

# L5HE series service manual


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# 1. Important Safety Information

## Important Notice

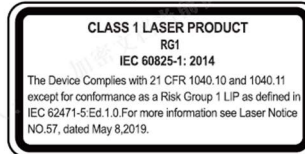
Paragraphs beginning with the symbol  indicate important instructions, tips or conditions for the following settings.

 For your own safety and the optimal performance of your device, ensure to read the safety instructions before performing any installation.

Compatibility with 3rd party products, software and services are not guaranteed. We cannot be held liable for any damage or loss suffered whilst operating, using or connecting to incompatible devices or apps.

The recording and playback of content on this or any other device may require permission from the owner of the copyright or other such rights in that content. It is your responsibility to ensure that your use of this or any other device complies with applicable copyright legislation in your country. Please refer to that legislation for more information on the relevant laws and regulations involved or contact the owner of the rights of the content you wish to record or playback.

Read these instructions  
Follow all instructions  
Heed all warnings  
Keep these instructions  
All rights reserved.



## Safety Instructions

To ensure safe and correct use of this product, always comply with the following precautions to avoid dangerous situations and damage to your unit:



The lightning flash with arrowhead symbol, within an equilateral triangle is intended to alert the user to the presence of uninsulated dangerous voltage within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.



AC voltage: This symbol indicates that the rated voltage marked with the symbol is AC voltage.



Class I product: This symbol indicates that it requires a safety connection of protective earthing (ground).

## The intended use and ambient conditions for this device

This device is intended for the rendering of video and audio signals, on a table-top, in a home or office environment. It must not be used in rooms with a high level of humidity or dust concentration. The warranty is only valid if used as intended by the manufacturer.



### WARNING

High humidity and dust concentration may lead to current leaks in the device. To reduce the risk of fire or electrical shock:

- Do not expose this unit to rain, moisture, dripping or splashing water, and do not place objects filled with liquids, such as vases, cups, etc. on or over the unit.
- Do not touch the device with wet hands.
- Do not expose to direct air-conditioning and keep candles or other naked flames away from the device at all times.

If the device is moved from a cold environment to a hot environment, leave it switched off for at least an hour to avoid condensation. If used outside, make sure it is protected from moisture.

If you notice anything unusual, immediately remove the power plug.

In case of fire, use preferably a CO<sub>2</sub> gas or powder fire extinguisher. If such extinguishers are not accessible, try to isolate the electrical supply before using a water fire extinguisher.

A Laser TV may fall, causing serious personal injury or death. Many injuries, particularly to children, can be avoided by taking simple precautions such as:

- ALWAYS use cabinets or stands or mounting methods recommended by the manufacturer of the Laser TV.
- ALWAYS use furniture that can safely support the Laser TV.
- ALWAYS ensure the Laser TV is not overhanging the edge of the supporting furniture.
- ALWAYS educate children about the dangers of climbing on furniture to reach the Laser TV or its controls.
- ALWAYS route cords and cables connected to your Laser TV so they cannot be tripped over, pulled or grabbed.
- NEVER place a Laser TV in an unstable location.
- NEVER place the Laser TV on tall furniture (for example, cupboards or bookcases) without anchoring both the furniture and Laser TV to a suitable support.
- NEVER place the Laser TV on cloth or other materials that may be located between the Laser TV and supporting furniture.
- NEVER place items that might tempt children to climb, such as toys and remote controls, on the top of the Laser TV or furniture on which the Laser TV is placed.

If your existing Laser TV is being retained and relocated, the same considerations as above should be applied.

### Power Supply

Incorrect voltages can damage the device. Only connect this unit to a power supply with the correct voltage and frequency noted on the type plate, using the supplied power cable.

The power plug must be easily accessible so that the device can be disconnected at all time. The unit is live, even if in standby mode, as long as the unit is connected to a power outlet.

It is recommended that this unit is placed on a dedicated circuit.

- Do not overload the power outlets by connect too many appliances to the same outlet. Overloaded wall outlets, extension cords, etc. are dangerous and can result in electric shock and fire.

After power off, don't turn it on again in 5 seconds. Frequent switching power supply in a short period of time can cause abnormal device.

**The apparatus shall be connected to a MAINS socket outlet with a protective earthing connection.**

#### ■ Power plug and power cable

- Do not touch the power plug with wet hands.
- Do not place heavy objects on the power cable. Route the cable so that it is not kinked or laid over sharp edges, walked on or exposed to chemicals. A power cable with damaged insulation can cause electric shock and fire.
- Pull the power plug, NOT on the cable when disconnecting. The cable can become damaged and cause a short circuit if pulled on.
- Do not place the power cable near a high temperature object.
- Do not move the device with the power cable plugged into a socket.
- Do not use a damaged or loose power cable, or a damaged socket outlet.
- Do not use any power cords other than the one supplied with this unit.
- MAIN plug on the power cord is used as the disconnect device, the disconnect device and socket-outlet shall be easily accessible.

#### ■ Volume

Loud music and noises can lead to irreversible damage to your ears. Avoid extreme volume, especially over long periods and when using headphones.

If you hear a drumming noise in your ears, turn down the volume or temporarily stop using headphones.

#### ■ Thunder Storms

Pull out the power plug and all connected antenna cables from the device during a thunderstorm. Overvoltage caused by lightning strikes can damage the device via the antenna system, as well as the wall socket.

#### ■ Long periods of absence

As long as the power plug is connected to a live socket outlet, the device will consume power even in standby mode. The power plug and all connected antenna cables should be disconnected out during long periods of absence.

#### ■ Cleaning and care

##### CAUTION:

Unplug the power cord prior to cleaning the device.

Clean the device, the screen, and the remote control with a soft, moist, clean and color-natural cloth only. Do not use any chemicals.

- Do not subject the surfaces to insect repellent, solvent, thinner or other volatile substances. This may degrade the surface quality.

#### ■ Air ventilation and high temperatures

Install your device only where there is proper ventilation, and ensure that there is at least 20 cm free space on the sides and 5 cm free space on the back unit for air circulation. Excessive heat and obstruction of ventilation could lead to fire or early failure of some electric components.

- Do not block any ventilation openings with newspapers, tablecloths, curtains, etc.
- Do not dry clothing etc. on top of the unit.
- Take care not to touch the ventilation openings since they may become hot.
- Do not insert foreign objects into the device through the vents.

#### ■ Warning about off-gassing

New furniture, carpet, paint, building materials and electronics can release chemicals into the air through evaporation. After you set your device up and turn it on for the first time, you may notice a slight smell within a couple of hours. This is because some components of device are heating up for the first time. The materials that we use fully meet the environmental requirements and regulations. Your device is working just fine and the fumes from the off-gassing will diminish eventually.

#### ■ Supervision

- Do not let children play unsupervised close to the device. It could tip over, be pushed off or pulled down from the stand surface and injure someone.
- Do not allow a switched-on device to run unattended.
- Do not spray water or other liquids directly on the device. Liquid inside the device could lead to product failure.
- The surface of the display panel is treated and may be easily damaged. Take care not to scratch it with fingernails or other hard objects.
- Also wipe the power plug with a dry cloth at regular intervals.

#### ■ Service/Repair

Never remove the cover/back of the device; there are no user serviceable parts inside. Refer all service to qualified service personnel.

#### ■ Packaging

Keep the anti-moisture materials and plastic bags out of reach of children.

Plastic bags can cause suffocation and the anti-moisture material is harmful if swallowed. If swallowed by mistake, force the patient to vomit and visit the nearest hospital.

#### ■ Modification

Do not attempt to modify this product in any way. Unauthorized modification could void the warranty of this unit, cause electric shock and fires.

#### ■ Remote Control batteries

- Incorrect installation may cause battery leakage, corrosion and explosion.
- Replace only with the same or equivalent type.



- Do not mix old and new batteries.
- Do not mix different battery types.
- Do not use rechargeable batteries.
- Do not burn or break up batteries.
- Be sure to dispose of batteries correctly.
- Do not expose batteries to excessive heat such as sunshine, fire or the like.

#### ■ Outdoor Antenna Grounding

If an outdoor antenna used, be sure the antenna system is protected against voltage surges and built-up static charges.

#### ■ Disposal

Refer to the recycling section of this manual.

#### ■ Laser

**Do not look directly at the lens when this device is on because the laser light may damage your eyes!**

- This product comes with a laser module. Do not tear or modify this device in any manner; otherwise, it may result in personal injury.

RG1 IEC 62471-5: 2015  
 CLASS 1 LASER PRODUCT IEC 60825-1: 2014  
 $\lambda = 455\pm 6\text{nm}$   
 Wavelength 455±6nm

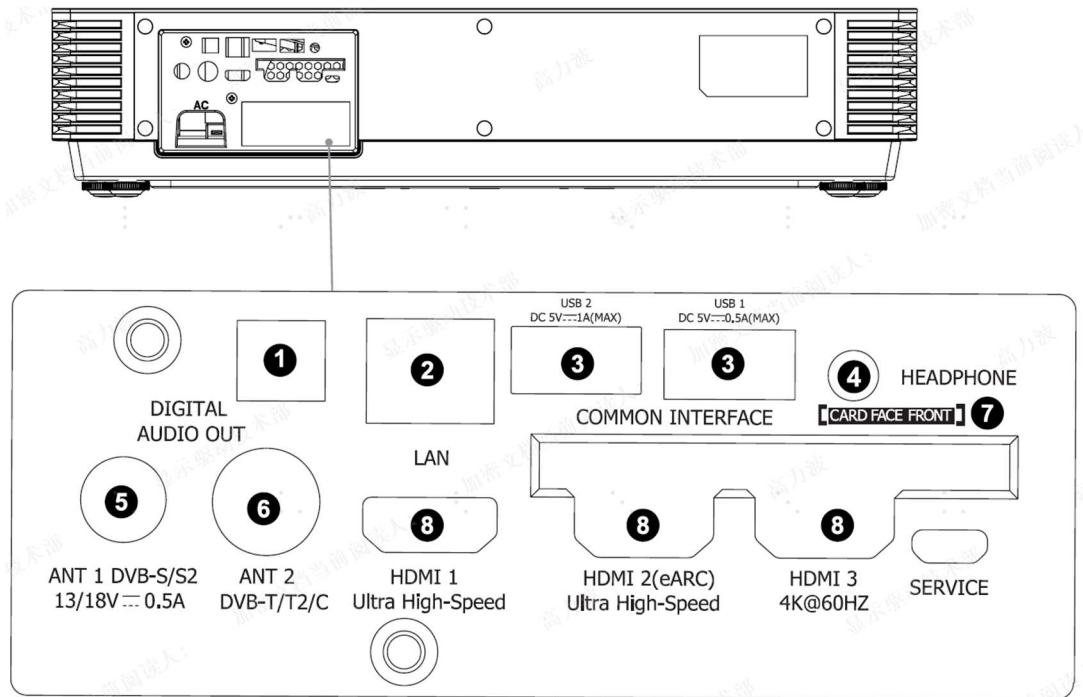
#### CAUTION:

Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

- If this device requires a repair, please wear laser eye protection with an optical density OD that is 4 or higher and has a wave length of 445-465nm.
- Do not place any water-containing vessel on this device, such as cosmetics or liquid medicine.
- If any object or water enters this device, please unplug this device and contact the service staff of Hisense.
- Do not place any exposed fire source (e.g. burning candle) on this device. Keep away from high temperature and heat.
- Do not expose the battery to direct sunlight or candle light.
- Keep air vents on both sides clear from any objects to prevent the device from overheating inside.
- To avoid a short circuit, product damage or electric shock, do not use any sharp object or metal to touch the ports or other openings on the Laser TV.
- If this device has been in a warm environment, allow any built-up condensation to evaporate first BEFORE you switch the device on.
- Do not allow a child to stand on or climb up this device.
- Do not place any object above or in front of the lens because the laser light could cause the object to become flammable.
- Clean the lens periodically with a clean cloth and make sure the Laser TV is turned off before you start.

## 2. Unit and External Ports





### 3. List of circuit boards

NO.	Part	NO.	Part
1	Display board (including software)	8	Indicator lamp Panel Assembly
2	Main Board (including software)	9	Fan conversion Board
3	Power Board	10	IR Assembly
4	Key board	11	WIFI Board
5	Right Eye Protection Board		
6	Left Eye Protection Board		
7	DMD Board		

### 4. Power board PIN list

XP904 is the power board to the main board connection line

XP902 is the power board to the display board connection line

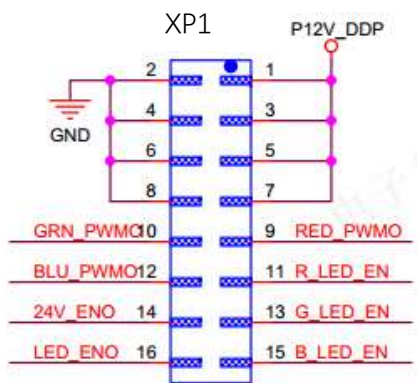
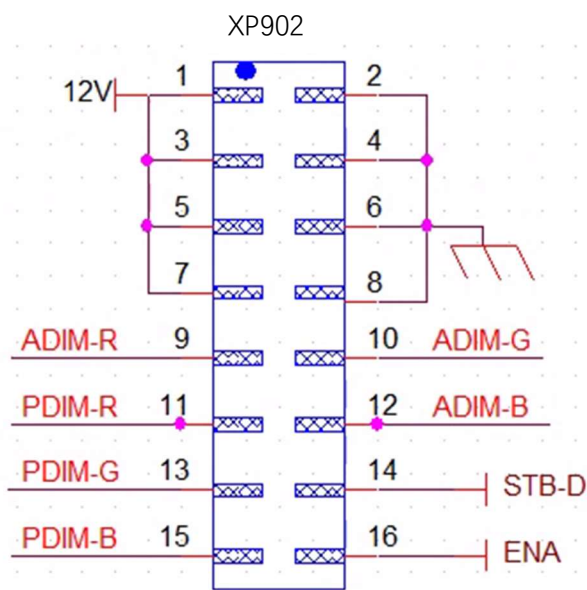
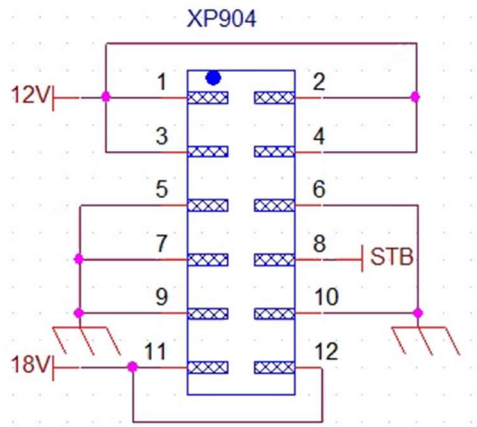
XP1 is the power terminal on the display board.

XP902:

(1) Pin 1, 3, 5, and 7 are the 12V power supply pins for the display board

(2) Pins 9, 10, and 12 are the R, G, and B analog dimming pins (current adjustment pins) that the display board outputs to the power supply board, and the maximum is 5V.

(3) Pins 11, 13, and 15 are the R, G, and B digital dimming pins that the display board outputs to the power supply board, and are square waves with a duty cycle.



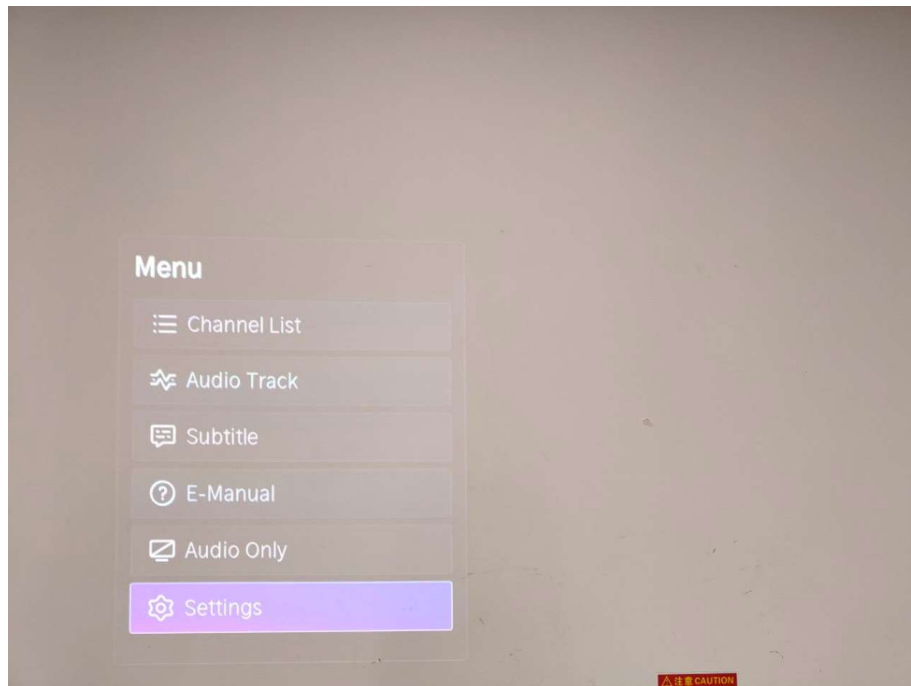
## 5. Factory/Service OSD Menu and Adjustment

### 5.1 How to enter the Factory Menu

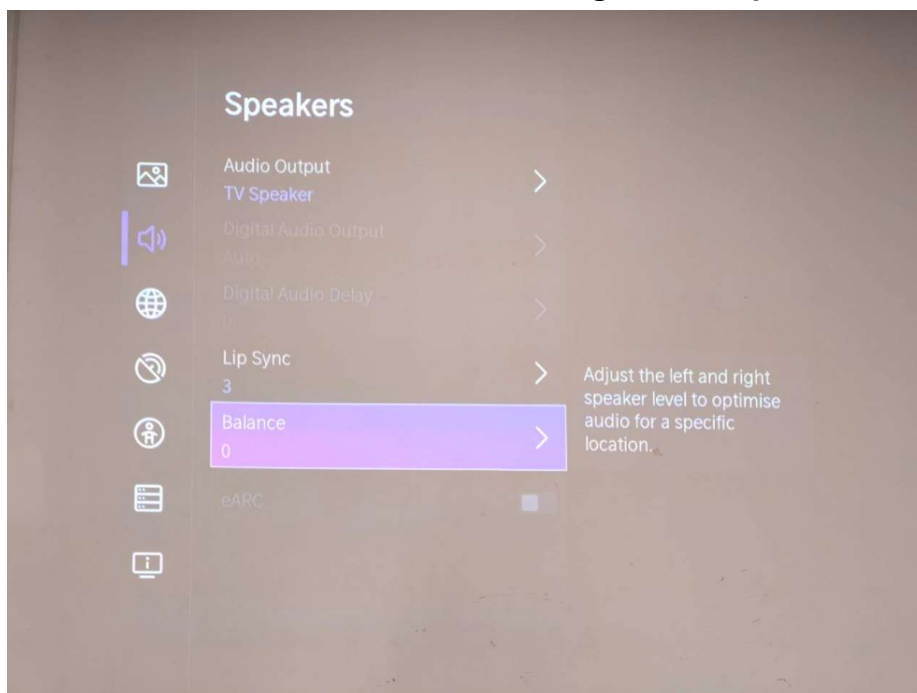
With user's RC

(1) Power TV on

(2) Press button on the RC then call up “Menu” option.



(3) Move and “ok “button on RC to select **Setting-Sound-Speakers-Balance**

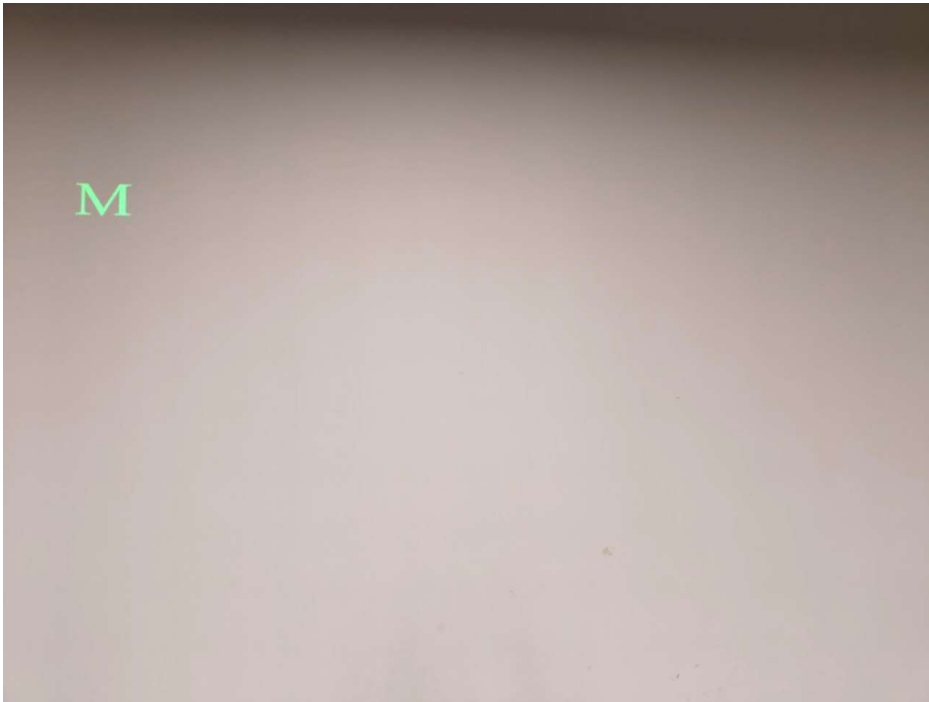


(4) On the **Balance**, input figure 1->9->6->9 in sequence on RC.

Note: It is important to remember that the hand fingers can't shield the RC emitter diode.

(5) Call up a “M” on the left-top of TV, then press button again, the Factory menu appear then



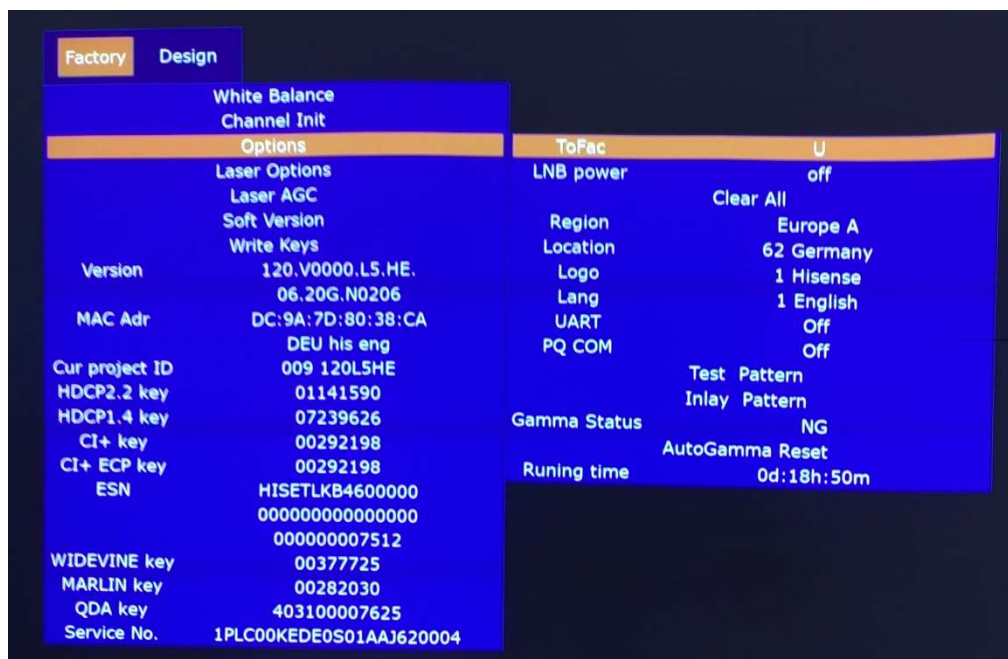


(6) DC power off and DC power on the TV, which can exit Factory OSD.

## 5.2 Factory OSD Menu

Factory OSD menu list: if you want to learn more about TV, you'd better read it but would not adjust the value please. The Factory menu may be have difference for diverse market and customer.

### 5.2.1 Factory Option



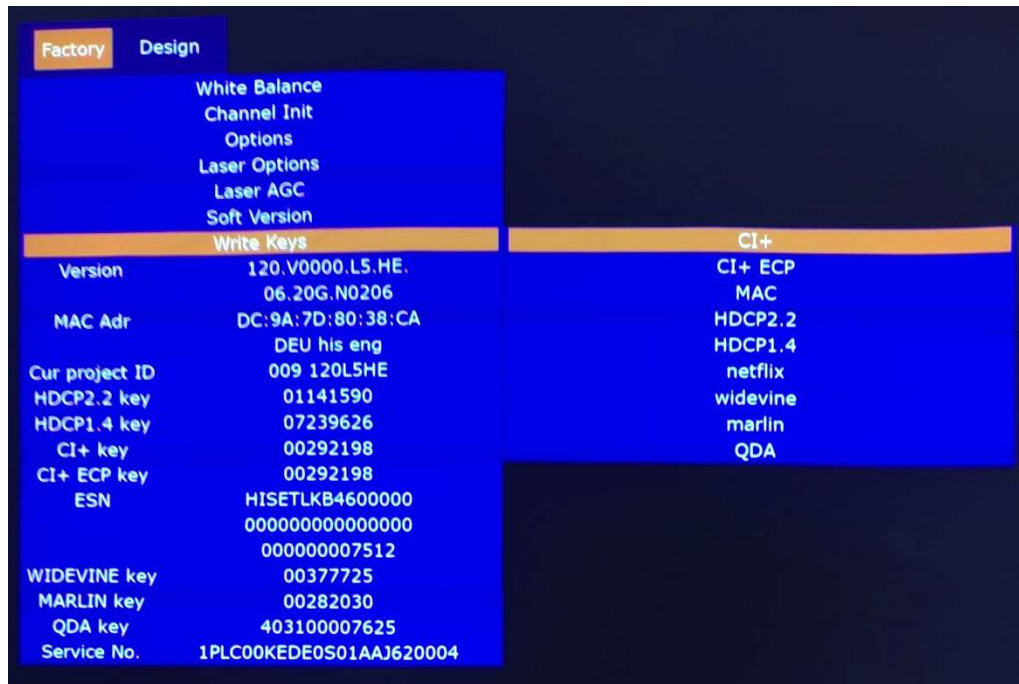
### 5.2.2 Laser Options

Factory		Design	
White Balance		Clear BT	
Channel Init			
Options			
Laser Options			
Laser AGC		To Alarm	Off
Soft Version		Display upgrade	Off
Write Keys		Temperature protect	Off
Version	120.V0000.L5.HE. 06.20G.N0206	MIRROR	0
MAC Adr	DC:9A:7D:80:38:CA	Laser run time	22h
	DEU his eng	Screen Type	Wide Angle ALR
Cur project ID	009 120L5HE	Eye protect	Off
HDCP2.2 key	01141590	DLP Upgrade	
HDCP1.4 key	07239626	Fan speed	
CI+ key	00292198		
CI+ ECP key	00292198		
ESN	HISETLKB4600000 0000000000000000 000000007512		
WIDEVINE key	00377725		
MARLIN key	00282030		
QDA key	403100007625		
Service No.	1PLC00KEDE0S01AAJ620004		

### 5.2.3 Soft Version

Factory		Design	
White Balance		Soft Version	
Channel Init		120.V0000.L5.HE.	
Options		06.20G.N0206	
Laser Options			
Laser AGC			
Soft Version			
Write Keys			
Version	120.V0000.L5.HE. 06.20G.N0206	TCON Version	NULL
MAC Adr	DC:9A:7D:80:38:CA	FRC Version	NULL
	DEU his eng	BLU Version	NULL
Cur project ID	009 120L5HE	BLU Status	NULL
HDCP2.2 key	01141590	MAC Version	DC:9A:7D:80:38:CA
HDCP1.4 key	07239626	ChipID	3ca2daf0ff6e2dec
CI+ key	00292198	QDA UUID	403100007625
CI+ ECP key	00292198	DLP version	24
ESN	HISETLKB4600000 0000000000000000 000000007512	DLP MCU version	9
WIDEVINE key	00377725	DLP FPGA version	0
MARLIN key	00282030	GC MCU version	0.0.0.0
QDA key	403100007625	GC FPGA version	0.0.0.0
Service No.	1PLC00KEDE0S01AAJ620004		

### 5.2.4 Write keys



### Note:

The Factory menu may have difference for diverse market and customer, above Factory menu only for reference.

The factory menu data varies according to different sources. In case of changing the factory data by error, you can choose to "Clear all", by which you can resume the default value.

### 5.2.5 clean the EEPROM

- (1) Select the item "Option"--"Clear all" in Factory mode
- (2) Press button to clear the EEPROM data
- (3) Laser TV restarts automatically

## 6. Software Upgrade Method

Main software upgrade directly with USB

### 6.1 TV in user mode

The main software can be upgraded with USB disk.

### 6.2 TV in factory mode

TV is in factory mode, only AC power off TV and insert the USB disk, next AC power on, TV can identify automatically to update, till call up "USB Update".

**Once choose another TV mode, must AC power off and power on the TV to reboot.**

Figure-1: Loading data

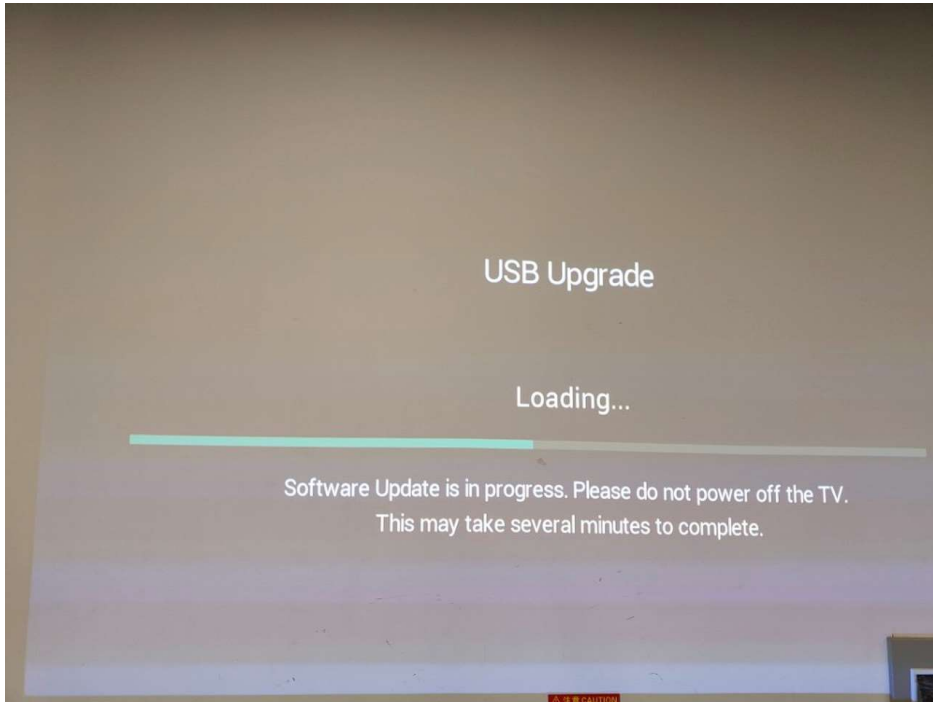


Figure-2: Checking data

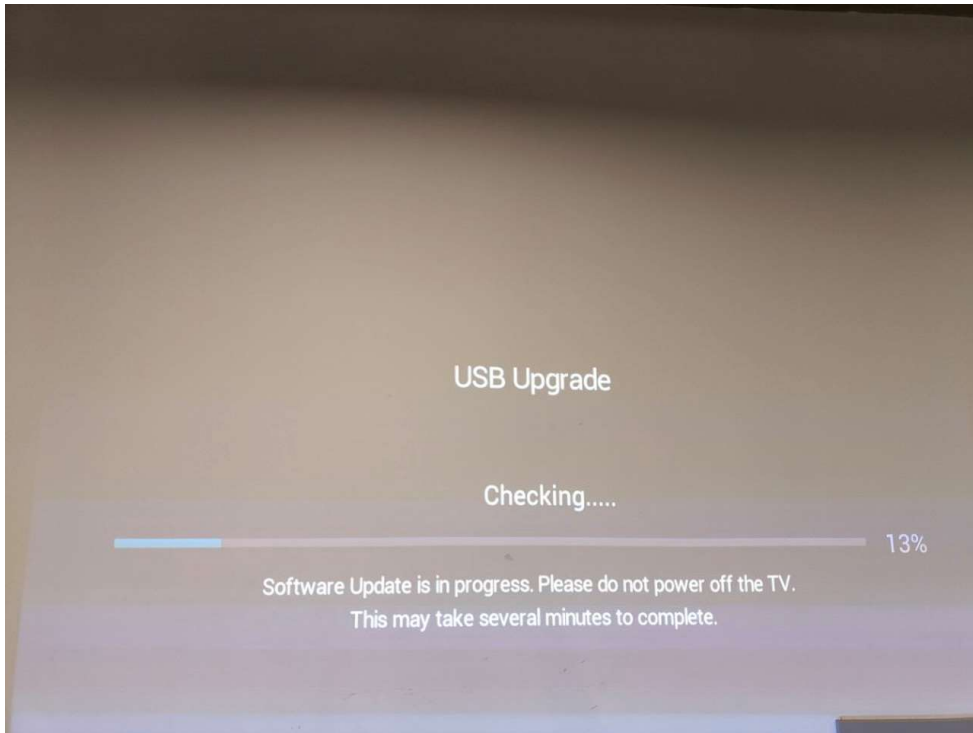


Figure-3: Installing

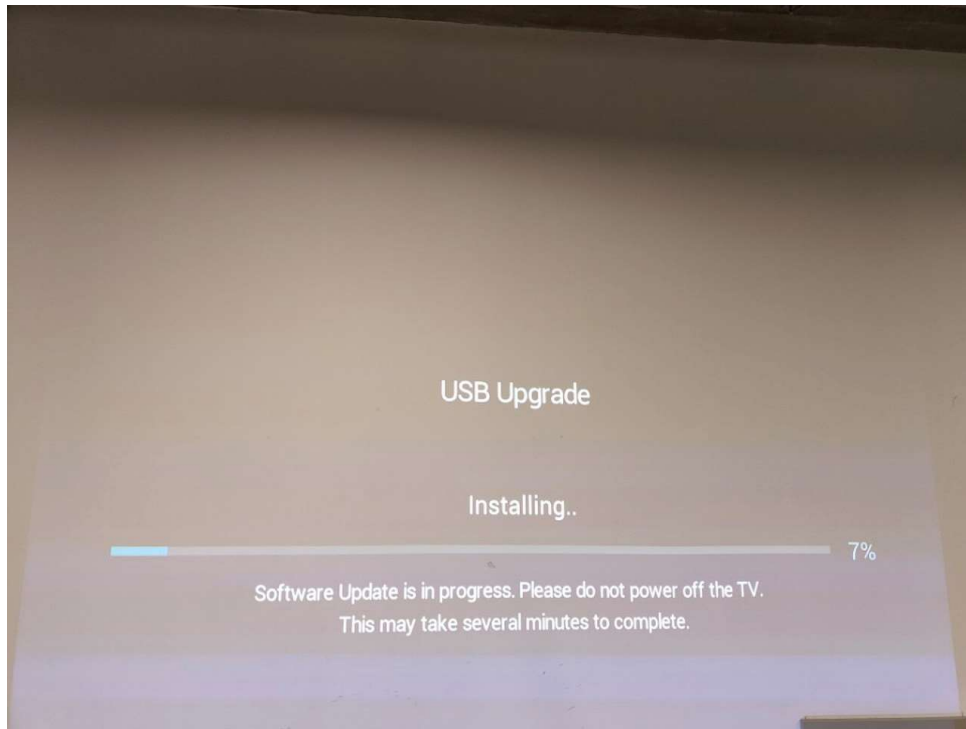
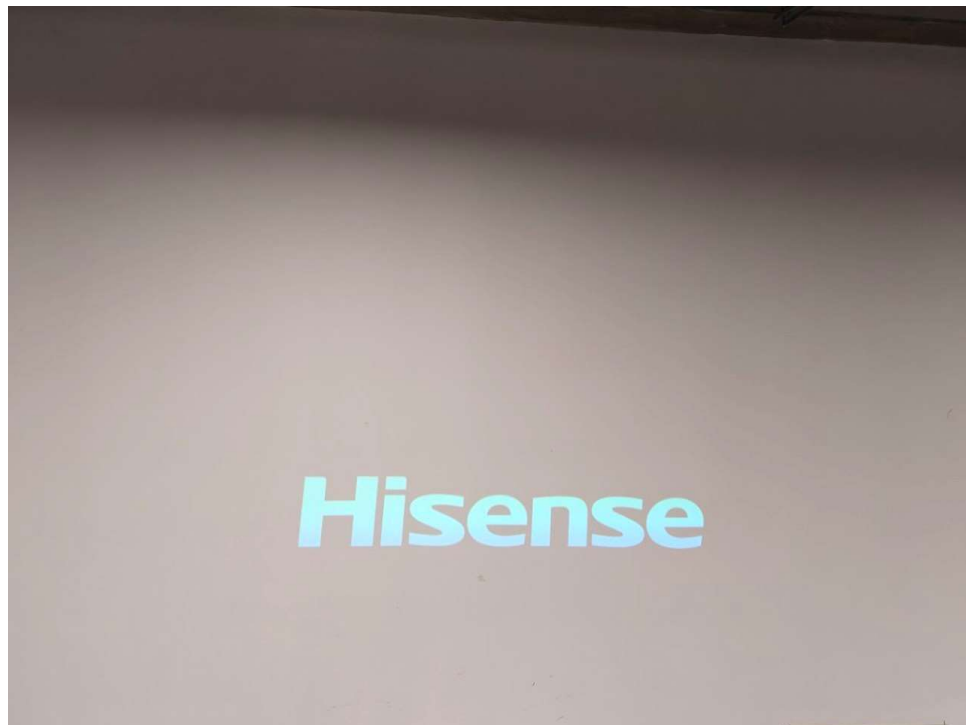


Figure-4: Software upgrade complete, TV automatically reboot.



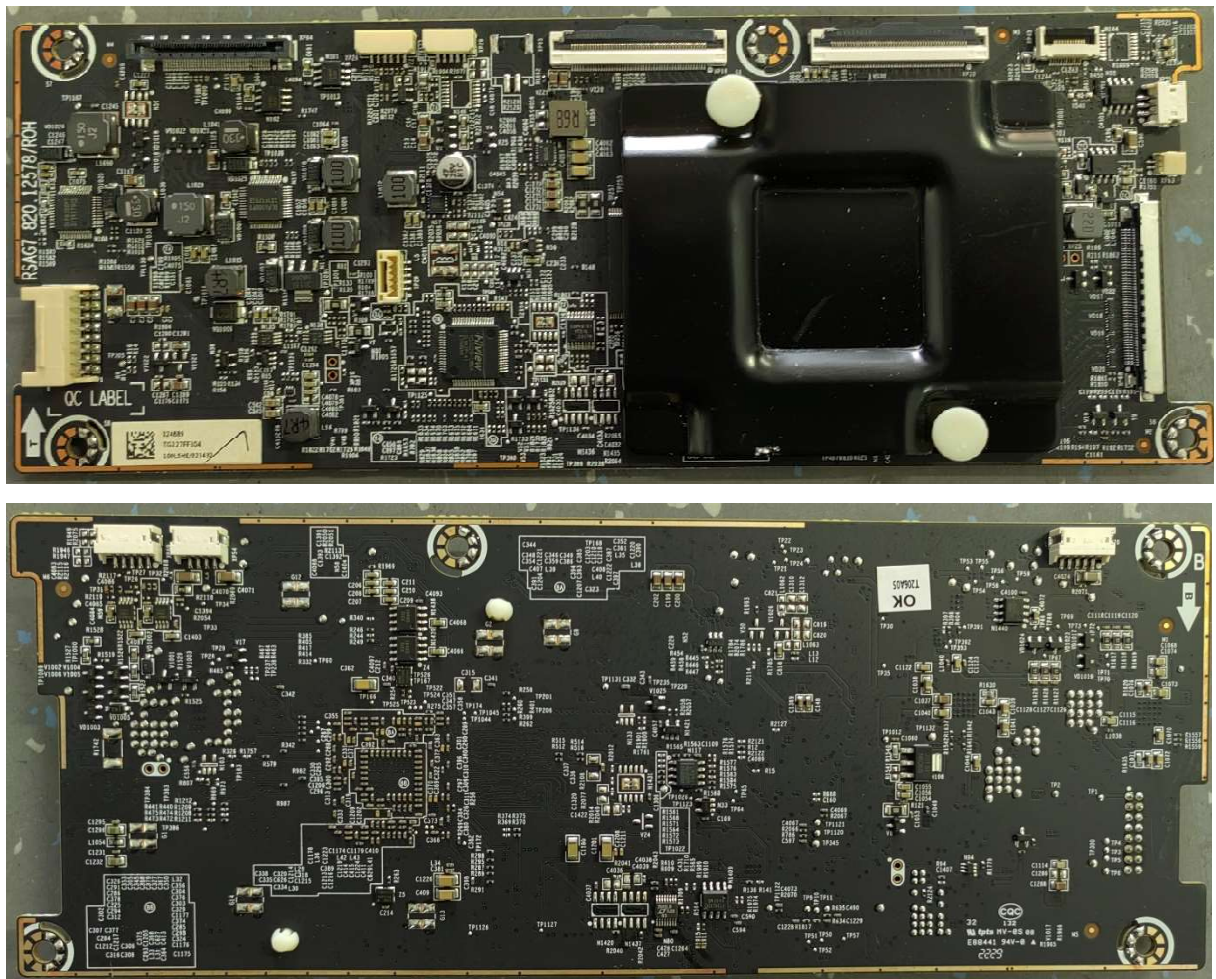


## 7. Troubleshooting

### 7.1 Warning indicator light

Light	Failure principle	Fault determination
Flash 1	The NTC temperature exceeds the protection temperature	(1) If there is a shield in the air outlet / inlet (the distance between the left and right sides of the main engine is 20CM) or the ambient temperature is too high (not higher than 35°), --- remove the shield / reduce the ambient temperature (2) NTC failure/poor plug-in --- shutdown cooling (25 degrees), the measurement value is about 10K, then NTC has no problem, such as the resistance value is too large or too small (obvious open circuit or short circuit), NTC is bad, replace NTC resistance.
Flash 2	The fan speed is slow or stops spinning	(1) A foreign object jams the fan, causing the fan speed to be abnormal or stop rotating --- cleaning (2) The fan is broken ---replace the fan (3) Poor fan transmission a. Fan directly connected to the display board --- replace the display board b. Poor replacement of the display board/fan adapter board --- optical engine fan
Flash 3	DLP system failure	(1) The FFC between the display board and the DMD board is poorly plugged/ failure--- reinserted/replaced FFC (2) DMD part is not installed in place/DMD failure/DMD board failure--- reassemble DMD/replace DMD/replace DMD board (3) The display board failure--- replace the display board
Flash 4	Communication failure from the display board to the TV board	(1) Check whether there is a problem with the connection cable from the display board to the TV board--- reinsert/replace the cable (2) The display board failure ---replace the display board (3) The mainboard failure--- Replace the mainboard (4) If there are other boards (such as FRC, geometric correction, etc.) between the mainboard and the display board, all intermediate links may cause this problem and should be investigated
The red led is on	Eye protection sensor is not connected	Check whether the eye protection plate is poorly plugged and re-inserted

## 7.2 display board



## 7.3 Special operating procedure

### 7.3.1.EYE PROTECTION- Open by default, user can close

#### a. Function:

When a person approaches, a prompt box will pop up (countdown 5S). If the human is far away within 5 seconds, the prompt box will disappear and the light machine will not be turned off, otherwise the light machine will be turned off, and the light machine will be turned on automatically when the human body is far away;

#### b. Screen prompt:

In order to protect your eyes, do not look into the lens. This projector is shutting down in 5 seconds

#### c. The path for turning off the eye protection function:

Settings->system->console settings->Eye Protection

#### d. Fault determination:

If the Eye protection board failure, the eye protection function is not effective

If the Eye protection board poor connection, the unit not hit, indicator flash 7 times

### 7.3.2. Power Indicator

Function: When turn on the Laser TV, the Power Indicator can be lighted. When the Laser TV is error, the Power Indicator flash to report the error.

### 7.3.4 Automatic dust removal-users cannot close

a. Function:

The machine will automatically trigger the automatic dust removal function every 500 hours of operation, and the fan of the whole machine will run at high speed for 3 minutes. There is a prompt at the bottom of the screen during dust removal.

b. Is it normal to watch the dust removal process→yes

c. Does the subtitle disappear during the dust removal process → not disappear, keeps prompting

d. What happens when the dust removal ends → the subtitle prompt disappears directly after the dust removal ends

### 7.3.5 Temperature reminder

a. Function:

When the ambient temperature reaches 42, the machine will automatically shut down. (The ambient temperature sensor is at the rear air inlet)

b. Screen prompt:

When power on again, it will prompt “The previous shutdown was due to the high temperature of the laser TV, and it was automatically turned off for protection”

c. Fault determination:

If there is a warning of overheating, first check if there are any obstructions around the machine, which may cause poor heat dissipation. If so, remove obstructions.

## 8. Cleaning and Maintenance

(1) Keep dry, avoid long periods of inactivity.

(2) When using the HDMI interface to connect or disconnect multimedia devices, be sure to do it after "turn off the TV".

(3) Regular cleaning

**Host:** Use air blower to clean the dust, not touch or wipe with your hands. For oil stains and fingerprints, wipe carefully with a microfiber cleaning cloth to avoid damage to the optical coating.

**Screen:** Clean the screen with a brush or microfiber cleaning cloth. If there are dirt, fingerprints, etc. on the screen, you can try to wipe it with clean water with a dust-free cloth first, and if it can't be wiped off, you can try to wipe it gently with a dust-free cloth dipped in alcohol.