



LG

Life's Good

Internal Use Only

LED LCD MONITOR SERVICE MANUAL

CHASSIS : LM71F

MODEL : 32UD59 32UD59-BB

CAUTION

BEFORE SERVICING THE CHASSIS, READ THE SAFETY PRECAUTIONS IN THIS MANUAL.




P/NO : MFL62449346(1705-REV00)

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PRECAUTION

WARNING FOR THE SAFETY-RELATED COMPONENT.

- There are some special components used in LCD monitor that are important for safety. **These parts are marked  on the schematic diagram and the Exploded View.** It is essential that these critical parts should be replaced with the manufacturer's specified parts to prevent electric shock, fire or other hazard.
- Do not modify original design without obtaining written permission from manufacturer or you will void the original parts and labor guarantee.

TAKE CARE DURING HANDLING THE LCD MODULE WITH BACKLIGHT UNIT.

- Must mount the module using mounting holes arranged in four corners.
- Do not press on the panel, edge of the frame strongly or electric shock as this will result in damage to the screen.
- Do not scratch or press on the panel with any sharp objects, such as pencil or pen as this may result in damage to the panel.
- Protect the module from the ESD as it may damage the electronic circuit (C-MOS).
- Make certain that treatment person's body are grounded through wrist band.
- Do not leave the module in high temperature and in areas of high humidity for a long time.
- The module not be exposed to the direct sunlight.
- Avoid contact with water as it may a short circuit within the module.
- If the surface of panel become dirty, please wipe it off with a softmaterial. (Cleaning with a dirty or rough cloth may damage the panel.)

CAUTION

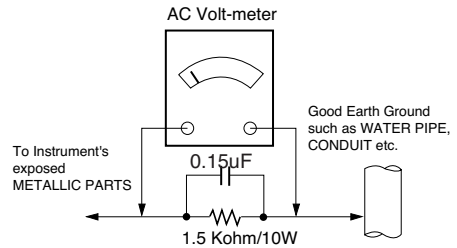
Please use only a plastic screwdriver to protect yourself from shock hazard during service operation.

WARNING

BE CAREFUL ELECTRIC SHOCK !

- If you want to replace with the new backlight (CCFL) or LIPS part, must disconnect the AC power because high voltage appears at inverter circuit about 650Vrms.
- Handle with care wires or connectors of the inverter circuit. If the wires are pressed cause short and may burn or take fire.

Leakage Current Hot Check Circuit



When 25A is impressed between Earth and 2nd Ground for 1 second, Resistance must be less than 0.1 Ω
*Base on Adjustment standard

SERVICING PRECAUTIONS

CAUTION: Before servicing receivers covered by this service manual and its supplements and addenda, read and follow the **SAFETY PRECAUTIONS** on page 3 of this publication.

NOTE: If unforeseen circumstances create conflict between the following servicing precautions and any of the safety precautions on page 3 of this publication, always follow the safety precautions. Remember: Safety First.

General Servicing Precautions

1. Always unplug the receiver AC power cord from the AC power source before;
 - a. Removing or reinstalling any component, circuit board module or any other receiver assembly.
 - b. Disconnecting or re-connecting any receiver electrical plug or other electrical connection.
 - c. Connecting a test substitute in parallel with an electrolytic capacitor in the receiver.
CAUTION: A wrong part substitution or incorrect polarity installation of electrolytic capacitors may result in an explosion hazard.

2. Test high voltage only by measuring it with an appropriate high voltage meter or other voltage measuring device (DVM, FETVOM, etc) equipped with a suitable high voltage probe. Do not test high voltage by "drawing an arc".

3. Do not spray chemicals on or near this receiver or any of its assemblies.

4. Unless specified otherwise in this service manual, clean electrical contacts only by applying the following mixture to the contacts with a pipe cleaner, cotton-tipped stick or comparable non-abrasive applicator; 10% (by volume) Acetone and 90% (by volume) isopropyl alcohol (90%-99% strength)

CAUTION: This is a flammable mixture.

Unless specified otherwise in this service manual, lubrication of contacts is not required.

5. Do not defeat any plug/socket B+ voltage interlocks with which receivers covered by this service manual might be equipped.

6. Do not apply AC power to this instrument and/or any of its electrical assemblies unless all solid-state device heat sinks are correctly installed.

7. Always connect the test receiver ground lead to the receiver chassis ground before connecting the test receiver positive lead.

Always remove the test receiver ground lead last.

8. *Use with this receiver only the test fixtures specified in this service manual.*

CAUTION: Do not connect the test fixture ground strap to any heat sink in this receiver.

Electrostatically Sensitive (ES) Devices

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

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any electrostatic charge on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging wrist strap device, which should be removed to prevent potential shock reasons prior to applying power to the unit under test.

2. After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.

3. Use only a grounded-tip soldering iron to solder or unsolder ES devices.

4. Use only an anti-static type solder removal device. Some solder removal devices not classified as "anti-static" can generate electrical charges sufficient to damage ES devices.

5. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ES devices.

6. Do not remove a replacement ES device from its protective package until immediately before you are ready to install it. (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminum foil or comparable conductive material).

7. Immediately before removing the protective material from the leads of a replacement ES device, 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 bodily motions when handling unpackaged replacement ES devices. (Otherwise harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity sufficient to damage an ES device.)

General Soldering Guidelines

1. Use a grounded-tip, low-wattage soldering iron and appropriate tip size and shape that will maintain tip temperature within the range of 500°F to 600°F.

2. Use an appropriate gauge of RMA resin-core solder composed of 60 parts tin/40 parts lead.

3. Keep the soldering iron tip clean and well tinned.

4. Thoroughly clean the surfaces to be soldered. Use a mall wire-bristle (0.5 inch, or 1.25cm) brush with a metal handle. Do not use freon-propelled spray-on cleaners.

5. Use the following unsoldering technique

- a. Allow the soldering iron tip to reach normal temperature. (500°F to 600°F)

- b. Heat the component lead until the solder melts.

- c. Quickly draw the melted solder with an anti-static, suction-type solder removal device or with solder braid.

CAUTION: Work quickly to avoid overheating the circuit board printed foil.

6. Use the following soldering technique.

- a. Allow the soldering iron tip to reach a normal temperature (500°F to 600°F)

- b. First, hold the soldering iron tip and solder the strand against the component lead until the solder melts.

- c. Quickly move the soldering iron tip to the junction of the component lead and the printed circuit foil, and hold it there only until the solder flows onto and around both the component lead and the foil.

CAUTION: Work quickly to avoid overheating the circuit board printed foil.

- d. Closely inspect the solder area and remove any excess or splashed solder with a small wire-bristle brush.

IC Remove/Replacement

Some chassis circuit boards have slotted holes (oblong) through which the IC leads are inserted and then bent flat against the circuit foil. When holes are the slotted type, the following technique should be used to remove and replace the IC. When working with boards using the familiar round hole, use the standard technique as outlined in paragraphs 5 and 6 above.

Removal

1. Desolder and straighten each IC lead in one operation by gently prying up on the lead with the soldering iron tip as the solder melts.
2. Draw away the melted solder with an anti-static suction-type solder removal device (or with solder braid) before removing the IC.

Replacement

1. Carefully insert the replacement IC in the circuit board.
2. Carefully bend each IC lead against the circuit foil pad and solder it.
3. Clean the soldered areas with a small wire-bristle brush. (It is not necessary to reapply acrylic coating to the areas).

"Small-Signal" Discrete Transistor Removal/Replacement

1. Remove the defective transistor by clipping its leads as close as possible to the component body.
2. Bend into a "U" shape the end of each of three leads remaining on the circuit board.
3. Bend into a "U" shape the replacement transistor leads.
4. Connect the replacement transistor leads to the corresponding leads extending from the circuit board and crimp the "U" with long nose pliers to insure metal to metal contact then solder each connection.

Power Output, Transistor Device Removal/Replacement

1. Heat and remove all solder from around the transistor leads.
2. Remove the heat sink mounting screw (if so equipped).
3. Carefully remove the transistor from the heat sink of the circuit board.
4. Insert new transistor in the circuit board.
5. Solder each transistor lead, and clip off excess lead.
6. Replace heat sink.

Diode Removal/Replacement

1. Remove defective diode by clipping its leads as close as possible to diode body.
2. Bend the two remaining leads perpendicular y to the circuit board.
3. Observing diode polarity, wrap each lead of the new diode around the corresponding lead on the circuit board.
4. Securely crimp each connection and solder it.
5. Inspect (on the circuit board copper side) the solder joints of the two "original" leads. If they are not shiny, reheat them and if necessary, apply additional solder.

Fuse and Conventional Resistor Removal/Replacement

1. Clip each fuse or resistor lead at top of the circuit board hollow stake.
2. Securely crimp the leads of replacement component around notch at stake top.
3. Solder the connections.

CAUTION: Maintain original spacing between the replaced component and adjacent components and the circuit board to prevent excessive component temperatures.

Circuit Board Foil Repair

Excessive heat applied to the copper foil of any printed circuit board will weaken the adhesive that bonds the foil to the circuit board causing the foil to separate from or "lift-off" the board. The following guidelines and procedures should be followed whenever this condition is encountered.

At IC Connections

To repair a defective copper pattern at IC connections use the following procedure to install a jumper wire on the copper pattern side of the circuit board. (Use this technique only on IC connections).

1. Carefully remove the damaged copper pattern with a sharp knife. (Remove only as much copper as absolutely necessary).
2. Carefully scratch away the solder resist and acrylic coating (if used) from the end of the remaining copper pattern.
3. Bend a small "U" in one end of a small gauge jumper wire and carefully crimp it around the IC pin. Solder the IC connection.
4. Route the jumper wire along the path of the out-away copper pattern and let it overlap the previously scraped end of the good copper pattern. Solder the overlapped area and clip off any excess jumper wire.

At Other Connections

Use the following technique to repair the defective copper pattern at connections other than IC Pins. This technique involves the installation of a jumper wire on the component side of the circuit board.


1. Remove the defective copper pattern with a sharp knife. Remove at least 1/4 inch of copper, to ensure that a hazardous condition will not exist if the jumper wire opens.
2. Trace along the copper pattern from both sides of the pattern break and locate the nearest component that is directly connected to the affected copper pattern.
3. Connect insulated 20-gauge jumper wire from the lead of the nearest component on one side of the pattern break to the lead of the nearest component on the other side. Carefully crimp and solder the connections.
CAUTION: Be sure the insulated jumper wire is dressed so the it does not touch components or sharp edges.

SPECIFICATION

NOTE: Specifications and others are subject to change without notice for improvement.

1.32UD59

**** Provided accessory: #7/#8/#9/#10/#11/#12/#13**

No	Item	Content	Remark
1	Customer	BRAND	
2	User Model Name	32UD59	
3	Sale region	Worldwide	
4	Feature	31.5" LCD MONITOR(UHD)	
5	Chassis Name	LM71F	
6	General Scope	External SW & Adj.  5-way joystick switch	
		Function Picture Mode, Ratio, S.E.S, Six Color, On Screen Control, Dual Controller Gamma calibration	
7	Power Cord	Length : 1.55±0.05 M / Shape : Wall-out / Color : Black Weight : 0.16kg ± 10%	Power cord can be changed according to region.
	Cable	HDMI Length : 1.5m±0.05m / Shape : Detachable Type / Color : Black / Weight : 0.091kg± 10% CABLE : 100Ω±10Ω CONNECTOR : 100Ω±15Ω	SET accessory P/N : EAD63954401
		DisplayPort Length : 1.5m±0.05m Shape : Detachable Type / Color : Black / Weight : 0.095kg± 10% CABLE : 100Ω±5Ω CONNECTOR : 100Ω±10Ω	SET accessory P/N : EAD63749401
9	Power	Output: DC 19V 3.42A, 65W Adapter Color: Black, Weight : 0.58kg ±10%, without vinyl bag	P/N : EAY62990906
10	Factory calibration report	0.002kg	SET accessory / Refer to BOM
11	Applying module list	P/No	Specification
		EAJ64127601	M315DJJ-K30

2. Applying module Character

1) Characteristic

No	Item	Content	Remark	
1	LCD Module Feature	Maker	INX	
		Type	VA	
		Active Display Area	31.5 inches(80.0051cm) (Aspect ratio 16:9)	
		Pixel Pitch [mm]	0.0603 [mm]X RGB X 0.18159 [mm]	
		Electrical Interface	V by 1	
		Color Depth	1.073 Billion colors	
		Size (Outline) [mm]	717.4(H)x413.85(V)x17.9(D)mm (Typ.)	
		Surface Treatment	AG type, 3H hard coating, Haze 25	
		Operating Mode	Transmissive mode, normally Black	
		Back light Unit	White LED	
		Color Gamut	DCI-P3 95%	

Standard Measurement Condition

- Ambient Luminance Level : dark (< 10 lux)
- Ambient Temperature : Normal Temperature(10 ~ 25 °C)
- warm-up Time : More than 30min (at Full White Pattern)
- Input Signal : 3840X2160@60Hz
- Contrast : 70 / Brightness : Max. 100
- 6500K : Color Temperature Setting is 6500 K(if it's not special specification)
- Another Spec.: Product Specification Standard(LG(55)G1-1034)
- Cosmetic Spec. : LCD Module IIS Spec

TIMING CHART

Signal (Video & Sync)

– DisplayPort

Mode	section	polarity	DOT CLOCK[MHz]	Frequency [kHz]/[Hz]	Total Period(E)	Display (A)	Front Porch(D)	Sync. (C)	Back Porch(B)	Resolution
1	H(Pixels)	-	25.175	31.469	800	640	16	96	48	640 x 480
	V(Lines)	-		59.94	525	480	10	2	33	
2	H(Pixels)	+	40	37.879	1056	800	40	128	88	800 x 600
	V(Lines)	+		60.317	628	600	1	4	23	
3	H(Pixels)	-	65	48.363	1344	1024	24	136	160	1024 x 768
	V(Lines)	-		60	806	768	3	6	29	
4	H(Pixels)	+	79.99	54.347	1472	1152	32	96	192	1152 x 864
	V(Lines)	+		60.05	905	864	1	3	37	
5	H(Pixels)	+	74.250	45.00	1650	1280	110	40	220	1280 x 720
	V(Lines)	+		60.00	750	720	5	5	20	
6	H(Pixels)	+	108	63.981	1688	1280	48	112	248	1280 x 1024
	V(Lines)	+		60.02	1066	1024	1	3	38	
7	H(Pixels)	+	108.00	60.00	1800	1600	24	80	96	1600 x 900
	V(Lines)	+		60.00	1000	900	1	3	96	
8	H(Pixels)	+	148.5	67.5	2200	1920	88	44	148	1920 x 1080
	V(Lines)	-		60	1125	1080	4	5	36	
9	H(Pixels)	+	241.50	88.79	2720	2560	48	32	80	2560 x 1440
	V(Lines)	-		59.95	1481	1440	3	5	33	
10	H(Pixels)	+	266.64	66.66	4000	3840	8	144	8	3840 x 2160
	V(Lines)	-		30	2222	2160	54	5	3	
11 ¹⁾	H(Pixels)	+	533	133.32	4000	3840	8	144	8	3840 x 2160
	V(Lines)	-		60	2222	2160	54	5	3	

< HDMI >

Mode	section	polarity	DOT CLOCK[MHz]	Frequency [kHz]/[Hz]	Total Period(E)	Display (A)	Front Porch(D)	Sync. (C)	Back Porch(B)	Resolution
1	H(Pixels)	-	25.175	31.469	800	640	16	96	48	640 x 480
	V(Lines)	-		59.94	525	480	10	2	33	
2	H(Pixels)	+	40	37.879	1056	800	40	128	88	800 x 600
	V(Lines)	+		60.317	628	600	1	4	23	
3	H(Pixels)	-	65	48.363	1344	1024	24	136	160	1024 x 768
	V(Lines)	-		60	806	768	3	6	29	
4	H(Pixels)	+	79.99	54.347	1472	1152	32	96	192	1152 x 864
	V(Lines)	+		60.05	905	864	1	3	37	
5	H(Pixels)	+	74.250	45.00	1650	1280	110	40	220	1280 x 720
	V(Lines)	+		60.00	750	720	5	5	20	
6	H(Pixels)	+	108	63.981	1688	1280	48	112	248	1280 x 1024
	V(Lines)	+		60.02	1066	1024	1	3	38	
7	H(Pixels)	+	108.00	60.00	1800	1600	24	80	96	1600 x 900
	V(Lines)	+		60.00	1000	900	1	3	96	
8	H(Pixels)	+	148.5	67.5	2200	1920	88	44	148	1920 x 1080
	V(Lines)	-		60	1125	1080	4	5	36	
9	H(Pixels)	+	241.50	88.79	2720	2560	48	32	80	2560 x 1440
	V(Lines)	-		59.95	1481	1440	3	5	33	
10	H(Pixels)	+	297	67.5	4400	3840	176	88	296	3840 x 2160
	V(Lines)	-		30	2250	2160	8	10	72	
11 ¹⁾	H(Pixels)	+	594	135	4400	3840	176	88	296	3840 x 2160
	V(Lines)	-		60	2250	2160	8	10	72	

Main Recommended Timing(HDMI Video input)

	Factory support mode	Horizontal frequency	Vertical frequency
	(Preset Mode)	(KHz)	(Hz)
1	480P	31.5	60
2	720P	45	60
3	1080P	67.5	60
4	2160P	135	60

4. Supporting timing

- Established I, Established II, Manufacturer Timing
- Standard Timing
- Detailed Timing (1Page)
- Detailed Timing (2Page)

EDID 내의 PC Timing										
수평 크기	수직 크기	주파수	HDMI1/2 (1.4)	HDMI 1/2 (2.0)	HDMI FreeSync Extended	HDMI FreeSync Basic	DP	DP FreeSync Extended	DP FreeSync Basic	
640	480	60	●	●	●	●	●	●	●	
800	600	60	●	●	●	●	●	●	●	
1024	768	60	●	●	●	●	●	●	●	
1152	864	60	●	●	●	●	●	●	●	
1280	720	60	●	●	●	●	●	●	●	
1280	800	60	●	●	●	●	●	●	●	
1280	1024	60	●	●	●	●	●	●	●	
1600	900	60	●	●	●	●	●	●	●	
1920	1080	60	●	●	●	●	●	●	●	
2560	1440	60	●	●	●	●	●	●	●	
3840	2160	30	●	●	●	●	●	●	●	
		60	●	●	●	●	●	●	●	
VF min (hz)			56hz	56hz	40hz	48hz	56hz	40hz	48hz	
VF max (hz)			61hz	61hz	61hz	61hz	61hz	61hz	61hz	
HF min (khz)			30khz	30khz	30khz	30khz	30khz	135khz	135khz	
HF max (khz)			135khz	135khz	135khz	135khz	135khz	135khz	135khz	
Clock (Mhz)			300Mhz	600Mhz	600Mhz	600Mhz	560Mhz	560Mhz	560Mhz	

EDID 2Page 영역의 Video Short Block Description							
수평 크기	수직 크기	주사방식	주파수	비율	HDMI 1.4	HDMI 2.0 HDMI FreeSync	DP DP FreeSync
640	480	P	59.94/60	4:3	●	●	●
720	480	P	59.94/60	4:3		●	
720	480	P	59.94/60	16:9	●	●	●
1280	720	P	59.94/60	16:9	●	●	●
1920	1080	I	59.94/60	16:9	●	●	
1920	1080	P	23.98/24	16:9		●	
1920	1080	P	29.97/30	16:9	●	●	
1920	1080	P	59.94/60	16:9	●	●	●
3840	2160	P	23.98/24	16:9		●	
3840	2160	P	25	16:9		●	
3840	2160	P	29.97/30	16:9		●	
3840	2160	P	50	16:9		●	
3840	2160	P	59.94/60	16:9		●	

ADJUSTMENT

1. How to Enter the SVC mode

- #1) Monitor Power off using the Circle OSD
- #2) Move joystick button Left 3 Times and Right 1 Time
- #5) DC On (Click the Joystick Power button)
- #6) Select the Menu

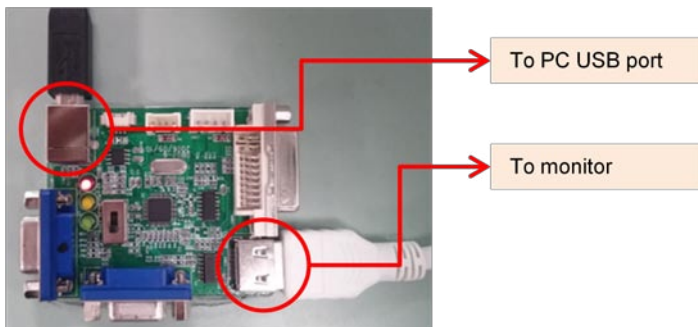


#7) you can see Service Menu at the top left side and you can get information from it.

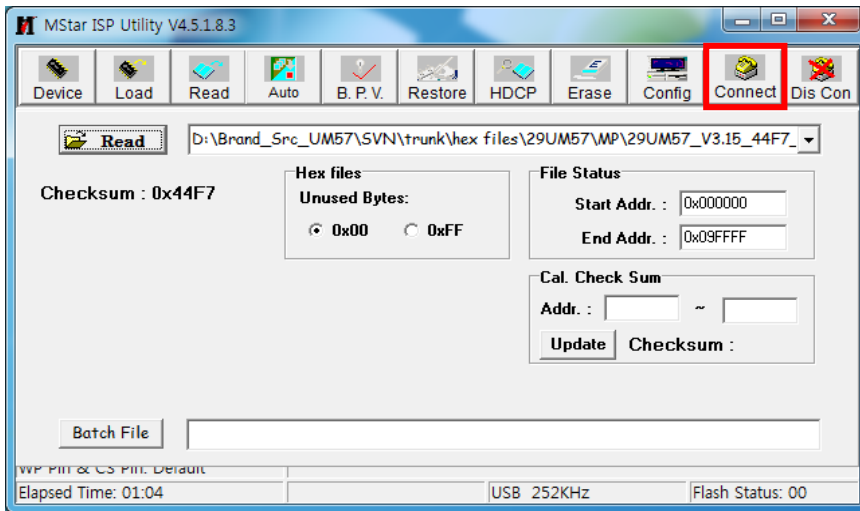


2. How to update the F/W” (refer to Next Page)

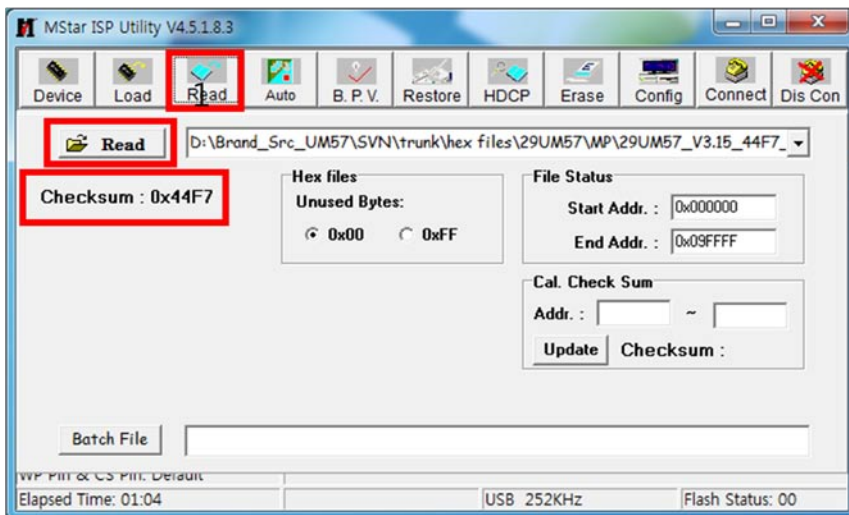
#1). Connect Mstar Jig to monitor and PC.



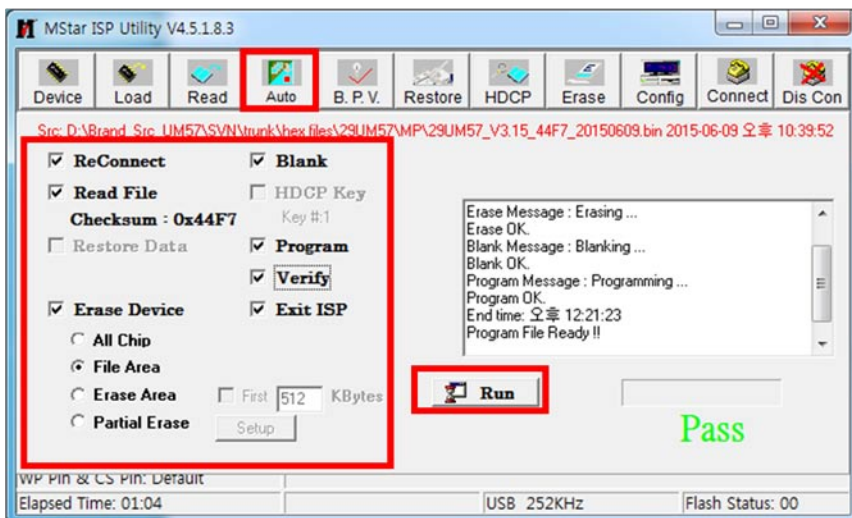
#2). Connect HDMI cable and select “Connect” button.



#3). Select “Read” button(1st) and find bin file(2nd) and then check the checksum value(3th).

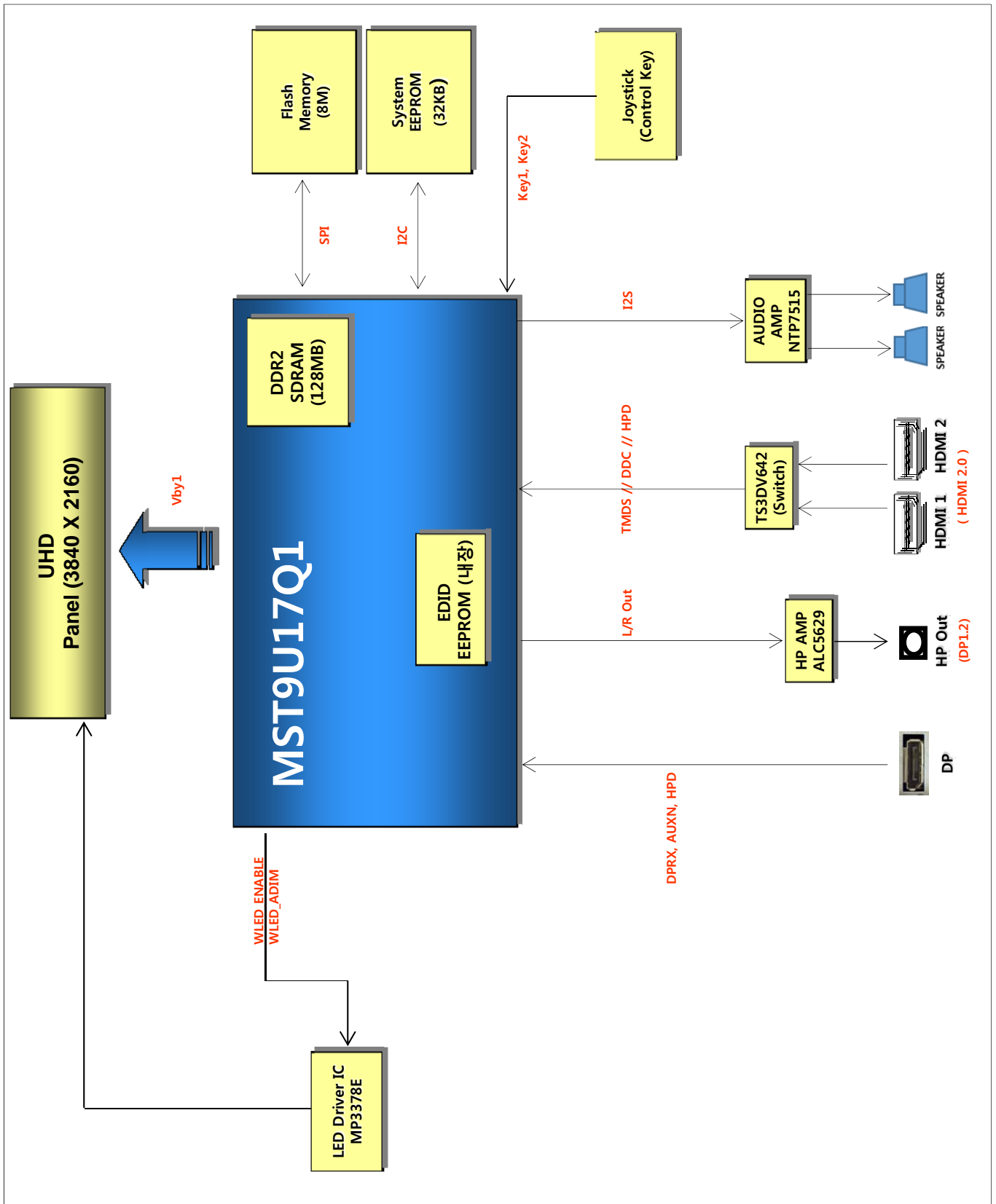


#4). Select “Auto” button(1st) and confirm the checkbox settings(2nd) and then select “Run” button(3th).
*Please make sure that “File Area” option is selected.



#5). After ISP is completed, do factory reset in the OSD main menu.

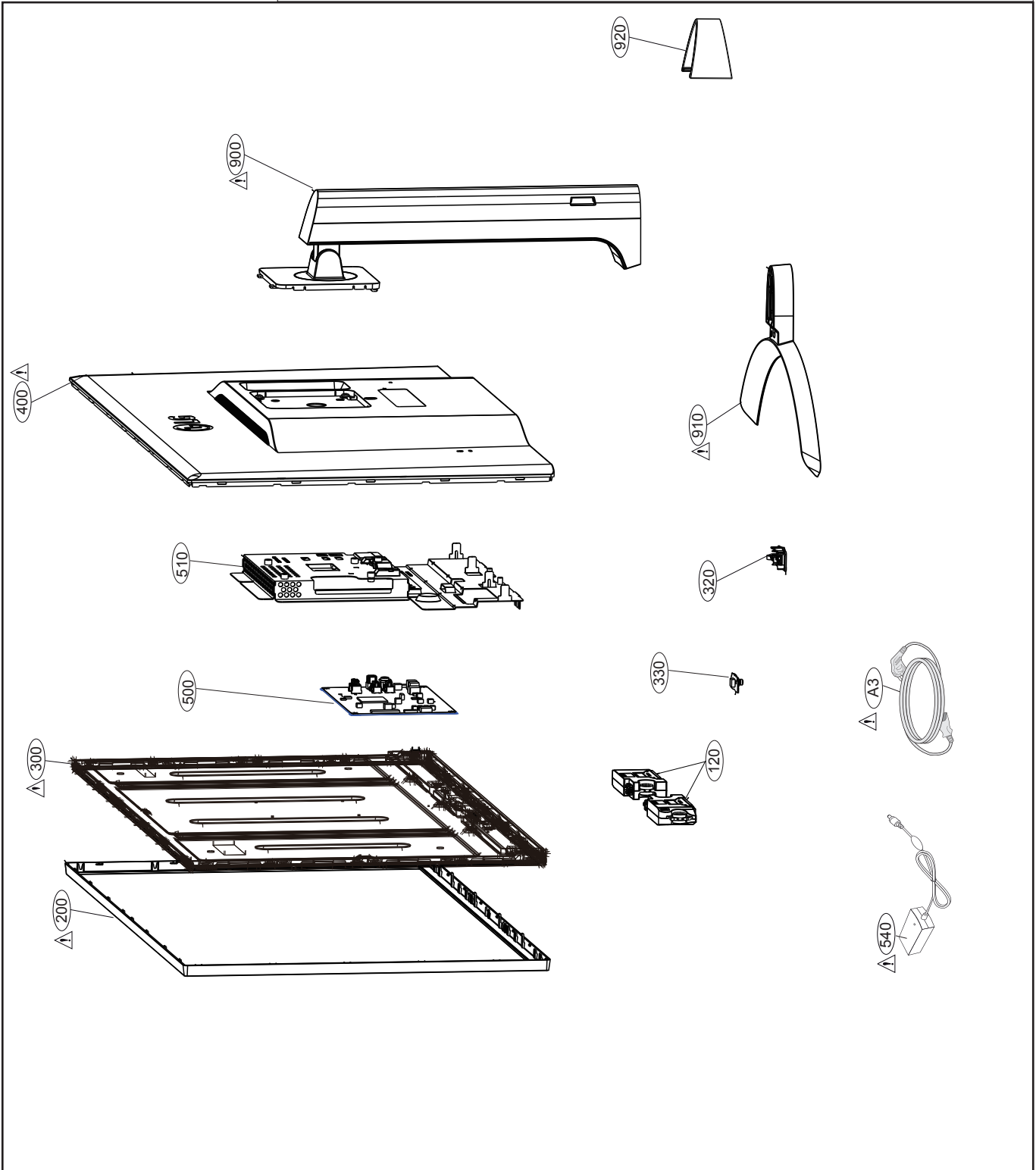
BLOCK DIAGRAM (Main)



EXPLODED VIEW

IMPORTANT SAFETY NOTICE

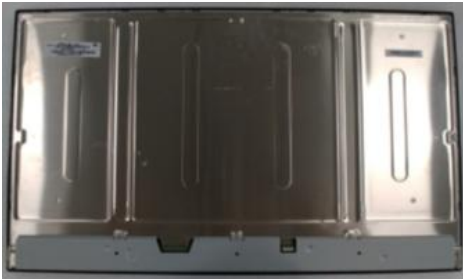
Many electrical and mechanical parts in this chassis have special safety-related characteristics. These parts are identified by Δ in the Schematic Diagram and EXPLODED VIEW. It is essential that these special safety parts should be replaced with the same components as recommended in this manual to prevent Shock, Fire, or other Hazards. Do not modify the original design without permission of manufacturer.



Assemble and disassemble method



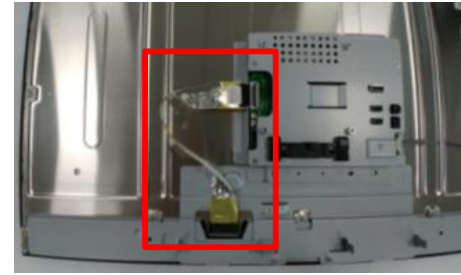
■ assemble method **Caution: SVC man must check insulation sheet on the module before assembling the set**



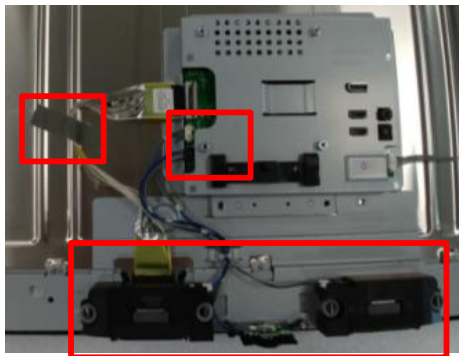
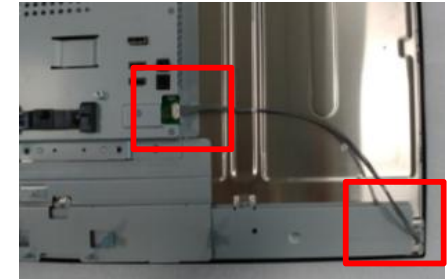
1. Assemble with CA+ Module
2. Assemble by latches



1. Put on the rear shield assy on the module guided by cabinet rib



1. Assemble LVDS cable by hand.
2. Assemble LED driver cable by hand.



1. Assemble the Jog assy and speaker assy and attach tape 1EA



1. Assemble the B/C and cabinet by latch



1. Assemble screw 4EA back cover with rear shield



1. Assemble Stand base and Body by Thumb screw.



1. Assemble Stand assy at back cover (One click button)

■ Tool Description



General drivers

Gloves

Assemble and disassemble method

■ Disassemble method



1. Remove the stand using one click button



1.Remove the Screw 4EA



1.Disassemble from top ->left/right ->top corner .



1.The open status top/side of both , one hand was supported module, and open the Back cover.



1. Disassemble the Rear shield assy and all cable.



1. Remove the cabinet from module

■ Tool Description

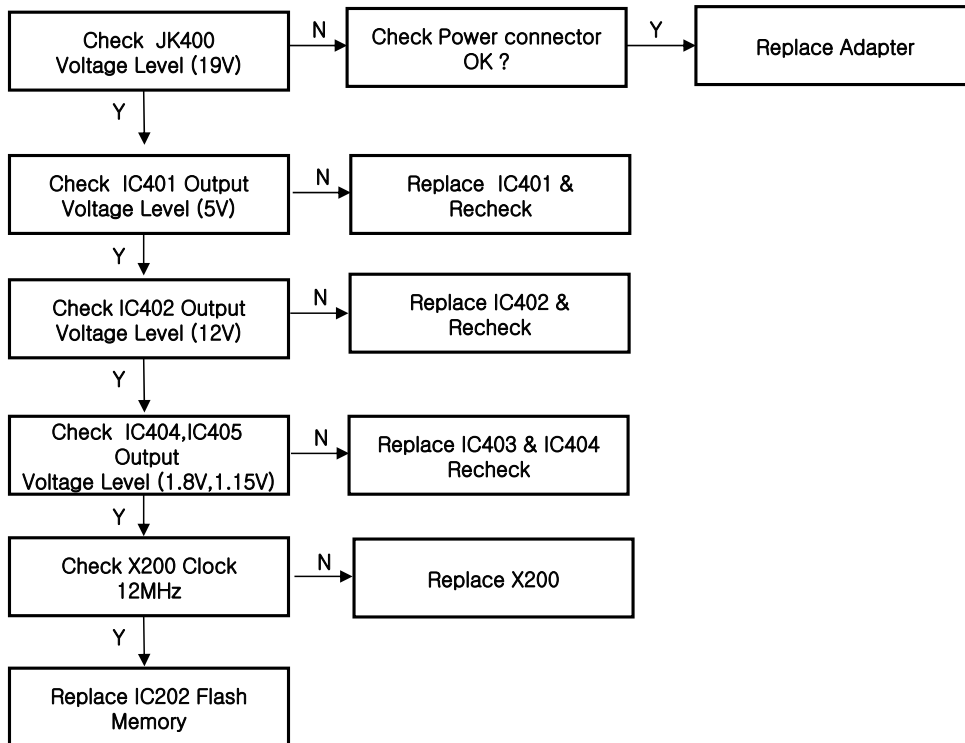


General drivers

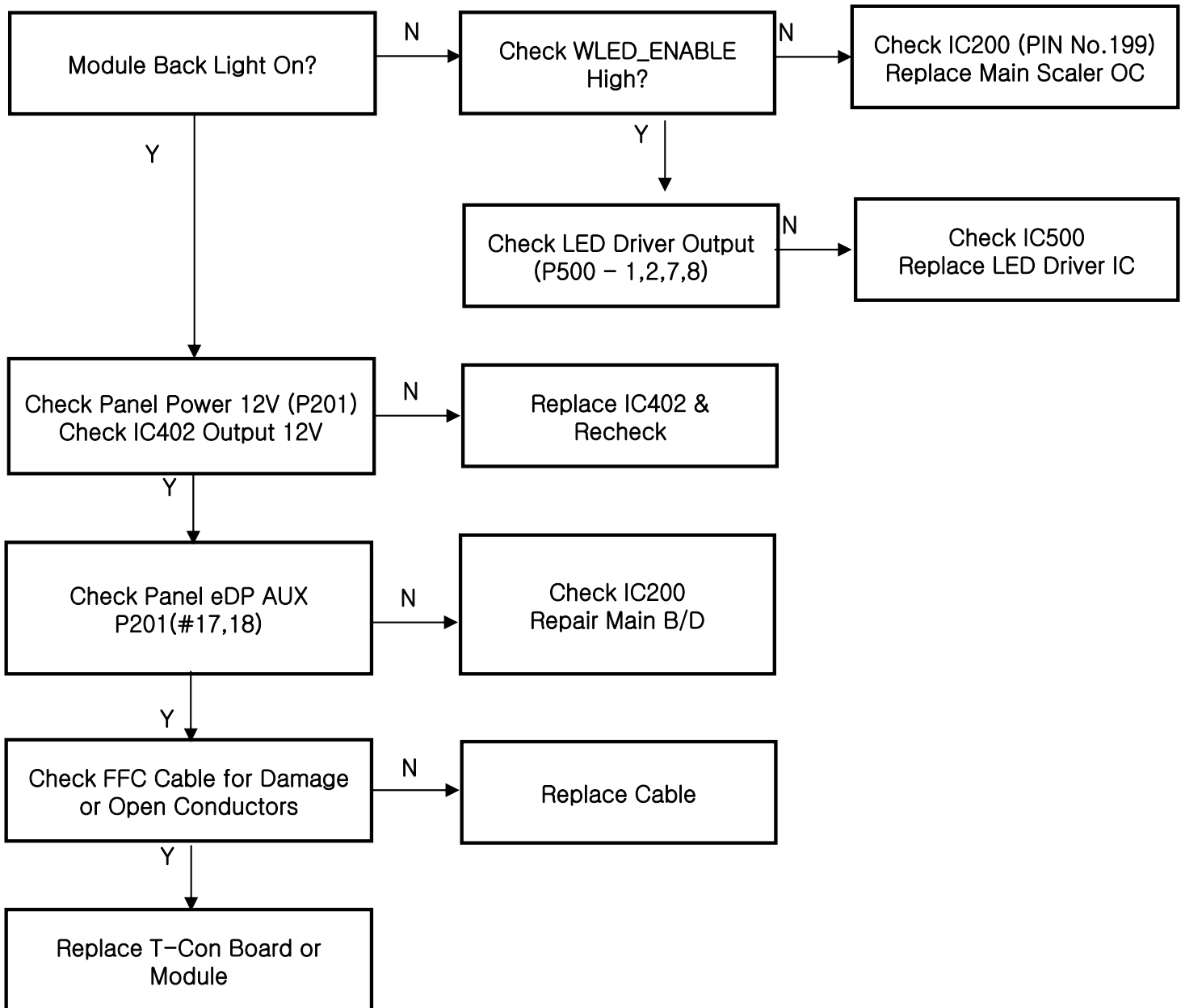
Gloves

Trouble shooting : No Power

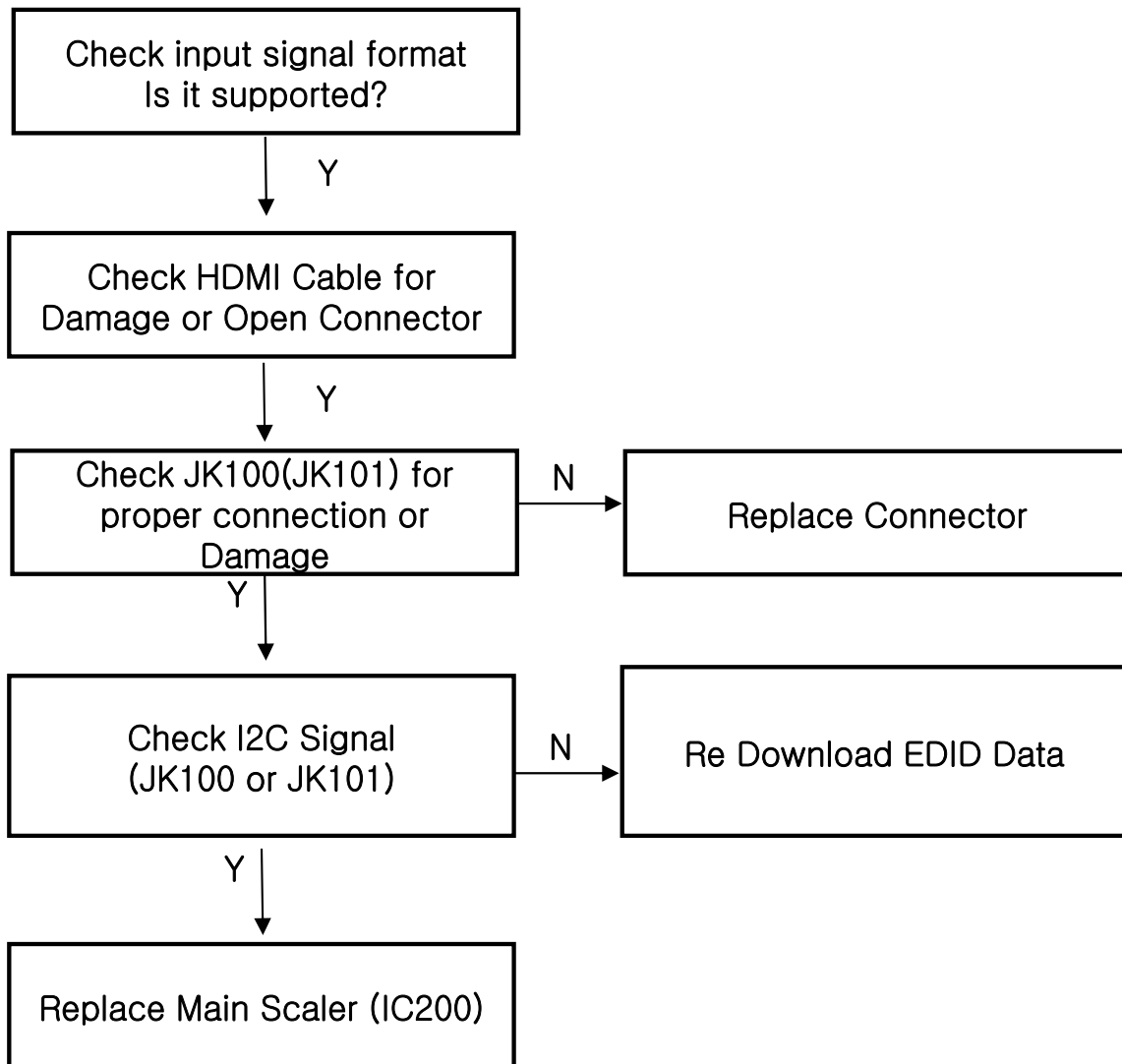
First of all, Check whether there is SVC Bulletin in GCSC System for these model.



Trouble shooting : No Screen on



Trouble shooting : No Video – HDMI



Trouble shooting : No Video – DP

