LED-TV

Chassis : U71A

Model : UE60EH600**

SERVICE MANUAL

LED TV

UE60EH600**

Contents

Refer to the service manual in the GSPN (see the rear cover) for more information.

Contents

1. Precautions

1.1. Safety Precautions

Follow these safety, servicing and ESD precautions to prevent damage and to protect against potential hazards such as electrical shock.

1-1-1. Warnings

WARNING

For continued safety, do not attempt to modify the circuit board.
Disconnect the AC power and DC power jack before servicing.

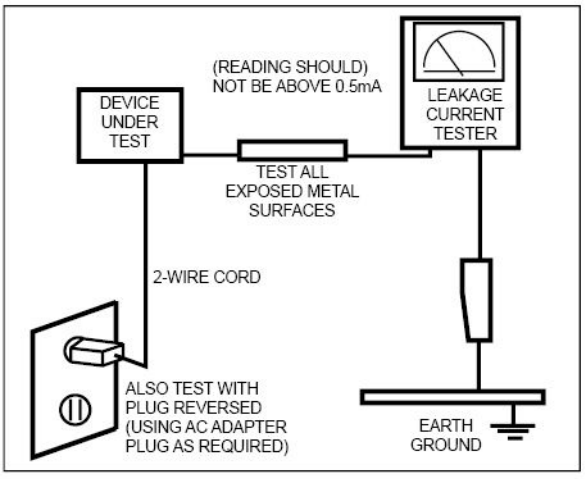
1-1-2. Servicing the LED TV

1. When servicing the LED TV, Disconnect the AC line cord from the AC outlet.
2. It is essential that service technicians have an accurate voltage meter available at all times. Check the calibration of this meter periodically.

1-1-3. Fire and Shock Hazard

Before returning the monitor to the user, perform the following safety checks:

1. Inspect each lead dress to make certain that the leads are not pinched or that hardware is not lodged between the chassis and other metal parts in the monitor.
2. Inspect all protective devices such as nonmetallic control knobs, insulating materials, cabinet backs, adjustment and compartment covers or shields, isolation resistorcapacitor networks, mechanical insulators, etc.
3. Leakage Current Hot Check:



WARNING

Do not use an isolation transformer during this test.
Use a leakage current tester or a metering system that complies with American National Standards Institute (ANSI C101.1, Leakage Current for Appliances), and Underwriters Laboratories (UL Publication UL1410, 59.7).

4. With the unit completely reassembled, plug the AC line cord directly into a 120V AC outlet. With the unit's AC switch first in the ON position and then OFF, measure the current between a known earth ground (metal water pipe, conduit, etc.) and all exposed metal parts, including: metal cabinets, screwheads and control shafts.
The current measured should not exceed 0.5 milliamp.
Reverse the power-plug prongs in the AC outlet and repeat the test.

1-1-4. Product Safety Notices

Some electrical and mechanical parts have special safetyrelated characteristics which are often not evident from visual inspection. The protection they give may not be obtained by replacing them with components rated for higher voltage, wattage, etc. Parts that have special safety characteristics are identified by ⚠ on schematics and parts lists. A substitute replacement that does not have the same safety characteristics as the recommended replacement part might create shock, fire and/or other hazards. Product safety is under review continuously and new instructions are issued whenever appropriate.

1.2. Servicing Precautions

An electrolytic capacitor installed with the wrong polarity might explode.

Before servicing units covered by this service manual, read and follow the Safety Precautions section of this manual.

If unforeseen circumstances create conflict between the following servicing precautions and any of the safety precautions, always follow the safety precautions.

1-2-1. General Servicing Precautions

1. Always unplug the unit's AC power cord from the AC power source and disconnect the DC Power Jack before attempting to: (a) remove or reinstall any component or assembly, (b) disconnect PCB plugs or connectors, (c) connect a test component in parallel with an electrolytic capacitor.
2. Some components are raised above the printed circuit board for safety. An insulation tube or tape is sometimes used. The internal wiring is sometimes clamped to prevent contact with thermally hot components. Reinstall all such elements to their original position.
3. After servicing, always check that the screws, components and wiring have been correctly reinstalled. Make sure that the area around the serviced part has not been damaged.
4. Check the insulation between the blades of the AC plug and accessible conductive parts (examples: metal panels, input terminals and earphone jacks).
5. Insulation Checking Procedure: Disconnect the power cord from the AC source and turn the power switch ON. Connect an insulation resistance meter (500 V) to theblades of the AC plug. The insulation resistance between each blade of the AC plug and accessible conductive parts (see above) should be greater than 1 megohm.
6. Always connect a test instrument's ground lead to the instrument chassis ground before connecting the positive lead; always remove the instrument's ground lead last.

1.3. Static Electricity Precautions

Some semiconductor (solid state) devices can be easily damaged by static electricity. Such components are commonly called Electrostatically Sensitive Devices (ESD). Examples of typical ESD are integrated circuits and some field-effect transistors. The following techniques will reduce the incidence of component damage caused by static electricity.

1. Immediately before handling any semiconductor components or assemblies, drain the electrostatic charge from your body by touching a known earth ground. Alternatively, wear a discharging wrist-strap device. To avoid a shock hazard, be sure to remove the wrist strap before applying power to the monitor.
2. After removing an ESD-equipped assembly, place it on a conductive surface such as aluminum foil to prevent accumulation of an electrostatic charge.
3. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ESDs.
4. Use only a grounded-tip soldering iron to solder or desolder ESDs.
5. Use only an anti-static solder removal device. Some solder removal devices not classified as “anti-static” can generate electrical charges sufficient to damage ESDs.
6. Do not remove a replacement ESD from its protective package until you are ready to install it. Most replacement ESDs are packaged with leads that are electrically shorted together by conductive foam, aluminum foil or other conductive materials.
7. Immediately before removing the protective material from the leads of a replacement ESD, touch the protective material to the chassis or circuit assembly into which the device will be installed.

CAUTION Be sure no power is applied to the chassis or circuit and observe all other safety precautions.

8. Minimize body motions when handling unpackaged replacement ESDs. Motions such as brushing clothes together, or lifting your foot from a carpeted floor can generate enough static electricity to damage an ESD.

1.4. Installation Precautions

1. For safety reasons, more than a people are required for carrying the product.
2. Keep the power cord away from any heat emitting devices, as a melted covering may cause fire or electric shock.
3. Do not place the product in areas with poor ventilation such as a bookshelf or closet. The increased internal temperature may cause fire.
4. Bend the external antenna cable when connecting it to the product. This is a measure to protect it from being exposed to moisture. Otherwise, it may cause a fire or electric shock.
5. Make sure to turn the power off and unplug the power cord from the outlet before repositioning the product. Also check the antenna cable or the external connectors if they are fully unplugged. Damage to the cord may cause fire or electric shock.
6. Keep the antenna far away from any high-voltage cables and install it firmly. Contact with the highvoltage cable or the antenna falling over may cause fire or electric shock.
7. When installing the product, leave enough space (0.4m) between the product and the wall for ventilation purposes. A rise in temperature within the product may cause fire.

2. Product Specifications

2.1. Product Information

2-1-1. Model Comparison

Model	UE60EH600**		
Front View	 * W : Width H : High D : Depth		
Detail View			
Front Color	Black (Panel)		
Dimensions (W x H x D)	60"	Set with Stand	1374.1 x 859.0 x 329.8 mm / 54.1 x 33.8 x 13.0 inches
		Set without Stand	1374.1 x 807.0 x 94.3 mm / 54.1 x 31.8 x 3.7 inches
		Set without Stand	1374.1 x 807.0 x 94.3 mm / 54.1 x 31.8 x 3.7 inches
Weight	60"	Set with Stand	25.8 kg / 56.9 lbs
		Set without Stand	23.2 kg / 51.1 lbs
Panel Type	Anti Glare		
Internal Memory	None		
DDR	128 Mbtye		
Feature	Media Play(Movie)		

2-1-2. Feature & Specifications

Model	UE60EH600**

Feature

- Digital-TV, RF, 1-HDMI, 1-Component, 1-A/V, 1-USB2.0
- High Contrast Ratio : MEGA
- Response Time : 8 ms
- CMR Clear Motion Rate : 200

Specifications

Item	Description	
LCD Panel	60 inch FHD 60 Hz	
Scanning Frequency	Horizontal : 60 kHz ~ 73 kHz (Automatic) Vertical : 47 Hz ~ 63 Hz (Automatic)	
Display Colors	16.7M colors	
Maximum Resolution	Horizontal : 1920 Pixels Vertical : 1080 Pixels	
Input Signal	Analog 0.7 Vp-p ± 5% positive at 75Ω, internally terminated	
Input Sync Signal	H/V Separate, TTL, P. or N.	
Maximum Pixel Clock Rate	74.25 MHz	
Active Display (H x V)* * Horizontal x Vertical	1329.1 (H) x 747.6 (V) mm / 54.2 (H) x 30.5 (V) inches	
AC Power Voltage & Frequency	AC 220 V ~ 240 V, 50/60 Hz	
Power Consumption	147 W (Under 0.3 W, Stand by)	
Dimensions Set (W x H x D)* * Width x High x Depth	Set with Stand	1374.1 x 859.0 x 329.8 mm / 54.1 x 33.8 x 13.0 inches
	Set without Stand	1374.1 x 807.0 x 94.3 mm / 54.1 x 31.8 x 3.7 inches
Weight	Set with Stand	25.8 kg / 56.9 lbs
	Set without Stand	23.2 kg / 51.1 lbs
TV System	Tunning	Frequency Synthesize (Refer to detailed Frequency Table)
	System	DVB-TCS2/T2C, PAL
	Sound	BK, DK, NICAM, MPEG1
Environmental Considerations	Operating Temperature: 32°F ~ 122°F (0°C ~ 50°C) Operating Humidity: 20% ~ 90% Storage Temperature: -4°F ~ 140°F (-20°C ~ 60°C) Storage Humidity: 10% ~ 90%	
Audio Specifications	MAX Internal Audio Output Power : Each 10 W(Left/Right) Equalizer : 5 Band Output Frequency : • RF : 20 Hz ~ 15.4 kHz • AV/Componet/HDMI : 20 Hz ~ 20 kHz	
Note: Dolby Digital Plus/Pulse, USB2.0, Film mode, Energy Saving, Eco sensor		

2-1-3. Specification Comparison to Old Models

Model	UE6Q(UA60EH600**)	UD6T(UE**D6000SM)	
Design			
Diplay Type	LED TV	LED TV	
Built-in Tuner	O	O	
Resolution	1920 x 1080	1920 x 1080	
LCD Panel	TFT LCD Panel 60 Hz	TFT LCD Panel 100 Hz	
Screen Size	60"	32" / 40" / 46" / 55"	
Picture ratio	16 : 9	16 : 9	
Power Consumption	Under 147 W (under 0.3 W, Standby)	32"	Under 100 W (under 0.3 W, Standby)
		40"	Under 120 W (under 0.3 W, Standby)
		46"	Under 130 W (under 0.3 W, Standby)
		55"	Under 160 W (under 0.3 W, Standby)
Dimensions (W x H x D)	1374.1 x 807.0 x 94.3 mm_without stand	32"	30.2 x 21.0 x 9.4 inches_with stand
			30.2 x 18.7 x 1.2 inches_without stand
		40"	37.6 x 25.1 x 10.0 inches_with stand
			37.6 x 22.9 x 1.2 inches_without stand
	54.1 x 31.8 x 3.7 inches_without stand	46"	42.9 x 28.1 x 10.8 inches_with stand
			42.9 x 25.9 x 1.2 inches_without stand
		55"	50.4 x 32.3 x 12.0 inches_with stand
			50.4 x 30.0 x 1.2 inches_without stand
Weight	25.8 kg / 56.9 lbs_with stand	32"	21.40 lbs_with stand
			15.40 lbs_without stand
		40"	31.30 lbs_with stand
			24.00 lbs_without stand
	23.2 kg / 51.1 lbs_without stand	46"	37.73 lbs_with stand
			29.78 lbs_without stand
		55"	48.98 lbs_with stand
			39.71 lbs_without stand
Contrast Ratio	MEGA	MEGA	
Picture Enhancer	HyperReal Engine (X9)	HyperReal Engine (Genoa-S)	
Wide Color Enhance Plus	Wide Color Enhance Plus	Wide Color Enhance Plus	

Model	UE6Q(UA60EH600**)	UD6T(UE**D6000SM)	
Equalizer	5 Band	5 Band	
Auto Volume Control	O	O	
Surround Sound	Dolby Digital Plus/Pulse	Dolby Digital Plus	
Speaker Output	10 W x 10 W	32"	10 W x 10 W
		40"	10 W x 10 W
		46"	10 W x 10 W
		55"	15 W x 15 W
PIP	O	O	
Function	Jog function	Touch function	
Caption	O	O	
Game Mode	O	O	
Energy Saving	O	O	
Network	X	O	
Anynet+	X	O	
Antenna	1(Cable/Air)	1(Cable/Air)	

2.2. Detail Factory Option

NOTE

If you replace the main board with new one, please change the factory option as well.
The options you must change are "Type".

Model Name		UE60EH600**
PANEL	Vendor	SHARP
	Code	BN95-00621A
	Spec.	DE600CGS-V1
SMPS	Vendor	SEM
	Code	BN44-00500A
	Spec.	PSLF131C04A
MAIN	Chassis Ass'y	BN91-10031*
	PBA Ass'y	BN94-06079*

Byte	Item	
0	Factory Reset	-
1	Type	60H1AF0D
2	Local Set	EU_GER
3	Basic Model	UEH6000
4	SVC Model	6000
5	TUNER	DVB_TCS2
6	Ch Table	-
7	Front Color	U-S-C-6K

2.3. Accessories

Product	Description	Code. No		Remark
	Remote Control	AA59-00602A		Samsung Electronics Service center
	Batteries (AAA x 2)	4301-000121		
	Power Cord	UK	3903-000619	
		Germany	3903-000623	
	Owners Manual	UK	BN68-04634K	
		Germany	BN68-04634D	
	Holder-Wire Stand	BN61-05491A		
	Holder-Ring (4 EA)	BN96-18153A		

3. Disassembly and Reassembly

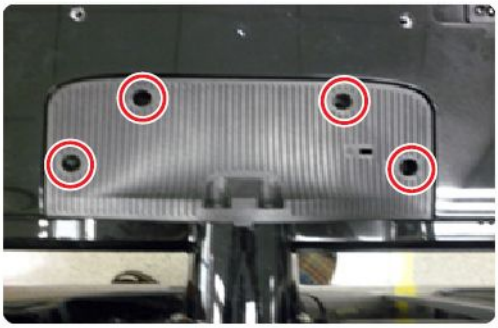
This section of the service manual describes the disassembly and reassembly procedures for the LED TV.

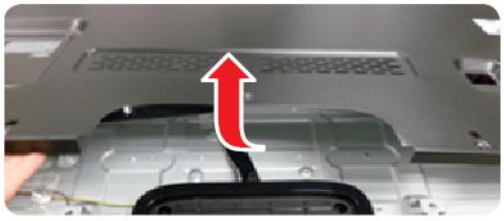
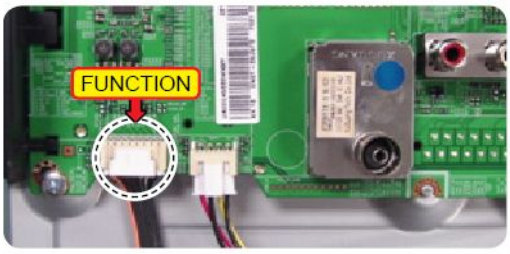
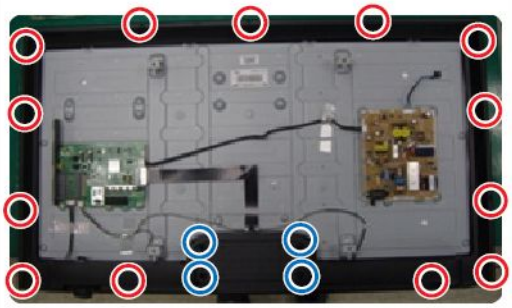
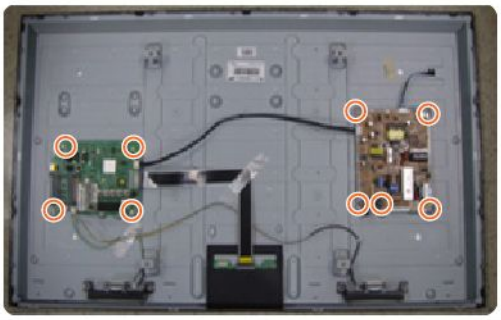
WARNING This LED TV contains electrostatically sensitive devices. Use caution when handling these components.

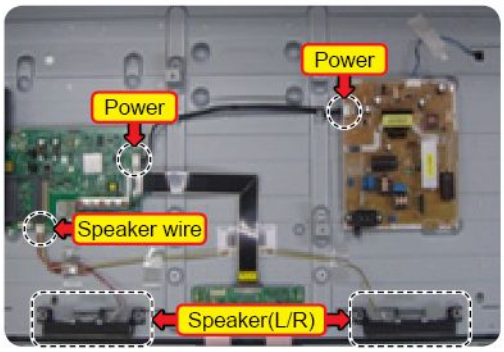
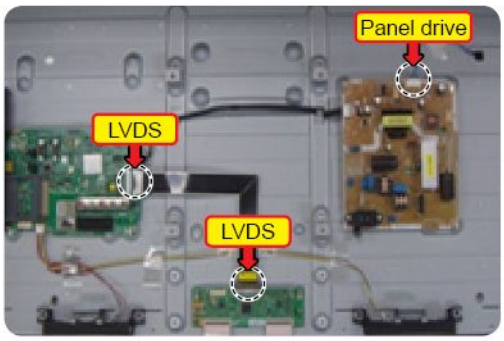
3.1. Disassembly and Reassembly

CAUTION

1. Disconnect the LED TV from the power source before disassembly.
2. Follow these directions carefully; never use metal instruments to pry apart the cabinet.
3. If there is no additional coment, it is same for all inches.

Description	Picture Description	Screws
1 Place TV face down on cushioned table.		
2 Remove 4 screws from the Stand.		 6003-001782
3 Remove Stand.		

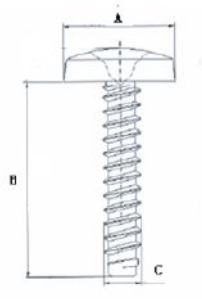
Description	Picture Description	Screws
4 Remove the 10 EA screws of ASSY COVER P-REAR.		 6003-001782  6003-002755
5 Remove the ASSY COVER P-REAR.		
6 Disconnect the Function Cable.		
7 Remove the 17 EA screws of ASSY COVER P-REAR.		 6003-001782  6003-002755
8 Remove the ASSY COVER P-MIDDLE.		
9 Remove the screws of MAIN BOARD, SMPS BOARD. • MAIN BOARD: 4 EA • SMPS BOARD: 5 EA		 6001-002756

Description	Picture Description	Screws
10 Remove the 4 screws of BRACKET-WALL.		 6001-002756
11 Remove the ASSY SPEAKER (L/R) and Power Cables.		
12 Remove the LVDS Cable and Panel Drive Cable.		
12 Completed disassembly.		

NOTE

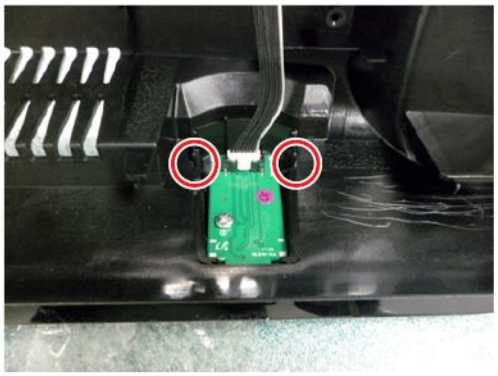
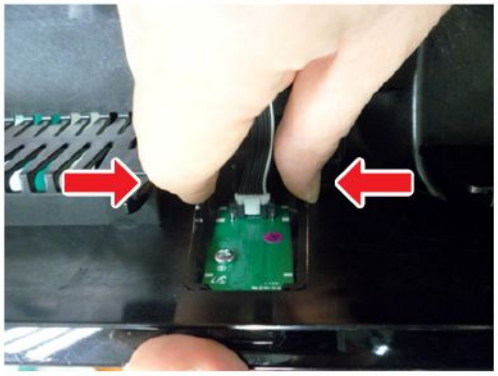
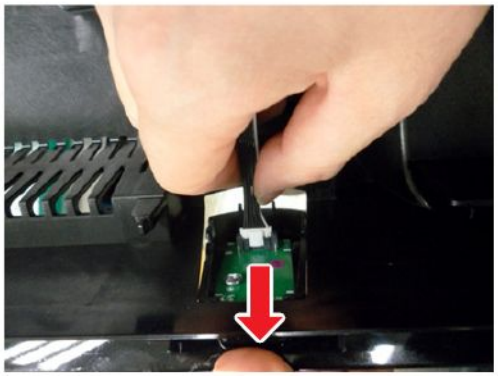
Reassembly procedures are in the reverse order of disassembly procedures.

Screw Size

Code No.	COLOR	A (mm)	B (mm)	C (mm)	
6003-001782	BLACK	7.80~8.30	11.20~12.00	3.81~3.91	
6001-002755	BLACK	7.1~7.5	5.7~6.0	2.98~3.02	
6001-002756	WHITE	7.1~7.5	5.7~6.0	2.98~3.02	

3.2. Assy Board P-Jog Switch & Ir

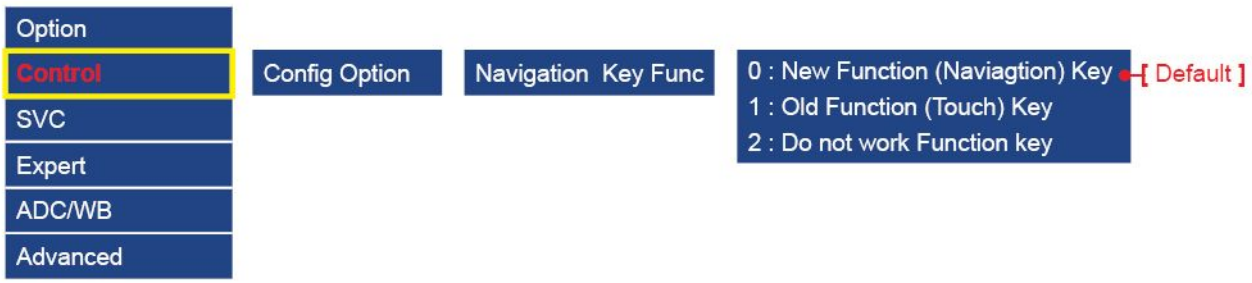
■ How to disassembly

	Description	Picture Description	Refer
1	Check the 2 Locking Holders.		
2	Press both holders.		
3	Remove the Function Assy.		

■ How to assembly

Description	Picture Description	Refer
1 Check the locking hole.		
2 Combine the function assy to locking hole.		
3 Press the function assy to TV.		

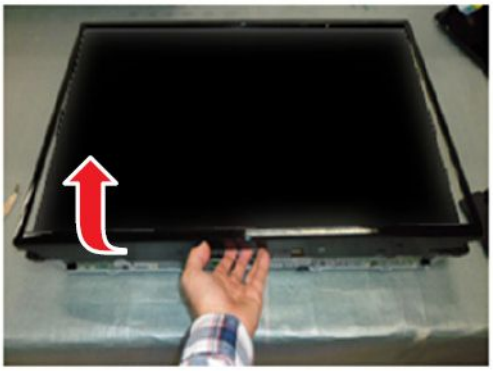
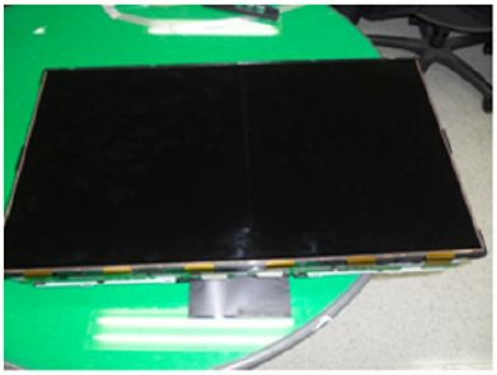
When you want to ignore the funtion key actions



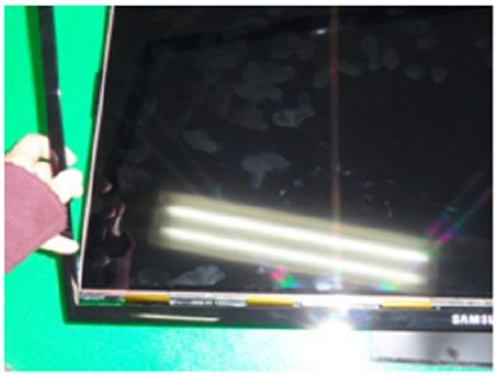
3.3. Disassembly(PTC)

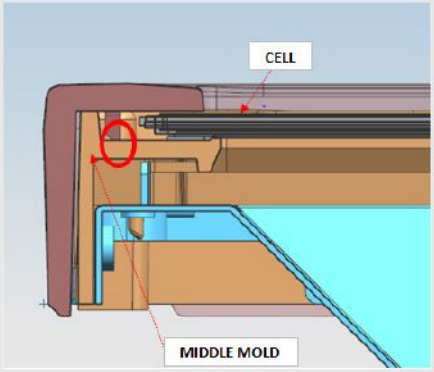
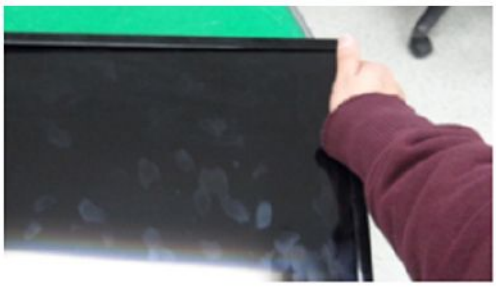
■ How to disassembly

Description	Picture Description	Refer
1 Place TV face up on cushioned table.		
2 Remove the ASSY Function assy.		
3 Spread the both sides of PTC upper (marked "▼") by use the tool. **CAUTION** Do not scratch on both side by use tool. Gate Cof will be damaged. 	 	

Description	Picture Description	Refer
4 Separate the left and right side of the PTC as shown.		
5 Separate the Bottom of the PTC as shown		
6 Raise up the PTC Bottom.		
7 Disassembly is complete.		

■ How to reassembly

Description	Picture Description	Refer
1 Attach the PTC Bottom first to the Panel.		
		
2 Secure the plastic latch on the left and right side of the PTC as shown.		

Description	Picture Description	Refer
3 Visually inspect the spacing between the PTC and the Panel for equal clearance. **CAUTION** Combine to stick the PTC Rib into the middle mold. 		
		
		
		
		

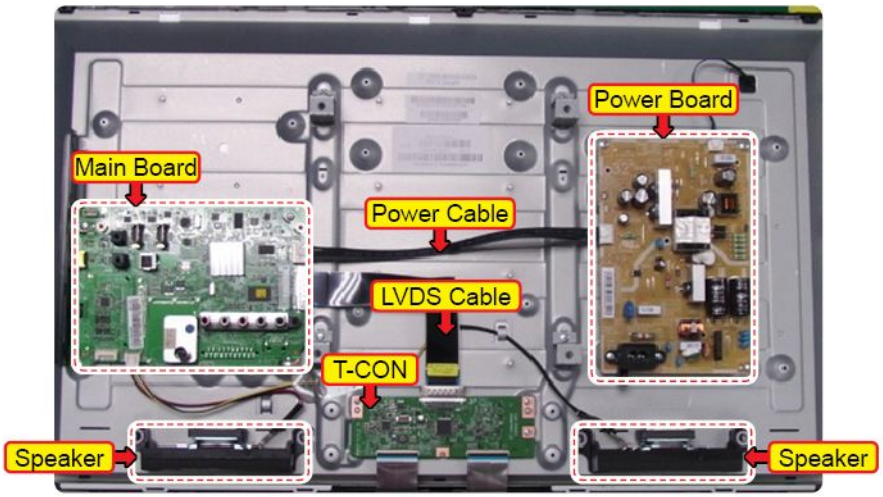
Description	Picture Description	Refer
4 Assembly is complete.		

4. Troubleshooting

4.1. Troubleshooting

■ Previous Check

1. Check the various cable connections first.
   - Check to see if there is a burnt or damaged cable.
   - Check to see if there is a disconnected or loose cable connection.
   - Check to see if the cables are connected according to the connection diagram.
2. Check the power input to the Main Board.



Main Ass'y (CN204_L, CN203_S)			
13	B13V	14	B13V
11	B13V	**12**	**B13V**
9	B13VS	10	SW_INV
7	B13VS	8	GND
5	GND	6	GND
3	B5.3V	4	A5.3V
1	B5.3V	2	SW_PW

Power Ass'y (CMN801)			
14	B13V	13	B13V
12	**B13V**	11	B13V
10	SW_INV	9	B13VS
8	GND	7	B13VS
6	GND	5	GND
4	A5.3V	3	B5.3V
2	SW_PW	1	B5.3V

* Change the 12 PIN to B13V(2012) from NC(2011)

3. Check the power in & output between IP & Main Board, Main Board & Panel, IP & Panel.

■ How to know it is from Main Board or T-Con when some problems happen

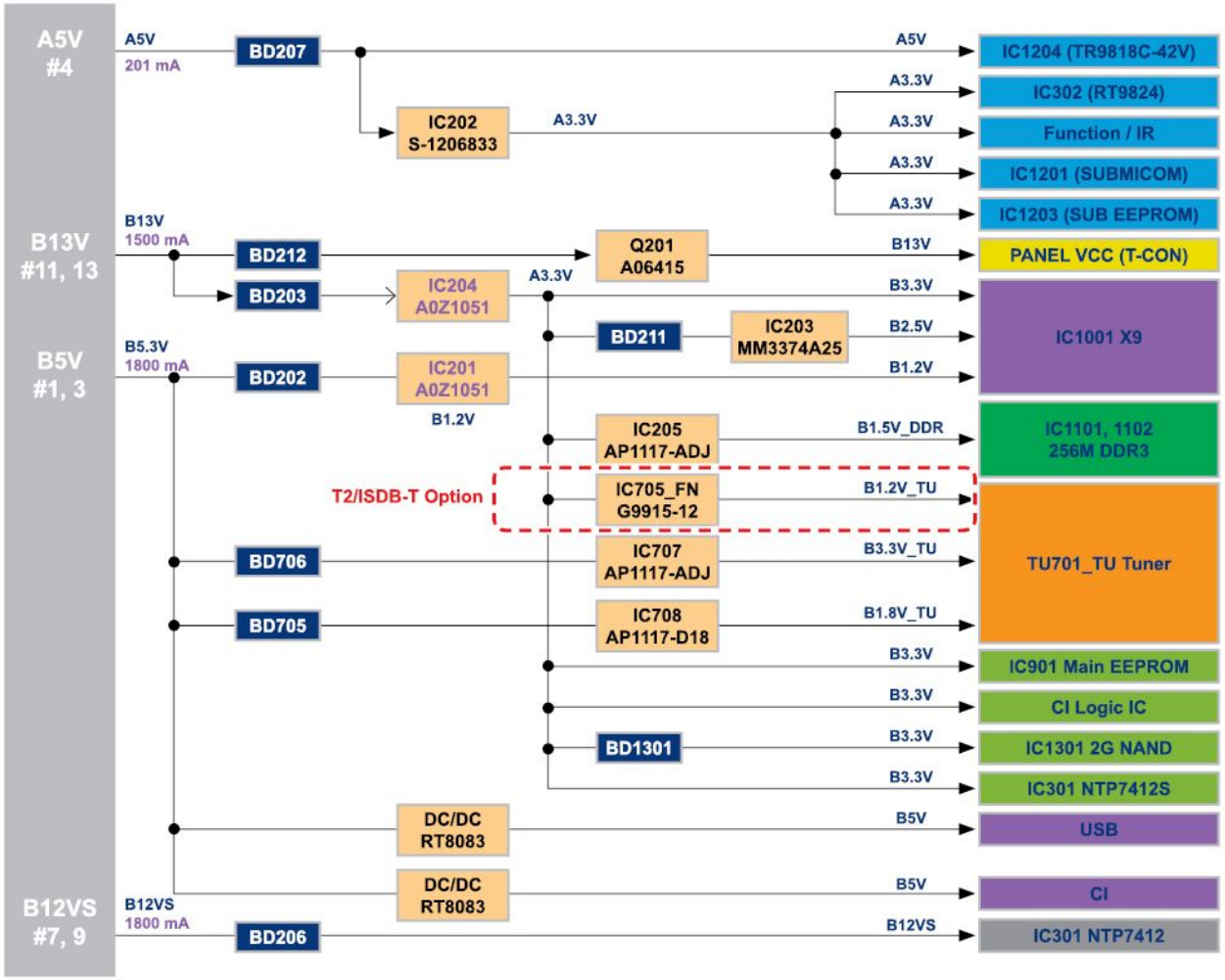
1. No Picture : Backlight is on, but there is no picture and LED indicator in front of TV is blinking.
   - Check the LVDS Cable connection. If still problems, change the T-Con Board and then Main Board step by step.
2. Picture distortion : Enter the service mode ···› Choose 'SVC' ···› Check the 'internal pattern.'
   - Enter 'Service Mode.'
     - If you do not have Factory remote control

       Power OFF → MUTE → 1 → 8 → 2 → Power On
     - If you have Factory remote control

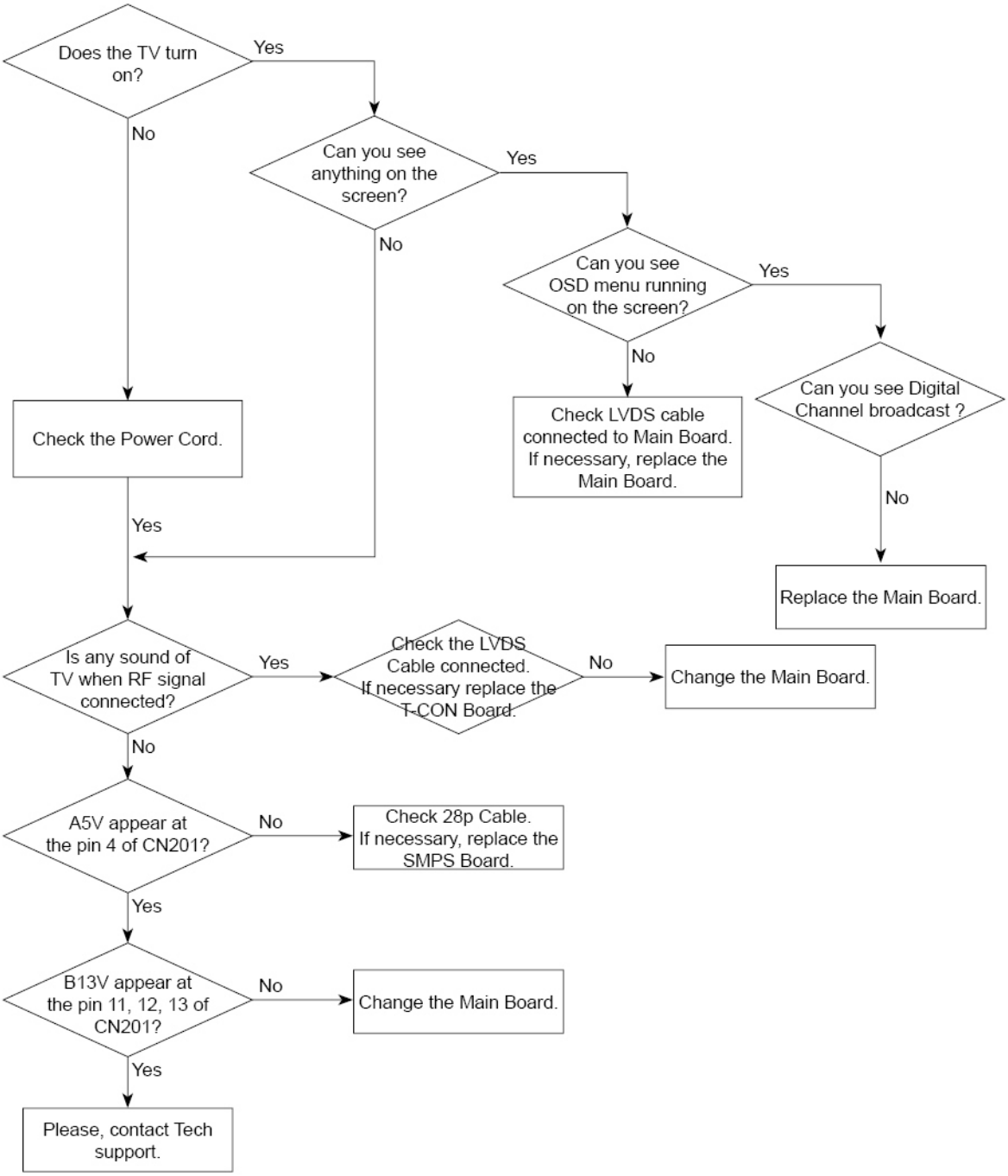
       INFO → Factory
3. Choose 'SVC.'
4. Choose 'Test pattern.'
5. Select the each pattern and then check all pattern is ok or not.

Pattern Status is	Change the	Test Pattern is made by the MSTAR IC
OK	Main Board	We guess front of MSTAR IC has problem.
NG	Panel and T-Con Board	We guess back of MSATR IC has problem.

■ Power-Tree



■ Simple flow chart of malfunction



4.2. How to check fault symptom

4-2-1. NO Power and No Video

Symptom

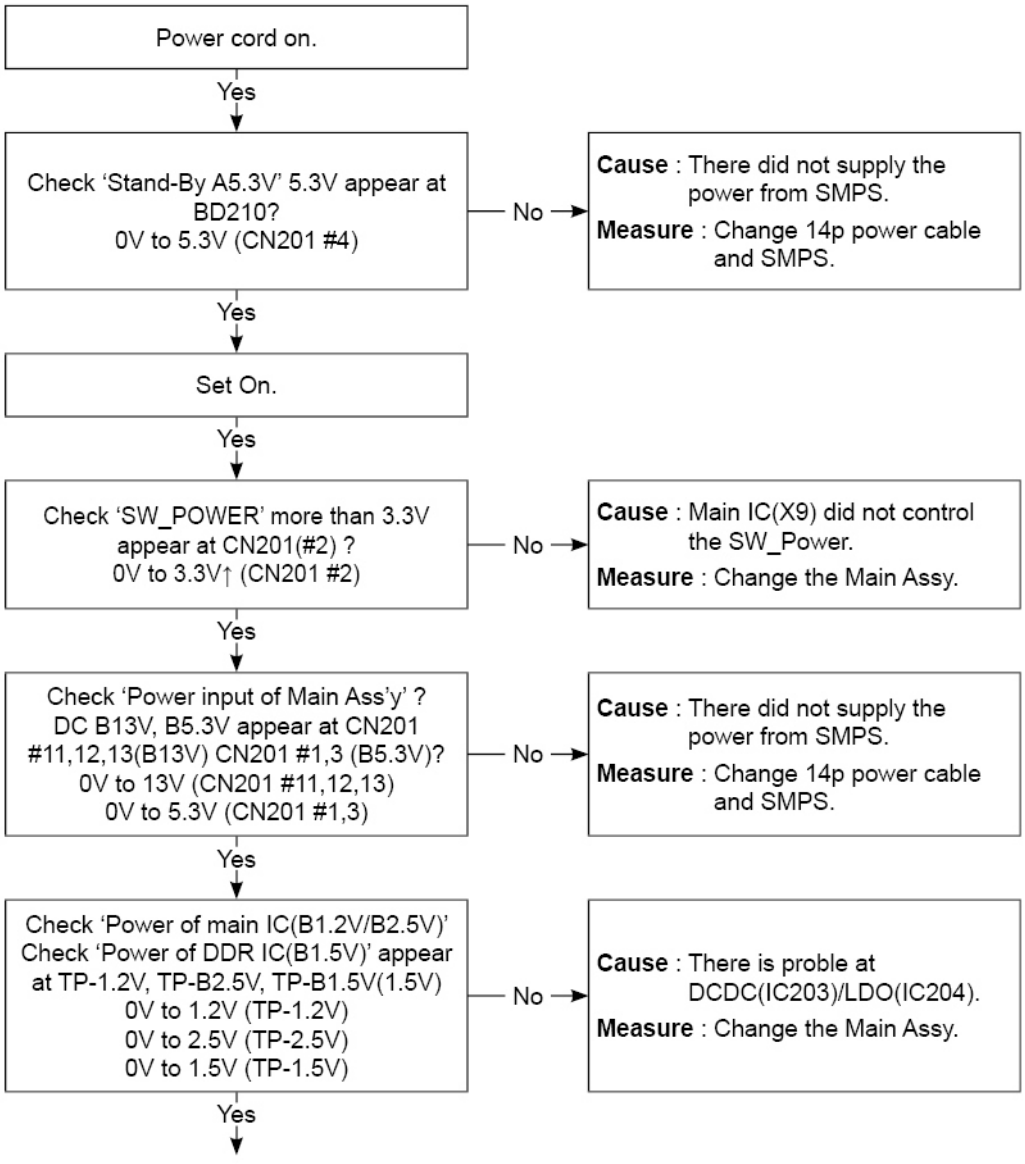
- The LEDs on The front panel do not work when connecting The power cord.
- The SMPS relay does not work when connecting The power cord.
- The units appears to be dead.

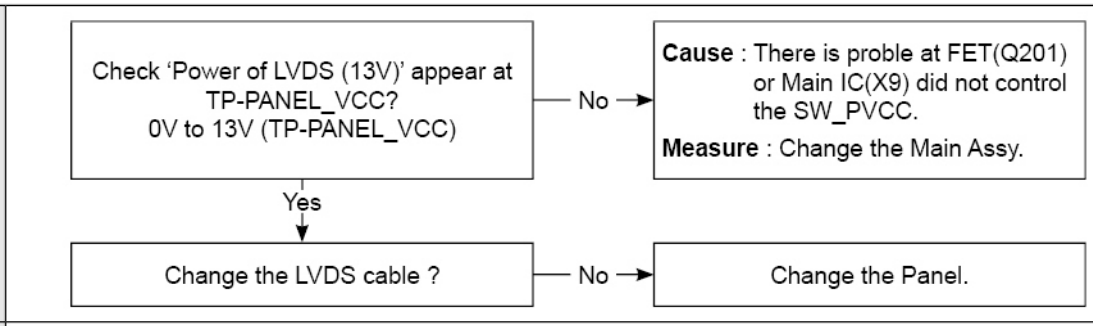
Major checkpoints

The IP relay or the LEDs on the front panel does not work when connecting the power cord if the cables are improperly connected or the Main Board or SMPS is not functioning. In this case, check the following:

- Check the internal cable connection status inside the unit.
- Check the fuses of each part.
- Check the output voltage of SMPS.
- Replace the Main Board.

Diagnostics

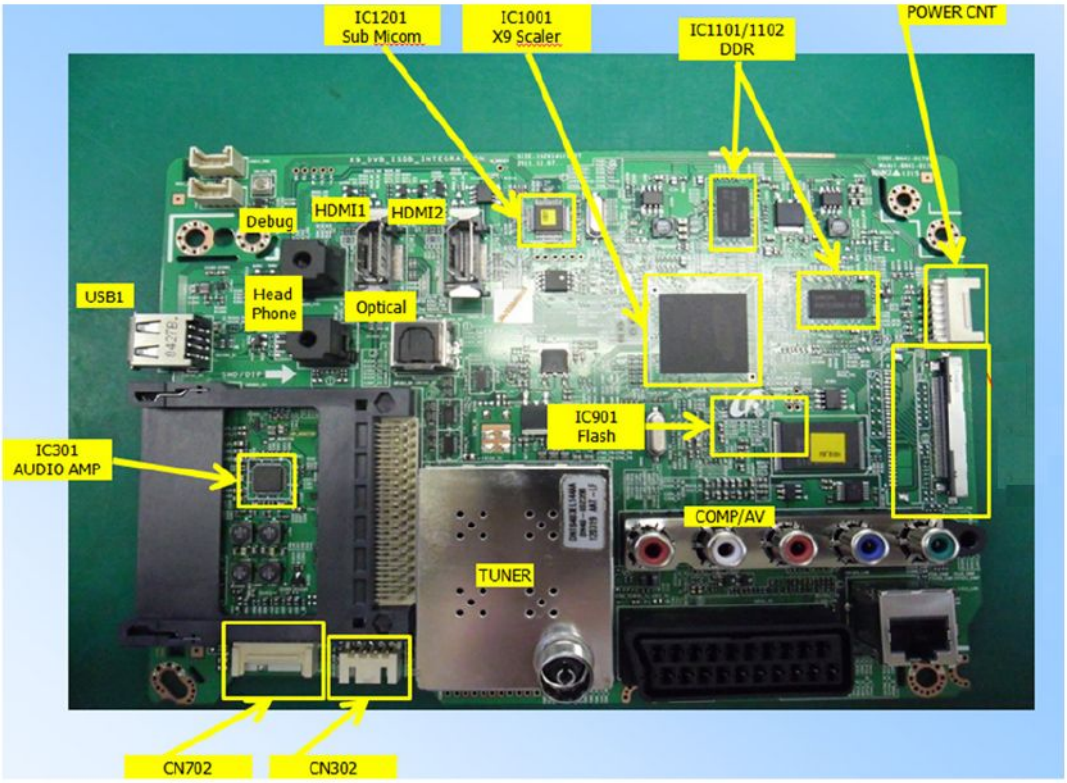




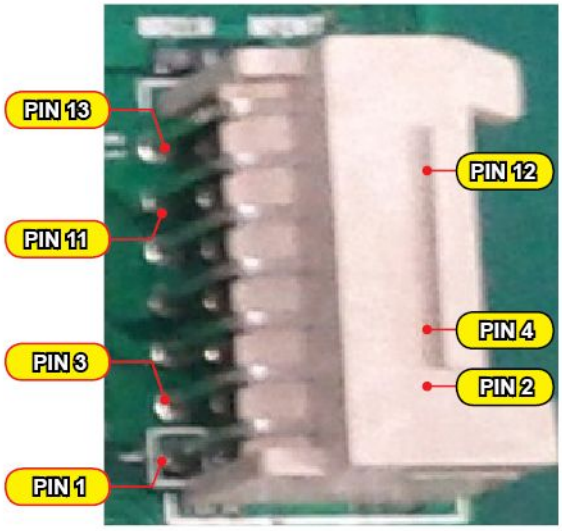
Caution	Make sure to disconnect the power before working on the IP board.

■ Location of Parts

Main Board_Front



CN201 POWER CNT



4.3. Factory Mode Adjustments

4-3-1. Entering Factory Mode

To enter 'Service Mode' Press the remote -control keys in this sequence :

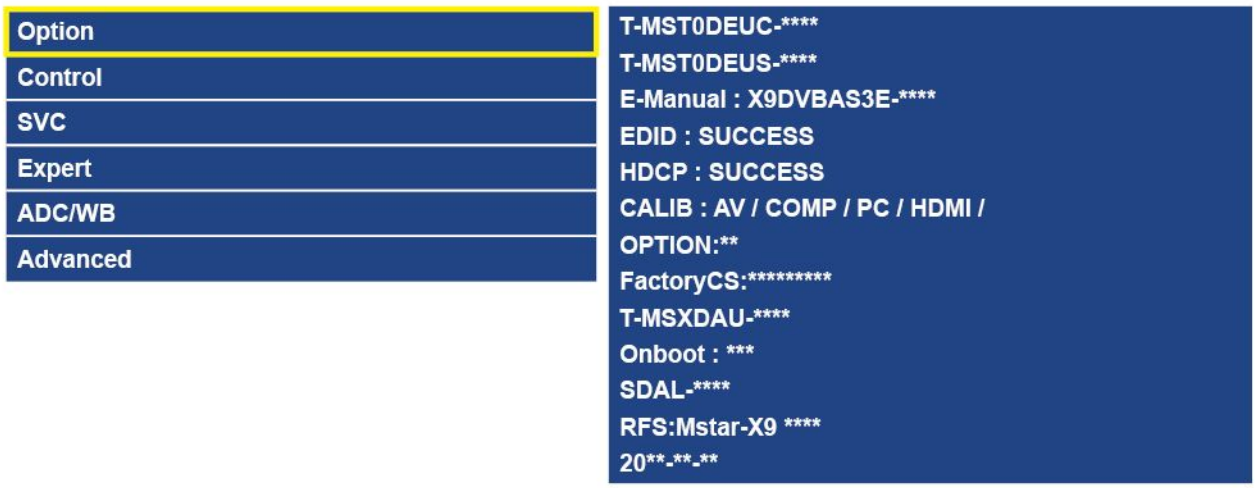
- If you do not have Factory remote control

  Power OFF → INFO → MENU → MUTE → Power On

- If you have Factory remote control

  INFO → Factory

- If you don't have Factory remote control, can't control some menus. (Expert, Advanced menu)



- How to enter the hidden factory mode.

1. Into the factory mode.
2. Move the tap to Advanced.
3. Key input : 0 + 0 + 0 + 0.

NOTE

hidden menu : Advanced

4-3-2. Factory Data

■ Option

Factory Menu Name	Data	Range	Remark
Factory Reset	-	-	
Type	60H1AF0D		
Local Set	EU_GER		
Basic Model	UEH6000	E4000/E4030/E4050/E4800/E5000/E5010/ E5030/E5050/E5100/E6000/E6050/E420/ E4080/E5080/E3900/E4900/E5005/E450	
SVC Model	6000		
TUNER	DVB_TCS2		do not change
Ch Table	NONE		
Front Color	U-S-C-6K	NONE/S-C-BLK/S-R-BLK/S-BLK/T-R-BLK/T-C-BLK/S-B-BLK	

■ Control

Factory Menu Name	Data	Range	Remark
EDID			
EDID ON/OFF	Off	On/Off	
EDID WRITE ALL		Success/Failure	use to write the EDID
EDID WRITE PC		Success/Failure	
EDID WRITE HDMI1		Success/Failure	
EDID WRITE HDMI2		Success/Failure	
EDID WRITE HDMI3		Success/Failure	
EDID WRITE HDMI4		Success/Failure	
EDID VER		HDMI 1.3/HDMI1/2	
EDID PORT		NONE/Not Support/HDMI2/HDMI3/HDMI4	
EDID WROTE DVI			
Sub Option			
RF Mute Time	600ms	0ms~1000ms	
RS-232 Jack	UART	Debug/Login/UART	
Watchdog	ON	ON/OFF	
WD Count	0	0~255	
Lvds Format	JEIDA	JEIDA/VESA/19INCH	
Language_Arbic	UNKNOWN	EAST ASIA/IRANISRAEL/MIDDLE ASIA/S_ AMERICA/TAIWANAFRICAN_AFRICA/ WSET ASIA/MALAYSIA/KR/US/EU/ TURKEYCHINA/ HONGKONG/JAPAN	
TOOLS Support	56	0~255	
LNA Support	0	0~255	
NETWORK Support	EXT_WIFI	Not Support/Cable/EXT_WIFI	

Factory Menu Name	Data	Range	Remark
IPERF	Stopped	Stopped/Running	
Info Link Server Type	development	operationg/development/developing	
Info Link Country	None	TBD	
TTX List	…	fixed	
TTX Group	…	fixed	
24Px4 Support	OFF	ON/OFF	
Power Indicator Support	ON	ON/OFF	
BD Wise Support	OFF	ON/OFF	
Data Service Support	OFF	ON/OFF	
Alternate Del	OFF	ON/OFF	
Visual Test	Disable	fixed	
Emergency Log Copy			
Checksum	0x0000		
View Log			
Select Log Type	IR Key	NVRAM/DIAGNOSIS/IR KEY	
Log View			
Delete Log			
Gemstar On/Off	OFF	ON/OFF	
WSS Support	ON	ON/OFF	
PVR Support	OFF	ON/OFF	
CI Support	OFF	ON/OFF	
Eeprom Reset			
EER Reset			
NVR All Clear	OFF		
Spread Spectrum			
LVDS Spread	ON	ON/OFF	
Period	40K	30K/40K/50K/60K	
Amplitude	1.5	0.0/0.5/1.0/1.5/2.0/2.5/3.0	
DDR Spread	1%	0.1~2.0%	
DDR Margin			
A CTRL_OFFSET_0_3	0X0		
A CTRL_OFFSET_D	0X0		
B CTRL_OFFSET_0_3	0X0		
B CTRL_OFFSET_D	0X0		
H.264 Margin	8	0~2000	
MPEG Margin	1000	0~2001	
2nd mips	ON	ON/OFF	

Factory Menu Name	Data	Range	Remark
2nd mips count	0	0~255	
Region	ASIA_DTV	TBD	
PnP Language	ENG	TBD	
PC Auto Ident	Enable	Auto/Enable	
OTP Lock	…	fixed	
Auto Power	MEMORY	MEMORY/Always On/Always Off	
Key Sensitivity	Not used	Not used, 1~255	
OTA Support	General	General/OFF	
FKP Down			
WIFI REGION	O	A~Z	
e-POP Default	ON	ON/OFF	
OPTION_SWU			
OTN Server Type	operating	operating/development	
OTN Test Server	OFF	OFF/A Zone ~ E Zone	
SWU Reset			
SWU Duration	OFF	OFF/ON	
SWU Fail Test	OFF	OFF/ON	
OTN Support	OFF	OFF/ON	
SWU_Diag_Code			
OPTION_MEDIAPLAY			
MediaPlay DB	OFF		
MediaPlay Movie			
MediaPlay DLNA	OFF		
MediaPlay Playlist	OFF		
3D OPTIMIZE VALUE	1	0~10	
ECO IC TYPE	NLS1006		
Energy Star Logo	OFF	ON/OFF	
PDP Option			
Hotel Option			
Hospitality Mode	OFF	ON/OFF	
Power Ion			
Menu OSD			
Operation			
Music Mode			
External Source			
Eco Solution			
Cloning			

Factory Menu Name	Data	Range	Remark
Shop Option			
Shop Mode			
Exhibition Mode			
Asia Option			
TTX	OFF	ON/OFF	
China HD	OFF	ON/OFF	
NT Conversion	OFF	ON/OFF	
Sepco 120Hz	OFF	ON/OFF	
Unbalance	OFF	ON/OFF	
FMTransmitter Support	OFF	ON/OFF	
FMTransmitter Carrier	OFF	ON/OFF	
AF Level adjust	3	0~7	
TX Power Level	0	0~3	
Mono Last Memory	OFF	ON/OFF	
H Shaking	OFF	ON/OFF	
Sound			
High Devi	OFF	ON/OFF	
Carrier_Mute	ON	ON/OFF	
Volume Curve	Type1	Type1/Type2/error	
Speaker Delay Normal	10	0~255	
Pilot Level High Thld	0x28h	0x00~0xff	
Pilot Level Low Thld	0x10h	0x00~0xff	
FM Prescale	46	0~255	
AM Prescale	49	0~255	
NICAM Prescale	45	0~255	
Amp Volume	0xc7h	0x00~0xff	
Amp Scale	0x8eh	0x00~0xff	
Amp Check Sum	0x01B52015	fixed	
Woofer Type	1	1~7	
Woofer Scale	0x8ah	0x00~0xff	
Woofer Check Sum			
Speaker EQ	ON	ON/OFF	
PEQ Test	0	0~7	
Amp Model	NTP7412	SAT369B/TAS5715/NPT7300	
Speaker cut-off Freq	4	0~16	
SPDIF PCM Gain	-9dB	-10dB~0dB	
FM M Prescale	48		

Factory Menu Name	Data	Range	Remark
BTSC Mono Prescale	25	-10~10	
BTSC streo Prescale	47	-10~10	
SAP Prescale	43	-10~10	
A2 Ident High Thld	31	-10~10	
A2 Ident Low Thld	2	-10~10	
Carrier2 Amp High Thld	4	-10~10	
Carrier2 Amp Low Thld	3	-10~10	
Carrier2 SNR High THR	16	-10~10	
Carrier2 SNR Low THR	80	-10~10	
Audio-IP Test	Ready		
TruBass-Checksum	0xFFFFFFFF		
PWM Mode	BD		
Mic Scale	0		
SubWoofer Support	0		
India Sound	OFF	ON/OFF	
Config Option			
Num of ATV	1	1~2	
Num of DTV	1	0~2	
Num of AV	1	0~3	
Num of SVIDEO	0	1~3	
Num of Comp	1	1~3	
Num of HDMI	2	0~4	
Num of PC	0	0~1	
Num of SCART	0	0~2	
Num of DVI	0	0~1	
Num of OPTICAL Link	0	fixed	
Num of MEDIA	1	0~1	
Num of PANEL KEY	6	0~8	
Num of USB Port	1	0~2	
Num of HeadPhone	1	0~1	
Num of RVU	0		
MFT Offset	62.5	50/62.5	
Select LCD/PDP	LCD	LCD/PDP	
HDMI/DVI SEL	1	1~4	
Indicator Led	OFF	ON/OFF	
Wall Mount	OFF	ON/OFF	
HV Flip	ON	ON/OFF	

Factory Menu Name	Data	Range	Remark
Num of Display	2	1~2	
DVI/HDMI SOUND	Auto	Auto/DVI	
HDMI HOT PLUG	Disable	Enable/Disable	
HOTPLUG SWITCHING	Boot	Disable/Boot/Source	
HOTPLUG DURATION	1200ms	0~2000ms	
CLK TERM DURATION	1200ms	0~2000ms	
HDMI FLT CNT SIG	100ms	0~1000ms	
HDMI FLT CNT LOS	100ms	0~1000ms	
UNSTABLE BAN CNT	3500ms	0~100000ms	
HDMI Err Cnt	1	0~10	
HDMI ROBIN	ON	ON/OFF	
HDMI Callback	OFF	ON/OFF	
HDMI CTS Thld	8	0~15	
HDMI CTS Cnt1	1	0~15	
TMDS_EQ2_Boost	1	0~7	
HDMI EQ	AUTO	AUTO/Low/Middle/High/Strong	
HDMI Write Type	Separate	Combine/Separate	
HDMI Switch	NONE	NONE/SIL9287/TMDS461	
DVI SET TIME	300ms	0~1000ms	
Type Of PANEL KEY	None	Horzontal/Vertical/PDPVertical/Nne	
EcoSensor Support	ON	ON/OFF	
LEDMotionPlus Support	ON	ON/OFF	
Natural Mode Support	ON	ON/OFF	
All Share Support	OFF	ON/OFF	
Relax Mode Support	OFF	ON/OFF	
BT Support	OFF	ON/OFF	
3D Support	OFF	ON/OFF	
H Write			
HDMI Sync	DE	DE/HV	
HeadPhone Port			
FANET	OFF	ON/OFF	
Support MultiMedia Key	ON	ON/OFF	
Config_AV_PATH			
NUM of IPTV	0	0/1	
PVR RECORD NUM	0	0/1	
NUM of RUI	0	0/1	
5 Way Function Key	R BOTTOM	L BOTTM/R BOTTOM/L BACK/R BACK/NONE	

Factory Menu Name	Data	Range	Remark
Contents Bar	OFF	ON/OFF	
Num Of Tuner	1	0~2	

■ SVC

Factory Menu Name	Data	Range	Remark	Key
Test Pattern				
Pattern Sel	OFF	OFF/ White/BlackRed/Green/ Blue/Cross/OneDot/Color Bar/ GrayStep/ETC		
Logic Pattern Sel	…	fixed		
Logic Level Sel	…	fixed		
Echo-FS Pre Test Pattern	0			
Echo-FS Post Test Pattern	0			
Echo-FS FRC FDISPLAY ON/OFF	OFF			
Echo-FS 3D FDISPLAY ON/ OFF	OFF			
Echo-FS PC Mode ON/OFF	OFF			
NT72312 Pre Test Pattern	0			
NT72312 Post Test Pattern	0			
NT72312 PC Mode ON/OFF	OFF	ON/OFF		
Panel Display Time	**22Hr**			
Logic Usb D/L	Off			
Tuner Status				
DVB				
SNR				
BER				
Singal Strength				
Bandwidth				
Frequency				
LNA Status				
FFT				
Modulation				
Code Rate				
GI				
Hier Modulation				
Frequency Offset				
Timing Offset				
AGC				
UCB				

Factory Menu Name	Data	Range	Remark	Key
PLL Type				
DEMOD Type				
TPS LOCK				
RS Lock				
SSI				
SQI				
ISDB-T				
FFT Size_1				
Guard Interval_1				
Freq. Offset_1				
SNR_1				
IF AGC_1				
TMCC Lock_1				
TS Packet_1				
Master Lock_1				
A_Modulation_1				
A_Code Rate_1				
A_Timer InterLeave_1				
A_Segments Num_1				
A_Ber_1				
B_Modulation_I				
B_Code Rate_1				
B_Timer InterLeave_1				
B_Segments Num_1				
B_BER_1				
C_Modulation_1				
C_Code Rate_1				
C_Timer InterLeave_1				
C_Segments Num_1				
C_BER_1				
T-CONUsbDownload	**Failire**			
T-CON CheckSum	**Error**			
Tuner Margin	**10**			
CAM Wait Time				
TS Clock delay	**0**			
SUBMICOM UPGRADE	**OFF**			
BT ADDRESS	**0**			

Factory Menu Name	Data	Range	Remark	Key
BT UPGRADE				
BT FREEPARING	ON			
SVC Reset				
TCON_TEMP READ	0			
TEMP LAST	60			
DCC VERSION	0X0			
DCC CHK SEL	0			
DCC CHECK LOCAL	0X0			
DCC CHECK TOTAL				
Function Upgrade	OFF			
Smart Hub Reset	OFF			
WIFI ER COUNT	0			
BT ER COUNT	0			
Debug Log Down				
MulitACC Check sum	Error			
SVC Info				

■ ADC/WB

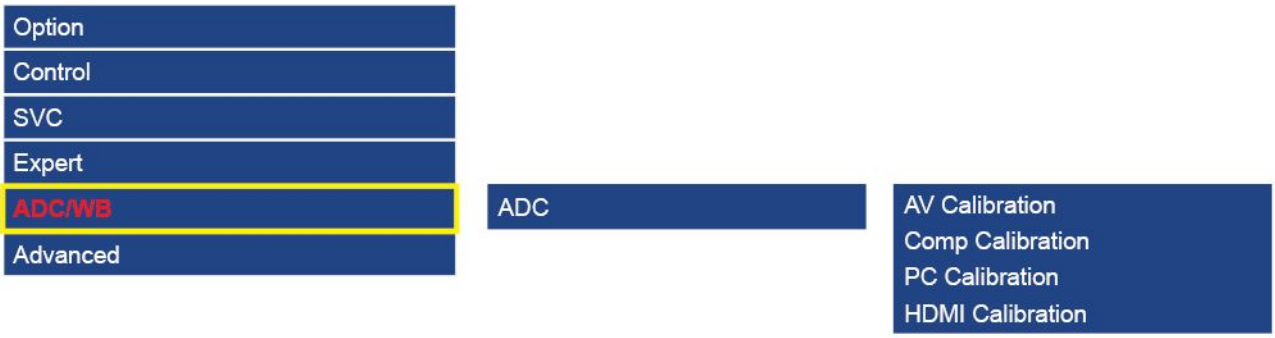
Factory Menu Name	Data	Range	Remark	Key
ADC				
AV Calibration	Success	Success / Failure		
Comp Calibration	Success	Success / Failure		
PC Calibration	Success	Success / Failure		
HDMI Calibration	Success	Success / Failure		
ADC Target				
1st_AV_Low	64	0 ~ 1020		
1st_AV_High	880	0 ~ 1020		
1st_AV_Delta	2	0 ~ 7		
1st_COMP_Y_Low	64	0 ~ 1020		
1st_COMP_Cb_Low	512	0 ~ 1020		
1st_COMP_Cr_Low	512	0 ~ 1020		
1st_COMP_Y_High	940	0 ~ 1020		
1st_COMP_Cb_High	512	0 ~ 1020		
1st_COMP_Cr_High	512	0 ~ 1020		
1st_COMP_Delta	2	0~7		
1st_PC_Low	4	0 ~ 1020		
1st_PC_High	1004	0 ~ 1020		
1st_PC_Delta	2	0~7		

Factory Menu Name	Data	Range	Remark	Key
2nd_ACH_Low	4	0 ~ 1020		
2nd_ACH_high	940	0 ~ 1020		
2nd_PC_Low	4	0 ~ 1020		
2nd_PC_High	940	0 ~ 1020		
2nd_Delta	2	0~7		
ADC Result				
1st_Y_GH	0	fixed		
1st_Y_GL	0	fixed		
1st_Cb_BH	0	fixed		
1st_Cb_BL	0	fixed		
1st_Cr_RH	0	fixed		
1st_Cr_RL	0	fixed		
2nd_R_L	134	0 ~ 255		
2nd_G_L	134	0 ~ 255		
2nd_B_L	134	0 ~ 255		
2nd_R_H	49	0 ~ 255		
2nd_G_H	49	0 ~ 255		
2nd_B_H	49	0 ~ 255		
WB				
Sub Brightness	128	0 ~ 1023		
R_Offset	128	0 ~ 1023		
G_Offset	128	0 ~ 1023		
B_Offset	128	0 ~ 1023		
Sub Contrast	128	0 ~ 1023		
R_Gain	128	0 ~ 1023		
G_Gain	128	0 ~ 1023		
B_Gain	128	0 ~ 1023		
Movie R Offset	…	fixed		
Movie B Offset	…	fixed		
Movie R Gain	…	fixed		
Movie B Gain	…	fixed		

4.4. White Balance

4-4-1. Calibration

1. Into the Factory Mode.
2. Select SVC Menu.
3. Select ADC/WB menu.
4. Select ADC menu.



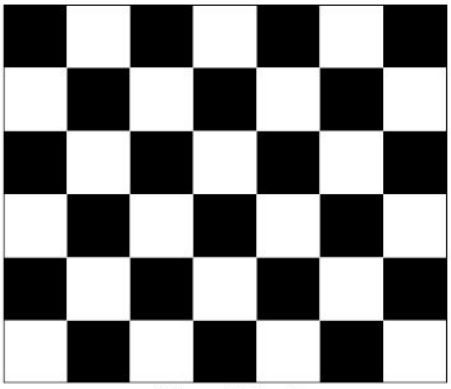
4-4-2. Service Adjustment

You must perform Calibration in the Lattice Pattern before adjusting the White Balance.

■ Color Calibration

- Adjust Specification

Source	Setting Mode	Pattern	Use Equipment
HDMI	1280 x 720@60 Hz	Pattern #24 (Chess Pattern)	CA210 & Master MSPG925 Generator



(Chess Pattern)

– Use other equipment only after comparing the result with that of the Master equipment.

Input mode	Calibration	Pattern
CVBS IN (Model_#1)	Perform in NTSC B&W Pattern #24	Lattice
Component IN (Model_#6)	Perform in 720p B&W Pattern #24	Lattice
PC Analog IN (Model_#21)	Perform in VESA XGA (1024x768) B&W Pattern #24	Lattice
HDMI IN	Perform in 720p B&W Pattern #24	Lattice

■ Method of Color Calibration (AV)

1. Apply the NTSC Lattice (N0. 3) pattern signal to the AV IN 1 port.
2. Press the Source key to switch to “AV1” mode.
3. Enter Service mode.
4. Select the “ADC” menu.
5. Select the “AV Calibration” menu.
6. In “AV Calibration Off” status, press the “► ” key to perform Calibration.
7. When Calibration is complete, it returns to the high-level menu.
8. You can see the change of the “AV Calibration” status from Failure to Success.

■ Method of Color Calibration (Component)

1. Apply the 720p Lattice (N0. 6) pattern signal to the Component IN 1 port.
2. Press the Source key to switch to “Component1” mode.
3. Enter Service mode.
4. Select the “ADC” menu.
5. Select the “Comp Calibration” menu.
6. In “Comp Calibration Off” status, press the “ ►” key to perform Calibration.
7. When Calibration is complete, it returns to the high-level menu.
8. You can see the change of the “Comp Calibration” status from Failure to Success.

■ Method of Color Calibration (PC)

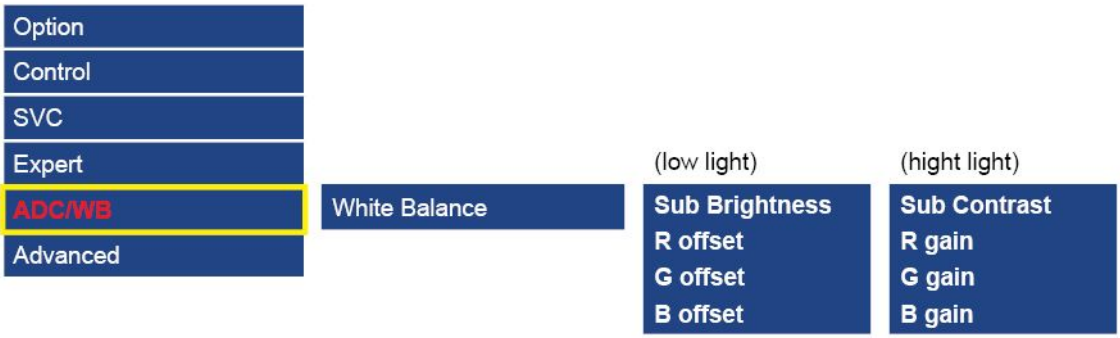
1. Apply the VESA XGA Lattice (N0. 21) pattern signal to the PC IN port.
2. Press the Source key to switch to “PC” mode.
3. Enter Service mode.
4. Select the “ADC” menu.
5. Select the “PC Calibration” menu.
6. In “PC Calibration Off” status, press the “ ►” key to perform Calibration.
7. When Calibration is complete, it returns to the high-level menu.
8. You can see the change of the “PC Calibration” status from Failure to Success.

■ Method of Color Calibration (HDMI)

1. Apply the 720p Lattice (N0. 6) pattern signal to the HDMI1/DVI IN port.
2. Press the Source key to switch to “HDMI1” mode.
3. Enter Service mode.
4. Select the “ADC” menu.
5. Select the “HDMI Calibration” menu.
6. In “HDMI Calibration Off” status, press the “►” key to perform Calibration.
7. When Calibration is complete, it returns to the high-level menu.
8. You can see the change of the “HDMI Calibration” status from Failure to Success.

4-4-3. Adjustment

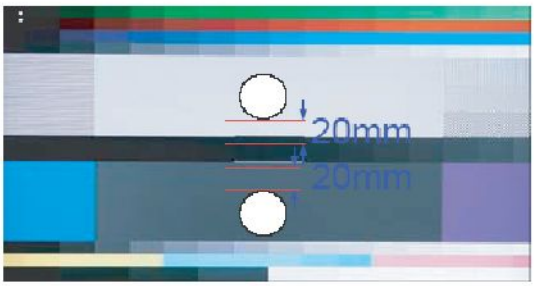
1. Into the Factory Mode.
2. Select SVC Menu.
3. Select ADC/WB menu.
4. Select White Balance menu.



4.5. White Ratio (Balance) Adjustment

1. You can adjust the white ratio in factory mode (1:Calibration, 3:White-Balance).
2. Since the adjustment value and the data value vary depending on the input source, you have to adjust these in CVBS, Component 1 and HDMI 1 modes.
3. The optimal values for each mode are configured by default. It varies with Panel's size and Specification.

- Equipment : CS-210
- Pattern: MIK K-7256 #92 "Flat W/B Pattern" as standard
- Altenate Equipmet : CA200& anyone Master supported pattern#92(refer to right photo)
- Use other Equipment only after comparing the result with that of the Master equipment.
- Set Aging time : 60 min



Calibration and Manual setting for WB adjustment

- HDMI : Calibration at #24 Chessboard Pattern Manual adjustment at #92 pattern (720p)
- COMP: Calibration at #24 Chessboard Pattern Manual adjustment at #92 pattern (720p)
- CVBS: Calibration at #24 Chessboard Pattern Manual adjustment at #92 pattern (NTSC)

NOTE

If finishing in HDMI mode, adjustment coordinate is almost same in AV/COMP mode.

White Balance Manual adjustment

P-Mode Input source	Section	Adjustment Coordinate CA-210					
HDMI COMP VIDEO	W/B High	Hx	264	Hy	274	HY	-
	W/B Low	Lx	-	Ly	-	LY	-
MOVIE	W/B High	Hx	318	Hy	340	HY	-
	W/B Low	Lx	-	Ly	-	LY	-

- Fixed Parameter

Sub Contrast	135	**Sub Bright**	128		
R-Gain	ADJ	**G-Gain**	128	**B-Gain**	ADJ
R-Offset	128	**G-Offset**	128	**B-Offset**	128

4.6. Software Upgrade

Software Upgrade can be performed by downloading the. latest firmware from samsung.com to a USB memory device.

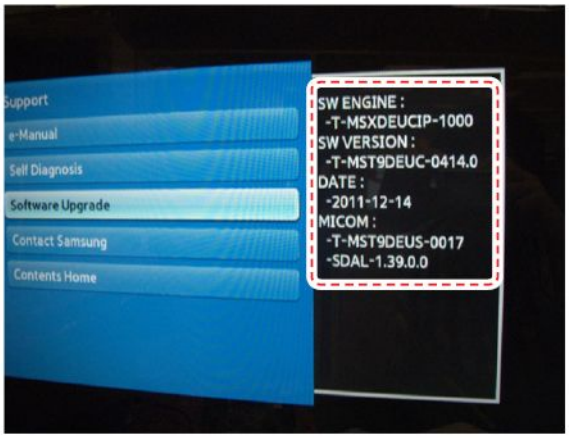
- Current Version - The software already installed in the TV.

Software is represented as 'Year/Month/Day_Version'.

4-7-1. How to Check the Software Version

■ Use the Main Menu

1. Click the "MENU" key in remote controller.
2. Select "Support" menu.
3. Locate the menu cursor "Software Upgrade" menu.
4. Click the "INFO" key.
   - Check the Main SW and Micom version.



■ Use the Factory Mode

Option	T-MST0DEUC-****
Control	T-MST0DEUS-****
SVC	EDID : SUCCESS
Expert	HDCP : SUCCESS
ADC/WB	CALIB : AV / COMP / PC / HDMI /
Advanced	OPTION:**
	FactoryCS:*********
	T-MSXDAU-****
	Onboot : ***
	SDAL-****
	RFS:Mstar-X9 ****
	20**-**-**

4-7-2. How to Upgade Software

1. Insert a USB drive containing the firmware upgrade downloaded from samsung.com into the TV.

> **NOTE**
>
> Please be careful not to disconnect the power or remove the USB drive while upgrades are being applied.

2. The TV will turn off and turn on automatically after completing the firmware upgrade.
3. Please check the firmware version after the upgrades are complete.
   - the new version will have a higher number than the older version.

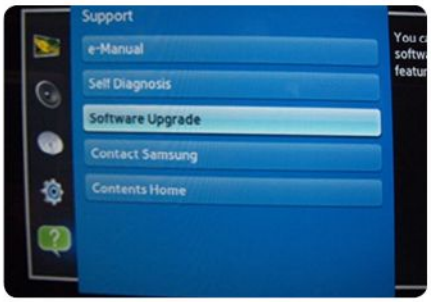
> **NOTE**
>
> - When software is upgraded, video and audio settings you have made will return to their default (factory) settings.
> - We recommend you write down your settings before beginning firmware update.

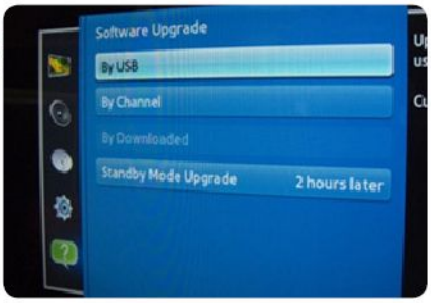
4. After update is completed, restore your previous settings.

■ Main Software Upgrade

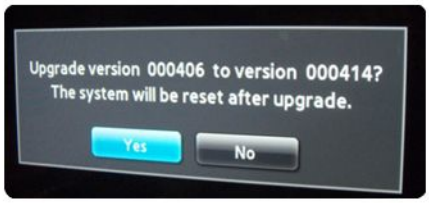
1. Store the sw program named "T-MST0DEUC" in USB memory stick.

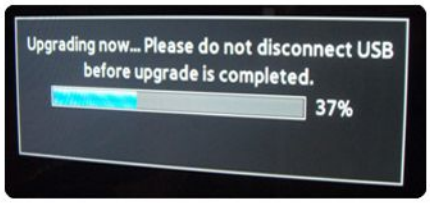
2. Click the "MENU" key in Remote Controller.
3. Select "Support - Software Upgrade - By USB" menu.





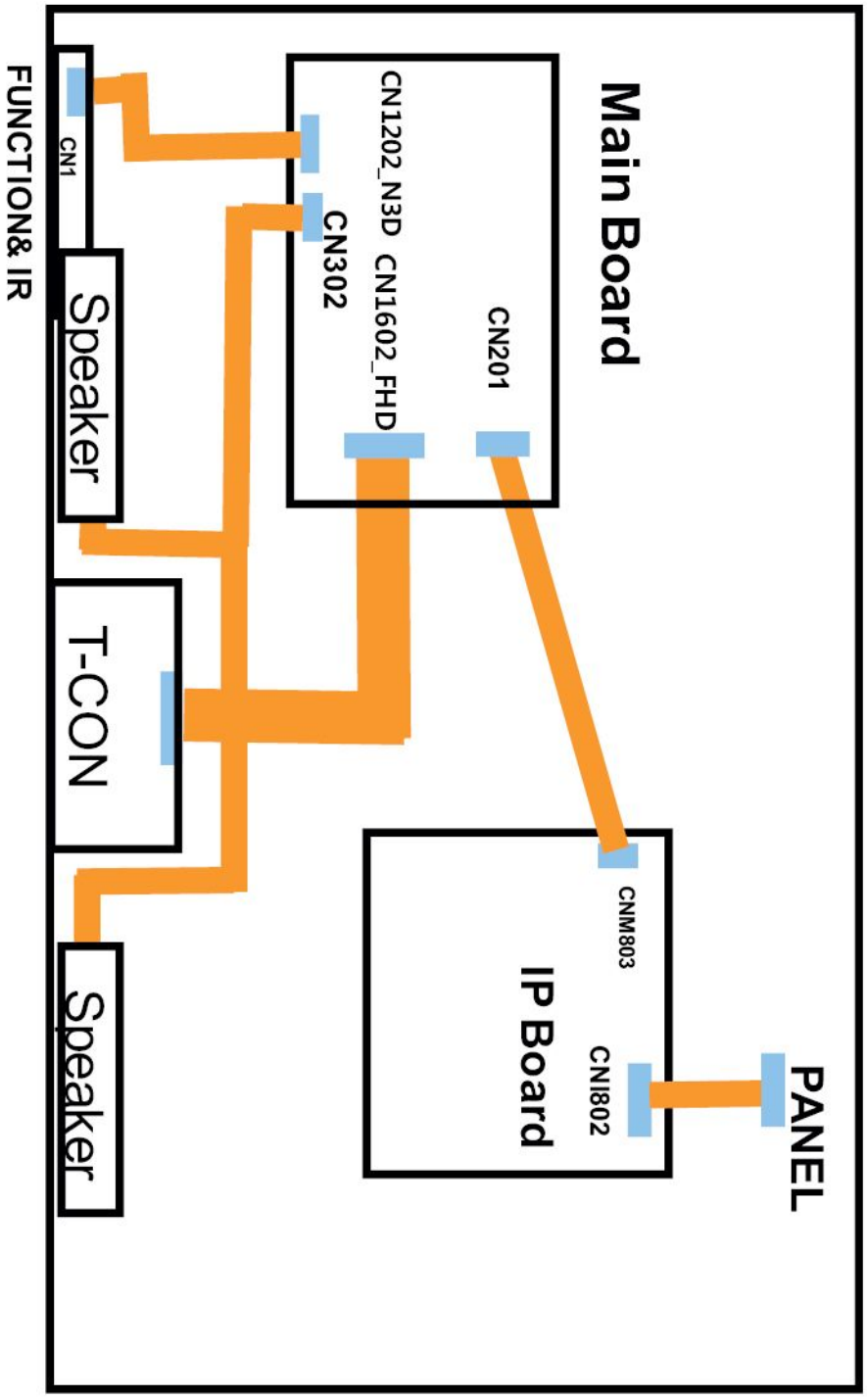
4. Click the "ENTER" key.
   - Wait for upgrade complete.
   - Check the Software Version.





5. Wiring Diagram

5.1. Wiring Diagram



5.2. Connector

❶ CN1602_FHD (to Panel)			
1	NC	27	EVEN[0]-
2	NC	28	GND
3	NC	29	ODD[4]+
4	NC	30	ODD[4]-
5	NC	31	ODD[3]+
6	NC	32	ODD[3]-
7	FORMAT	33	GND
8	SDA_Panel	34	ODDCLK+
9	TCON_WP	35	ODDCLK-
10	NC	36	GND
11	SDA_Panel	37	ODD[2]+
12	SCL_Panel	38	ODD[2]-
13	GND	39	ODD[1]+
14	EVEN[4]+	40	ODD[1]-
15	EVEN[4]-	41	ODD[0]+
16	EVEN[3]+	42	ODD[0]-
17	EVEN[3]-	43	GND
18	GND	44	GND
19	EVENCLK+	45	GND
20	EVENCLK-	46	NC
21	GND	47	Panel_VCC
22	EVEN[2]+	48	Panel_VCC
23	EVEN[2]-	49	Panel_VCC
24	EVEN[1]+	50	Panel_VCC
25	EVEN[1]-	51	Panel_VCC
26	EVEN[0]+		

❷ CN201 (to Powr board)			
1	B5V	8	GND
2	SW_POWER	9	B13VS
3	B5V	10	SW_INVERTER
4	A5V	11	B13V
5	GND	12	B13V
6	GND	13	B13V
7	B13VS	14	PWM_DIMM

❸ CN1202_N3D (FUNCTION)			
1	IR	5	MSDA
2	GND	6	KEY1
3	A3.3V	7	KEY2
4	MSCL	8	GND

❹ CN302 (SPEAKER)			
1	R+	3	L+
2	R-	4	L-

❺ CN503_FPC(DEBUG)			
1	GND	4	DEBUG_TX
2	DEBUG_RX	5	DEBUG_TX
3	DEBUG_TX	6	GND

❻ CN502(COMPONETN)			
1	GND	9	GND
2	COMP1_Y	10	GND
3	IDENT_AV	11	SL
4	GND	12	SR
5	PB	13	GND
6	IDENT_COMP	14	SR
7	GND	15	SL
8	PR		

❼ CN501 (HDMI1)			
1	HDMI1_RX2+	11	GND
2	GND	12	HDMI1_RXCLK-
3	HDMI1_RX2-	13	HDMI_CEC
4	HDMI1_RX1+	14	GND
5	GND	15	SCL
6	HDMI1_RX1-	16	SDA
7	HDMI1_RX0+	17	GND
8	GND	18	5V
9	HDMI1_RX0-	19	HPD
10	HDMI1_RXCLK+		

❽ CN502 (HDMI2)			
1	HDMI2_RX2+	11	GND
2	GND	12	HDMI2_RXCLK-
3	HDMI2_RX2-	13	HDMI_CEC
4	HDMI2_RX1+	14	GND
5	GND	15	SCL
6	HDMI2_RX1-	16	SDA
7	HDMI2_RX0+	17	GND
8	GND	18	5V
9	HDMI2_RX0-	19	HPD
10	HDMI2_RXCLK+		

⑨ CN1201 (USB1)			
1	USB_VCC	3	USB_DP
2	USB_DM	4	GND

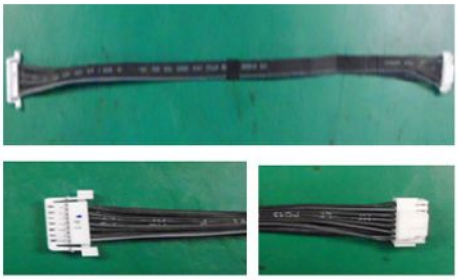
⑩ OP301 (Optical)			
1	SPDIF_OUT	3	GND
2	GND		

⑪ CN301(MONITOR OUT)			
1	GND	4	GND
2	SR_OUT	5	NC
3	SL_OUT	6	GND

5.3. Connector Functions

Connector	Function
CN201 ↔ IP CNM803	Supply main power and dimming signal from IP Board to Main Board.
CN1602_FHD ↔ T-CON CNF1	The LVDS signal transfered from Main Board to Panel.

5.4. Cables

Use	LEAD (Main-IP 14P)	LVDS CALBE (Main - Panel 30P)
Code No.	BN39-01449U	BN96-22239M
Image		  

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