Applicable Country & Regions:

All Regions

Product Service Manual – Level 2

Service Manual for BenQ:
Projector/W1070
< 9H.J7L77.17x>

Version: 00c
Date:2012/11/27

Notice:

For RO to input specific “Legal Requirement” in specific NS regarding to responsibility and liability statements.

Please check BenQ’s eSupport web site, http://esupport.benq.com, to ensure that you have the most recent version of this manual.

First Edition (Oct 2012)

Content Index

1. Abbreviations & Acronyms 3
2. About This Manual 4
2.1 Trademark 4
2.2 Introduction 4
2.3 Important Service Information 4
2.4 Safety Notice 5
2.5 Compliance Statement 5
2.6 General Descriptions 5
2.7 Related Service Information 5
3. Product Overview 6
3.1 Specification Overview 7
3.2 Packing 26
3.3 Customer Acceptance 39
4. Level 1 Cosmetic / Appearance / Alignment Service 42
4.1 Cosmetic / Appearance Inspection Criteria 42
4.2 OPERATIONAL INSPECTION CRITERIA 45
4.3 Software/Firmware Upgrade Process 49
4.4 Method to enter factory menu 68
4.5 RS-232 connection 70
4.6 Adjustment / Alignment Procedure 72
5. Level 2 Circuit Board and Standard Parts Replacement 76
5.1 Product Exploded View 76
5.2 Product Disassembly / Assembly 81
5.3 Module Assembly Key Point - Optical Engine 85
5.4 Module Assembly Key Point - Mechanical 101
5.5 Block Diagram 121
5.6 Trouble shooting 122
Appendix 1 – Screw List / Torque 131
Appendix 2 - Code List: IR / RS232 / DDC Data 133
Appendix 3 – Ceiling Mount Drawing 142

Update History

Revision	Chapter	Changes	Date
Rev. 00a		Initial version	2012/10/4
Rev. 00b		revise service tool SOP	2012/10/15
Rev. 00c	p.83-84	revise disassembly SOP(update chip BD photo)	2012/11/27

1. Abbreviations & Acronyms

A	
A/D	Analog to Digital
B	
BenQ	BenQ Corporation
C	
C/W	Color Wheel
CM	Concave Mirror
D	
DLP	Digital Light Processing / Texas Instruments®
DMD	Digital Micro mirror Device
DVI	Digital Video Interface
DVI-I	Digital Video Interface-Integrated
P	
PL	Projection Lens
POM	Pond of Mirrors
R	
RS232	Interface Between Data terminal Equipment and Data Communications Equipment Employing Serial Binary Data Interchange
S	
SVGA	Super Video Graphics Array, A screen resolution of 800 x 600 pixels.
SXGA	Super XGA. A screen resolution of 1280x1024 pixels.
V	
VGA	Video Graphics Array. A screen resolution of 640x480 pixels.
X	
XGA	A screen resolution of 1024x768 pixels.

2. About This Manual

This manual contains information about maintenance and service of BenQ products. Use this manual to perform diagnostics tests, troubleshoot problems, and align the BenQ product.

Important

Only trained service personnel who are familiar with this BenQ Product shall perform service or maintenance to it. Before performing any maintenance or service, the engineer MUST read the "Important Safety Information"

2.1 Trademark

The following terms are trademarks of BenQ Corporation:
BenQ

Other companies, products, or service names may be the trademarks of their respective companies.

2.2 Introduction

This section contains general service information, please read through carefully. It should be stored for easy access place.

2.3 Important Service Information

RoHS (2002/95/EC) Requirements – Applied to all countries require RoHS.

The RoHS (Restriction of Hazardous Substance in Electrical and Electronic Equipment Directive) is a legal requirement by EU (European Union) for the global electronics industry which sold in EU and some counties also require this requirement. Any electrical and electronics products launched in the market after June 2006 should meet this RoHS requirements. Products launched in the market before June 2006 are not required to compliant with RoHS parts. If the original parts are not RoHS complaints, the replacement parts can be non ROHS complaints, but if the original parts are RoHS compliant, the replacement parts MUST be RoHS complaints.
If the product service or maintenance require replacing any parts, please confirming the RoHS requirement before replace them.

2.4 Safety Notice

1 Make sure your working environment is dry and clean, and meets all government safety requirements.
2 Ensure that other persons are safe while you are servicing the product.
3 DO NOT perform any action that may cause a hazard to the customer or make the product unsafe.
4 Use proper safety devices to ensure your personal safety.
5 Always use approved tools and test equipment for servicing.
6 Never assume the product's power is disconnected from the mains power supply. Check that it is disconnected before opening the product's cabinet.
7 Modules containing electrical components are sensitive to electrostatic discharge (ESD). Follow ESD safety procedures while handling these parts.
8 Some products contain more than one battery. Do not disassemble any battery, or expose it to high temperatures such as throwing into fire or it may explode.
9 Refer to government requirements for battery recycling or disposal.

2.5 Compliance Statement

Caution: This Optical Storage Product contains a Laser device. Refer to the product specifications and your local Laser Safety Compliance Requirements.

2.6 General Descriptions

This Service Manual contains general information. There are 2 levels of service:
Level 1: Cosmetic / Appearance / Alignment Service
Level 2: Circuit Board or Standard Parts Replacement

2.7 Related Service Information

Service Web Site
BenQ Global Service Website: http://www.benq.com/support/
eSupport Website: http://esupport.benq.com/v2

3. Product Overview

The projector consists of DLP projector controller, Lamp controller, Power supply system, and System cooling controller. The DLP controller captures digital PC data and video data and then converts them into the DMD display device. The Lamp controller dominates the lamp's power and synchronizes its frequency with color display sequence. The Power supply unit controls the AC line power factor and converts primary voltage to secondary low voltages for digital board. The System cooling controller drives the airflow to quench the lamp's heat and electrical component's heat.

- Specification Overview
  - 1.0 Panel Information
  - 2.0 Projection Lens Specification
  - 3.0 Optical Specification
  - 4.0 Lamp Specification
  - 5.0 Mechanical Specification
  - 6.0 Packaging
  - 7.0 Thermal Specification
  - 8.0 Power Requirements
  - 9.0 Compatibility
  - 10.0 User Interface
  - 11.0 Regulatory
  - 12.0 Reliability
  - 13.0 Other Feature
- Input / Output Connectors
  1. Input Terminals
  2. Output Terminals
  3. Control Terminals and Interface
- Accessories
- Environmental
- Electrical Specification
- Power Supply Specification
- UI Specification

3.1 Specification Overview

● Specification Overview

W1070	*Version: 00*		
Item	**Specification**		
1.Panel Information			
1.1 Panel Type	0.65” 1080p 2xLVDS S600 DMD		
1.2 Package Type	Series 600		
1.3 Size	0.65”		
1.4 Pixels	1920(H) x 1080(V)		
1.5 Color Depth	30 Bits (1,037,000,000 Colors)		
1.6 Driver Type	DDP 4422		
1.7 Panel Pixel Quality	Follow TI spec.		
1.8 Image Imperfection	Follow TI spec.		
2. Projection Lens Specification (For Reference)			
2.1 F/#	Wide	Tele	
	2.59	2.87	
2.2 Zoom Ratio	1.3±2%		
2.3 Throw Ratio	1.15~1.5 (79"±3% @ 2m)		
2.4 True Zoom	NA		
2.5 Focal Length	Wide:	Tele:	
	16.88 mm	21.88mm	
2.6 Offset	(110%~130%)+/-5%		
2.61default offset	TBD(SI Provide)		
2.7 Visible Focus Range	1~8m		
2.8 Clearly Focus Range	1.5~6m		
2.9 Keystone Distortion	Wide & Tele <1%		
2.9 TV Distortion	Wide & Tele <1%		
2.10 Screen Distortion	|A| <= 5.0 mm, |B| <= 5.0 mm, |C| <= 3.5 mm @ 60”		
2.11 Zoom Ring Torque	110~230g (Follow Vendor Lens SPEC)		
2.12 Focus Ring Torque	50~150g (Follow Vendor Lens SPEC)		
2.13 Center Position Shift(W-T) (Video Projector only)	N.A.		
2.14 Zoom&Focus shaking level	Follow typical sample (When needed)		
2.15 Lens Shift Shaking Level	N.A.		
2.16 Lateral Color		Center @ 49”	All other area
	R-G	<2/3 pixel	<1.0 pixel
	B-G	<2/3 pixel	<1.0 pixel
	R-B	<1.0 pixel	<1.0 pixel
2.17 Color wheel segment	6-Seg. (RGBRGB CW) (TBD)		
2.18 Color wheel speed	2x , 3x (50Hz)		
3.Optical Specification Test under 60” (diagonal) image size with Wide projection lens position. Reference Meter: Vendor Factory CL-200 Meter (SN head:81531011, body:82521013)			
3.1 ANSI Brightness	Normal: Minimum 1600lm		

	(Typical 1800 lm, only for reference) ECO: Minimum 1150 lm (For reference) Connect HDMI =Optical native(DMD-full-on) If no HDMI Source, measure PC Input ≧ 97% of Optical Native (DMD-full-on)		
3.2 ANSI (-) uniformity	Minimum -50%		
3.3 ISO Uniformity	Minimum 70%		
3.4 ANSI Contrast	Minimum 150:1		
3.5 FOFO Contrast	Minimum 6000:1 (WCE3)		
3.7 FOFO Contrast with DB	N.A.		
3.8 Focus Quality			
3.8.1 ☒ Pattern	(1) The pattern can be uniformly focused – then pass! (2) If it's difficult to judge, then check 3.8.2		
3.8.2	R	G	B
Defocus (Maximum)	2.5	2.5	2.5
Flare (Maximum)	3.5	3.5	3.5
3.9 Focus unbalance	Max. 60cm		
3.10 Color Coordinate (Confirm at PVT stage)	Color	x	y
	White	0.279±0.02	0.386±0.02
	Red	0.644±0.04	0.342±0.04
	Green	0.304±0.04	0.624±0.04
	Blue	0.145±0.03	0.055±0.03
3.11 Color Uniformity (Confirm at PVT stage)	Color	△uv	
	White	≦0.02	
	Red	≦0.03	
	Green	≦0.02	
	Blue	≦0.02	
3.12 Color Gamut(Compare to NTSC)	Typical REC709		
3.13 Light Leakage in AA	△≦0.5 lux compared with center point @ full black pattern within 60" (Diagonal at 1.52m). This light-leakage is only described as the spot light with obvious shape. The uniformity difference of black pattern is not included.		
3.14 Light Leakage out of AA	≦0.5 lux, @ full black pattern with 60"~80" (Diagonal at 1.52m) (Except DMD Defect)		
3.15 Ghost	Follow limited sample (When needed).		
3.16 Lens Shift Speed(sec) (only for motorized len shift)	N.A.		
3.17 Defect (Color Band, Dark Corner, Dark band)	Follow limited sample (When needed).		
3.18 Preset mode setting			
4.Lamp Specification			
4.1 Lamp	Osram P-VIP 240W/0.8 E20.9n		
4.2 Lamp Sync Type	AC Lamp		
4.3 Lamp Flick	Follow limited sample (When needed).		
4.4 Lamp Power	Normal Mode	240W	
	ECO Mode	170W	

	Image-care or equivalent	72W(TBD)
5. Mechanical Specification		
5.1 Color & Texture specifications	Refer to ID document for details	
5.2 Physical Dimensions(Width X Depth X Height)	311.81 x 109.26 x 244.12 mm	
5.3 Gross Weight	≤2.65kg (TBD)	
5.4 Security Slot	Kensington compatible slot 20Kg break away force	
5.5 Lens Cover	Detached lens cover	
5.6 Adjustment Feet	Fast adjustable foot in front, Adjustable foot in rear. Front/ Rear foot Tilt: 0-6° ,Right/Left: +2.2° /-0.5°	
5.7 Ceiling Mounting	Match BenQ's ceiling mount required. Use the same mounting as current shipping projectors.	
5.8 Screws	All color of screws should similar with the plastic color which close it.	
5.9 During PVT stage, limited sample of color and texture should be approved by BenQ industrial designer and mechanical engineer.	N/A	
6. Packaging		
6.1 Box Dimension	Refer to packing description (Internal :Refer to B405 document)	
6.2 Net Weight (Esti.)	≤ 2.65kg (TBD)	
6.3 Gross Weight (Esti.)	< 3.85 kg (Including Accessories, Projector)(TBD)	
6.4 Container Loading (40')	Refer to packing description (Internal :Refer to B405 document)	
6.5 Container Loading (20')	Refer to packing description (Internal :Refer to B405 document)	
6.6 Packaging Conceptual	Refer to packing description (Internal :Refer to B405 document)	
6.7 Container Layout	Refer to packing description (Internal :Refer to B405 document)	
6.8 Cushion Orientation	Refer to packing description (Internal :Refer to B405 document)	
6.9 Cushion Material	EPE(TBD)	
6.10 Box Compression Test	N/A	
6.11 Carton Artwork	Refer Packing Description and Appearance Description	
7. Thermal Specification Mechanical component temperature at ambience 0~40℃		
7.1 Surface held or touched for short periods	Normal surface: Metal< 60 ℃ Plastic< 85 ℃ Bottom surface @25℃ Metal< 55 ℃ Plastic< 70 ℃	
7.2 Surface which my be touched	Metal	Plastic
	< 70 ℃	< 95 ℃
7.3 Exhaust Air	< 95 ℃	
7.4 Audible Noise Level	Typical	Normal mode: 33dBA@ 25°C(table center)

		Eco mode: 30dBA @ 25°C(table center)
	Max.	Normal mode: 35dBA@ 25°C(table center) Eco mode: 32dBA @ 25°C(table center)
7.5 Fan Numbers	4	
8.0 Power Requirements		
8.1 Power Supply (Normal)		
8.2 Power consumption	Max.	375W
	Standby	0.5W Max. at 100 ~ 240VAC (disable loop through, LAN control, audio out)
	Normal	Typical 353W@110Vac
	ECO	Typical 292W@110Vac
	ECO Blank	Minimum **90W**@100VAC~240VAC
8.3 Power Connector	IEC 60320 C14	
8.4 Power Switch	No	
9.0 Compatibility		
9.1 Data Compatibility (Version 03)		
9.1.1 RGB Digital	Refer to 2.1.4 HDMI/DVI Input	
9.1.2 RGB Analog	Refer to 2.1.5 PC Input	
9.1.3 Macintosh	MAC 13/16/19/21	
9.2 Video Compatibility		
9.2.1 SDTV	480i/576i	
9.2.2 EDTV	480P/576P	
9.2.3 HDTV	720@50P/60P,1080@50i/60i/50p/60p/24p/25p/30p	
9.2.4 Video	NTSC/ NTSC4.43/ PAL (Including PAL-M, PAL-N)/ SECAM/ PAL60/	
9.3 Frequency		
9.3.1 H-Sync	15~102KHz	
9.3.2 V-Sync	23 ~ 120 Hz	
9.4 DDC	EDID 1.3	
10.0 User Interface		
10.1 Operator Keypad	10 Keys: Power ; Source ;Auto ; Blank ; Mode/Enter ; Menu/Exit ; Right ; Left ; Up(Keystone+) ; Down(Keystone-)	
10.2 LED Indicators	3 LEDS	
10.2.1 Power On/Off Status	Refer to 4.4 LED definition	
10.2.2 Lamp Status	Refer to 4.4 LED definition	
10.2.3 Temperature Status	Refer to 4.4 LED definition	
10.3 Electric Keystone	Vertical keystone and adjustable range ±40° without digital zoom or 3D function activate.(It will be updated in EVT0 stage)	
10.4 Remote Control	5F.261Q5.021 x 1	
11.0 Regulatory		
11.1 Safety	Vendor: Refer to RFQ Internal: Refer to B106 document	
11.2 EMC	Vendor: Refer to RFQ Internal: Refer to B106 document	
11.3 ESD	Follow IEC 61000-4-2 and EN55024 regulation	
11.4 GP	1.BenQ restriction of Hazardous Substance Guideline (SUP-QM-07-02) 2.Other GP control items please refer PRR	

12.0 Reliability	
12.1 MTBF	40000 hours except DMD chip, Color wheel, Lamp and Fan, Ballast
12.2 Lamp Lifetime	1). Lamp hour = Total lamp hour= X(hours used in Normal mode) + Y(hours used in Eco mode) + Z(hours used in SmartEco mode) X= lamp life spec of SmartEco/lamp life spec of Normal mode Y= lamp life spec of SmartEco/lamp life spec of Eco mode Z= lamp life spec of SmartEco/lamp life spec of SmartEco mode. 2). 50% of Projectors will have 50% Initial Minimum Brightness
12.2.1 Normal Mode	3500 hrs
12.2.2 ECO Mode	5000 hrs
12.2.3 Smart Eco Mode	6000 hrs(TBD)
13.0 Other Feature	
13.1 Color Temperature at Normal	5500/6500/7500/9300K(TBD) need customer confirm
13.2 Digital Zoom	PC: max 2X, Video: max 1.8X
13.3 Aspect Ratio	Auto / Real / 4:3 / Wide / Anamorphic / Letter Box
13.4 Projection Methods	Floor Front/Ceiling Front/Floor Rear/Ceiling Rear
13.5 3D Display	Yes, support DLP 3D
13.5.1 3D test condition	For Video application 1. Screen size:160” 2. 3D Goggle distance: 6M 3. Content: Samsung 3D Demo 4. 3D Goggle: Benq provide 5.lamp mdde:Eco mode
13.6 LAN	
13.6.1 LAN-Crestron eControl	NA
13.6.2 LAN-RoomView compatible	NA
13.6.3 LAN-PJ Link compatible	NA
13.6.4 LAN-AMX compatible	NA
13.6.5 LAN-Display(1 to many) (4 to 1)	NA
13.7 Certificate	
13.7.1 Win7 Certificate	NA
13.7.1 Crestron Certificate	NA
13.7.3 WEEE Certificate	Yes
13.7.4 SRS Certificate	NA
13.8 WCE3.0**	1. WCE will activate, if below conditions is fulfilled: (1)Input PC Source, (2)Dynamic mode, (3)Normal Lamp Power (4)RGB level <5% and last for 10 second (TBD) The lamp power will dim to Lamp Dimmest Power (follow Lamp Capability).
13.9 Screen Savor Mode** (Eco Blank & Lamp Saver)	Turn on Eco Blank: 1. When user presses the button once, the image would turn toEco Blank mode and show "Eco Blank" and other words in the bottom of screen.

	2. The lamp power will dim to Lamp Dimmest Power (follow Lamp Capability). Turn off Eco Blank: 1. When the image is in Eco Blank mode and user done: (1) Press any Keypad (2) Press IR The projector would turn off Eco Blank mode 2. The lamp power will back to original mode power
	Turn on Lamp Saver: 1. When there is no signal input and didn't do any projector operation last to 3 mins, a full black pattern will be displayed with "No single" and other message 3. The lamp power will dim to Lamp Dimmest Power (follow Lamp Capability).
	Turn off Lamp Saver: 1. When the image is in Lamp Saver mode and user done: (1) Press any Keypad (2) Input Signal (3) Press IR The projector would turn off Lamp Saver mode 4. The lamp power will back to original mode power
13.10 Smart ECO*	1. When the Smart ECO Mode is activated, lamp power will be changed automatically in the range of 100%~ Lamp Dimmest Power (follow Lamp Capability) based upon the input content. 2. When user press this key on remote, the "Lamp Settings" OSD will be pop-up.
13.11 Off-line cooling	NA
14.0 Green Eco Design	
14.1BenQ ecoFACTS	Refer to BenQ ecoFACTS Checking list

"* *" TBD

1. These mode only can operation after 3 min from start-up or recovery operation.
2. To dim the lamp power at Lamp Dimmest Power (follow Lamp Capability) is limited in 30mins duration and needs to go to Eco
   power 6 mins obligatory and automatically. After 6min, lamp will dim to Lamp Dimmest Power (follow Lamp Capability) continue.
3. Lamp power from one mode to another mode need around 20 sec to stabilize power

Input / Output Connectors

1.Input Terminals	
1.1 Computer Input - 1	RGB DB-15 x 1 (Female Type)
1.2 Computer Input - 2	NA
1.3 Video	Composite Video (RCA X 1)
1.4 S-Video	S-Video (Mini Din) X 1
1.5 Component - 1	RCA RGB x 1
1.6 Component - 2	NA
1.7 DVI - 1	NA
1.8 DVI - 2	NA
1.9 HDMI Digital Video – 1	HDMI 1.4 x1 (HDCP)
1.9.1 Support Audio Input	YES
1.9.2 CEC control	Yes (Follow Customer define)
1.9.3 HDMI Receive Distance	For Video, Auditorium model (Deep color 10bit:AWG26 25m) Deep color 12 bit:TBD m The cable and HDMI signal instrument is TBD
1.10 HDMI Digital Video – 2	HDMI 1.4 x1 (HDCP)
1.10.1 Support Audio Input	YES
1.10.2 CEC control	Yes (Follow Customer define)
1.11 Audio Input – 1 (Mini Jack)	Φ3.5mm Stereo Mini-Jack x 1
1.11.1 Related Source	Computer audio input
1.11.2 Input Signal Level	500mVrms 10 KΩ
1.12 Audio Input – 2 (Mini Jack)	NA
1.12.1 Related Source	NA
1.12.2 Input Signal Level	NA
1.13 Audio Input – 3 (RCA R &L)	RCA Audio Jack right and left
1.13.1 Related Source	Video/S-Video/ Component audio input
1.14 Audio Input – 4 (Mini Jack)	NA
1.15 USB Input	NA
1.16 LAN Input	NA
2.Output Terminals	
2.1 Computer Output	NA
2.1.1 Signal Source	NA
2.2 Audio Output	Φ3.5mm Mono Mini-Jack x 1
2.2.1 Signal Source	Shared with all audio Input and Power on/off Ring Tone
2.3 Speaker	10W X 1
2.3.1 Amplifier	8W
3.Control Terminals and Interface	
3.1 IR Receiver	IR Receiver x 2 (Front & Top)
3.1.1 Angle	±30°
3.1.2 Distance	0~8m
3.2 USB	
3.2.1 FW Upgrade	Yes
3.2.2 Mouse Control	Page up/down
3.2.3 USB Display	No
3.3 RS-232	D-Sub 9 Pins x 1, male Type
3.3.1 FW Upgrade	Yes
3.3.2 Control Command	Yes
3.4 Lan Control	No

3.5 12V Trigger (Screen Control)	Φ3.5mm Stereo Mini-Jack x 1
3.5.1 Driving Power	12V,500mA (Max)
3.5.2 Overload Protection	Yes (reversible)
3.6 Wired Remote Control	No

● Accessories

1.Accessory	
1. Power Cord 1.8m	X1
2. VGA Cable 1.8m	X1
3. CD x 1 (22 Language)	X 1
4. Quick-Start_Card (18Language)	X 1
5. Remote Control	5F.261Q5.021 x 1
6. Carry Case	N/A
7. Warranty Card	By SKU
8. Adapter	N/A

● Environmental

1.Environmental		
1.1 Temperature	Operating	0~40°C, without condensation
	Storage	-20~60°C, without condensation
1.2 Humidity	Operating	10~90%RH, without condensation
	Storage	10~90%RH, without condensation
1.3 Altitude	Operating	Without high altitude mode 0°C~35°C @ 0~1499m above sea level With high altitude mode 0°C~30°C @ 1500~3000m above sea level
	Storage	30℃@0~12,200m above sea level

Electrical Specification

1.1 Electrical Interface Character

1.1.1 Composite Video Input : N/A

(1) Pin definition (RCA Jack)

Composite Video

(2) Signal Level:

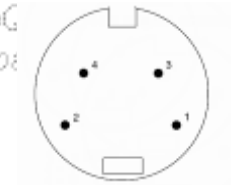
Signal	Parameter	Min	Type	Max	
CVBS Luminance	Amplitude, total (video+ sync)		1		Volts peak to peak
	Amplitude, video		0.7		Volts peak to peak
	Amplitude, sync		0.3		Volts peak to peak
	Impedance		75		ohm

(3) Support Timings: (Version 03)

Video mode	Horizontal frequency (KHz)	Vertical frequency (Hz)	Sub-carrier Frequency (MHz)	User Manual Supported	3D Field Sequential
NTSC*	15.73	60	3.58	Yes	◎
PAL	15.63	50	4.43	Yes	
SECAM	15.63	50	4.25 or 4.41	Yes	
PAL-M	15.73	60	3.58	Yes	
PAL-N	15.63	50	3.58	Yes	
PAL-60	15.73	60	4.43	Yes	
NTSC4.43	15.73	60	4.43	Yes	

1.1.2 S-Video Input

(1) Pin definition (Mini Din)



4-pin Mini Din Connector

(2) Signal Level:

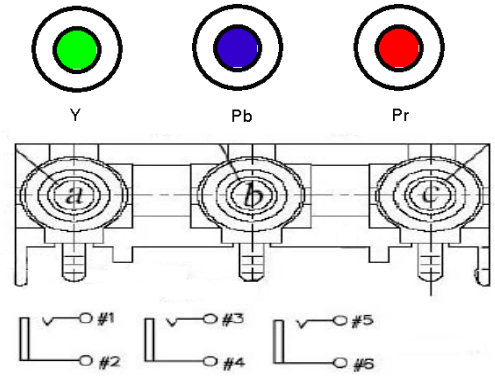
PIN	Signal	Parameter	Min	Type	Max	
1	GND					
2	GND					
3	CVBS Luminance	Amplitude, total (video+ sync)		1		Volts peak to peak
		Amplitude, video		0.7		Volts peak to peak
		Amplitude, sync		0.3		Volts peak to peak
		Impedance		75		ohm
4	CVBS Luminance	Amplitude (for NTSC)		286		m Volts peak to peak
		Amplitude (for PAL/SECAM)		300		m Volts peak to peak
		Impedance		75		ohm

(3) Support Timings: (Version 03)

Video mode	Horizontal frequency (KHz)	Vertical frequency (Hz)	Sub-carrier Frequency (MHz)	User Manual Supported	3D Field Sequential
NTSC*	15.73	60	3.58	Yes	◎
PAL	15.63	50	4.43	Yes	
SECAM	15.63	50	4.25 or 4.41	Yes	
PAL-M	15.73	60	3.58	Yes	
PAL-N	15.63	50	3.58	Yes	
PAL-60	15.73	60	4.43	Yes	
NTSC4.43	15.73	60	4.43	Yes	

1.1.3 Component Video Input

(1) Pin definition



(2) Signal Level:

Pin	Signal	Parameter	Min	Type	Max	
5	Pr DATA	Impedance		75		Ohm
3	Pb DATA	Black pedestal		0		Volts
1	Y DATA_SOG	Impedance		75		Ohm
		Amplitude		1		Volts peak-to-peak
		Video amplitude		0.7		Volts peak-to-peak
		Sync amplitude		0.3		Volts peak-to-peak
		Black pedestal		0		Volts
6	Red GND					
2	Green GND					
4	Blue GND					

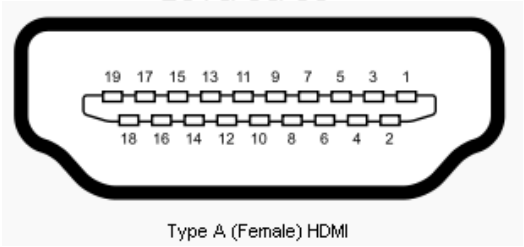
(3) Support Timings: (Version 03)

Timing	Resolution	Horizontal frequency (KHz)	Vertical Frequency (Hz)	Dot Clock Frequency (MHz)	User Manual Supported	3D Field Sequential
480i*	720 x 480	15.73	59.94	13.5	Yes	◎
480p	720 x 480	31.47	59.94	27	Yes	
576i	720 x 576	15.63	50	13.5	Yes	
576p	720 x 576	31.25	50	27	Yes	
720/50p	1280 x 720	37.5	50	74.25	Yes	
720/60p	1280 x 720	45.00	60	74.25	Yes	
1080/50i	1920 x 1080	28.13	50	74.25	Yes	
1080/60i	1920 x 1080	33.75	60	74.25	Yes	
1080/24P	1920 x 1080	27	24	74.25	Yes	
1080/25P	1920 x 1080	28.13	25	74.25	Yes	
1080/30P	1920 x 1080	33.75	30	74.25	Yes	
1080/50P	1920 x 1080	56.25	50	148.5	Yes	
1080/60P	1920 x 1080	67.5	60	148.5	Yes	

1.1.4 HDMI/DVI Input

- HDMI 1.3 Compliance
- DVI 1.0 Compliance
- HDCP 1.1 Compliance

(1) Pin definition



Type A (Female) HDMI

Pin	Signal
1	TMDS Data2+
2	TMDS Data2 Shield
3	TMDS Data2–
4	TMDS Data1+
5	TMDS Data1 Shield
6	TMDS Data1–
7	TMDS Data0+
8	TMDS Data0 Shield
9	TMDS Data0–
10	TMDS Clock+
11	TMDS Clock Shield
12	TMDS Clock–
13	CEC
14	Reserved (N.C. on device)
15	SCL
16	SDA
17	DDC/CEC Ground
18	+5 V Power (max 50 mA)
19	Hot Plug Detect

(2) Support Video Timings: (Version 03)

Timing	Resolution	Horizontal frequency (KHz)	Vertical frequency (Hz)	Dot Clock Frequency (MHz)	Remark	User Manual Supported	3D Field Sequential	3D frame packing	3D over-under	3D side-by-side
480i	720(1440) x 480	15.73	59.94	27	HDMI onl	Yes	◎			
480p	720 x 480	31.47	59.94	27	HDMI onl	Yes				
576i	720(1440) x 576	15.63	50	27	HDMI/DV	Yes				
576p	720 x 576	31.25	50	27	HDMI/DV	Yes				
720/50p	1280 x 720	37.5	50	74.25	HDMI/DV	Yes		◎	◎	
720/60p	1280 x 720	45.00	60	74.25	HDMI/DV	Yes		◎	◎	
1080/24P	1920 x 1080	27	24	74.25	HDMI/DV	Yes		◎	◎	
1080/25P	1920 x 1080	28.13	25	74.25	HDMI/DV	Yes				
1080/30P	1920 x 1080	33.75	30	74.25	HDMI/DV	Yes				
1080/50i	1920 x 1080	28.13	50	74.25	HDMI/DV	Yes				◎
1080/60i	1920 x 1080	33.75	60	74.25	HDMI/DV	Yes				◎
1080/50P	1920 x 1080	56.25	50	148.5	HDMI/DV	Yes				
1080/60P	1920 x 1080	67.5	60	148.5	HDMI/DV	Yes				

(3) Support P Timings: (Version 03)

Resolution	Mode	Refresh rate (Hz)	H-frequency (kHz)	Clock (MHz)	User Manual Supported	3D frame sequential	3D over-under	3D side-by-side
640 x 480	VGA_60*	59.940	31.469	25.175	Yes	◎	◎	◎
	VGA_72	72.809	37.861	31.500	Yes			
	VGA_75	75.000	37.500	31.500	Yes			
	VGA_85	85.008	43.269	36.000	Yes			
720 x 400	720x400_70	70.087	31.469	28.3221	Yes			
800 x 600	SVGA_60*	60.317	37.879	40.000	Yes	◎	◎	◎
	SVGA_72	72.188	48.077	50.000	Yes			
	SVGA_75	75.000	46.875	49.500	Yes			
	SVGA_85	85.061	53.674	56.250	Yes			
	SVGA_120** (Reduce Blanking)	119.854	77.425	83.000	Yes	◎		
1024 x 768	XGA_60*	60.004	48.363	65.000	Yes	◎	◎	◎
	XGA_70	70.069	56.476	75.000	Yes			
	XGA_75	75.029	60.023	78.750	Yes			
	XGA_85	84.997	68.667	94.500	Yes			
	XGA_120** (Reduce Blanking)	119.989	97.551	115.500	Yes	◎		
1152 x 864	1152 x 864_75	75.00	67.500	108.000	Yes			
1024x576	BenQ Notebook Timing	60.00	35.820	46.996	Yes			
1024x600	BenQ Notebook Timing	64.995	41.467	51.419	Yes			
1280x720	1280 x 720_60*	60	45.000	74.250	Yes	◎	◎	◎
	1280x720_120**	120	90.000	148.500	No	◎		
1280 x 768	1280 x 768_60* (Reduce Blanking)	60	47.396	68.25	No	◎	◎	◎
	1280 x 768_60*	59.870	47.776	79.5	Yes	◎	◎	◎
1280 x 800	WXGA_60*	59.810	49.702	83.500	Yes	◎	◎	◎
	WXGA_75	74.934	62.795	106.500	Yes			
	WXGA_85	84.880	71.554	122.500	Yes			
	WXGA_120** (Reduce Blanking)	119.909	101.563	146.25	Yes	◎		
1280 x 1024	SXGA_60***	60.020	63.981	108.000	Yes		◎	◎
	SXGA_75	75.025	79.976	135.000	Yes			
	SXGA_85	85.024	91.146	157.500	Yes			
1280 x 960	1280 x 960_60***	60.000	60.000	108	Yes		◎	◎
	1280 x 960_85	85.002	85.938	148.500	Yes			
1360 x 768	1360 x 768_60***	60.015	47.712	85.500	Yes		◎	◎
1440 x 900	WXGA+_60*** (Reduce Blanking)	60	55.469	88.75	No		◎	◎
	WXGA+_60***	59.887	55.935	106.500	Yes		◎	◎
1400X1050	SXGA+_60***	59.978	65.317	121.750	Yes		◎	◎
1600x1200	UXGA***	60.000	75.000	162.000	Yes		◎	◎

1680x1050	1680x1050_60*** (Reduce Blanking)	59.883	64.674	119.000	No		◎	◎
	1680x1050_60***	59.954	65.290	146.250	Yes		◎	◎
1920 x 1200	1920x1200_60*** (Reduce Blanking)	59.950	74.038	154.000	No		◎	◎
640x480 @67Hz	MAC13	66.667	35.000	30.240	Yes			
832x624 @75Hz	MAC16	74.546	49.722	57.280	Yes			
1024x768 @75Hz	MAC19	75.020	60.241	80.000	Yes			
1152x870 @75Hz	MAC21	75.06	68.68	100.00	Yes			
1920X1080(VESA)	1920X1080_60	59.963	67.158	173	No			

Note. There 3D timing showing depend the EDID file and VGA display card.
It is possible that user cannot choose the above 3D timings on VGA display card.

(4) Support Audio:

(a) HDMI Mode:

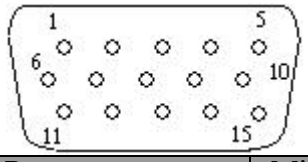
- Support LPCM, two audio channels
- Support audio sampling rate : 32kHz, 44.1kHz, 48kHz
- Support audio bit rate : 16 bits, 20 bits, 24 bits

(b) DVI Mode:

Analog audio is supported through PC audio input terminal.

1.1.5 PC Input

(1) Pin definition and Signal Level:



Pin	Signal	Parameter	Min	Type	Max	
1	RDATA	Impedance		75		Ohm
2	GDATA	Amplitude		0.7		Volts peak-to-peak
3	BDATA	Black pedestal		0		Volts
		Pixel Clock		170		M Hz
2	GDATA_SOG	Impedance		75		Ohm
		Amplitude		1		Volts peak-to-peak
		Video amplitude		0.7		Volts peak-to-peak
		Sync amplitude		0.3		Volts peak-to-peak
		Black pedestal		0		Volts
		Pixel Clock		170		M Hz
13	HDATA	Impedance		1		K ohm
		Amplitude, low level	0		0.5	volt
		Amplitude, high level	2.5		5	Volt
		Frequency	31		102	K Hz
14	VDATA	Impedance		1		K ohm
		Amplitude, low level	0		0.8	volt
		Amplitude, high level	2.5		5	Volt
		Frequency	48		120	Hz
12	SDADATA	Amplitude, low level	0		0.8	volt
		Amplitude, high level	2.5		5	Volt
15	SCLDATA	Amplitude, low level	0		0.8	volt
		Amplitude, high level	2.5		5	Volt
4	NC					

5	NC					
6	Red GND					
7	Green GND					
8	Blue GND					
9	DDCP 5V			5		Volts
10	Sync. Return					
11	GND					
2	G DATA Share with Y	Amplitude (with sync)		1		Volts peak to peak
		Impedance		75		ohm
1	R DATA Share with Pr	Amplitude		0.7		Volts peak to peak
		Impedance		75		ohm
3	B DATA Share with Pb	Amplitude		0.7		Volts peak to peak
		Impedance		75		ohm

(2) Support PC Timings: (Version 03)

Resolution	Mode	Refresh rate (Hz)	H-frequency (kHz)	Clock (MHz)	User Manual Supported	3D frame sequential	3D over-under	3D side-by-side
720 x 400	720x400_70	70.087	31.469	28.3221	Yes			
640 x 480	VGA_60*	59.940	31.469	25.175	Yes	◎	◎	◎
	VGA_72	72.809	37.861	31.500	Yes			
	VGA_75	75.000	37.500	31.500	Yes			
	VGA_85	85.008	43.269	36.000	Yes			
800 x 600	SVGA_60*	60.317	37.879	40.000	Yes	◎	◎	◎
	SVGA_72	72.188	48.077	50.000	Yes			
	SVGA_75	75.000	46.875	49.500	Yes			
	SVGA_85	85.061	53.674	56.250	Yes			
	SVGA_120** (Reduce Blanking)	119.854	77.425	83.000	Yes	◎		
1024 x 768	XGA_60*	60.004	48.363	65.000	Yes	◎	◎	◎
	XGA_70	70.069	56.476	75.000	Yes			
	XGA_75	75.029	60.023	78.750	Yes			
	XGA_85	84.997	68.667	94.500	Yes			
	XGA_120** (Reduce Blanking)	119.989	97.551	115.500	Yes	◎		
1152 x 864	1152 x 864_75	75.00	67.500	108.000	Yes			
1024 x 576	BenQ NB Timing	60.0	35.820	46.966	Yes			
1024 x 600	BenQ NB Timing	64.995	41.467	51.419	Yes			
1280x720	1280 x 720_60*	60	45.000	74.250	Yes	◎	◎	◎
	1280x720_120**	120	90.000	148.500	No	◎		
1280 x 768	1280 x 768_60* (Reduce Blanking)	60	47.396	68.25	No	◎	◎	◎
	1280 x 768_60*	59.870	47.776	79.5	Yes	◎	◎	◎
1280 x 800	WXGA_60*	59.810	49.702	83.500	Yes	◎	◎	◎
	WXGA_75	74.934	62.795	106.500	Yes			
	WXGA_85	84.880	71.554	122.500	Yes			
	WXGA_120** (Reduce Blanking)	119.909	101.563	146.25	Yes	◎		
1280 x 1024	SXGA_60***	60.020	63.981	108.000	Yes		◎	◎

	SXGA_75	75.025	79.976	135.000	Yes			
	SXGA_85	85.024	91.146	157.500	Yes			
1280 x 960	1280 x 960_60***	60.000	60.000	108	Yes		◎	◎
	1280 x 960_85	85.002	85.938	148.500	Yes			
1360 x 768	1360 x 768_60***	60.015	47.712	85.500	Yes		◎	◎
1440 x 900	WXGA+_60*** (Reduce Blanking)	60	55.469	88.75	No		◎	◎
	WXGA+_60***	59.887	55.935	106.500	Yes		◎	◎
1400X1050	SXGA+_60***	59.978	65.317	121.750	Yes		◎	◎
1600x1200	UXGA***	60.000	75.000	162.000	Yes		◎	◎
1680 x 1050	1680x1050_60*** (Reduce Blanking)	59.883	64.674	119.000	No		◎	◎
	1680x1050_60***	59.954	65.290	146.250	Yes		◎	◎
640x480@67Hz	MAC13	66.667	35.000	30.240	Yes			
832x624@75Hz	MAC16	74.546	49.722	57.280	Yes			
1024x768@75Hz	MAC19	74.93	60.241	80.000	Yes			
1152x870@75Hz	MAC21	75.06	68.68	100.00	Yes			
1920X1080(VESA)	1920X1080_60****	59.963	67.158	173	No			

Note. There 3D timing showing depend the EDID file and VGA display card.
It is possible that user cannot choose the above 3D timings on VGA display card.

(3) Support Timings: (Version 03)

Timing	Resolution	Horizontal frequency (KHz)	Vertical Frequency (Hz)	Dot Clock Frequency (MHz)	User Manual Supported	3D Field Sequential
480i	720 x 480	15.73	59.94	13.5	Yes	◎
480p	720 x 480	31.47	59.94	27	Yes	
576i	720 x 576	15.63	50	13.5	Yes	
576p	720 x 576	31.25	50	27	Yes	
720/50p	1280 x 720	37.5	50	74.25	Yes	
720/60p	1280 x 720	45.00	60	74.25	Yes	
1080/50i	1920 x 1080	28.13	50	74.25	Yes	
1080/60i	1920 x 1080	33.75	60	74.25	Yes	
1080/24P	1920 x 1080	27	24	74.25	Yes	
1080/25P	1920 x 1080	28.13	25	74.25	Yes	
1080/30P	1920 x 1080	33.75	30	74.25	Yes	
1080/50P	1920 x 1080	56.25	50	148.5	Yes	
1080/60P	1920 x 1080	67.5	60	148.5	Yes	

1.1.6 Audio Input (RCAx2)

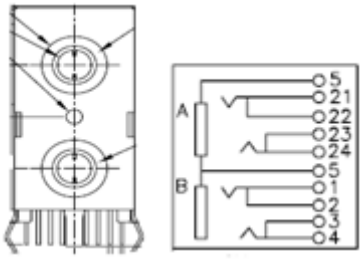
(1) Pin definition :

(2) Signal Level: N/A

PIN	Signal	Parameter	Min	Type	Max	
1	L Audio	Amplitude		0.5	2	VRMS
		Impedance	10			KΩ
2	R Audio	Amplitude		0.5	2	VRMS
		Impedance	10			KΩ

1.1.7 Audio Input (Mini-Jack φ3.5mm)

(1) Pin definition

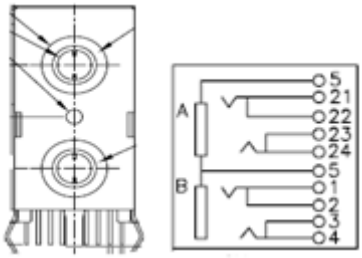


(2) Signal Level:

PIN	Signal	Parameter	Min	Type	Max	
5	GND					
4	Audio In Left	Amplitude		0.5	2	VRMS
		Impedance	10			KΩ
3	NC					
2	NC					
1	Audio In Right	Amplitude		0.5	2	VRMS
		Impedance	10			KΩ

1.1.8 Audio Headphone Output (Phone-Jack φ3.5mm)

(1) Pin definition

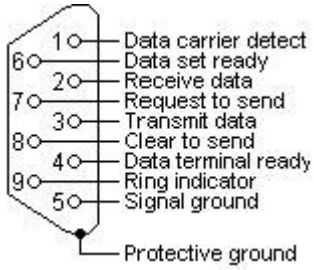


(2) Signal Level:

PIN	Signal	Parameter	Min	Type	Max	
24	Audio Out Left	Amplitude				mV
		Impedance		32		Ω
22,23	Audio out detect	Output ON			0.2	VDD
		Output Off	0.8			VDD
21	Audio Out Right	Amplitude				mV
		Impedance		32		Ω

1.1.9 RS232 Control Port

(1) Pin definition (D-Sub 9 Pin)



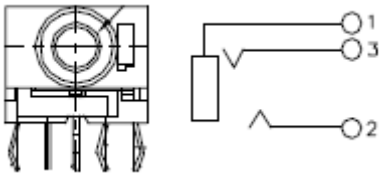
(2) Signal Level:

PIN	Signal	Parameter	Min	Type	Max	
1	NC					
2	RX	Amplitude (with sync)	-25		25	Volt
3	TX	Amplitude	-13.2		13.2	Volt
4	NC					
5	GND					

6	NC					
7	RTSZ					
8	CTSZ					
9	NC					

1.1.10 Lan Control Port (Follow IEEE 802.3) : N/A

1.1.11 Screen control output (Phone-Jack φ 3.5mm)



(1) Signal Level:

PIN	Signal	Parameter	Min	Type	Max	
2	DC	Amplitude			12	V
		Current			0.5	A
3	Ring					
1	GND					

(2) Overload Protection:
- Reversible Fuse.

Signal	Parameter	Min	Type	Max	
I hode				0.5	A
I trip		1.0			A

1.1.12 Microphone : N/A

1.2 Speaker

Signal	Parameter	Min	Type	Max	
Audio	Impedance (audio in)		10		Kohm
	Amplitude (audio in)		500		mVolts rms
	Bandwidth	300Hz		16kHz	
	S/N Ratio	40			dB
	Total Harmonic Distortion			10	%

● Power Supply Specification

1.1 Input Power Specification

Specification	Description
Input Voltage Range	The unit shall meet all the operating requirements with the range 90 ~ 264 VAC
Frequency Range	The unit shall meet all the operating requirements with an input frequency range 47 Hz ~ 63 Hz
Regulation Efficiency	80 % (typical) measuring at 115Vac and full load

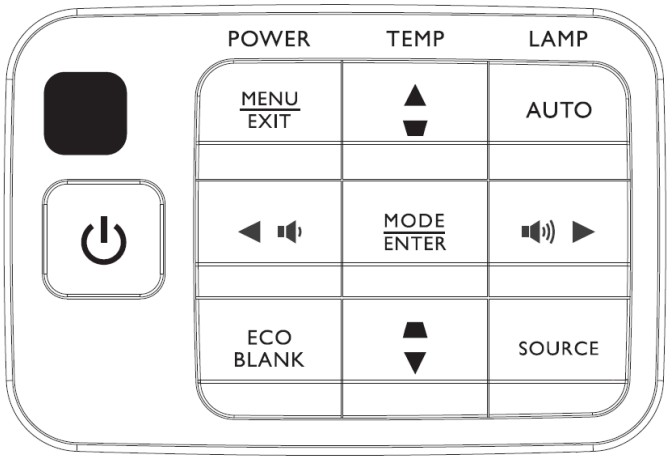
1.2 Varistor Requirement
The power supply's Varistor component should stand 510V or higher power.

1.3 Lamp Power Requirement

Specification	Description
Starting pulse from Ignitor	2.4KV Min.

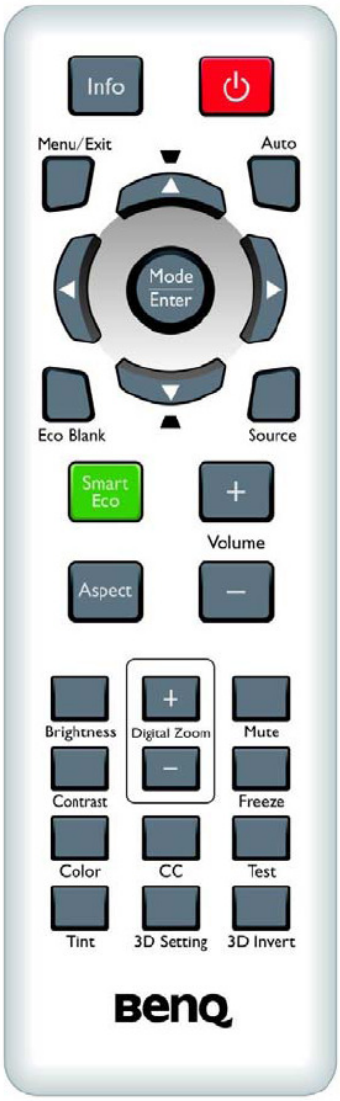
UI Specification

Keypad Description



Key Name	Detailed Description
◄ / Volume -	1. When there is OSD menu, user can press this key to move to the left item.
	2. By pressing "Volume -" button, the volume of the magnified sound will be reduced gradually.
► / Volume +	1. When there is OSD menu, user can press this key to move to right item
	2. By pressing "Volume +" button, the volume of the magnified sound will be increase gradually.
▲ / Keystone +	1. When user presses this button once, it will increase the keystone value
	2. When there is OSD menu, user can press this key to move to upper item
▼ / Keystone -	1. When user presses this button once, it will decrease the keystone value
	2. When there is OSD menu, user can press this key to move to next item
Source	User could press this key to call out Source OSD to select search source. After pressing "Enter" key, system would keep searching selected source
Power	1. User presses this key once to turn on projector
Auto	"Auto" will not be active under video input, including video, S-video and Y/Pb/Pr. The current source info will be displayed at the bottom right of the screen for 3 seconds after users press Auto
Eco Blank	1. When user presses the button once, the image would turn to blank and show Eco Blank message in the right-bottom of screen
	2. When the image is blank, user press this key back to normal image
Mode/Enter	1. When there is no OSD menu, this button is Mode hot key; user would press this button to choose one of preset modes
	2. When there is confirm message, user could press this key to confirm
Menu/Exit	1. User could press this button to call out OSD
	2. When it exits OSD, user could press this button to leave current page or items or to close OSD.

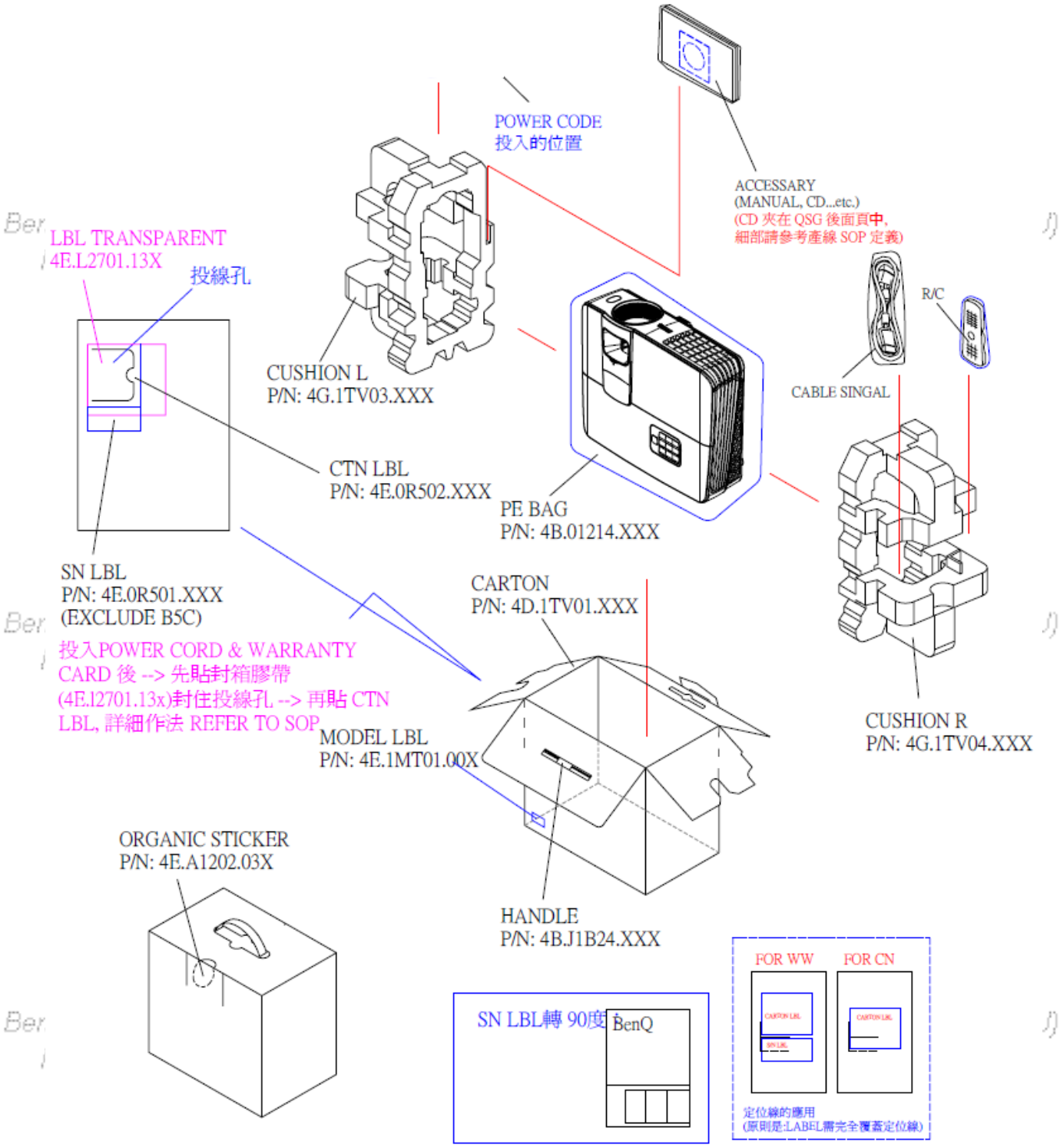
Remote Control Function and Key Code Definition
(Detail See Appendix2)



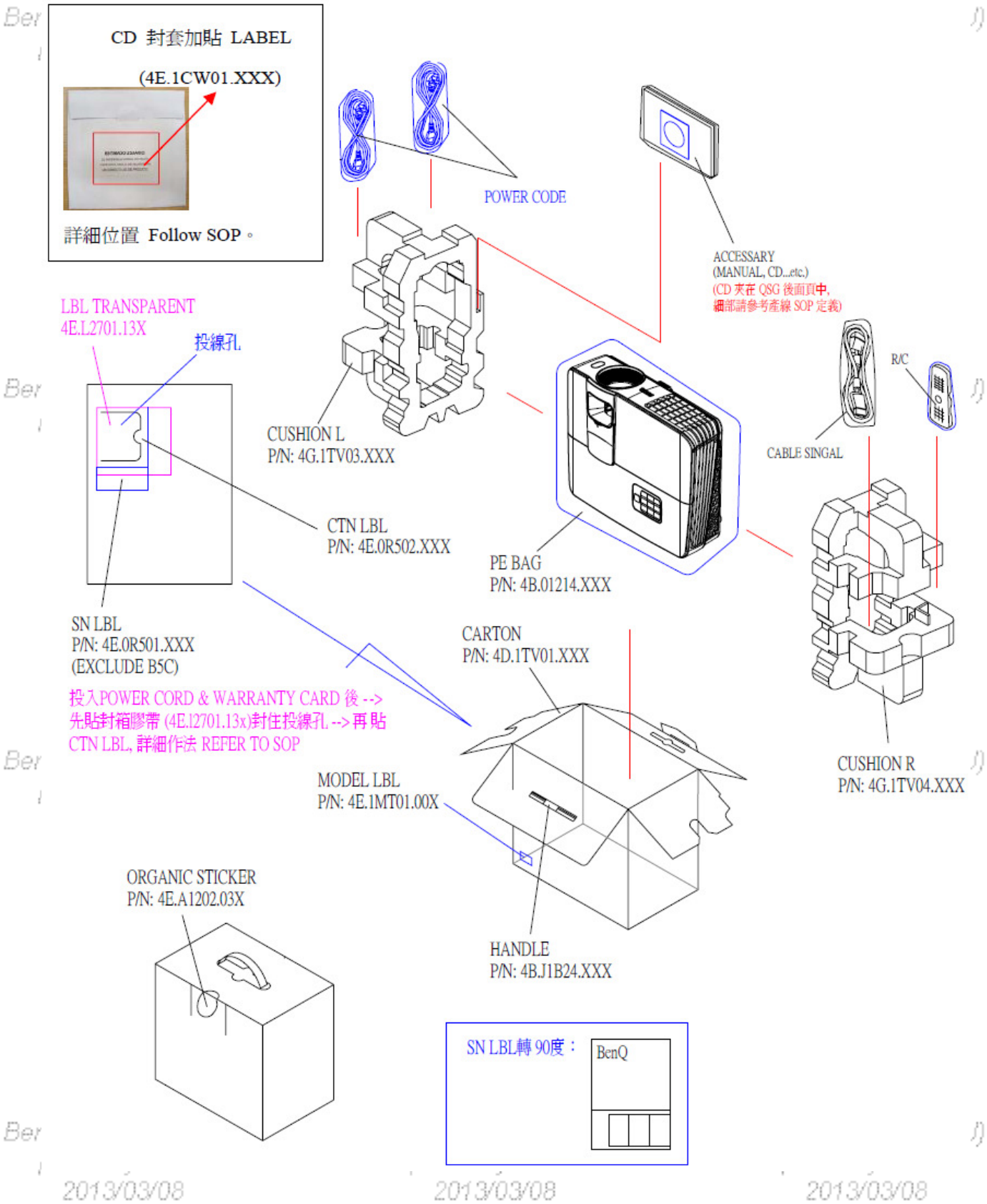
3.2 Packing

【NOTE】The updated Service BOM is on SPO system. Please check it to order service parts.

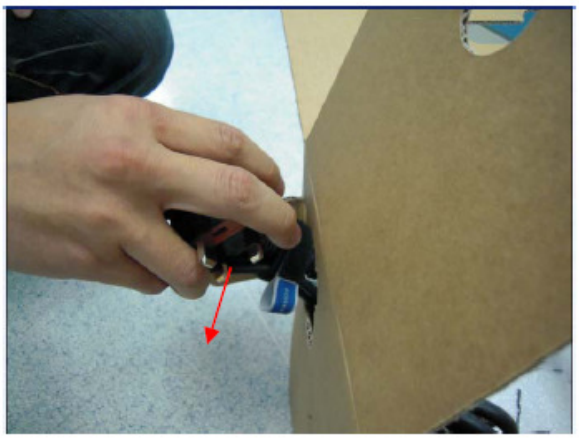
1. For 9H.J7L77.17A~T, exclude L :



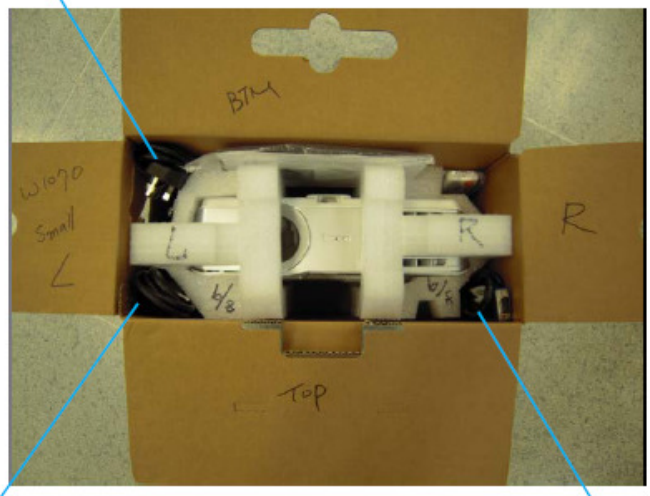
2. For 9H.J7L77.17L :



2013/03/08 2013/03/08 2013/03/08



注意線材 PIN 腳方向必須不能朝向機台，投線時 PIN 腳如圖示



ONLY FOR L SKU

BenQ Russia (BQRU)
pavel.myakotin
2013/03/08

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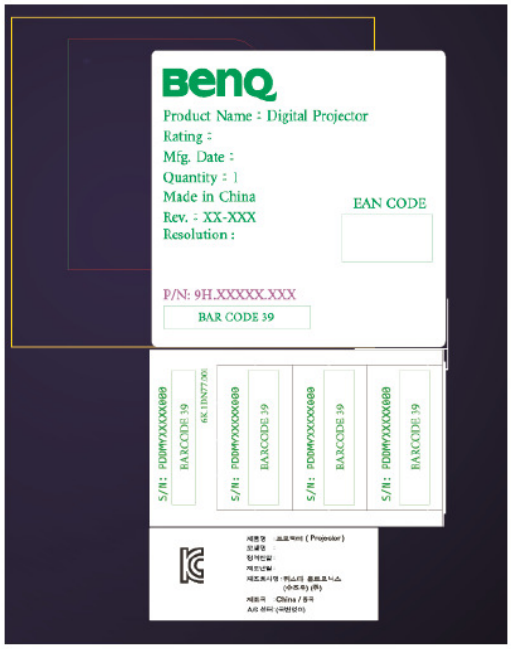
pavel.myakotin
2013/03/08

BenQ Russia (BQRU)
pavel.myakotin
2013/03/08

For **17F** : CTN label location

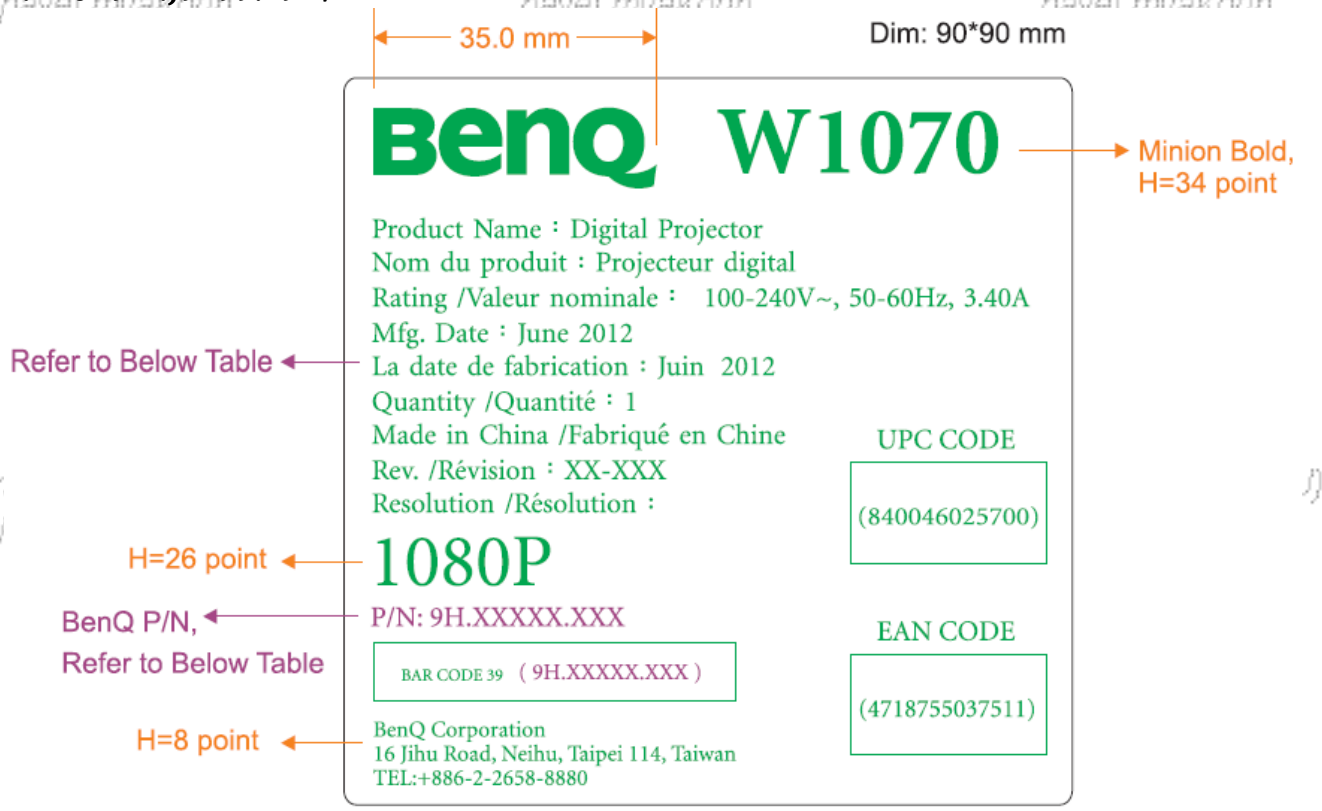
For **17K**: CTN label location



For **17D**: CTN label location

CTN LBL PRINTING:

1. For 9H.J7L77.17A/L



*** Besides Mark, English Font - Minion, H=10 point

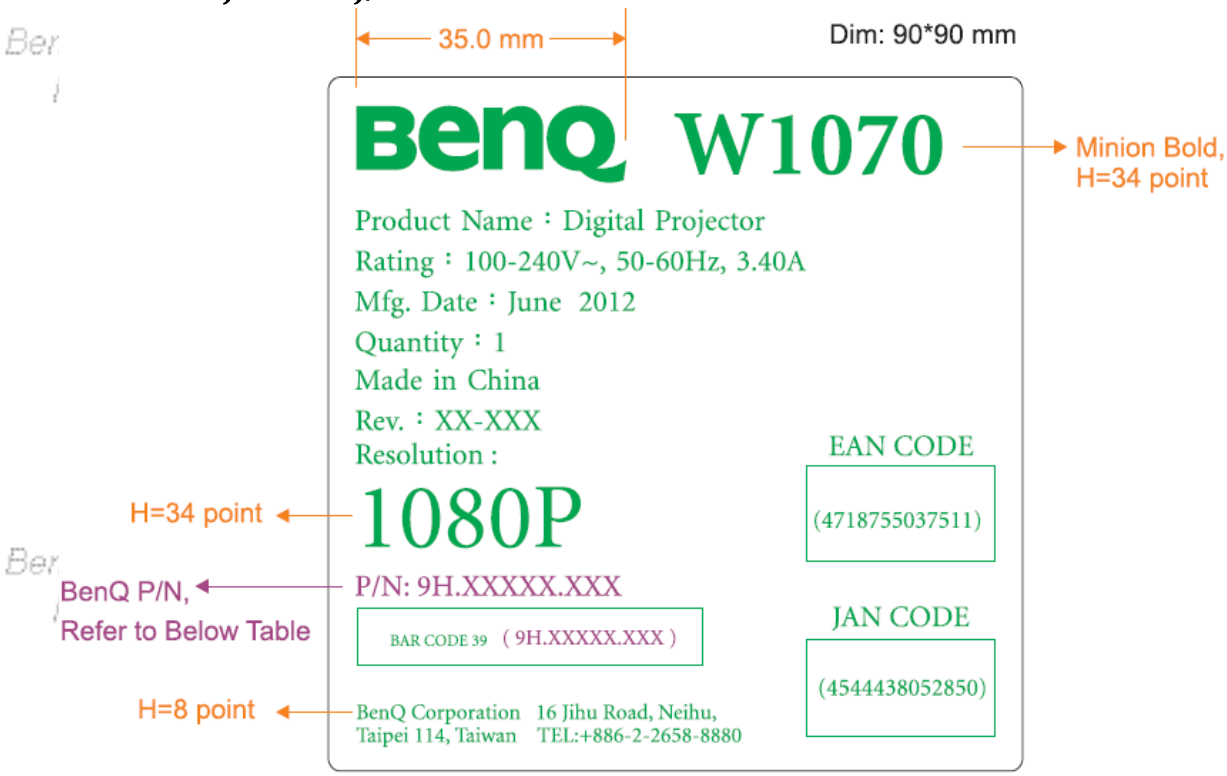
*** Scale 1:1

English	French
January	Janvier
February	Février
March	Mars
April	Avril
May	Mai
June	Juin

English	French
July	Juillet
August	Août
September	Septembre
October	Octobre
November	Novembre
December	Décembre

Qisda P/N	BenQ P/N
9J.1TV77.B5A	9H.J7L77.17A
9J.1TV77.B5L	9H.J7L77.17L

2. For 9H.J7L77.17J/K



*** Besides Mark, English Font - Minion, H=11 point

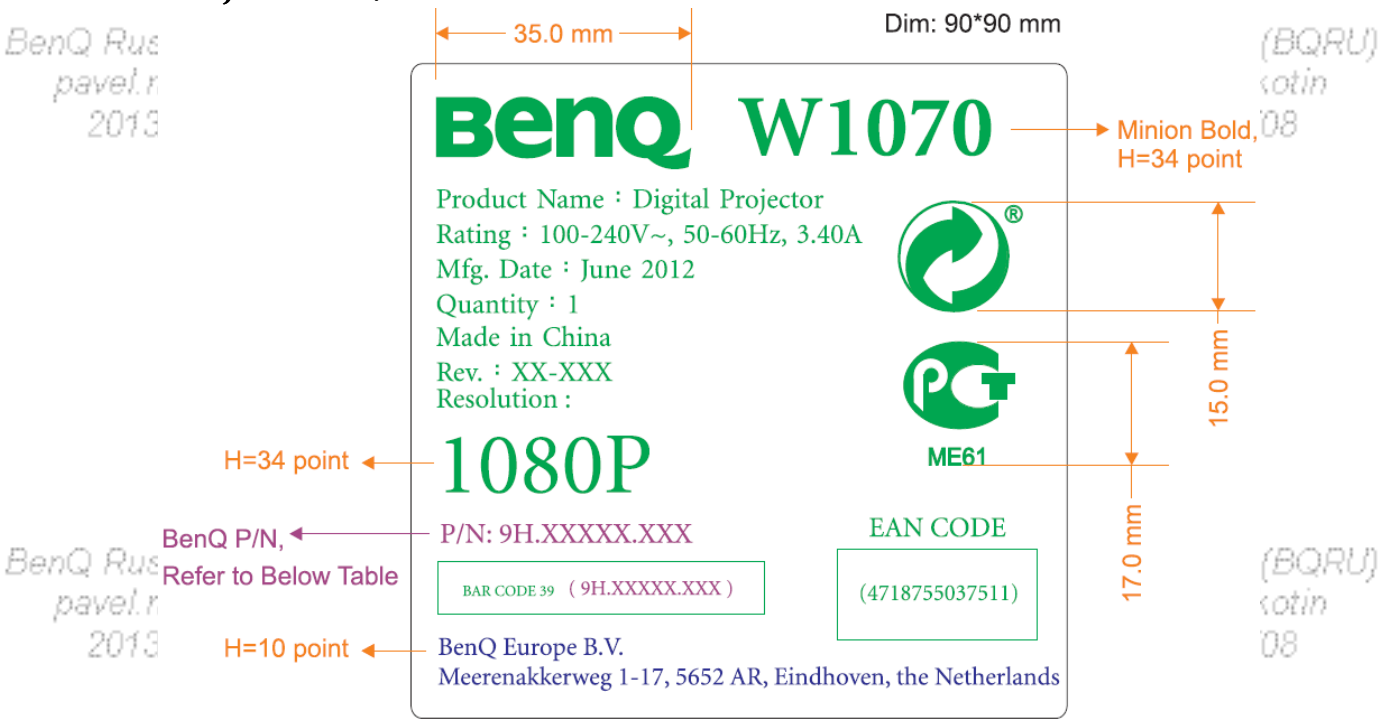
*** Scale 1:1

Qisda P/N	BenQ P/N
9J.1TV77.B5J	9H.J7L77.17J
9J.1TV77.B5K	9H.J7L77.17K

KC label only for 13K:

*** English Font - Minion, H=7 point

3. For 9H.J7L77.17E/U

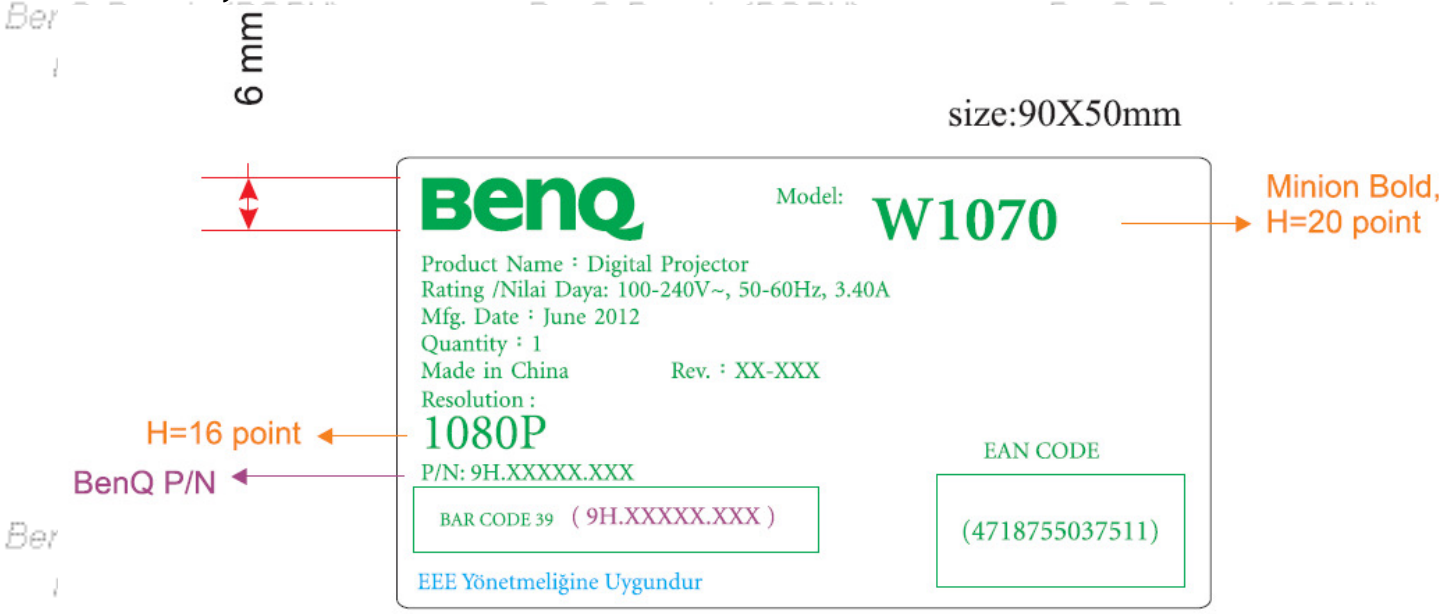


*** Besides Mark, English Font - Minion, H=11 point

*** Scale 1:1

Qisda P/N	BenQ P/N
9J.1TV77.B5E	9H.J7L77.17E
9J.1TV77.B5U	9H.J7L77.17U

4. For 9H.J7L77.17F

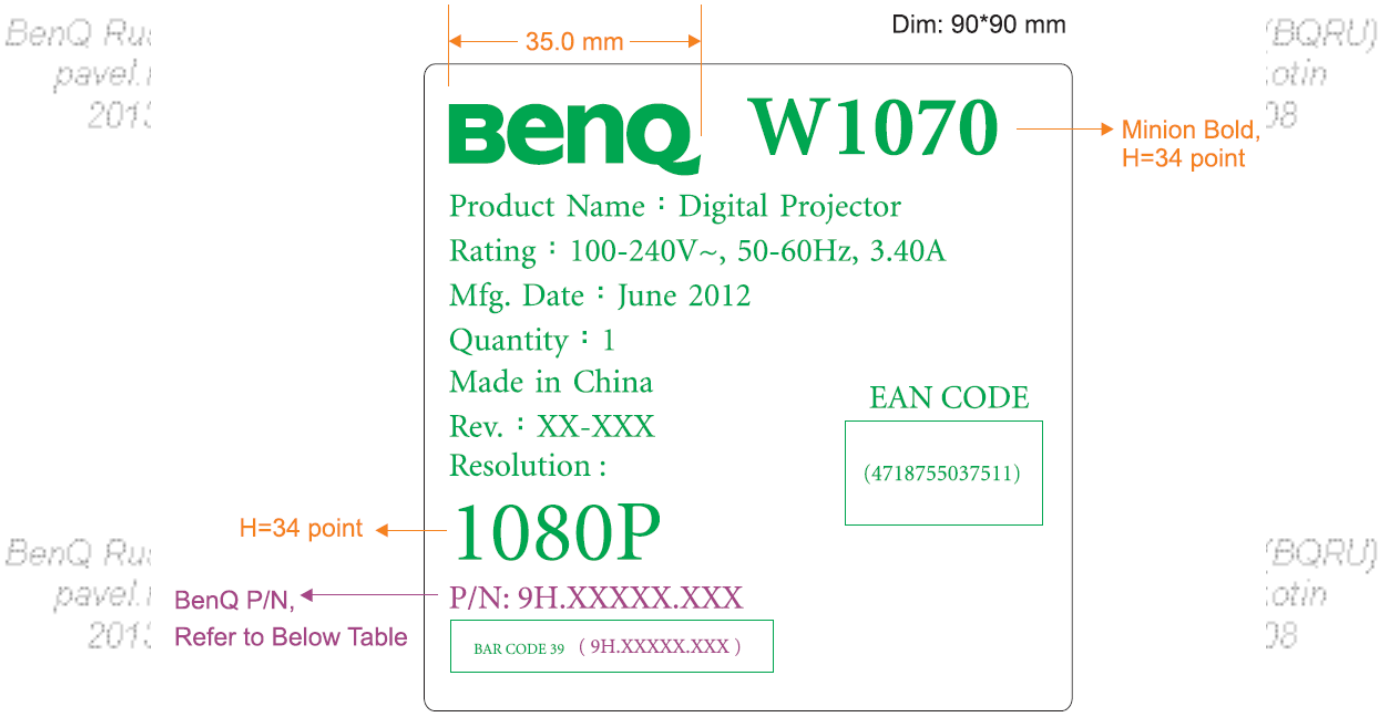


*** Besides Mark, English Font - Minion, H=7.5 point

*** Scale 1:1

Qisda P/N	BenQ P/N
9J.1TV77.B5F	9H.J7L77.17F

5. For 9H.J7L77.17D/P/S



*** Besides Mark, English Font - Minion, H=13 point

*** Scale 1:1

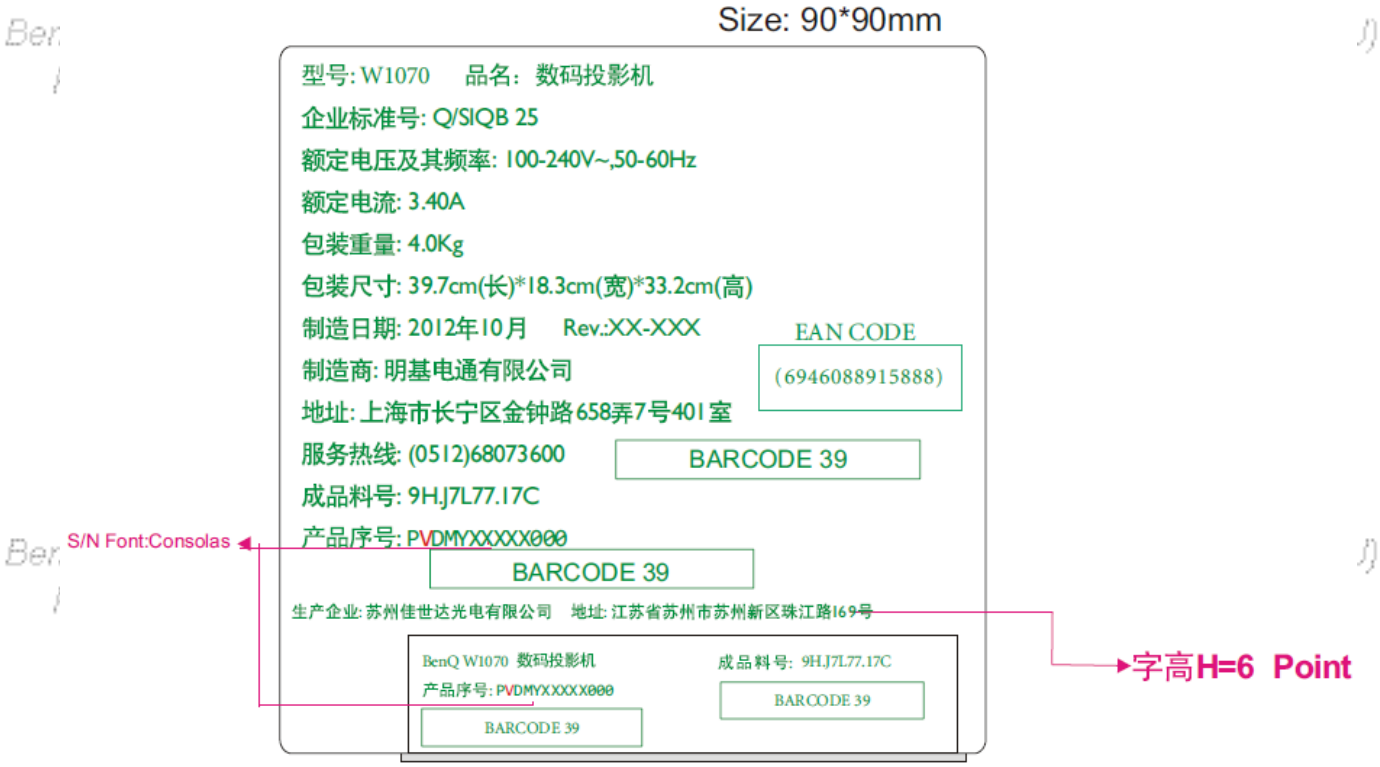
Qisda P/N	BenQ P/N
9J.1TV77.B5P	9H.J7L77.17P
9J.1TV77.B5S	9H.J7L77.17S
9J.1TV77.B5D	9H.J7L77.17D

6. For 9H.J7L77.17T

*** Besides Mark, English Font - Minion, TC Font 文鼎中黑 H=10point

*** Scale 1:1

7. For 9H.J7L77.17C



注：除特别标示外打印的中文印字型为黑体，
英文及数字的打印字型为Minion，字高是 9Point。

SPEC LBL PRINTING:

1. For 9H.J7L77.17x, exclude 13C/L

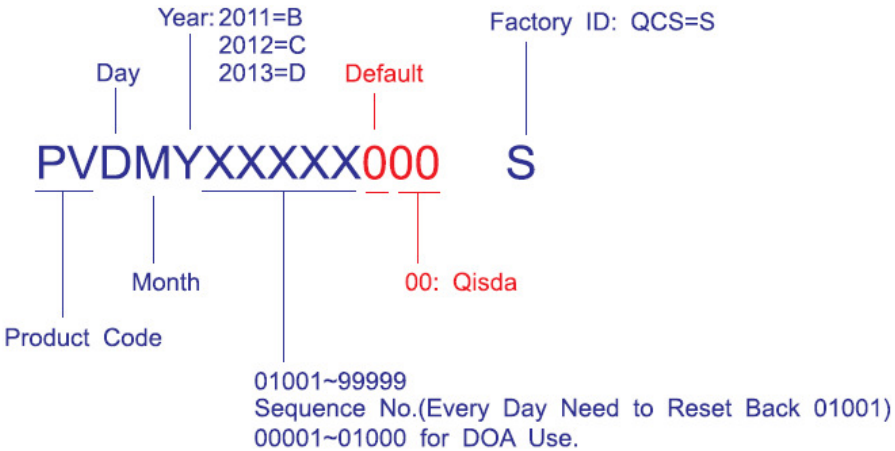
Dim: 95*55 mm

S/N Font: Consolas

*** Besides Mark, English Font - Gill Sans, TC Font - 文鼎中黑, SC Font, H=5.5 point

*** P/N / 產品料號：9H.J7L77.17X，最後一碼以 X 表示。

*** Scale 1:1

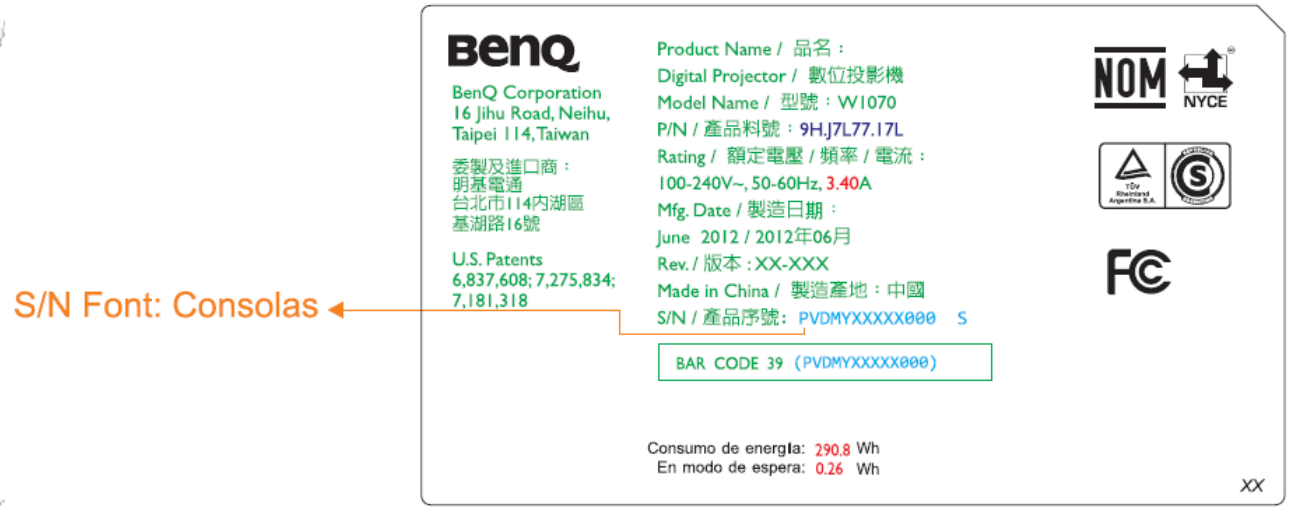


Day: 1~9, A=10, B=11, C=12, D=13, E=14, F=15, G=16, H=17, J=18, K=19, L=20, M=21, N=22, P=23, R=24, S=25, T=26, V=27, W=28, X=29, Y=30, Z=31(don't use :0,I,O,Q,U)

Month: 1=Jan, 2=Feb, 3=Mar, 4=Apr, 5=May, 6=Jun, 7=Jul, 8=Aug, 9=Sep, A=Oct., B=Nov, C=Dec

2. For 9H.J7L77.17L

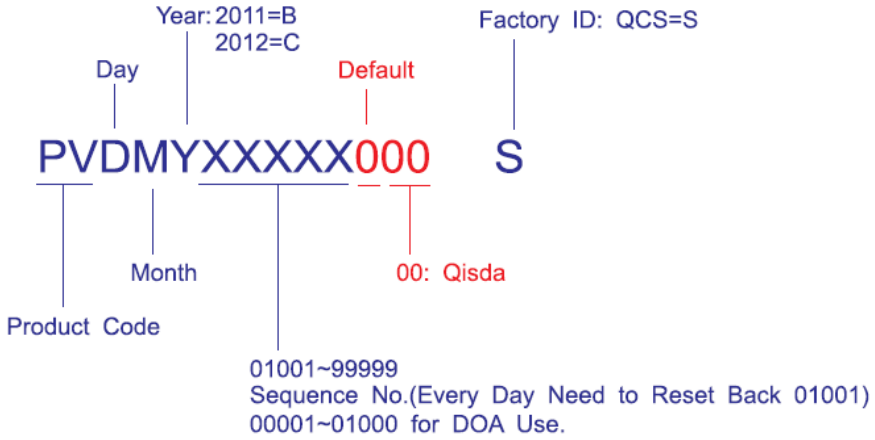
Dim: 95*55 mm



S/N Font: Consolas

*** Besides Mark, English Font - Gill Sans, TC Font - 文鼎中黑, SC Font, H=6 point

*** Scale 1:1

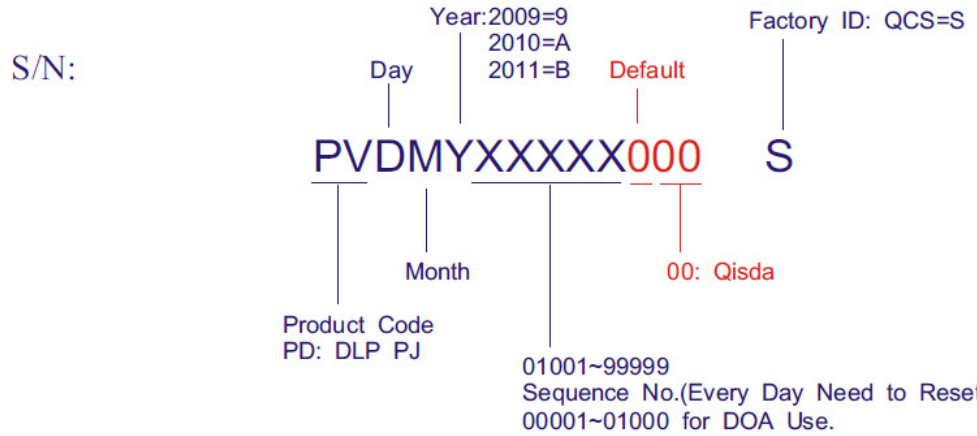


Day: 1~9, A=10, B=11, C=12, D=13, E=14, F=15, G=16, H=17, J=18, K=19, L=20, M=21, N=22, P=23, R=24, S=25, T=26, V=27, W=28, X=29, Y=30, Z=31(don't use :0,I,O,Q,U)

Month: 1=Jan, 2=Feb, 3=Mar, 4=Apr, 5=May, 6=Jun, 7=Jul, 8=Aug, 9=Sep, A=Oct., B=Nov, C=Dec

3. For 9H.J7L77.17C

*除了特殊规定外，中文打印字型为黑体7级，
英文数字打印字体为Gill Sans 7 级；



Day: 1~9, A=10, B=11, C=12, D=13, E=14, F=15, G=16, H=17, J=18, K=19, L=20, M=21, N=22, P=23, R=24, S=25, T=26, V=27, W=28, X=29, Y=30, Z=31(don't use :0,I,O,Q,U)

Month: 1=Jan, 2=Feb, 3=Mar, 4=Apr, 5=May, 6=Jun, 7=Jul, 8=Aug, 9=Sep, A=Oct., B=Nov, C=Dec

LAMP LBL PRINTING

*** English Font - Gill Sans, H = 6 point

*** Scale 1:1

3.3 Customer Acceptance

1.0 SCOPE

This document establishes the general workmanship standards and functional acceptance criteria for projector produced by BENQ.

2.0 PURPOSE

The purpose of this publication is to define a procedure for inspection of the projector by means of a customer acceptance test, the method of evaluation of defects and rules for specifying acceptance levels.

3.0 APPLICATION

The "Customer Acceptance Criteria" is applicable to the inspection of the projector, completely packed and ready for dispatch to customers. Unless otherwise specified, the customer acceptance inspection should be conducted at manufacturer's site.

4.0 DEFINITION

The "Customer Acceptance Criteria" is the document defining the process of examining, testing or otherwise comparing the product with a given set of specified technical, esthetic and workmanship requirements leading to an evaluation of the "degree of fitness for use", including possible personal injury or property damage for the use of the product.

5.0 CLASSIFICATION OF DEFECTS

The defects are grouped into the following classes:

5.1 Critical defect

A critical defect is a defect which judgment and experience indicate that there is likely to result in hazardous or unsafe conditions for individuals using product.

5.2 Major defect

A major defect is a defect, other than critical one, is likely to result in failure, or to reduce materially the usability of the product for its intended purpose.

5.3 Minor defect

A minor defect is a defect that is not likely to reduce materially the usability of its intended purpose, or is a departure from established standards having little bearing on the effective use of operation of the product.

Note: If BenQ defect undefined failure, and it judged that is reduce the merchandisebility, BenQ CM Inform this defect. After that parties make communication and decide how to solve.

6.0 EXPRESSION OF DEFECTIVES

$$\text{Percent of defects} = \frac{\text{Number of defects}}{\text{Number of products inspected}} \times 100\%$$

7.0 INSPECTION STANDARD

Unless otherwise specified, the inspection standard will be defined by MIL-STD-105E, NORMAL INSPECTION LEVEL Ⅱ, SINGLE SAMPLING PLAN.

7.1 Acceptance Quality Level

7.1.1 Critical Defect:

When a critical defect is found, this must be reported immediately upon detection, the lot or batch shall be rejected and further shipments shall be held up pending instructions from the responsible person in relevant department.

7.1.2 under normal sampling

Critical	Defective : 0% AQL
Major	Defective : 0.65% AQL
Minor	Defective : 2.5% AQL

8.0 GENERAL RULES

8.1 The inspection must be carried out by trained inspectors who have good knowledge about the product.

8.2 The inspection must be based upon the documents concerning the completely assembled and packed product.

8.3 When more defects appear with the same unit only the most serious defect has to be taken into account.

8.4 Defects found in accessory packed with the product such as Cable, Connector, Manual, CD and the like, and being inspected as a part of the complete product, must be included in the evaluation.

8.5 The evaluation must be within the limits of the product specification and, for not specified characteristics, refer to the sample machine or the judgment of BENQ QA Engineer. But any kind of proposals or judgments must be reasonable and acceptable by both sides.

8.6 Faults must be able to be repeatedly demonstrated.

9.0 TEST CONDITIONS

Unless other prescription, the test conditions are as followings:

Nominal voltage: refer to operation manual

Environmental illumination:

Variable from 500 to 800 Lux (For appearance inspection)

Variable from 0 to 7 Lux (For functional inspection)

Temperature: 25±5℃

Visual inspection shall be done with the distance from eyes to the sample 40~50 cm.

Display mode: refer to operation manual

10.0 TEST EQUIPMENTS

Dark room

PC

Pattern Generator: Chroma or equivalent

DVD player

Power supply (100~240 VAC) with consumption meter

Measuring tape

4. Level 1 Cosmetic / Appearance / Alignment Service

4.1 Cosmetic / Appearance Inspection Criteria

TABLE 1. General Product of plastic outlook of dot, blemish, and others spec inspection standard (产品一般外观塑料件的黑点、杂质、凸点、砂粒缺陷检验标准)

	规格 Spec (面积 cm^2) (Area cm^2)	A 级面 A surface (允许数) (Number of defect)				B 级面 B surface (允许数) (Number of defect)				C 级面 C surface (允许数) (Number of defect)			
		20*20	50*50	70*70	100*100	20*20	50*50	70*70	100*100	20*20	50*50	70*70	100*100
杂质 Particle	P < 0.1 mm^2 点距 Distance 2cm	不计 Ignore	不计 Ignore	不计 Ignore	不计 Ignore	不计 Ignore	不计 Ignore	不计 Ignore	不计 Ignore	不计 Ignore	不计 Ignore	不计 Ignore	不计 Ignore
黑点 Blemish | 异色点	0.1≦P< 0.2 mm^2 点距 Distance 4cm	2	3	4	5	2	3	4	5	4	4	5	6
	0.2≦P <0.3mm^2 点距 Distance 4cm	0	0	0	0	2	3	4	5	3	4	5	6
凸点 砂粒 棉絮 毛屑 Particle | 同色点 Spot with same color	P<0.1 mm^2 点距 Distance 2cm	不计 Ignore	不计 Ignore	不计 Ignore	不计 Ignore	不计 Ignore	不计 Ignore	不计 Ignore	不计 Ignore	不计 Ignore	不计 Ignore	不计 Ignore	不计 Ignore
	0.1≦P<0.2mm^2 点距 Distance 4cm	4	4	5	6	5	5	6	7	6	6	7	8
	0.2≦P < 0.3mm^2 点距 Distance 4cm	3	4	4	5	4	5	5	6	6	7	7	8
	0.3≦P < 0.5mm^2 点距 Distance 5cm	2	2	3	4	3	3	4	5	4	4	5	6
	Total	4	4	5	6	5	5	6	7	6	6	7	8

备注 Note:

1. 检测面积 A <20*20 以 20*20 之规范检验之, 20*20≦A<50*50，以 50*50 等级检验之，以此类推.
   Use the 20*20 criteria to the area less than 20*20; 50*50 inspection criteria to the area 20*20≦A<50*50; etc.

   杂质/黑点/异色点(Particle/Blemish/Color Spot)

   1.1 A、B、C 级面定义请参考 6.2 级面定义。
   Definition of surface A, B, C refer to 6.2

   1.2 LOGO 周边 2 cm 内不可有 0.05 mm^2 以上之点, (0.05 mm^2 以内之点不计)。
   Blemish around the logo must be equal or smaller than 0.05 mm^2

   1.3 表面气泡—不可有。
   Bubble on the surface is to be reject.

TABLE 2 :产品一般外观的塑料件检验标准(General Product of plastic outlook inspection standard)

NO	Appearance	Spec
1	缩水 Shrinkage	A 区：不可有缩水，以带手套检验，手摸过去不可有凹陷的感觉 A region: No Shrink. With gloves, no feeling of sink when touching the surface B / C 区：不能明显看出 B/C region: not obvious
2	流痕，咬花， 光泽 Run, Texture, Gloss	不能有明显的深浅不均 No obvious non-uniformity
3	接合线 Welding Line/Knit Line	用指甲划过不会有停顿感,并附近无明显之光泽差异 When scratching on it, there's no feeling of obstruction. Also, there should not be obvious difference in gloss nearby it.
4	顶白 Ejector Mark	不可 Reject
5	Label/screws shortage	不允许 Reject
6	缺料 Material shortage	缺料不可影响机构强度和表面 Material shortage is not allowed to impact structure strength and surface
7	色差 Chromatic aberration	喷漆(Painting): ΔE<=2; L<=1.5 ; Δ A,B <= 0.6 银粉漆 (Paint, aluminum). ΔE<=2 L<=1.0; Δ A, B <= 0.6 非银粉漆(Paint, non-aluminum) 素材(Raw material) : ΔL,A,B<=0.6 ,ΔE<=0.75
8	印刷 Printing	文字印刷不得有漏印、断线、重影、组细不均、溢墨、印偏(1mm)、印斜 (歪斜＜0.3 mm)。 Printing must not have incomplete printing, break off, overlap, uneven thickness, excessive ink, printing misalignment (1mm), printing slanting & crooked (<0.3mm) 文字印刷颜色须确认是否正确 。 Printing color must be comparable to color chip and sample.
9	Logo of panel sticker	文字印刷不得有漏印.断线.重影.组细不均.溢墨.印偏(1mm)印斜 (歪斜 ＜ 0.5 mm). Printing must not have incomplete printing, break off, overlap, uneven thickness, excessive ink, printing misalignment (1mm), printing slanting & crooked (<0.5mm) 文字印刷颜色须确认是否正确. Printing color must be comparable to color chip and sample.
10	刮伤 Scratch/Nicks	Side A: (W < 0.1mm , L < 3mm): 容许 1 个 Only 1 this kind of scratch is accepted W < 0.1mm , L < 3-5mm 容许 0 个 No this kind of scratch is accepted Side B: W < 0.15mm , L < 3mm 容许 2 个 Only less than 2 this kind of scratch is accepted W < 0.15mm , L < 3-5mm 容许 1 个 Only 1 this kind of scratch is accepted Side C:

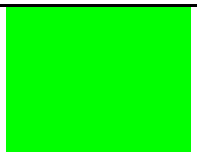
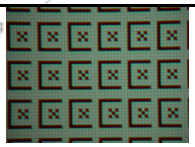
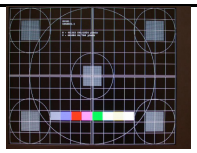
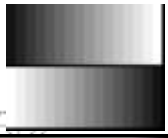
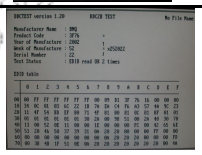
		W < 0.2mm , L < 1mm 容许 4 个 Only 4 this kind of scratch is accepted W < 0.2mm , L < 3mm 容许 3 个 Only 3 this kind of scratch is accepted W < 0.2mm , L < 3-5mm 容许 2 个 Only 2 this kind of scratch is accepted Note: 刮伤见底材者不允许 Severe scratch which disclose the Natural 1. 刮擦伤两两需相距 5cm 以上 Each scratch should be 5cm more far away from each other

TABLE 3 产品镁铝合金制品之黑点、杂质、凸点、砂粒缺陷检验标准检验规范
(Magnesium-Aluminum Alloy Products that Dot, Blemish, and Others spec.)

	规格 Spec (面积 cm^2) (Area cm^2)	A 级面 A surface (允许数) (Number of defect)				B 级面 B surface (允许数) (Number of defect)				C 级面 C surface (允许数) (Number of defect)			
		20*20	50*50	70*70	100*100	20*20	50*50	70*70	100*100	20*20	50*50	70*70	100*100
杂质 Particle 黑点 Blemish | 异色点 Color spot	P < 0.1 mm^2	不计 Ignore	不计 Ignore	不计 Ignore	不计 Ignore	不计 Ignore	不计 Ignore	不计 Ignore	不计 Ignore	不计 Ignore	不计 Ignore	不计 Ignore	不计 Ignore
	0.1≦P< 0.3 mm^2 点距 7.5cm Distance	1	2	3	4	2	3	3	5	3	4	5	6
	0.3≦P <0.5mm^2 点距 7.5cm Distance	0	0	0	0	2	2	3	4	2	3	4	5
	0.5≦P <0.7mm^2 点距 7.5cm Distance	0	0	0	0	0	0	1	2	1	2	3	4
凸点砂粒棉絮毛屑 Particle | 同色点 Spot with same color	P<0.1 mm^2 点距 7.5cm Distance	不计 Ignore	不计 Ignore	不计 Ignore	不计 Ignore	不计 Ignore	不计 Ignore	不计 Ignore	不计 Ignore	不计 Ignore	不计 Ignore	不计 Ignore	不计 Ignore
	0.1≦P<0.3mm^2 点距 7.5cm Distance	2	2	3	4	3	4	5	6	4	5	6	7
	0.3≦P < 0.5mm^2 点距 7.5cm Distance	1	1	2	3	2	2	3	4	2	3	3	4
	0.5≦P < 0.7mm^2 点距 7.5cm Distance	0	0	1	2	1	1	2	3	1	2	2	3
	Total	3	3	4	5	5	6	7	8	6	7	8	9

4.2 OPERATIONAL INSPECTION CRITERIA

1. TEST PATTERN

PATTERN	PATTERN	TEST ITEM
Full white		ANSI Brightness、Bright Uniformity、FOFO Contrast Ratio、CIE white coordinate、Throw Ratio、Zoom Ratio、Distortion
Full Dark		FOFO Contrast Ratio
Full Red		Impurity、CIE coordinate
Full Green		Impurity、CIE coordinate
Full Blue		Impurity、CIE coordinate
Chromo Pattern84		Focus Range
General-1 pattern		Performance/ Timing check/ function check
32 Gray		Gray Check
DDC check		Check the DDC information, Including S/N, model, manufacturer name, product code.

2. TEST CONTENT:

	Test Condition	TEST ITEM	Input	Equipment
PC Mode	Chroma pattern	Focus/ Focus range	D-SUB	Chroma
	FULL W , R , G , B	Impurity, CIE coordinate, pixel fail		
HDTV	NTSC	Picture performance	YPbPr	Chroma / BS Tuner
DVD picture	NTSC disk/ PAL disk	Picture quality	Video S-video	DVD player

3. SPECIFICATION:

Item	Spec.	Condition	Pattern
ANSI Brightness	Minimum 1600Lumens	Contrast: Preset Brightness: Preset	Full white
Bright Uniformity	Minimum -50%	Contrast: Preset Brightness: Preset	Full white
ANSI Contrast	Minimum 150:1	Contrast: Preset Brightness: Preset	Chessboard
FOFO Contrast Ratio	Minimum 6000:1	Contrast: Preset Brightness: Preset	Full white and Full dark
Light Leakage (In Active Area)	△≦0.5 lux compared to center point within 60” (Diagonal at 1.52m) image size	Contrast: Preset Brightness: Preset	Full dark
Light Leakage (Out of Active Area)	△≦0.5 lux within 60”～80” (Diagonal at 1.52m) image size	Contrast: Preset Brightness: Preset	Full dark
CIE white coordinate	x=0.279±0.02 y=0.386±0.02	Contrast: Preset Brightness: Preset	Full white
CIE red coordinate	x=0.644±0.04 y=0.342±0.04	Contrast: Preset Brightness: Preset	Full Red
CIE green coordinate	x=0.304±0.04 y=0.624±0.04	Contrast: Preset Brightness: Preset	Full Green
CIE blue coordinate	x=0.145±0.03 y=0.055±0.03	Contrast: Preset Brightness: Preset	Full Blue
Throw Ratio	79”±3% Diagonal @ 1M	Contrast: Preset Brightness: Preset	Full white
Keystone Distortion	(W2-W1) / (W1+W2) <1.0%	Contrast: Preset Brightness: Preset	Full white
Vertical TV Distortion	(H1+H2-2×H3)/2H2 <1.0%	Contrast: Preset Brightness: Preset	Full white
Clearly Focus Range	Pixel clear and uniform at 1.5~6m	Contrast: Preset Brightness: Preset	Chroma 84 X pattern
Gray Check	Should be clear and bright	Brightness: Preset Contrast: Preset	Chromo 32 gray pattern
DMD Image Quality	See Defect Classification	See Defect Classification	See Defect Classification
PC	640X480→ 1024X768, compressed 1600x1200;	Contrast: Preset Brightness: Preset	General-1 pattern
Video	NTSC/NTSC4.43/PAL(Including PAL-M, PAL-n) /SECAM/PAL60	Contrast: Preset Brightness: Preset	Color-bar pattern
YPbPr	NTSC (480i)/ 480p/ PAL (576i)/576p, HDTV (720P/1080i/p)	Contrast: Preset Brightness: Preset	Color-bar pattern

4. Power Consumption:

8.2 Power consumption	Max.	375W
	Standby	0.5W Max. at 100 ~ 240VAC (disable loop through, LAN control, audio out)
	Normal	Typical 353W@110Vac
	ECO	Typical 292W@110Vac
	ECO Blank	Minimum 90W@100VAC~240VAC

5. OPERATIONAL INSPECTION CRITERIA:

No	Description	Class
1	**Noise**	
1.1	When power on or power off, fan or color wheel get abnormal noise.	Major
1.2	When normal operation, noise exceed noise level (refer to Q201 document)	Major
2	**Display Quality** (include input: Video, S-video, YPbPr, HDMI, and D-sub or RGB)	
2.1	Focus range out of specification	Major
2.2	Focus fail (focus not clear or flare/ defocus/ lateral color out of specification)	Major
2.3	Brightness & Uniformity --- out of specification.	Major
2.4	Contrast ratio --- out of specification	Major
2.5	Color coordinates --- out of specification.	Major
2.6	Light leakage out of specification (active area or out of active area)	Major
2.7	Throw ratio out of specification	Major
2.8	Room ratio out of specification	Major
2.9	Picture distortion out of specification	Major
2.10	DMD image out of specification	Major
2.11	Picture dust or other image quality out of specification	Major
2.12	Gray stage check --- Missing stage	Major
2.13	Video noise --- If video noise presented	Major
2.14	DDC data error / incorrect	Major
2.15	Mode detection error	Major
2.16	OSD Malfunction	Major
3	**Audio Quality**	
3.1	Audio malfunction	Major
3.2	Speaker no function	Major
3.4	Volume mute malfunction	Major
4	**Remote control malfunction**	Major

6. IMAGE QUALITY SPECIFICATION:

SEQ#	Test	SCREEN	ACCEPTANCE CRITERIA
1	Major Dark Blemish	Two Zone Blue 60	1. ≦4 visible dark blemishes are allowed in the active area 2. No blemish will be ＞1.5” long/diameter
2	Major Light Blemish	Two Zone Gray 10	1. ≦4 visible dark blemishes are allowed in the active area 2. No blemish will be ＞1.5” long/diameter
3	Non-Active Area Artifacts / Border Defects	Any Screen	1. Non-Active Area Artifacts are acceptable 2. Border Defects are acceptable
4	Reset Boundary Artifact	Any Screen	Reset boundary artifacts are acceptable
5	Minor Blemishes	Any screen	1. ≦8 total minor blemishes allowed 2. No blemished shall be >5 inches long/diameter
6	Projected Images	1. Any screen 2. Gray 10 3. Any screen 4. Gray 10 5. White	1. No adjacent pixels 2. No bright pixels in Active Area 3. No unstable Pixels in Active Area 4. ≦ 1 right pixel in the POM 5. 0 dark pixels in Zone A and ≦2 in Zone B

4.3 Software/Firmware Upgrade Process

A. Basic Operating

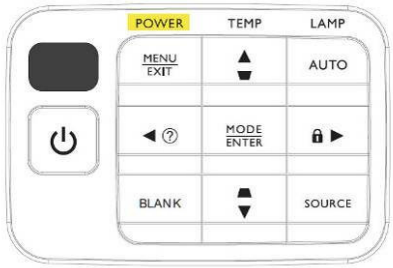
(a) Standby Mode：

User can just plug in power cord, then projector will enter standby mode. Power LED will show Red for around 1 sec, then show Orange continuously as the figure below shown. When the power LED shows Red, it means system is not ready for standby. In another word, if the power LED shows Orange, it means system is in standby mode and the DLP system has no power support, except MCU and its related circuits.

When standby mode, system power consumption will be less than 0.5 Watt.

User can turn on projector after plugging in power cord whatever the power led is red or orange.

Standby Mode

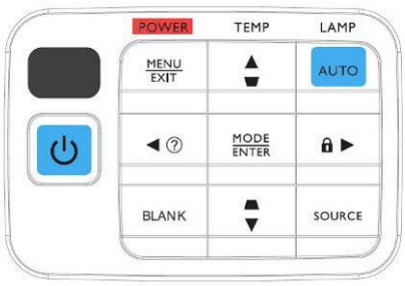


(b) Download Mode：

This mode is applied for firmware download.

If operator wants to enter this mode, he should press and hold keypad-**POWER** and Keypad-**AUTO** at the same time, then plug in power cord. Release the two keypads. Power LED will show Red continuously as the figure below shown. In download mode, system will be supported by full power but will not turn on projector. Operator can use DLP composer to download new firmware.

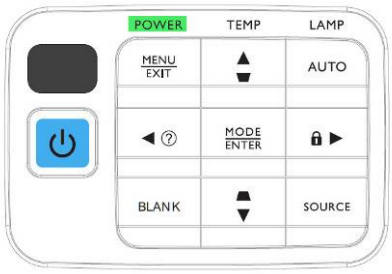
Download Mode



(c) Power On：

User can press Keypad Power to turn on projector. User can also use IR remote control and RS-232 Command：<CR>*pow=on#<CR> to do this action. When turning on, power LED will flash Green as the figure below shown.

Power On

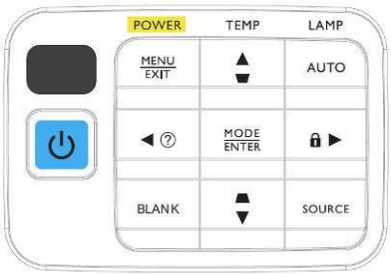


(d) Power Off：

If user wants turn off projector, user can double click keypad Power, use IR remote control, or RS-232 Command：<CR>*pow=off#<CR>. Then, system will cool itself via fans for 30 or 90 secs.

During cooling, Power LED will flash Orange. After cooling, System will return to standby mode and Power LED will become Orange as the figure below shown.

Power Off

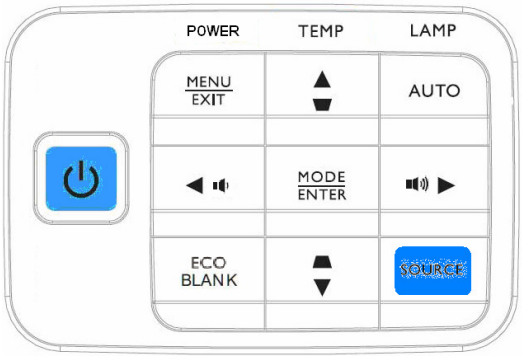


(e) EDID Download mode：

To relief PC/ HDMI EDID write protect function:

1. Press **Power+Source** on keypad then plug in power cord.
2. EDID can be downloaded to EEPROM by Q-EDID tools. PC1& PC2 share the same EEPROM.

EDID Download mode



B. Download MCU Code and Firmware

(a) Auto MCU Code Download：(for Low-Power Standby)

Condition：

Auto Detect, download by MCU itself.

Situation 1：MCU code is empty (The 1st time to plug in power cord)

Situation 2：MCU version update

System Action：

System needs around 2 sec to download MCU itself automatically.

Downloading：Power LED will show Red and Lamp LED will show Green.

Download Fail：Power LED will show Orange and Lamp LED will show Red.

Download Success：System will go back standby mode and Power LED will show Orange.

Notice：

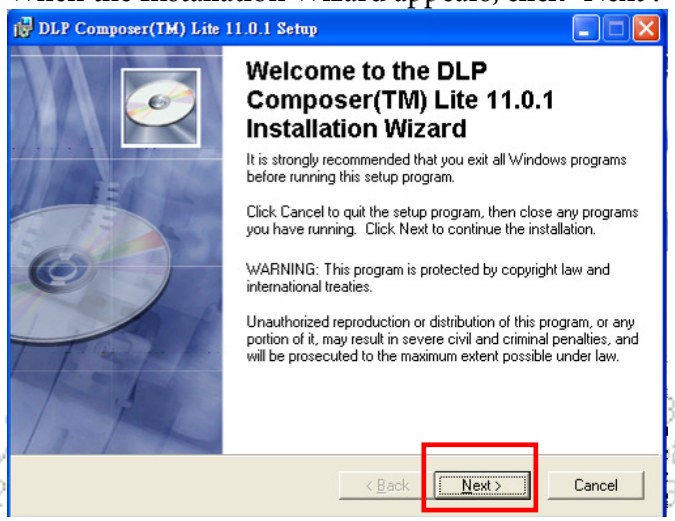
Do NOT interrupt power when downloading.

(b) Download Firmware

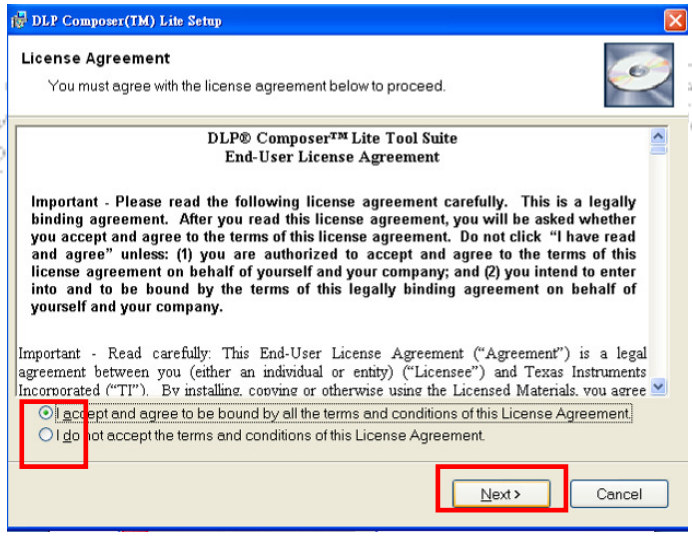
i. DLP Composer lite install procedure

(1) Installation

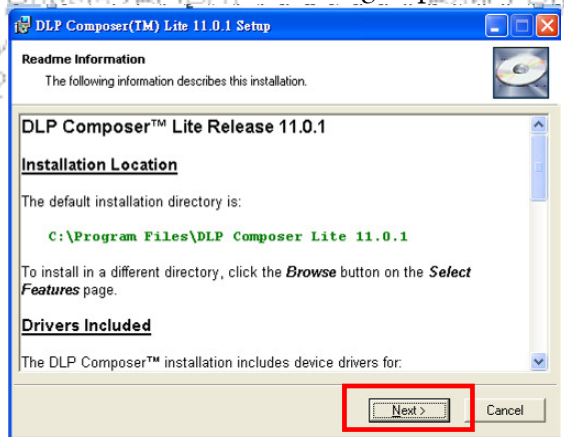
1. Double click the Setup file for DLP Composer Lite (use 11.0 or above version) to start to install program.
2. When the Installation Wizard appears, click "Next".

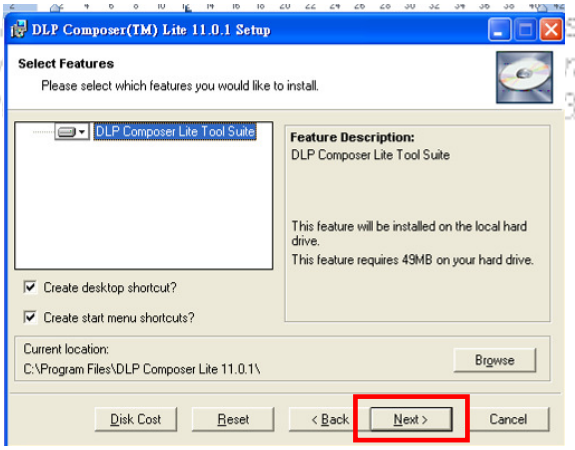


3. Select to accept the License Agreement, than click "Next"

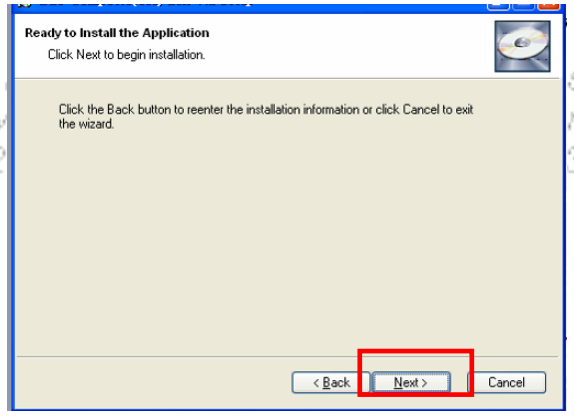


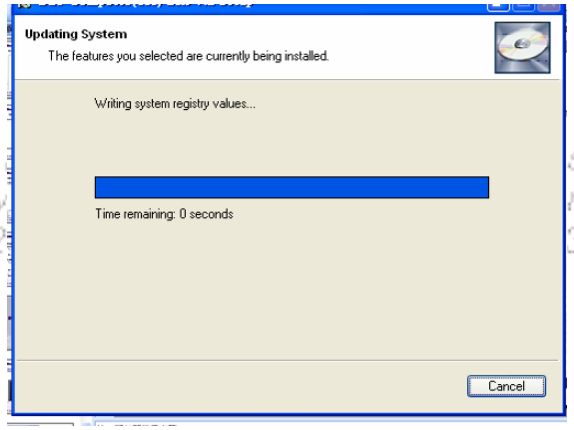
4. Click "Next" in the following steps to continue installation process.



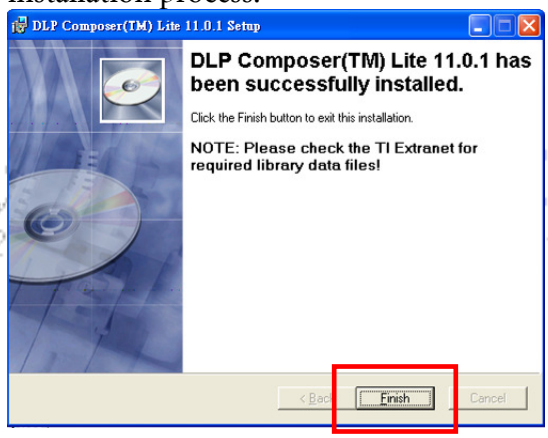


Note:
The default installation directory is:
C:\Program Files\DLP Composer Lite 11.0.1
If you want to install to a different directory (perhaps alongside a prior release of DLP Composer™ Lite), click the "Browse" button on the "Select Features" page.





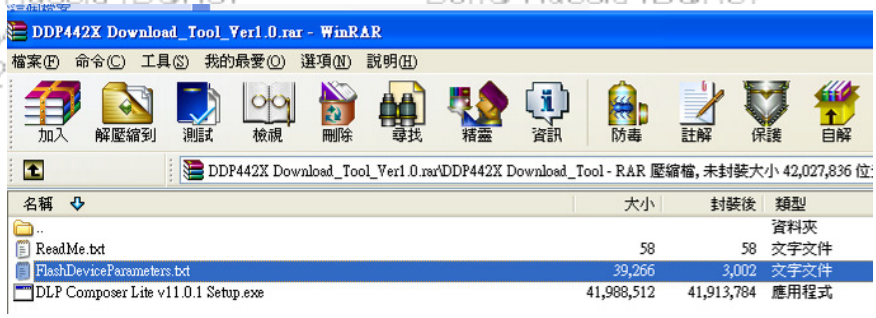
5. When finishing installation, click “Finish”, and then restart your computer to complete the installation process.

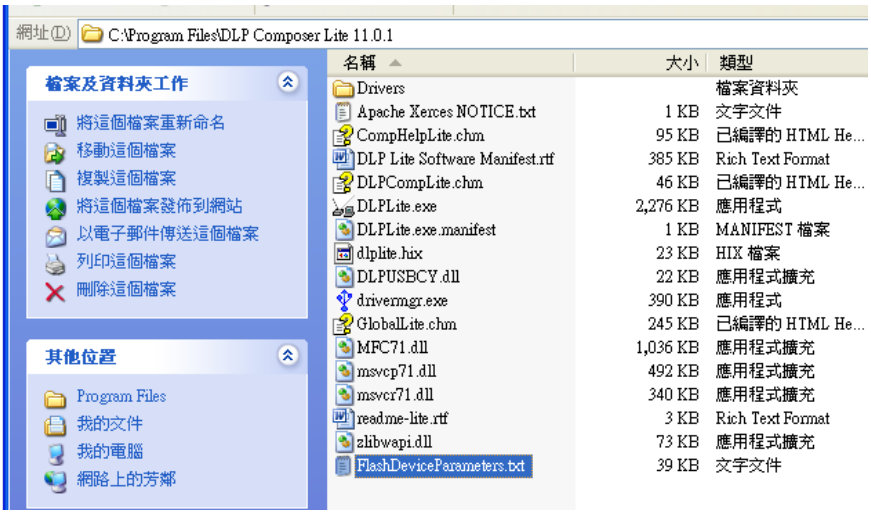


(2) Setting for your first use

- **Library setting:**

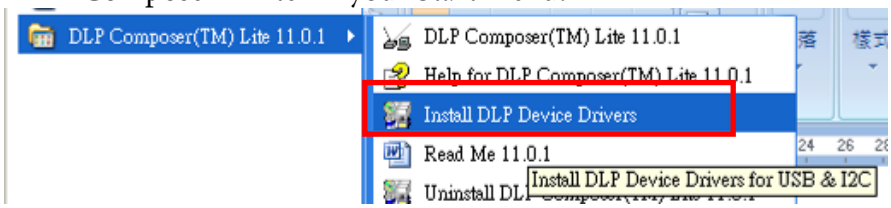
1. Save the “FlashDeviceParameters.txt” into the DLP Composer Lite11.0 installed folder.
   You can get the txt file from the installation file “DDP442X Download_Tool_Ver1.0.rar” or later version.



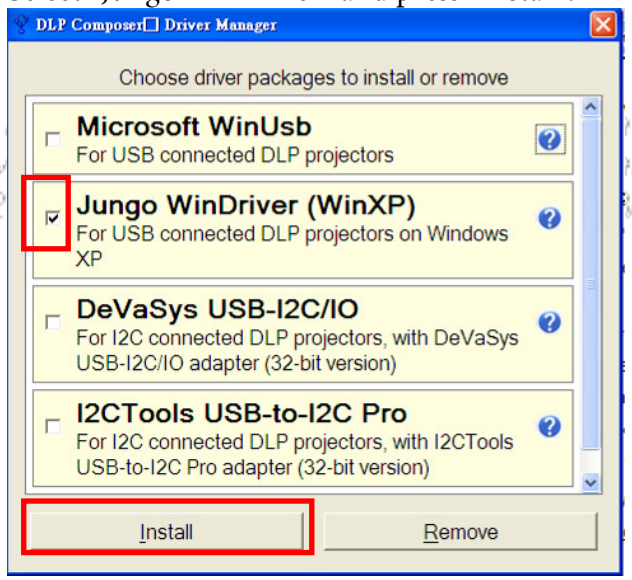


- **USB Driver Installation (Only for download by USB):**

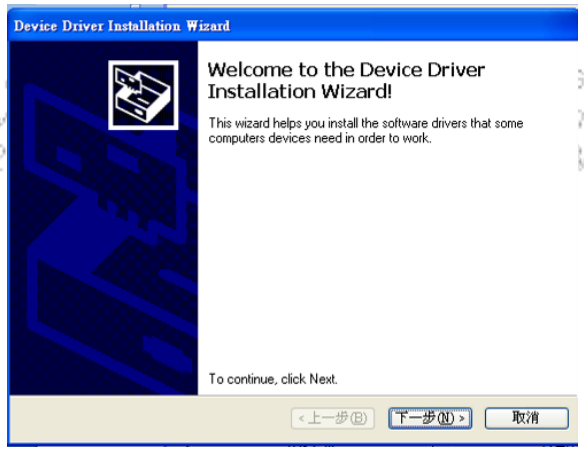
1. After DLP Composer™ Lite 11.0 is installed, it can auto detect your USB driver.
2. If PC still cannot recognize the USB device, choose the "Install DLP Device Drivers" icon under "DLP Composer™ Lite" in your Start menu.

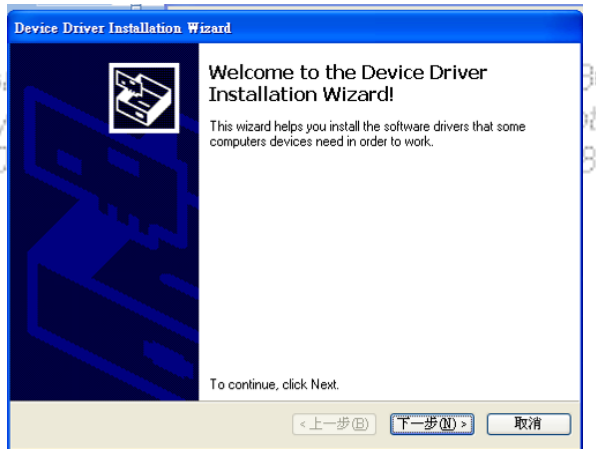


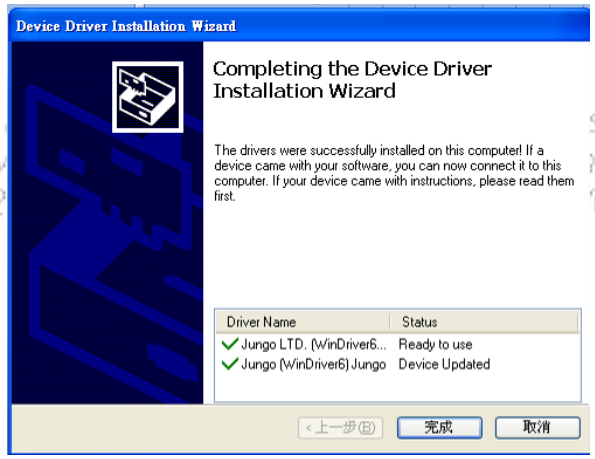
3. Select “Jungo WinDriver” and press “Install”.



4. Follow the message show in message, and complete the installation when you see the “Completing the Device Driver Installation Wizard” message.





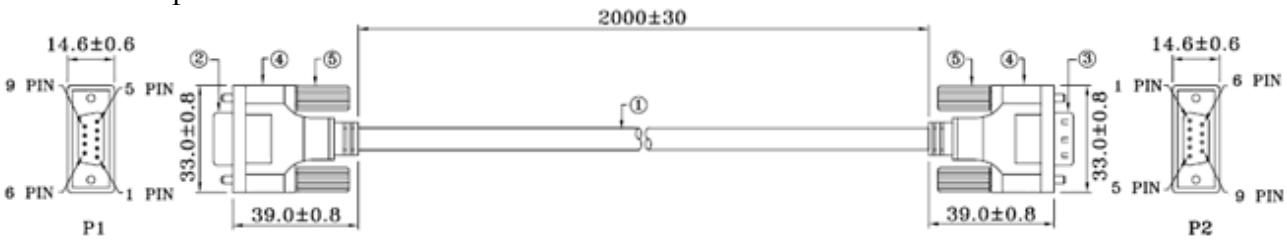


ii. Download Procedure

- **How to download (Method -1 : by RS232)**

Hardware required

1. Standard RS232 Download cable (SPEC as below)
   D-sub 9-pin Female for Both terminals



WIRE ARRANGEMENT		
P1	COLOR	P2
1	BLACK	1
2	BROWN	3
3	RED	2
4	ORANGE	4
5	YELLOW	5
6	GREEN	6
7	BLUE	8
8	PURPLE	7
9	GRAY	9
CASE	DRAIN WIRE	CASE

2. Personal computer or laptop computer

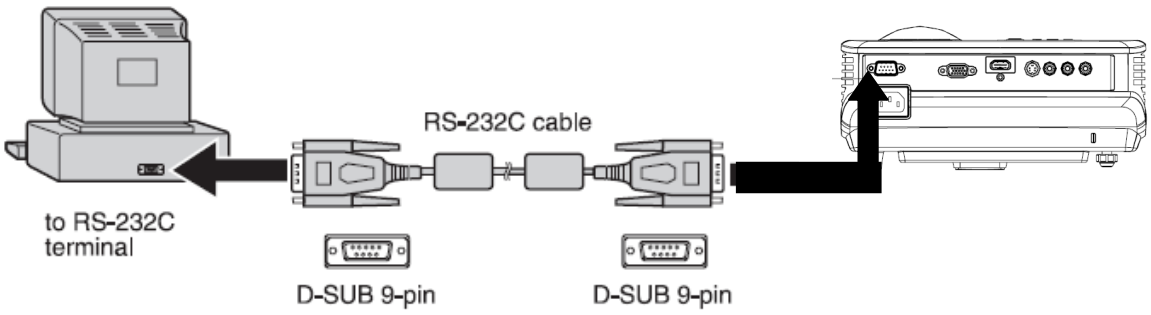
Software required

1. DLP Composer Lite program
2. New version FW

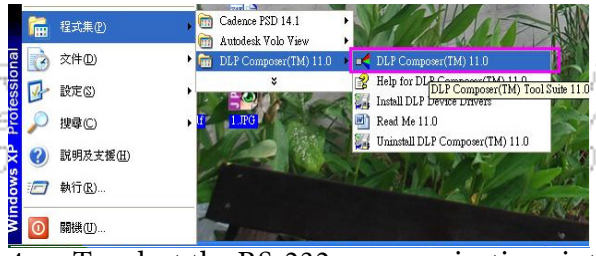
Download procedure

<**Notice**: Before download FW, make sure the adjusted values are read and kept by Service Tool.>

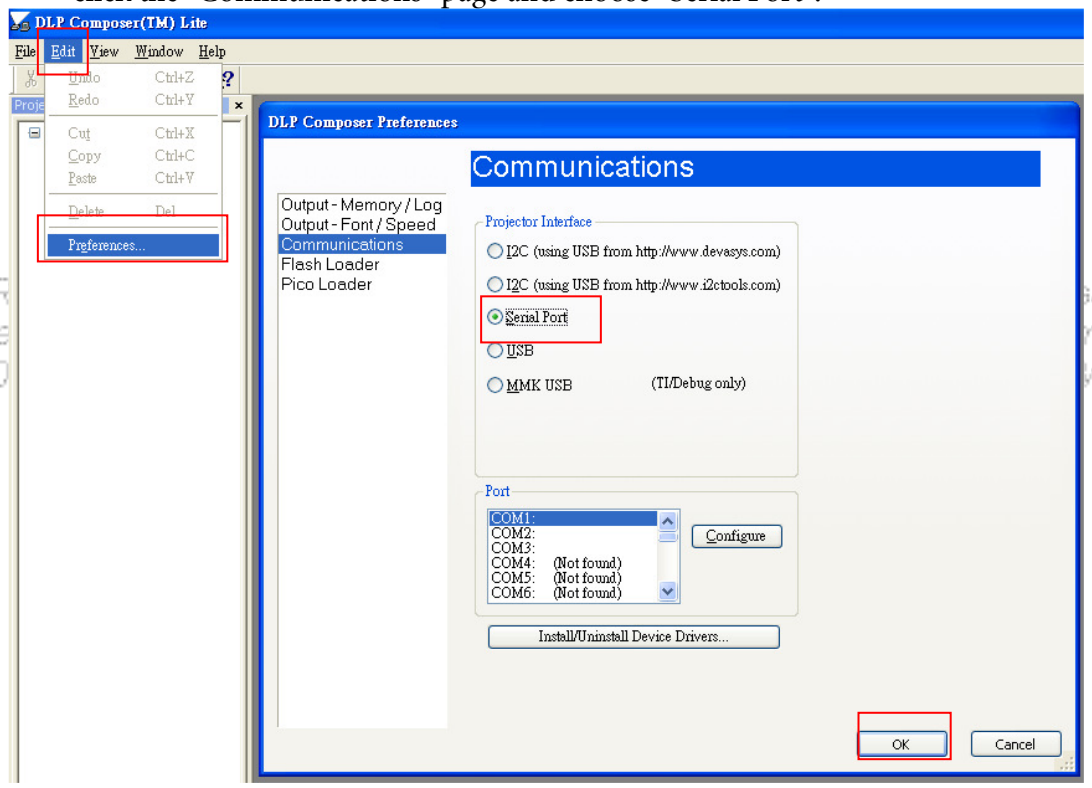
1. Connect RS-232 cable to PC and projector



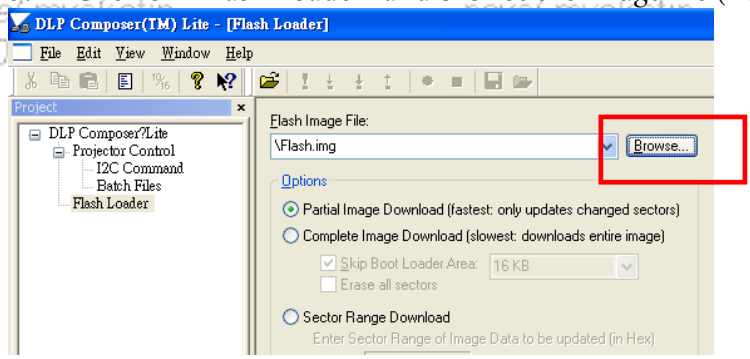
2. Let projector be in **Download Mode :**
   - Press and hold keypad-**POWER** and **AUTO** at the same time, then plug in power cord.
   - Power LED will show Red continuously.
3. Execute DLP Composer Lite 11.0 program

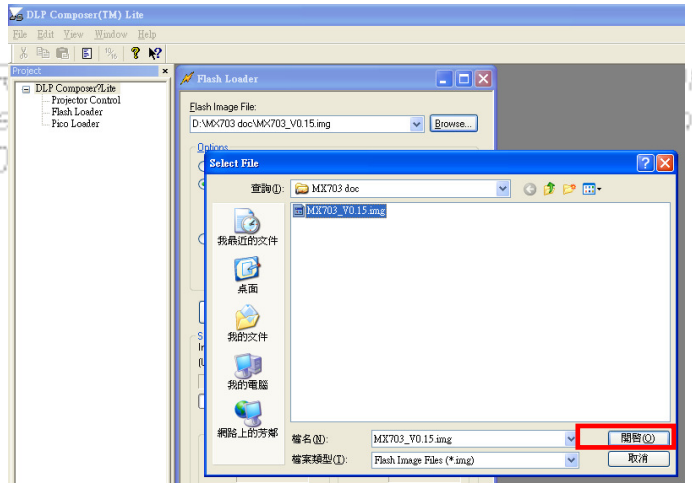


4. To select the RS-232 communications interface, choose "Preferences" from the "Edit" menu, click the "Communications" page and choose "Serial Port".

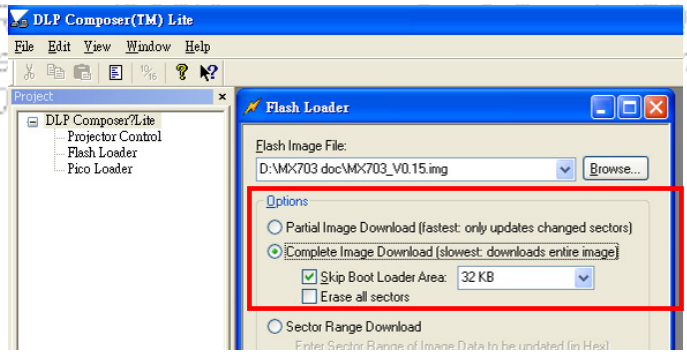


5. Click on “Flash Loader” and browse the image file (new version firmware)

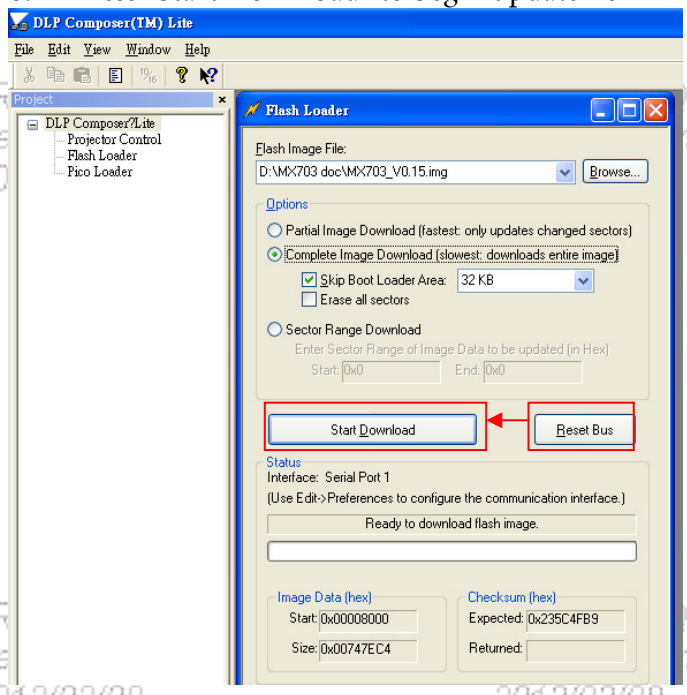




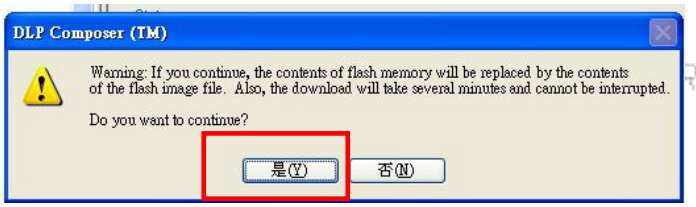
6. Select Complete Image Download, and make sure to check “Skip Boot loader area (32KB)”



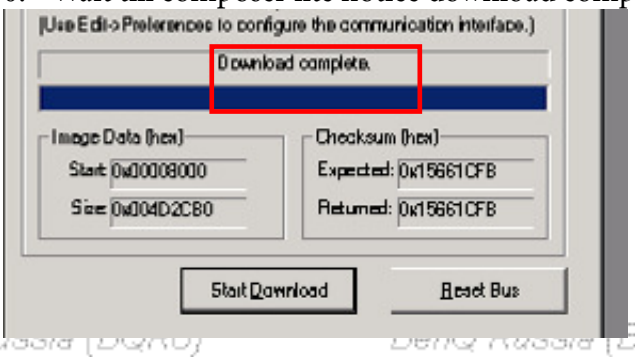
7. Press “Reset Bus” and check the status which should show “Bus Reset”
8. Press “Start Download” to begin update new firmware.



9. Press “Yes” to continue.



10. Wait till composer lite notice download complete.



11. When download complete, LED signal on projector will show standby status (orange light continuously).

<**Notice**: After download FW, make sure the adjusted values are written to projector by Service Tool.>

- **How to download (Method-2 : By USB)**

Hardware required

1. Standard USB Download cable(mini B type)
2. Personal computer or laptop computer

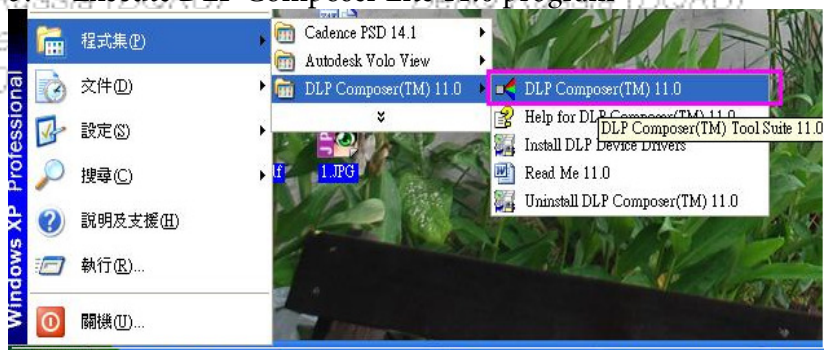
Software required

1. DLP Composer Lite program
2. New version FW

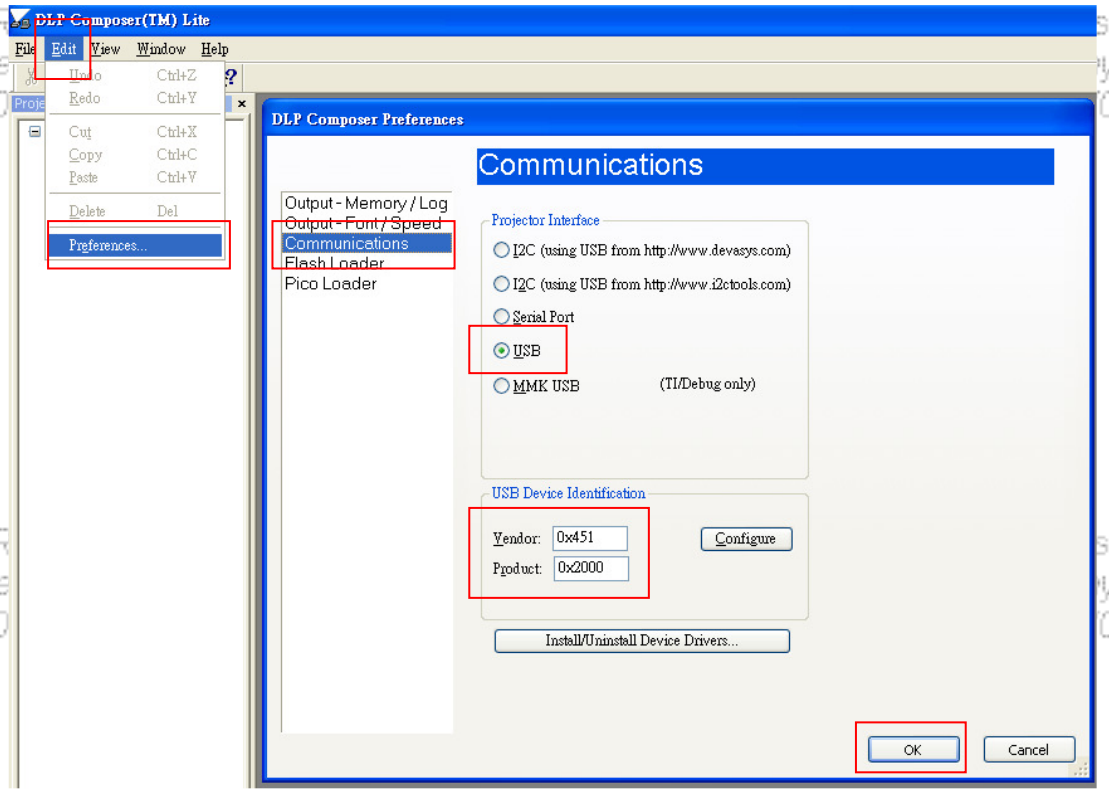
Download procedure

<**Notice**: Before download FW, make sure the adjusted values are read and kept by Service Tool.>

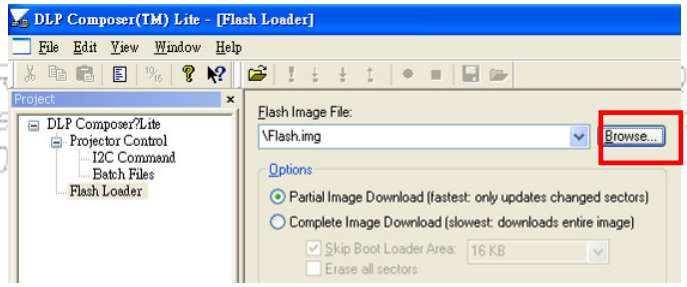
1. Connect USB cable to PC and projector
2. Let projector be in **Download Mode:**
   - Press and hold keypad-**POWER** and **AUTO** at the same time, then plug in power cord.
   - Power LED will show Red continuously.
3. Execute DLP Composer Lite 11.0 program

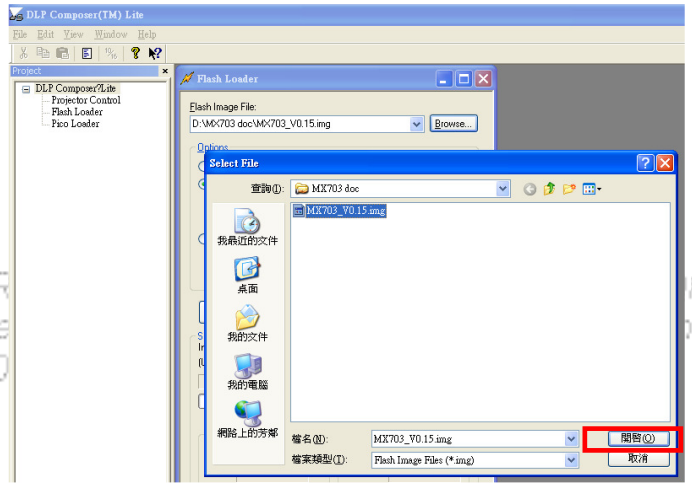


4. To select the USB communications interface, choose "Preferences" from the "Edit" menu, click the "Communications" page and choose "USB".
5. Check the USB Device Identification. Vendor should be **0x451**. Product should be **0x2000.**

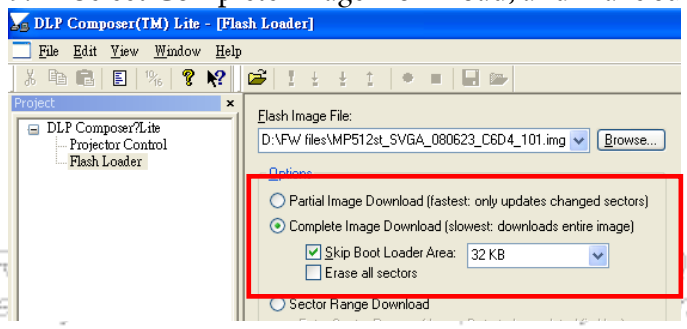


6. Click on “Flash Loader” and browse the image file (new version firmware)

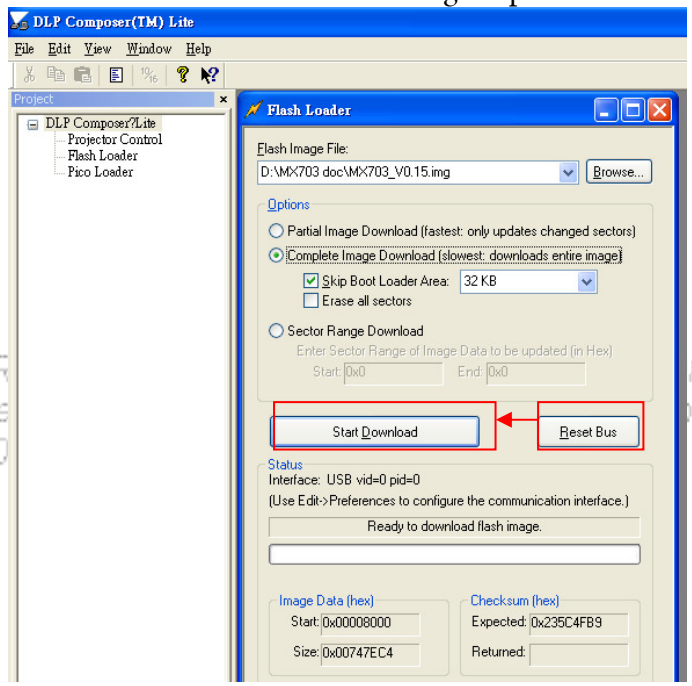




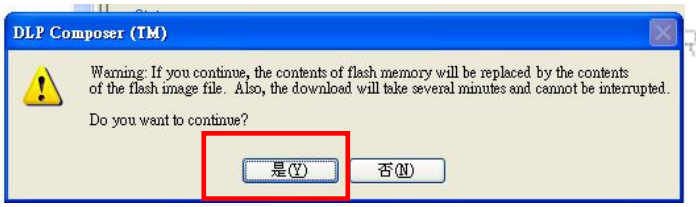
7. Select Complete Image Download, and make sure to check “Skip Boot loader area (32KB)”



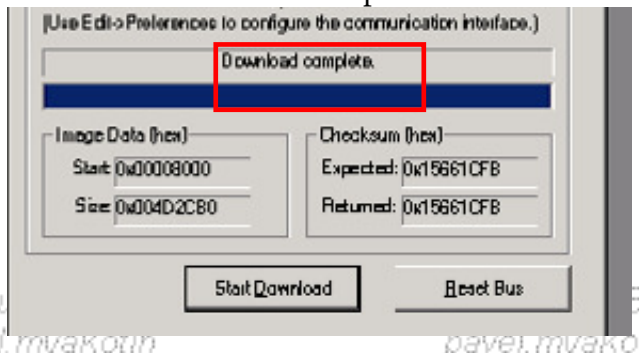
8. Press “Reset Bus” and check the status which should show “Bus Reset”
9. Press “Start Download” to begin update new firmware.



10. Press “Yes” to continue.



11. Wait till Download complete.



12. When download complete, LED signal on projector will show standby status (orange light continuously).

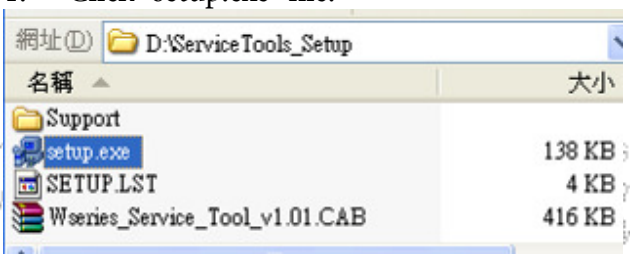
<**Notice**: After download FW, make sure the adjusted values are written to projector by Service Tool.>

Service Tool –Read and Write data in Main Board

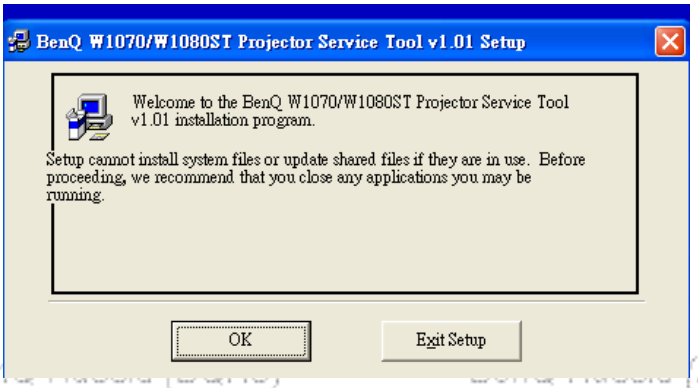
- **Need to use service tool to read data from Main board before FW re-download. After FW downloaded, need to write data form service tool into Main Board.**
- **Tool:**
  - **Install W1070/W1080ST service tool**
  - **PC**
  - **RS232 CABLE**
- **Procedure:**

I. Installation:

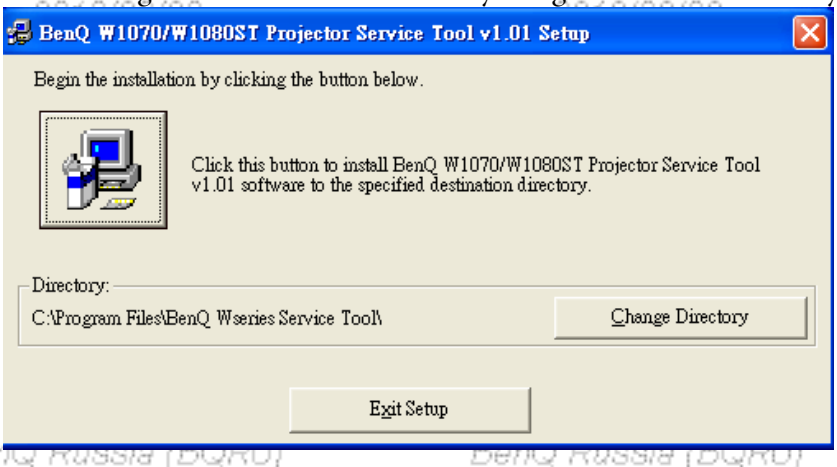
1. Click “setup.exe” file.



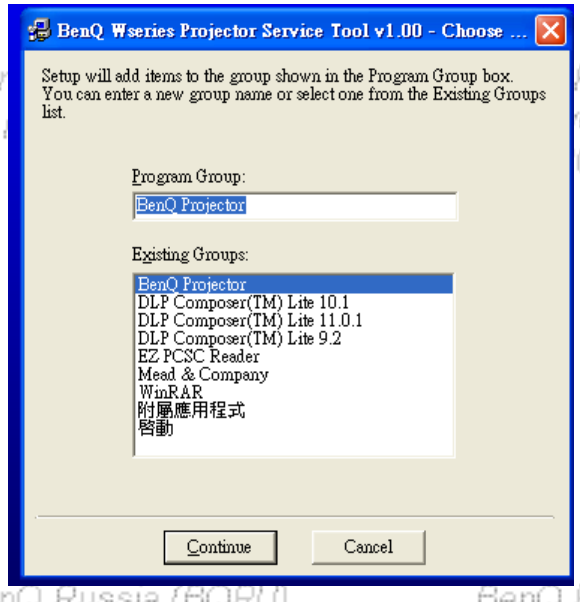
2. Click “OK.”



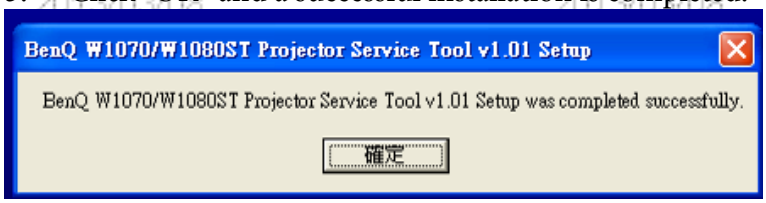
3. Change an installation dictionary or agree default dictionary and then click the icon button.



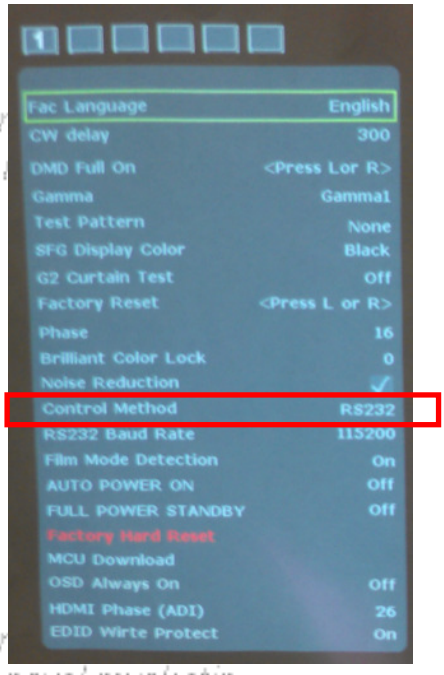
4. Enter a new group name or select one from the “Existing Groups” list and then click “Continue.”



5. Click "OK" and a successful installation is completed.



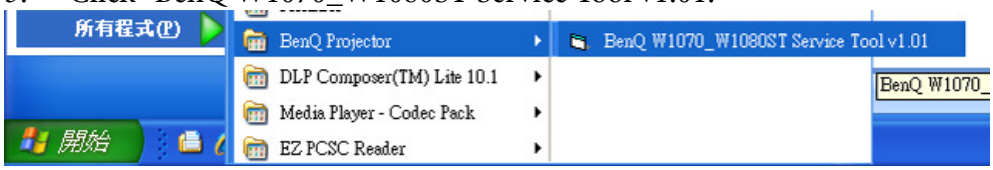
<Notice: > Before using Service tool, please check the Control Method in Factory Mode page1 must be set as "RS232."(It's default value.)



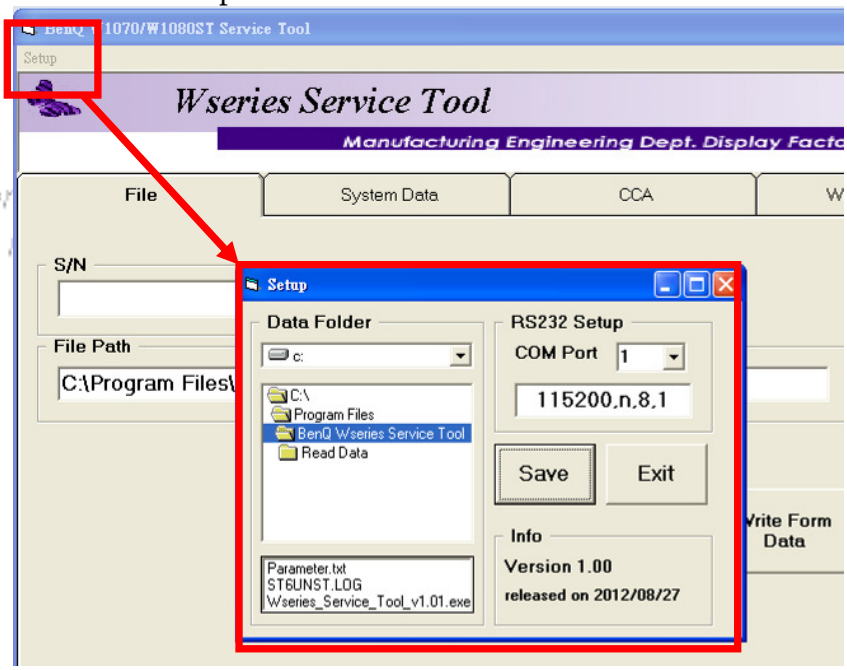
II. How to Use Service Tool

(1) Read Data From Main Board:

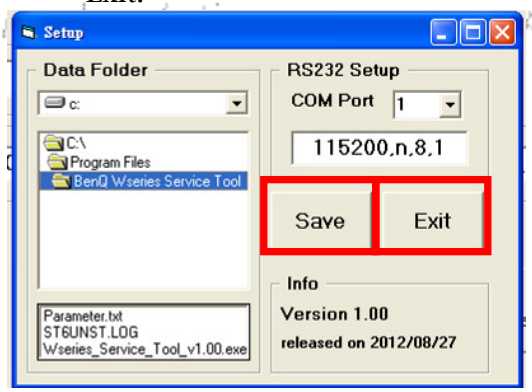
1. Connect PC with projector by a RS232 cable.
2. Turn on projector.
3. Click "BenQ W1070_W1080ST Service Tool v1.01."



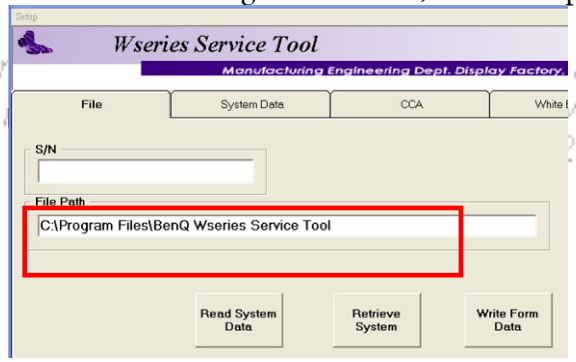
4. Click "Setup" first.



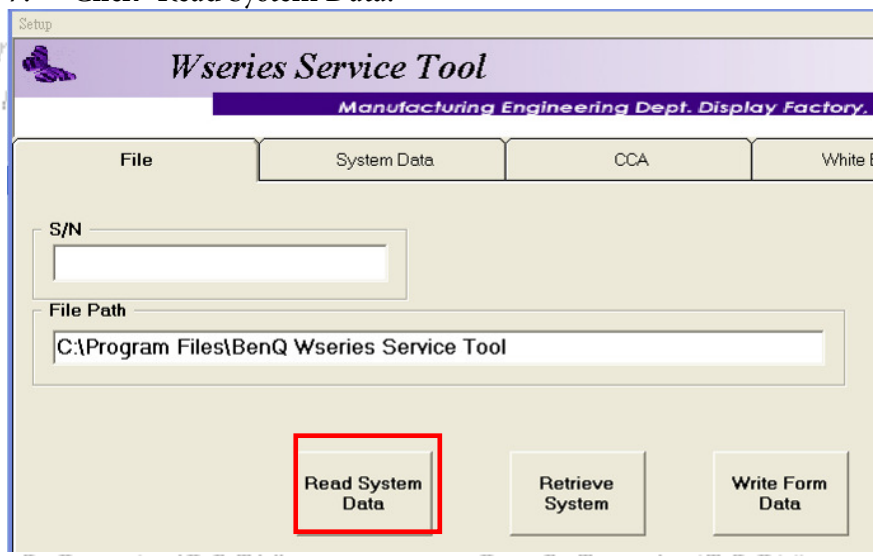
5. Select a folder for saving projector data and a specified COM port and then click "Save" and "Exit."



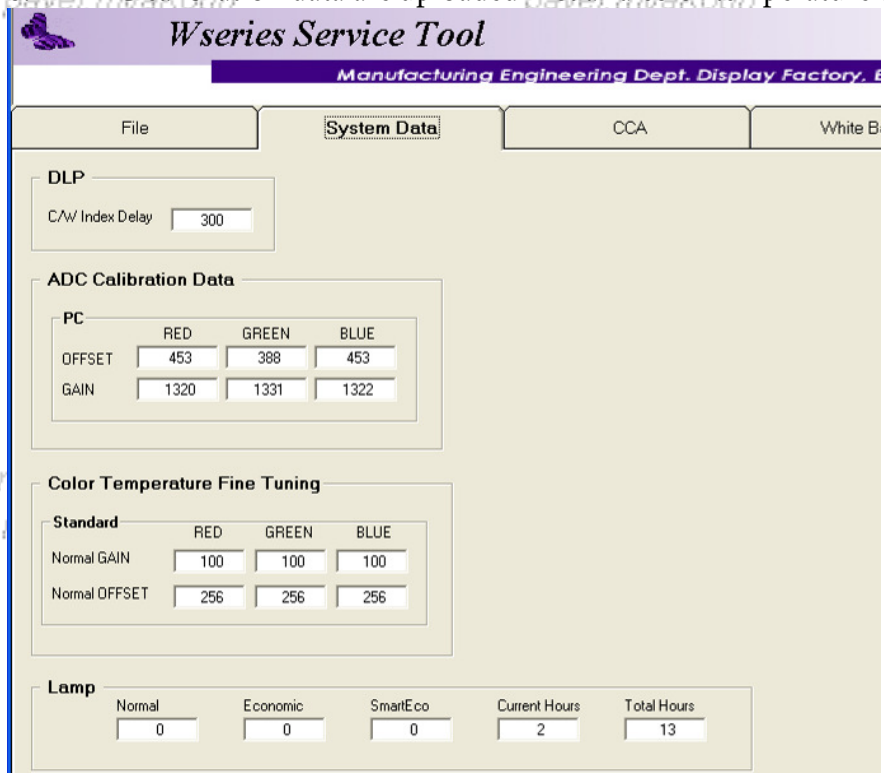
6. After selecting a data folder, the folder path is showed in "File Path."



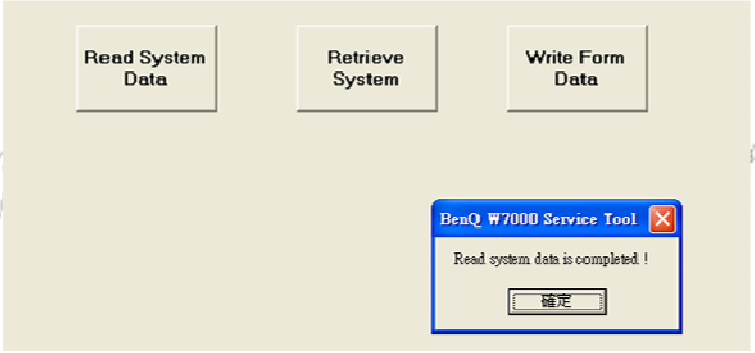
7. Click “Read System Data.”



8. ADC calibration data are uploaded first and color temperature data after.



9. After all pages data are uploaded, “Read System Data” is completed.



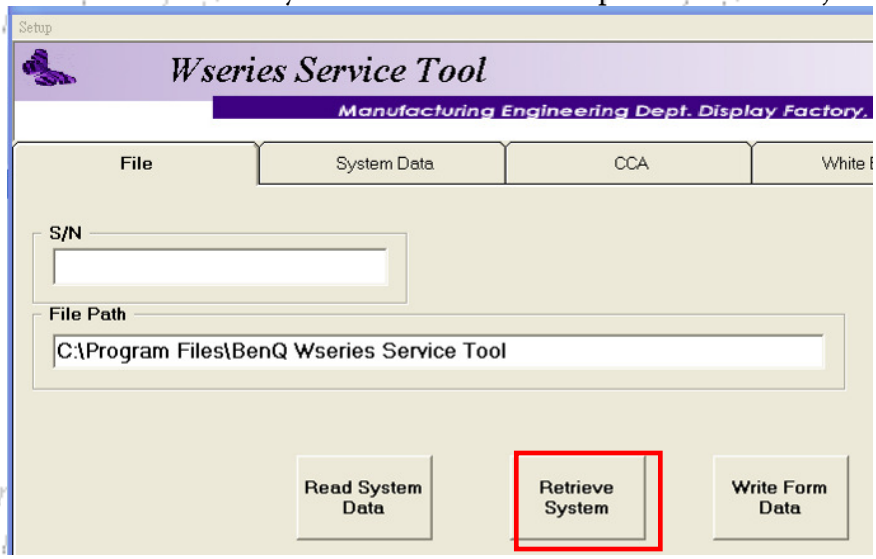
10. After completing “Read System Data,” there is a folder named “Read Data” added in the selected folder before.

11. A file named “Scaler.dat” including adjustment data of projector is added in the “Read Data” folder.

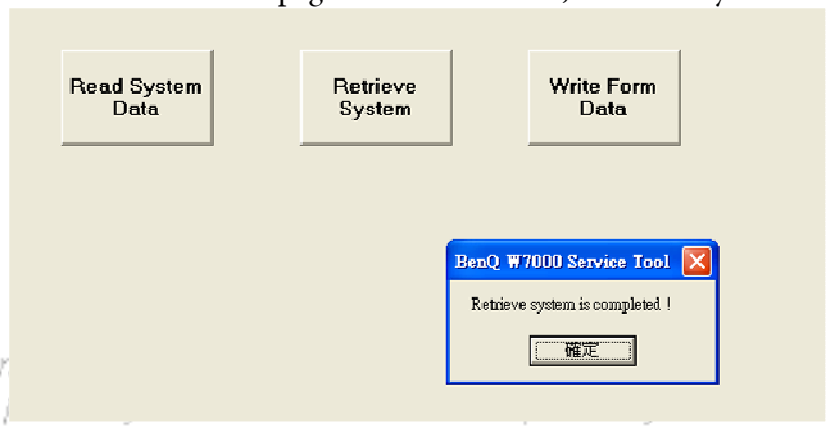
12. Turn off projector and the service tool, and then download a new firmware.

(2) Write Data From Main Board to Projector:

13. After completing firmware download, open the service tool (need to click “Setup” and “Save” to connect RS232 again).
14. Click “Retrieve System” to write back the previous saved adjustment data.

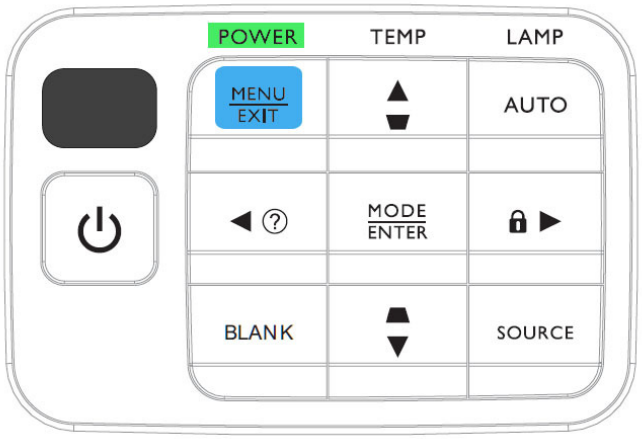


15. ADC calibration data are written back first and other data after.
16. After data in all pages are written back, “Retrieve System” is completed.

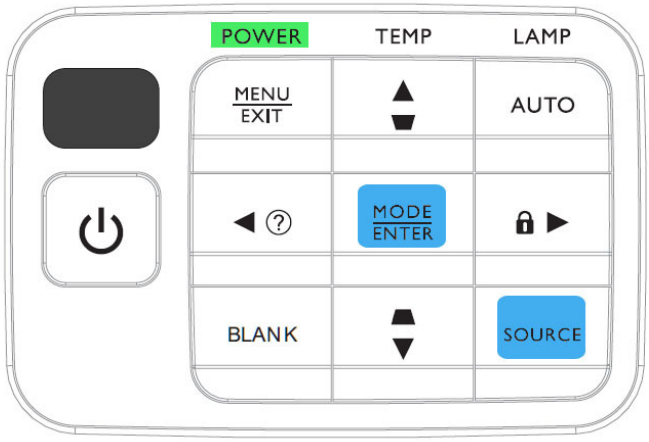


4.4 Method to enter factory menu

1. Press Menu/EXIT on keypad than the main menu popup



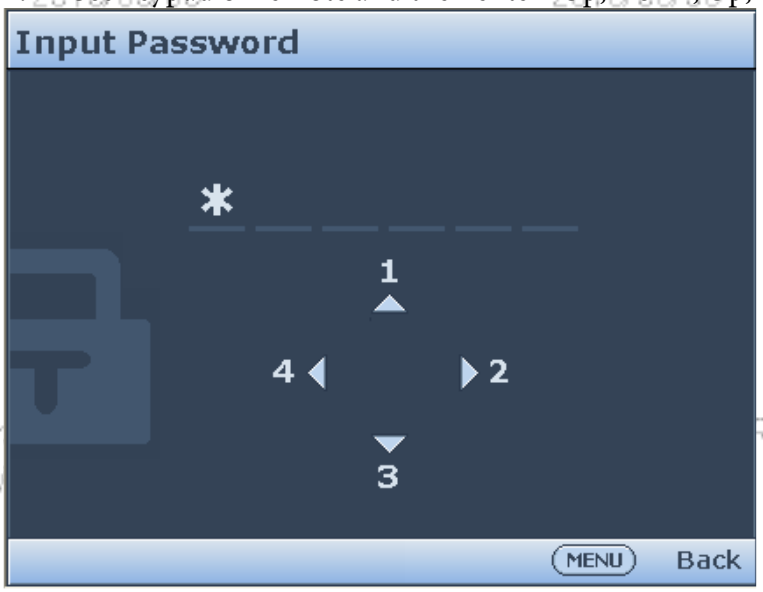
2. When showing main menu, press Source + Mode/ENTER at the same time



3. Factory menu popup at the top-left of display

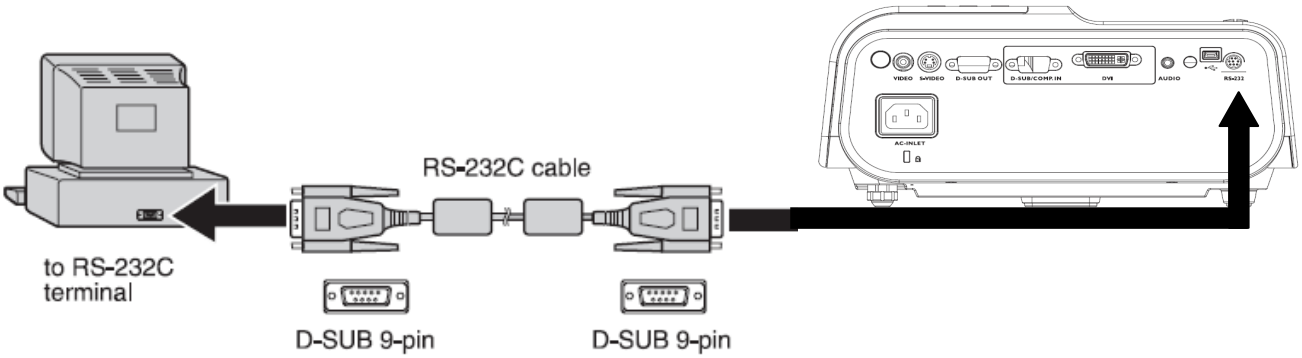
4.5 ISF Password:

1. Use keypad or remote and then enter “Up, Down, Up, Down, Left, Right”.



4.6 RS-232 connection

1. Below shows the illustration of connection between PC and Projector.

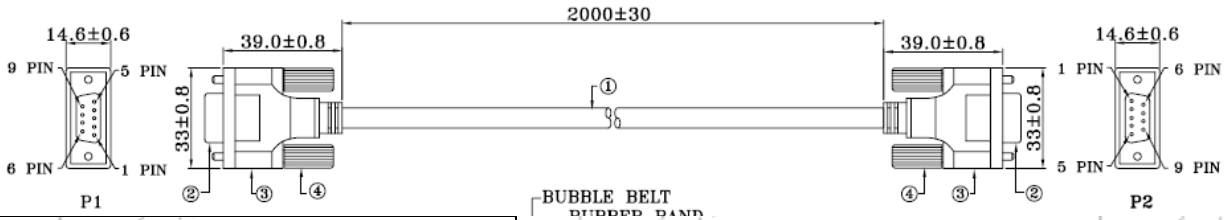


<CAUTION>

- Make sure that your computer and projector are turned off before connection.
- Power on the computer first, and then plug the power cord of the projector. (It may cause Com port incorrect function, if you do not follow this instruction)
- Adapters may be necessary depending on the PC connected to this projector. Please contact with your dealer for further details.

2. Hardware connection

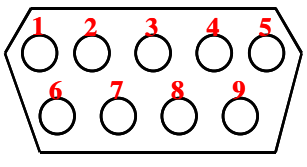
<Download cable 1>



WIRE ARRANGEMENT		
P1	COLOR	P2
1	BLACK	1
2	BROWN	3
3	RED	2
4	ORANGE	4
5	YELLOW	5
6	GREEN	6
7	BLUE	8
8	PURPLE	7
9	GRAY	9
CASE	DRAIN WIRE	CASE

<pin assignment for this two end>

Pin	Description	Pin	Description
1	NC	2	RXD
3	TXD	4	NC
5	GND	6	NC
7	RTS	8	CTS
9	NC		



Interface Settings

RS-232 protocol	
Baud Rate	115200 bps (default) Changeable settings in User OSD (2400/4800/9600/14400/19200/38400/57600/115200)
Data Length	8 bit
Parity Check	None
Stop Bit	1 bit
Flow Control	None

Software specification

1. When input cmd fail, e.g. correct input is "*pow=?#" but input "*po=?#", or input "*mute=on#" while projector is already mute, it will show "*Illegal format#".
2. When input cmd but projector has no such function item, e.g. input "*sour=RGB2#" but projector has no RGB2 connector, it will show "*Unsupported item#".
3. When cmd and function are both workable, but it's not under the status which cmd can be executed, e.g. input "*asp=4:3#" while not connecting source, it will show "*Block item#".
4. When input "query" cmd (with "?"), e.g. input "*sour=?#", it will echo the same input strings with some value.
5. Press "Enter" key after" ＞", it should be no echo and skip to the next row.
6. Press "Space" and "Enter" key after" ＞", it will echo"*Illegal format#"

Command Category

Refer to Appendix 2

4.7 Adjustment / Alignment Procedure

Content

4.7.1. Color Wheel Delay Alignment

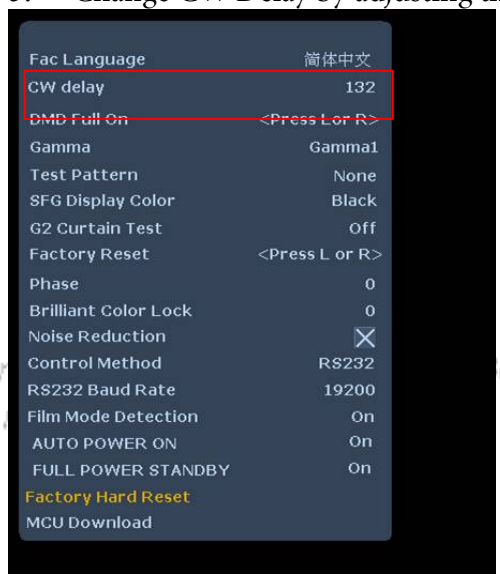
4.7.2. Overfill adjustment

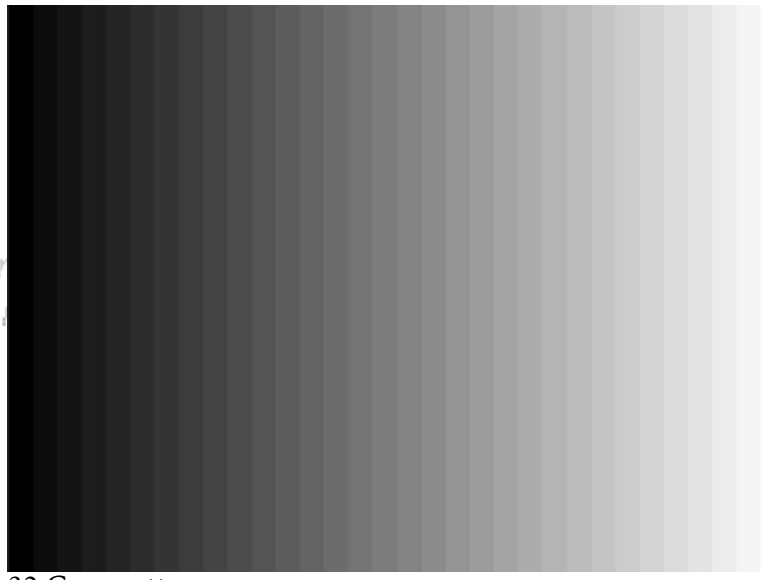
4.7.3. PC Alignment Procedure

4.7.1. Color Wheel Delay Alignment

Procedure:

1. Enter Factory Mode
2. Enter Block 1
3. Change CW Delay by adjusting the following gray pattern to smooth

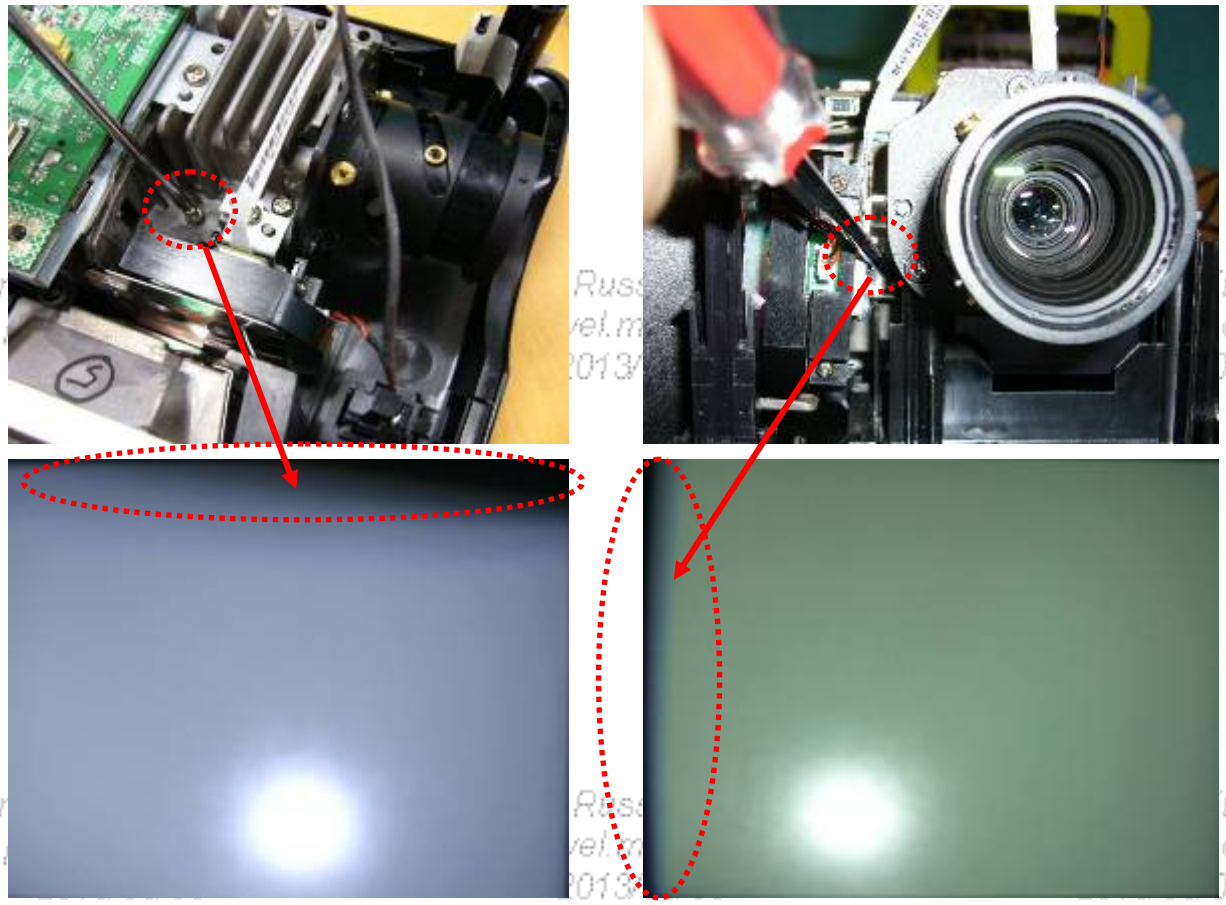




32 Gray pattern

4.7.2. Overfill adjustment

1. "Full White Pattern" is suggested for this alignment.
2. Adjust 2 LP-alignment Screws (upper side / lower front side of Optical Engine) behind Color Wheel.
3. Alignment Criteria is to adjust these 2 screws until "No Dark Edges" and "No Shadows" can be observed in image.



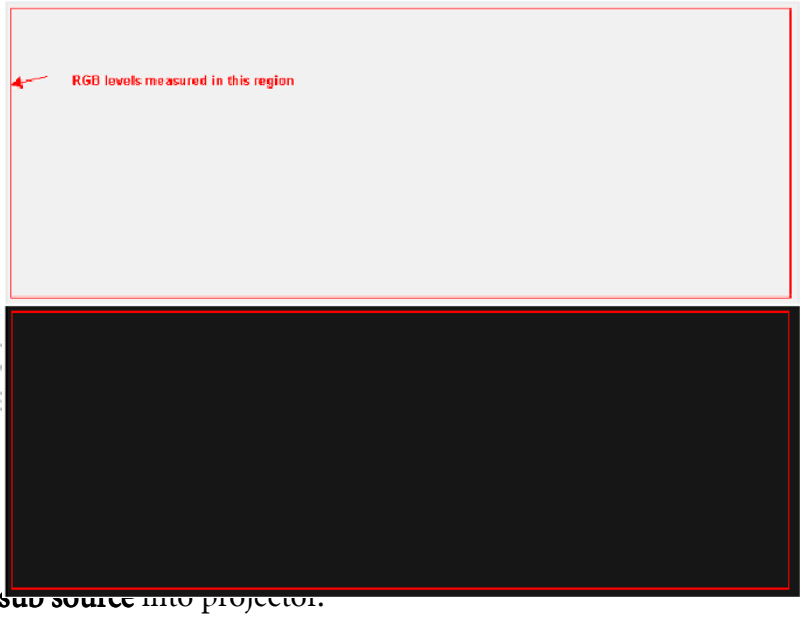
4.7.3 PC Alignment Procedure

Equipment：

- Pattern generator

OSD Default value：

Item	Value
Cal R Offset	512
Cal G Offset	512
Cal B Offset	512
Cal R Gain	1024
Cal G Gain	1024
Cal B Gain	1024



Procedure：

1. Connect power cord and **PC D-sub source** into projector.
2. Turn on projector.
3. Change **Timing** of pattern generator:

   Timing:

   1280*1024 @60Hz (1080p models)

   1024*768 @60Hz (XGA models)

   800*600@60Hz (SVGA models)
4. Change Pattern of pattern generator:

   Pattern: Full frame pattern, ex.pattern1
5. Press "Auto" to catch the full screen
6. Change Pattern of pattern generator:

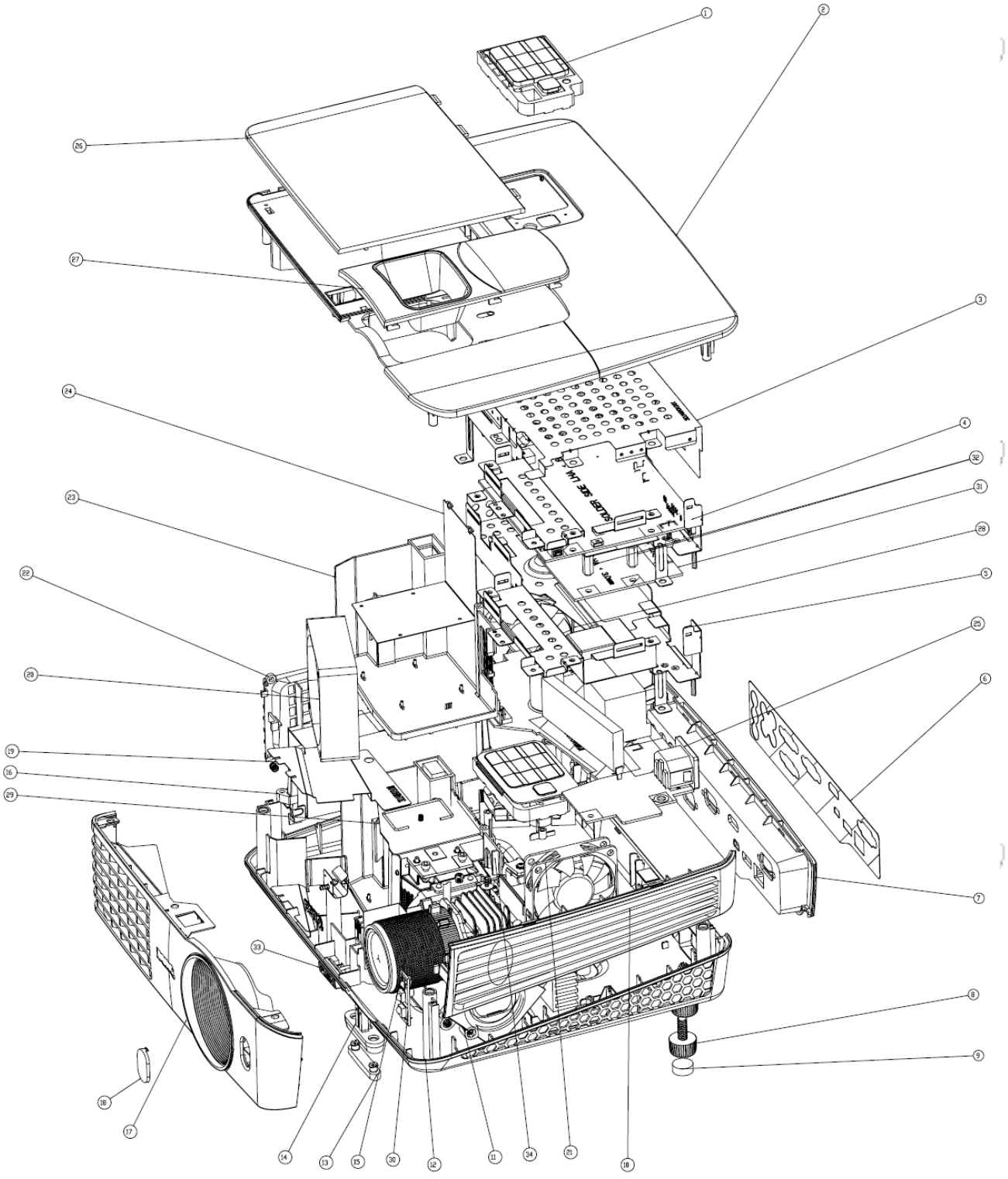
   Pattern: A near white color (240,240,240) and a near black color(16,16,16)
7. Enter Factory mode, block 3
8. Press "**Calibration RGB <Press L or R>**" to let the black level to just distinguish, and the light output of white level to just max.
9. Check the 32 levels of gray. All steps must appear.
10. Done

5. Level 2 Circuit Board and Standard Parts Replacement

5.1 Product Exploded View

Module 1 – Total Exploded View

No.	Description	Qty
1	KEYPAD RUBBER PLUTO10-3	1
2	ASSY SUB CASE UPPER PLUTO10-3	1
3	SHD MAIN BD SPTE PLUTO10-3	1
4	PCBA MAIN BD MI PLUTO10-3	1
5	BKT MB SECC PLUTO10-3	1
6	MYLAR I/O PLUTO10-3	1
7	CASE REAR PLUTO10-3	1
8	FOOT ADJUST REAR PC	1
9	RUBBER FOOT REAR	2
10	ASSY CASE RIGHT PLUTO10-3	1
11	SPK 10W 8OHM	1
12	ASSY CASE LOWER PLUTO10-3	1
13	RUBBER ADJ	1
14	FOOT ADJ	1
15	ASSY OPT-ENG MX711	1
16	BALLAST 230W EUC	1
17	CASE FRONT PC PLUTO10-3	1
18	LENS IR FRONT PC PLUTO10-3	1
19	SHD LC PLUTO10-12	1
20	FAN 70*70*25 145MM	1
21	FAN60*60*13 55MM	1
22	CASE LEFT PC PLUTO10-3	1
23	AHD LAMPFRAME PLUTO10-2	1
24	FRAME LAMP PLUTO10-2	1
25	PCBA POWER BD MI PLUTO10-3	1
26	ASSY DOOR LAMP PLUTO10-3	1
27	COVER ZOOM FOCUS PC PLUTO10-3	1
28	FAN60*60*13 65MM	1
29	ASSY LAMP-MOD U230W PLUTO	1
30	PCBA IR BD MI	1
31	PCBA EXTENSION BD MI PLUTO10-3	1
32	STAND OFF M3 D6*17L CU	2
33	BUTTON PUSH	1
34	ASSY BLOWER PLUTO10-3	1



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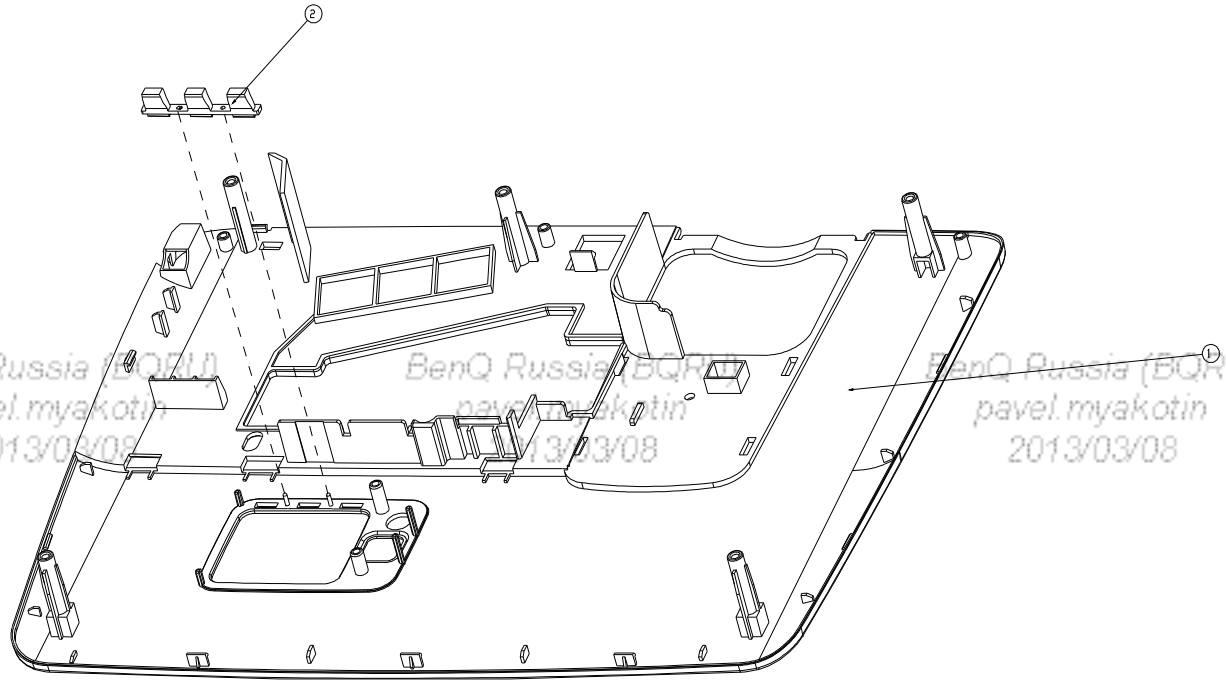
2013/03/08

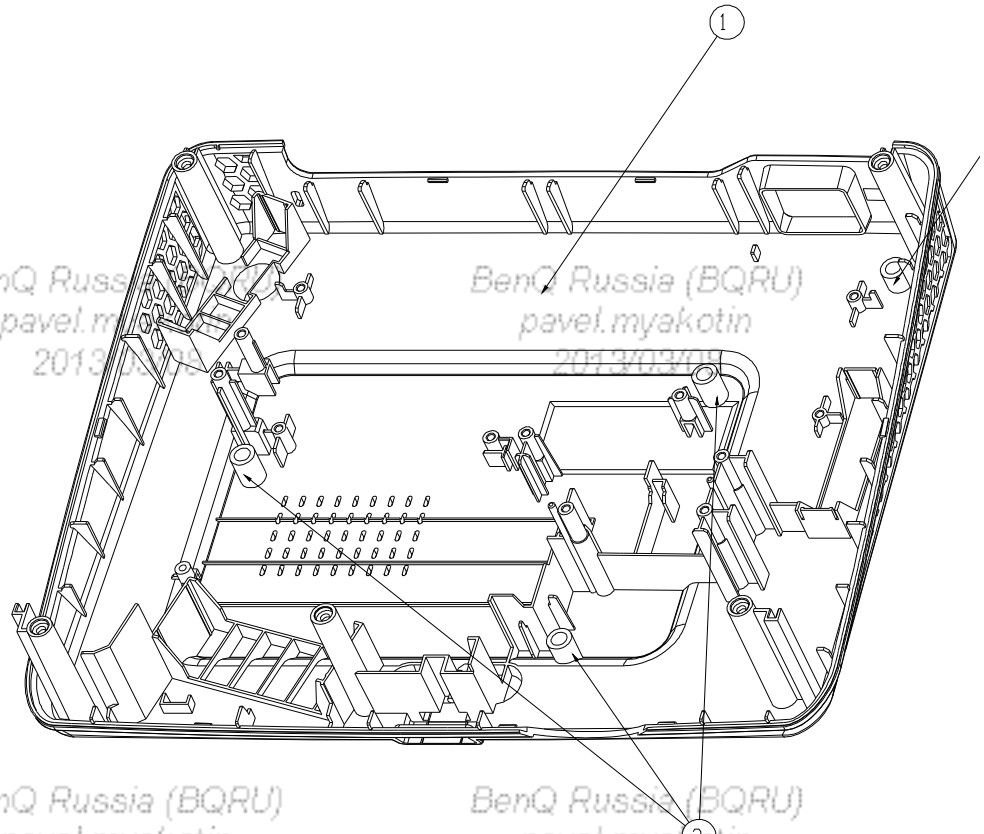
Module 2 – ASSY UPPER CASE

ITEM	DESCRIPTION	Q'TY
1	CASE UPPER PC PLUTO10-3	1
2	LENS LED ABS PLUTO10-3	1

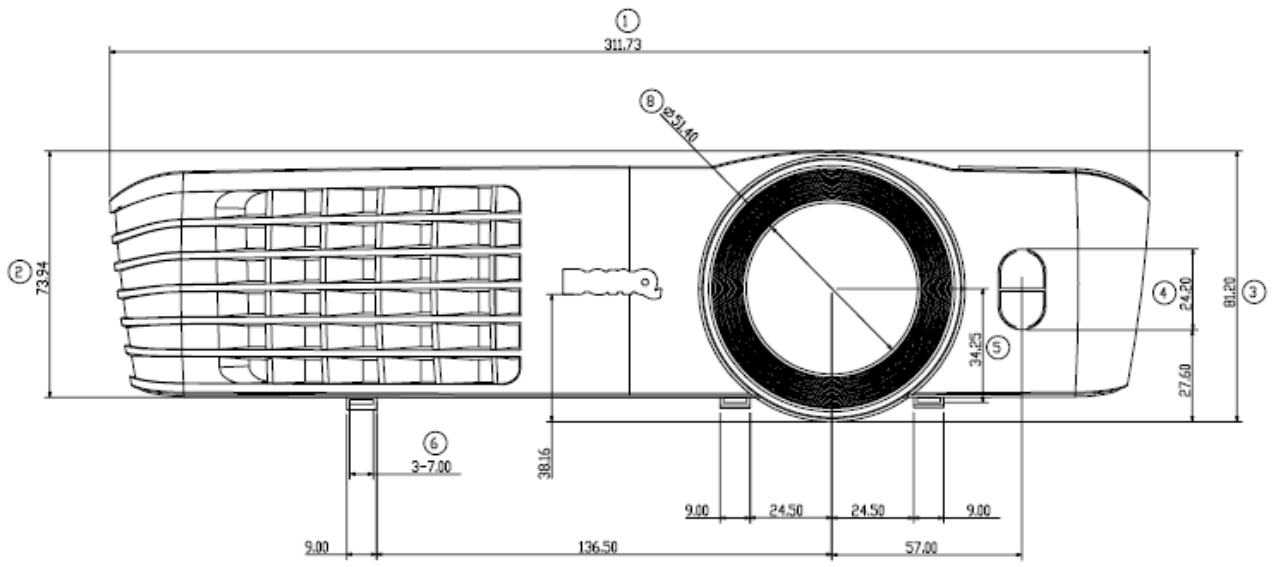


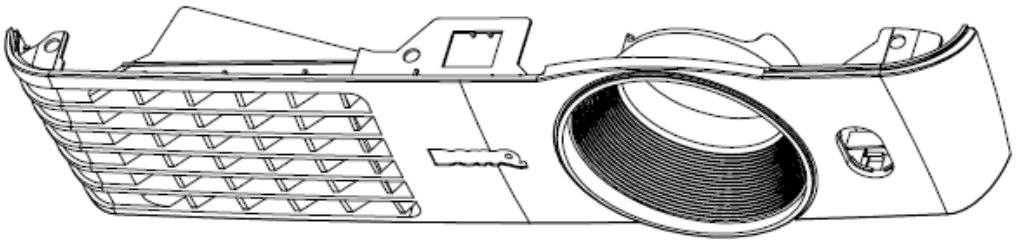
Module 3 – ASSY LOWER CASE

ITEM	DESCRIPTION	Q'TY
1	CASE LOWER PC PLUTO10-3	1
2	NUT INSERT M4*15L D6.3 BRASS	3



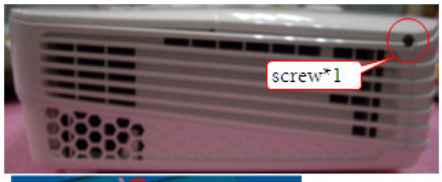
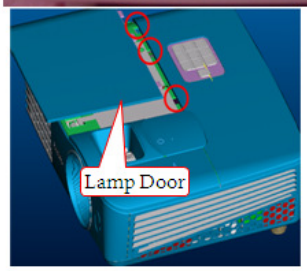
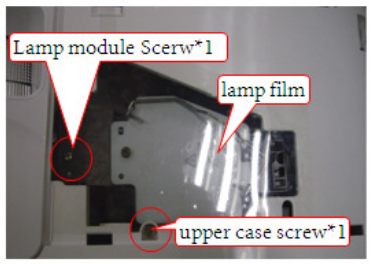
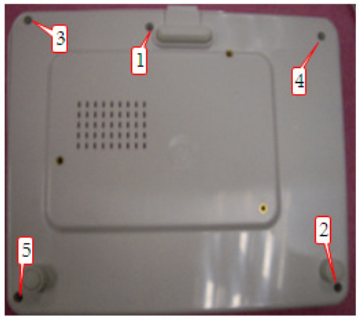
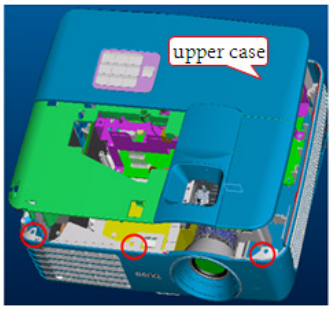
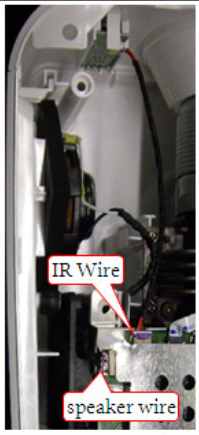
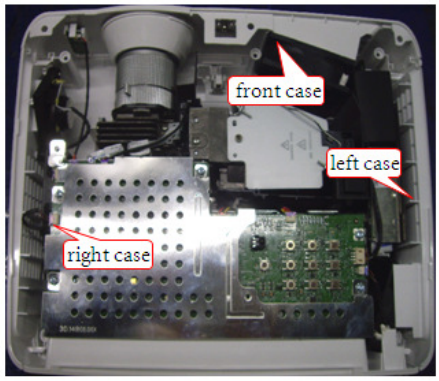
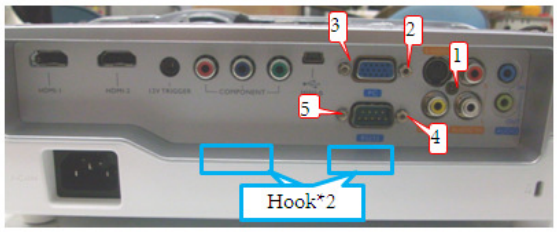
Module 4 – ASSY FRONT CASE

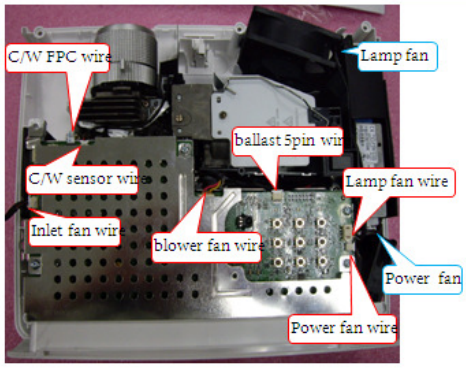
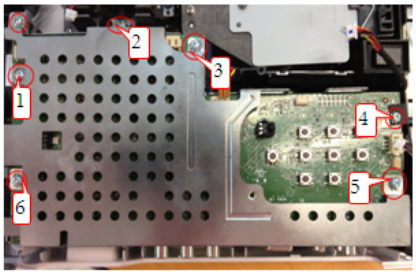
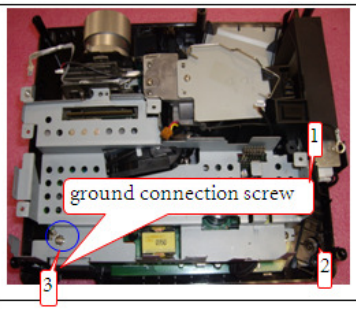
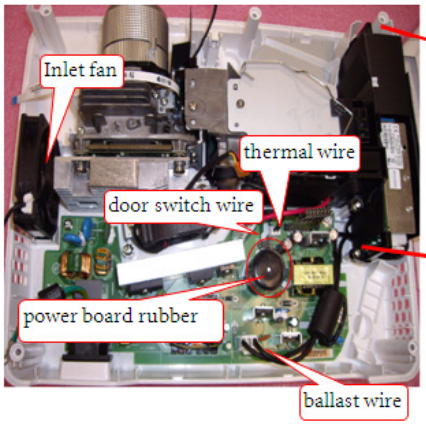
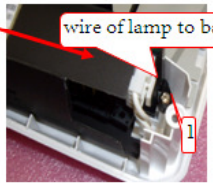
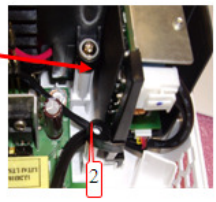
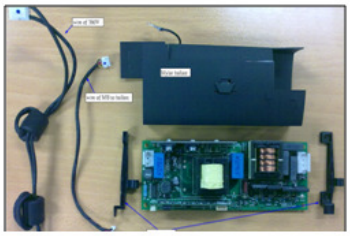
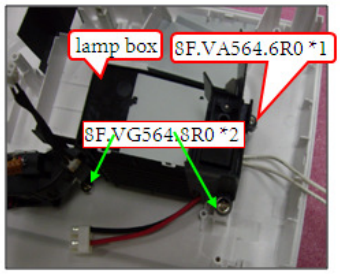
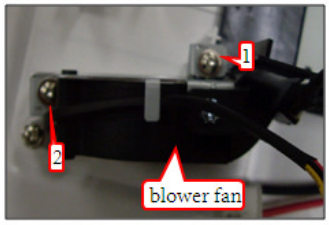


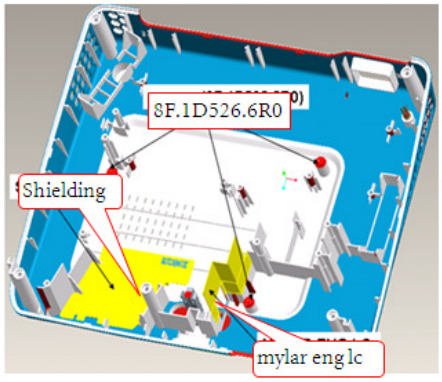
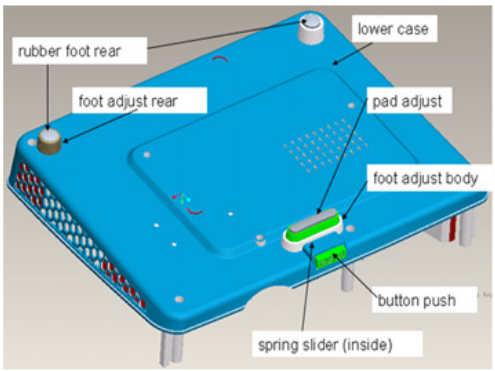


5.2 Product Disassembly / Assembly

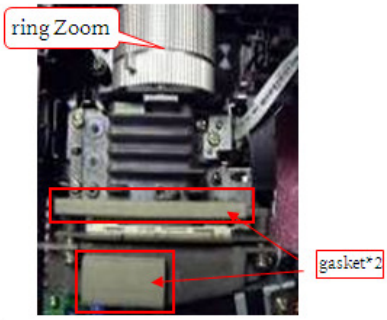
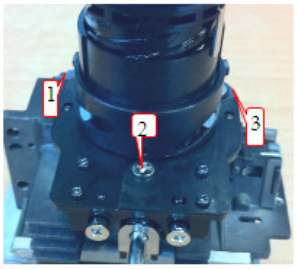
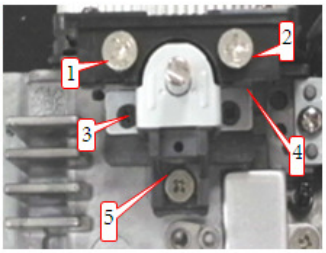
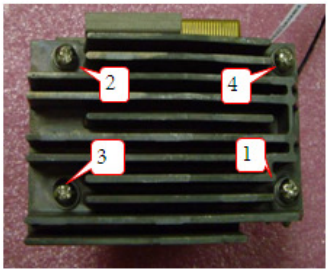
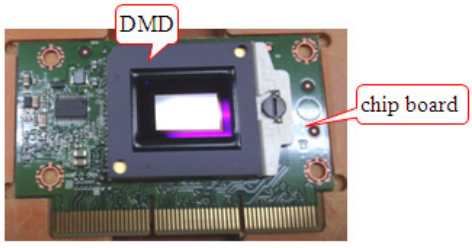
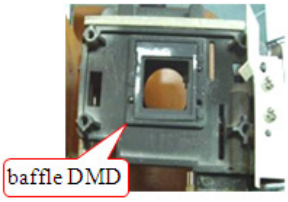
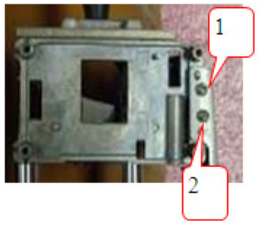
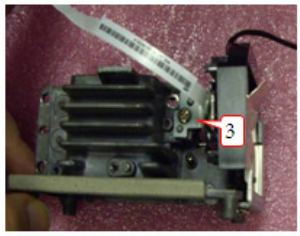
W1070 Dismantle SOP

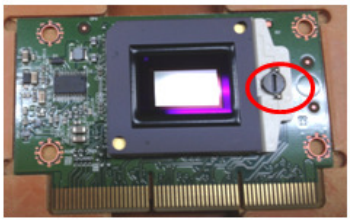
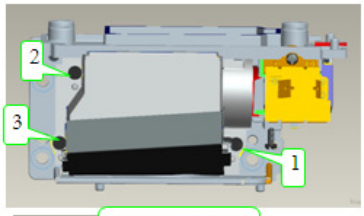
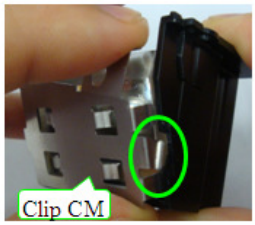
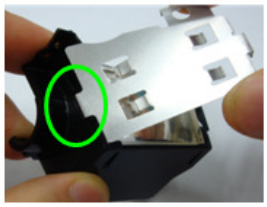
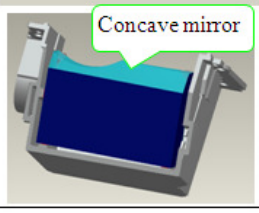
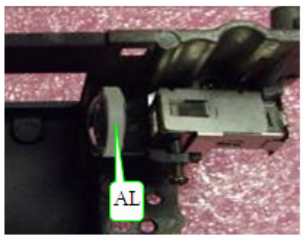
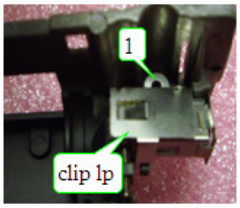
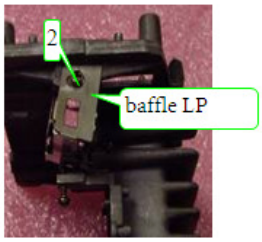
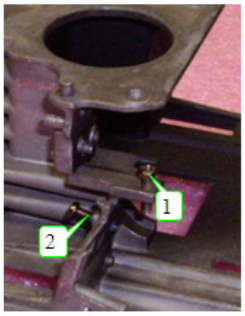
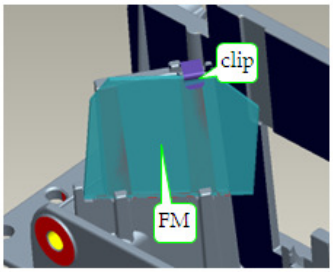
Step	Description		Tool
1	Disassemble the Left case screw*1 and take off the lamp door. Disassemble the lamp film of anti-explosion. Disassemble the lamp module screw*1 and take off the lamp module,as the right Figure . Disassemble the upper case screw*1	  	screw driver
2	Disassemble the lower case screw* 5（8F.VA564.8R0）.and take off the upper case	 	screw driver
3	Extract the IR Wire and the speaker wire from mainboard and take off the front case module. Push the boss behind, and take off the left case and right case module.	 	
4	Dismantle screw*5 on rear case, then take off rear case		screw driver

5	Dismantle Inlet fan wire, C/W FPC wire, C/W sensor wire, blower fan wire, ballast 5pin wire, Power fan wire, Lamp fan wire on main board. Disassemble the screw*6, and take off the shield main board . Disassemble the main board and take off the Power fan and Lamp fan.	 	screw driver
6	Disassemble the screw*3. Disassemble the ground connection screw*1, and take off the Braket.		screw driver
7	Extract the door switch wire/thermal wire ballast wire and take off the power board rubber. Disassemble screw*1. Take off the Power board. Disassemble screw*3 Take off the Engine module and the Inlet fan. Disassemble screw*2, and take off the ballast module. Dismantle wire of lamp to ballast.	  	screw driver
8	Disassemble the ballast wire*2, ballast holder*2 and ballast mylar		
9	Disassemble the screw*3, and take off the lamp box. Disassemble the screw*2, and take off the blower fan	 	screw driver

10	Take off the push button . Disassemble the screw*3 . Take off the shielding. Take off the mylar eng lc. Extract the rubber foot rear*2, foot adjust rear, pad adjust, foor adjust body, spring slider and the push button in the lower case.	 	screw driver

W1070 Engine Dismantle SOP

Step	Description		Tool
1	Take off the gasket*2. Disassemble the Ring Zoom		
2	Take off the LENS screw*3 and and Ring Focus screw*2 Take off the LENS Shift screw*5.	  	screw driver
3	Disassemble the screw*4, and take off the Hest-sink and DMD chip with Chip BD.	 	screw driver
4	Disassemble the baffle DMD. Disassemble the screw*3 and take off the CW module.	  	screw driver

5	Rotate to open the switch on socket, and take off the DMD chip.		screw driver
6	Disassemble ILL module(screw*3). Take off Clip CM, then take off the Concave mirror. Take off the sponge.	    	screw driver
7	Take off the AL. Disassemble the screw*2. Take off the clip lp and baffle LP Take off the LP module . Disassemble the screw*2. Take off the clip and the FM.	     	screw driver

5.3 Module Assembly Key Point - Optical Engine

1. Light Pipe Module assembly and overfill alignment

1.1 Assembly LP Module to HSG DMD

i. Assembly two Overfill adjustment screws (M2) to HSG DMD (Fig. 1-1).
** Adjustment criteria refer to below item 1.2 & Fig. 1-2.

ii. Press CLIP of BKT LP first and push it into the hole (Fig. 1-3).

iii. Hook Clip LP to HSG DMD, and lock with screw well. (Fig. 1-4).

iv. Placed LP Module on LP datum of "DMD HSG" and adjustment screw well, shown(Fig. 1-5).

v. Assembly "Baffle LP", Hook top of Baffle LP first (Fig. 1-6) & screws(M2) well (Fig. 1-7).

1.2 Overfill Adjustment @ LP Module

Overfill Adjustment Criteria:

i. Pre-assembly 2 adjusting screws. Criteria shown as Fig.1-1

ii. Alignment Sequence:

a. To adjust "Horizontal Adjustment Screw" firstly, and then "Vertical Adjustment Screw".

b. Refer to Fig. 1-1

1.3 For Overfill Re-adjustment:

a. Those 2 Adjustment Screws must be released closely to the "Pre-assembly" positions first (Fig. 1-4).

b. Follow adjustment steps shown in Item 1.2-ii..

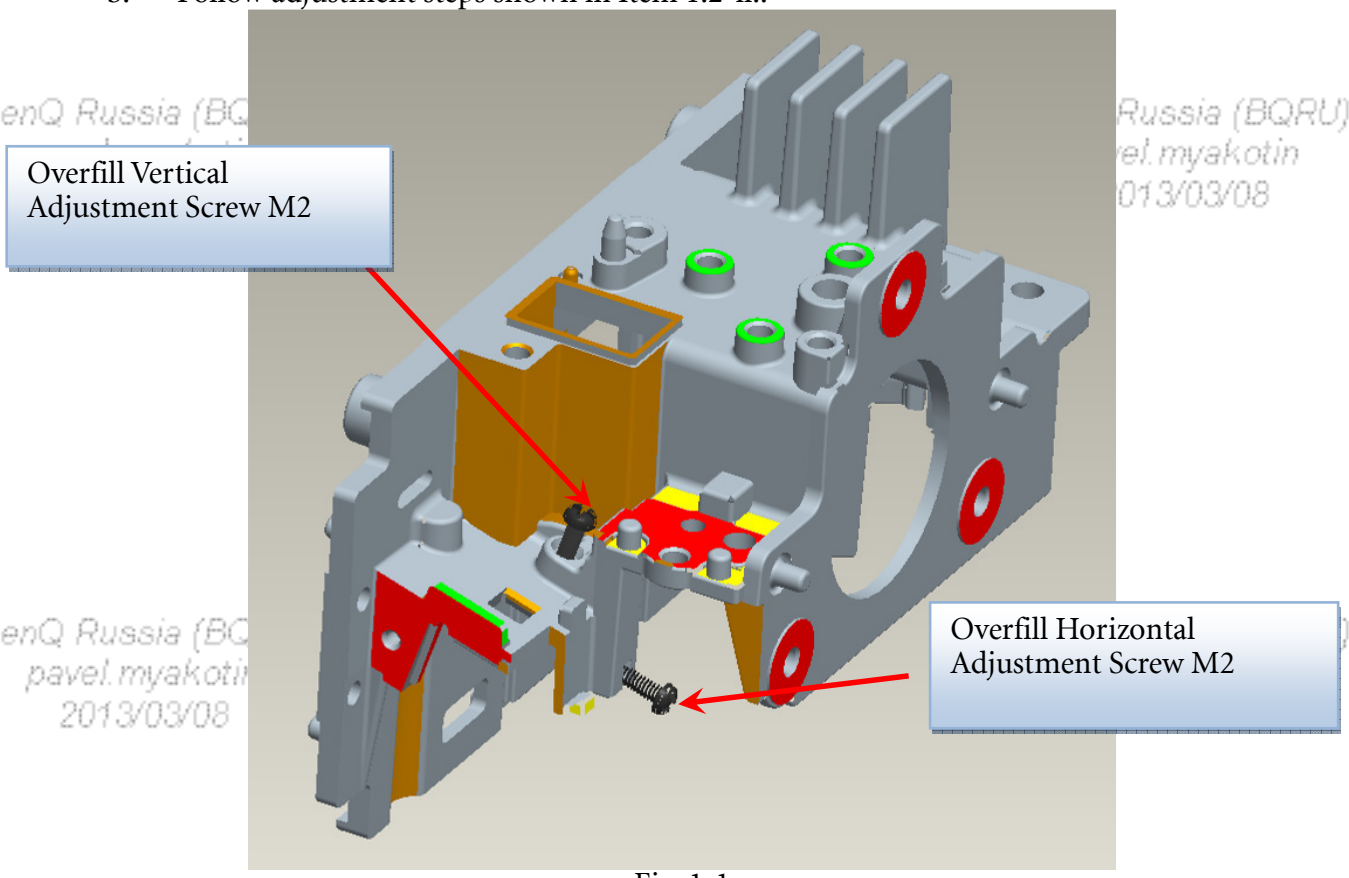


Fig. 1-1

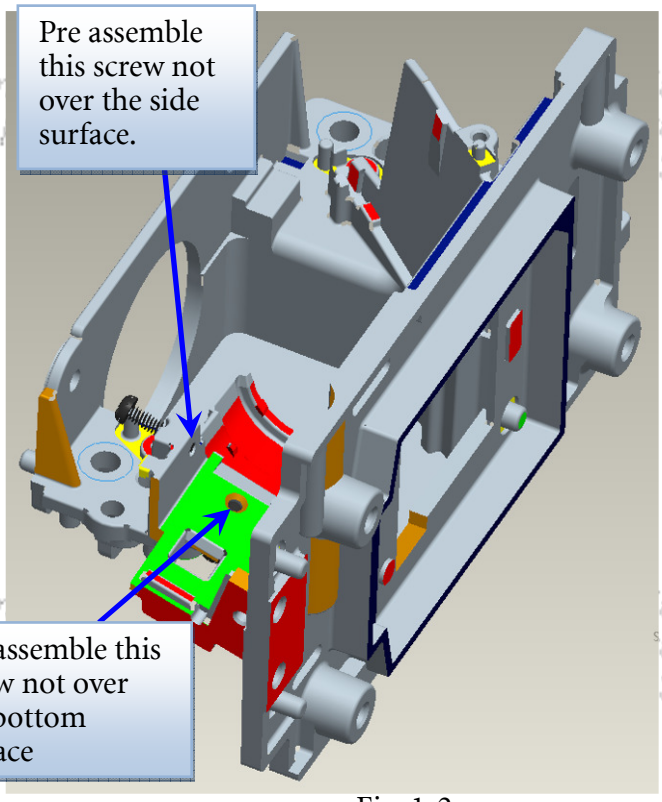


Fig. 1-2

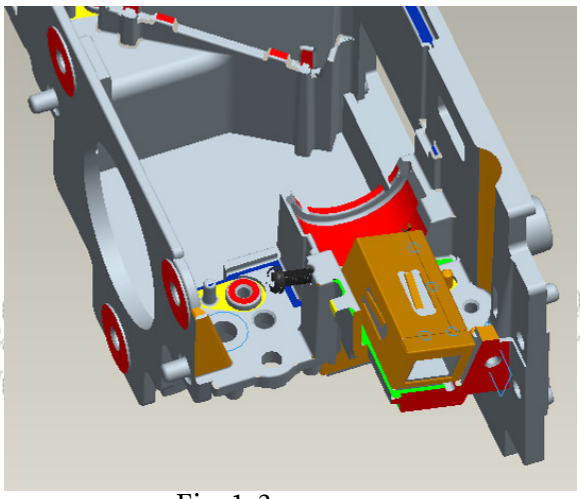


Fig. 1-3

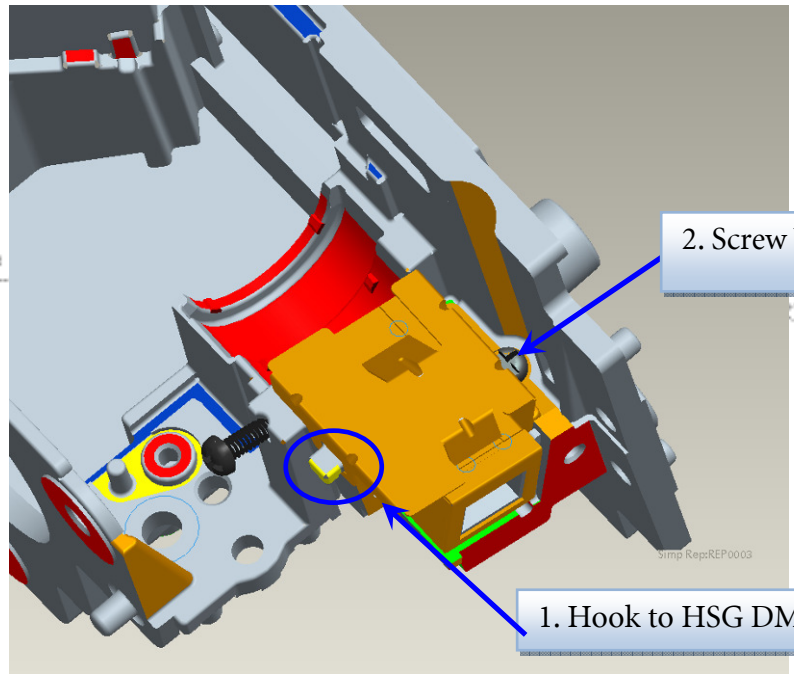


Fig. 1-4

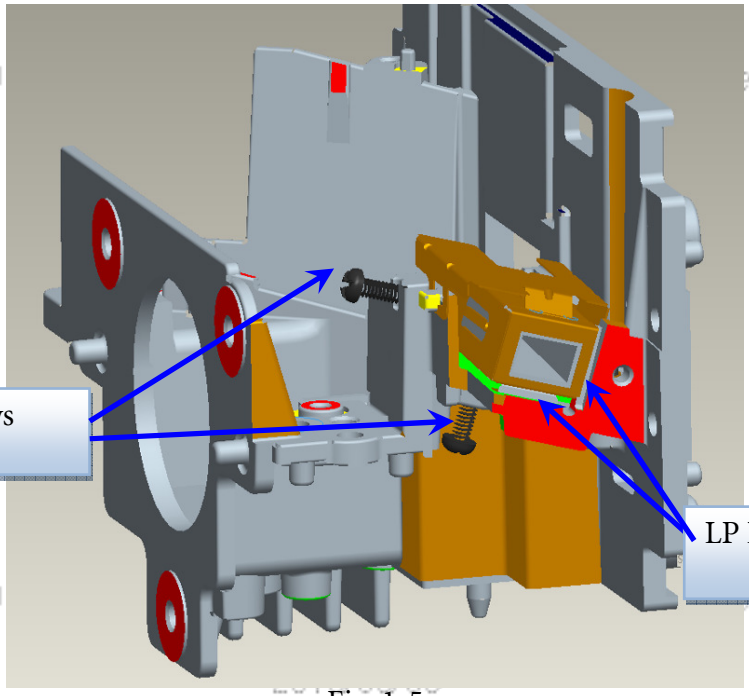


Fig. 1-5

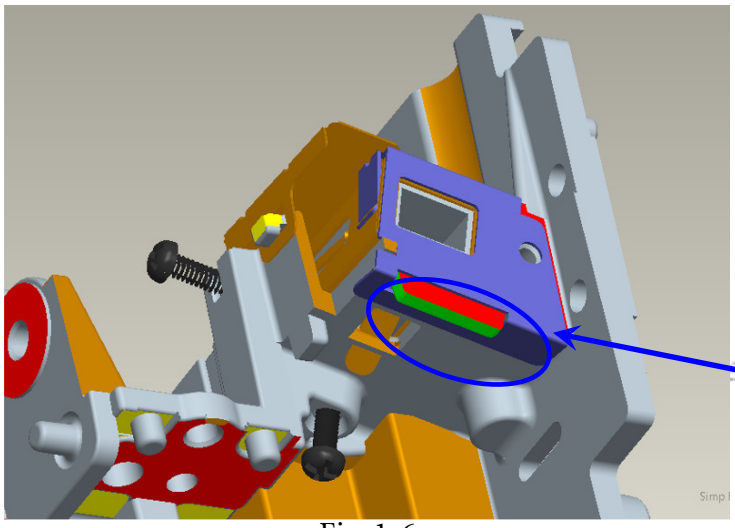


Fig. 1-6

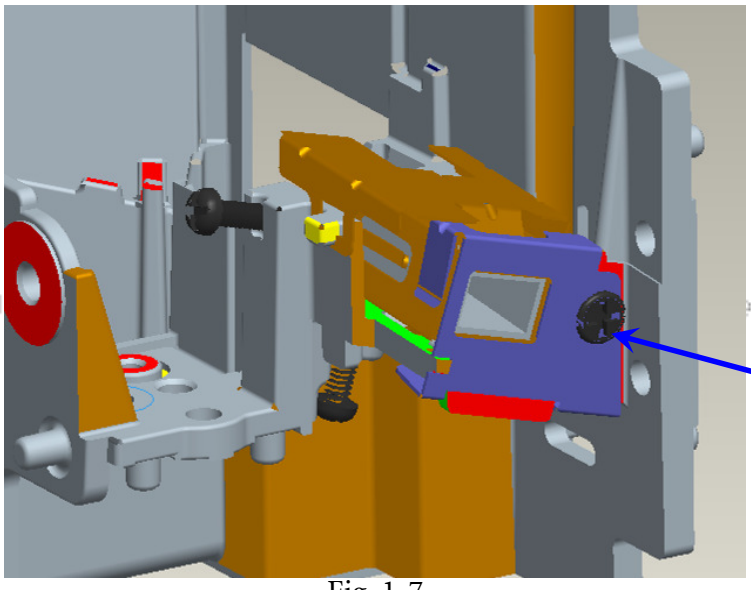


Fig. 1-7

2. Assembly HSG ILL Module:

2.1 CM Assembly

I. Assemble CM to Sub HSG and to make CM contact Sub HSG datum Well (Fig. 2-1, 2-2).

II. Hook Clip CM to Sub HSG first and push it into the hole. (Fig. 2-3, 2-4).

III. To check and make sure Clip CM hooks the Sub HSG Well (Fig. 2-5).

IV. Paste “Mylar Cover Sub” to cover “Clip CM” and ”Sub HSG” (Fig. 2-5).

V. Paste “Sponge tube AL” on cannelure of ”Sub HSG” (Fig. 2-5).

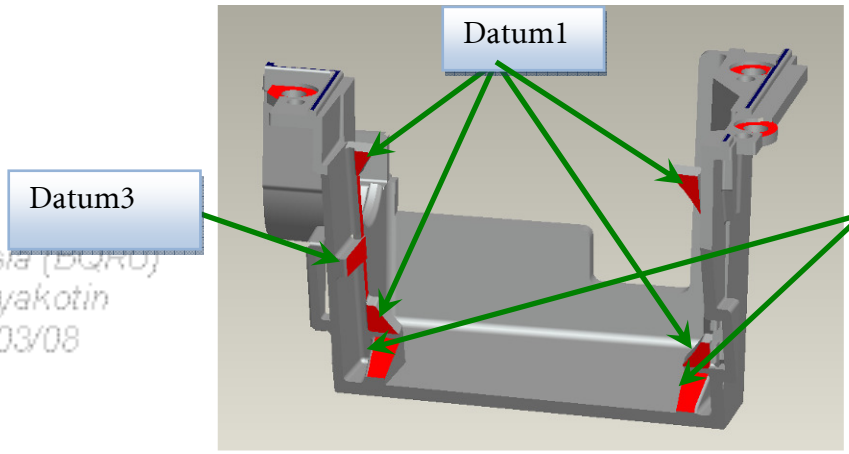


Fig. 2-1

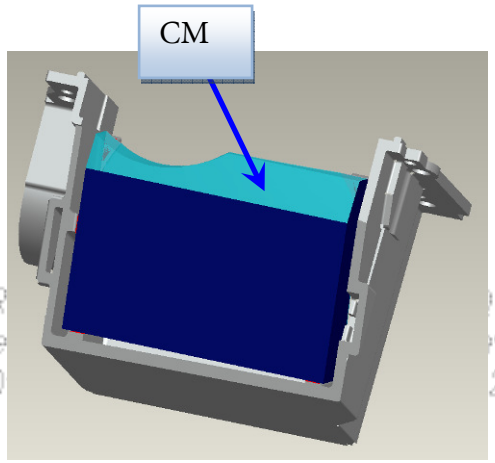


Fig. 2-2

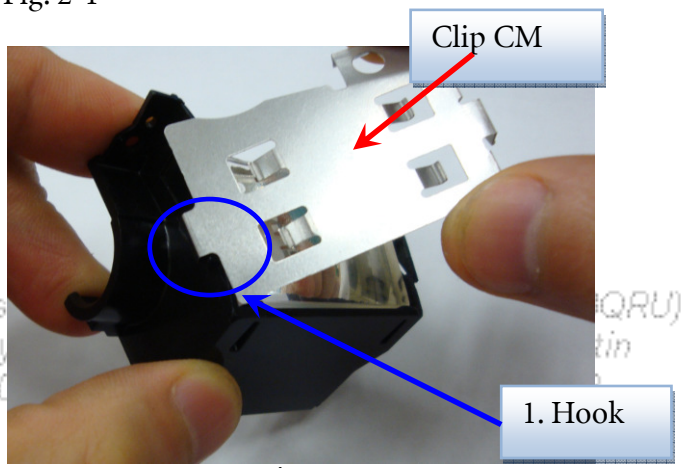


Fig. 2-3

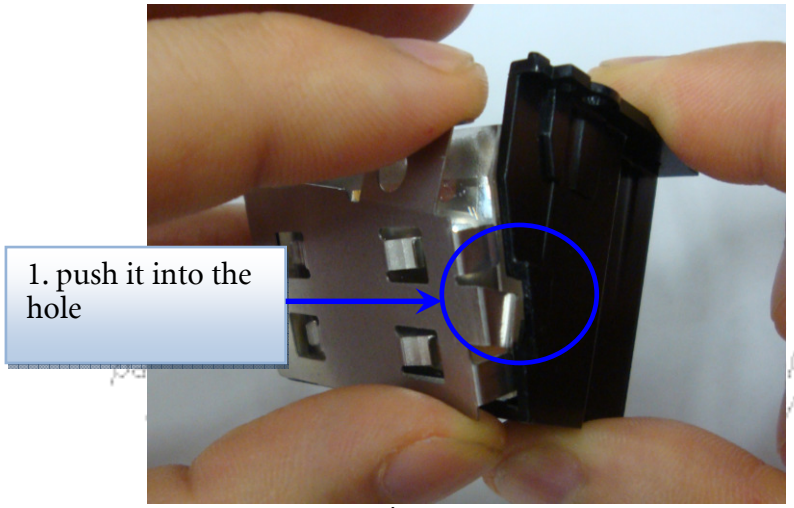


Fig. 2-4

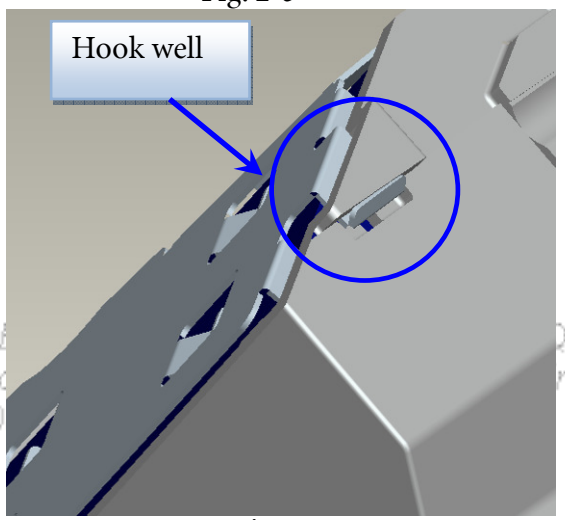


Fig. 2-5

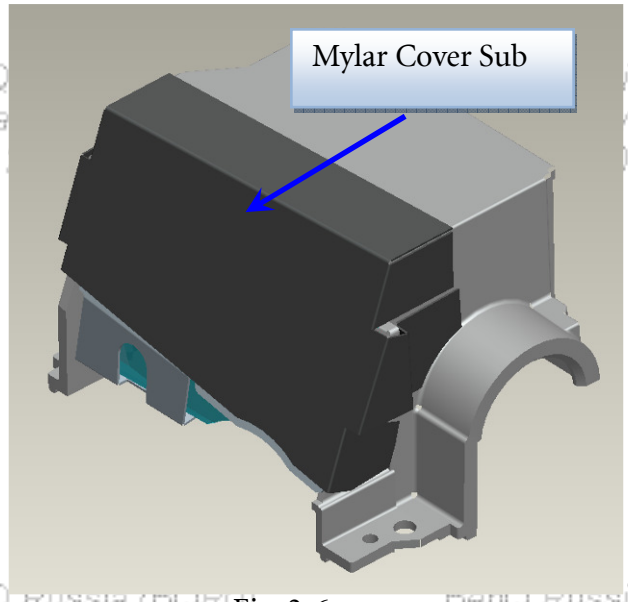


Fig. 2-6

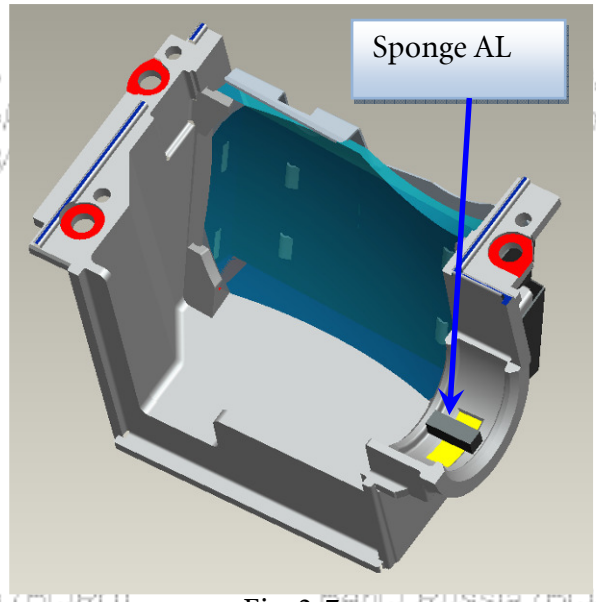


Fig. 2-7

2.2 FM Module Assembly

I. Check mark point of FM and place FM on "HSG DMD" surface (Fig. 2-6-1, 2-6-2).

II. Assemble "Clip FM " to fix FM(Fig. 2-7).

III. Check Clip FM hook HSG DMD and Screw Well (Fig. 2-7)

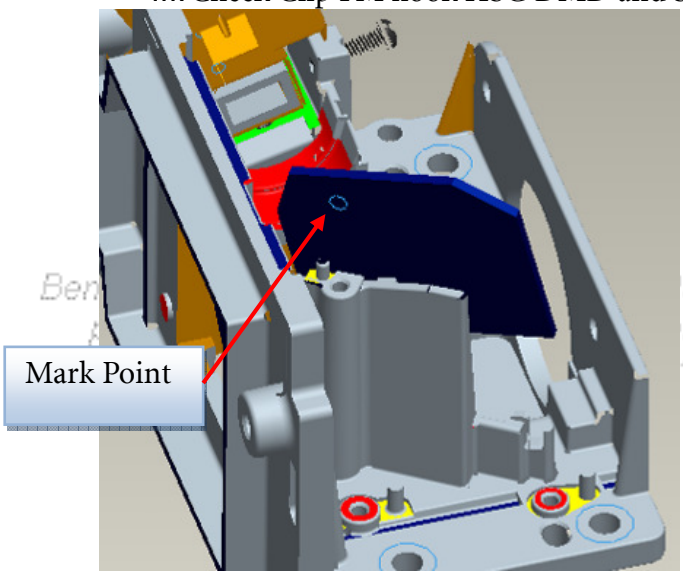


Fig. 2-6-1

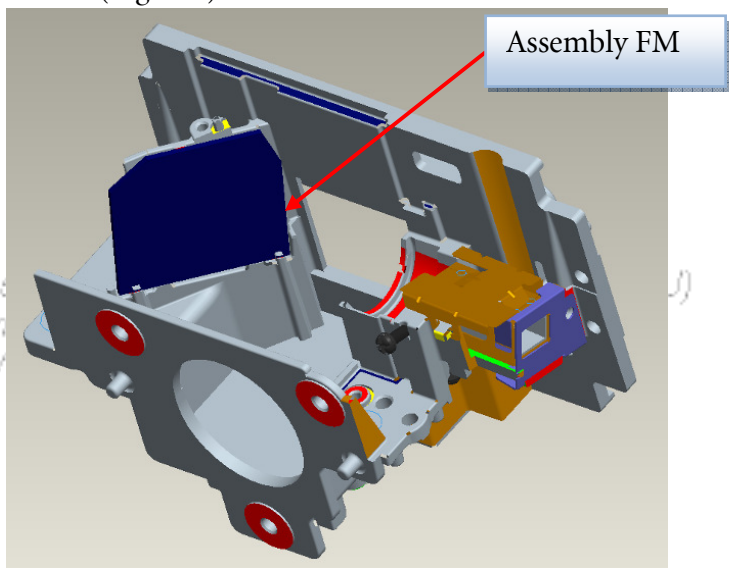


Fig. 2-6-2

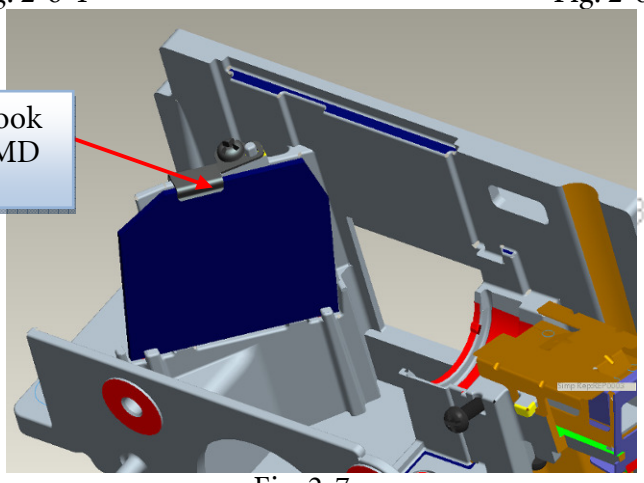


Fig. 2-7

3. AL, HSG ILL and HSG DMD Assembly:

3.1 Placed “AL” on the “HSG DMD”. The “raised surface” of “AL” shall toward “DMD direction” (Fig. 3-1).

3.2 To assemble ” SUB HSG Module” with “HSG DMD” and cover over on “AL” and the then lock with screws(Fig. 3-2).

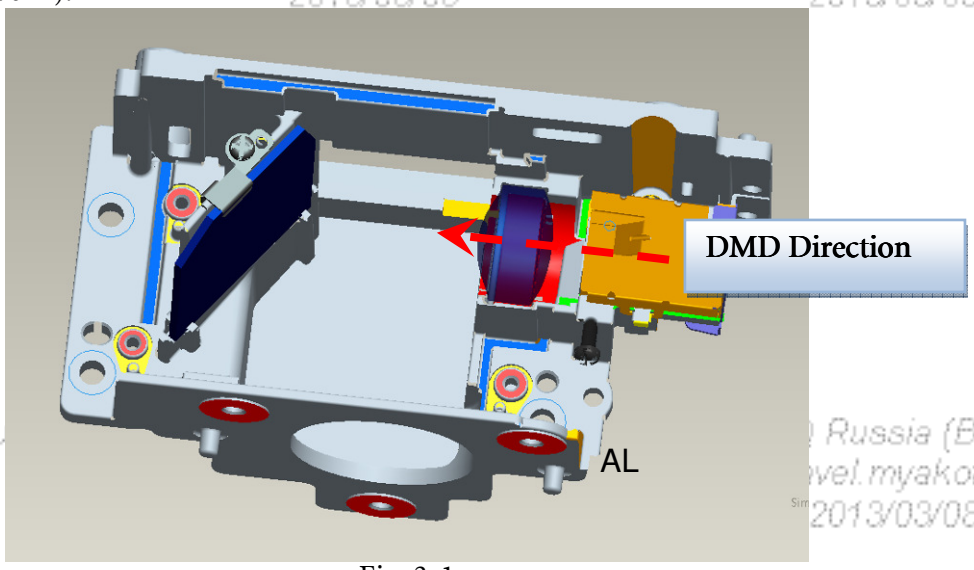


Fig. 3-1

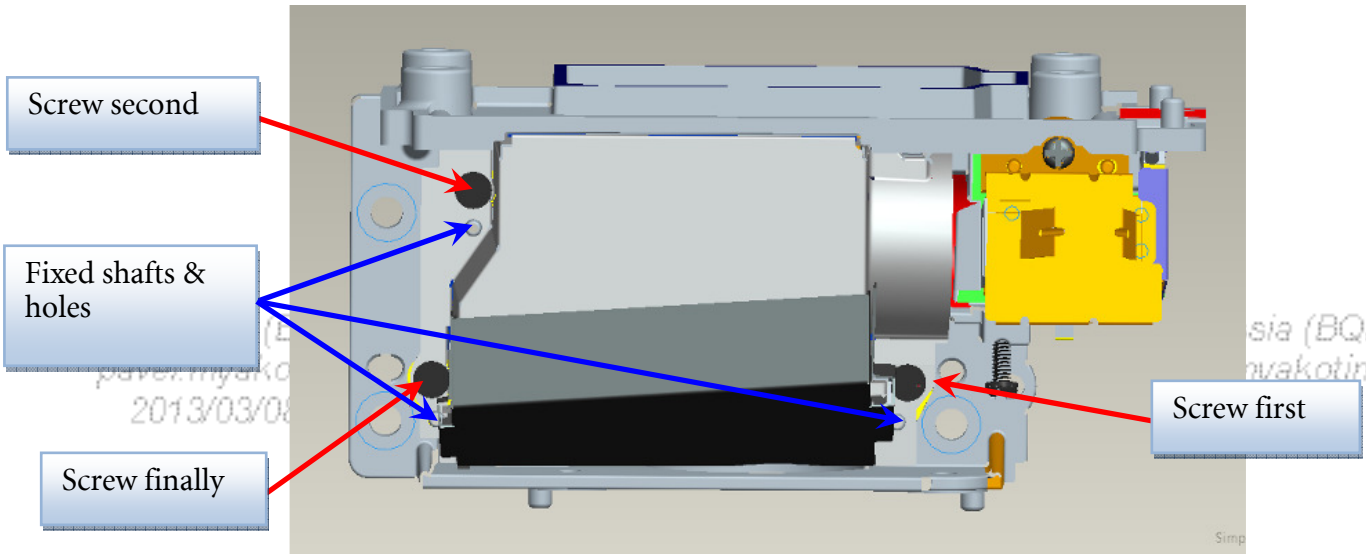


Fig. 3-2

3.3 Paste “Sponge Anti Dust” on Clearance between ”Sub HSG” and “HSG DMD” (Fig. 3-3-1,2).

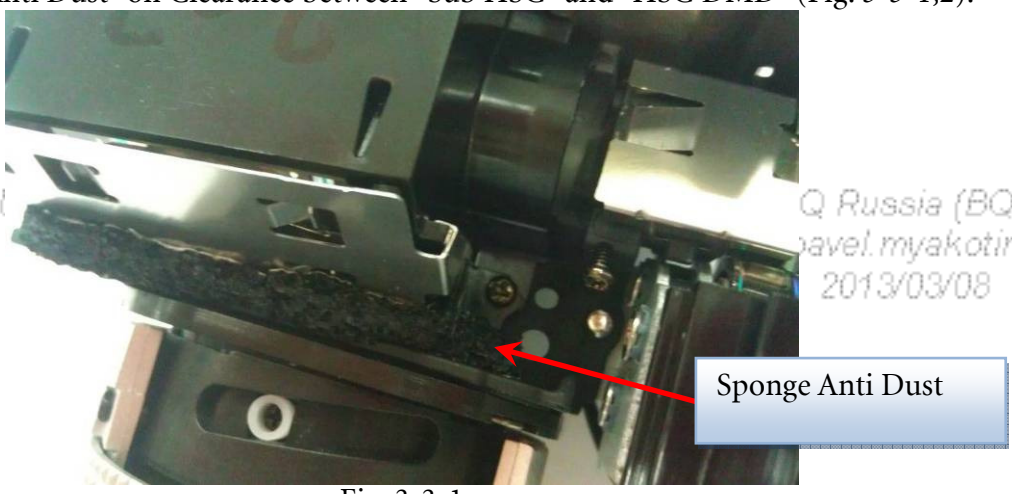


Fig. 3-3-1

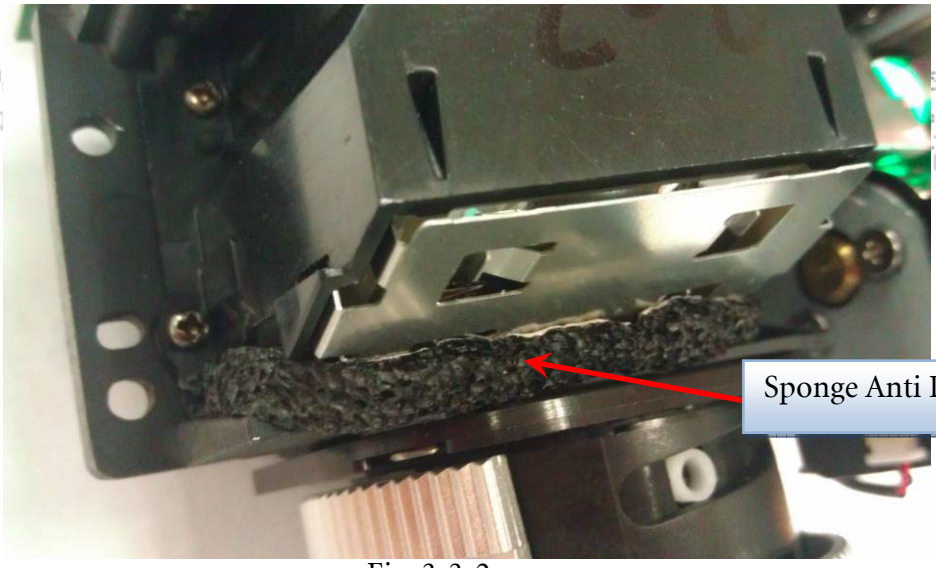


Fig. 3-3-2

4. DMD and Chip B/D Module:

4.1. Judge Chip B/D and DMD alignment keying first (Fig. 4-1, 4-2).

4.2. Alight keying and Assemble DMD to Chip B/D (Fig. 4-3).

4.3. Push DMD slightly and use screwdriver rotate clockwise button to lock (close notation) DMD on Chip B/D (Fig. 4-4).

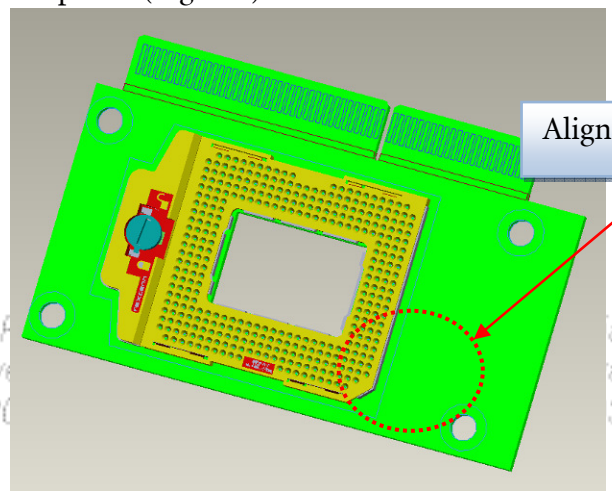


Fig. 4-1

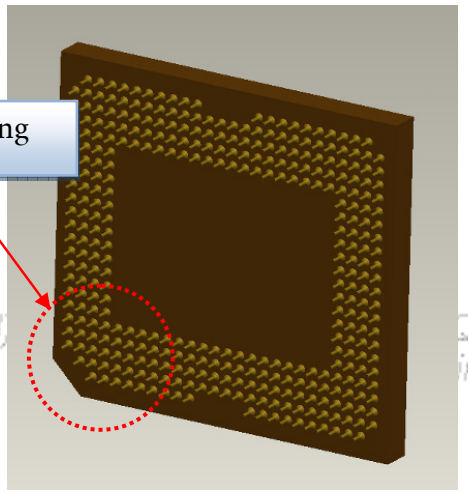


Fig. 4-2

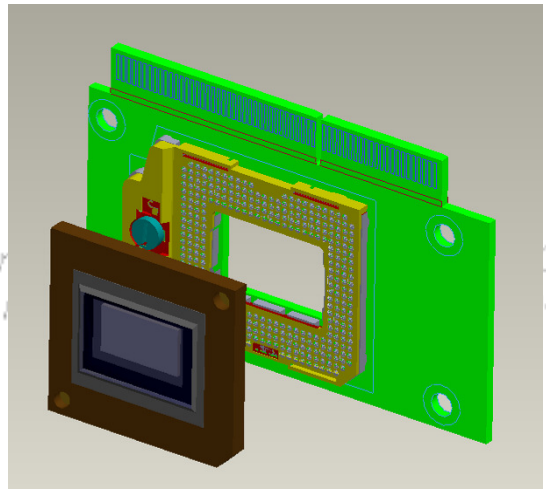


Fig. 4-3

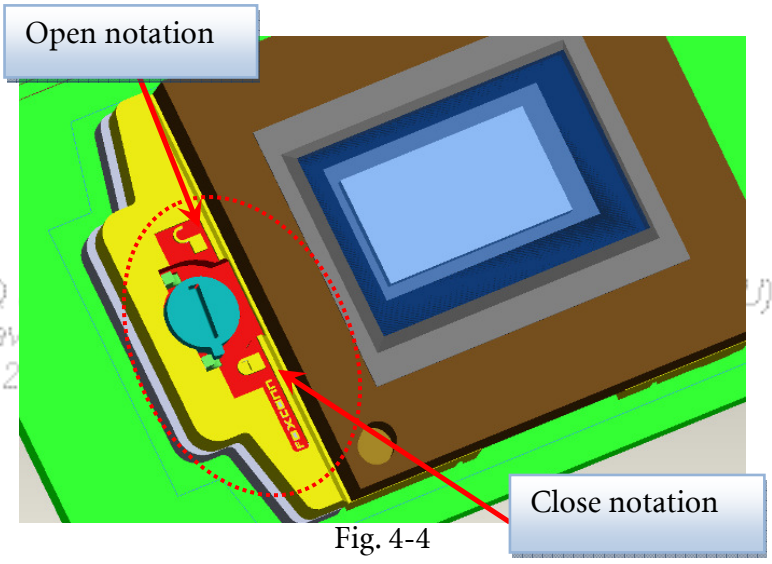


Fig. 4-4

5. Assembly Optical ENG

5.1 Assemble “Baffle DMD” to “HSG DMD” (Fig.5-1).

Assemble Chip B/D Module to “HSG DMD” (Fig. 5-2 , Fig. 5-3).).

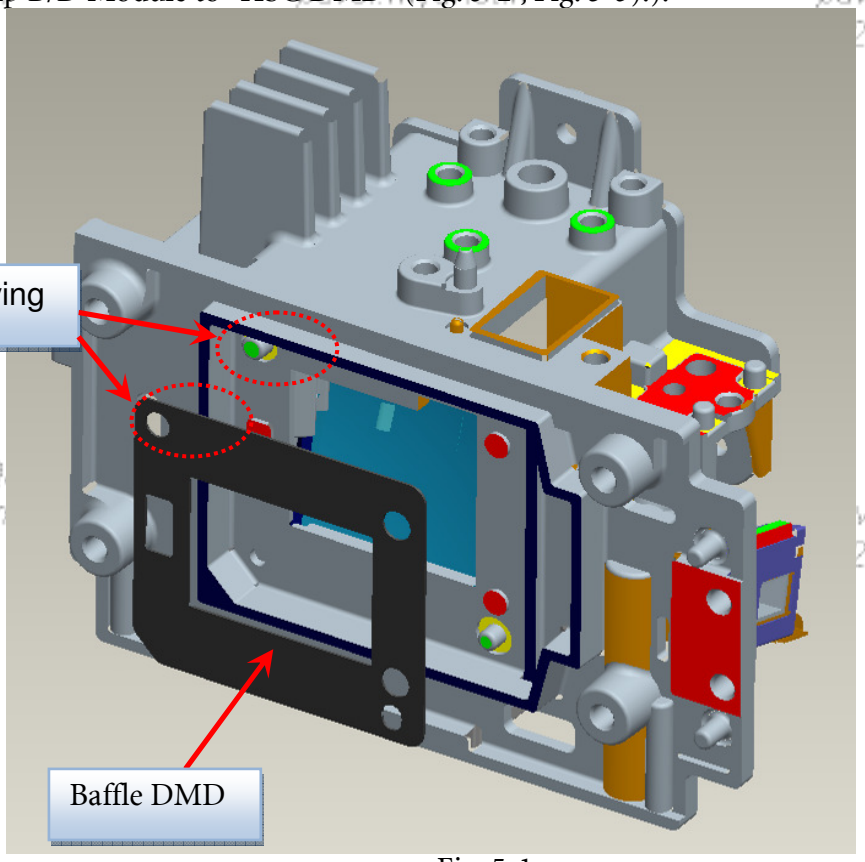


Fig. 5-1

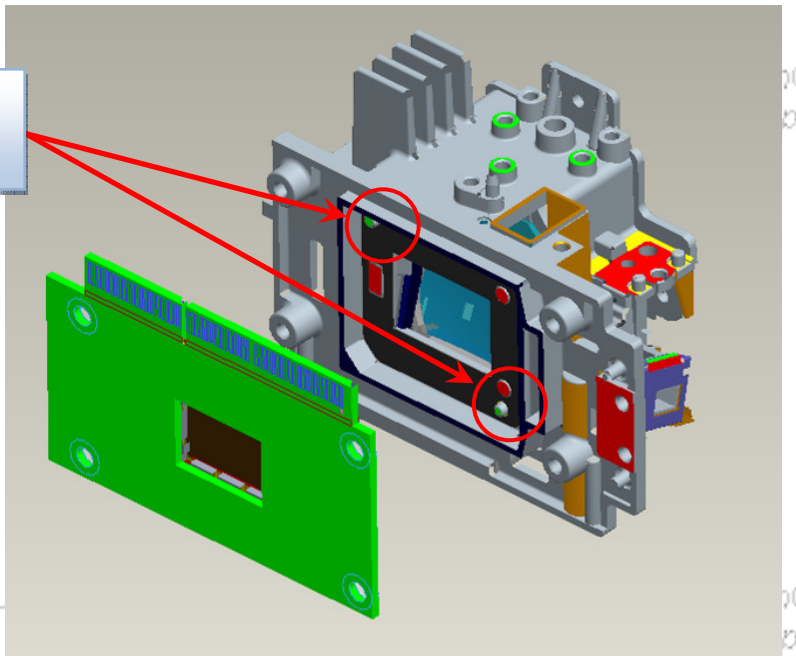


Fig.5-2

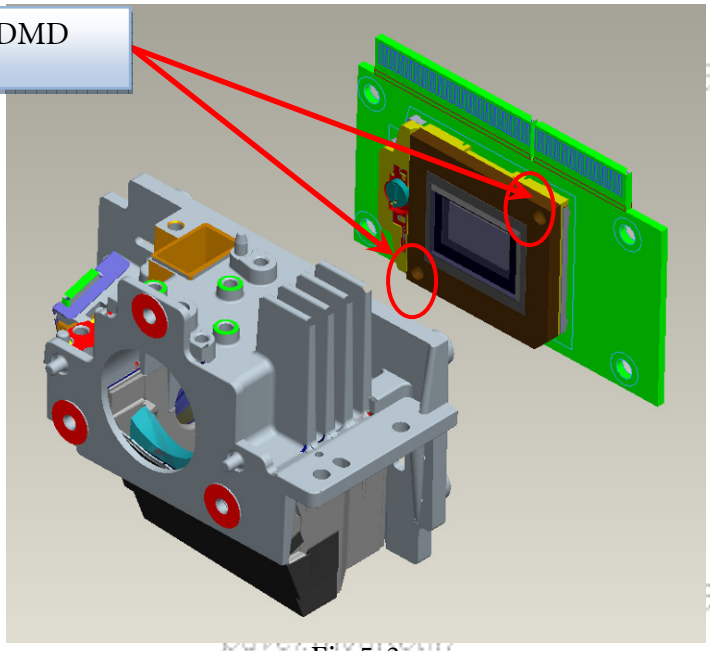


Fig.5-3

5.2 Assemble Thermal Pad & Gasket Hest-sink then place contact DMD (Fig. 5-4).

1.> Press center of Heatsink before assemble spring screw
then keeps press until spring screw assembly finish.

2.> Pre-fastening Sequence: [1] - [2] - [3] - [4].

3.> Fastening Sequence: [2] - [1] - [4] - [3].

4.> Screw Torque must be confirmed to be 6 kg-cm.

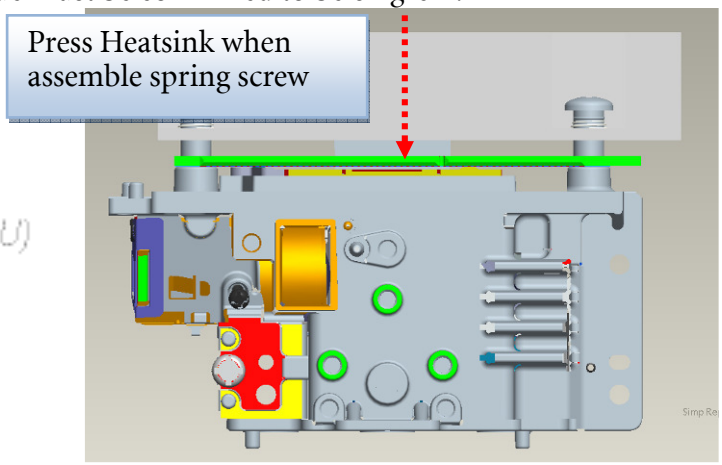


Fig. 5-4-1

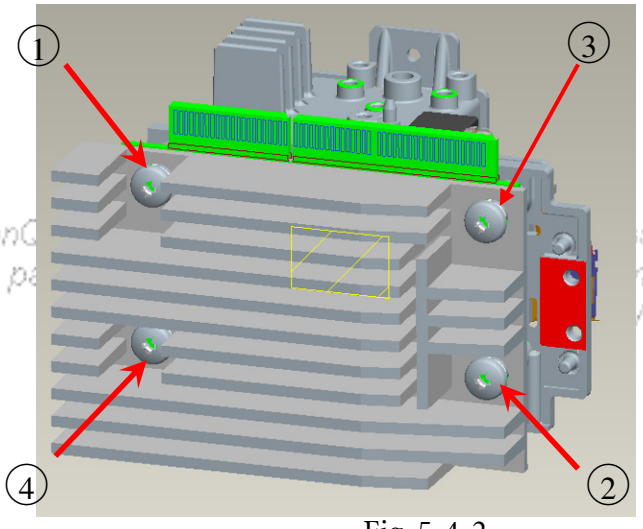


Fig. 5-4-2

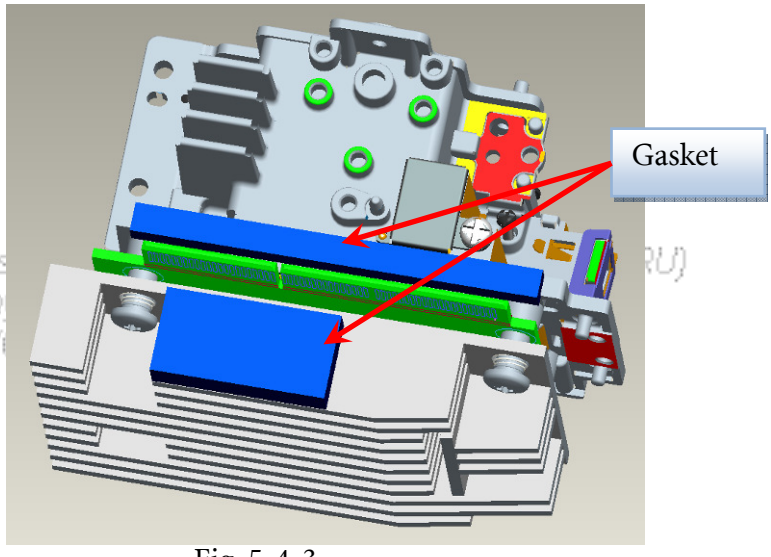


Fig. 5-4-3

5.3 Assemble “CW Module” and “Cover HSG DMD” to “DMD HSG” then lock with screws well (Fig.5-5).

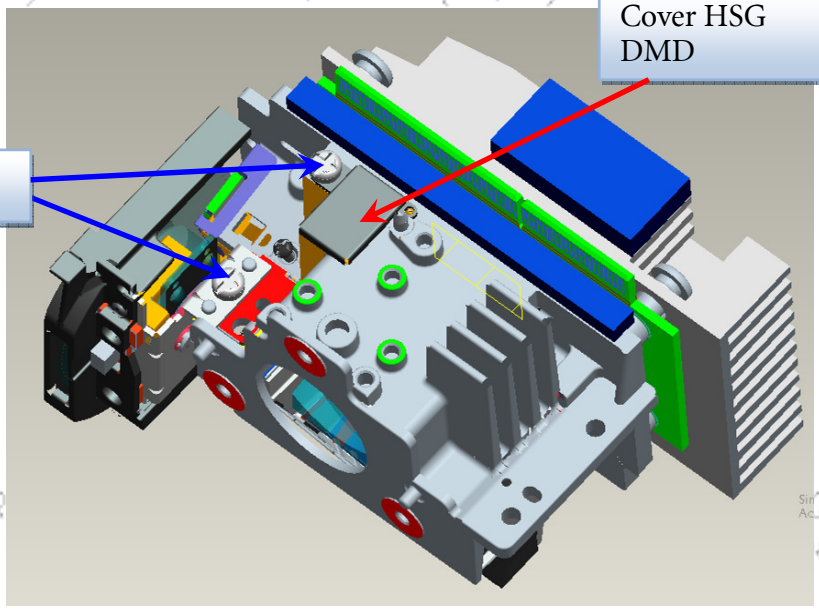


Fig. 5-5

5.4 Assemble “BKT Link Lamp & CW shield” on “DMD HSG” and then screws well (Fig. 5-6).

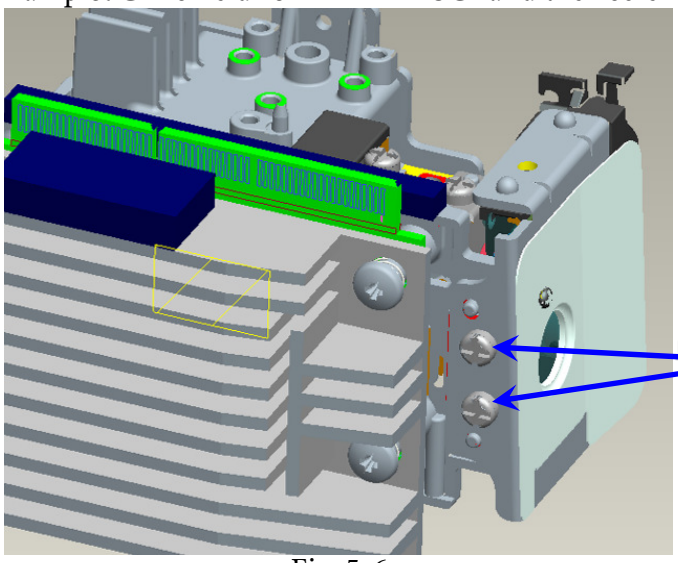


Fig. 5-6

5.5 Assemble “Sponge Adaptor” well.

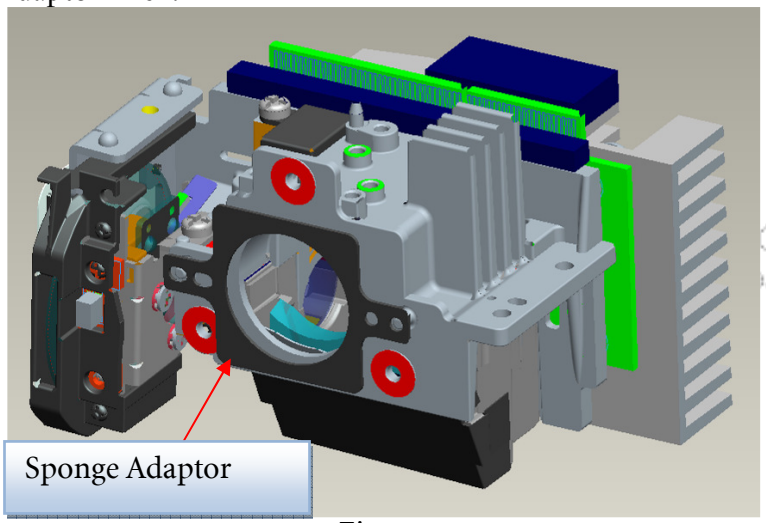


Fig.5-7

5.6 Assemble “Lens” and lock with screws well.

i. Pre-Assemble “Lens” and “HLD Adapter Flange” screws well. (Fig. 5-8-1,5-8-2)

ii. Assemble Lens and the Assembly direction must be horizontal, and do not impact CM. (Fig. 5-9, 5-10)

iii. Pre-fastening Screws firstly. Screw Torque must be confirmed to be 1-2 kg-cm. (Fig. 5-11)

iv. Fastening the Screws well. Screw Torque must be confirmed to be 6.0-7.0 kg-cm. (Fig. 5-12)

v. Place Lens Frame to “High position” finally.

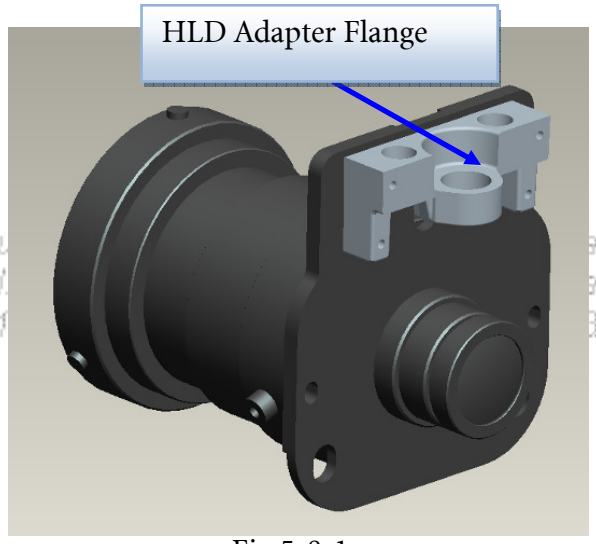


Fig.5-8-1

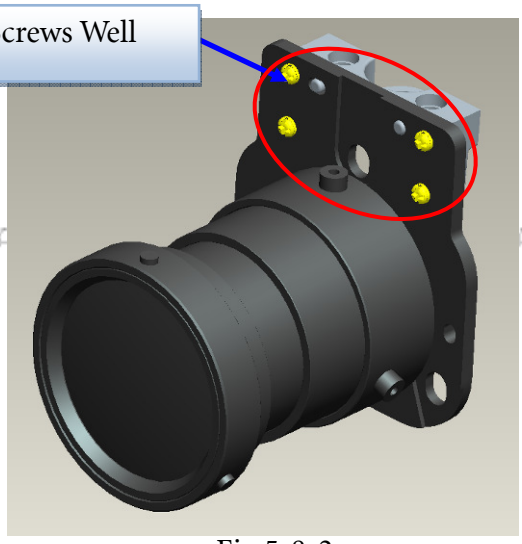


Fig.5-8-2

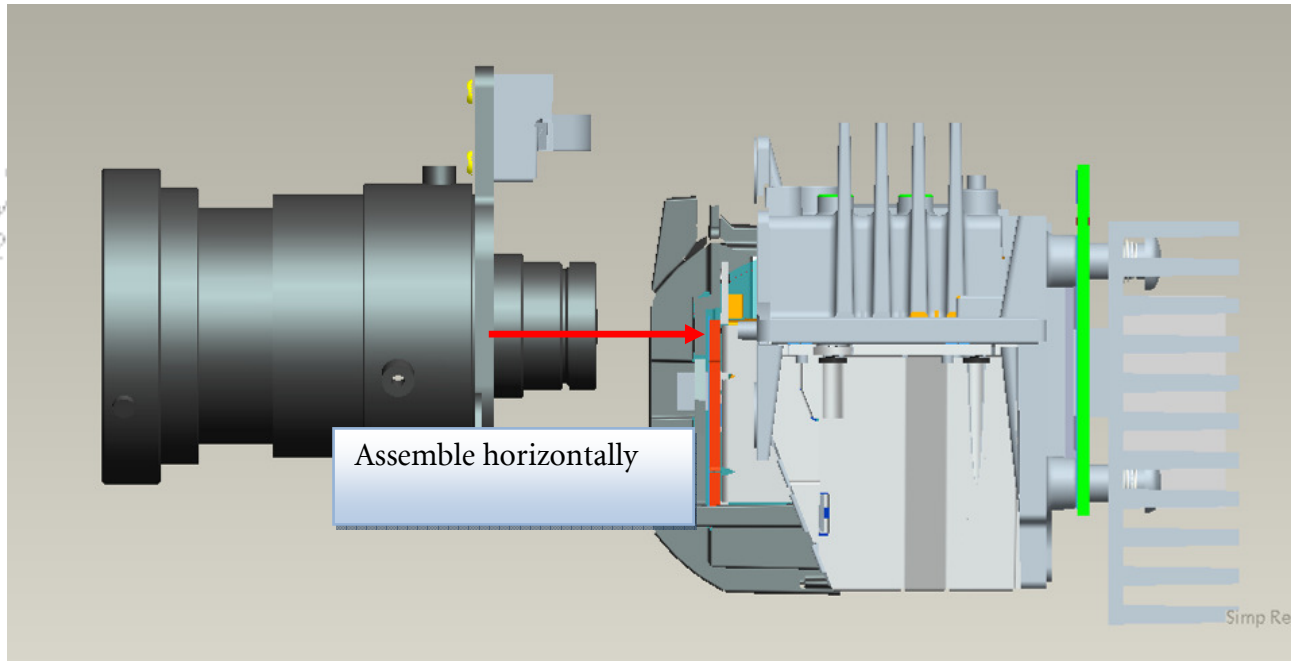


Fig. 5-9

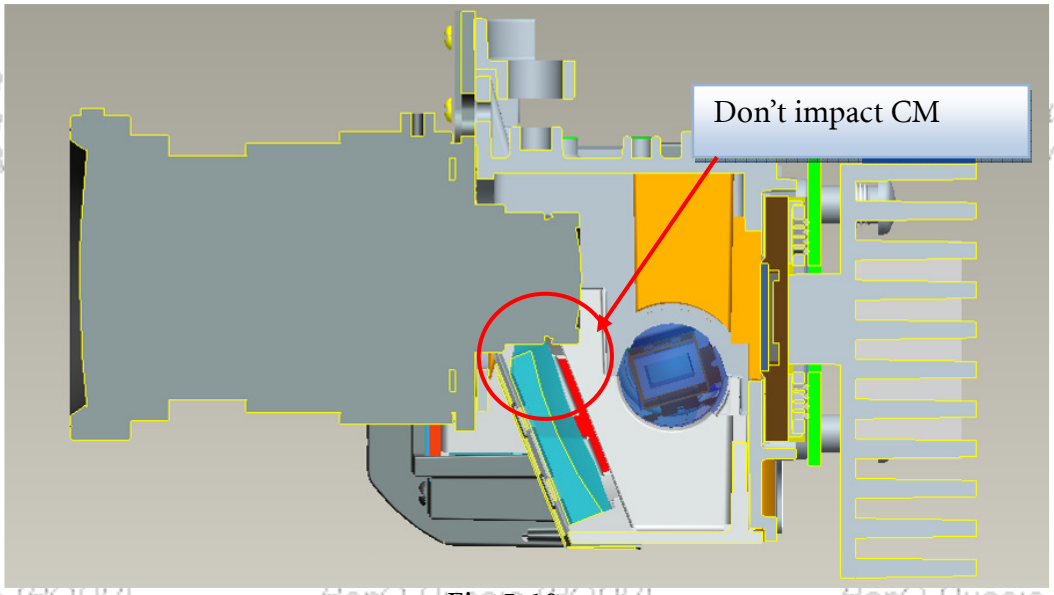


Fig. 5-10

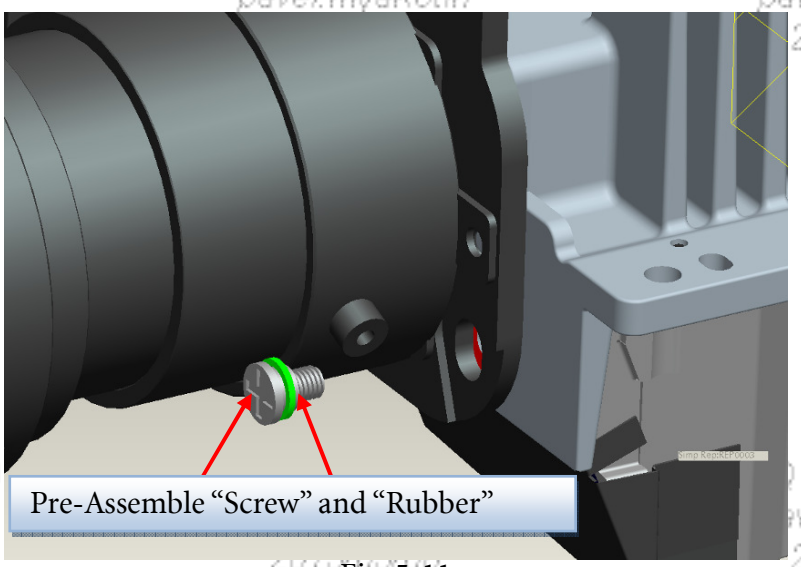


Fig. 5-11

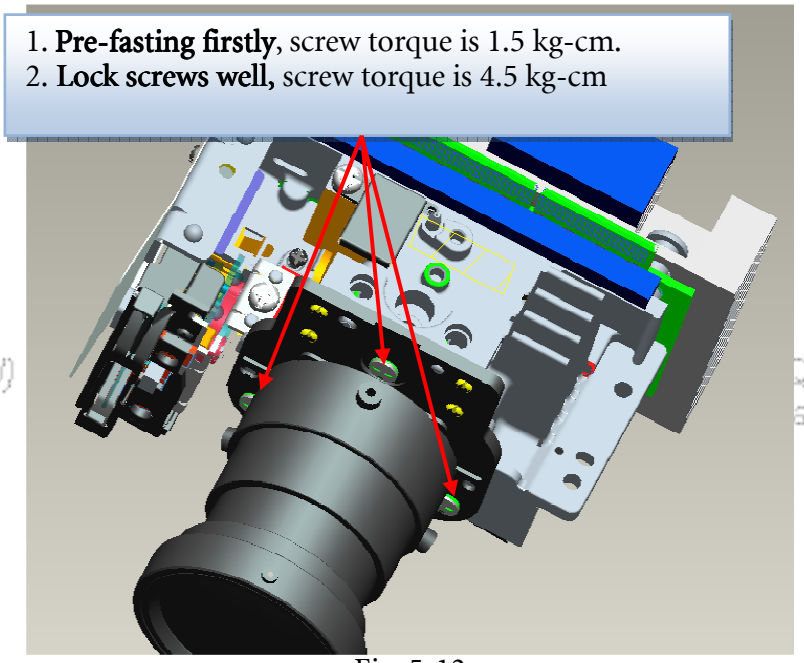


Fig. 5-12

5.7 Assemble Ring Zoom with screw well

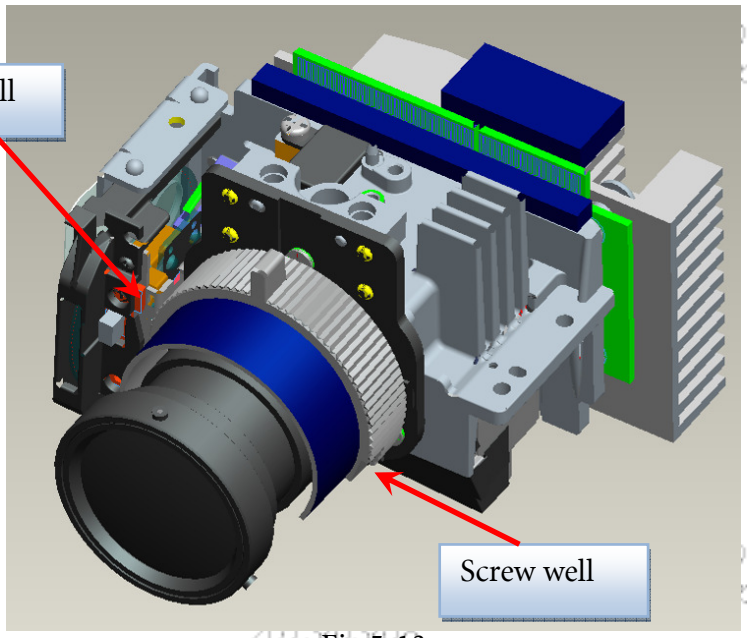


Fig.5-13

5.8 Assemble Ring Focus well

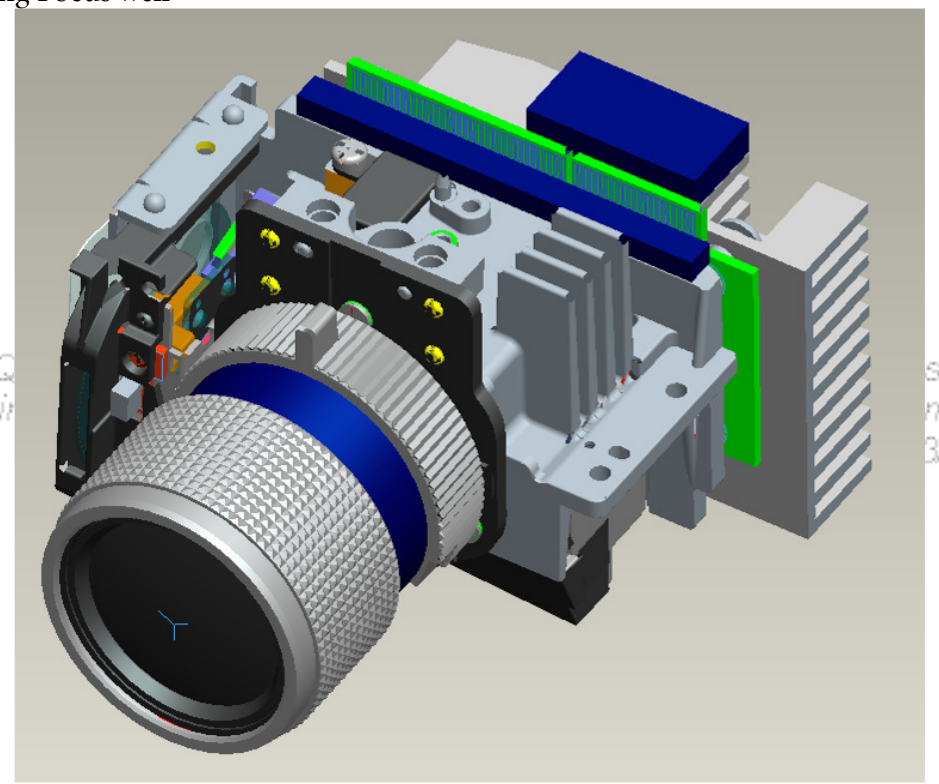


Fig.5-14

6. Assemble Lens Shift Module:

6.1. Assemble “Hold Lens Shift” and Screw well (Fig. 6-1)
Note: Lens must be place to “High position”, Otherwise, The “Hold Lens Shift” can not be Assembled

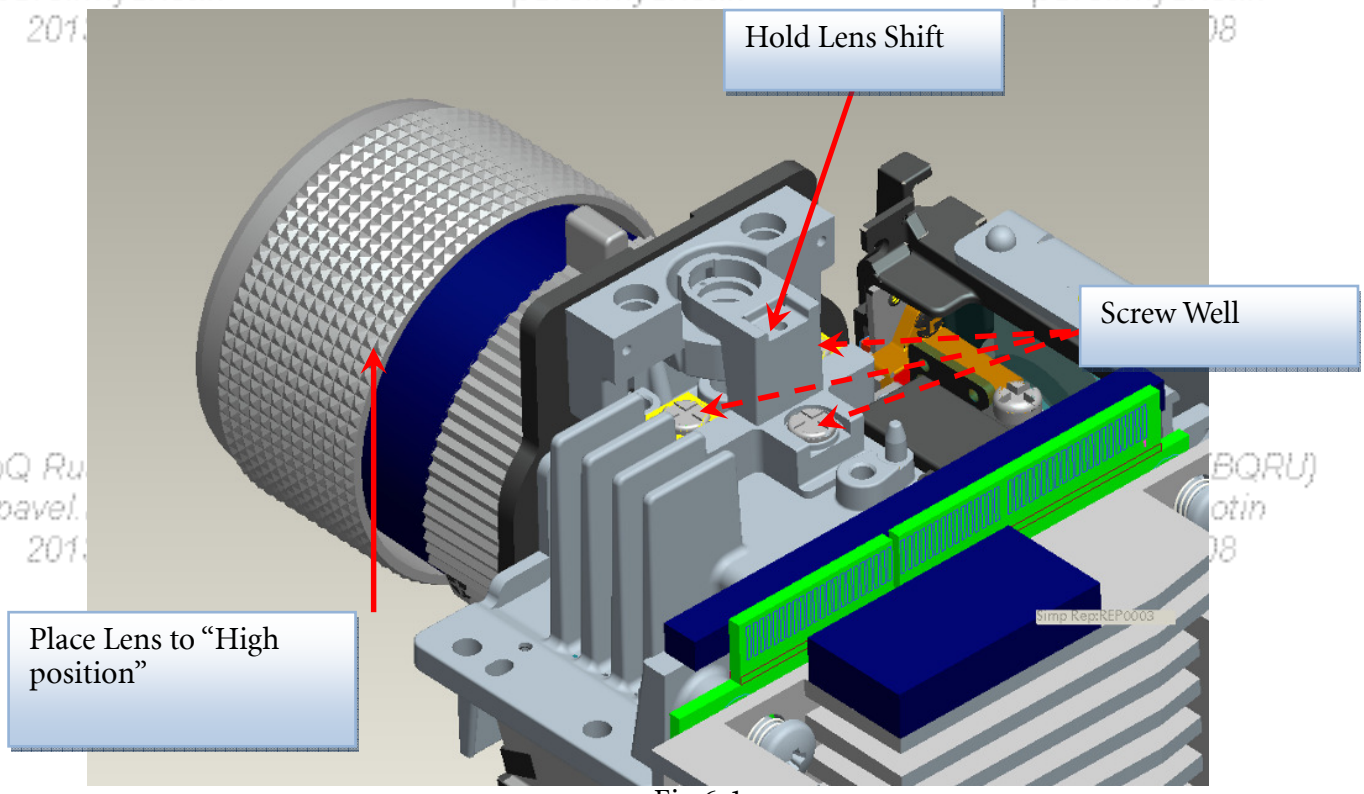


Fig.6-1

6.2 Assemble “Shaft Lens Shift” and “Slide Lens Shift” to “HSG DMD”. (Fig. 6-2, 6-3)
Note: Pre-Assemble Rubber O Ring into Shaft Lens Shift

6.2.1 Assemble “CVR Lens Shift” to “Hold Lens Shift” and Screw well. (Fig. 6-4)

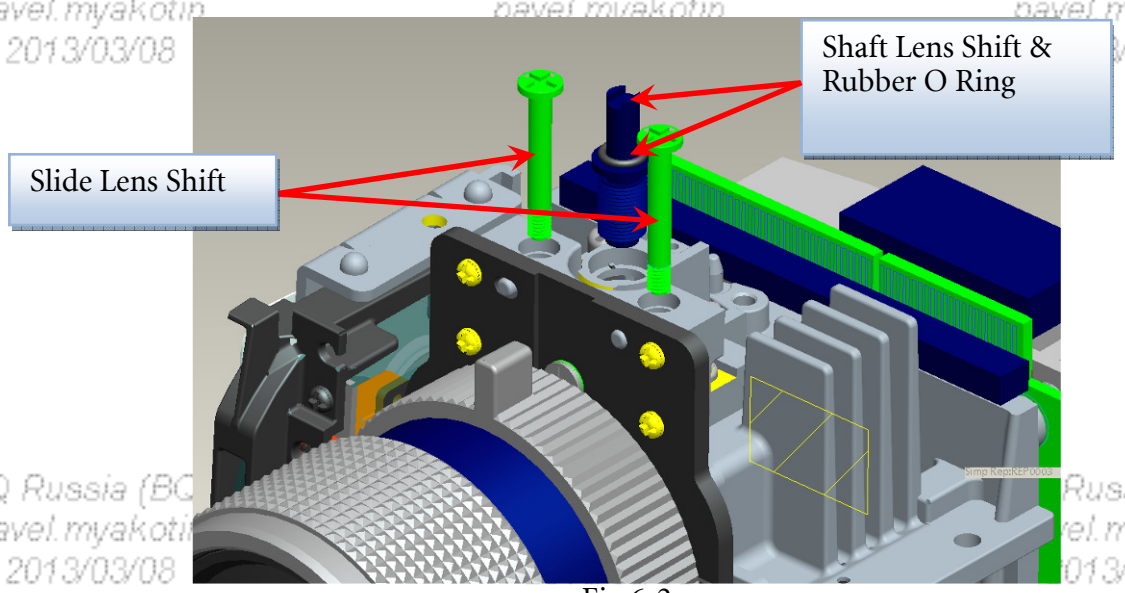


Fig.6-2

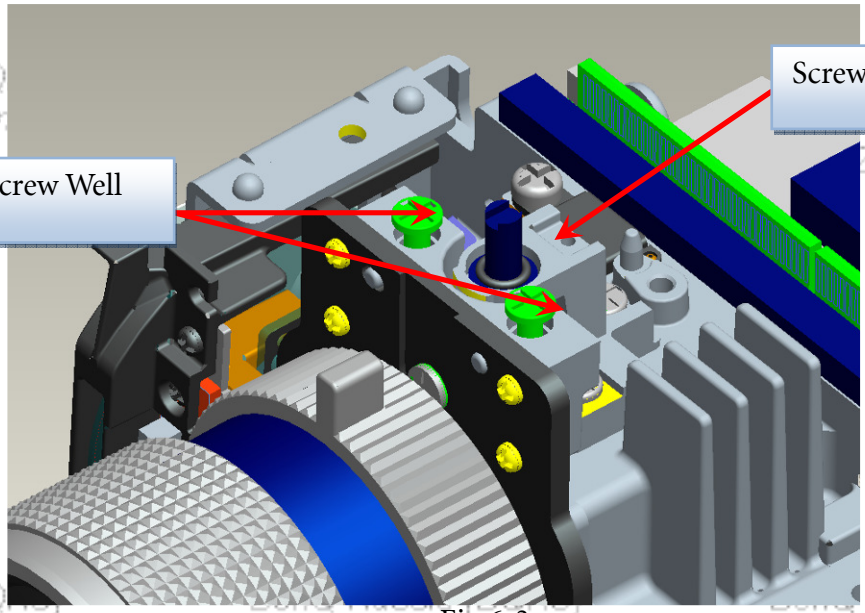


Fig.6-3

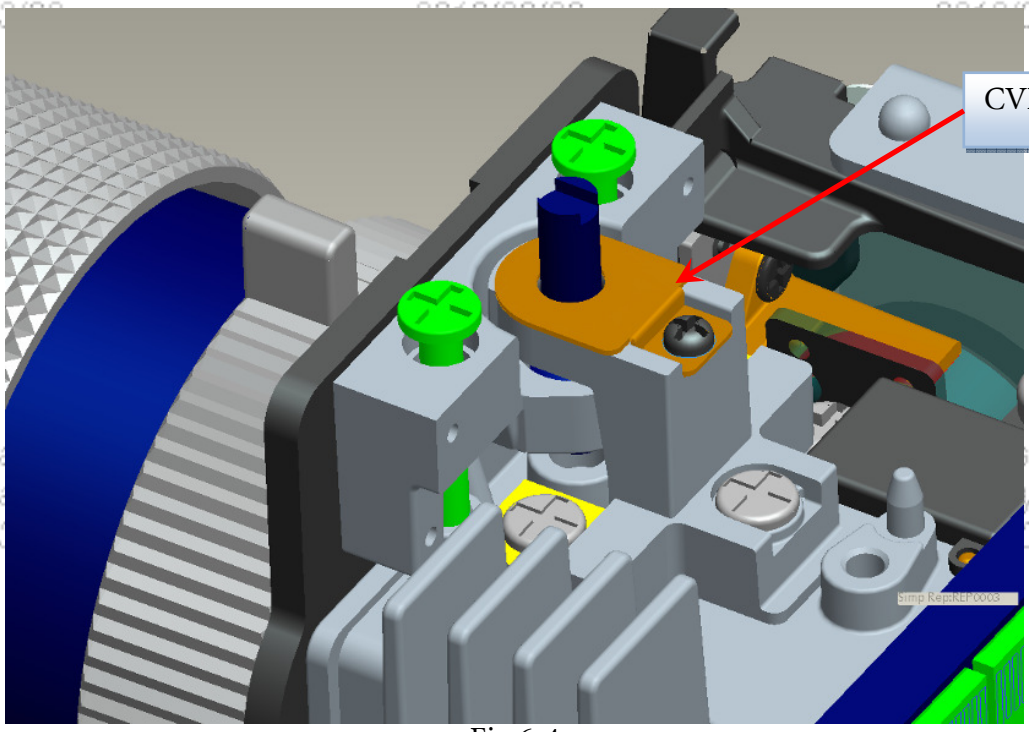


Fig.6-4

7. Assemble Lamp Module to “BKT Link Lamp” and then lock with screw well (Fig. 7-1).

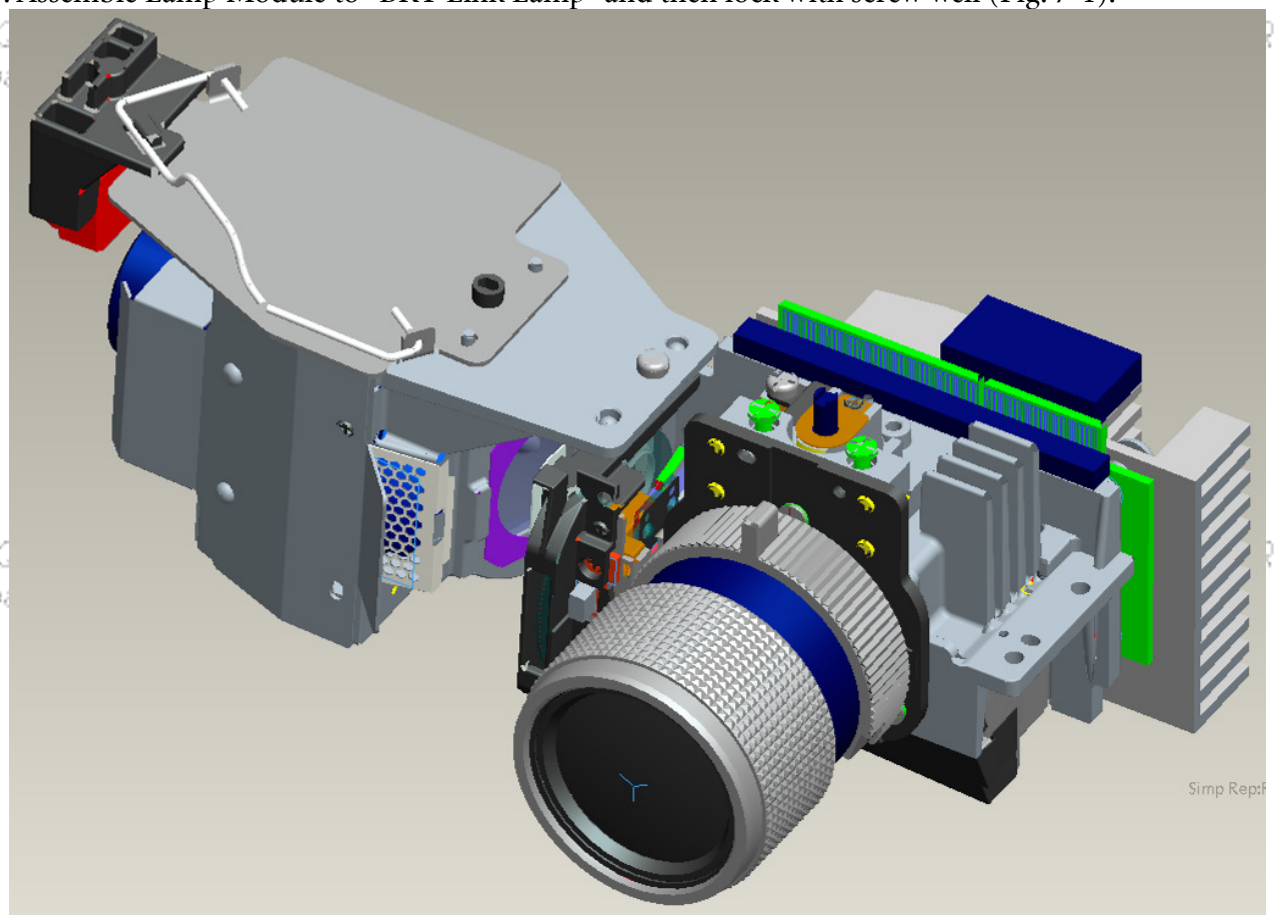


Fig.7-1

5.4 Module Assembly Key Point - Mechanical

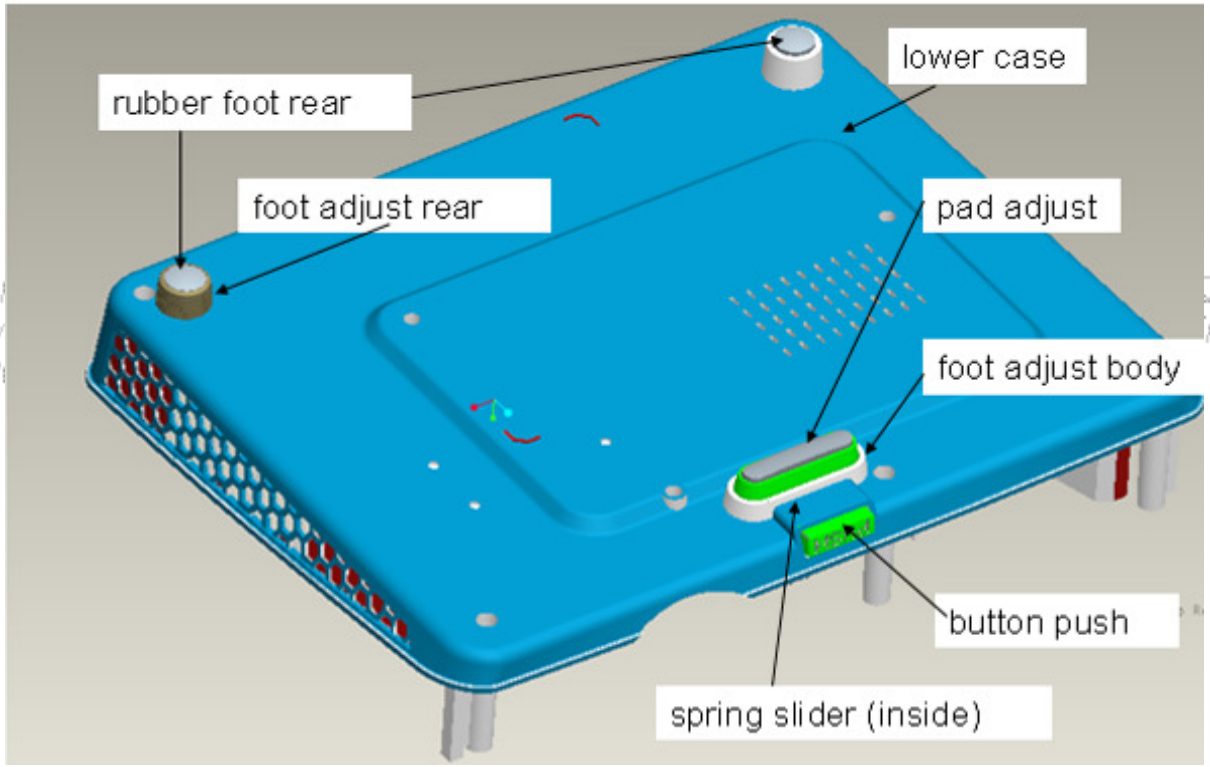
1. Lower case module assembly
2. OM module assembly
3. Lamp frame module assembly
4. Nozzle module assembly
5. Internal parts assembly
6. Rear case assembly
7. Right and Left case assembly
8. Front case assembly
9. Upper case assembly
10. Lamp module assembly
11. Lamp door assembly

1. Lower case module assembly

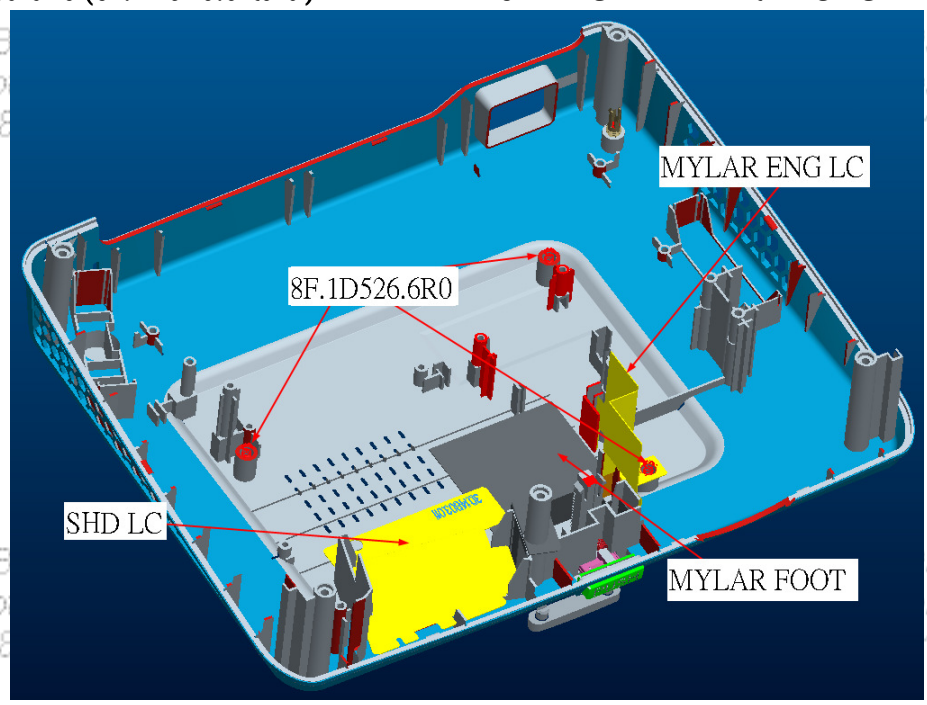
The lower case module assembly processes are as follows,

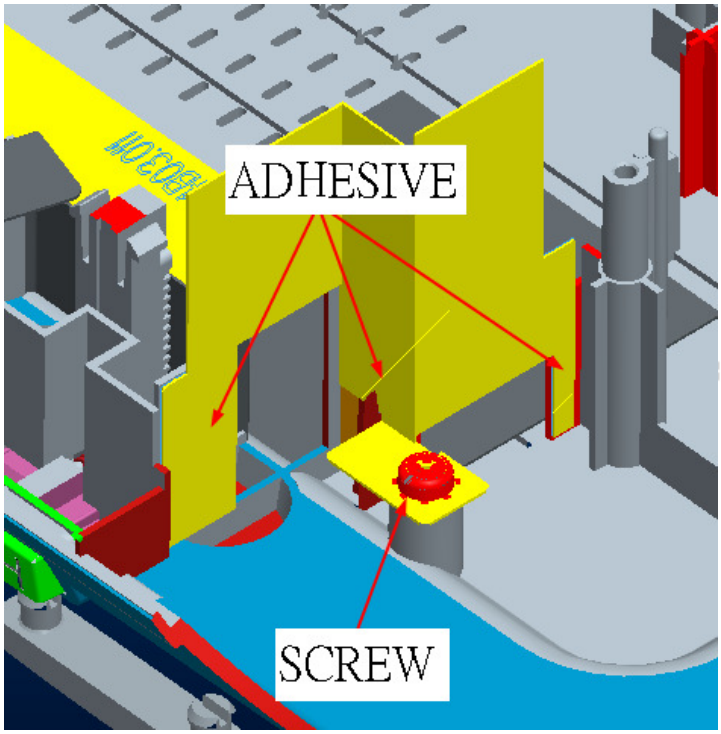
1.1 Insert the **rubber foot rear** 、**foot adjust rear** on the **lower case**.

Assemble the front adjust foot module including **foot adjust body**、**pad adjust**、**spring slider**、**button push** on the **lower case**, and the assembling method is as other models.



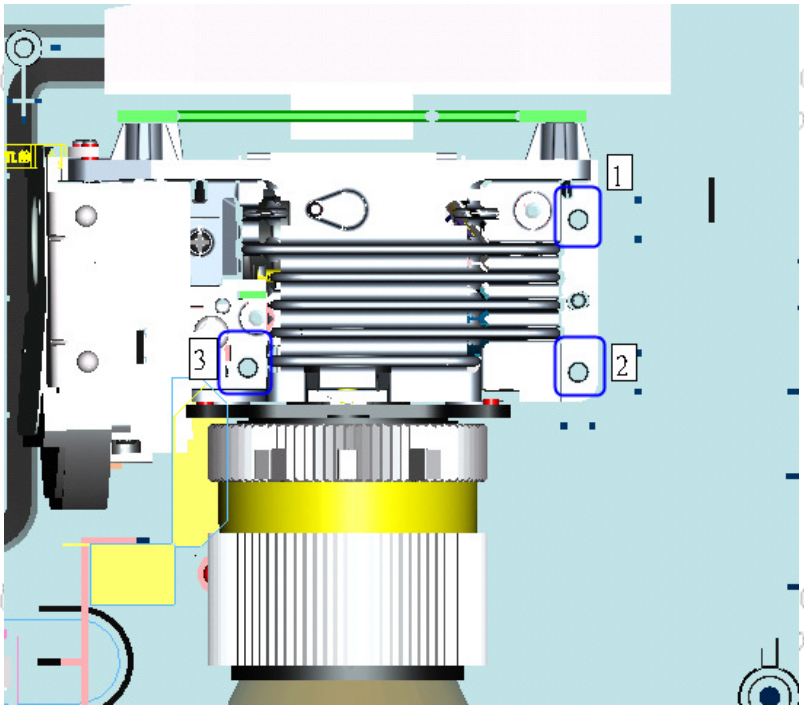
1.2 Insert the **screws (8F.1D526.6R0*3)** and assemble **SHD LC** 、**MYLAR ENG LC** on the lower case.





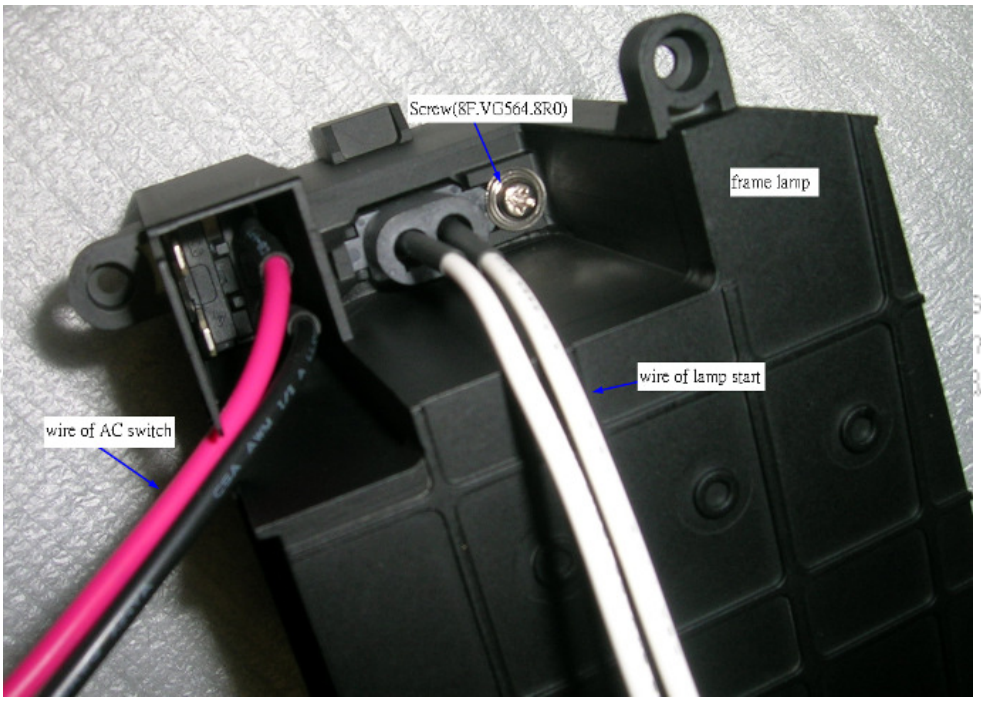
2. OM module assembly

Assemble OM module and **clip cable** on the lower case as figure shows by **screws*3**, and follow the sequence 1→2→3. The screw torque please refer to Appendix 1



3. Lamp frame module assembly

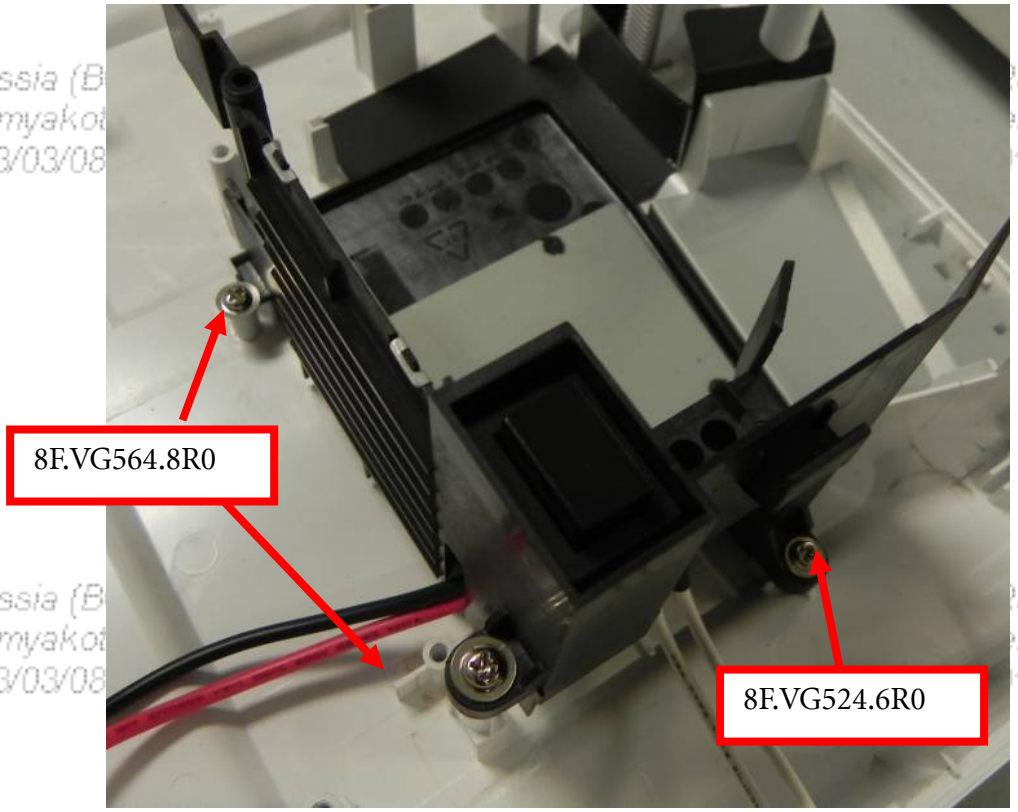
The screw torque please refer to document of Appendix 1.



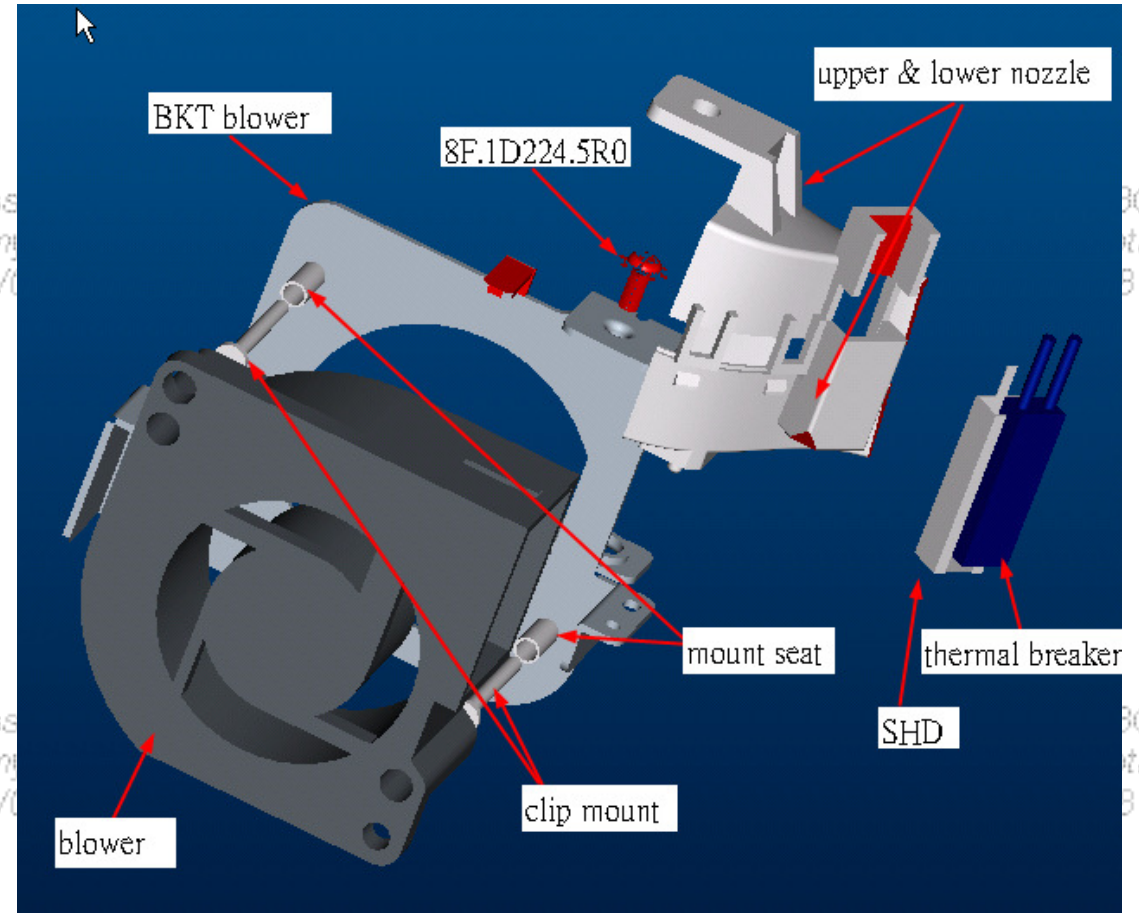
Step1. Assemble **wire of AC switch** in the **lamp frame** and check wire is inside near the wall as figure shows.

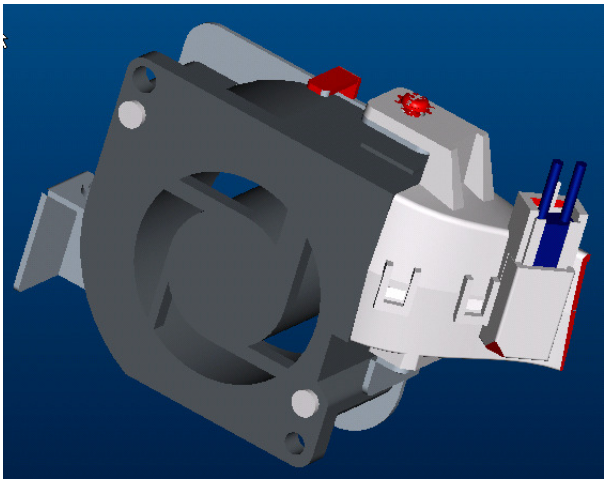
Step2. Assemble **wire of lamp start** with **screw.**

Step3. Assemble lamp frame module on the lower case with **screw (8F.VG564.8R0*2)** and **screw (8F.VG524.6R0*1)**.

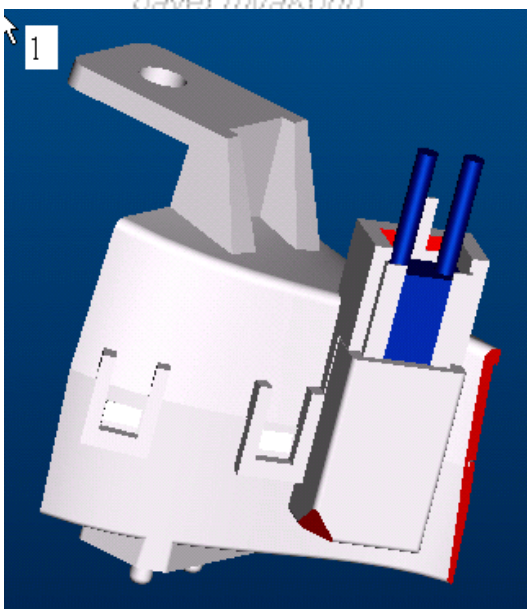


4. Nozzle module assembly



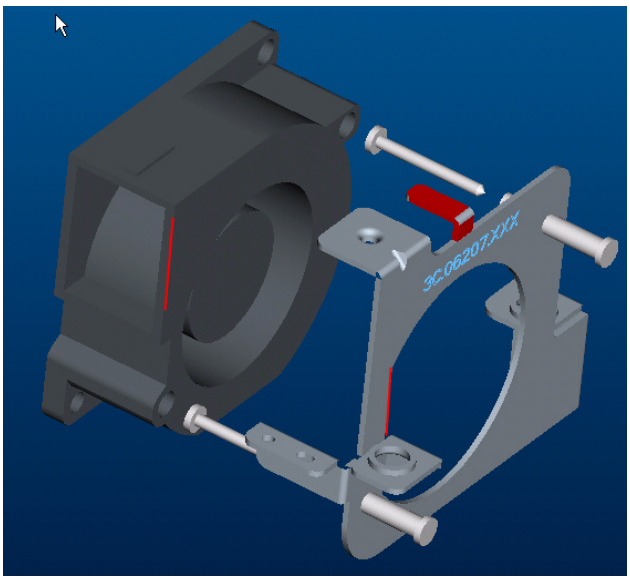


Step1. Place **thermal breaker** in the **nozzles** and check words side is outside. Next insert the **SHD** as figure shows, and check copper surface is inside.



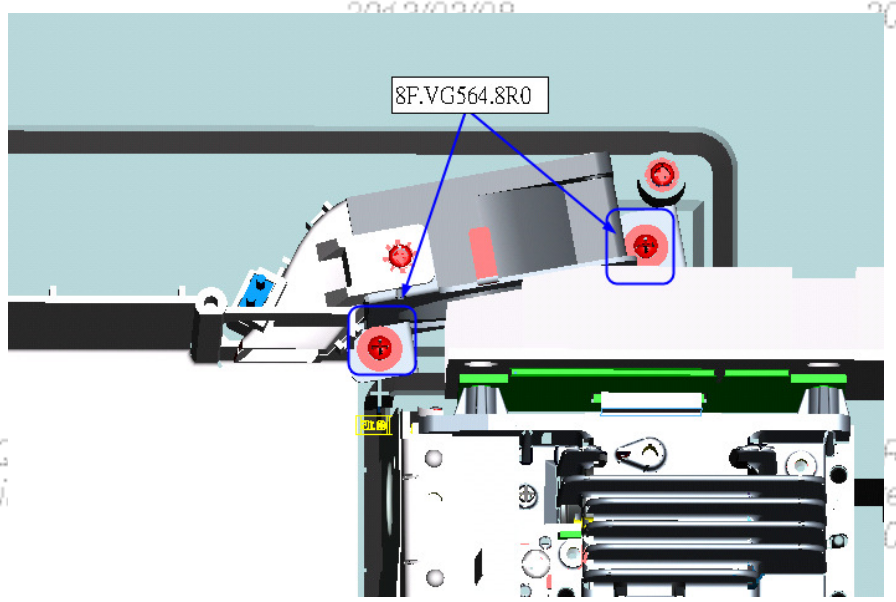
Step2. Insert the **clip mount** and **mount seat** to combine the **blower** and **BKT**.

(Check the red edge on blower and BKT is the same direction.)



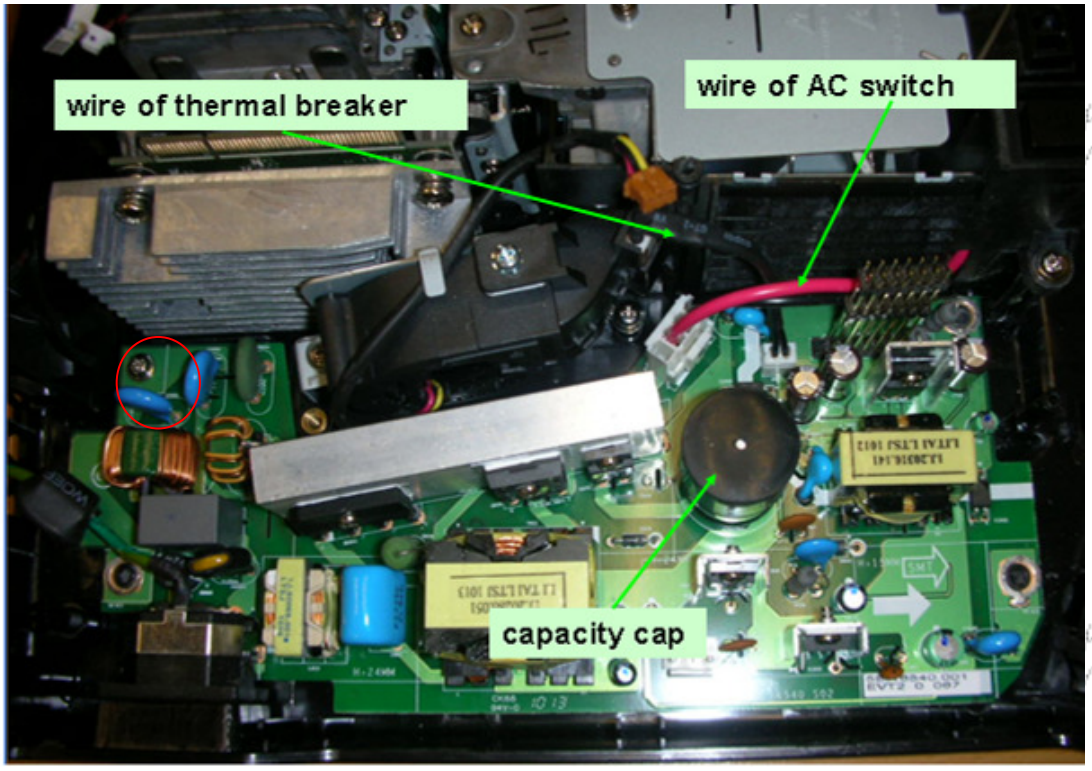
Step3. Assemble them by screw

Step4. Assemble blower module on the lower case by screws*2



5. Inner parts assembly

5.1 Assemble power board on the lower case, and screw (8F.VG524.6R0)*1.

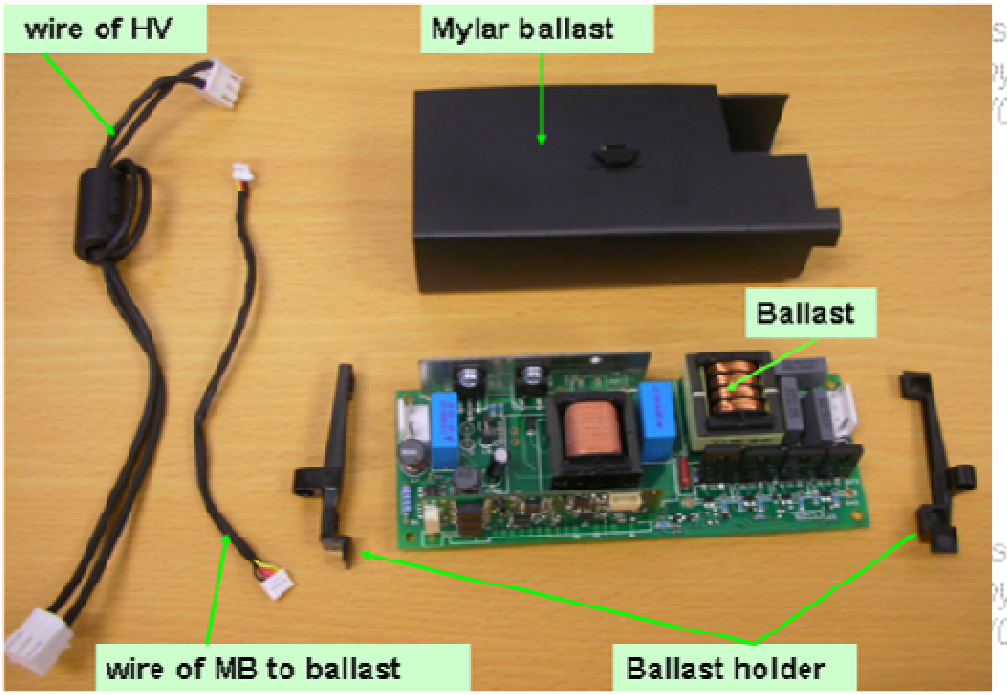


Step1. Plug the **wire of thermal breaker** in the connector.

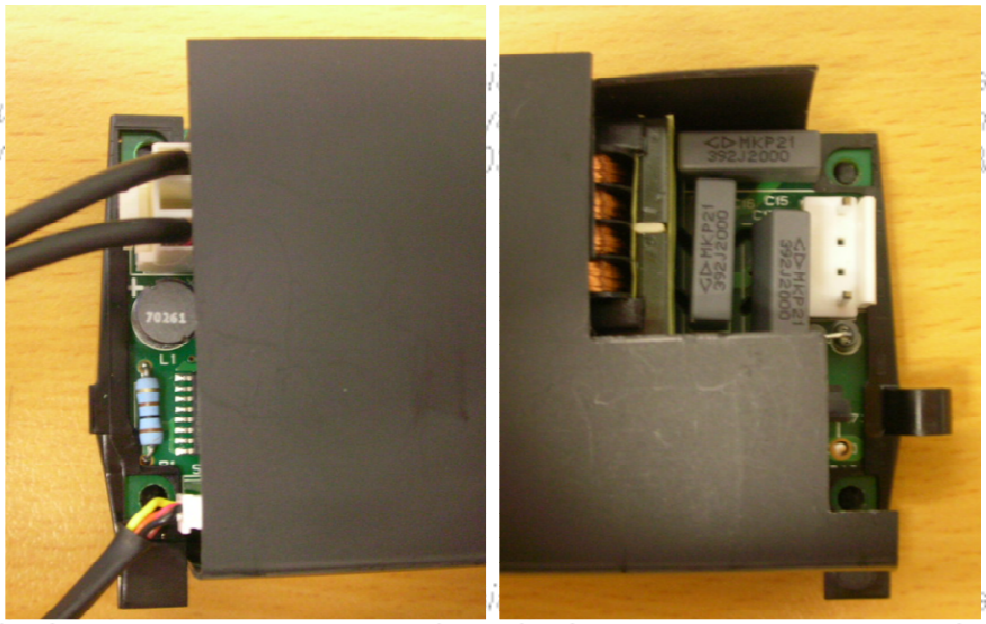
Step2. Plug in the **wire of AC switch**, and check the wire Don't block the screw hole as figure shows.

5.2 Assemble ballast board fixed with 2 holder on the lower case by screw (8F.VA564.8R0 *2). Plug in the **wire of HV** and **wire of MB to ballast**.

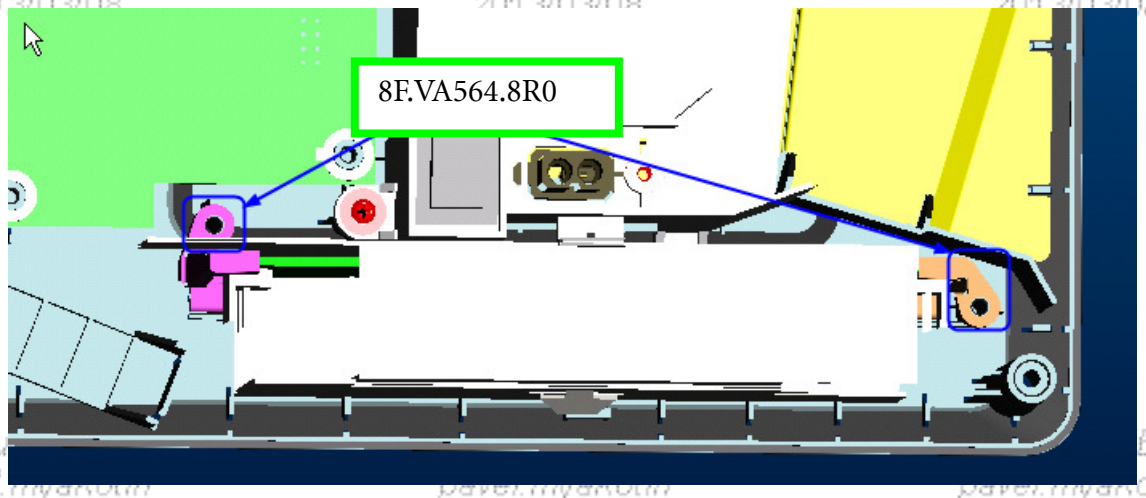
Check the wire arrangement must follow figure shows.

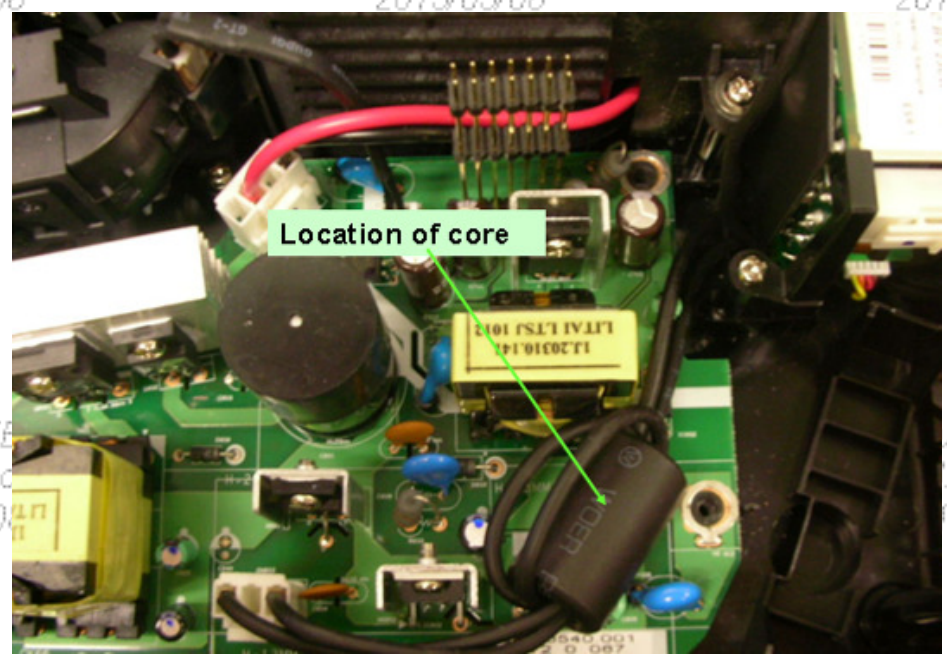


Step1. Assemble the holder 2 first, then insert the Mylar ballast, and at last assemble the holder 1 and 2 wires.



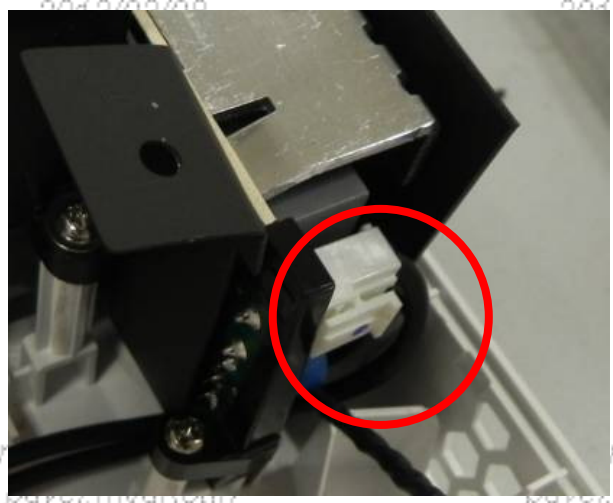
Step2. Assemble the ballast module on the lower case by screws (8F.VA564.8R0*2).

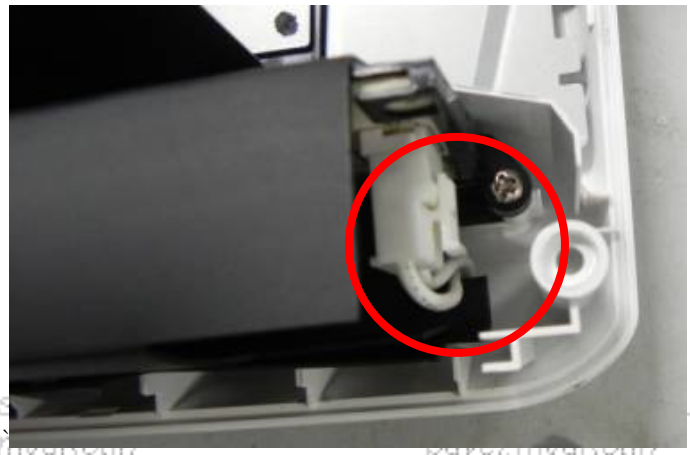




Step3. Insert the wire of HV and wire of lamp start.

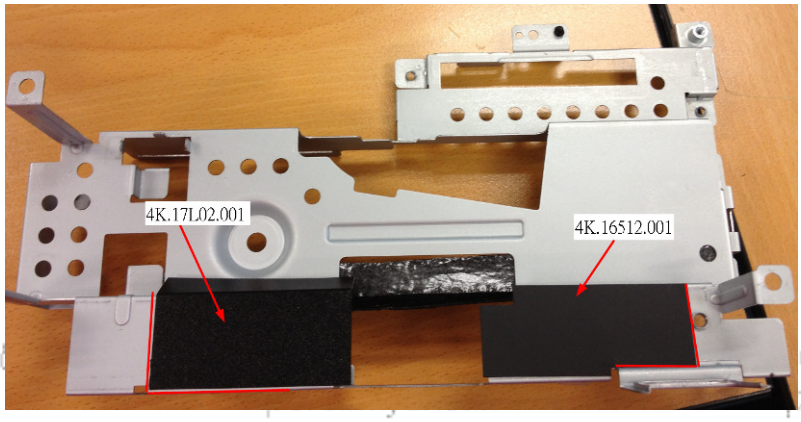
Check the both wires should under the ballast board, and wire of lamp start should be arrangement as figure shows.

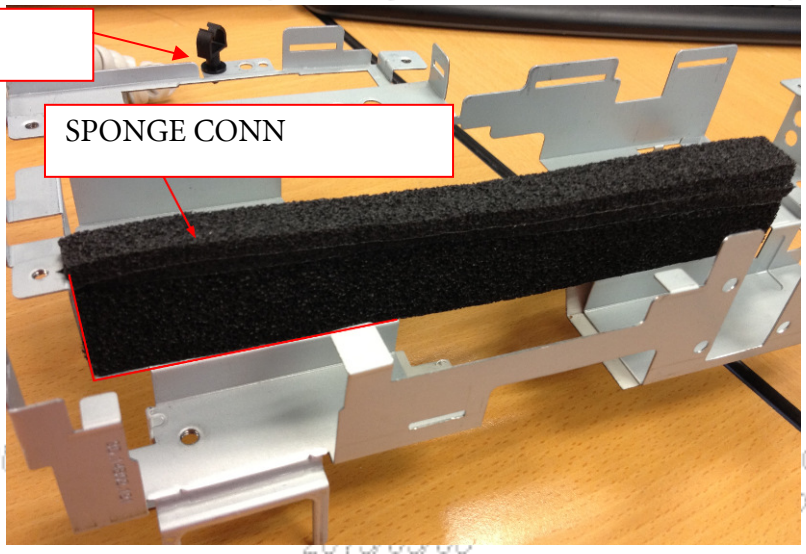




5.3 BKT of MB assembly

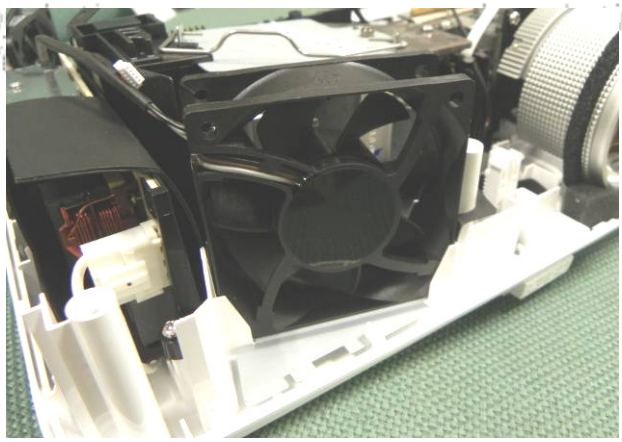
BKT:

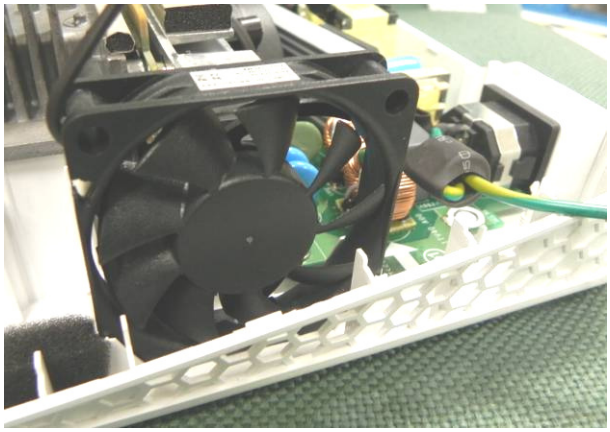




5.4 Fan

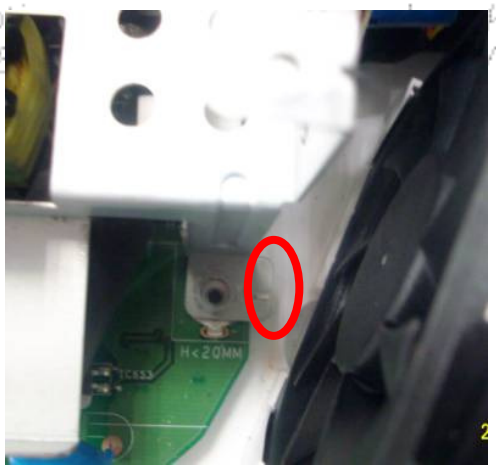
Step1. Assemble axial fan on lower case before assemble main board bracket.





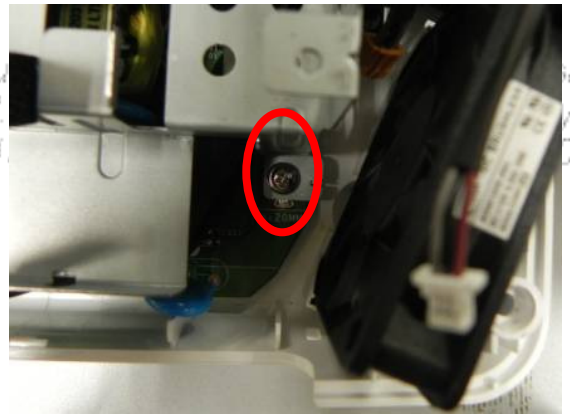
5.5 Bracket (BKT)

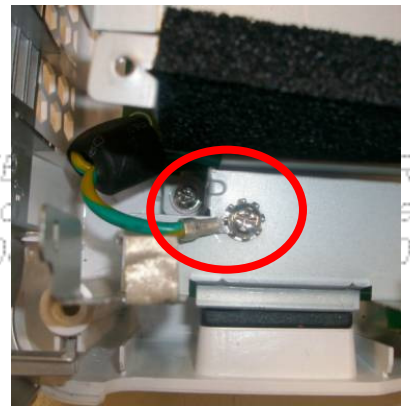
Step1. Assemble the left leg of BKT behind AC socket and align the right leg with rib on the lower case.



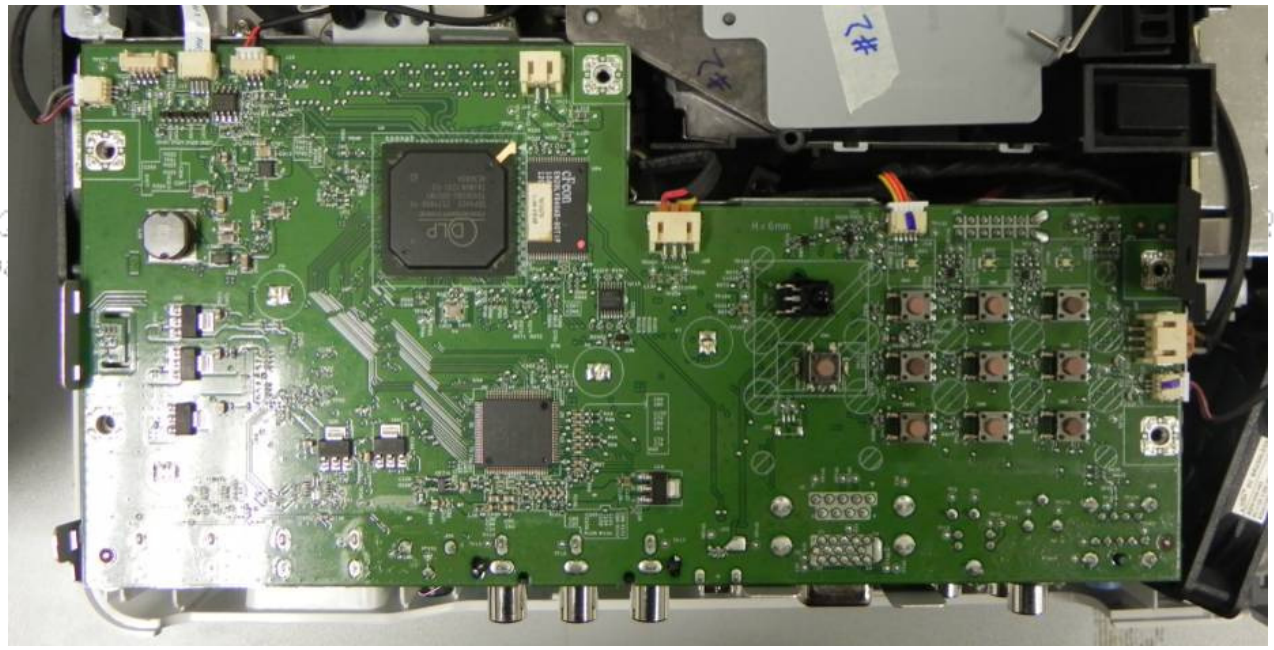
Step2. Assemble the BKT on the lower case sequentially by screw (8F.VG524.6R0*3) and screw ground connection (8F.1D526.6R0).

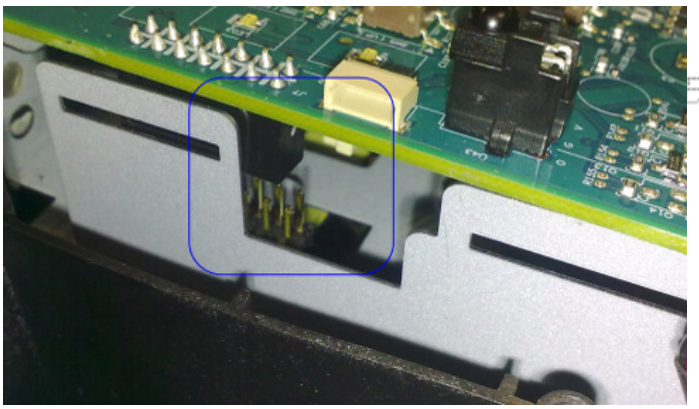
Check the wire of AC socket must through the gap as figure shows.



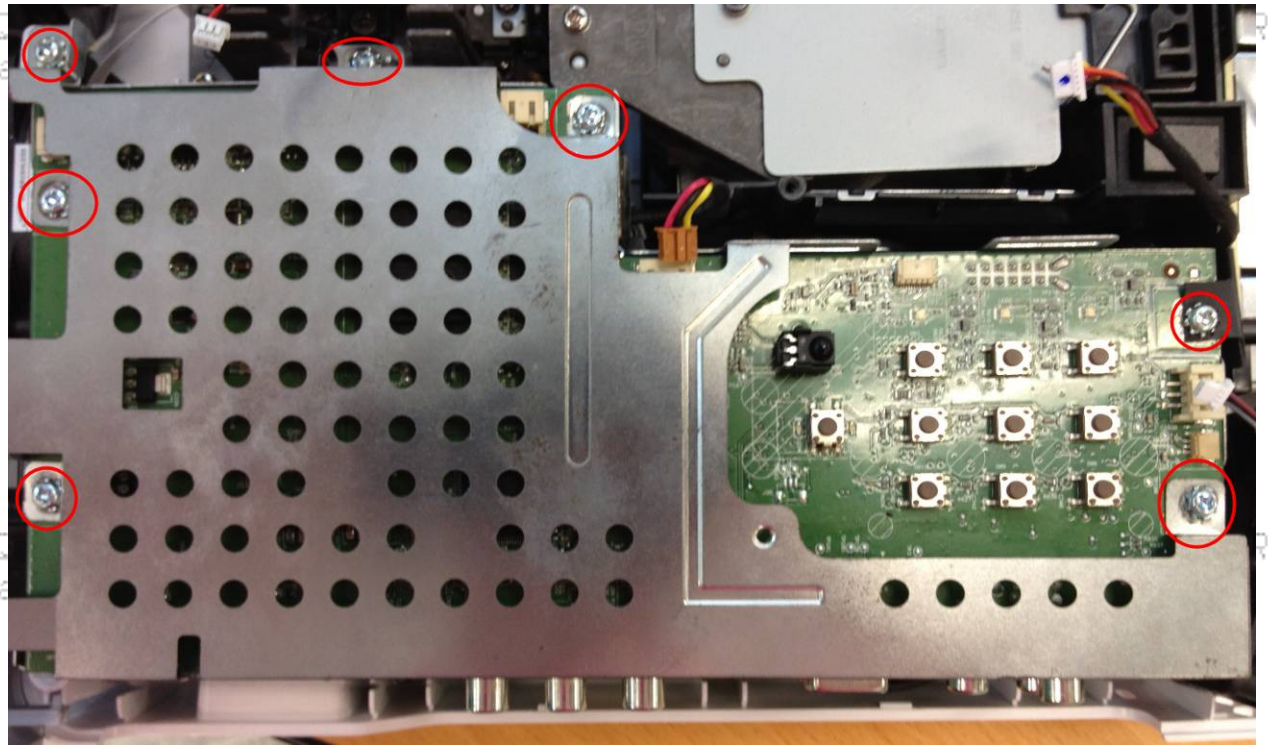


Step3. Put MB on the BKT and operator can check golden pins from the opening of BKT.

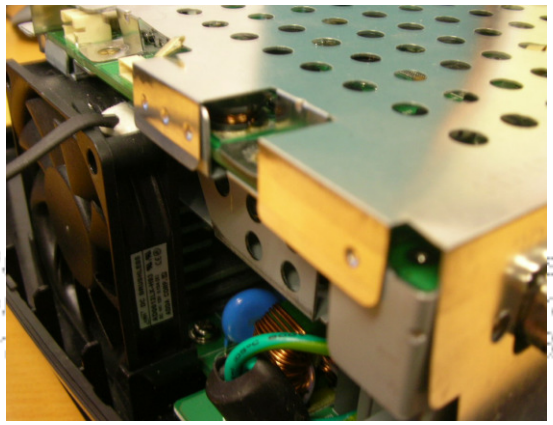


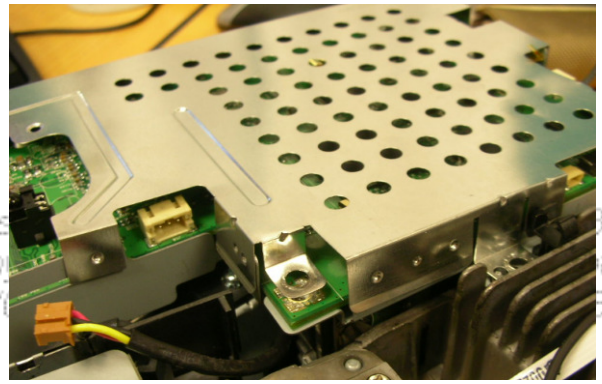


Step4. Assemble the shielding of MB and **screw *7,** and a clip on the BKT.



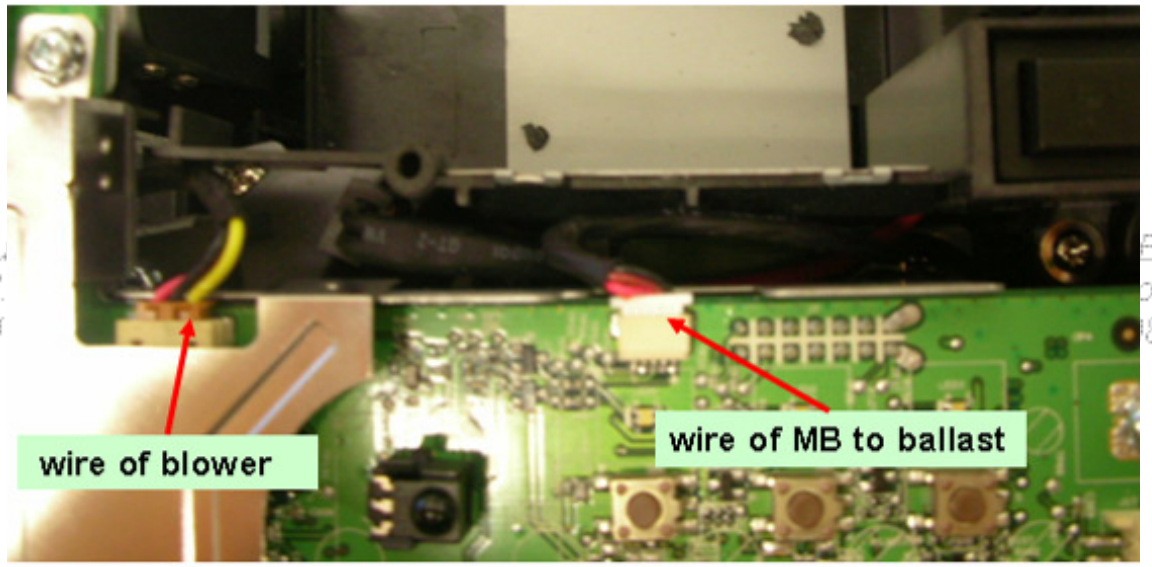
Step5. Check the upper shielding need to cover on main board bracket before fasten the screws.

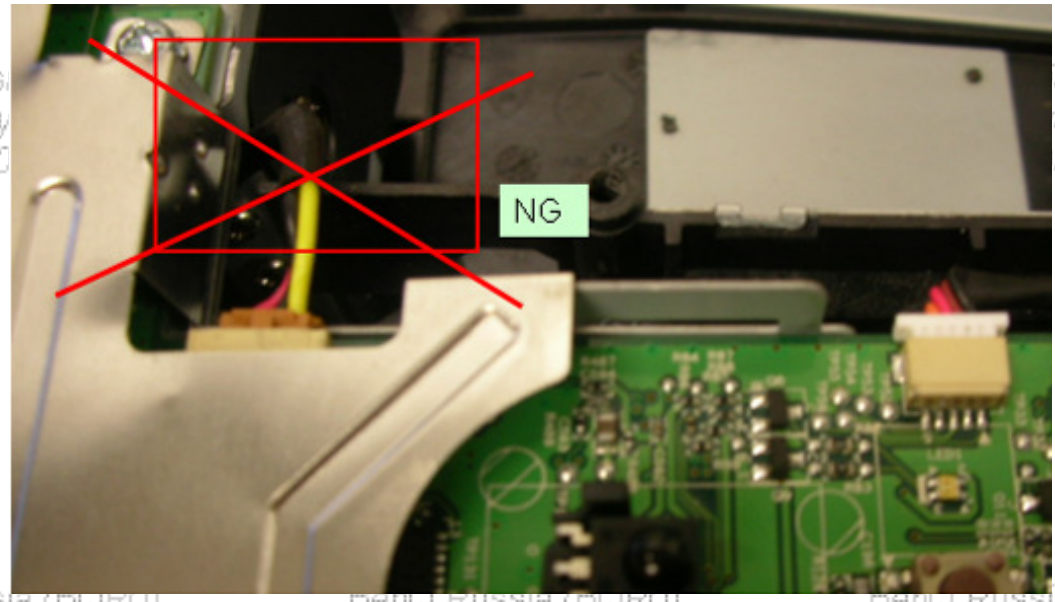




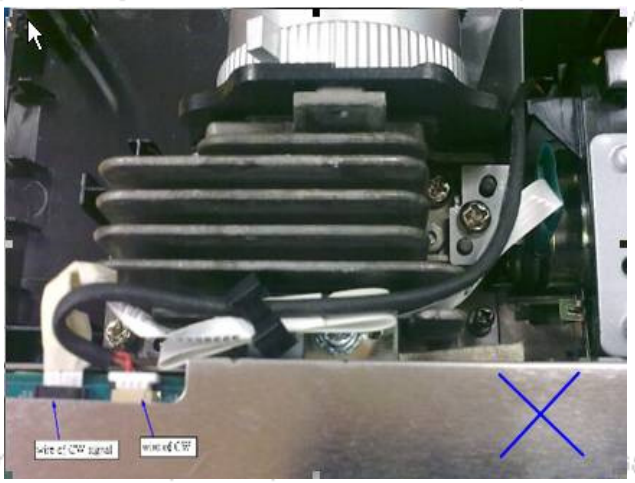
5.6 Wires arrangement

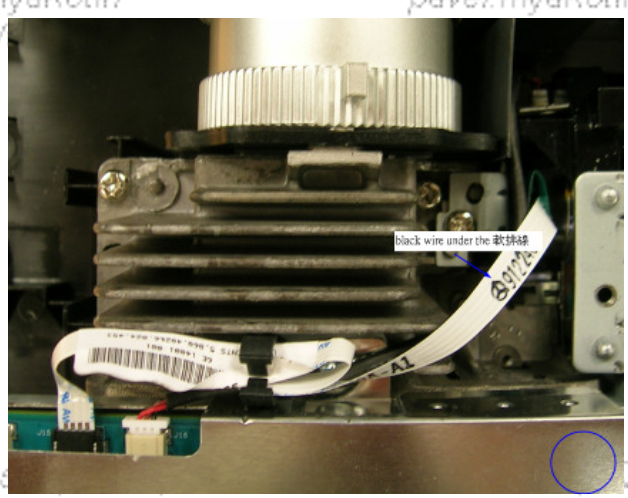
Step1. Plug the **wire of blower** and **wire of MB to ballast**.



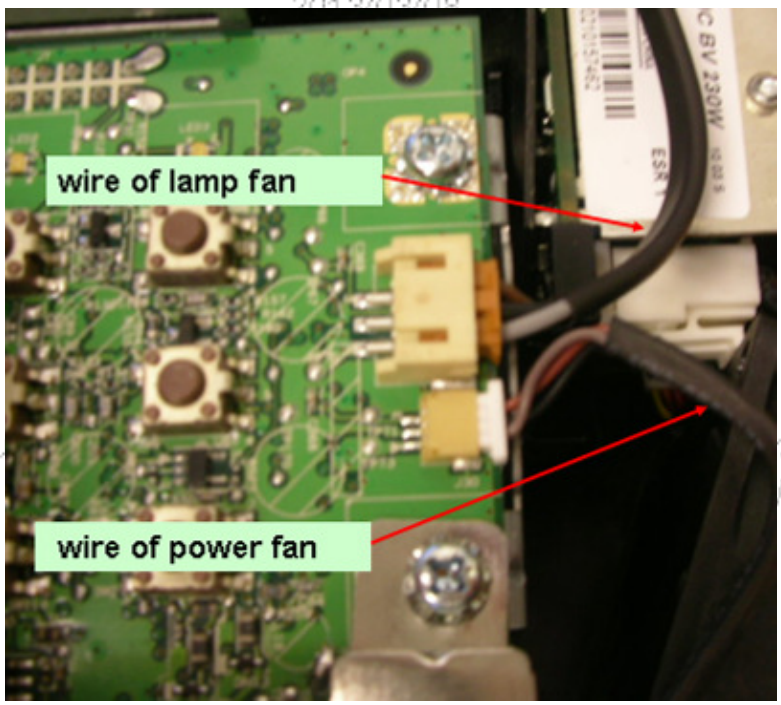


Step2. Plug in the **wire of CW signal** and **wire of CW**.





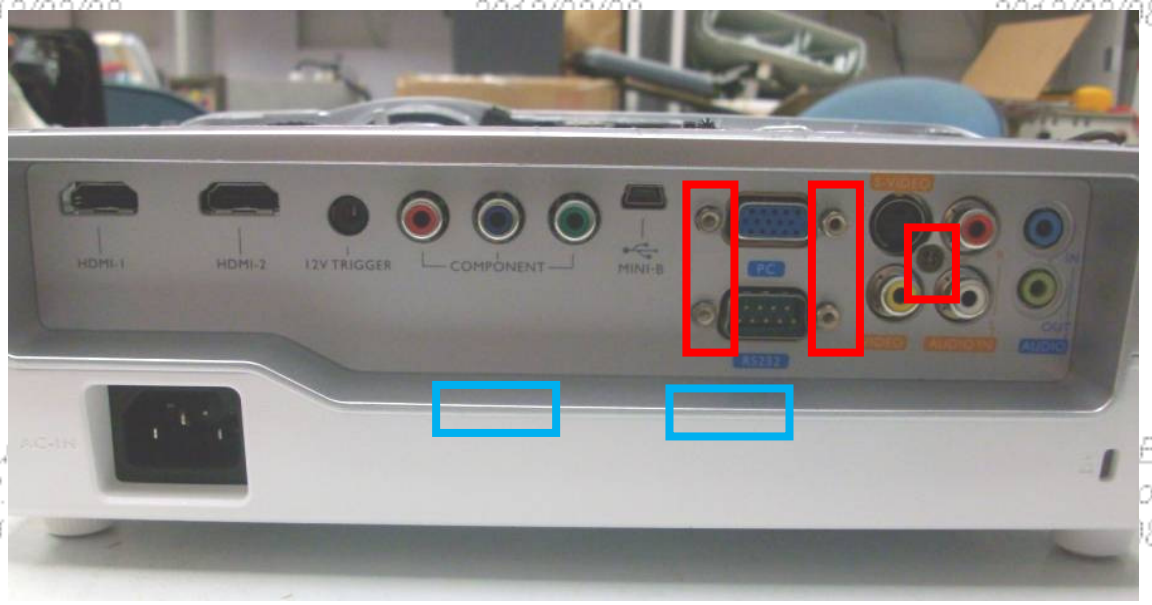
Step3. Plug in the **wire of lamp fan (7025)** and **wire of power fan (6013)**.



6. Rear case assemble

Step1. Assemble the assy sub rear case module on the lower case as figure shows.

Note: Fasten the Mylar on rear case first!

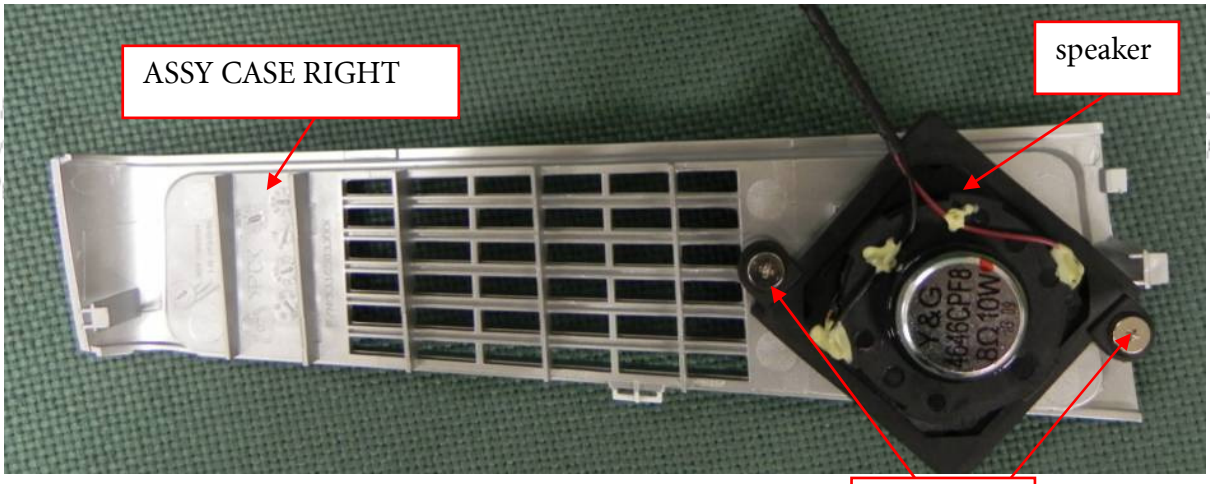


Check two hooks are near the location as blue circle shows.

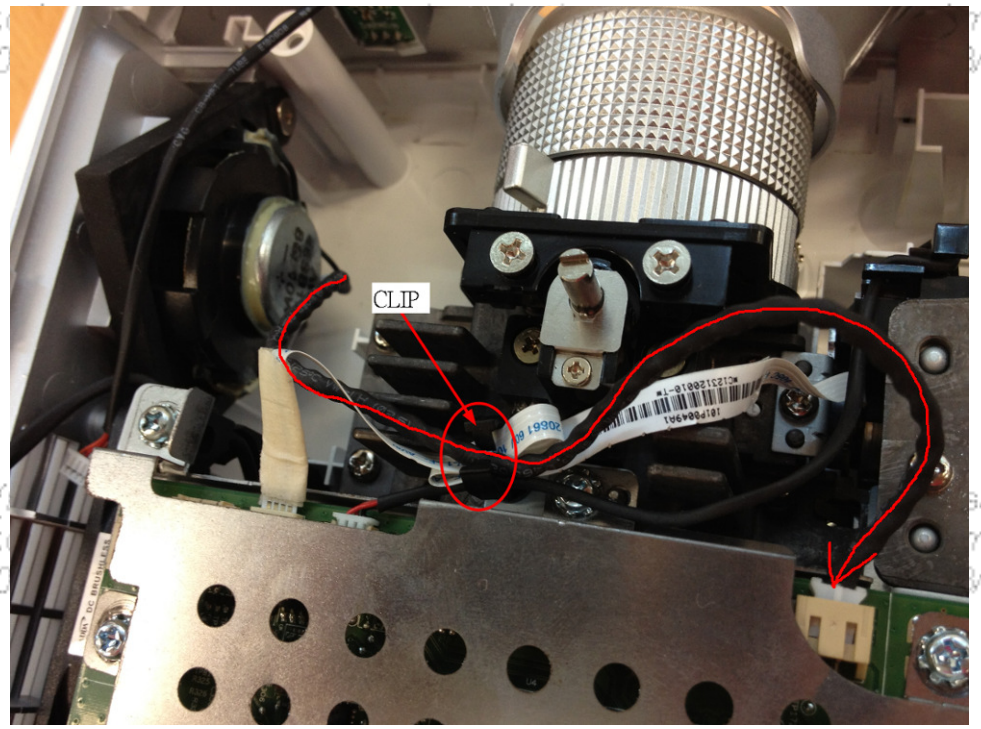
7. Right and Left case assembly

Step1. Right case assemble

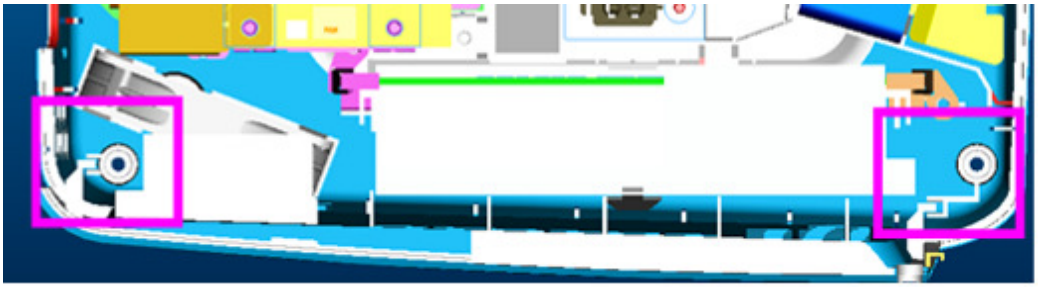
Assemble the **speaker** on the assy sub right case by **screws*2**.

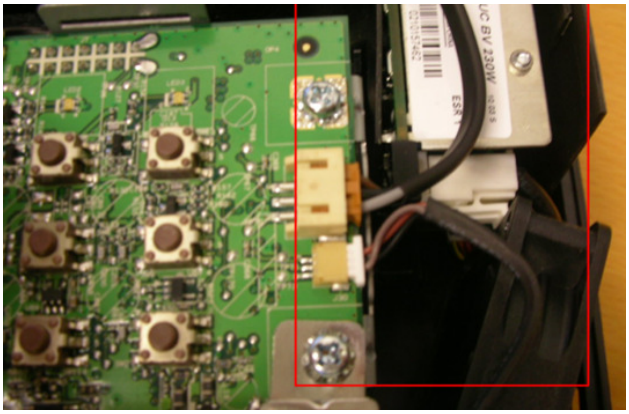


Step2. Plug in the speaker connector as figure shows and put the speaker wire as below. Then, assemble the sub-right case on the lower case.



Step3. Assemble the left case on the lower case, and check the wire of outlet fan arranged as figure shows.





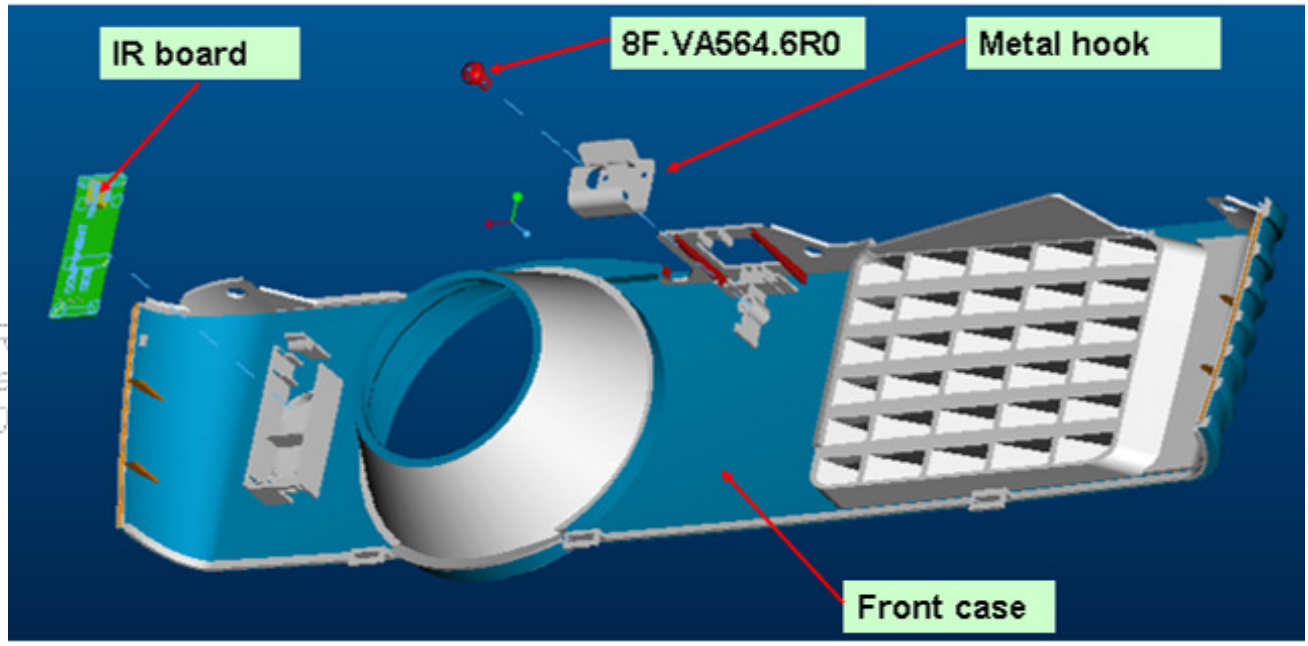
8. Front case assemble

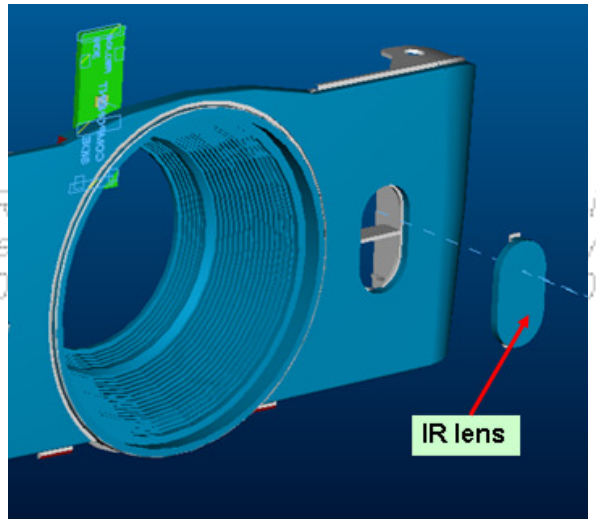
Step1. Assemble Sponge on the IR Lens

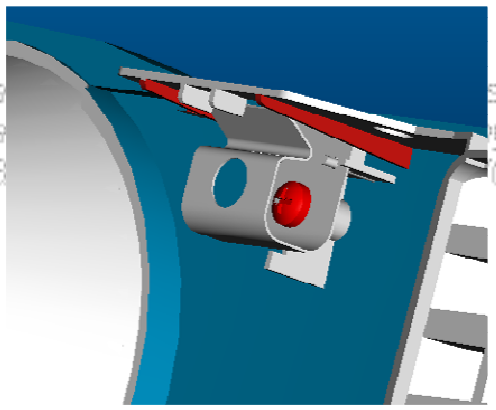
Step2. Assemble the lens IR ,BenQ logo and hook on the front case by screw*1.

Next insert the IR board on the front case.

Check the IR lens: don't set the wrong direction.

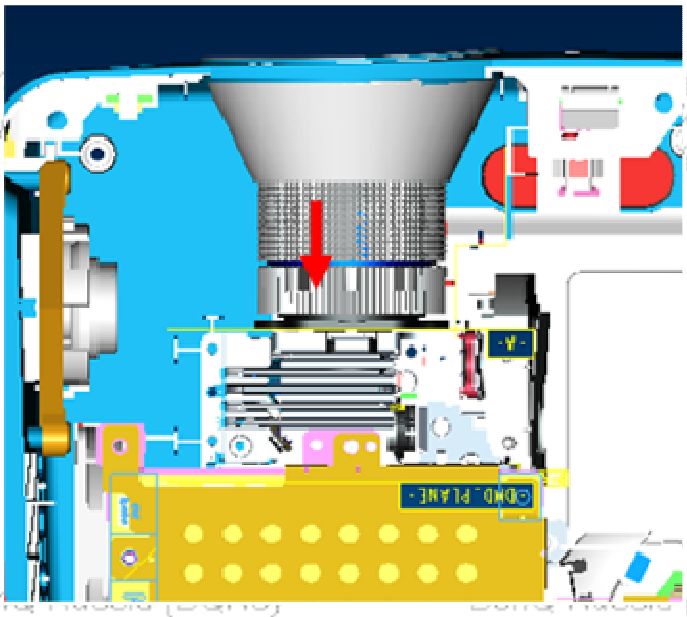


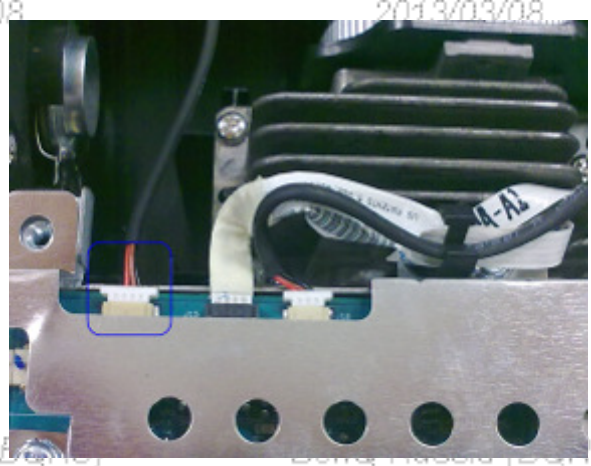


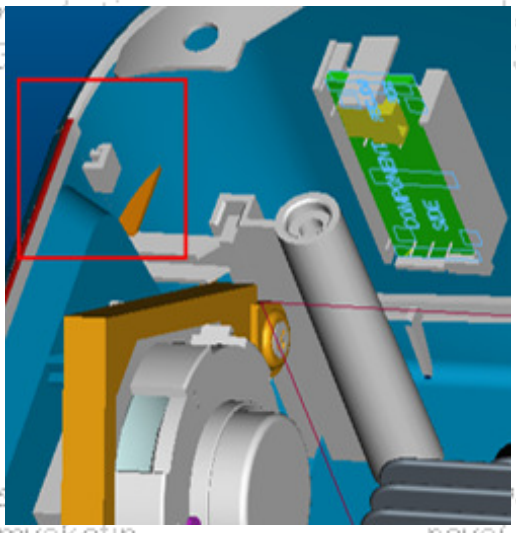


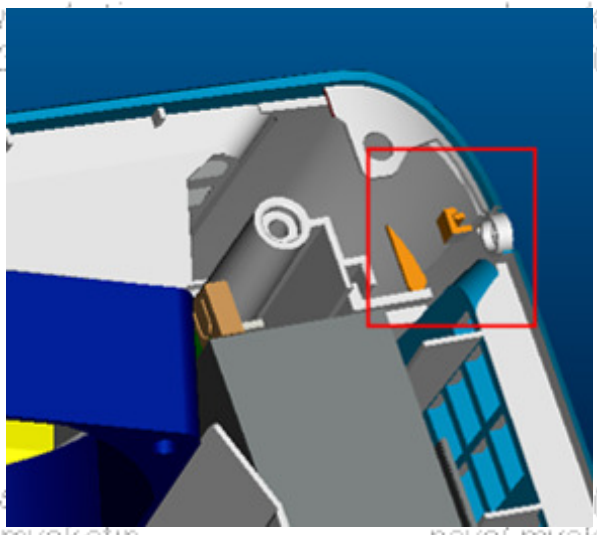
Step3. Turn the zoom ring back to wide mode, then assemble the front case on the lower case and check there are structures on the both side of front case to help fix with side cases.

Finally, plug in the IR connector as figure shows.



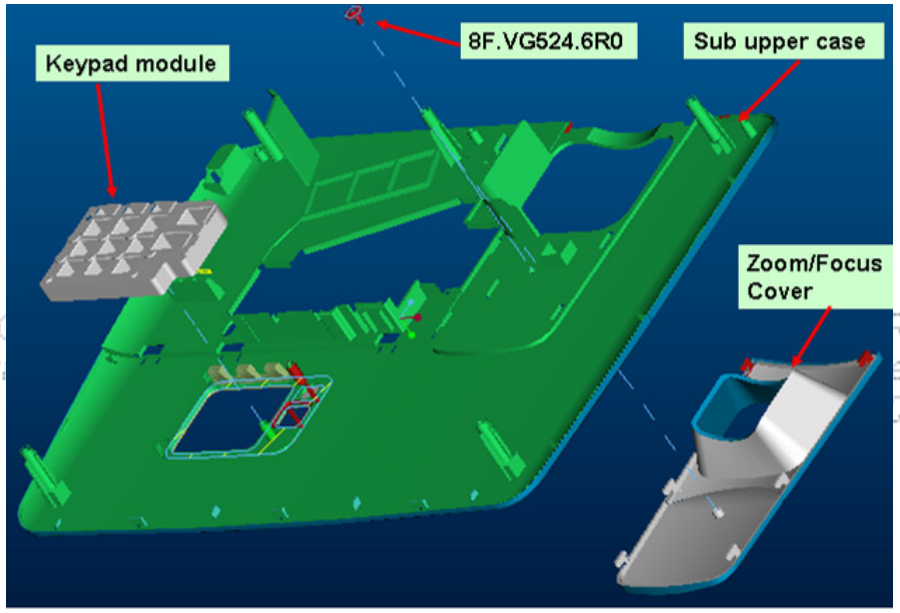




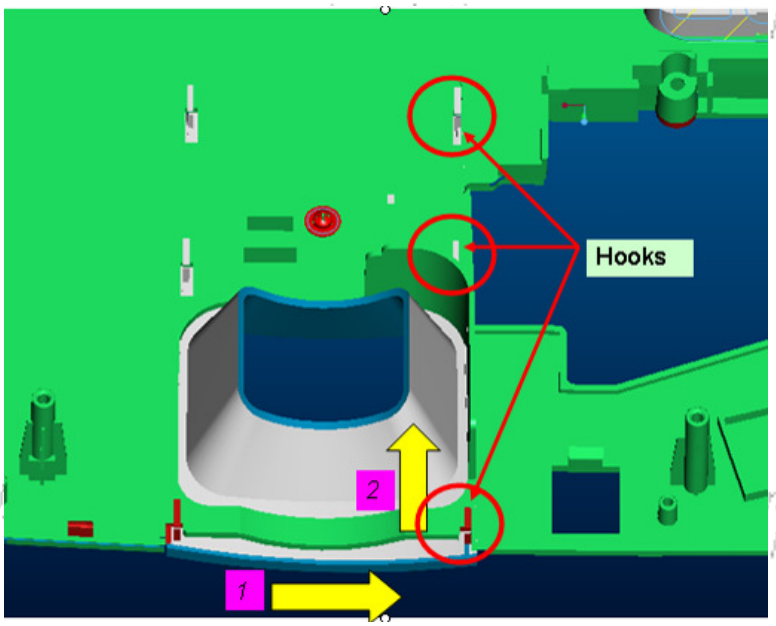


9. Upper case assemble

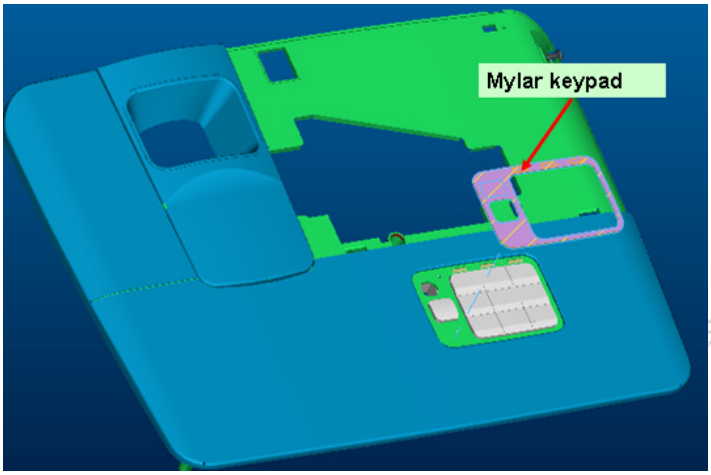
Step1. Assemble **keypad module** (P+R) and fasten **Zoom/Focus cover** by screw (**8F.VG524.6R0**) on the **sub upper case**.



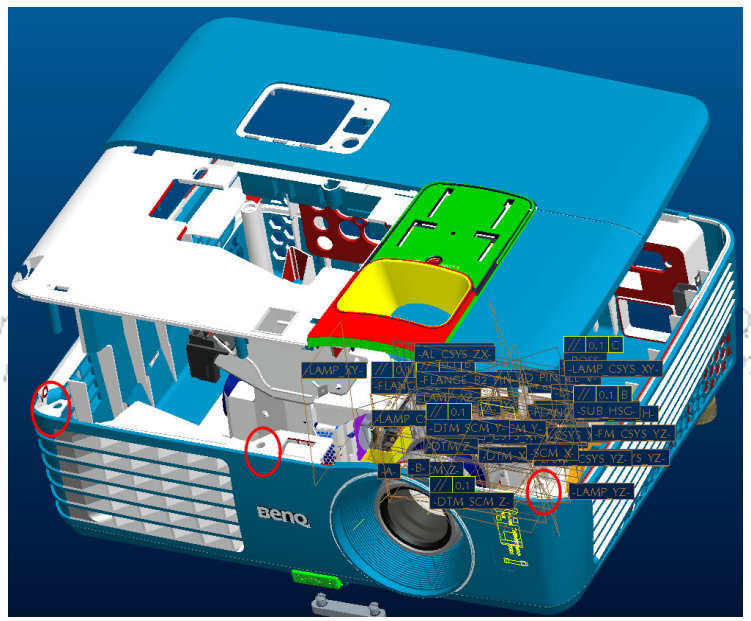
Note: Assemble Zoom/Focus cover by the steps below. Need to push the cover until hook on cover touch the side wall of the upper case.

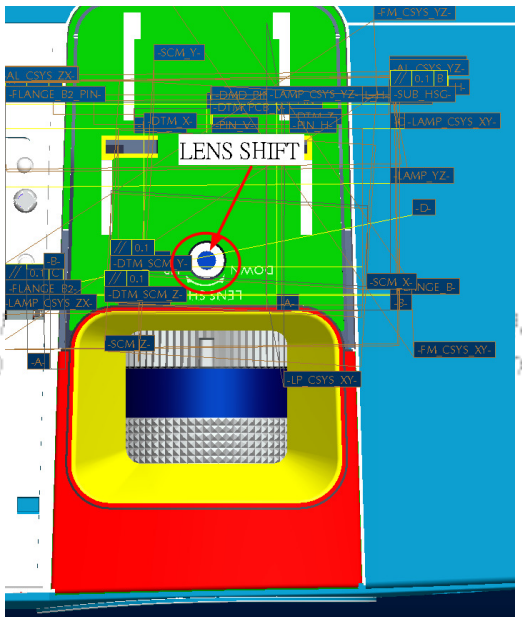


Step2. Assemble **Mylar keypad** on the s**ub upper case**.

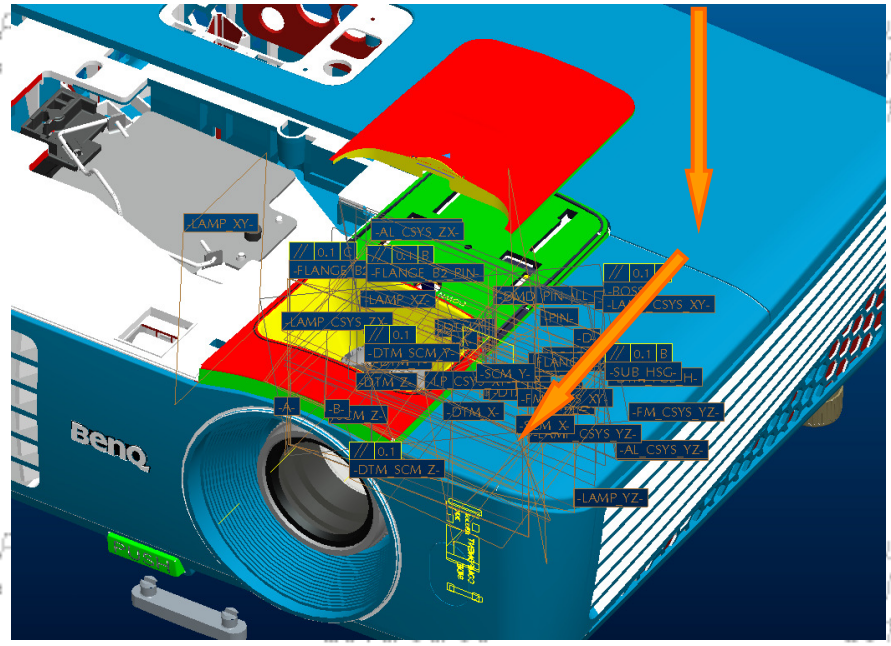


Step3. Assemble upper case module on the whole projector, check three pins will insert front case.

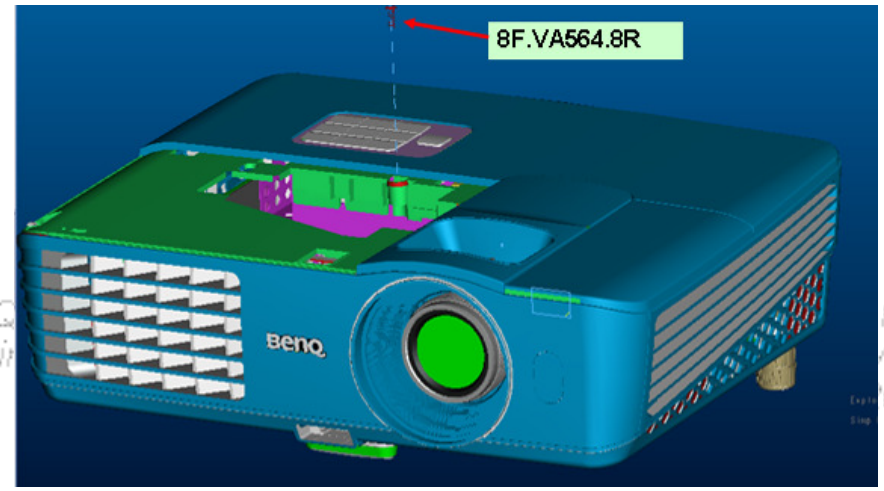


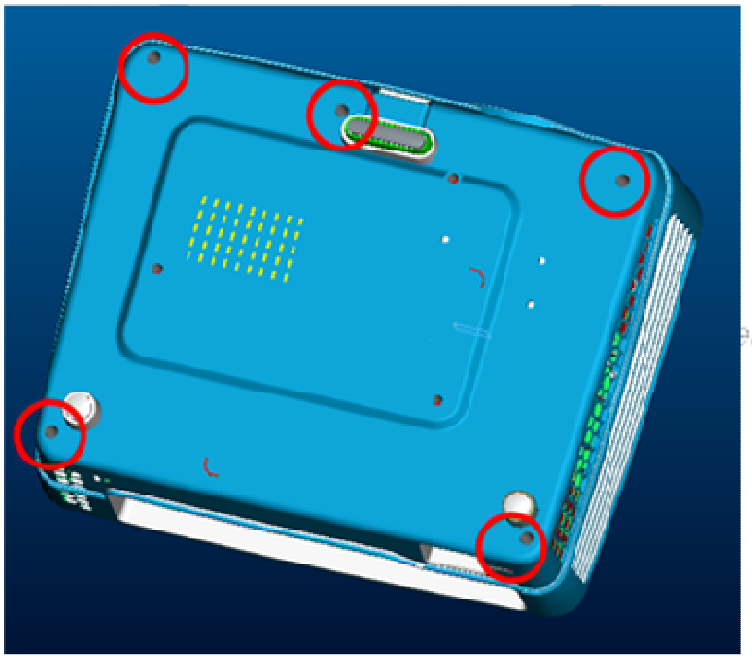


Step4. Assemble the cover slide on upper case.



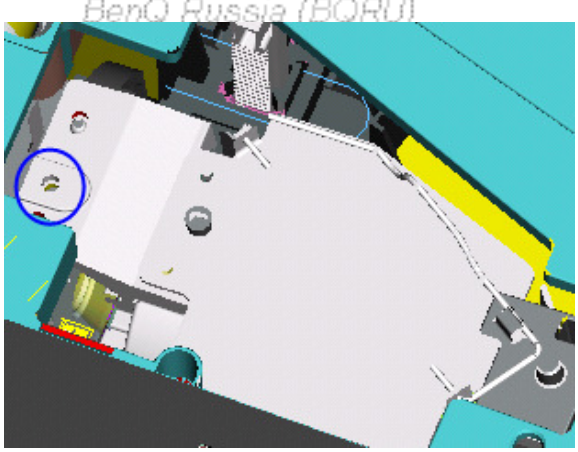
Step5. Assemble the upper case on the projector and screw (8F.VA564.8R0) on the lamp frame and 5 screws (8F.VA564.8R0*5) at the bottom as figure shows.





10. Lamp module assembly

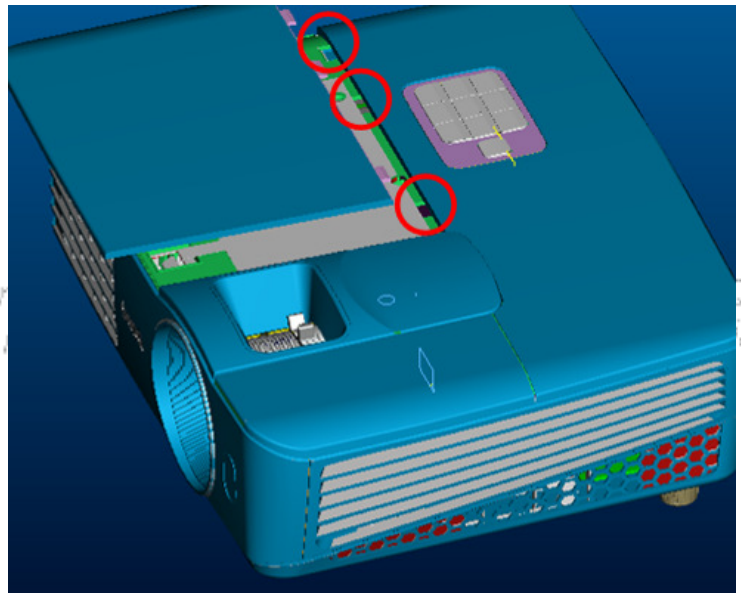
Assemble the lamp module and screw it.

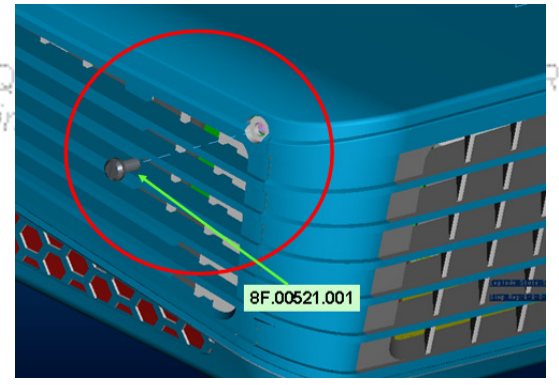


11. Lamp door assemble

Step1. Assemble the Mylar of anti-explosion along the edges of upper case as figure shows.

Step2. Insert the lamp door into the 3 hooks on the upper case and fix it by screw (8F.00521.001) on the left case as below figure shows.





5.5 Block Diagram

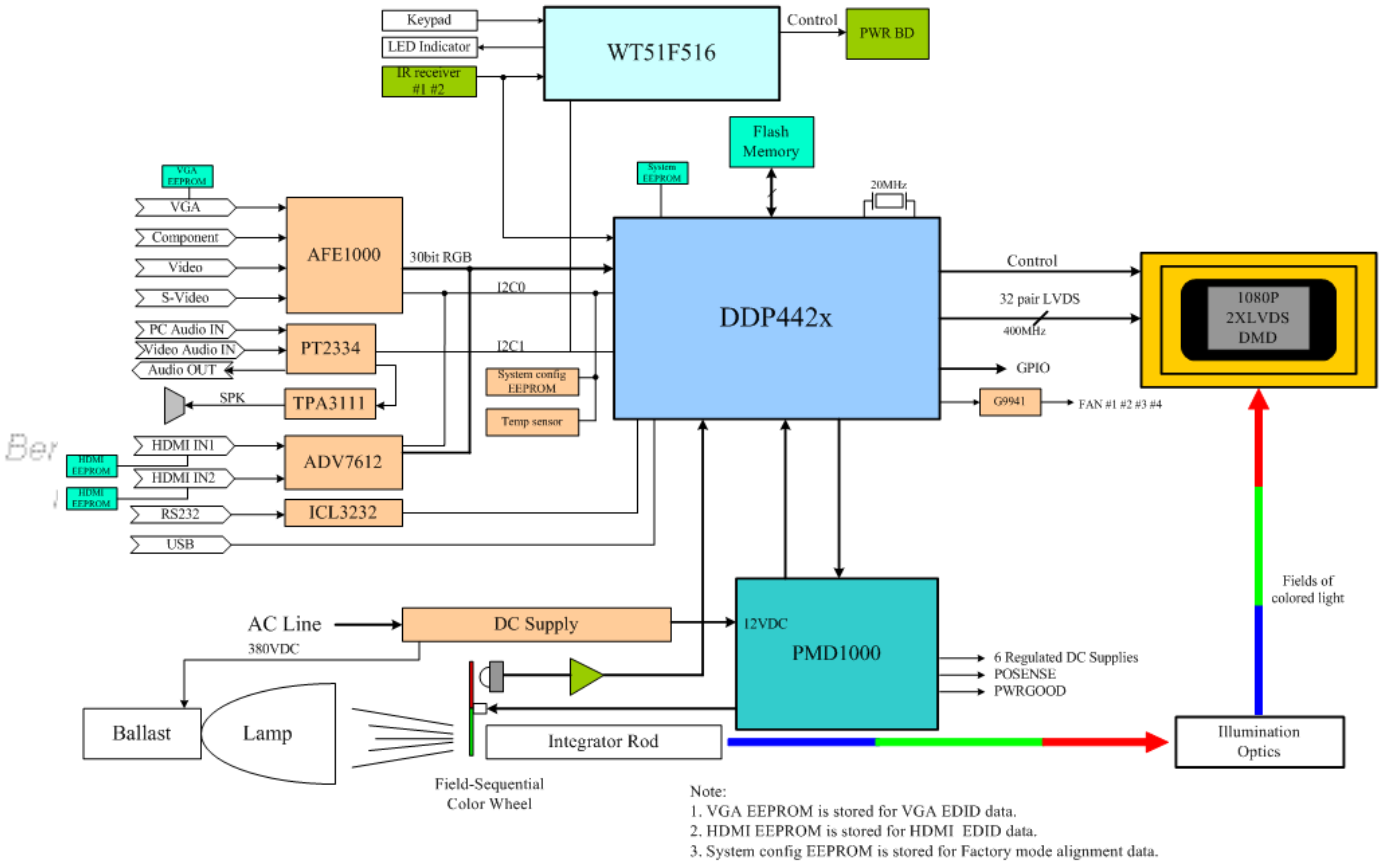
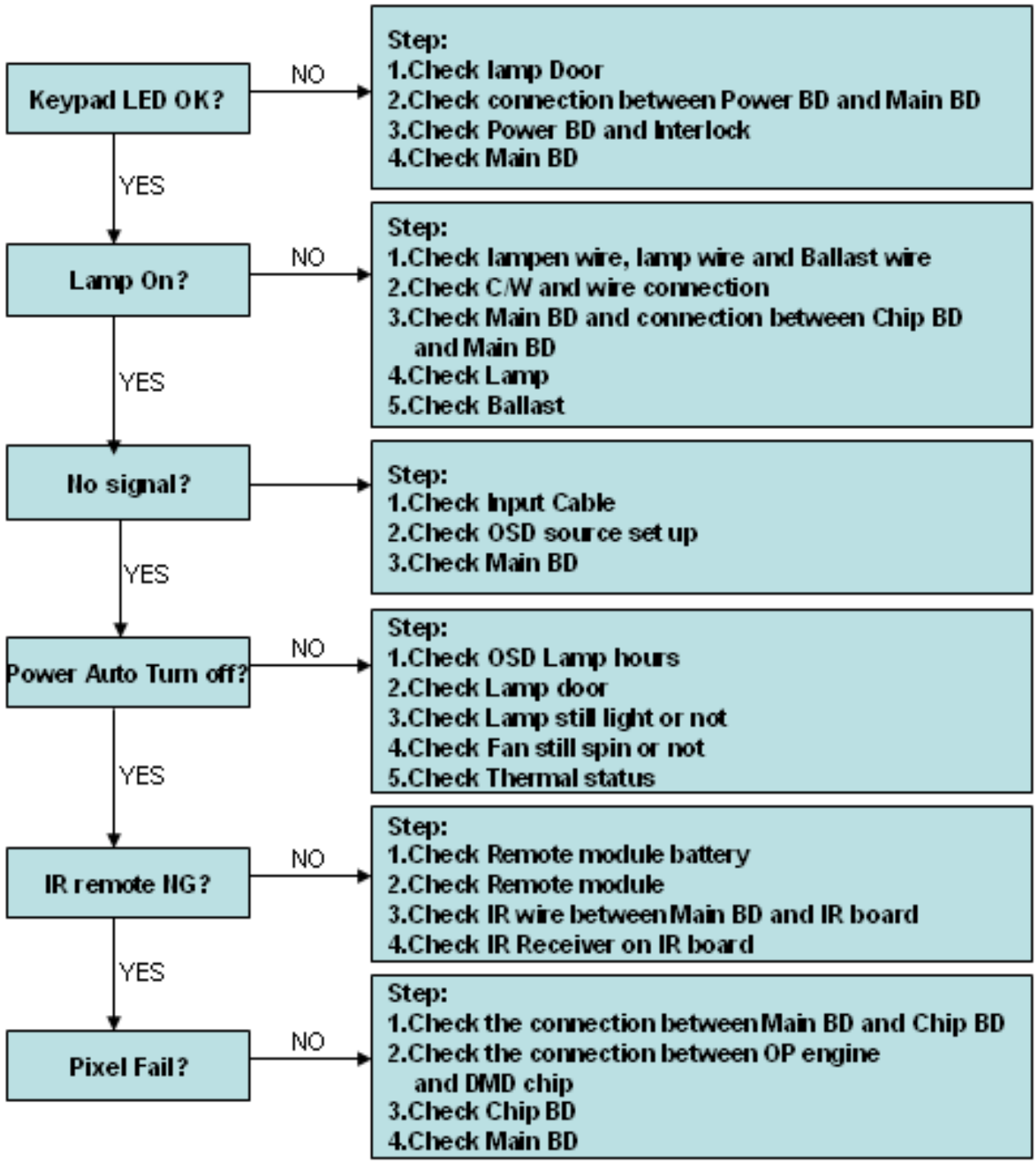


Figure 1 Main board & Input board Block Diagram

5.6 Trouble shooting

Chapter 1 System Analysis
Chapter 2 Optical & Optical Engine Trouble Shooting Guide
Chapter 3 Power Supply Trouble Shooting Guide
Chapter 4 LED Messages Definition
Chapter 5 Error Count Messages Definition



Chapter 2 Optical & Optical Engine Trouble Shooting Guide

No.	Item	Trouble Shooting Guide
1	Brightness	1. Change lamp
2	Uniformity	1. Change lamp
3	FOFO Contrast	1. Check ADC calibration 2. Check user's menu brightness & contrast are default 3. Clean DMD 4. Clean PL
4	ANSI Contrast	1. Clean PL 2. Clean DMD 3. Change PL
5	Color	1. Check color wheel delay 2. Check CW 50% point. Replace CW if necessary
6	Color Uniformity	1. Change lamp
7	Blue Edge	1. Refer to Item#2-1 (attached below) 2. Change CM 3. Change SUB HSG
8	Blue/Purple Border	1. Refer to Item#2-1(attached below) 2. Change CM 3. Change SUB HSG
9	Focus	1. Change Projection Lens 2. Check parallel between PL datum and DMD
10	Dust	Clean DMD
11	Horizontal/Vertical Strips	1. Check connector between chipBD and MainBD 2. Re-install DMD with chipBD 3. Check if any pin of C-Spring is missing, damaged or dirty 4. Change new ChipBD/C-Spring 5. Change new DMD
12	Pixel Fail	Change new DMD

2-1. "Blue Edge" Trouble Shooting:

I. Re-adjust "Overfill" first.
For Overfill Re-adjustment:

i. Those 2 Adjustment Screws must be released for around 2 mm first.

ii. Alignment Sequence:

a. To adjust "Horizontal Adjustment Screw" firstly, then "Vertical Adjustment Screw".

b. Refer to Figure 2-1..

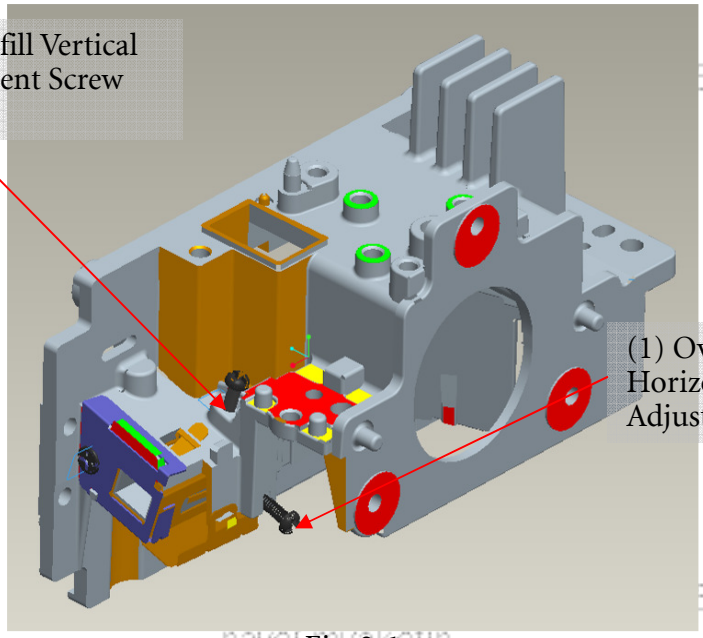


Fig. 2-1

II. Re-assemble LP module—include LP, LP Baffle, LP clip.

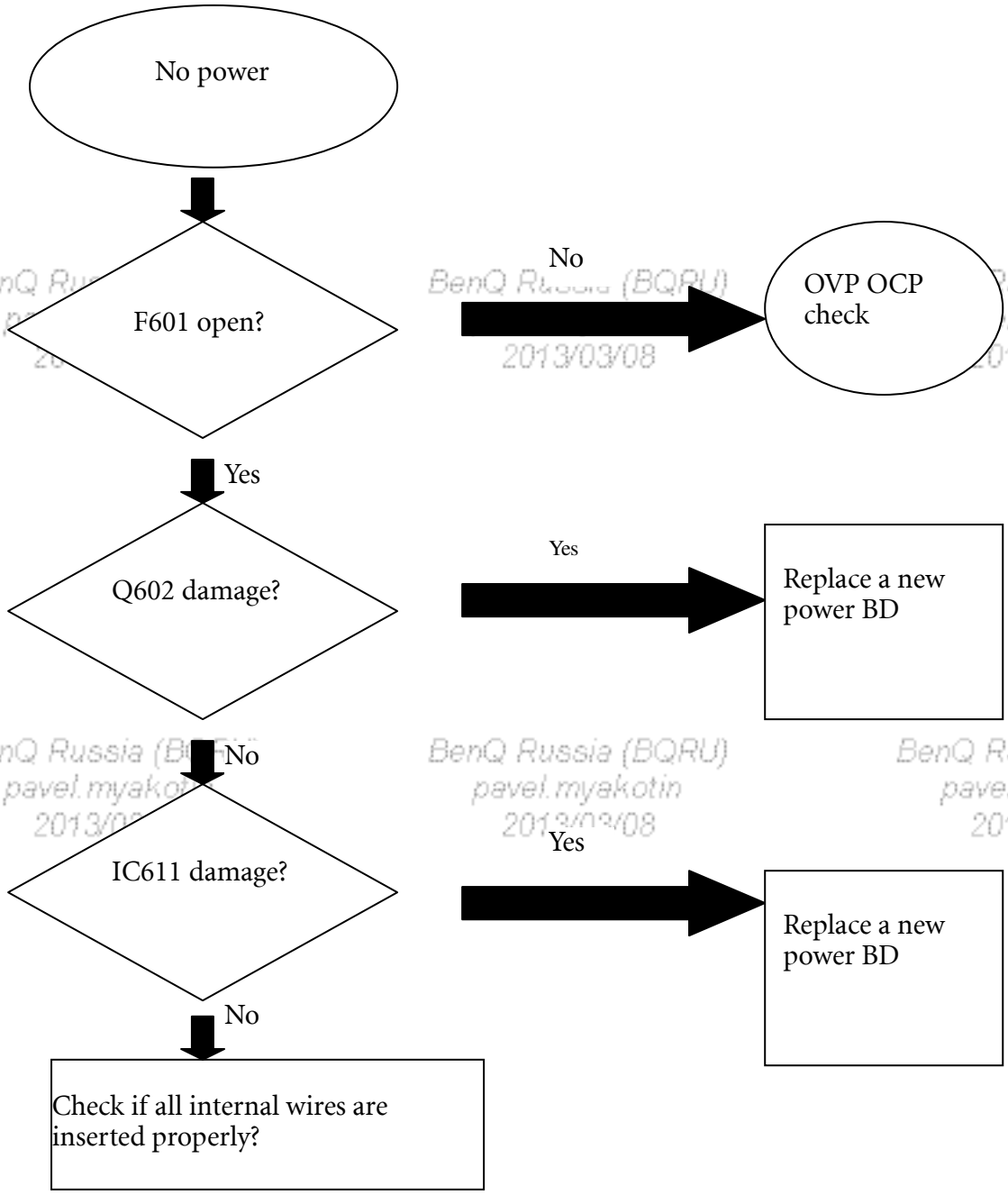
Chapter 3 Power Supply Trouble Shooting Guide

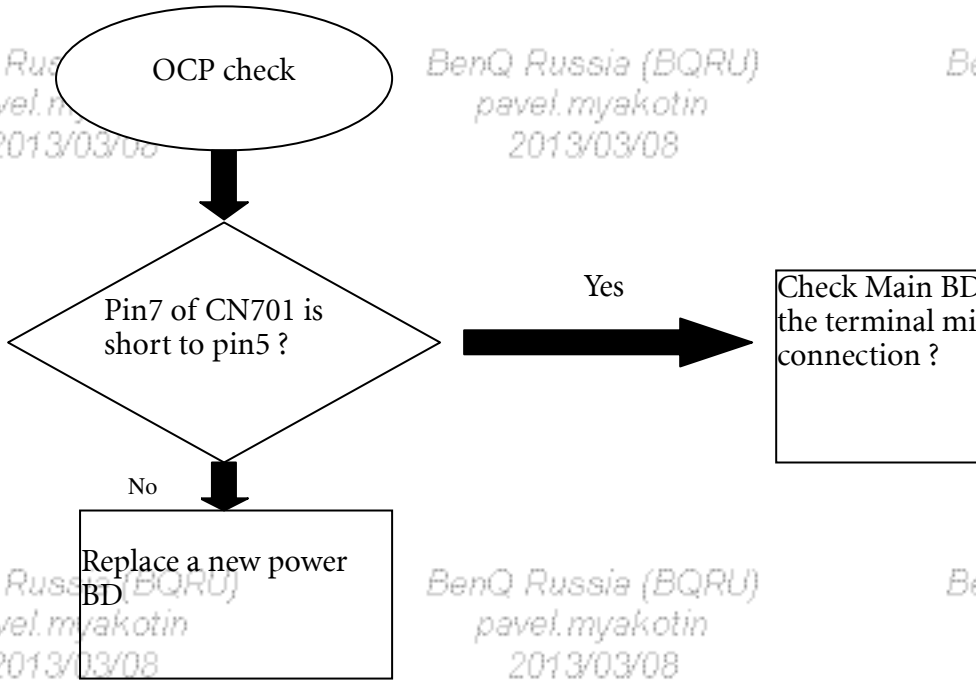
1. Introduction

This document is prepared to be a guide to repair trouble sets, some problems happen more frequently are taken as example in it.

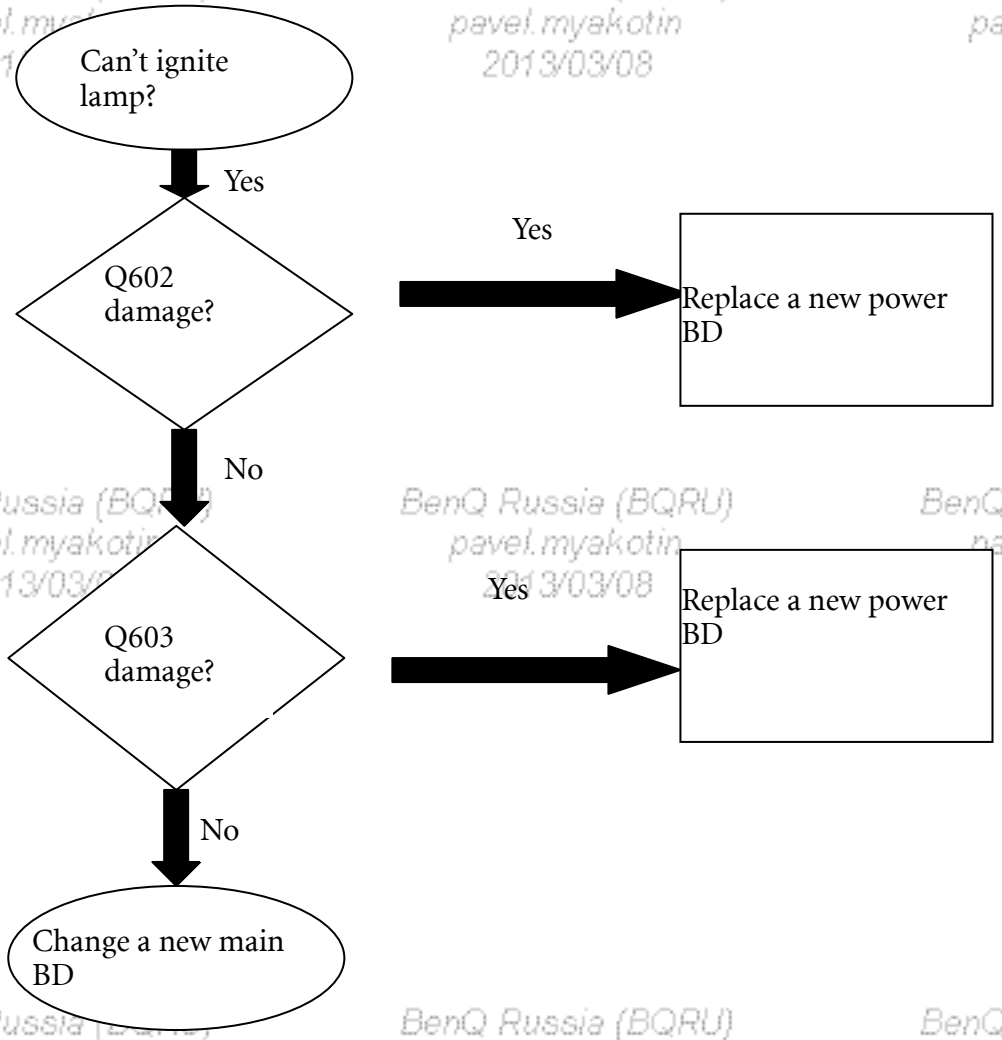
2. Problems

(a) no power





(b) Lamp cannot turned on



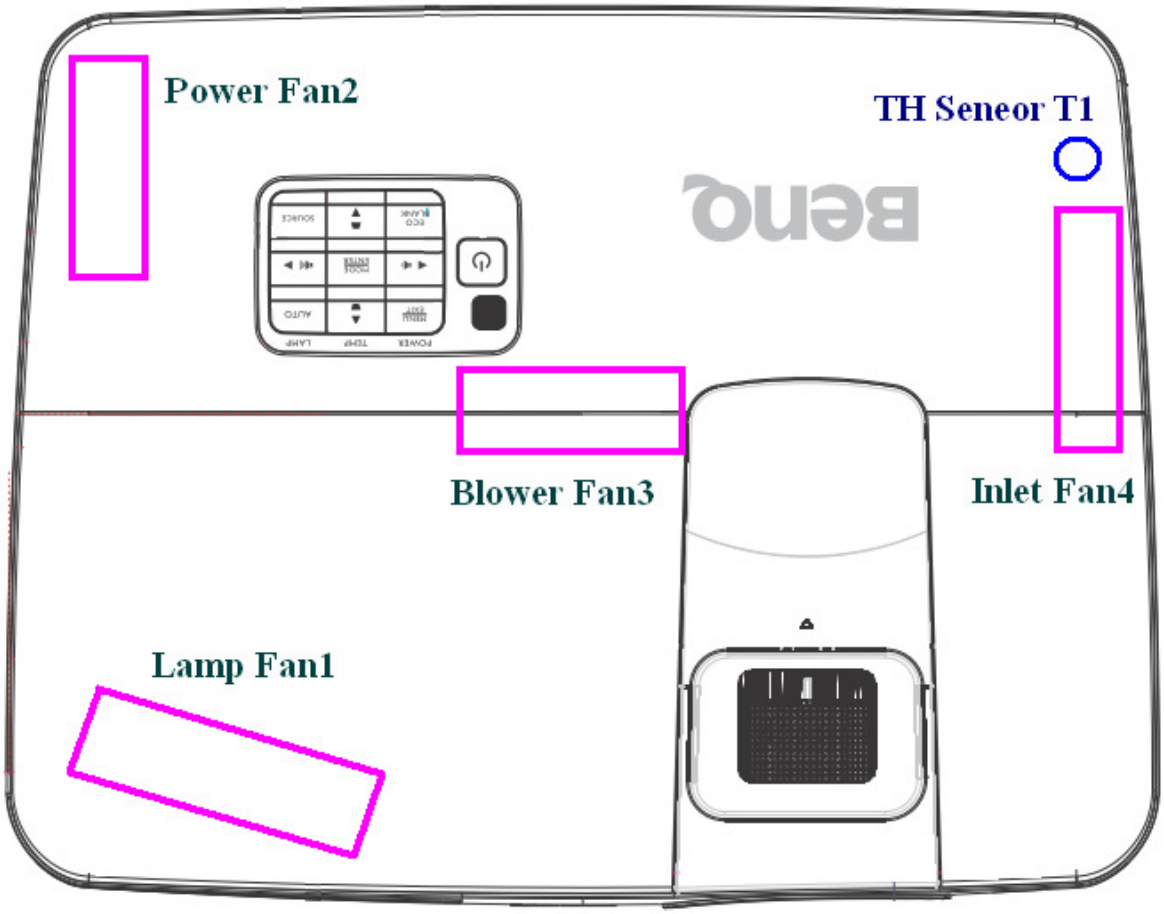
Chapter 4 - LED Messages Definition

LED Messages Definition

Power	Temp	Lamp1	Status
System Messages			
O	-	-	Stand-by
G	-	-	Powering up
G	-	-	Normal operation
O	-	-	Normal power-down cooling
R	-	-	Download
G	-	R	CW start fail
R	-	-	Scaler shutdown fail(data abord)
Burn-In Messages			
G	-	-	Burn-in ON
G	G	G	Burn-in OFF
Lamp Error Messages			
-	-	R	Lamp1 error in normal operation
-	-	R	Lamp is not lit up
Thermal Error Messages			
R	R	-	Fan 1 error (the actual fan speed is ±25% outside the desired speed)
R	R	-	Fan 2 error (the actual fan speed is ±25% outside the desired speed)
R	G	-	Fan 3 error (the actual fan speed is ±25% outside the desired speed)
R	G	-	Fan 4 error (the actual fan speed is ±25% outside the desired speed)
G	R	-	Temperature 1 error (over limited temperature)
G	R	-	Thermal Sensor 1 open error
G	G	-	Thermal Sensor 1 short error
G	G	-	Thermal IC #1 I2C Connection error

Chapter 5 - Error Count Messages Definition

Error Count	Definition	Specification
Lamp Fail	Lamp Off	Detect LampLit NG
Fan 1 Speed Error	Lamp Fan Speed Error	Speed Over ± 20%
Fan 2 Speed Error	Power Fan Speed Error	Speed Over ± 20%
Fan 3 Speed Error	Blower Fan Speed Error	Speed Over ± 20%
Fan 4 Speed Error	Inlet Fan Speed Error	Speed Over ± 20%
Sensor 1 Open Error	Main Board Sensor Error	TH Sensor T1
Sensor 1 Short Error	Main Board Sensor Error	TH Sensor T1
Temperature 1 Error	Over temperature	T1 > 70℃
FanIC 1 I2C Error	N/A	N/A
Color Wheel Error	Color wheel operating Error	
Abnormal Power down	System abnormal power down	



Appendix 1 – Screw List / Torque

Model name : W1070 (MD)

	No.	Screw P/N	Description				Q'TY	Torque	Where use
			Type	Head	Length	Coating		(kgf-cm)	
M2.5	1	8F.00430.6R0	MACH	PH	6	NI	2	4~5	Right case & Speaker(2*)
M3.0	1	8F.VG564.8R0	TAP	PH	8	NI	5	6~7	Lamp frame & Connector(1*)
									Lower case & Blower BKT(2*)
									Lower case & Lamp frame(2*)
	2	8F.VG524.6R0	TAP	PH	6	NI	5	6~7	Lower case & PWR BD(4*)
									Lower case & Lamp frame(1*)
									Upper case & Zoom/Focus Cover(1*)
	3	8F.VA564.6R0	TAP	PH	6	NI	2	6~7	Hook & Front case(1*)
								5~6	Upper case & Lamp frame(1*)
	4	8F.VA564.8R0	TAP	PH	8	NI	10	6~7	OM & Lower case(3*)
									Upper case & Lower case(5*)
									Lower case & Ballast holder(2*)
	5	8F.TA724.8R0	TAP	FH	8	B-NI	1	6~7	Rear case & Main board (1*)
	6	8F.1D224.5R0	MACH	PH	5	NI	7	5.5~6.5	SHD MB & BKT MB(7*)
	7	8F.00521.001	MACH	PH	8	B-NI	1	5.5~6.5	Lamp door & Left case(1*)
	8	8F.1A554.6R0	MACH	PH	6	NI	1	5.5~6.5	Blower BKT & Nozzle(1*)
	9	8F.1A524.100	MACH	PH	10	NI	2	5.5~6.5	Blower BKT & Blower(2*)
M4.0	1	8F.1D526.6R0	MACH	TAPTITE	6	NI	4	5.5~6.5	AC Wire & BKT MB(1*)
								5.5~6.5	Lower case for ceiling (3*)

- Screw Type: 11 types
- Screw quantity: 40

Standoff										
	NO.	screw P/N	description				Torque	Where use	Q'ty	total Q'ty
			Type	Head	Length	Surface	(kgf-cm)		Unit	
#4-40	1	8F.00649.120	MACH	STAND	8	NI	2~3	Rear case & D-SUB(4*)	4	4

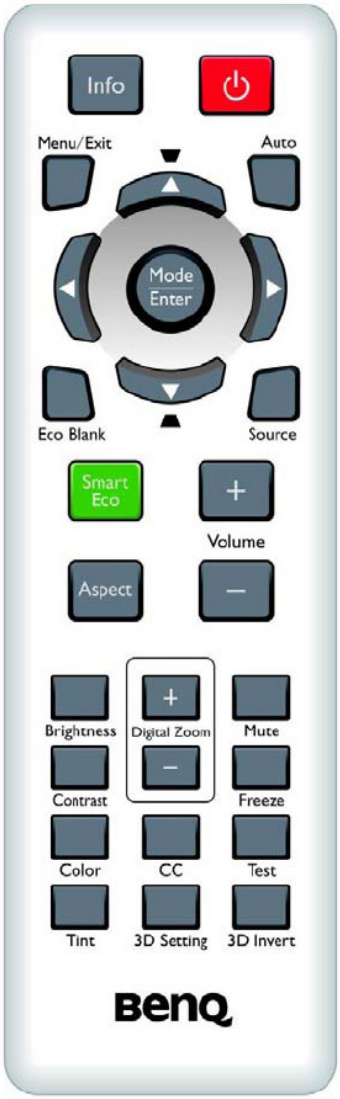
- Screw quantity: 4

Model Name : W1070 (OM)										
MODULE	Type	P/N	Description				Torque	Where use	Unit	Q'ty
			Type	Head	Length (mm)	Surface	(kgf-cm)			
DMD HSG	M2	8F.8A752.3R5	MACH	FPH	3.5	B-NI	2.5+/-0.5	CW Shield VS. BKT Link Lamp	1	4
								Clip FM VS. HSG DMD	1	
								Clip LP VS. HSG DMD	1	
								Baffle LP VS. HSG DMD	1	
		8F.00603.4R0	MACH	FPH	4	B-NI	2.5+/-0.5	SUB HSG Module VS. HSG DMD	3	3
		8F.1A752.8R0	MACH	PH	2	B-NI	2.5+/-0.5	LP Adjustment	2	2
	M3	8F.1A554.5R0	MACH	PAN	5	NI	4+/-0.5	BKT Link Lamp VS. HSG DMD	2	3
								CW Module VS. HSG DMD	1	
		6E.1P501.001	MACH	PH	13	NI	6+/-0.5	H-Sink VS. HSG DMD	4	4
CW Module	M2	8F.1A752.3R0	MACH	PH	3	B-NI	2.5+/-0.5	CW Sensor BD VS. BKT CW	1	2
								CVR CW VS. BKT CW	1	
		8F.8A752.3R5	MACH	FPH	3.5	B-NI	2.5+/-0.5	Shield Anti-Dust VS. BKT CW	1	1
	M2.5	8F.00345.5R6	MACH	FPH	5.6	NI	3.5+/-0.5	CW VS. BKT CW	3	3
Lamp Module	M2	8F.1A752.3R0	MACH	PH	3	B-NI	2.5+/-0.5	FIN VS. HLD Lamp	1	8
								Clip Lamp UP VS. HLD Lamp	2	
								Clip Lamp Down VS. HLD Lamp	2	
								Clip FG VS. HLD Lamp	1	
								CVR Lamp VS. HLD Lamp	2	
	M3	8F.1A554.6R0	MACH	PAN	6	NI	5+/-0.5	BKT Link Lamp VS. HLD Lamp	1	1
		8F.2R754.6R0	MACH	HEX	6	B-NI	5+/-0.5	Plate Lamp VS. HLD Lamp	1	1
		8F.VA564.6R0	TAP	PH	6	NI	5+/-0.5	Plate Lamp VS. Connector	1	1
		8F.VG564.8R0	TAP	PH	8	NI	5+/-0.5	Lamp Wire VS. Connector	1	1
Lens Shift	M2	8F.AA722.6R0	TAP	PH	6	NI	3.5+/-0.5	HLD Adapter flange VS. Lens flange	4	4
		8F.8A752.3R5	MACH	FPH	3	ZN	3.5+/-0.5	BKT Lens Shift VS. HLD Lens Shift	2	2
		8F.FA322.3R5	TAP	FPH	3	B-NI	3.5+/-0.5	Ring Zoom VS. HLD LENS	2	2
		8F.00705.001	MACH	FPH	5.8	B-NI	3.5+/-0.5	LENS VS. Frame	3	3
		3D.1TV05.001	MACH	FPH	3	NI	5+/-0.5	HLD Adapter Flange VS. HSG DMD	2	2
	M3	8F.JA754.4R0	MACH	FPH	4	B-NI	5+/-0.5	HLD Lens Shift VS. HSG DMD	1	1

Appendix 2 - Code List: IR / RS232 / DDC Data

Remote Control Code:

1. IR Code

Key	Function	Description	Code	Support	ID and Protocol	
1	Wireless		0x00	No	Frequency	38 KHz
2	Power	This button will on/off the projector.	0x02	**Yes**	Protocol	NEC Format
3	Freeze	This button will freeze/ unfreeze the image.	0x03	**Yes**	Custom Code	0x0030
4	Source	This button will show available source options.	0x04	**Yes**		
5	Page Up	By pressing "Page Up" button, could enable Page Up function.	0x05	No		
6	Page Down	By pressing "Page Down" button, could enable Page Down function.	0x06	No		
7	Eco Blank	This button will turn projector into/out of blank mode.	0x07	**Yes**		
8	Auto	This button will automatically adjust projector's picture quality.	0x08	**Yes**		
9	Keystone +		0x09	No		
10	Keystone -		0x0A	No		
11	Up	When there is no OSD on screen, this button will correct optical keystone in negative direction. When there is OSD menu on screen, this button will move the chooser item to the upper one.	0x0B	**Yes**		
12	Down	When there is no OSD on screen, this button will correct optical keystone in positive direction. When there is OSD menu on the screen, this button will move the chooser item to the next one.	0x0C	**Yes**		
13	Left	When there is OSD menu on screen, this button will move the chooser item to the left one.	0x0D	**Yes**		
14	Right	This button will move the chooser item to the right one.	0x0E	**Yes**		
15	Menu/Exit	This button will turn on/off OSD menu.	0x0F	**Yes**		
16	Mode	When there is no OSD menu on the screen, the button will change picture mode. When there is OSD menu on the screen, this button will excite the item chooser.	0x10	**Yes**		
17	Contrast	Displays the CONTRAST setting bar.	0x11	**Yes**		
18	SWAP		0x12	No		
19	Aspect	Select the display aspect ratios.	0x13	**Yes**		
20	Mute	Mutes the built-in speaker.	0x14	**Yes**		
21	Enter/OK	Enter key for OSD menu.	0x15	No		
22	Brightness	Displays the BRIGHTNESS setting bar.	0x16	**Yes**		
23	Wireless channel		0x17	No		
24	Digital Zoom +	This button will show unsupported logo.	0x18	**Yes**		

25	Digital Zoom -	This button will show unsupported logo.	0x19	**Yes**	
26	Audio		0x1A	No	
27	PIP	Turns the PIP window on or off and makes related adjustments.	0x1B	No	
28	POP		0x1C	No	
29	PAP		0x1D	No	
30	Capture		0x1E	No	
31	S-video	Displays the S-VIDEO source selection.	0x1F	No	
32	Q?	Starts the INFORMATION function.	0x20	**Yes**	
33	Play/pause (iPhone)		0x21	No	
34	Next (iPhone)		0x22	No	
35	Prev. (iPhone)		0x23	No	
36	Menu/Back (iPhone)		0x24	No	
37	Timer on	When the presentation timer is off , this button will activate/ stop the timer. When the presentation timer is on , this button will restart, continue or turn off the timer.	0x25	No	
38	Timer Setup		0x26	No	
39	Scroll Up (iPhone)		0x27	No	
40	Scroll Down (iPhone)		0x28	No	
41	OK (iPhone)		0x29	No	
42	0/ Smart Eco	By pressing “Smart Eco” button, could open “Quick Lamp Menu” to select lamp mode.	0x30	**Yes**	
43	1		0x31	No	
44	2		0x32	No	
45	3		0x33	No	
46	4		0x34	No	
47	5		0x35	No	
48	6		0x36	No	
49	7		0x37	No	
50	8		0x38	No	
51	9		0x39	No	
52	RGBHV	Displays the PC source selection.	0x40	No	
53	RGB-PC1	Displays the PC 1 source selection.	0x41	No	
54	DVI-D	Displays the DVI-D source selection.	0x42	No	
55	DVI-A	Displays the DVI-A source selection.	0x43	No	
56	DVI-I	Displays the DVI-I source selection.	0x44	No	
57	RGB-PC2	Displays the PC 2 source selection.	0x45	No	
58	Network Display	Displays the LAN source selection.	0x46	No	
59	USB Display	Displays the mini USB source selection.	0x47	No	
60	USB Reader	Displays the USB disk source selection via type A USB port.	0x48	No	
61	Power Off	Turns off the projector.	0x4E	No	

62	Power On	Turns on the projector.	Ox4F	No	
63	Comp2	Displays the COMPONENT 2 source selection.	Ox50	No	
64	Comp1	Displays the COMPONENT 1 source selection.	0x51	No	
65	CVBS-1	Displays the CVBS-1 source selection.	0x52	No	
66	CVBS-2	Displays the CVBS-2 source selection.	0x53	No	
67	S-video2	Displays the S-Video 2 source selection.	0x54	No	
68	HDMI	Displays the HDMI source selection.	0x58	No	
69	HDMI2	Displays the HDMI source selection.	0x59	No	
70	GAMMA		0x5E	No	
71	COLOR TEMP		0x5F	No	
72	USB SETTING		0x60	No	
73	USB Up		0x61	No	
74	USB Down		0x62	No	
75	USB Left		0x63	No	
76	USB Right		0x64	No	
77	USB Select		0x65	No	
78	USB Return		0x66	No	
79	ANA	Selects the ANA aspect ratio.	0x70	No	
80	04:03	Selects the 4:3 aspect ratio.	0x71	No	
81	LB	Selects the LB aspect ratio.	0x72	No	
82	WIDE	Selects the WIDE aspect ratio.	0x73	No	
83	REAL	Selects the REAL aspect ratio.	0x74	No	
84	MEMORY1	Select the User memory settings.	0x75	No	
85	MEMORY2	Select the User memory settings.	0x76	No	
86	MEMORY3	Select the User memory settings.	0x77	No	
87	Default		0x78	No	
88	COLOR	Displays the COLOR setting bar.	0x79	**Yes**	
89	TINT	Displays the TINT setting bar.	0x7A	**Yes**	
90	ACTIVE		0x7B	No	
91	IRIS	Displays the setting bar for the adjustment of the motorised aperture lens IRIS.	0x7C	No	
92	Brilliant Color		0x7D	No	
93	SHARP		0x7E	No	
94	OVERSCAN		0x7F	No	
95	Memory	Select the User memory settings.	0x80	No	
96	Network Setting		0x81	No	
97	Volume +	This button will magnify the volume gradually.	0x82	**Yes**	
98	Volume -	This button will reduce the volume gradually.	0x83	**Yes**	
99	Back	Goes back to previous OSD menu, exits and saves menu settings.	0x85	No	
100	Key Lock		0x87	No	
101	PAN		0x88	No	
102	Lens	Displays the setting page for the adjustment of the motorised vertical Lens shift value.	0x8A	No	
103	Focus		0x8B	No	
104	Zoom		0x8C	No	

105	3D setting		0x8D	**Yes**	
106	V-keystone		0x8E	No	
107	H-keystone		0x8F	No	
108	PIP Size		0x90	No	
109	PIP Position		0x91	No	
110	Return		0x92	No	
111	My Screen		0x93	No	
112	Pattern		0x94	**Yes**	
113	On(Split screen)		0x95	No	
114	Off(Split screen)		0x96	No	
115	Mic. Vol +		0x97	No	
116	Mic. Vol -		0x98	No	
117	SRS		0x99	No	
118	CC		0x9A	**Yes**	
119	Teaching Template		0x9B	No	
120	3D Menu		0x9C	No	
121	3D Sync Invert		0x9D	**Yes**	
122	Mouse Left		0x9E	No	
123	Mouse Right		0x9F	No	

2. RS-232 Command Code

(Each input upper case and lower case character should be action) (Version 12)

Function	Type	Operation	ASCII	Support
Power	Write	Power On	<CR>*pow=on#<CR>	Yes
	Write	Power off	<CR>*pow=off#<CR>	Yes
	Read	Power Status	<CR>*pow=?#<CR>	Yes
Source Selection	Write	COMPUTER/YPbPr	<CR>*sour=RGB#<CR>	Yes
	Write	COMPUTER 2/YPbPr2	<CR>*sour=RGB2#<CR>	No
	Write	Component	<CR>*sour=ypbr#<CR>	Yes
	Write	DVI-A	<CR>*sour=dviA#<CR>	No
	Write	DVI-D	<CR>*sour=dvid#<CR>	No
	Write	HDMI	<CR>*sour=hdmi#<CR>	Yes
	Write	HDMI 2	<CR>*sour=hdmi2#<CR>	Yes
	Write	Composite	<CR>*sour=vid#<CR>	Yes
	Write	S-Video	<CR>*sour=svid#<CR>	Yes
	Write	Network	<CR>*sour=network#<CR>	No
	Write	USB Display	<CR>*sour=usbdisplay#<CR>	No
	Write	USB Reader	<CR>*sour=usbreader#<CR>	No
	Read	Current source	<CR>*sour=?#<CR>	Yes
Audio Control	Write	Mute On	<CR>*mute=on#<CR>	Yes
	Write	Mute Off	<CR>*mute=off#<CR>	Yes
	Read	Mute Status	<CR>*mute=?#<CR>	Yes
	Write	Volume +	<CR>*vol=+#<CR>	Yes
	Write	Volume -	<CR>*vol=-#<CR>	Yes
	Read	Volume Status	<CR>*vol=?#<CR>	Yes
	Write	Mic. Volume +	<CR>*micvol=+#<CR>	No
	Write	Mic. Volume -	<CR>*micvol=-#<CR>	No
	Read	Mic. Volume Status	<CR>*micvol=?#<CR>	No
Audio source select	Write	Audio pass Through off	<CR>*audiosour=off#<CR>	No
	Write	Audio-Computer1	<CR>*audiosour=RGB#<CR>	No
	Write	Audio-Computer2	<CR>*audiosour=RGB2#<CR>	No
	Write	Audio-Video/S-Video	<CR>*audiosour=vid#<CR>	No
	Write	Audio-Component	<CR>*audiosour=ypbr#<CR>	No
	Write	Audio-HDMI	<CR>*audiosour=hdmi#<CR>	No
	Write	Audio-HDMI2	<CR>*audiosour=hdmi2#<CR>	No
	Read	Audio pass Status	<CR>*audiosour=?#<CR>	No
Picture Mode	Write	Dynamic	<CR>*appmod=dynamic#<CR>	Yes
	Write	Presentation	<CR>*appmod=preset#<CR>	No
	Write	sRGB	<CR>*appmod=srgb#<CR>	No
	Write	Bright	<CR>*appmod=bright#<CR>	No
	Write	Living Room	<CR>*appmod=livingroom#<CR>	No
	Write	Game	<CR>*appmod=game#<CR>	No
	Write	Cinema	<CR>*appmod=cine#<CR>	Yes
	Write	Standard	<CR>*appmod=std#<CR>	Yes
	Write	User1	<CR>*appmod=user1#<CR>	Yes
	Write	User2	<CR>*appmod=user2#<CR>	Yes
	Write	User3	<CR>*appmod=user3#<CR>	Yes
	Read	Picture Mode	<CR>*appmod=?#<CR>	Yes
Picture Setting	Write	Contrast +	<CR>*con=+#<CR>	Yes
	Write	Contrast -	<CR>*con=-#<CR>	Yes
	Read	Contrast value	<CR>*con=?#<CR>	Yes
	Write	Brightness +	<CR>*bri=+#<CR>	Yes
	Write	Brightness -	<CR>*bri=-#<CR>	Yes
	Read	Brightness value	<CR>*bri=?#<CR>	Yes
	Write	Color +	<CR>*color=+#<CR>	Yes

	Write	Color -	<CR>*color=-#<CR>	Yes
	Read	Color value	<CR>*color=?#<CR>	Yes
	Write	Sharpness +	<CR>*sharp=+#<CR>	Yes
	Write	Sharpness -	<CR>*sharp=-#<CR>	Yes
	Read	Sharpness value	<CR>*sharp=?#<CR>	Yes
	Write	Color Temperature-Warmer	<CR>*ct=warmer#<CR>	No
	Write	Color Temperature-Warm	<CR>*ct=warm#<CR>	Yes
	Write	Color Temperature-Normal	<CR>*ct=normal#<CR>	Yes
	Write	Color Temperature-Cool	<CR>*ct=cool#<CR>	Yes
	Write	Color Temperature-Cooler	<CR>*ct=cooler#<CR>	No
	Read	Color Temperature Status	<CR>*ct=?#<CR>	Yes
	Write	Aspect 4:3	<CR>*asp=4:3#<CR>	Yes
	Write	Aspect 16:9	<CR>*asp=16:9#<CR>	No
	Write	Aspect 16:10	<CR>*asp=16:10#<CR>	No
	Write	Aspect Auto	<CR>*asp=AUTO#<CR>	Yes
	Write	Aspect Real	<CR>*asp=REAL#<CR>	Yes
	Write	Aspect Letterbox	<CR>*asp=LBOX#<CR>	Yes
	Write	Aspect Wide	<CR>*asp=WIDE#<CR>	Yes
	Write	Aspect Anamorphic	<CR>*asp=ANAM#<CR>	Yes
	Read	Aspect Status	<CR>*asp=?#<CR>	Yes
	Write	Digital Zoom In	<CR>*zoomI#<CR>	Yes
	Write	Digital Zoom out	<CR>*zoomO#<CR>	Yes
	Write	Auto	<CR>*auto#<CR>	Yes
	Write	Brilliant color on	<CR>*BC=on#<CR>	Yes
	Write	Brilliant color off	<CR>*BC=off#<CR>	Yes
	Read	Brilliant color status	<CR>*BC=?#<CR>	Yes
Operation Settings	Write	Projector Position-Front Table	<CR>*pp=FT#<CR>	Yes
	Write	Projector Position-Rear Table	<CR>*pp=RE#<CR>	Yes
	Write	Projector Position-Rear Ceiling	<CR>*pp=RC#<CR>	Yes
	Write	Projector Position-Front Ceiling	<CR>*pp=FC#<CR>	Yes
	Read	Projector Position Status	<CR>*pp=?#<CR>	Yes
	Write	Quick auto search	<CR>*QAS=on#<CR>	Yes
	Write	Quick auto search	<CR>*QAS=off#<CR>	Yes
	Read	Quick auto search status	<CR>*QAS=?#<CR>	Yes
	Write	Direct Power On-on	<CR>*directpower=on#<CR>	No
	Write	Direct Power On-off	<CR>*directpower=off#<CR>	No
	Read	Direct Power On-Status	<CR>*directpower=?#<CR>	No
	Write	Signal Power On-on	<CR>*autopower=on#<CR>	No
	Write	Signal Power On-off	<CR>*autopower=off#<CR>	No
	Read	Signal Power On-Status	<CR>*autopower=?#<CR>	No
	Write	Standby Settings-Network on	<CR>*standbynet=on#<CR>	No
	Write	Standby Settings-Network off	<CR>*standbynet=off#<CR>	No
	Read	Standby Settings-Network Status	<CR>*standbynet=?#<CR>	No
	Write	Standby Settings-Microphone on	<CR>*standbymic=on#<CR>	No
	Write	Standby Settings-Microphone off	<CR>*standbymic=off#<CR>	No
	Read	Standby Settings-Microphone Status	<CR>*standbymic=?#<CR>	No
	Write	Standby Settings-Monitor Out on	<CR>*standbymnt=on#<CR>	No
	Write	Standby Settings-Monitor Out off	<CR>*standbymnt=off#<CR>	No
	Read	Standby Settings-Monitor Out Status	<CR>*standbymnt=?#<CR>	No
Baud Rate	Write	2400	<CR>*baud=2400#<CR>	Yes
	Write	4800	<CR>*baud=4800#<CR>	Yes
	Write	9600	<CR>*baud=9600#<CR>	Yes
	Write	14400	<CR>*baud=14400#<CR>	Yes
	Write	19200	<CR>*baud=19200#<CR>	Yes

	Write	38400	<CR>*baud=38400#<CR>	Yes
	Write	57600	<CR>*baud=57600#<CR>	Yes
	Write	115200	<CR>*baud=115200#<CR>	Yes
	Read	Current Baud Rate	<CR>*baud=?#<CR>	Yes
Lamp Control	Read	Lamp Hour	<CR>*ltim=?#<CR>	Yes
	Read	Lamp2 Hour	<CR>*ltim2=?#<CR>	No
	Write	Normal mode	<CR>*lampm=lnor#<CR>	Yes
	Write	Eco mode	<CR>*lampm=eco#<CR>	Yes
	Write	Smart Eco mode	<CR>*lampm=seco#<CR>	Yes
	Write	Dual Brightest	<CR>* lampm =dualbr#<CR>	No
	Write	Dual Reliable	<CR>* lampm =dualre#<CR>	No
	Write	Single Alternative	<CR>* lampm =single#<CR>	No
	Write	Single Alternative Eco	<CR>* lampm =singleeco#<CR>	No
	Read	Lamp Mode Status	<CR>*lampm=?#<CR>	Yes
Miscellaneous	Read	Model Name	<CR>*modelname=?#<CR>	Yes
	Write	Blank On	<CR>*blank=on#<CR>	Yes
	Write	Blank Off	<CR>*blank=off#<CR>	Yes
	Read	Blank Status	<CR>*blank=?#<CR>	Yes
	Write	Freeze On	<CR>*freeze=on#<CR>	Yes
	Write	Freeze Off	<CR>*freeze=off#<CR>	Yes
	Read	Freeze Status	<CR>*freeze=?#<CR>	Yes
	Write	Menu On	<CR>*menu=on#<CR>	Yes
	Write	Menu Off	<CR>*menu=off#<CR>	Yes
	Write	Up	<CR>*up#<CR>	Yes
	Write	Down	<CR>*down#<CR>	Yes
	Write	Right	<CR>*right#<CR>	Yes
	Write	Left	<CR>*left#<CR>	Yes
	Write	Enter	<CR>*enter#<CR>	Yes
	Write	3D Sync Off	<CR>*3d=off#<CR>	Yes
	Write	3D Auto	<CR>*3d=auto#<CR>	Yes
	Write	3D Sync Top Bottom	<CR>*3d=tb#<CR>	Yes
	Write	3D Sync Frame Sequential	<CR>*3d=fs#<CR>	Yes
	Write	3D Frame packing	<CR>*3d=fp#<CR>	Yes
	Write	3D Side by side	<CR>*3d=sbs#<CR>	Yes
	Write	3D inverter disable	<CR>*3d=da#<CR>	Yes
	Write	3D inverter	<CR>*3d=iv#<CR>	Yes
	Write	2D to 3D	<CR>*3d=2d3d#<CR>	No
	Read	3D Sync Status	<CR>*3d=?#<CR>	Yes
	Write	Remote Receiver-front+rear （front+top）	<CR>*rr=fr#<CR>	No
	Write	Remote Receiver-front	<CR>*rr=f#<CR>	No
	Write	Remote Receiver-rear(top)	<CR>*rr=r#<CR>	No
	Read	Remote Receiver Status	<CR>*rr=?#<CR>	No
	Write	Instant On-on	<CR>*ins=on#<CR>	No
	Write	Instant On-off	<CR>*ins=off#<CR>	No
	Read	Instant On Status	<CR>*ins=?#<CR>	No
	Write	Lamp Saver Mode-on	<CR>*lpsaver=on#<CR>	No
	Write	Lamp Saver Mode-off	<CR>*lpsaver=off#<CR>	No
	Read	Lamp Saver Mode Status	<CR>*lpsaver=?#<CR>	No
	Write	Projection Log In Code on	<CR>*prjlogincode=on#<CR>	No
	Write	Projection Log In Code off	<CR>*prjlogincode=off#<CR>	No
	Read	Projection Log In Code Status	<CR>*prjlogincode=?#<CR>	No
	Write	Broadcasting on	<CR>*broadcasting=on#<CR>	No
	Write	Broadcasting off	<CR>*broadcasting=off#<CR>	No
	Read	Broadcasting Status	<CR>*broadcasting=?<CR>	No

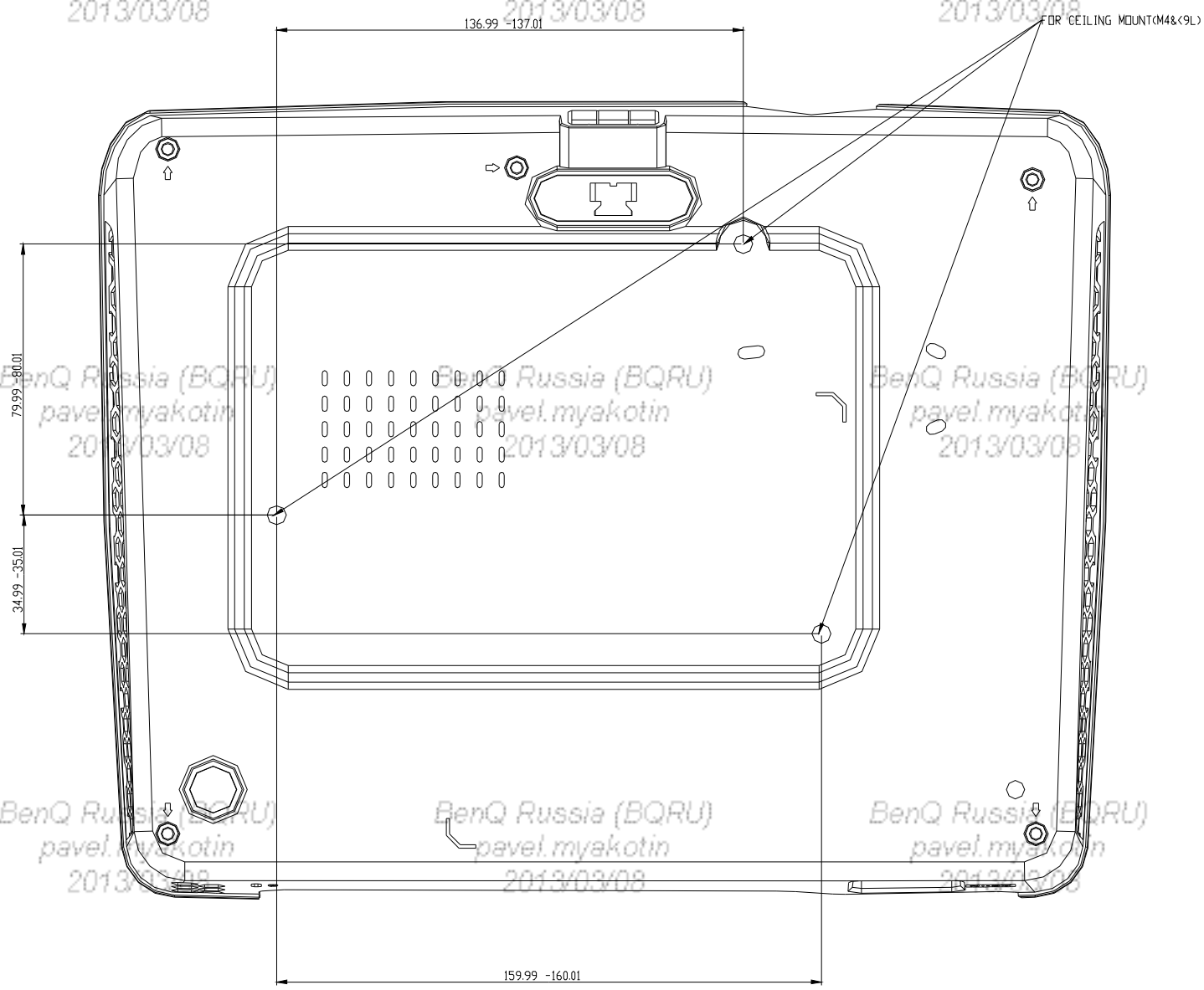
	Write	AMX Device Discovery-on	<CR>*amxdd=on#<CR>	No
	Write	AMX Device Discovery-off	<CR>*amxdd=off#<CR>	No
	Read	AMX Device Discovery Status	<CR>*amxdd=?#<CR>	No
	Read	Mac Address	<CR>*macaddr=?#<CR>	No
	Write	High Altitude mode on	<CR>*Highaltitude=on#<CR>	Yes
	Write	High Altitude mode off	<CR>*Highaltitude=off#<CR>	Yes
	Read	High Altitude mode status	<CR>*Highaltitude=?#<CR>	Yes

Note: The above function will be vary from model to model. (ex: source, audio settings, aspect ratio..etc)

DDC

D-Sub Analog EDID	HDMI-1 Digital EDID	HDMI-2 Digital EDID
00 FF FF FF FF FF FF 00 09 D1 02 41 01 00 00 00 26 16 01 03 0E 00 00 78 0A C9 3D A2 5B 54 92 25 12 50 5D BD EF 80 61 C0 81 C0 81 00 81 80 95 00 A9 40 61 7C 81 3C 02 3A 80 18 71 38 2D 40 58 2C 45 00 00 00 00 00 00 1E 00 00 00 FD 00 30 78 1F 66 11 00 0A 20 20 20 20 20 20 00 00 00 FE 00 42 45 4E 51 0A 20 20 20 20 20 20 20 20 00 00 00 FC 00 42 65 6E 51 20 50 4A 0A 20 20 20 20 20 00 59 6 BenQ W1070 ADT DSUB ddc2	00 FF FF FF FF FF FF 00 09 D1 02 41 01 00 00 00 26 16 01 03 80 00 00 78 0A C9 3D A2 5B 54 92 25 12 50 5D BD EF 80 61 C0 81 C0 81 00 81 80 95 00 A9 40 61 7C 81 3C 02 3A 80 18 71 38 2D 40 58 2C 45 00 00 00 00 00 00 1E 00 00 00 FD 00 17 78 0F 66 11 00 0A 20 20 20 20 20 20 00 00 00 FE 00 42 45 4E 51 0A 20 20 20 20 20 20 20 20 00 00 00 FC 00 42 65 6E 51 20 50 4A 0A 20 20 20 20 20 01 0F 02 03 29 71 4F 15 06 1F 10 03 84 05 11 13 14 02 12 20 21 22 23 09 07 07 83 01 00 00 6C 03 0C 00 10 00 18 2D 20 A0 02 01 41 02 3A 80 18 71 38 2D 40 58 2C 45 00 00 00 00 00 00 1E 01 1D 80 18 71 1C 16 20 58 2C 25 00 00 00 00 00 00 9E 01 1D 80 D0 72 1C 16 20 10 2C 25 80 00 00 00 00 00 9E 01 1D 00 BC 52 D0 1E 20 B8 28 55 40 00 00 00 00 00 1E 00 00 00 00 00 00 00 00 00 00 00 00 00 00 EC 6 BenQ W1070 ADT HDMI ddc2	00 FF FF FF FF FF FF 00 09 D1 02 41 01 00 00 00 26 16 01 03 80 00 00 78 0A C9 3D A2 5B 54 92 25 12 50 5D BD EF 80 61 C0 81 C0 81 00 81 80 95 00 A9 40 61 7C 81 3C 02 3A 80 18 71 38 2D 40 58 2C 45 00 00 00 00 00 00 1E 00 00 00 FD 00 17 78 0F 66 11 00 0A 20 20 20 20 20 20 00 00 00 FE 00 42 45 4E 51 0A 20 20 20 20 20 20 20 20 00 00 00 FC 00 42 65 6E 51 20 50 4A 0A 20 20 20 20 20 01 0F 02 03 29 71 4F 15 06 1F 90 03 04 05 11 13 14 02 12 20 21 22 23 09 07 07 83 01 00 00 6C 03 0C 00 20 00 18 2D 20 A0 02 01 41 02 3A 80 18 71 38 2D 40 58 2C 45 00 00 00 00 00 00 1E 01 1D 80 18 71 1C 16 20 58 2C 25 00 00 00 00 00 00 9E 01 1D 80 D0 72 1C 16 20 10 2C 25 80 00 00 00 00 00 9E 01 1D 00 BC 52 D0 1E 20 B8 28 55 40 00 00 00 00 00 1E 00 00 00 00 00 00 00 00 00 00 00 00 00 00 DC 6 BenQ W1070 ADT HDMI ddc2

Appendix 3 – Ceiling Mount Drawing



M4,
max screw length (L),
L=ceiling arm thickness+8mm