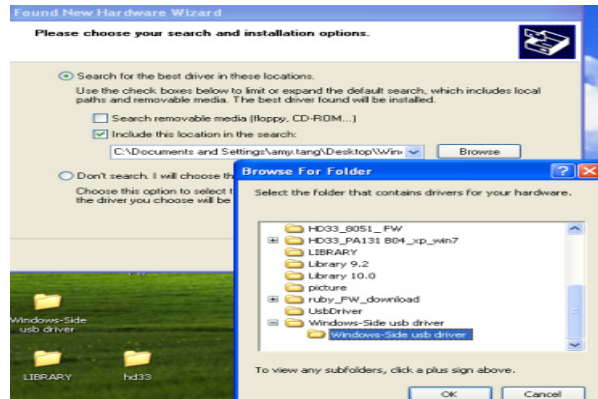


5-1-3 Install USB Driver

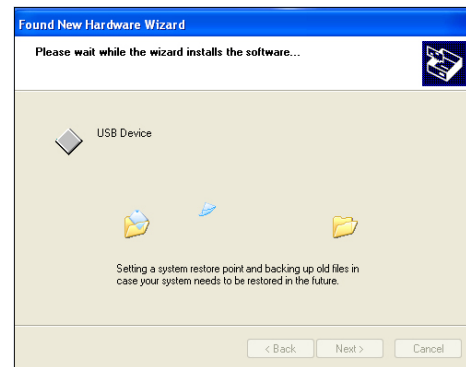
1. Click on the "Found New Hardware Wizard".
 - Select "Install from a list or special location (Advanced)".
 - Click "Next".
2. Select "Search for the best driver in these locations."
 - Choose "Include this location in the search".
 - Click "Browse".



3. Select the "Windows-Side usb driver" then click "OK".



4. Wait for several seconds.



5. Click "Finish".



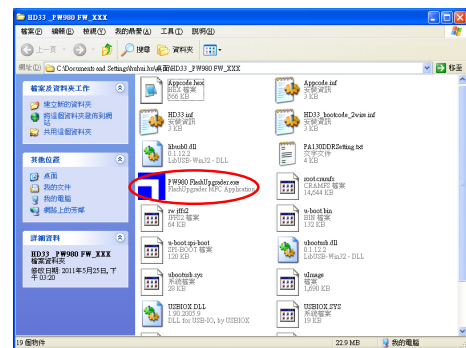
Note: - If "Found New Hardware Wizard" picture appear again, repeat step 2 to install USB Driver.

5-1-4 Firmware Upgrade Procedure

1. Double click the folder "HD33_PW980 FW_XXX".



2. Execute "PW980 FlashUpgrader.exe"



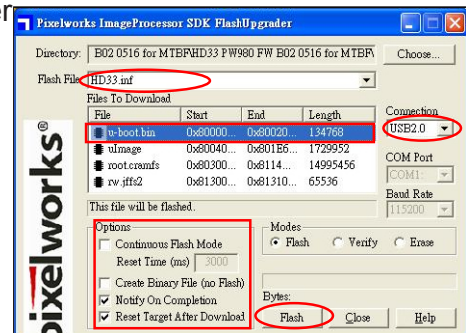
3. - Select "HD33.inf" for Flash File.

- Select "USB 2.0" for Connection

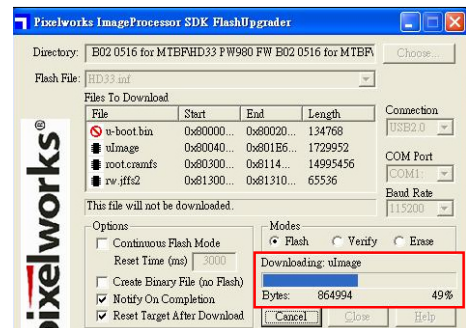
- Select "Notify On Completion" and "Reset Target After Download".

- Double click the "u-boot.bin"

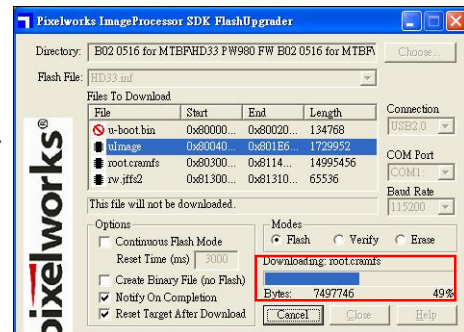
- Click "Flash" button.



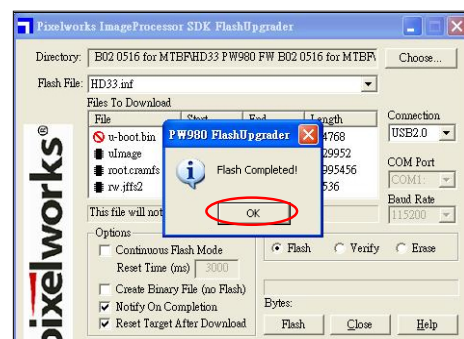
4. The "Downloading:ulmage" will running.



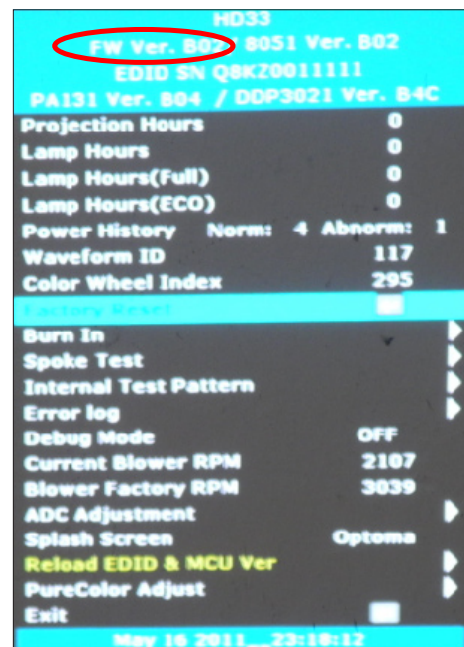
5. When “ulmage” downloads completely,
“Downloading :root.cramfs” will running automatically.



6. When message "Flash Completed" appears, click "OK".



7. Press “Power off”, “Left”, “Left” and “Up” button to get into service mode to check firmware version.



Section 2: PA131 for FW Upgrade (RS232)

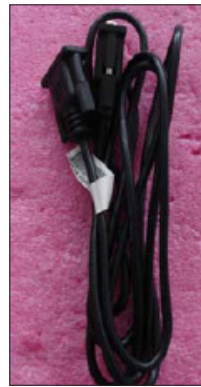
5-2-1 Equipment Needed

Software: (PA131)

- HD33_PA131 FW_xxx

Hardware:

- Projector
- Power Cord: 42.50115G001
- RS232 Cable 9PIN to 9PIN: 42.85H02G001
- PC or Laptop



5-2-2 Firmware Upgrade Procedure

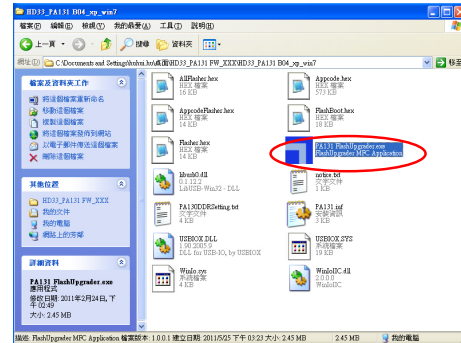
1. Plug in the power code, then connect the Projector and PC by RS232 cable.



2. Then hold "Power" button when the "Power" "Lamp" and "Temp" LED lights on, loosen "Power" button.



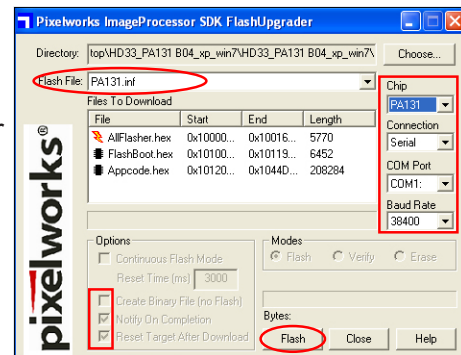
3. Double click the FW folder "HD33_PA131FW_xxx".



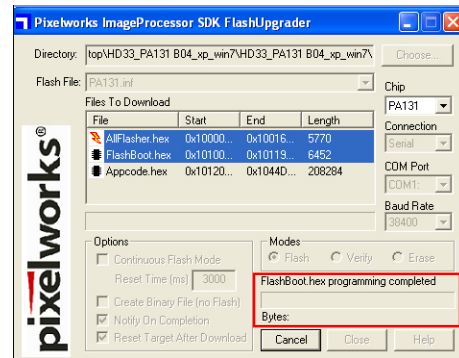
4. Execute "PA131 FlashUpgrader.exe"

5. Process

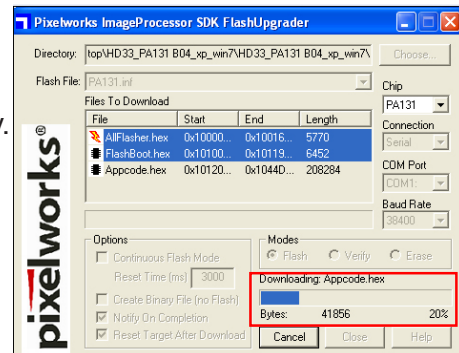
- Select "PA131" for Chip.
- Select "Serial" for Connection.
- Select the COM Port which you are using.
- Select "38400" for Baud Rate.
- Select "Notify On Completion" and "Reset Target After Download".
- Choose "PA131.inf" for Flash File.
- Click "Flash" button, then press "Power" button.



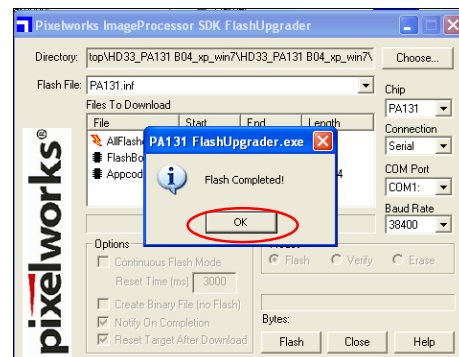
6. Wait a moment the “FlashBoot .hex programming completed”.



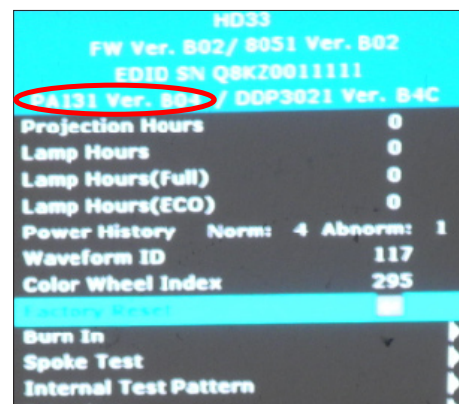
7. When “FlasherBoot.hex” downloads completely, “Downloading Appcode.hex” will running automatically.



8. When message “Flash Completed” appears, click “OK”.



9. Press “Power off”, “Left”, “Left” and “Up” button on remote controller to get into service mode to check firmware version.



Section 3: 8051 FW Upgrade

5-3-1 Equipment Needed

Software: (N79A901R-USB)

- Setup_NLINK_en
- Manley USB Driver_NLINK
- xxx_8051_xx.hex

Hardware:

- Projector
- Power cord: 42.50115G001
- USB Cable mini USB to USB (A) (42.00284G001)
- NLINK Fixture
- PC or Laptop



5-3-2 8051 Firmware Upgrade Procedure

1. Set-up

- Plug in the power cord, the power LED will light on red.
- Connect VGA-IN Port of projector with NLINK Fixture.
- Connect NLINK Fixture with PC by USB cable.

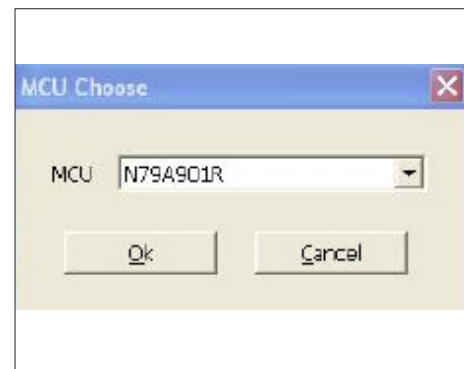
2. Execute 8051 FW Program

- Double click "NLINK V1.2" to execute NLINK program.



3. Choose the right type of MCU

- "MCU Choose" picture will appear on the screen, select "N79A901R".
- Click "OK".

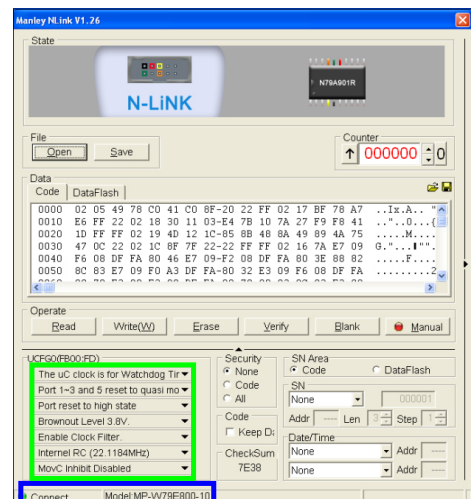


4. Program settings

Ensure NLINK Fixture and PC are securely connected: the indicator lights on green, and the state is "Connect" (as blue square).

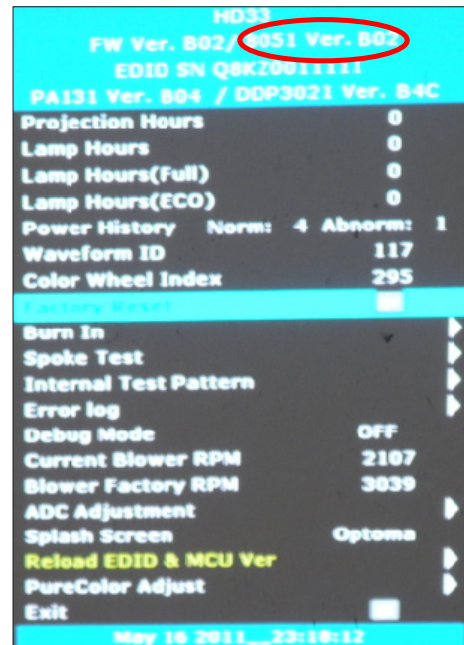
- Select "Brownout Level 3.8V" (as green square).
- Select "Internal RC(22.1184MHz)" (as green square).
- Click "Erase" then press "Write(W)" to execute 8051

Note: Another contents please refer to common service manual 5-Section 4.



5-3-3 Check 8051 FW version

1. Restart the unit and enter the Service Mode (Press Power off --> Left --> Left--> up).
2. The firmware version will be shown as red circle on the screen.



EDID Upgrade

6-1 EDID Upgrade Procedure

- The upgrade procedure for VGA and HDMI ports please refer to common service manual chapter 6.
- Please use "EDID 0.81.exe" Program and Key in the serial number into the "Unit No" blank space.



EDID Application Version 0.81 - OPTOMA

Barcode

Manf.Code

Unit No. Q8KZ1110011001101

EDID Informations

Serial 1101

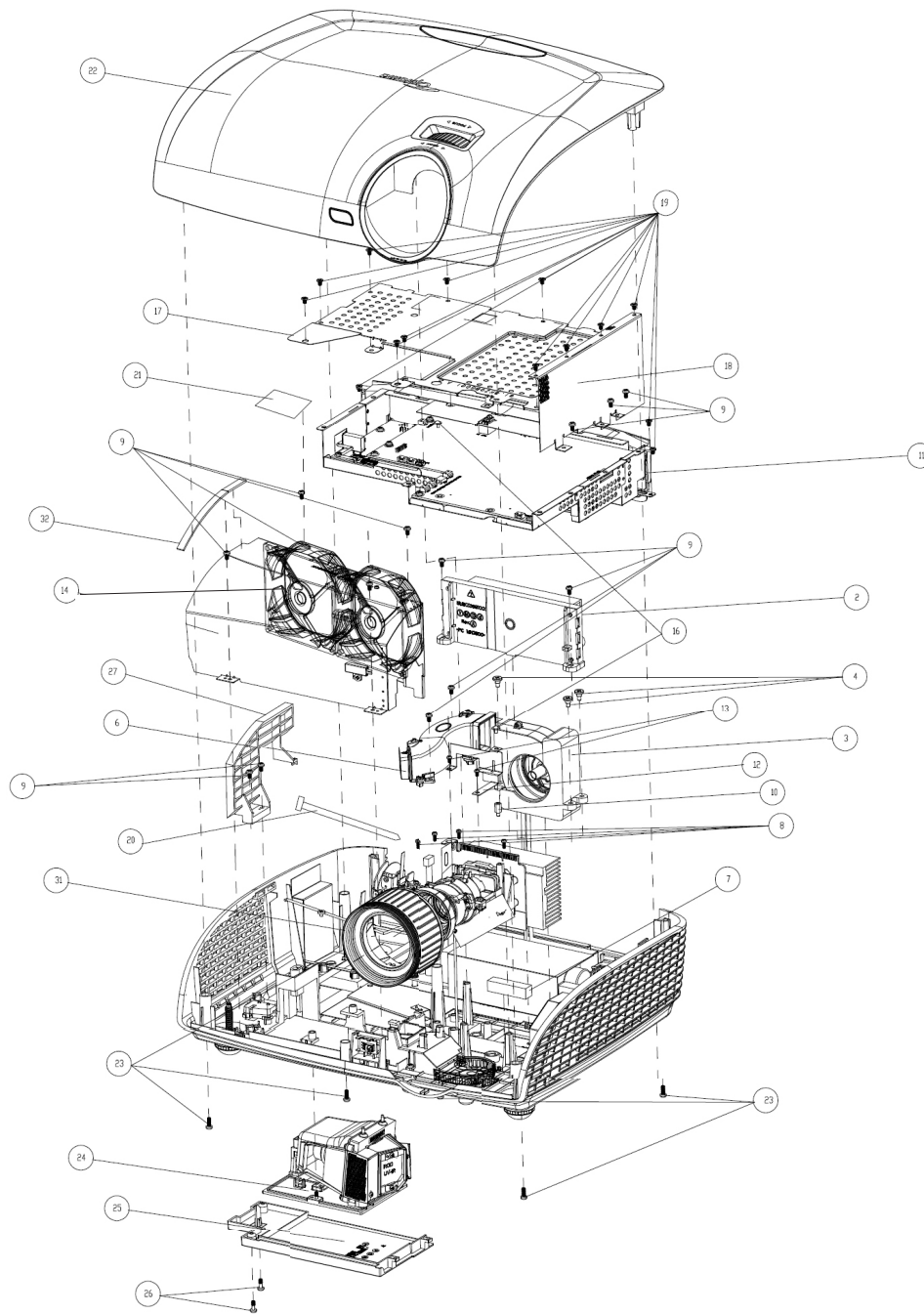
Week 11

Year 2011

Appendix A(Exploded Image)

Note: This chapter is only designed to show the exploded image of the projector. For updated part numbers, please refer to RSPL report.

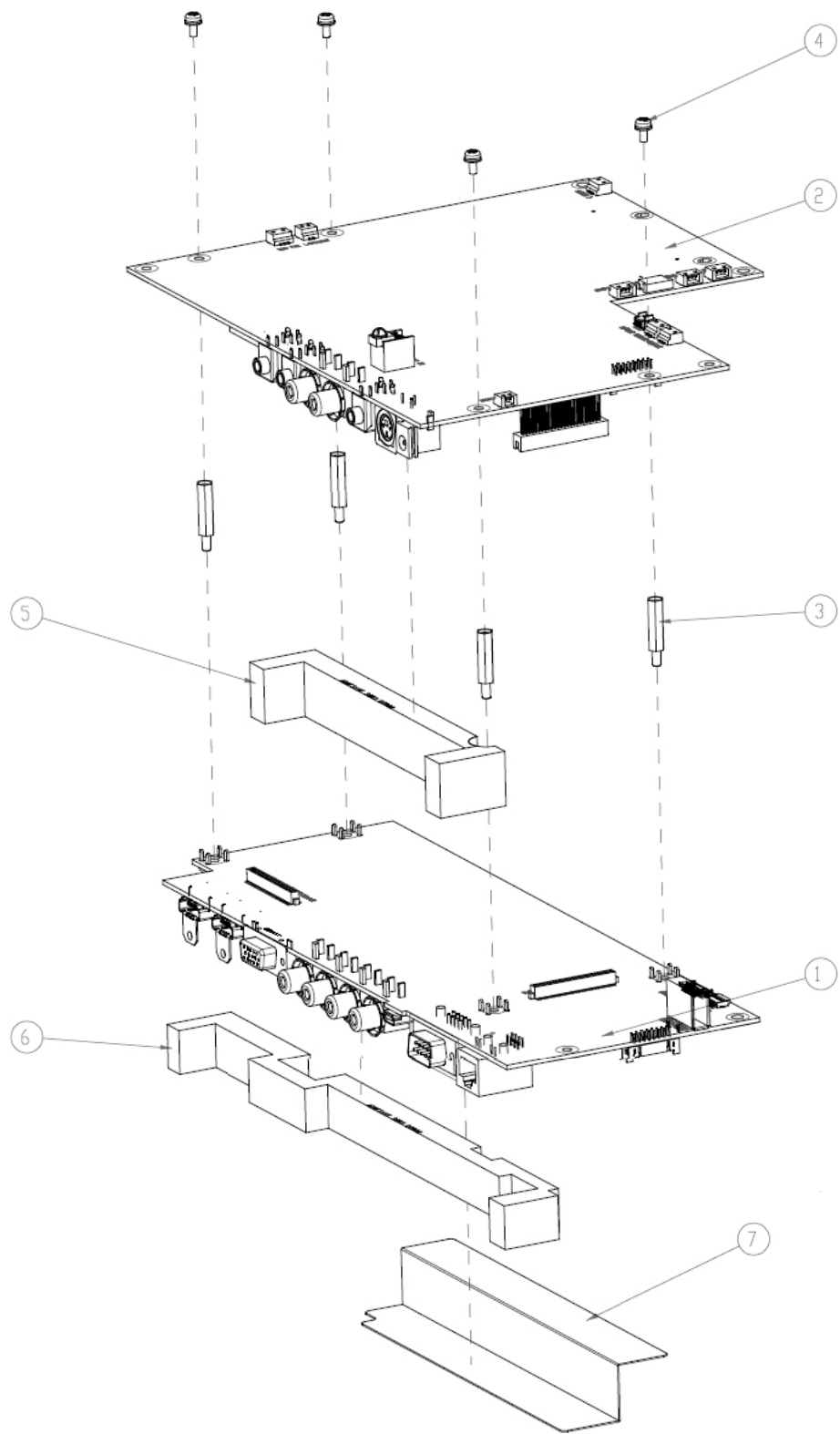
DC



| Item | PN | Description | Parts Supply |
|------|--------------|--|--------------|
| 1 | 70.8KZ15G001 | ASSYBOTTOMCOVERMODULE | |
| | 70.8KZ27GR01 | ASSY LAMP DRIVER MODULE 8KZ(SERVICE) | V |
| 2 | 70.8KZ11G001 | ASSYLAMPDRIVERMODULEHD33 | |
| 3 | 49.8FQ01G011 | 70x25FTYPELAMPBLOWER/RoHS2.0 | V |
| 4 | 61.8AF30G001 | SHOULDERSCREWM3.0*7VP22 | |
| 5 | 70.8KZ05G001 | ASSY7025BLOWERAIRDUCTMODULEHD33 | |
| 6 | 70.8KZ01G001 | ASSYOPTICALENGINEMODULEHD33 | |
| 7 | 41.8EA01G001 | EMICOPPERW50*L60 | |
| 8 | 85.1A526G060 | SCREW PANMECHM2.6*6NiNYLOK | |
| 9 | 85.1A123G050 | SCREW PANMECHM3*5Ni | |
| 10 | 85.00826G080 | HEXSCREWM2.6*H8*L4,BRASS | |
| 11 | 70.8KZ07G001 | MAINBOARD/IOTOTALASSEMBLYWHITE | |
| 12 | 61.8EG14G001 | EMISPRINGHD20 | |
| 13 | 85.1A126G040 | SCREW PANMECHM2.6*4Ni | |
| 14 | 49.8KZ02G011 | SUNON8525AXIALFANLOWROTATINGSPEED WITHLINELENGTH150MM/RoHS2.0 | V |
| 15 | 85.0A323G030 | SCREWP/FMECHM3*L3BLACK | |
| 16 | 85.3A126G060 | NEWSCREWM=2.6D=2.48-2.58L=6.0束尾2.0MM | |
| 17 | 61.8KZ08G001 | MAINBOARDTOPSHEETMETAL0.3T | |
| 18 | 61.8KZ01G001 | SIDEMESHHD33 | |
| 19 | 85.0A123G040 | SCREWP/FMECHM3*4Ni | |
| 20 | 51.00001G001 | CABLETIEPG-YJ-80 | |
| 21 | 51.81541G001 | TAPE3MJ35017*30mm | |
| 22 | 70.8KZ06G001 | TOPCOVERASSEMBLYWHITE | |
| 23 | 85.1A123G080 | PANSCREWM3*8FORYM-64FRONTCELL&SP | |
| 24 | 70.8KZ02G001 | ASSYORSAME20.8280WLAMPMODULEHD33 | |
| | 70.8KZ29GR01 | ASSY LAMP COVER MODULE 8KZ WHITE(SERVICE) | V |
| 25 | 51.8KZ04G001 | WHITELAMPCOVERHD33 | |

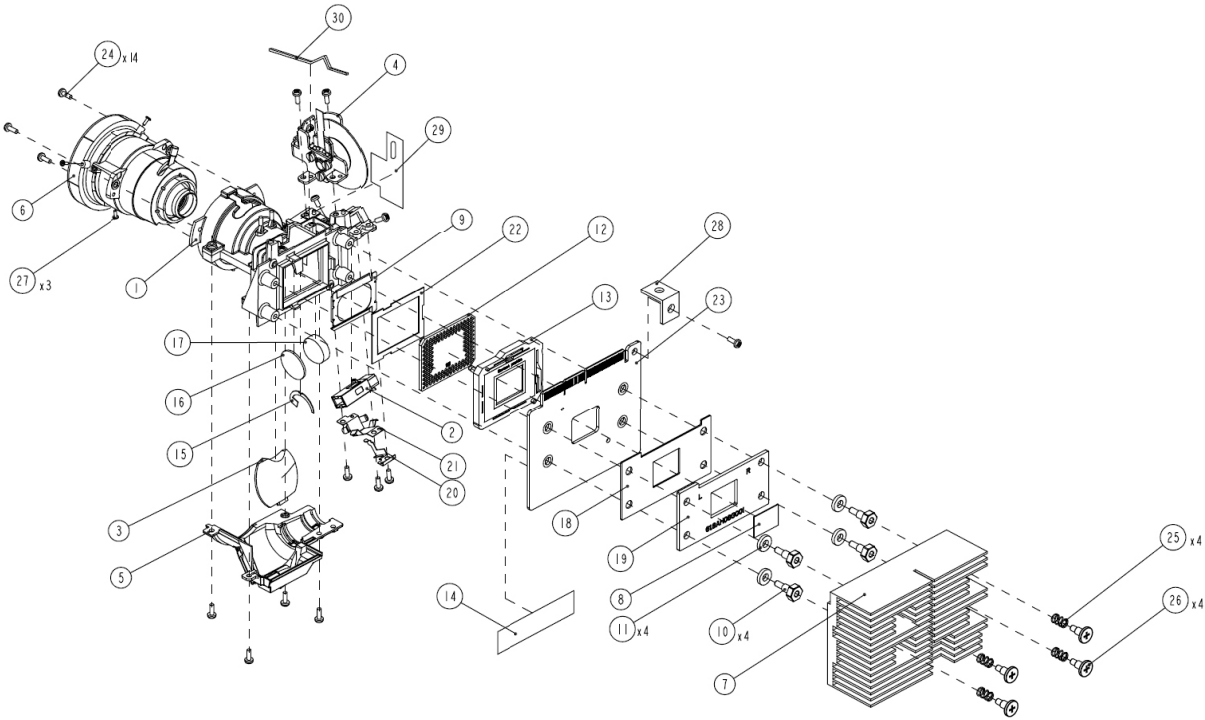
| Item | PN | Description | Parts Supply |
|------|--------------|-------------------------------|-----------------|
| 26 | 61.00061G001 | LOCKSCREW PANMECHM3*8.5-3.5Ni | |
| 27 | 51.8KZ24G001 | LEFTVENTHD33 | |
| 28 | 51.8KZ18G001 | TOPIRMYLARBLACK | |
| 29 | 51.8KZ20G001 | TOPPROTECTIVEFILMHD33 | |
| 30 | 61.8KZ03G001 | DUAL8525FANSHIELDINGHD33 | |
| 31 | 70.8KZ20G001 | FOCUSRINGASSEMBLYWHITE | |
| 32 | 52.8KZ08G001 | FANSHIELDINGTOPSPONGEHD33 | |

Assy Main Board



| Item | PN | Description | Parts Supply |
|------|--------------|------------------------------------|--------------|
| 1 | 80.8KZ06G001 | PCBAFORMATTERBOARDFORHD33PROJECTOR | V |
| 2 | 80.8KZ01G001 | PCBAMAINBOARDFORHD33PROJECTOR | V |
| 3 | 61.00074G001 | HEXSCREW L=18.4M3-M3Ni5100MP | |
| 4 | 85.1F123G060 | SCREW PANMECHW/SFM3*6NiGREEN | |
| 5 | 52.8KZ04G001 | FORMATTERLIGHTLEAKSPONGE | |
| 6 | 52.8KZ05G001 | SCALARBDLIGHTLEAKSPONGE | |
| 7 | 51.8KZ15G001 | MAINBDBOTTOMMYLAR | |

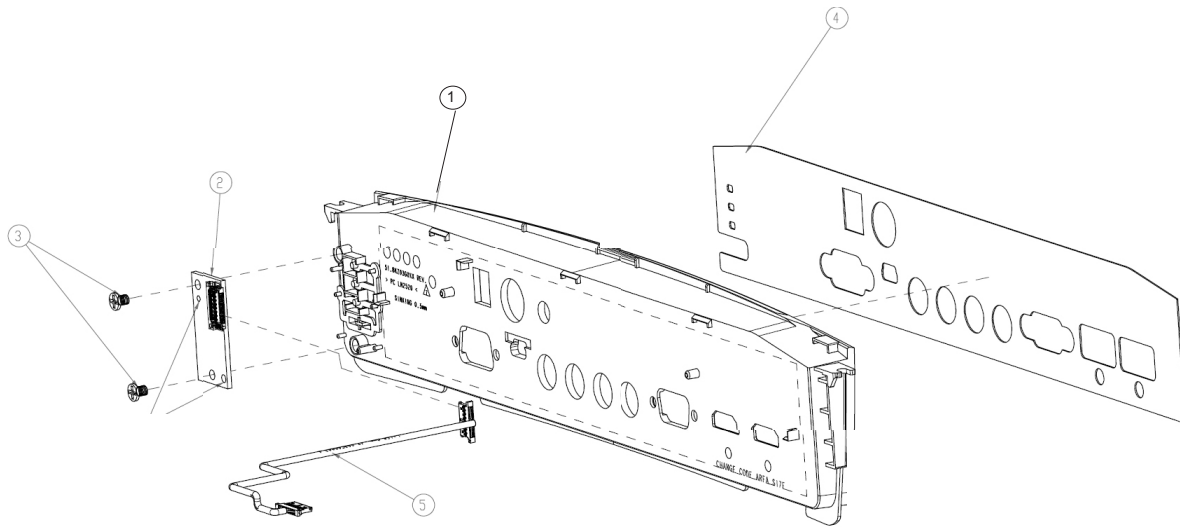
Assy Engine Module



| Item | PN | Description | Parts Supply |
|------|--------------|---|--------------|
| | 70.8KZ25GR01 | ASSYOPTICALENGINEMODULE8KZ(SERVICE) | V |
| 1 | 70.8EG16G001 | ASSYENGINEBASEHD20 | |
| | 70.8EG32GR01 | ASSY ROD MODULE FOR HD20 (SERVICE) | V |
| 2 | 70.8EG11G001 | ASSYRODMODULEHD20 | |
| 3 | 70.8CP15G001 | ASSYRELAYMODULEZ15 | |
| 4 | 70.8KZ10G001 | ASSYCOLORWHEELMODULEHD33 | |
| 5 | 70.8EG22G001 | ASSYENGINEBOTTOMHD20 | |
| 6 | 23.8CV01G001 | PROJECTIONLENSYM40 | |
| 7 | 61.8EG10G021 | DMDHEATSINKAL6063HD33 | |
| 8 | 52.8CG14G001 | THERMALPAD/XR-Hj18.5x14.5x0.5mm | |
| 9 | 61.8FC02G001 | DMDLIGHTMASKEH1020 | |
| 10 | 61.88611G001 | DMDSCREWIvy10X | |
| 11 | 51.00210G001 | DMDSCREWWASHERA39 | |
| 12 | 48.8EG01G001 | DMD1920*1080PIXEL0.65"1080P2xLVDSDC2TYPEA | V |
| 13 | 11.009F0G007 | CNNTF203PFOR720PLGADMDSOCKETPE020323-03040-10;FOXCO | |
| 15 | 51.81540G001 | TAPE3MJ35017*60mm | |
| 16 | 23.8AH20G001 | CONDENSER1FORA15W | |
| 17 | 23.8AH20G002 | CONDENSER2FORA15W | |
| 18 | 51.8EG34G001 | DMDINSULATIONSLICEHD20 | |
| 19 | 61.8AH08G001 | DMDPLATEALA6061M409WX | |
| 20 | 61.8GV01G001 | RODCOVERA15WEW330e | |
| 21 | 61.8EG18G001 | RODSPRINGSUS301HD20 | |
| 22 | 52.80J01G001 | DMDANTIDUSTRUBBER739SILICONERUBBER | |
| 23 | 80.8KZ02G001 | PCBADMDBOARDFORHD33PROJECTOR | V |
| 24 | 85.1A526G060 | SCREW PANMECHM2.6*6NiNYLOK | |

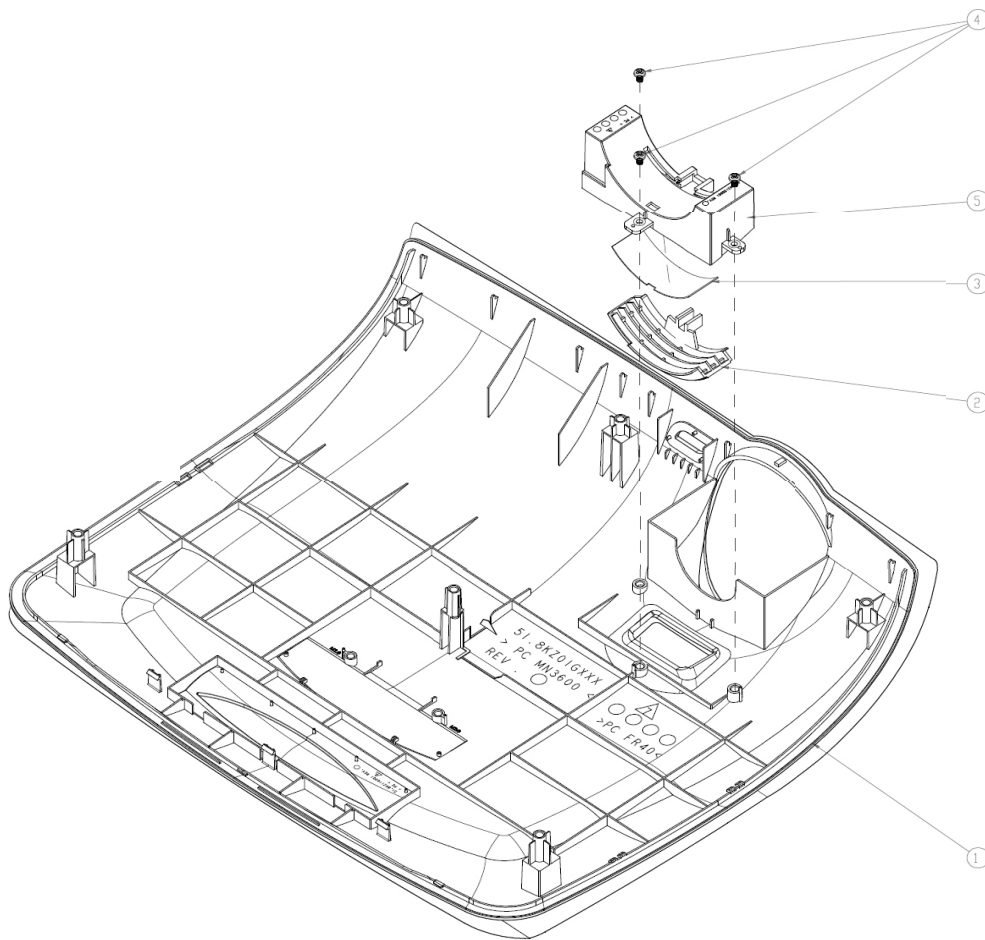
| Item | PN | Description | Parts Supply |
|------|--------------|-------------------------------|-----------------|
| 25 | 61.8AH13G001 | DMDHEATSINKSPRINGSUS304M409WX | |
| 26 | 61.85927G001 | DMDSHOULDERSCREWSB21 | |
| 27 | 61.8EG15G001 | STEPSCREWM2x4FORYM40LENS | |
| 28 | 61.8KZ05G001 | DMDBOARDBRACKETHD33 | |
| 29 | 51.8EG33G001 | 3MTAPEA15WENGINEBASEHD20 | |
| 30 | 52.8KZ07G001 | ENGINETOPSPONGEHD33 | |
| 30 | 61.8KZ03G001 | DUAL8525FANSHIELDINGHD33 | |
| 31 | 70.8KZ20G001 | FOCUSRINGASSEMBLYWHITE | |
| 32 | 52.8KZ08G001 | FANSHIELDINGTOPSPONGEHD33 | |

Assy IO Cover Module



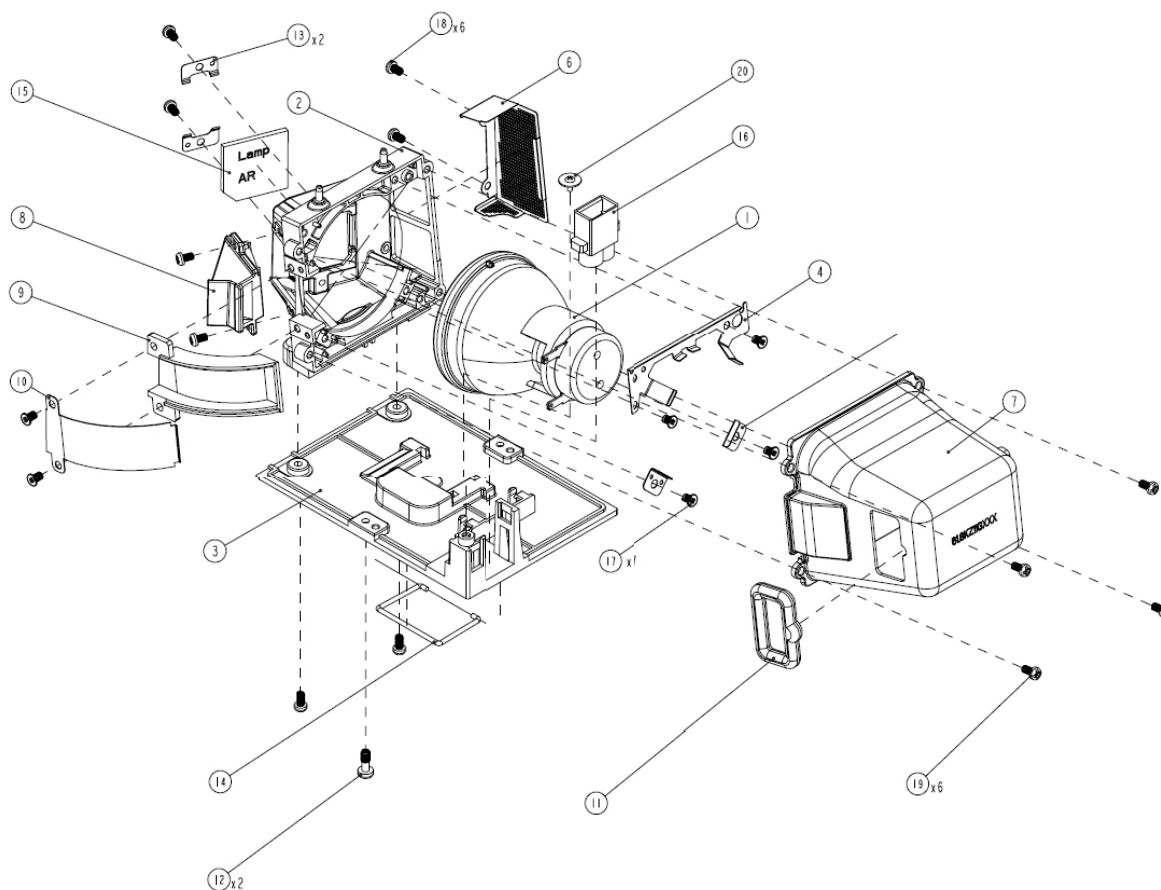
| Item | P/N | Description | Parts Supply |
|------|--------------|---|--------------|
| | 70.8KZ28GR01 | ASSY IO COVER MODULE 8KZ WHITE(SERVICE) | V |
| 1 | 75.8KZ02G001 | IOCOVERASSYWHITEHD33 | |
| 2 | 80.8KZ03G001 | PCBAPOWERLEDBDFORHD33PROJECTOR | V |
| 3 | 85.0A123G040 | SCREWP/FMECHM3*4Ni | |
| 4 | 35.8KZ01G001 | REARIOLABELHD33WHITE | |
| 5 | 42.005E0G002 | WIREPOWERBOARDTOMAINBOARD150MM | |

Assy Top Cover Module



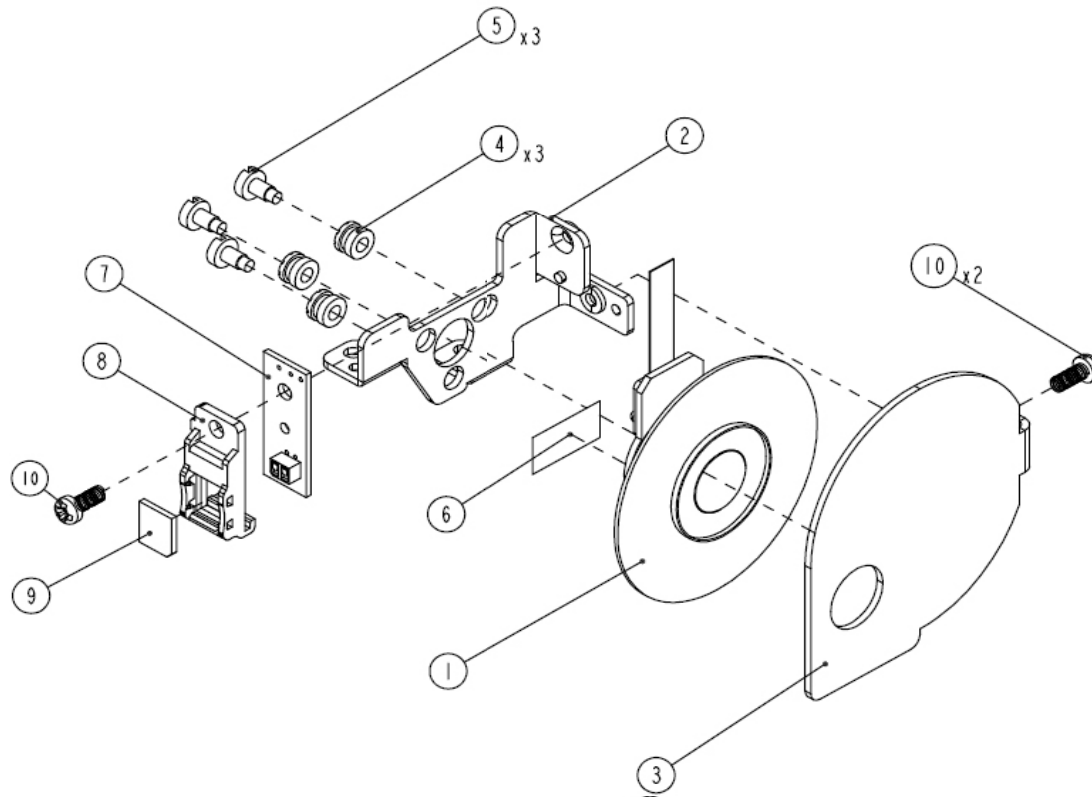
| Item | PN | Description | Parts Supply |
|------|--------------|---------------------|--------------|
| 1 | 75.8KZ01G001 | TOPCOVERWHITEHD33 | V |
| 2 | 51.8EG09G001 | ZOOMRINGHD20 | |
| 3 | 51.8KZ19G001 | ZOOMRINGTEFLONHD33 | |
| 4 | 85.1A123G050 | SCREW PANMECHM3*5Ni | |
| 5 | 51.8KZ12G001 | ZOOMRINGCOVERBLACK | |

Assy Lamp Module



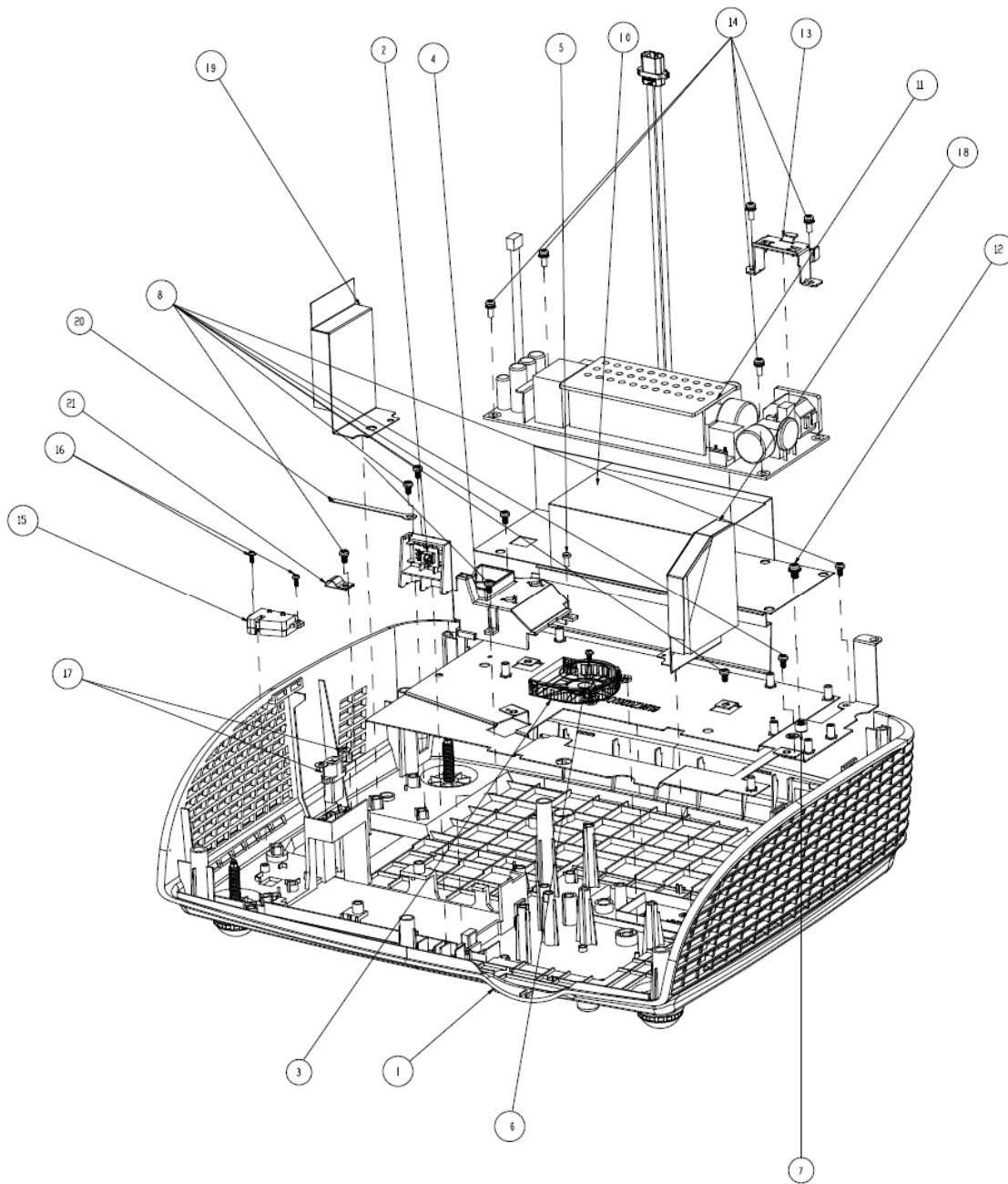
| Item | PN | Description | Parts Supply |
|------|--------------|--|--------------|
| | SP.8KZ01GC01 | LAMPMODULEFORPROJECTORHD33 | V |
| 1 | 23.8LL15G001 | LAMP-OSRAME20.8,P-VIP280/0.9EDU | |
| 2 | 61.8KZ10G001 | LAMPHOLDERE20.8HD33 | |
| 3 | 51.8KZ05G001 | LAMPBOTTOMHD33 | |
| 4 | 61.8BA06G001 | LAMPCLAMPTOPP1266 | |
| 5 | 61.8BA07G001 | LAMPCLAMPBOTTOMP1266 | |
| 6 | 61.8KZ06G001 | LAMPHOLDERMESHOUTLETHD33 | |
| 7 | 61.8KZ11G001 | LAMPLIGHTCUTHD33 | |
| 8 | 61.8KZ12G001 | LAMPBLOWERDUCTHD33 | |
| 9 | 61.8EE18H002 | LAMPDUCTBACKFOILALADC-12H7530 | |
| 10 | 61.8EE19H001 | LAMPDUCTCAPH7530 | |
| 11 | 52.8KZ02G001 | LAMPLIGHTCUTRUBBERHD33 | |
| 12 | 61.00018G003 | LOCKSCREW PANMECHM3*8.5-3.5BLACK(1018+HEATTREATMENT) | |
| 13 | 61.80L06G001 | UVIRSPRINGPLATESUS30180L | |
| 14 | 61.86808G002 | LAMPCHANGERHANDLESUS3041.6dDP725F ORCPC | |
| 15 | 23.88N10G001 | UV-IR24*25*2mm(5*5mmcut)_AddDotinkmark-Oerlikon | |
| 16 | 42.0043GG001 | W.A.2P#22MALE6KV200度 C140mmFORLAMPVP22 | |
| 17 | 85.0A126G040 | SCREWDOUBLEFLATMECHM2.6*4Ni | |
| 18 | 85.1A626G040 | SCREW PANMECHM2.6*4BLACKNYLOK | |
| 19 | 85.1A626G050 | SCREW PANMECHM2.6*5BLACKNYLOK | |
| 20 | 85.3A122G040 | SCREW CAPMECHM2*4Ni | |

Assy Color Wheel Module



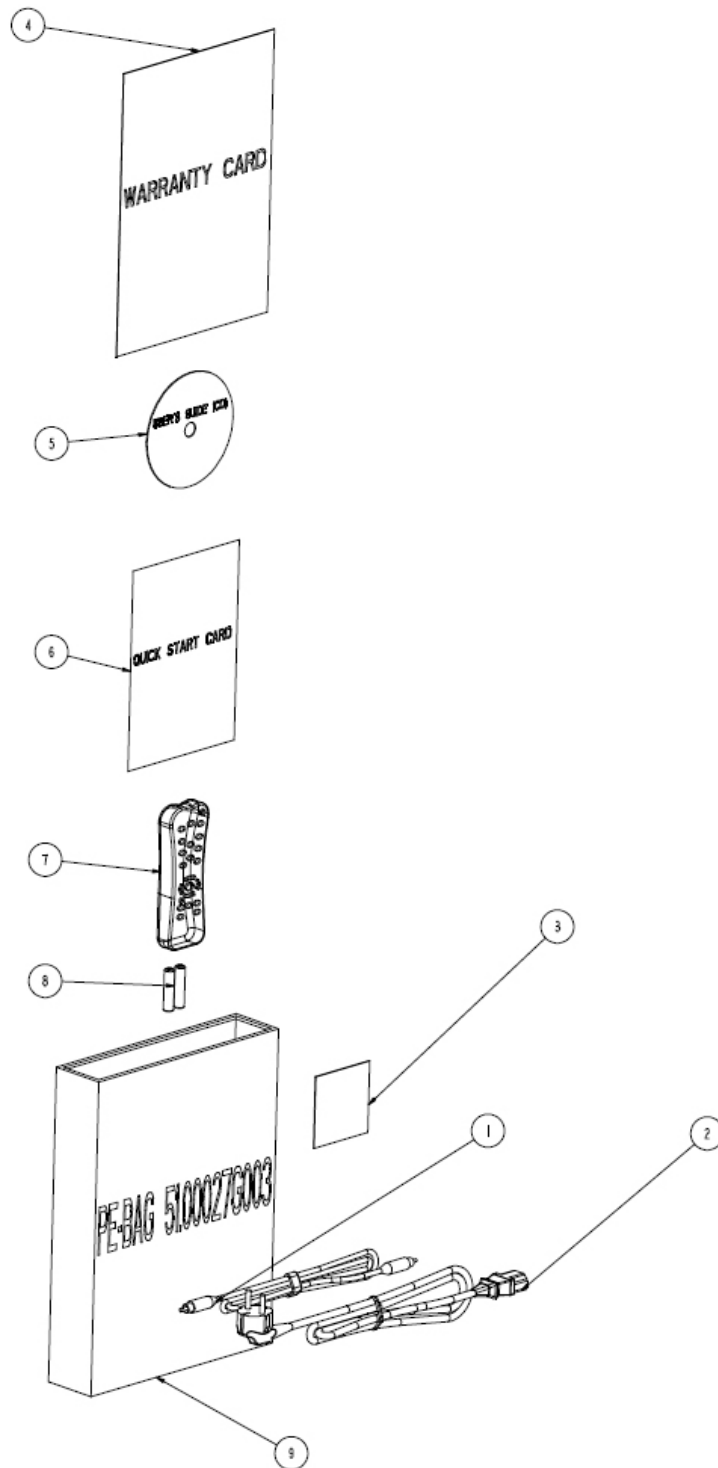
| Item | P/N | Description | Parts Supply |
|------|--------------|--|--------------|
| | 70.8KZ26GR01 | ASSYCOLORWHEELMODULE8KZR62G64B54R6 2G64B54(SERVICE) | V |
| 1 | 23.8EG19G013 | ASSYCOLORWHEELMODULEHD33 | |
| 2 | 61.8EG06G001 | D42COLORWHEELHOLDERHD20 | |
| 3 | 61.8EG07G001 | D42CWHOLDERCOVERHD20 | |
| 4 | 52.83615G001 | COLORWHEELDISCRUBBER,EzPro755 | |
| 5 | 61.83628G001 | COLORWHEELSHOULDERSCREW,EzPro755 | |
| 6 | 51.82Y29G001 | PCBAPHOTOSENSORBOARDFORHD20 | |
| 7 | 80.8LP04G001 | PCBAPHOTOSENSORBOARDFORES526XPROJE COR | V |
| 8 | 51.8HH08G001 | PHOTOSENSORCOVERHOLDERPCLN- 2520AUF65 | |
| 9 | 54.8HH01G001 | PHOTOSENSORCOVERGLASSUF65 | |
| 10 | 85.1A526G060 | SCREW PANMECHM2.6*6NiNYLOK | |

Assy Bottom Cover Module



| Item | PN | Description | Parts Supply |
|------|--------------|--|--------------|
| 1 | 51.8KZ02G001 | WHITE BOTTOM COVER HD33 | V |
| 2 | 70.8EG24G001 | ASSY FRONTIR MODULE HD20 | |
| 3 | 49.8JF01G002 | DELTA45*10mm/WIRE LENGTH 180mm BLOWER | V |
| 4 | 51.8KZ13G001 | 4510 BLOWER DUCT HD33 | |
| 5 | 85.1A126G060 | SCREW PAN MECH M2.6*6Ni | |
| 6 | 85.1A126G040 | SCREW PAN MECH M2.6*4Ni | |
| 7 | 61.8KZ02G001 | BOTTOM SHIELDING HD33 | |
| 8 | 85.1A123G050 | SCREW PAN MECH M3*5Ni | |
| 9 | 41.83J01G001 | EMI GASKET W5*H1.0*L155mm PD527 | |
| 10 | 51.8KZ21G001 | LVPS MYLAR HD33 | |
| 11 | 75.8FB01GP01 | ASSY 280W LVPS FOR EX762 | V |
| 12 | 85.1C224G051 | SCREW PAN MECHM4*5 COLORW/TOOTH WASHERCr3+ | |
| 13 | 61.88T19G011 | 8KZ AC INLET BRACKET | |
| 14 | 85.1F123G060 | SCREW PAN MECHW/SFM3*6NiGREEN | |
| 15 | 70.8KZ14G001 | ASSY LIMIT SWITCH HD33 | |
| 16 | 85.WA126G050 | SCREW PAN TAPM2.6*5Ni | |
| 17 | 85.3A122G040 | SCREWCAPMECHM2*4Ni | |
| 18 | 51.8KZ24G001 | LEFT VENT HD33 | |
| 19 | 51.8KZ24G001 | LEFT VENT HD33 | |
| 20 | 61.8BYP1G101 | HEATSINK ALUMINUM 95*48mm CT-400 HS1 XH | |
| 21 | 61.00079G001 | GROUNDING CABLE CLAMP FN-008 “PINGOOD | |
| 22 | 61.8CGB9G001 | GROUNDING CABLE CLAMP KTCC-9 “KANGYANG” SHASTA | |

AK



| Item | PN | Description | Parts Supply |
|------|--------------|---|--------------|
| 1 | 42.87205G001 | CABLE COMPOSITE VIDEO 1.8M 3200MP | V |
| | SP.87201GC01 | CABLE POWER CORD 1830mmSP30+IS14;BC-PUIXY01 | |
| 2 | 42.50115G001 | CABLE POWER CORD 1.8M SP30+IS14 US | V |
| | SP.80N03GC01 | CABLEPOWERCORD1830mmSP30+IS14;BC-PUIXY01 | |
| 3 | 35.82001G111 | AK LABEL 3"*3" BLANK | |
| 4 | 36.00024G001 | WARRANTYCARDUSFORLPPSERIES,1YEAR | |
| 5 | 36.8KZ01G001 | USER'SGUIDEMULTILINGUAL(CD)HD33 | V |
| 6 | 36.00040G011 | INSTRUCTIONCARD(OPTOMA)-BEFORERETURNFORPICO | |
| 7 | 45.8KZ01G001 | REMOTECONTROLFORHD33PROJECTOR | V |
| | SP.8KZ02GC01 | REMOTECONTROLFORHD33 | V |
| 8 | 46.80S01G101 | BATTERY#71.5VNOVACELL | |
| 9 | 51.00027G003 | PEBAGZIPPER33cm*25cmSIZEGREENFOROPTOMA | |
| 10 | AK.8KZ01GC0A | A.K.HD33FORAMERICA | |

Appendix B

I. Serial Number System Definition

Serial Number Format for Projector

Q 8KZ 1 15 AAAAA C 0001

① ② ③ ④ ⑤ ⑥ ⑦

- ① : Q = Optoma
- ② : 8KZ = Project Code
- ③ : 1 = Last number of the manufacture year (ex:2011 = 1)
- ④ : 15 = week of the manufacture year (ex:the fifteenth week of the year = 15)
- ⑤ : AAAAA = not-defined
- ⑥ : C = Manufacture factory
- ⑦ : 0001 = Serial Code

EX: Q8KZ115AAAAAC0001

This label "Q8KZ115AAAAAC0001" represents the serial number for HD33. It is produced at CPC on fifteenth of 2011. Its serial code is 0001.

II. PCBA Code Definition

PCBA Code for Projector

| | | | | | |
|----------|----------|-------------------|----------|------------|-------------|
| <u>A</u> | <u>B</u> | <u>XXXXXXXXXX</u> | <u>C</u> | <u>XXX</u> | <u>EEEE</u> |
| ① | ② | ③ | ④ | ⑤ | ⑥ |

- ① : ID
- ② : Vendor Code
- ③ : P/N
- ④ : Revision
- ⑤ : Date Code
- ⑥ : S/N