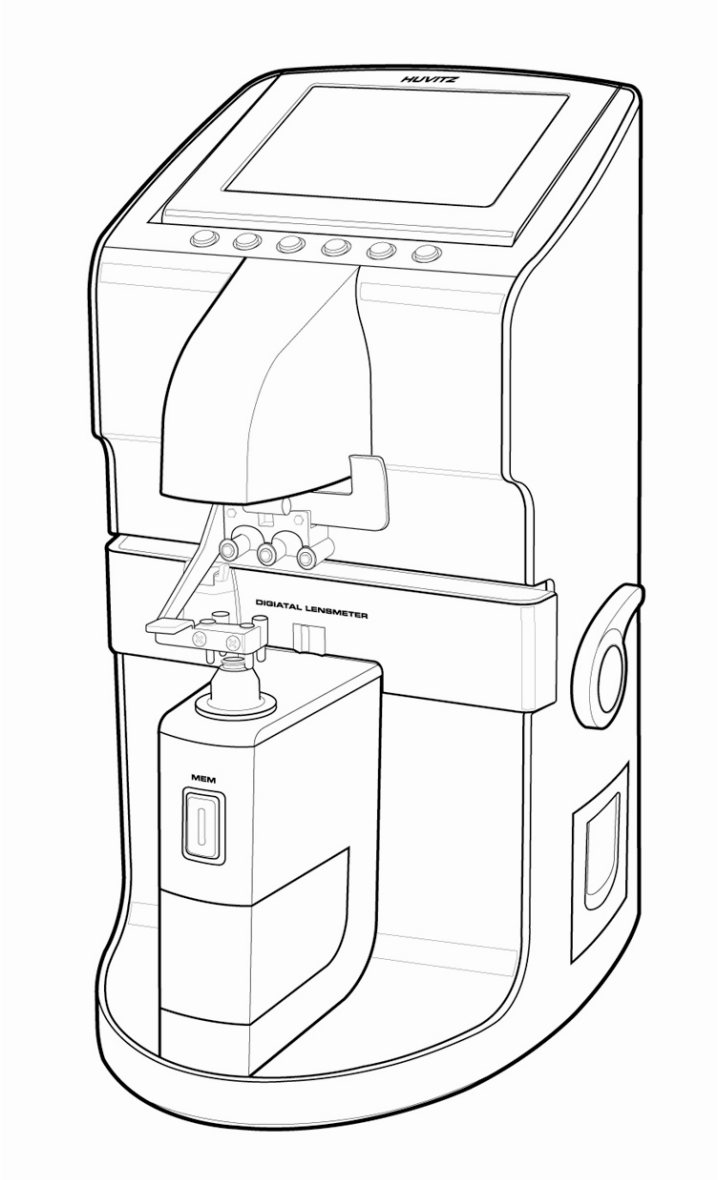
Service Manual

Auto Lensmeter HLM-7000



Huvitz
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1. Introduction

1.1. Components List

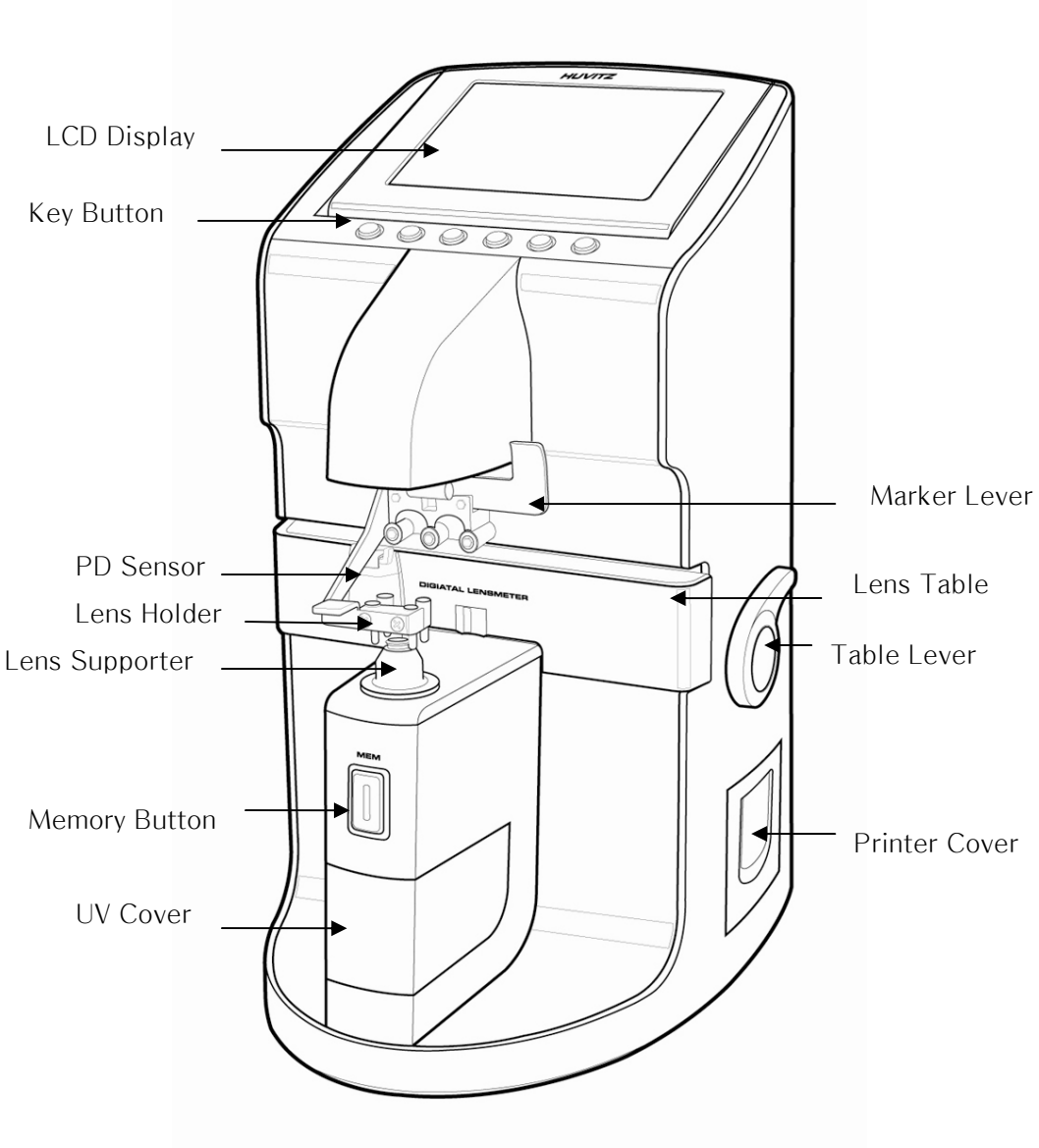


Figure 1. Components Names (I)

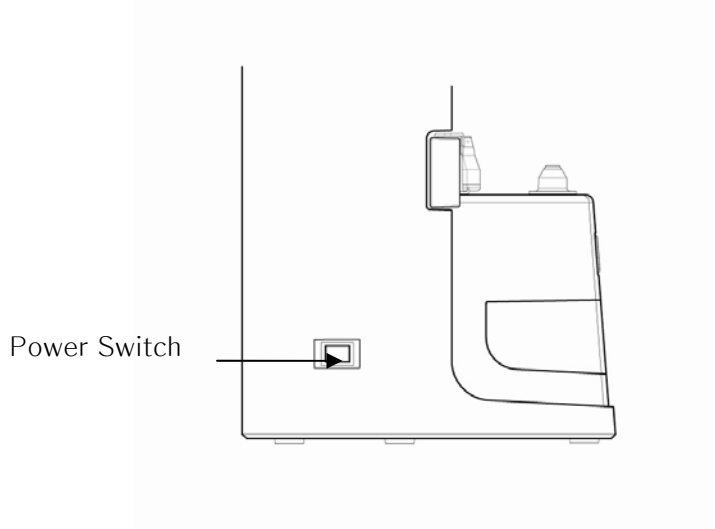


Figure 2. Components Names (II)

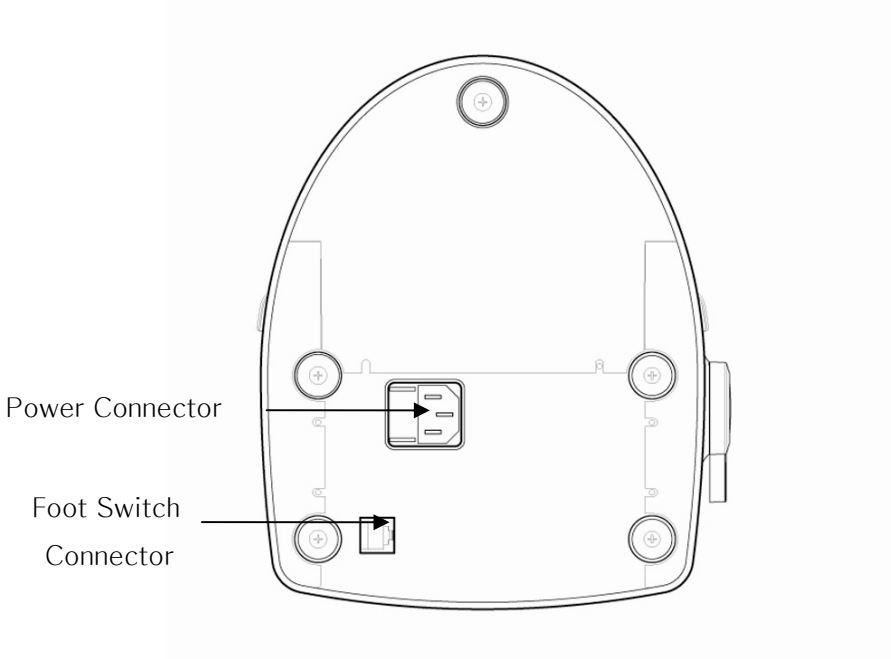


Figure 3. Components Names (III)

1.2. Repair Procedure

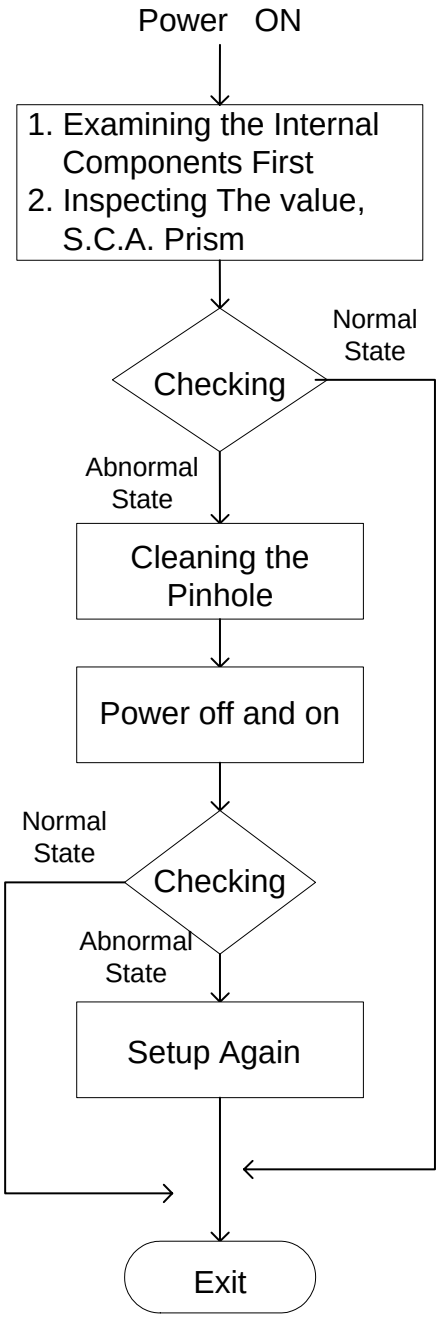


Figure 4. Repair procedure flow chart

1.3. Cautions

- Always protect this instrument with Dust Cover after using.
- Do not vibrate or drop this instrument; it can cause damage.
- Use soft cloth or cotton swaps with alcohol when clean the 4 pinhole.

1.4. Software OS version

Software OS version will be shown on the screen if you turn on the power switch.

1.5. Optical System

Optical system resolves the features of the lens such as diopter and prism. It is composed of emitting light part, transmit part and receiving light part: transmit part composed of collimator lens and 4 pinhole and receiving light part composed of 2-dimentional CMOS sensor. The followings are the components of each part:

Emitting Light Part

- Optic LED : 639nm
- Ball Lens : condenses the light radiated from Optic LED.
- Rubber Ring : fixes ball lens.
- Filter Paper : prevents the dispersion of light.
- Pinhole : 0.2mm diameter
- LED Cylinder : combines above five components and blocks exterior light.

Transmit Part

- Collimator Lens: makes parallel light.
- Pinhole : disperses parallel light into several signals. Prevent the other

light except the light source

- MLA : micro lens array. Focus the every spot.

Receiving Light Part

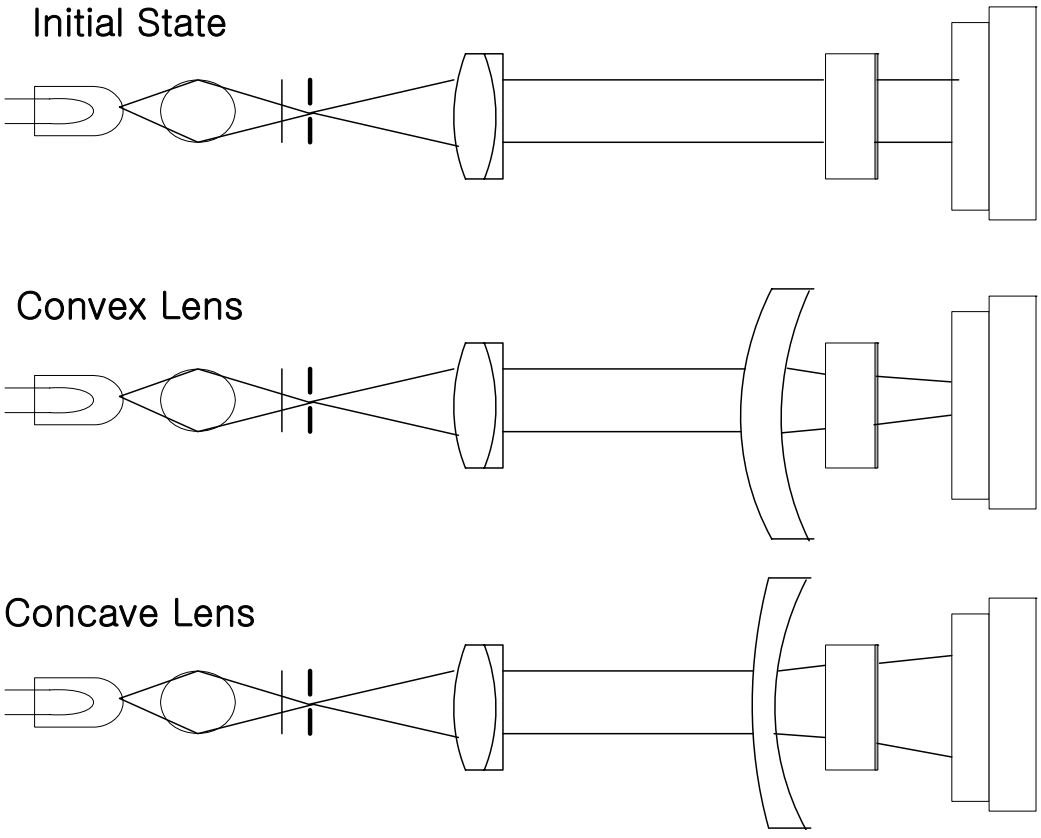
- 2-dimentional CMOS sensor : converts signals into digital value.

Emitting light part and receiving light part also built optical system for UV measurement. One is composed of UV lamp and the other receives UV light. The wavelength of the UV light is 395nm.

1.6. Measurement Principle

Basic Principle

When there is no lens (0D state), parallel light that has transmitted the collimator lens passes the pinhole and makes image on CCD. In case of convex lens (lens with plus diopter), parallel light that has transmitted the collimator lens converges through the measuring lens, passes the pinhole and then makes image on CCD. On the other hand, in case of concave lens (lens with minus diopter), parallel light that has transmitted the collimator lens diverges through the measuring lens and then passes the pinholes and at last makes image on CCD.



2. Checking and Setup Method

2.1. Setup Order

When you turn on the power switch, you should hear the beep sound and see the ROM information. At this point, press the two buttons together in the third button and sixth button. Then, after the beep sound, your lensmeter, HLM-7000 will start in setup and check mode. While this mode, 'SETUP' and 'Temperature' mark will flicker in the left-upper area of the centric circles. The booting steps with 'SETUP' mode are as follows:

A. Turn on the power switch. Then you can hear the beep sound.
B. Press the two buttons together in the third button and sixth button.
C. Check that 'SETUP' mark flickers in the left-upper area of the centric circle.

Setting and Controlling can be processed only in SETUP mode; lens, 0D prism, diopter prism, temperature, cylinder, UV and right/left switching position of PD. To all setting, you should convert the display step (STEP) into 0.01. In case of prism, convert the prism display into P-B format. Display step (STEP) and prism display format can be changed in 'User Setup' screen. To enter the mentioned 'User Setup' screen, press the 'CYL SETUP' (CYL SETUP) button for a while (2~3 seconds) in the basic display screen.

2.2. How to Set Origin

The steps of setting origin are as follows:

A. Press the 'LENS SETUP' (

) button.

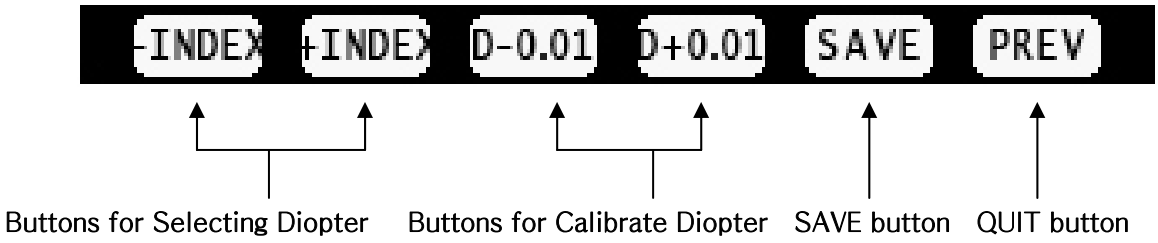
B. Press the 'MEASU' button.

C. Determine the lens to measure by using two '-INDEX', '+INDEX' buttons in the left side.

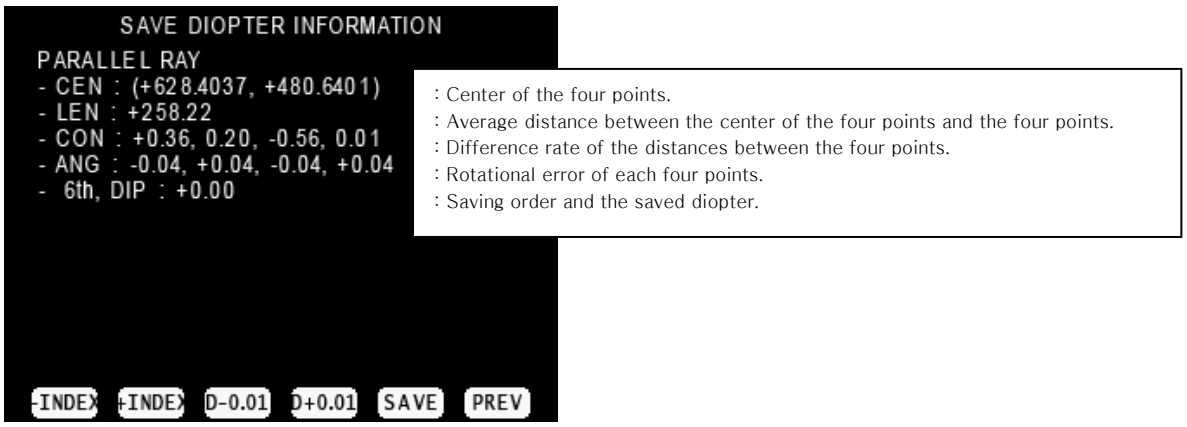
D. 'D-0.01' button and 'D+0.01' button by the given value in the standard model-eye specification.

E. To save and exit, press the 'SAVE' button.

F. Press the 'EXIT' button again. And check if the diopter that has been set up in the basic display screen is shown.



'SAVE SCREEN INFORMATION' is as follows:



If you want to return to the previous one without saving in the SAVE screen, press the rightmost 'PREV' button.

2.3. How to Set 12 standard lenses

If the measured value is not accurate, you should set the diopter variables again by using the standard lens-set: for all the 12 lenses in the standard lens set. Always keep the standard lens clean out of dust or stain.

A. Set the diopter display step into 0.01.
B. Place the standard lens and move it so that 'Marking OK' will appear.
C. Press the 'LENS SETUP' (LENS SETUP) button.
D. Press the 'MEASU' button.
E. Determine the lens to measure by using two '-INDEX', '+INDEX' buttons in the left side.
F. 'D-0.01' button and 'D+0.01' button by the given value in the standard model-eye specification.
G. To save and exit, press the 'SAVE' button.
H. Press the 'EXIT' button again. And check if the diopter that has been set up in the basic display screen is shown. .
I. Repeat the procedures from B to H for 12 standard lenses.

The information displayed in the 'Setting Diopter' screen is the same as that of 'Setting 0D' screen.

2.4. How to Set Prism

If the measured value is not accurate, you should set the 2Δ, 5Δ, 10Δ lens again by using the standard lens-set.

A. First, convert prism display format into P-B.

B. Then, press the 'OD PRISM' (

) button.

C. After selecting the 2Δ lens from the standard lens set, place it on the lens cap.

D. 'D-0.01' button and 'D+0.01' button by the given value in the standard model-eye specification.

E. Rotate it to become the Base value increase by the 0~45 degree center value.

F. Press the 'MEASU' button and check if 'A0 : ' value is changed.

G. Repeat from Step E ~ to Step F to the Base value equal to 316 ~ 360 degree center.

H. The all spots that should be marked are as the table at the next.

I. Finally the 'SAVE' button to save.

J. Repeat the procedures from C to I for 5Δ lens and 10Δ lens.

'Prism Setup' screen will show the following information:

- **PRISM** : 2 Prism, 5 Prism, 10 Prism
- **Idx** : Display prism index currently.
- **ANGLE** : Display axis index currently.

Angle	Prism Base
1st	0° ~ 45° center
2nd	46° ~ 90° center
3rd	91° ~ 135° center
4th	136° ~ 180° center
5th	181° ~ 225° center
6th	226° ~ 270° center
7th	271° ~ 315° center
8th	316° ~ 360° center

2.5. How to Set Diopter Prism

If the measured value is not accurate, you should set the -10D, -15D, -20D, -25D, +10D, +15D, +20D, +25D lens again by using the standard lens-set.

A. First, convert prism display format into P-B.

B. Then, press the 'DIOPT PRISM' (DIOPT PRISM) button.

C. After selecting the 10D lens from the standard lens set, place it on the lens cap.

D. Move it to become the Prism base value increase by the 0~45 degree center value and 3prism below.

E. Press the 'MEASU' button and check if 'A0 : ' first value is changed.

F. Repeat from Step D ~ to Step E to the Base value equal to 316 ~ 360 degree center.

G. Move it to become the Prism base value increase by the 0~45 degree center value and 3prism over.

H. Press the 'MEASU' button and check if 'A0 : ' second value is changed.

I. Repeat from Step G ~ to Step H to the Base value equal to 316 ~ 360 degree center.

J. Finally the 'SAVE' button to save.

K. Repeat the procedures from C to J for -15D, -20D, -25D, +10D, +15D, +20D, +25Dlens.

-10D, -15D, -20D, -25D, +10D

(LOW PRISM : 3prism below / HIGH PRISM : 3prism over)

+15D, +20D, +25D

(LOW PRISM : 5prism below / HIGH PRISM : 5prism over)

- but, LOW PRISM = step D and HIGH PRISM = step G.

'Diopter Prism Setup' screen will show the following information:

- (*)DIOPTER_IDX : -10, -15, -20, -25, +10, +15, +20, +25Diopter.
- ANG_IDX : Display axis index currently.
- PSM_IDX : Display prism index currently.

2.6. The calibration of the cylindrical axis

With the +5D rectangular cylindrical lens, we can calibrate the cylindrical axis of our machine. The procedures are as followings:

A. T hen, press the 'CYL SETUP' (CYL SETUP) button.

B. Place the +5D rectangular cylindrical lens on the lens cap.

C. '-0.01' button and '+0.01' button by the given value in the standard model-eye specification.

D. Locate it to the center while cling it to the lens.
(Axis : 0° /45° /90° /135° , Prism_x, y: 0)

E. Press the 'MEASU' button and check if 'A0' value is changed.

F. Rotate the cylinder lens with a counterclockwise, repeat from Step D ~ to Step E to the Axis value equal to 45° /90° /135° .

G. Finally the 'SAVE' button to save.

- CYLINDER	: 5Diopter cylinder lens.
- Idx	: Display axis index currently.
- AXIS	: Display axis base currently.

2.7. The to set PD

With the PD Sensor, we can calibrate the PD value of our machine.

The procedures are as followings:

A. Press the ‘PD&UV’ (

) button.

B. Push in the PD sensor is the leftmost. And press the ‘L Lim’ button.

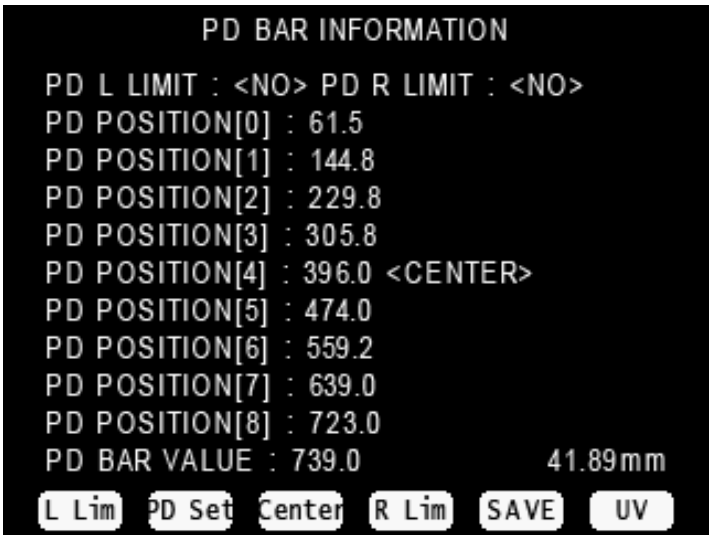
C. Push in the PD sensor is the rightmost. And press the ‘R Lim’ button.

D. Push in the PD sensor is the rightmost. Fixes in the scale mark 10mm moves, and press the ‘PD Set’ button sequentially.

E. Fifth PD Bar center press the ‘CENTER’ button. (PD POSITION[4])

F. Finally the ‘SAVE’ button to save.

The information displayed in ‘setting the position of PD’ screen is as follows:



2.8. The to set UV

With the UV, we can calibrate the UV value of our machine.

The procedures are as followings:

A. Press the 'PD&UV' (

) button.

B. Press the 'UV' button in right end.

C. Open UV cover.

D. Focus to UV 0.0 by using 'INDEX' button.

E. '-0.01' button and '+0.01' button by the given value in the UV lens specification.

F. When UV transmissivity is 0.0 : Prevent part that UV-LED comes out.
When UV transmissivity is 25.0/50.0/75.0 : Put a lens on the top of the UV-LED comes out..
When UV transmissivity is 100.0 : Nothing raises.

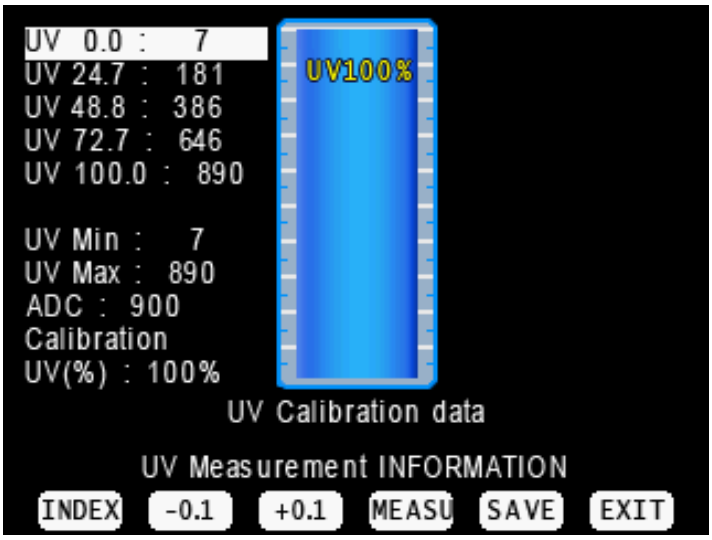
G. Press the 'MEASU' button.

H. UV transmissivity by 0.0->100.0->25.0->50.0->75.0 orders Step D ~ to Step G repeat.

I. Finally the 'SAVE' button to save.

J. Press the 'EXIT' button and get out.

The information displayed in 'setting the position of UV' screen is as follows:



2.9. Diopter Setting Variables List

The followings are diopter setting variables list:

DISP SCREEN INFORMATION

CEN : (+398.0612, +239.63) : center of the four points in 0D state.

0th: L=236.15 ; 1.00, 1.00, 1.00, 1.00 : average distance and distance rates between the four points and −25D −25D

1th: L=223.50 ; 1.00, 1.00, 1.00, 1.00 : average distance and distance rates between the four points and −20D

...

5th: L=166.53 ; 1.00, 1.00, 1.00, 1.00 : average distance and distance rates between the four points and −2.5D

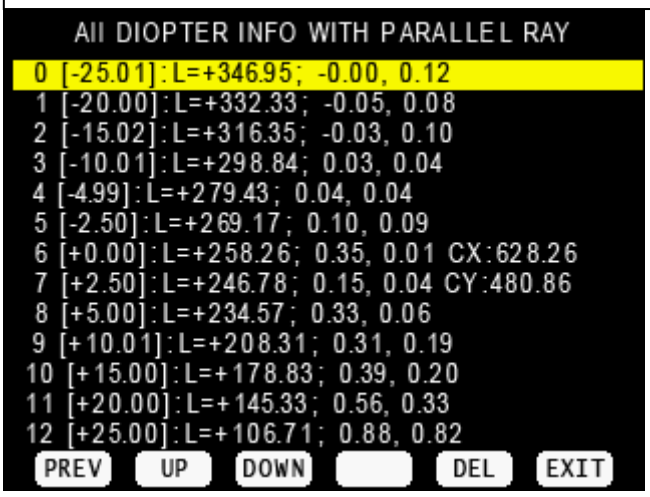
6th: L=156.27 ; 1.00, 1.00, 1.00, 1.00 : average distance and distance rates between the four points and 0D

7th: L=145.40 ; 1.00, 1.00, 1.00, 1.00 : average distance and distance rates between the four points and +2.5D

...

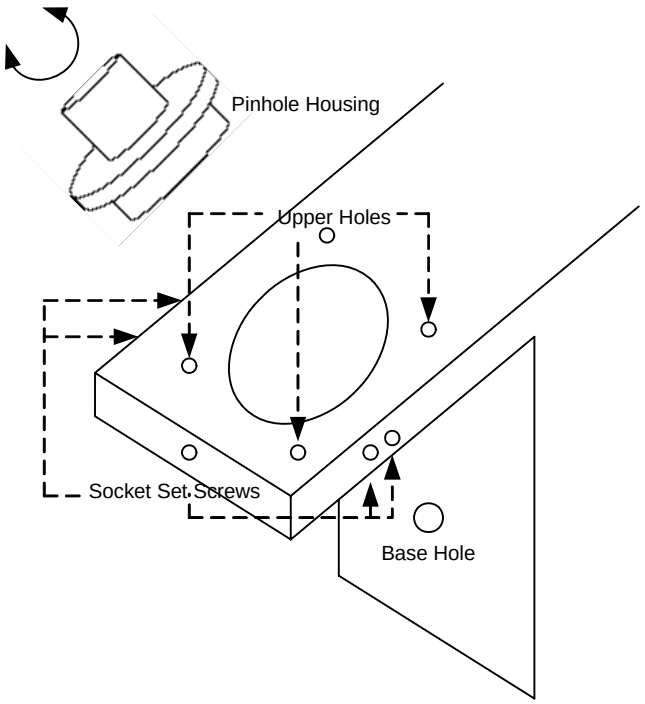
11th: L=+45.83 ; 1.04, 0.98, 1.00, 0.98 : average distance and distance rates between the four points and +20D

12th: L=+15.57 ; 1.04, 0.98, 1.00, 0.98 : average distance and distance rates between the four points and +25D



If diopter controlling is performed normally, the length of each row (L) decreases row by row.

2.10. How to change the CCD camera



The procedures for changing a camera are as followings.

A. Remove all subassemblies that are the side cover, the lens table and the lower cover and the CCD cover etc.
B. Loose the Base Screw I and then take out the old CCD assembly.
C. Detach the protective seal from the new CCD.
D. Place the new CCD in its position. Lift it up as much as you can. But Be careful not to collide with the bone metal.
E. Fasten the Base Screw I into Base Hole.
F. Loose CMOS Camera Screw I and CMOS Camera Screw II a little.
G. Turn on the machine as the setup mode and then press the 'CLEAR'( ) button for a while to go into the Calibration page.
H. Press the first 'POSTN' button to check the CMOS Camera position

continuously.

I. We should place the CMOS Camera keeping two conditions: The first condition is the position of center point. The center position is shown at the 5th row like this.

- CEN : (+640.00, +512.00)

It must be within (+640.00 ± 10, 512 ± 10)

The second one is the orientation of CMOS Camera. It should be parallel with that of the base side plane. Keep the side plane of CMOS Camera parallel with the plane of that of the Base metal as much as you can. While two conditions both are all right, fasten two CMOS Camera Screws.

J. If the sum of two A12 values in 6th row is greater than | 0.1 |, loose all set screws for the Pinhole Housing. And then rotate a little so that the sum of two A12 values is less than | 0.1 |. On the contrary, if the sum of two A12 values is within | 0.1 |, there is no need to do Step J and K.

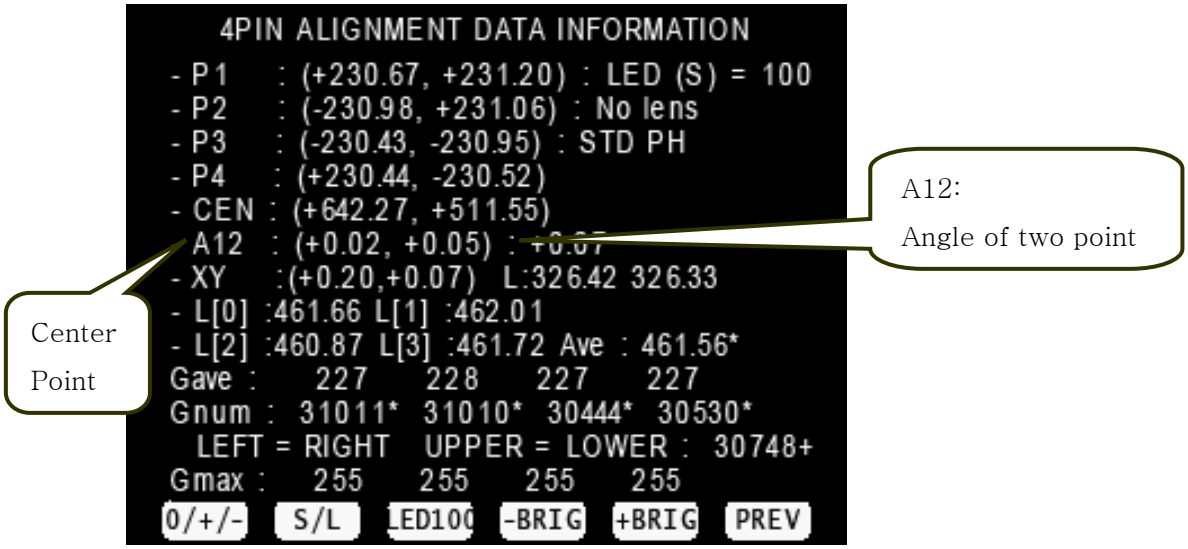
K. And then fasten all set screws for the Pinhole Housing.

L. Cover the CMOS Camera cover and fasten it.

M. Assemble all subassembly again.

N. You must execute all procedures for the calibration that are described in from section 2.2 to section 2.8.

When you loose the 5 socket set screws, be cautious not to crash the space of screws. To do so, force it pushing and rotate so slowly.


4PIN ALIGNMENT DATA INFORMATION
- P1 : (+230.67, +231.20) : LED (S) = 100
- P2 : (-230.98, +231.06) : No lens
- P3 : (-230.43, -230.95) : STD PH
- P4 : (+230.44, -230.52)
- CEN : (+642.27, +511.55)
A12 : (+0.02, +0.05) :
- XY :(+0.20,+0.07) L:326.42 326.33
- L[0] :461.66 L[1] :462.01
- L[2] :460.87 L[3] :461.72 Ave : 461.56*
Gave : 227 228 227 227
Gnum : 31011* 31010* 30444* 30530*
LEFT = RIGHT UPPER = LOWER : 30748+
Gmax : 255 255 255 255
0/+/- S/L LED100 -BRIG +BRIG PREV
A12:
Angle of two point
Center
Point

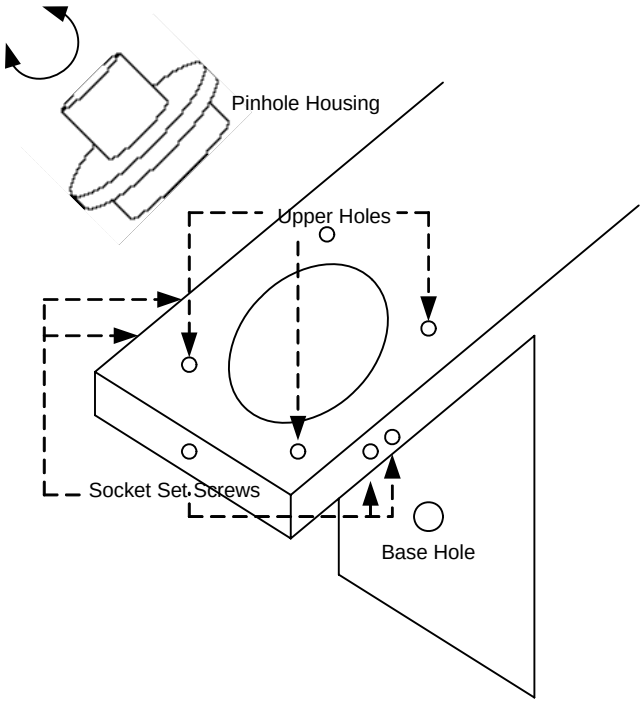
2.11. How to change the LED Assembly

The spare part for the LED assembly is the Upper Frame. So, we provide all upper frame assembly for the LED assembly.

The procedures for changing the upper frame Assembly are as followings:

B. Remove the Side Cover, Front Upper Cover and Upper Frame.
C. Place the new Upper Frame and fasten it.
D. Assemble the Front Upper Cover and the Side Cover again.
E. You must execute all procedures for the calibration that are described in from the section 2.2 to section 2.8.

2.12. How to change the Pinhole Housing



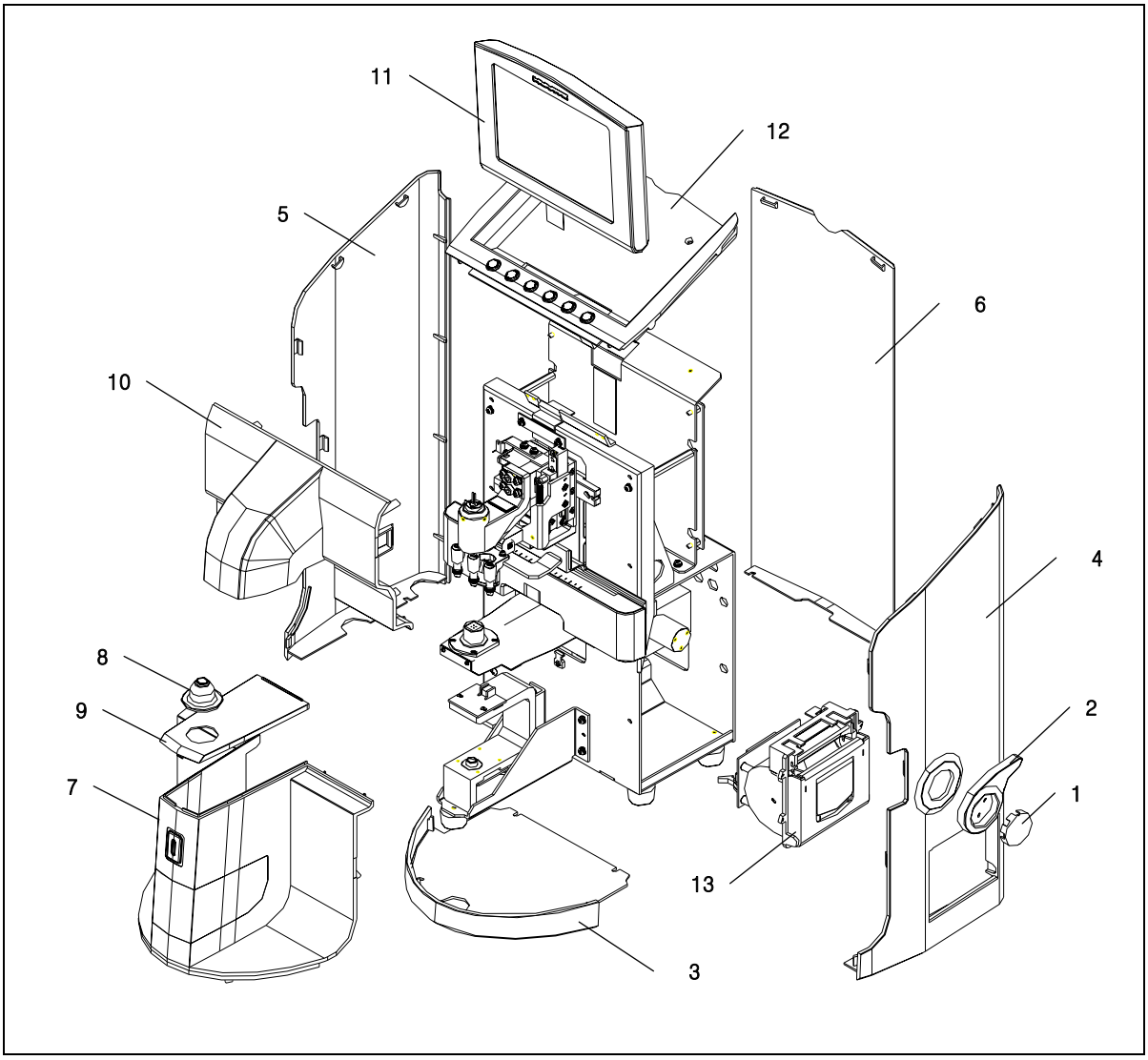
The procedures for changing the Pinhole Housing are as followings:

A. Take out the Lens Supporter.
B. Remove the Pinhole Housing Cover which is the below cover under the Lens Supporter. This is stuck with soft glue. Therefore we need to lift up smoothly.
C. Loose and take out the screws in Upper Holes.
D. Loose the Socket Set Screws.
E. Lift up the Pinhole Housing and replace it the new one.
F. Turn on the machine to the Setup Mode and then press 'CLEAR'( ) button for a while to go into the Calibration Display.
G. Press the first 'POSTN' button to see the position information.
H. Rotate the Pinhole Housing a little to make the parallel level which is the sum of two A12 less than |0.1|.
I. Fasten the 5 Socket Set Screws keeping the parallel level guaranteed.
J. Fasten all the screws in Upper Holes.
K. Place the Upper Cover of Pinhole Housing and stick it.
L. You must execute all procedures for the calibration that are described in from the section 2.2 to section 2.8.

3. Repair Standard

3.1. Removing cover assembly

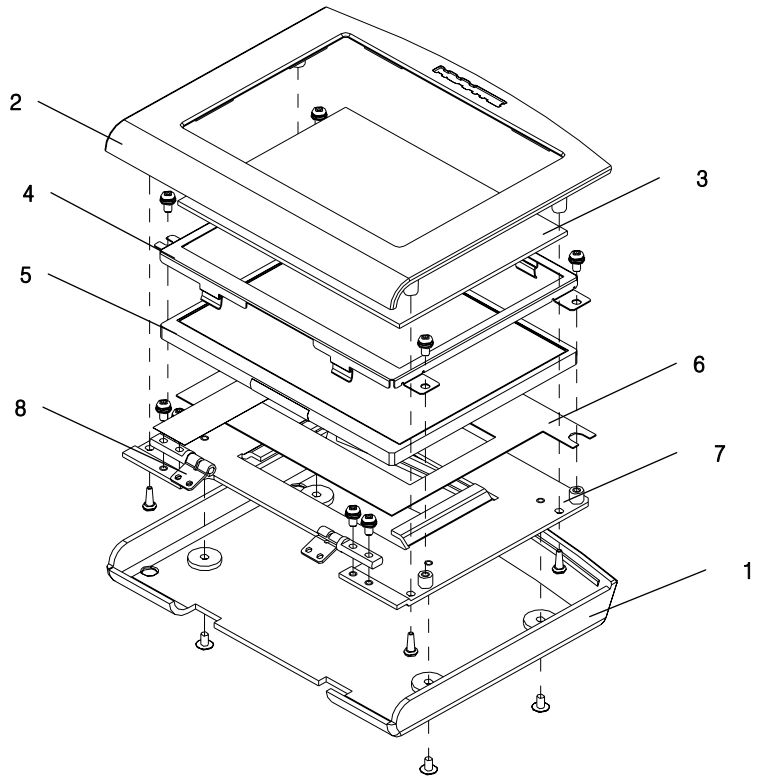
Picture



No	Component	Removal method
1	Cover PD Bar Handle Cap	– First, extract [1] using the sharp thing.
2	Cover PD Bar Handle	
3	Cover White Front	– Next, remove three screws from [2] and separate [2]
4	Cover Right	
5	Cover Left	– Next, remove nine screws that is located on the bottom side
6	Cover Back	
7	Cover Top 5 (Assy)	
8	Filter Housing Cap	– Separate the [3], [4], [5], [6]. This time, separate the 'APS Printer cable' that is linked on [4]
9	Cover Top 4	
10	Cover Top 2	
11	LCD (Assy)	
12	Cover Top 1	– Next, remove four screws that fix [7] and separate [7] and [8], [9]. This time, disconnect MEM S/W connector from [7]
13	APS Printer (Assy)	
		– Next, remove four screws that fix [10] and separate it.
		– Next, disconnect 'LCD cable' from main B/D to separate the [11]. Then, remove four screws(M2.6) that fix [11] and separate it from the 'Base Frame'
		– Next, remove two screws that fix [12] and separate it
		– Be careful that you never scratch on the surface of 'Cover' while assembling or disassembling.
		– Assembly is the reverse procedure of disassembly

3.2. Disassembling LCD ass'y

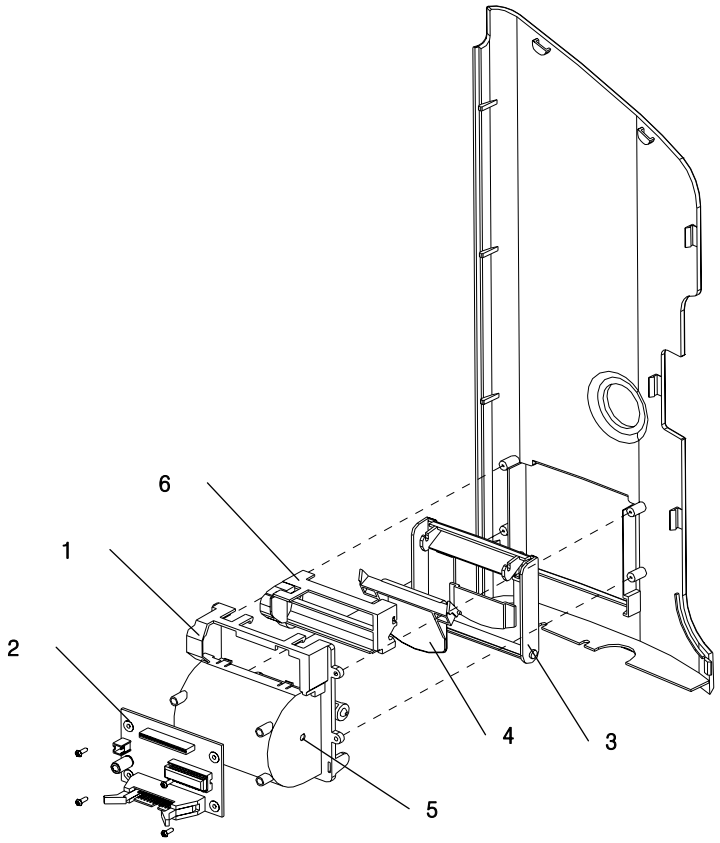
Picture



No	Component	Removal method
1	Cover LCD Back	- First, remove four screws that fix [1] and separate it.
2	Cover LCD Front	
3	LCD Window	- Next, remove four screws that fix [2] and separate it.
4	LCD Monitor Bracket	
5	LCD	- Next, remove four screws that fix [4] and [5]. Then separate them.
6	LCD Monitor Shield	
7	LCD Base Plate	
8	Torque Hinge	- And then, separate [6].
		- Next, remove four screws that fix [8] and separate it.
		- Be careful that [3] and [5] don't have any scratch on the surface while assembling or disassembling.
		- Assembly is the reverse procedure of disassembly.

3.3. Removing Printer ass'y

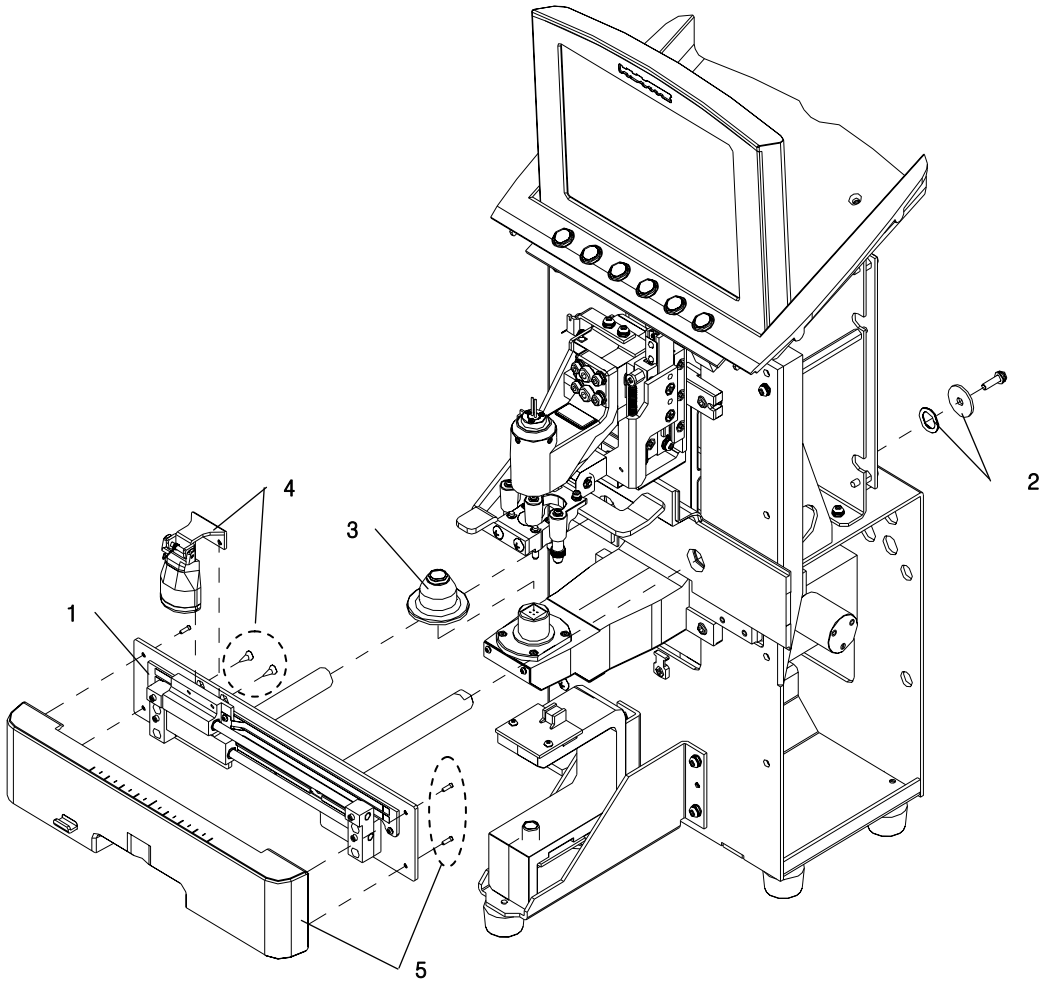
Picture



No	Component	Removal method
1	PR Body	– First, remove four screws that fix 'APS Print Assy' from the 'Cover Right'. Then, separate it from the 'Cover Right'
2	Thermal Printer B/D	
3	PR Open Cover	
4	PR Open Cover Holder	
5	Paper Holder	– Next, disconnect [6]'s flat cable from [2]. Then, remove four screws that fix [2] and separate it.
6	Thermal Printer Head	
		– Separate [3]and [4] from[1] and take out the 'Printer paper' and [5]
		– Be careful that there is no scratch and assembly is the reverse procedure of disassembly.

3.4. Removing PD assembly

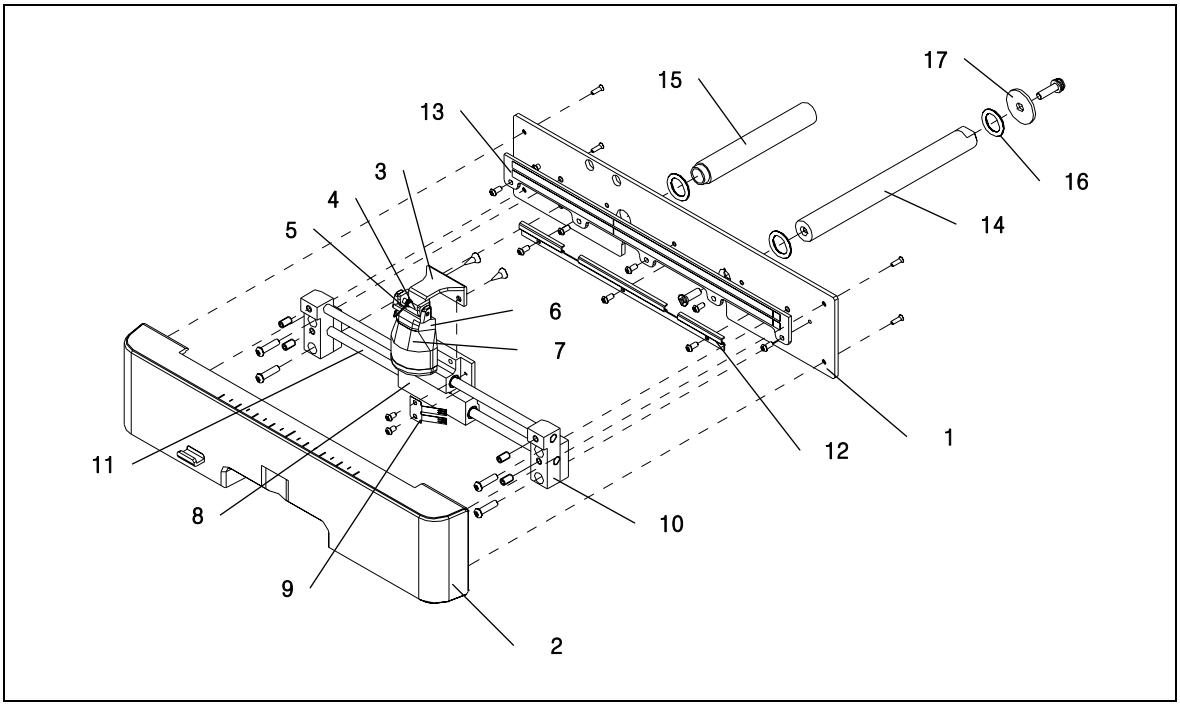
Picture



No	Component	Removal method
1	PD Bar Assembly	- Disconnect 'PD Bar Board' cable from 'Main Board'.
2	O-Ring & Washer	
3	Filter Housing Cap	- Then, remove two screws that fix [4] from the [1]. Then, separate it.
4	Nose Assembly	
5	PD Bar Cover	
		- To separate [2], remove one screw that is fixed to the 'PD Rack Gear Shaft'
		- Remove four screw that fix to the [5] Then, separate it.
		- Take off [3].
		- Pull [1] forward.
		- Be careful to prevent from interfering with the 'Filter housing' which is included in the optical components when assembling or disassembling the PD assembly.
		- Assembly is the reverse procedure of disassembly.

3.4.1. Removing PD-Bar subassembly

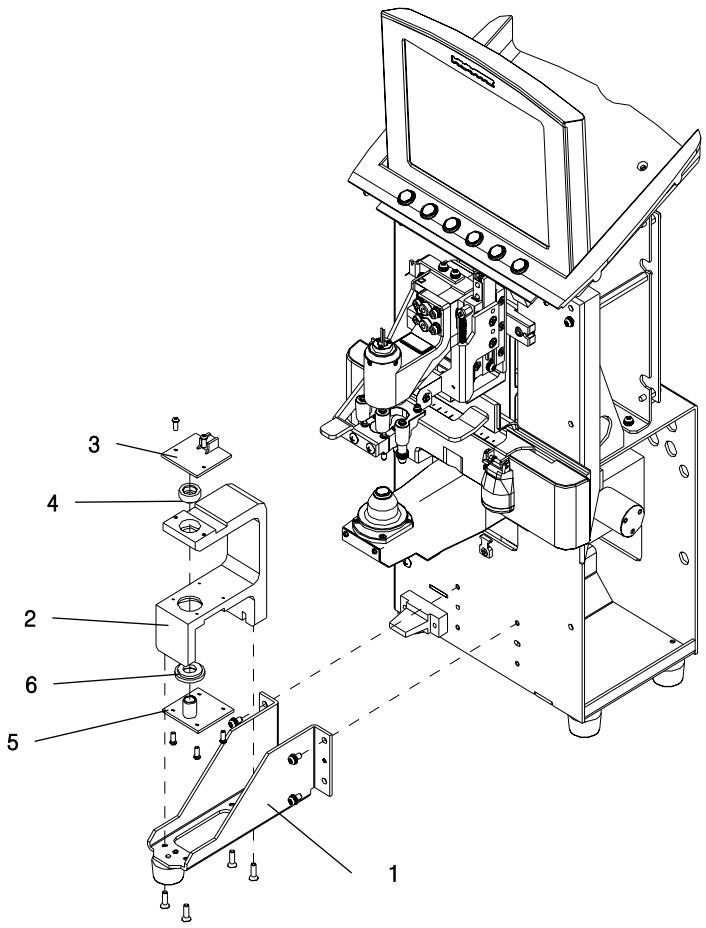
Picture



No	Component	Removal method
1	PD Bar Plate	- To separate the 'Nose Assembly([3]~[7])', remove two screws that fix [8]. Then, separate 'Nose Assembly'.
2	PD Bar Cover	
3	PD Nose Brk	
4	Nose Shaft	
5	Nose Spring	- Then, remove four screws that fix [2] and take off [2].
6	PD Nose	
7	Nose Rubber	- Remove four screws to separate [8]~[11]. Then, separate them. This time, be careful not to be deformed [9]'s shape.
8	PD Bar Encoder Housing	
9	PD Check Plate	
10	PD Encoder Shaft Block	
11	PD Shaft	- Remove three screws to separate [12].
12	PD Bar Cable Brk	
13	PD Bar B/D	- Remove four screws to separate [13].
14	PD Rack Gear Shaft	
15	PD Shaft	- Remove one screw to separate [14].
16	O-Ring	
17	Washer	- Assembly is the reverse procedure of disassembly.

3.5. Removing UV assembly

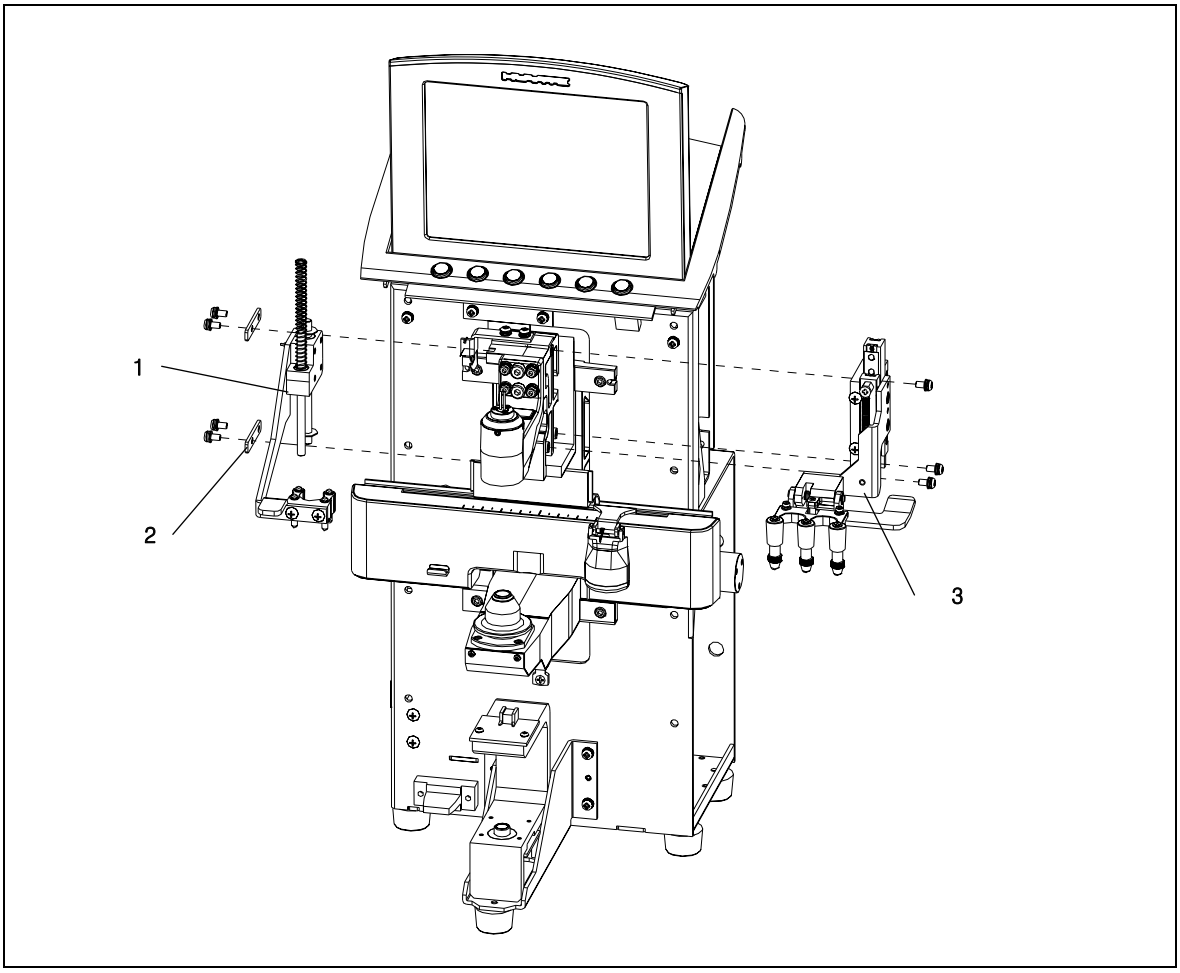
Picture



No	Component	Removal method
1	UV Frame Support Brk	– First, remove four screws that fix [1] from the 'Main Frame Assy" Then separate it.
2	UV Bone	
3	UV LED PCB	
4	UV Teflon (Upper)	
5	UV REC PCB	– After remove four screws that fix [2]~[6], then separate from [1].
6	UV Teflon (Lower)	
		– Remove two screws to separate [3].
		– And then separate [4] from [2].
		– Remove four screw to separate [5].
		– And then separate [6] from [2].
		– Be careful not to bend the [5]'s pin when you separate the [5].
		– Assembly is the reverse procedure of disassembly.

3.6. Removing Movement assembly

Picture



No	Component	Removal method
1	Movement Left Assembly	- To separate [1], remove four screws that fix [2].
2	Shaft Fix Brk	
3	Movement Right Assembly	- To separate [3], remove three screws that fix [3]
		- Assembly is the reverse procedure of disassembly.

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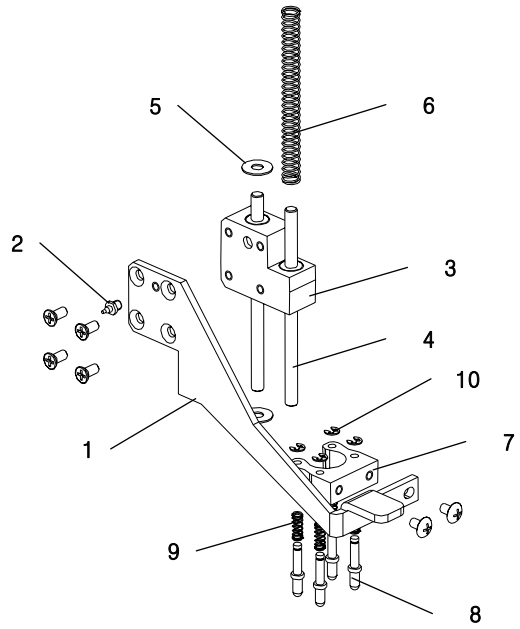
AUTO–LENSMETER

3.6.1. Removing Movement(Left) Subassembly

Picture	

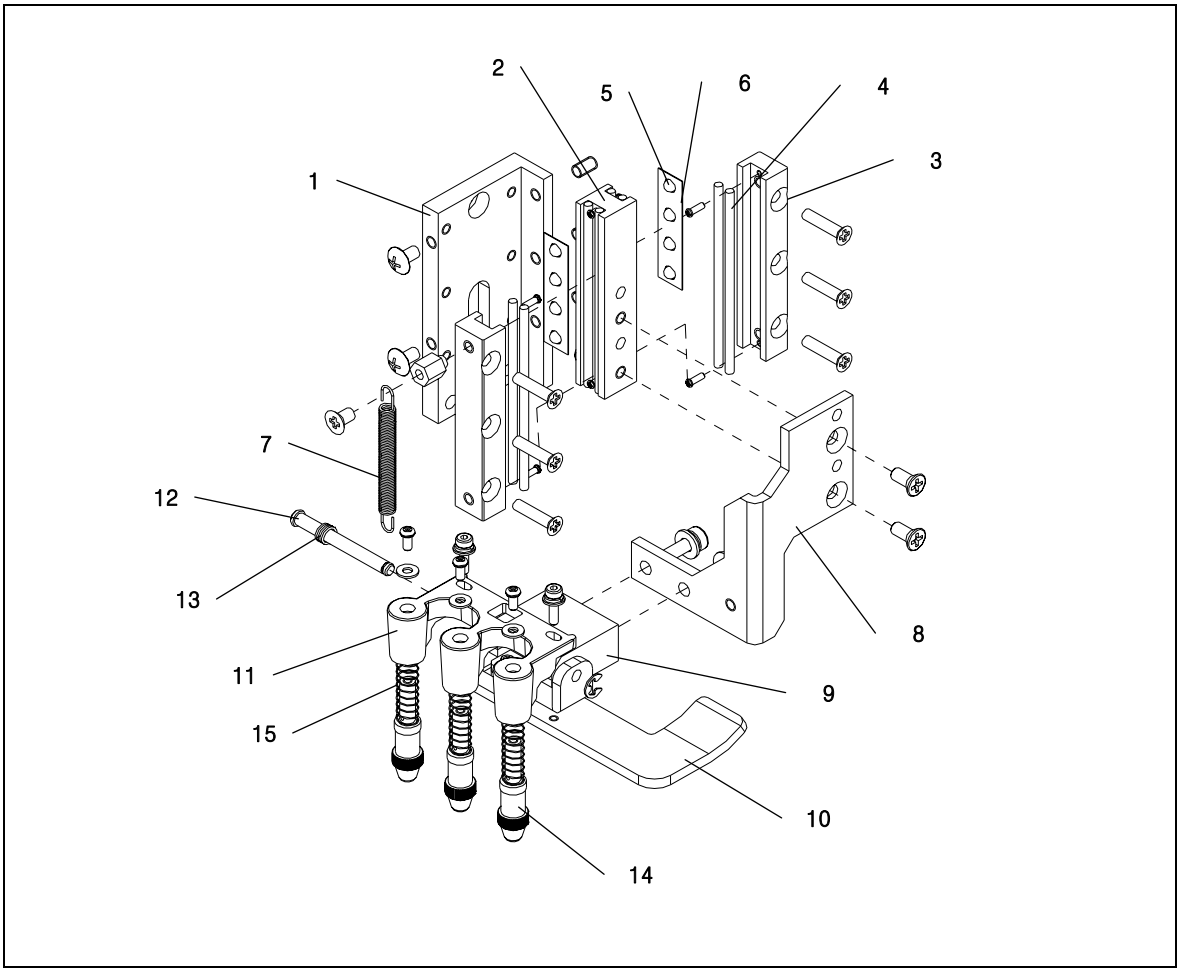


No	Component	Removal method
1	Foot Frame Brk	- Remove four screws to separate [1]'s sub assembly.
2	F T2 Control Pos Pin	
3	Foot Moving Block	- Unscrew [2] by using the spanner.
4	Guide Shaft 4	
5	Teflon Washer	- Remove two screws to separate [7]~[10]'s sub assembly.
6	Foot Extension Spring	
7	Foot Holder	
8	Position Foot Rubber Assy	- Separate [10], then separate [8], [9].
9	Position Foot Spring	
10	E-Ring	- Pull out [4] from [3] and then separate [5],[6].
		- Assembly is the reverse procedure of disassembly.

.

3.6.2. Removing Movement(Right) Subassembly

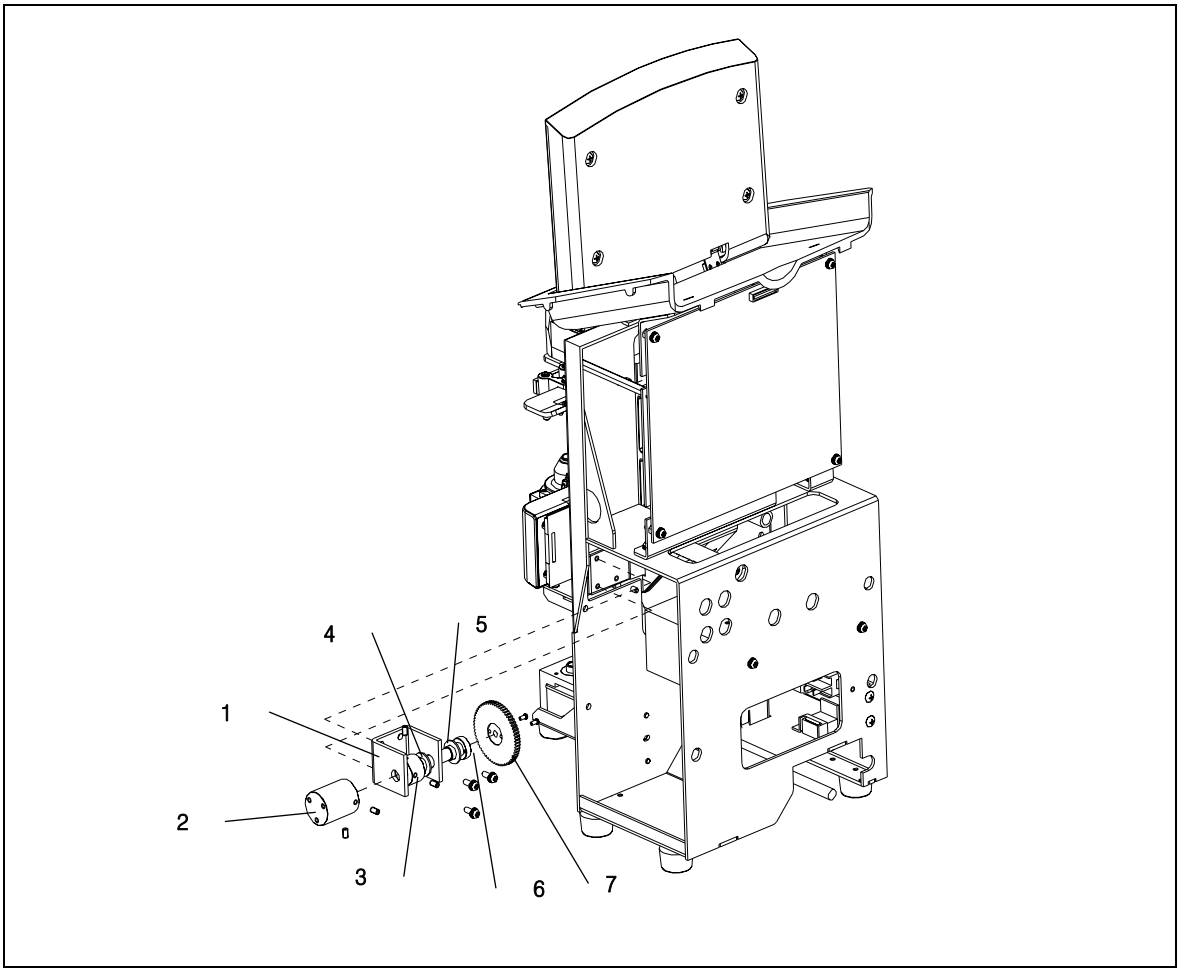
Picture



No	Component	Removal method
1	Pen Slide Base	– First, remove two screws that fix [8]~[15]'s sub assembly.
2	Slide Moving Block	
3	Slide Fix Block	
4	Slide Shaft	– Remove two screws to separate [9]~[15].
5	Bearing Ball (Ø3)	
6	Slide Guider	– Remove the 'E-ring' to separate [12]. And then separate [9], [10],[12], [13] and 'Pen assembly' in order.
7	Pen Extension Spring	
8	Pen Frame Brk	
9	Pen Cont Support	
10	Pen Press Brk	– Remove two screws to separate the 'Pen assembly'.
11	Pen Holder	
12	Pen Guide Shaft	– Remove three screws to disassemble [14], [15] from [11].
13	Pen Guide Spring	
14	Pen Assy	
15	Pen Spring	– Remove six screws to disassemble [1]~[6]. And then separate them. This time, Be careful to lose [5].
		– Assembly is the reverse procedure of disassembly.

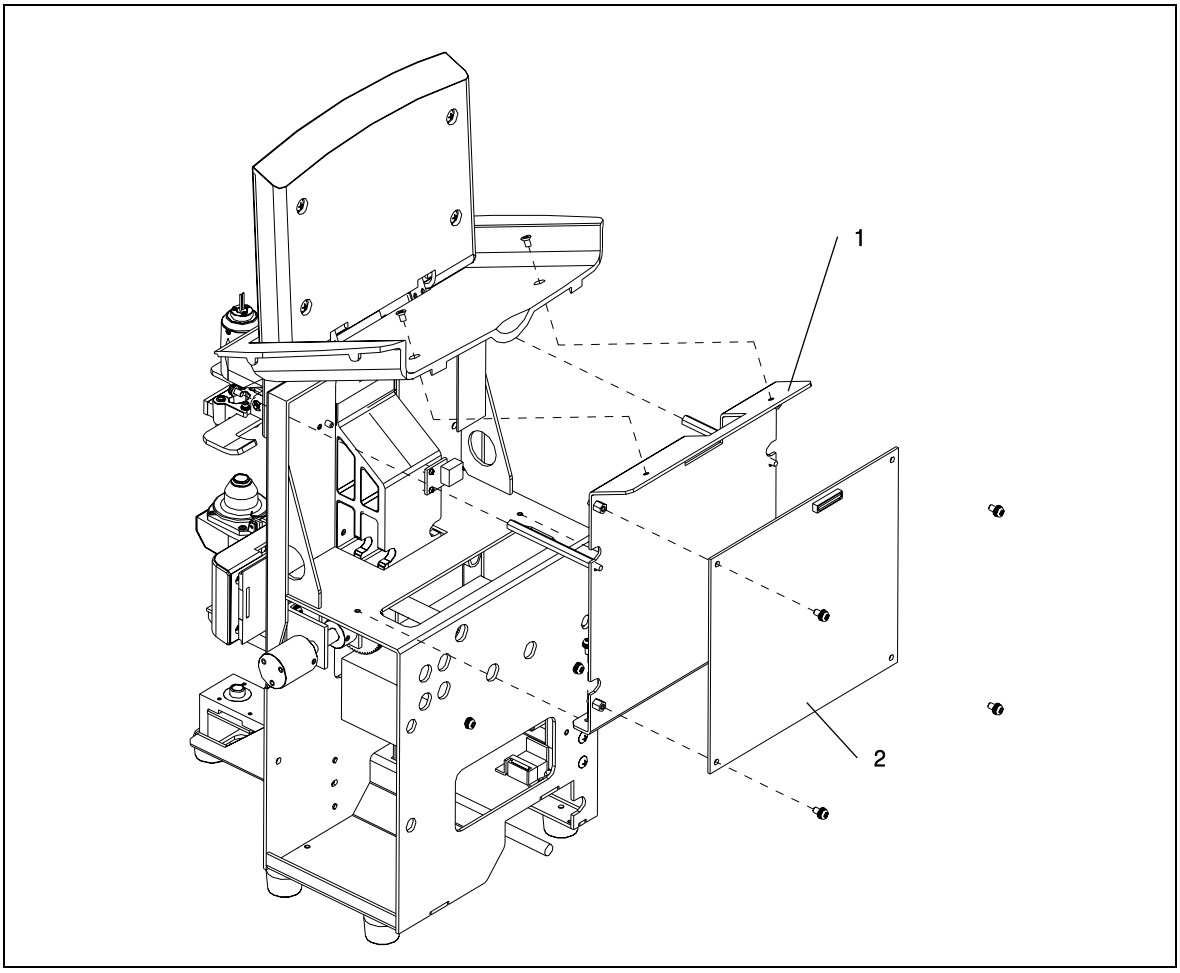
.

3.7. Removing Gear assembly

Picture	
	

No	Component	Removal method
1	PD Pinion Brk	- Remove three screws to separate the 'Gear Assembly' from the 'Back bone Assembly' And then separate it. - Unscrew two set-screws that fix [2], and then separate [2]. - Remove two screws that fix [7] and separate [7]. - Unscrew two set-screws that fix [3]. - Next, pull out [6]. And then, separate [3], [4], [5]. - In assembling, coincide the center of [7] and the center of teeth of 'PD Rack Gear Shaft'. - Assembly is the reverse procedure of disassembly.
2	PD Pinion Shaft Holder	
3	PD Pinion Nut	
4	Wave Washer	
5	Gear Washer	
6	PD Pinion Shaft	
7	Gear(L)	

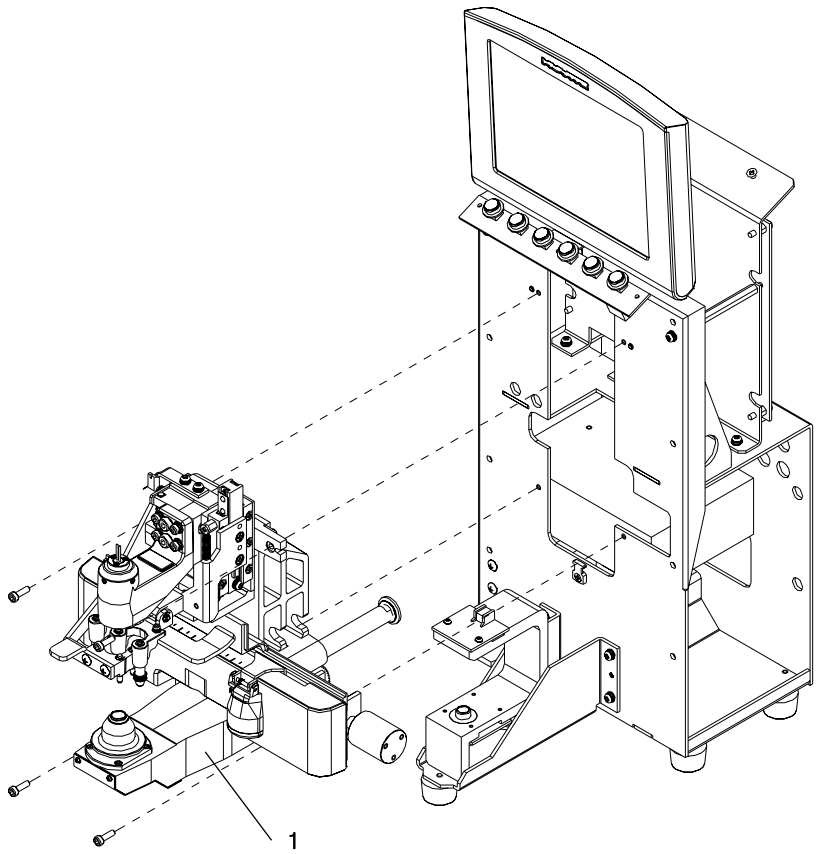
3.8. Removing Main board assembly

Picture	
	

No	Component	Removal method
1	Main BD Bracket	– Remove four screws that fix [2], and then separate [2].
2	HLM Main Board	
		– Remove two screw that fix to ‘Cover Top 1’
		– Remove two screw that fix ‘PCB Supports’
		– Remove two screw that fix [1].
		– And then, separate [1].
		– Assembly is the reverse procedure of disassembly.

3.9. Removing Back bone assembly

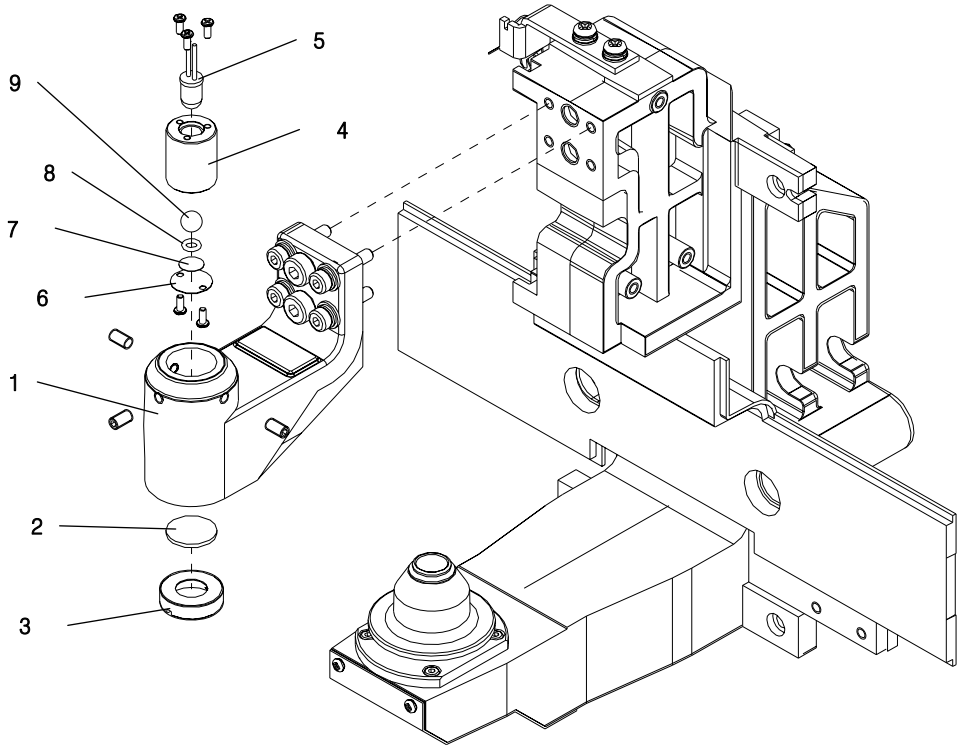
Picture



No	Component	Removal method
1	Back bone Assy	- Remove four wrench Bolts that fix [1].
2		
3		- And then, separate it.
4		
5		- Assembly is the reverse procedure of disassembly.
6		
7		

3.9.1. Removing Lens housing bone and LED subassembly

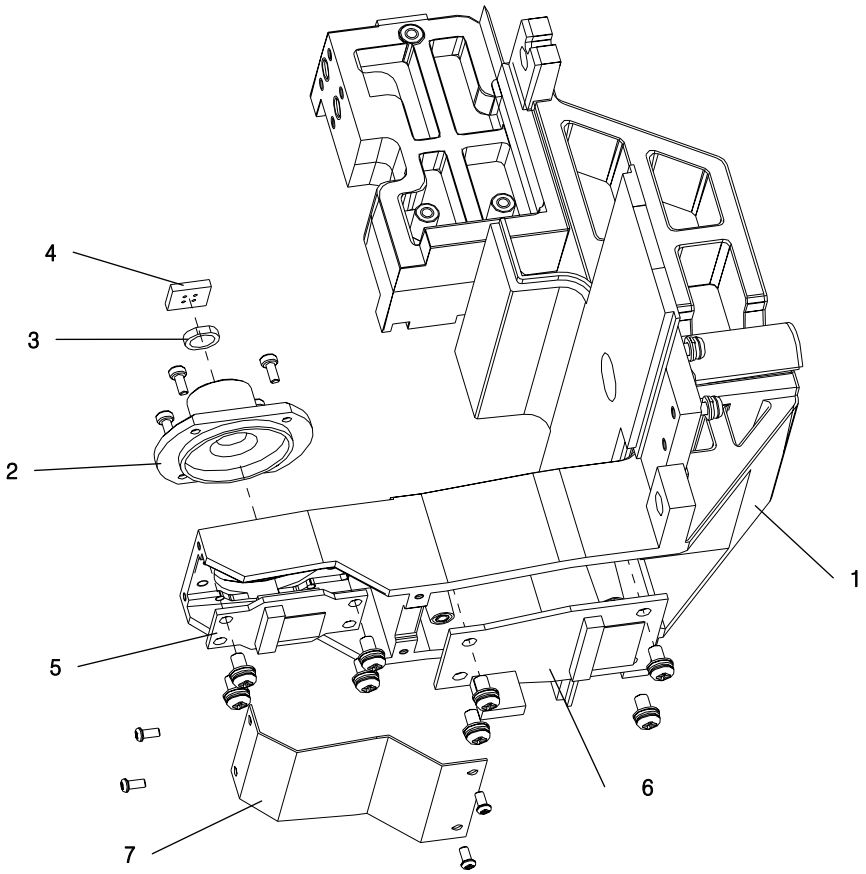
Picture



No	Component	Removal method
1	LED Bone	- Remove four wrench bolts to separate 'Lens housing bone Assembly' form the 'back Bone Assembly'
2	LM Lens	
3	LED Lens Nut	
4	LED Housing	- Unscrew [3], and then separate [3], [2] in order.
5	LED	
6	LED Diaphragm	- Unscrew three set-screws to separate 'LED Subassembly([4]~[9])'
7	Teflon Scatter	
8	O-Ring	
9	Ball Lens	- Remove three screws to separate [5], then separate it.
		- Remove two screws to separate [6]~[9]. Then separate them in order.
		- Assembly is the reverse procedure of disassembly.

3.9.2. Removing CCD Camera assembly

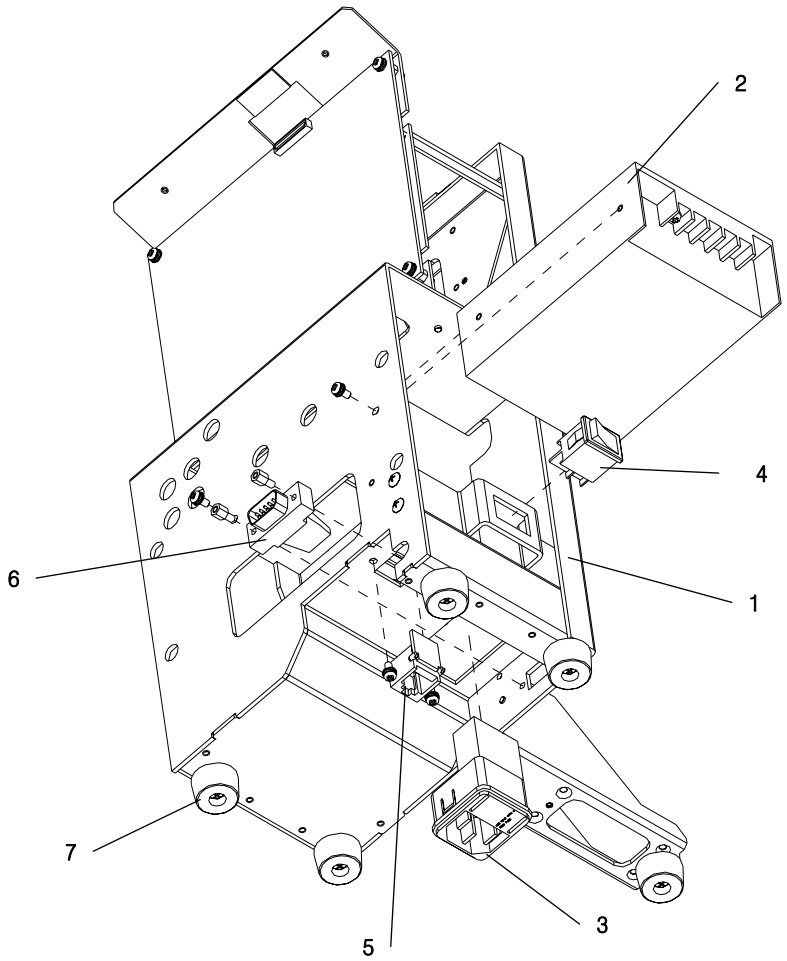
Picture



No	Component	Removal method
1	Back Bone	- Remove four screws to separate [2]~[4]assembly. Then separate it.
2	Filter Housing	
3	MM Lens Array	
4	4 Pin Hole	- Remove four screws that fix [7] and then separate it..
5	CMOS Sensor B/D	
6	CCD Camera Interface B/D	- To separate [5] from [1], remove four screws that fix [5].
7	CCD Camera Cover	
		- To separate [6] from [1], remove four screws that fix [6].
		- Assembly is the reverse procedure of disassembly.

3.10. Removing SMPS Assembly and Power S/W and Fuse Inlet

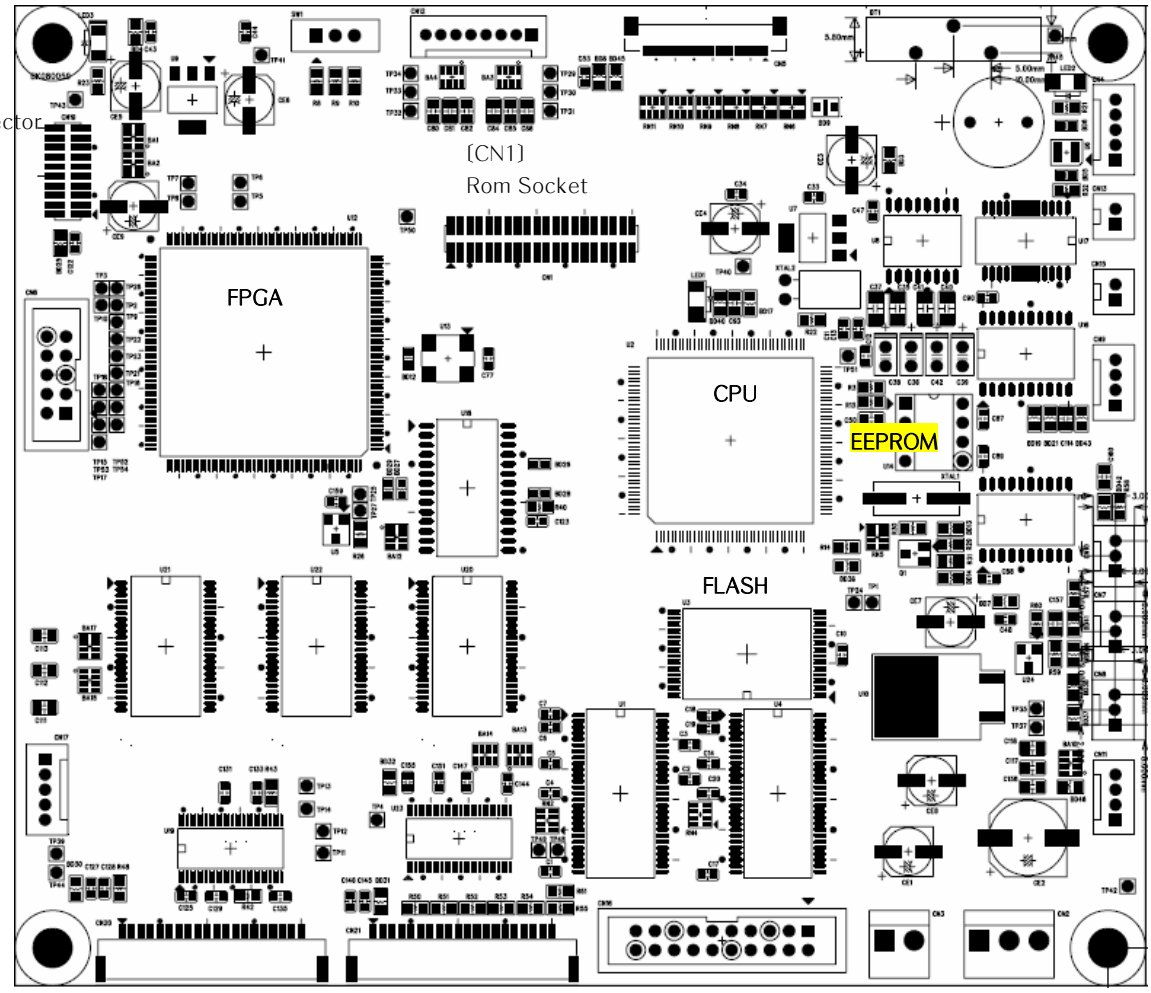
Picture



No	Component	Removal method
1	Base Frame	– Remove two screws that fix [2], then separate it from [1].
2	SMPS	
3	Fuse Inlet	
4	Power S/W	– Pull out [3], [4] from [1].
5	Foot S/W	
6	RS232c	– Remove two screw that fix [5]. And then, separate it.
7	Foot	
		– Remove two PCB Supports from [6]. And then, separate [6].
		– Finally, remove four screw that fix [7]. And then, separate [7].
		– Assembly is the reverse procedure of disassembly.

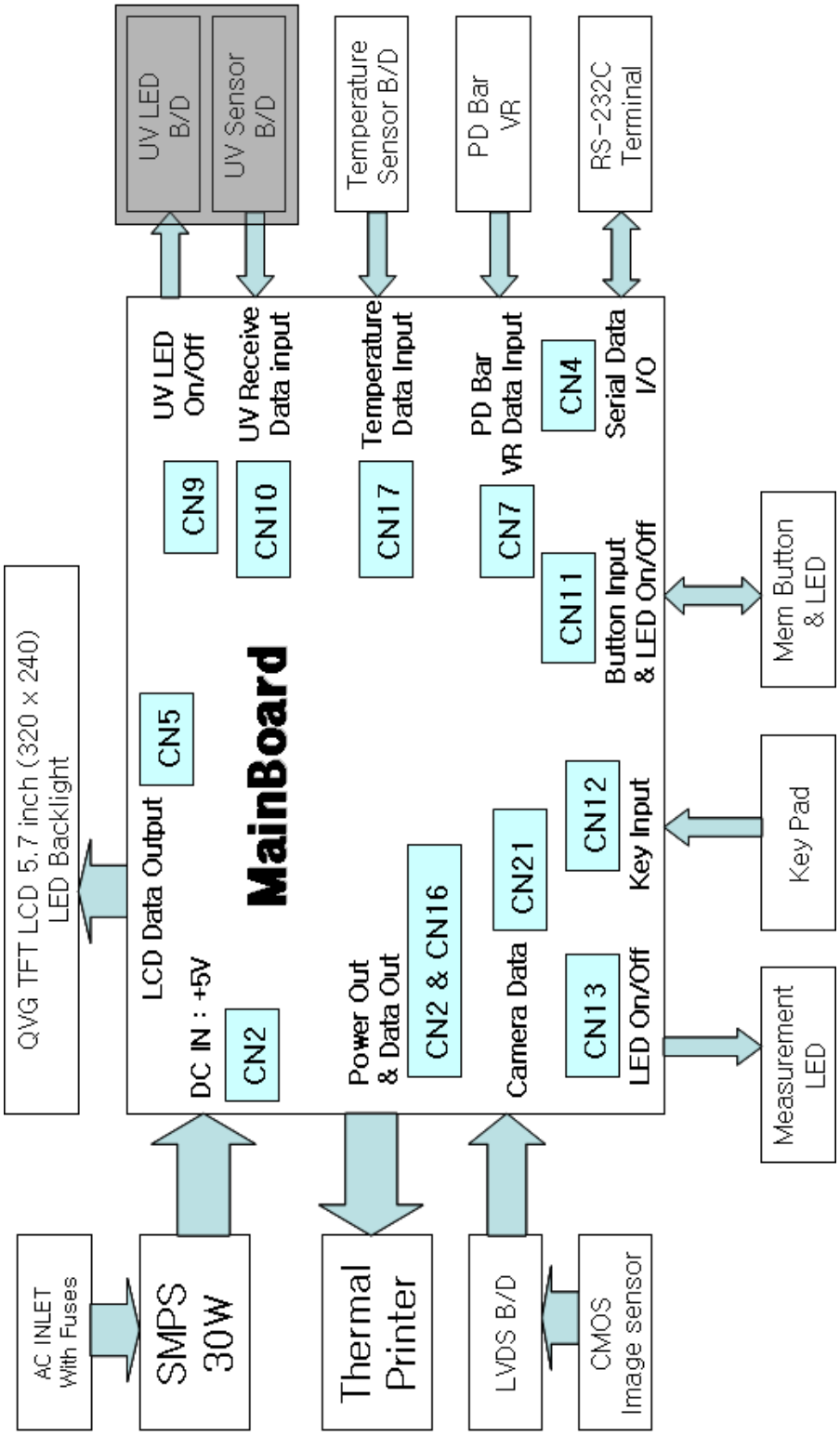
4. Electrical System

4.1. MAIN BOARD PCB ASS'Y

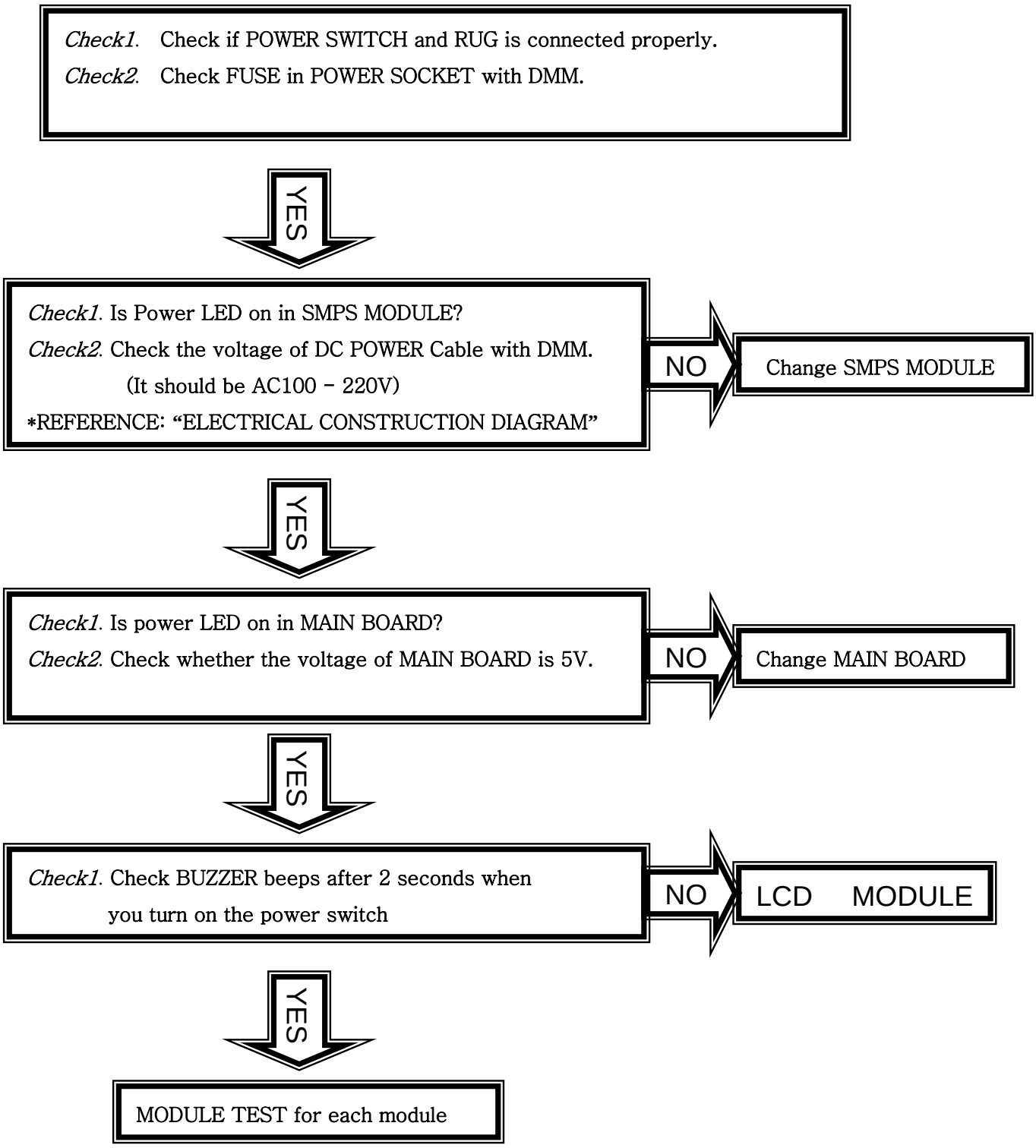


- When you change MAIN BOARD, replace EPROM because it stores SETUP DATA.
- In normal mode , place the direction of SW1 to [FLASH] position

4.2 Electrical block diagram

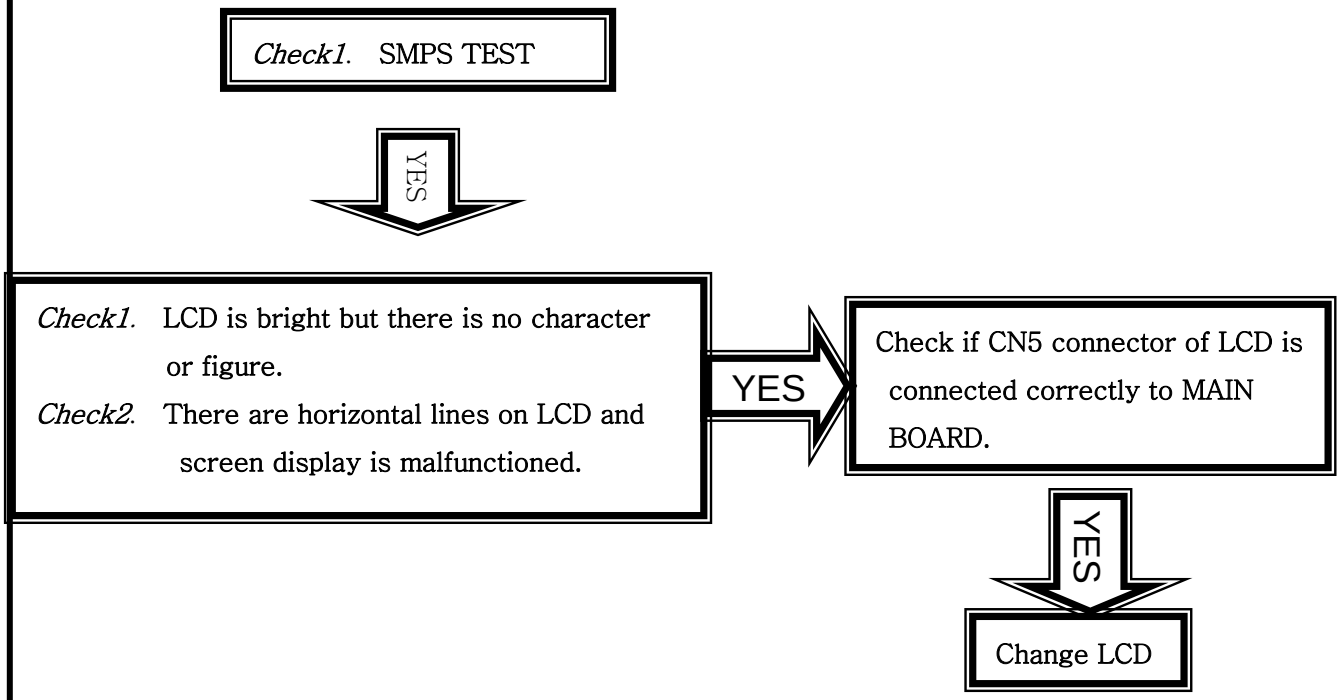


4.3. Inspecting SMPS



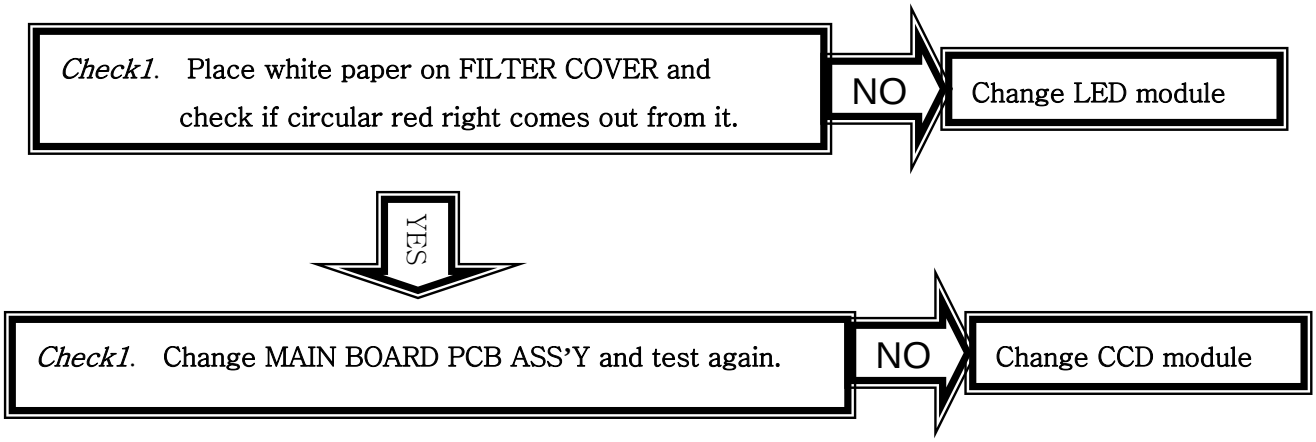
4.3. LCD TEST

- Measurement screen is not displayed…



4.4. LED TEST

- Cross mark (+) isn't displayed in measurement waiting state…



4.5. UV MODULE TEST

- I cannot get UV-LED value…

Check1. Check if violet light radiated from OPTIC LED comes out from UV measurement part.

NO → Change UV-LED PCB ASS'Y

- UV-LED value in UV mode is 0%.

Check1. Check if UV SENSER in UV measurement part is hidden by obstacles such as FILTER COVER .

ON ↓

Change UV MODULE

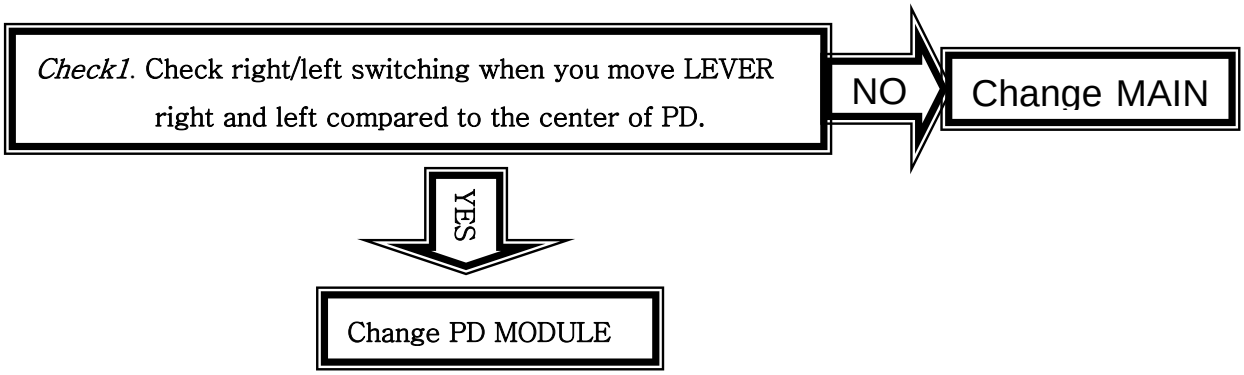
NO → Change MAIN BOARD PCB ASS'Y

- I can get UV-LED value at most 80 ~ 90 % in UV MODULE.

Check1. Turn on the power switch and enter UV MODE.
Check2. Turn variable resistance in UV-REC PCB with cross screw driver.
Check3. Press CAL BUTTON among MODE BUTTON and you can get 100%.

4.6. PD TEST

- PD value is not displayed…



4.7. THERMAL PRINTER TEST

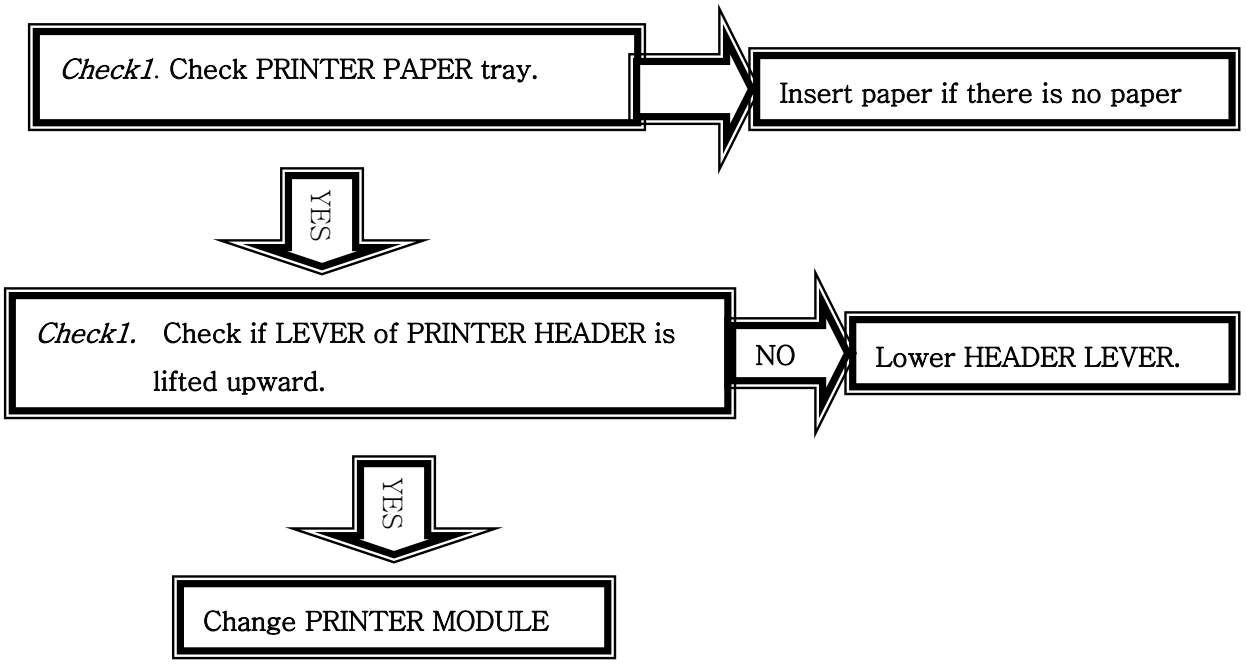
- "PRT: HEAD UP" message is displayed on LCD…

Check1. Open PRINTER COVER and check if HEADER LEVER towards upside.

- "PRT: PP EMPTY" message is displayed on LCD when pressing PRINTER BUTTON…

Check1. Open PRINTER COVER.
Check2. Check PRINTER PAPER tray.
Check3. Fill up PRINTER PAPER if PRINTER PAPER is empty or near empty.

- PRINTER PAPER doesn't feed properly…



5. How to upgrade the OS program

5.1. Introduction

Downloading program for HLM-7000 with RS232 cable (Lensmeter RS232) provides downloading function of the firmware software from PC to Lensmeter, HLM-7000 with serial cable.

An administrator of the Lensmeter hardware can receive the Firmware by e-mail or else and load it to his/her lensmeter by this downloading program when the new upgrade version of firmware comes out. If there is PC with Windows operating system and serial cable connected to the Lensmeter, with simple process about 5 to 10 minutes, he/she can upgrade the performance of his/her Lensmeter without sending and receiving it to the agency.

This downloading program is DNW application.

Check the following items before installing and running this software:

- Version of the Lensmeter
- COM port number of the PC connected to the Lensmeter
- Connection status of the serial cable on your PC and Lensmeter
- New firmware binary image file for the Lensmeter

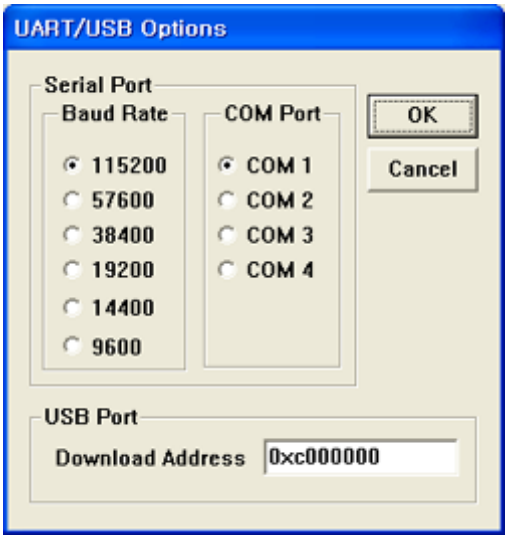
See the operation manual for the Lensmeter to learn how to connect PC and Lensmeter with serial cable.

5.2. How to upgrade the OS program using DNW application in HLM Machines

A. Copy the DNW application files. DNW consists of two files : the executable file(= dnw.exe), the configuration file(= dnw.ini). It is no need to install it in your desktop computer. Therefore just copy the files to the specified directory.

B. Execute the DNW application.

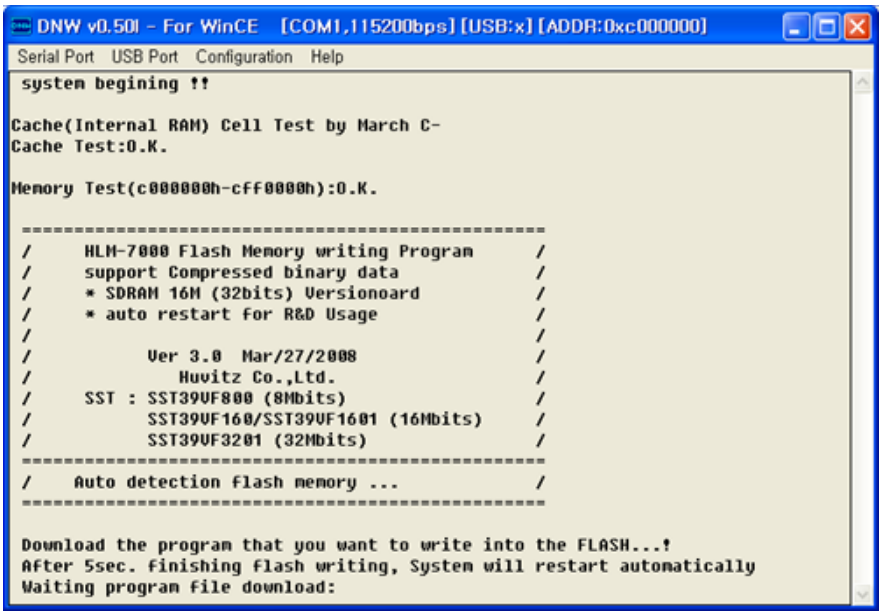
C. Set up the configuration. Click the *Options* item in the *Configuration* menu and then choose the Com port number and the baud rate



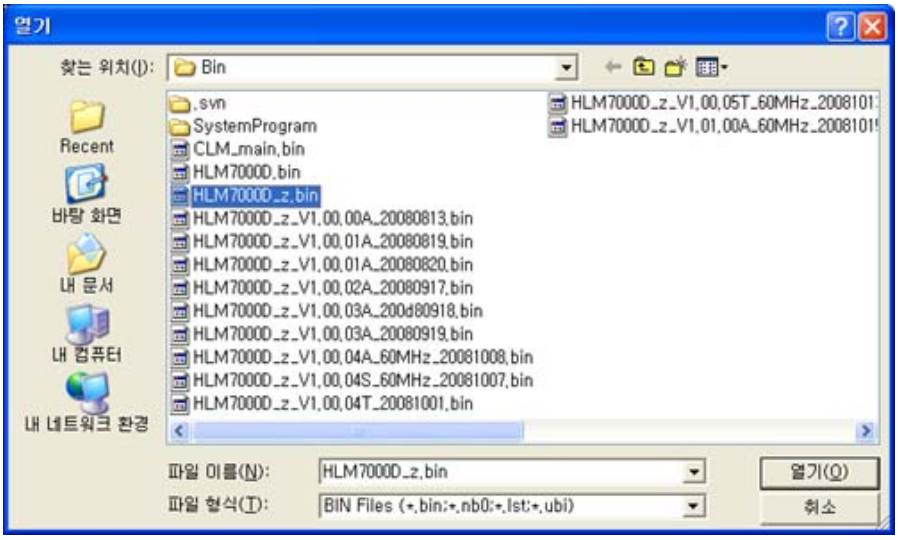
D. Click the *Connect* item in the *Serial Port* menu to open the specified serial port. After succeeding in opening the serial port, the title of DWN application shows the Com port and the Baud Rate on the title bar.

E. Connect our machine and your computer with the serial cable.

F. Turn on the machine according to the specified method. It should be started as the download mode. In HLM machine, turn on it while pressing the first and the fourth buttons. In MRK machine, turn on it while pressing the *AUTO* button. After that, you'll see some information at the DNW terminal.



G. Click the *Transmit* item in the *Serial Port* menu. And then choose the OS program file. Generally its name in HLM machine is HLM7000_z.bin, but it might be changed according to the type and model of the machine.



H. After finishing the procedure 9, you'll see some information on the terminal and finally you can see the screen as following :

I. Finally turn off and on the machine.