

Hisense

Smart mini projector C1 series service manual

MT9900

Version: V 1.00

April 25, 2023

REVISION HISTORY			
Version	Revise content	Reviser	Date
V1.00	first issued	Aven Jewel	2023-04-25

content

1. Important Safety Information	3
1.1 Precautions	3
1.2 Warning	3
1.3 Notes	4
5.1 How to enter the Factory Menu	7
5.2 Factory OSD Menu	7
5.2.1 Factory Option	8
5.2.2 Laser Options	8
5.2.3 Soft Version	9
5.2.4 Write keys	9
5.2.5 clean the EEPROM	10
6. Software Upgrade Method	10
6.1 TV in user mode	10
6.2 TV in factory mode	10
7. Troubleshooting	11
7.1 Warning indicator light	11
7.2 Warning display board light	12
7.3 Special operating procedure	12
7.3.1. EYE PROTECTION- Close by default, user can open	12
7.3.2. Auto correction and Auto focus	13
7.3.3. Power Indicator	14
7.3.4 Automatic dust removal-users cannot close	14
7.3.5 Temperature reminder	15
8. Cleaning and Maintenance	15

1. Important Safety Information

1.1 Precautions

BEFORE SERVICING THE mini projector, READ THE SAFETY PRECAUTIONS IN THIS MANUAL. USE ONLY MANUFACTURER SPECIFIED REPLACEMENT PARTS WHEN SERVICING. USE OF NON-AUTHORIZED PARTS WILL VOID THE MANUFACTURE'S WARRANTY

The service procedures recommended by Hisense and described in this Service Guide are effective methods of performing service operations. Some of these service operations require the use of tools specially designed for the purpose. The special tools should be used when and as recommended.

It is important to note that this manual contains various CAUTIONS and NOTICES which should be carefully read in order to minimize the risk of personal injury to service personnel. The possibility exists that improper service methods may damage the equipment and pose risk of personal injury. It is also important to understand that these CAUTIONS and NOTICES ARE NOT EXHAUSTIVE. Service should only be performed by an experienced electronics technician trained in the proper mini projector safety and service methods and procedures.

1.2 Warning

1.2.1

Use of non-manufacturer's recommended parts may create shock, fire, or other hazards. Under no circumstances should the original design be modified or altered without written permission from RCA. Hisense eassumes no liability, express or implied, arising out of any unauthorized modification of design. Service tech assumes all liability.

All ICs and many other semiconductors are susceptible to electrostatic discharges (ESD). Careless handling during repair can reduce life drastically. When repairing, be sure to use anti-static table mats and properly use a grounding wrist stra. Keep components and tools also at this same potential.

IMPORTANT:

Always disconnect the power cord from AC outlet before replacing parts or modules.

1.2.2

To prevent electrical shock, use only a properly grounded 3 prong outlet or extension cord.

1.2.3

Safety regulations require that after a repair the set must be returned in its original condition. In addition, prior to closing set, check that:

-Note:

- >All wire harnesses and flex cables are properly routed and secured with factory tape and/or mounted cable clamps.
- > All cables and connectors are properly insulated and do not have any bare wires/lead exposed

1.2.4

(1) Do not supply a voltage higher than that specified to this product. This may damage the product and may cause a fire.

(2) Do not use this product:

> High humidity areas

> In an area where any water could enter or splash into the unit. High humidity and water could damage the product and cause fire.

(3) If a foreign substance (such as water, metal, or liquid) gets inside the panel module, immediately turn off the power. Continuing to use the product may cause fire or electric shock.

(4) If the product emits smoke, and abnormal smell, or makes an abnormal sound, immediately turn off the power. Continuing to use the product, it may cause fire or electric shock.

(5) Do not pull out or insert the power cable from/to an outlet with wet hands. It may cause electric shock.

(6) Do not damage or modify the power cable. It may cause fire or electric shock.

(7) If the power cable is damaged, or if the connector is loose, do not use the product: otherwise, this can lead to fire or electric shock.

(8) If the power connector or the connector of the power cable becomes dirty or dusty, wipe it with a dry cloth. Otherwise, this can lead to fire.

(9) Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over

1.3 Notes

The work procedures shown with the Note indication are important for ensuring the safety of the product and the servicing work. Be sure to follow these instructions.

- Before starting the work, secure a sufficient working space.
- At all times other than when adjusting and checking the product, be sure to turn OFF the POWER Button and disconnect the power cable from the power

source during servicing.

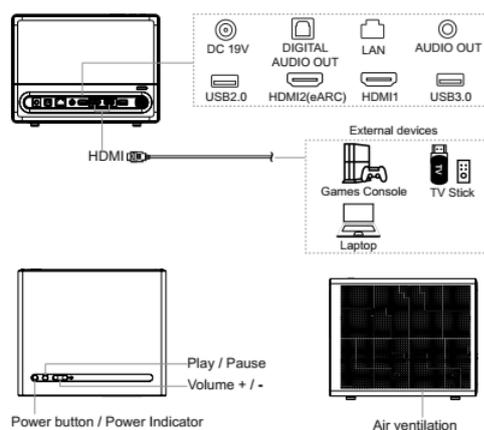
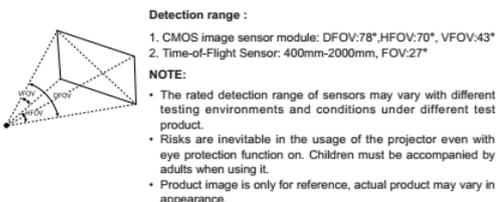
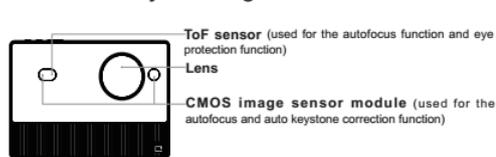
- To prevent electric shock and breakage of PC board, start the servicing work at least 30 seconds after the main power has been turned off. Especially when installing and removing the power board, start servicing at least 2 minutes after the main power has been turned off.
- While the main power is on, do not touch any parts or circuits other than the ones specified. If any connection other than the one specified is made between the measuring equipment and the high voltage power supply block, it can result in electric shock or may trip the main circuit breaker
- Be sure to handle the circuit board by holding the large parts as the heat sink or transformer. Failure to observe this precaution may result in the occurrence of an abnormality in the soldered areas.
- Do not stack the circuit boards. Failure to observe this precaution may result in problems resulting from scratches on the parts, the deformation of parts, and short-circuits due to residual electric charge.
- Perform a safety check when servicing is completed. Verify that the peripherals of the serviced points have not undergone any deterioration during servicing. Also verify that the screws, parts and cables removed for servicing purposes have all been returned to their proper locations in accordance with the original setup.

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 products 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

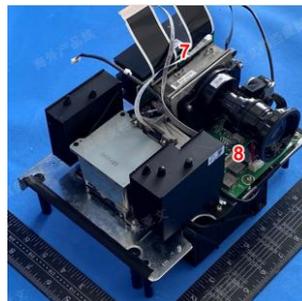
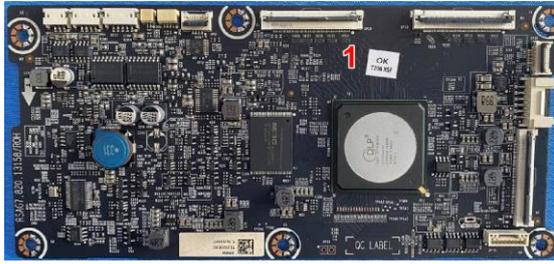
2. Unit and External Ports

Smart Mini Projector Diagram



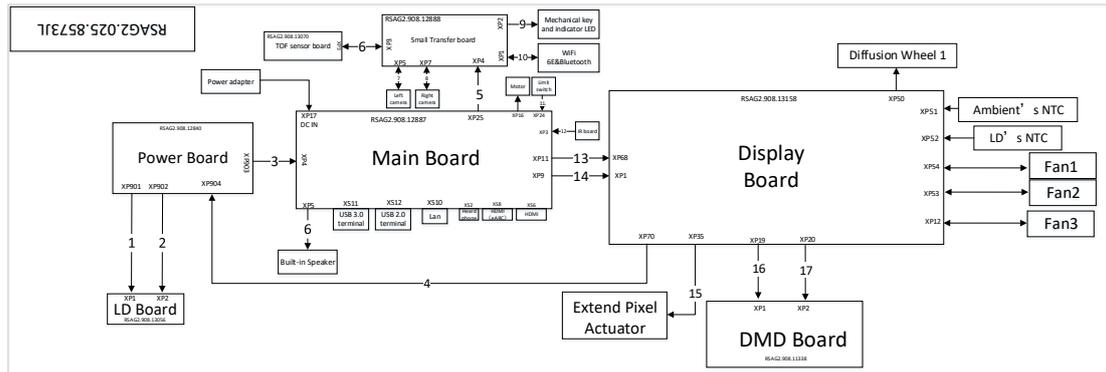
5

3. List of circuit boards



NO.	Part	NO.	Part
1	Display board (including software)	5	TOF sensor Board
2	Main Board (including software)	6	WiFi& Bluetooth
3	Small transfer Board	7	DMD board
4	Indicator led Panel board& Key Board	8	Power board

4. Wiring diagram



No.	Part number	Description	Notes	Quantity
1	1307535	条形连接线PHB-2X7Y-280-XUROH	Laser board to Power board cable	1
2	1307535	条形连接线PHB-2X7Y-280-XUROH	Laser board to Power board cable	1
3	1307467	条形连接线PHB-2X6Y-190-XUGUROH	Main board to Power board cable	1
4	1273823	条形连接线GH-8Y-GH-8Y-150-1H28UROH	Display board to power board cable	1
5	1273826	高速信号线VFC-T-41-NP1-114-Z0114UROH	Small transfer board to main board	1
6	1273820	条形连接器GH-6Y-GH-6Y-110-1X28UROHUG	TOF sensor board to small transfer board	1
7	1273821	条形连接器GH-5Y-GH-5Y-200-1X28UROHUG	Left camera to small transfer board cable	1
8	1273819	条形连接器GH-5Y-GH-5Y-108-1X28UROH	Right camera to small transfer board cable	1
9	1273806	条形连接线GH-8Y-47-HUGUROH	Small transfer board to Mechanical key and indicator board cable	1
10	1304795	高速信号线VFC-L-20-KP-135-Z1-11135UROH	WiFi & Bluetooth board to small transfer board cable	1
11	1282361	条形连接线GH-5Y-PH1.25-5Y-220-HUGUROH	Limit switch to main board cable	1
12	1280480	条形连接线GH-3Y-45-HUGUROH	IR board to main board cable	1
13	1280090	高速信号线VFC-V-51-KP1-53-Z053UROH	Main board to Display board FFC cable	1
14	1273824	条形连接器2008-6Y-2008-6Y-38-1H24UROH	Main board to display board cable	1
15	1273827	高速信号线VFC-T-12-K-141-Z2141UROH	Extend Pixel Actuator to Display board cable	1
16	1240744	高速信号线VFC-V-51-KA-75-Z075UROH	DMD board to Display board cable	1
17	1240744	高速信号线VFC-V-51-KA-75-Z075UROH	DMD board to Display board cable	1

设计	朱亚文	TL7K Connection Diagram	RSAG2.025.8573JL	
审核	陈许		阶段标记	质量
工艺	张一			比例
标准化	王玉乾		第 1 页	共 1 页
批准	吴超		海信视像科技股份有限公司	

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->Advanced setting -> 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

White Balance Options		Laser Options	
Soft Version		Soft Version	TL7.V0000.K.00.
Write Keys		06.20B.N0414	
Version	TL7.V0000.K.00.	TCON Version	NULL
	06.20B.N0414	FRC Version	NULL
MAC Adr	DC:9A:7D:FD:91:76	BLU Version	NULL
	USA his eng	BLU Status	NULL
Cur project ID	002 TL7K	MAC Version	DC:9A:7D:FD:91:76
HDCP2.2 key	00621448	ChipID	f21bcb9b8f938909
HDCP1.4 key	07352822		
ESN	HISETLKB4600000	QDA UUID	603100000520
	0000000000000000	DLP version	80
	000000010052	DLP MCU version	21
WIDEVINE key	00430417	DLP FPGA version	0
QDA key	603100000520	GC MCU version	0.0.0.0
Service No.	1PLA03ENUS0L01A2Y610037	GC FPGA version	0.0.0.0

5.2.2 Laser Options

White Balance Options		Clear BT	
Laser Options		Clear BT	
Soft Version		To Alarm	Off
Write Keys		Display upgrade	Off
Version	TL7.V0000.K.00.	Temperature protect	On
	06.20B.N0414	MIRROR	0
MAC Adr	DC:9A:7D:FD:91:76	Clear laser run time	
	USA his eng	Laser run time	44h
Cur project ID	002 TL7K	Screen Type	High Gain ALR (2)
HDCP2.2 key	00621448	Eye protect	Off
HDCP1.4 key	07352822	Display Model	Overlap
ESN	HISETLKB4600000	Overlap	0
	0000000000000000	CLO	4
	000000010052	DLP Upgrade	
WIDEVINE key	00430417	Fan speed	
QDA key	603100000520	Shift auto keystone	On
Service No.	1PLA03ENUS0L01A2Y610037	Camera auto adjust	
		Gyro and accelerometer calibration	
		Gyro and accelerometer	
		Reset to default scale	
		TOF data query	

5.2.3 Soft Version

Factory		Design	
White Balance			
Options			
Laser Options			
Soft Version			
Write Keys		Soft Version	
Version	TL7.V0000.K.00.	TL7.V0000.K.00.	
	06.20B.N0414	06.20B.N0414	
MAC Adr	DC:9A:7D:FD:91:76	TCON Version	NULL
	USA his eng	FRC Version	NULL
Cur project ID	002 TL7K	BLU Version	NULL
HDCP2.2 key	00621448	BLU Status	NULL
HDCP1.4 key	07352822	MAC Version	DC:9A:7D:FD:91:76
ESN	HISETLKB4600000	ChipID	f21bcb9b8f938909
	0000000000000000	QDA UUID	603100000520
	000000010052	DLP version	80
WIDEVINE key	00430417	DLP MCU version	21
QDA key	603100000520	DLP FPGA version	0
Service No.	1PLA03ENUS0L01A2Y610037	GC MCU version	0.0.0.0
		GC FPGA version	0.0.0.0

5.2.4 Write keys

Factory		Design	
White Balance			
Options			
Laser Options			
Soft Version			
Write Keys		MAC	
Version	TL7.V0000.K.00.	HDCP2.2	
	06.20B.N0414	HDCP1.4	
MAC Adr	DC:9A:7D:FD:91:76	netflix	
	USA his eng	widevine	
Cur project ID	002 TL7K	QDA	
HDCP2.2 key	00621448		
HDCP1.4 key	07352822		
ESN	HISETLKB4600000		
	0000000000000000		
	000000010052		
WIDEVINE key	00430417		
QDA key	603100000520		
Service No.	1PLA03ENUS0L01A2Y610037		

Note:

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

The factory menu data varies according to different sources. Incase 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 “Loading data” interface, update process bar is 1%.

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

Figure-1: Loading data

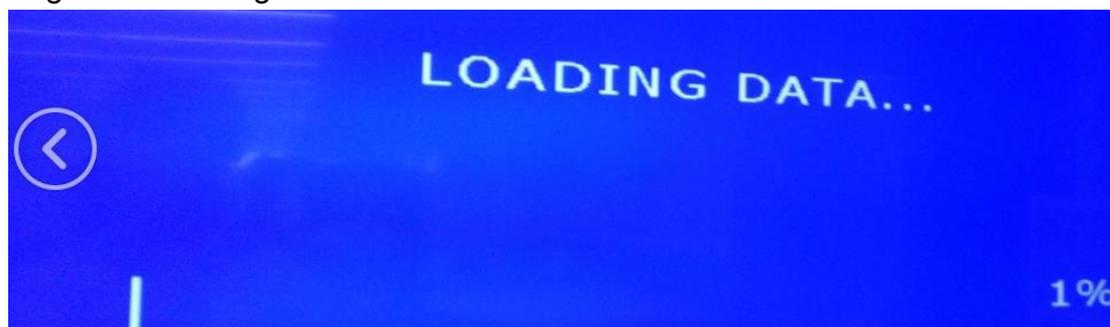
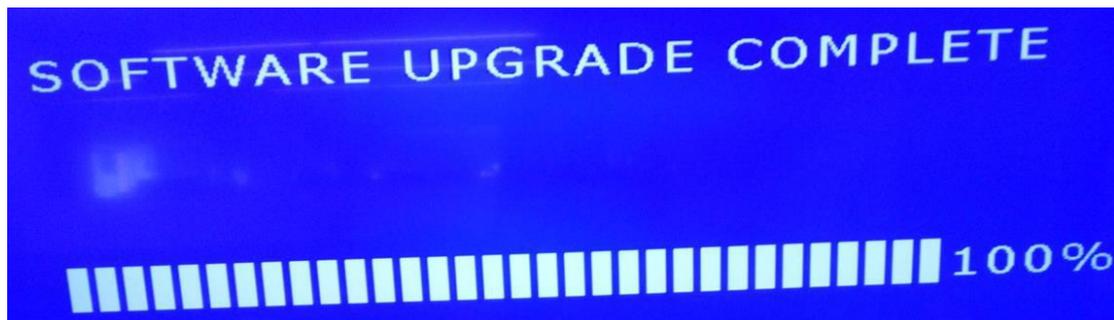


Figure-2: Upgrading software



Figure-3: 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
Flash 5	The foreign object detection function is triggered	(1) There is a foreign object that causes the detection function to trigger (non-faulty) -- remove the foreign object, and enter the factory menu for foreign object detection calibration (2) The failure of the foreign object detection sensor causes the detection function to be triggered by mistake -- replace the foreign object detection board, and enter the factory menu for foreign object detection calibration
Flash 6	Diffusion wheel failure	(1) The failure of the display board leads to abnormal color wheel feedback - replace the display board (2) The color wheel itself is poor - replace the optical engine
Flash 7	Eye protection sensor/foreign object detection sensor is not connected	Check whether the eye protection plate/foreign body detection plate is poorly plugged and re-inserted

7.2 Warning display board light

This display board don't have Led indicator.

7.3 Special operating procedure

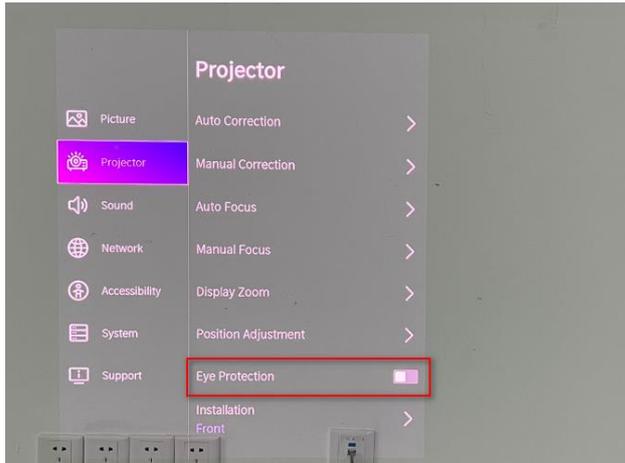
7.3.1.EYE PROTECTION- Close by default, user can open

a. Function:

When someone or object approaches the machine and triggers the eye protection, the screen immediately adjusts the backlight to the minimum; At the same time, the pop-up window prompts, " In order to protect your eyes, do not look into the lens. This projector is shutting down in 5 seconds (or Other)", the sensor continues to detect occlusion, then turn off the screen; if the person or object leaves, and the screen is turned on.

b. The path for turning off the eye protection function:

Settings->projector ->Eye Protection



7.3.2. Auto correction and Auto focus

2 Automatic Focus

When the automatic focus function is enabled, the device can automatically adjust the focus to make your projector picture clear.

- Enable automatic focus function by pressing the  button on the remote.
- You can enable manual focus function by pressing and holding the  button, and manually adjust the focus by pressing the D-pad on the remote.

3 Automatic Correction

Press Home button on your remote, and select **Settings > Projector > Auto Correction**.

The device can perform automatic keystone correction on the projected screen and automatically changes the screen shape into a rectangle.

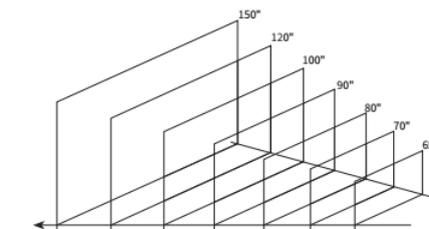
4 More Settings

Press Home button on your remote, select **Settings** to enter the Settings Menu to set up your device.

NOTE:

- For detailed instructions, please refer to the E-Manual.
- Parts of the software function changes with the system upgrade.

5 Image Size and Projection Distance



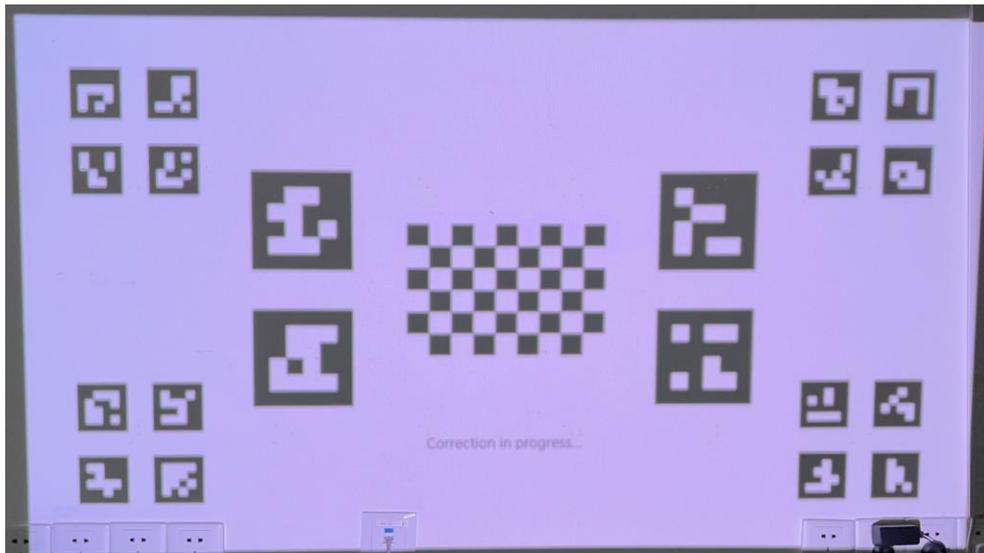
Screen Size	150"	120"	100"	90"	80"	70"	65"
Projection Distance							
mm	3985	3188	2657	2391	2125	1860	1727
inch	157	126	105	94	84	73	68

8

Setting->Projector->Auto Correction

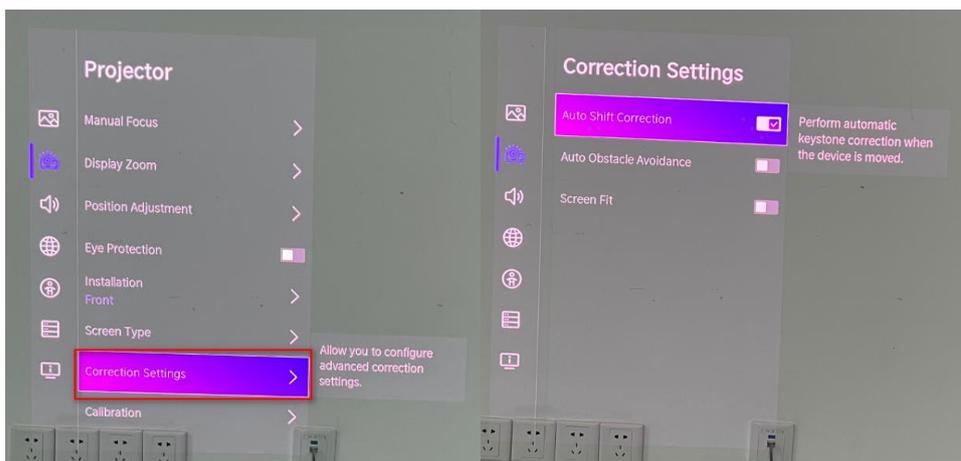
Setting->Projector->Auto Focus





If you want to use auto correction or auto obstacle avoidance function:

Setting->Projector->correction settings



7.3.3. 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 protect temperature, the screen will remind overheat protection, if continuous warming, the machine will automatically shut down.

- 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.