Pebble
2032BW/GW, 2232BW/GW
Training Manual

Development 3 Group

Development 6 (VD) Lab

SAMSUNG

Contents

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1. Product Overview (Product Features)

*. Feature

▶Scaler + MICOM inside + Dual signal (SE657MRH scaler)

▶Power Consumption : 45W(2032), 50W(2232)

▶DPMS : under 1 W

▶Glare Panel (2032GW, 2232GW) Non Glare(2032BW, 2232BW)

▶Response Time : 2ms

▶Dynamic Contrast Typ.3000:1

1. Product Overview (Product Specification)

Key Specification		
Model	2032BW 2032GW	2232BW 2232GW
Size	20" wide	22" wide
Resolution	1680*1050@60Hz	1680*1050@60Hz
Colors	16.7M	16.7M
Brightness	300cd/㎡	300cd/㎡
Contrast Ratio	1000:1 DCR ON Typ. 3000:1	1000:1 DCR ON Typ. 3000:1
Supported Resolutions	VGA ~ WSXGA+	VGA ~ WSXGA+
Horizontal Synchronization	30~81kHz	30~81kHz
Sync Type	Sep./Comp./SOG	Sep./Comp./SOG
Vertical Frequency	56~75Hz	56~75Hz
Viewing Angle	160°/160° (CR>10)	160°/160° (CR>10)
Response Time	2ms(G to G)	2ms(G to G)
Signal Input	Analog / DVI Digital with HDCP	Analog / DVI Digital with HDCP
Power Consumption	45Watt(Max)	50Watt(Max)
Size(W/O stand)	476*344*70(W*H*D)	517*372*70(W*H*D)
Panel	2032BW : CPT, AU 2032GW : CPT	2232BW : AU, CMO 223GW : AU

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1. Product Overview (Product Specification)

Key Specification		
Function	**Detail Function**	**Description**
Magic color	Off	Magic Color Off
	Demo	Used for shop demos. The left one is for Magic Color On. The right one is for Magic Color Off.
	Full	Presents more abundant colors by expanding the three color tones of R, G and B.
	Intelligent	Expands all R/G/B colors except for skin tones.
Magic Bright	Custom	Factory defaults
	Text	The brightness setting for text editing (100 to 160 cd/m2)
	Internet	The brightness setting for Internet use (140 to 200 cd/m2)
	Game	The brightness setting for playing Internet games (Stronger than 225 cd/m2)
	Sports	The brightness and color temperature settings for watching sports programs (Stronger than 180 cd/m2, 8000K)
	Movie	The brightness and color temperature settings for watching movies (Stronger than 200 cd/m2, 6500K)
	Dynamic Contrast	Dynamic Contrast is to automatically detect distribution of inputted visual signal and adjust to create optimum contrast.
Color Tone	Cool	The blue tone from the R/G/B colors is emphasized (9300K)
	Normal	Natural state. There is no artificial adjustment to the R/G/B colors
	Warm	The red tone from the R/G/B colors is emphasized (6500K)
	Custom	The user-defined state of the R/G/B Color Control is saved

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1. Product Overview (Product Specification)

Key Specification		
Function	**Detail Function**	**Description**
Gamma	Mode 1	The default gamma settings supported by the panel. (Gamma 2.2)
	Mode 2	Adjusts the entire screen to look brighter using the Scaler (Gamma 2.0)
	Mode 3	Adjusts the entire screen to look darker using the Scaler (Gamma 2.4)
Sharpness	Sharpness	Makes characters look smooth or clear when they appear overlapped or spread because the signals input from the PC have a lot of peakings.
RTA	RTA	A function that accelerates the response speed of the panel so as to provide a sharper and more natural video display.

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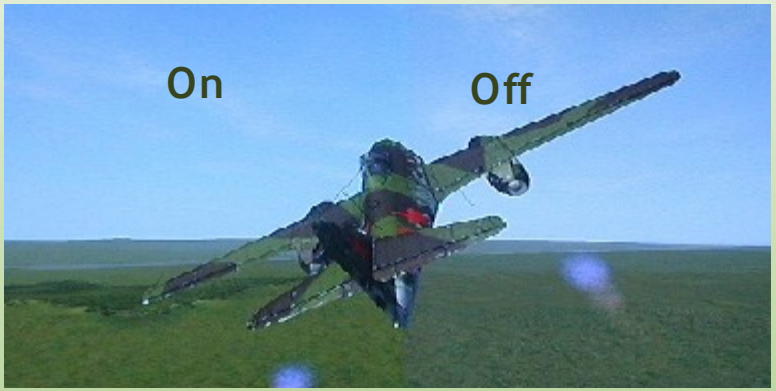
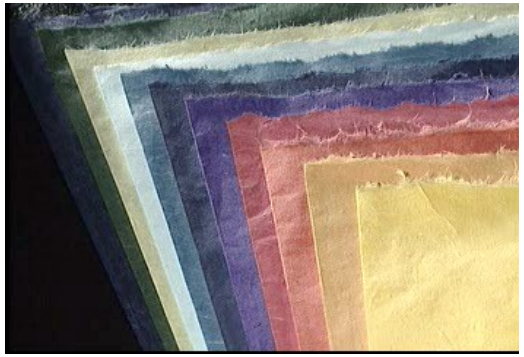
1. Product Overview (Magic Color)

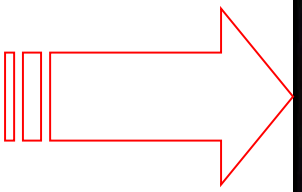
Magic color Demo Mode

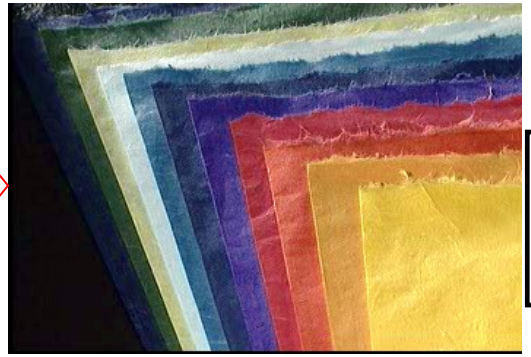


DEMO mode

Magic color Full Mode







All R/G/B Colors Expanded

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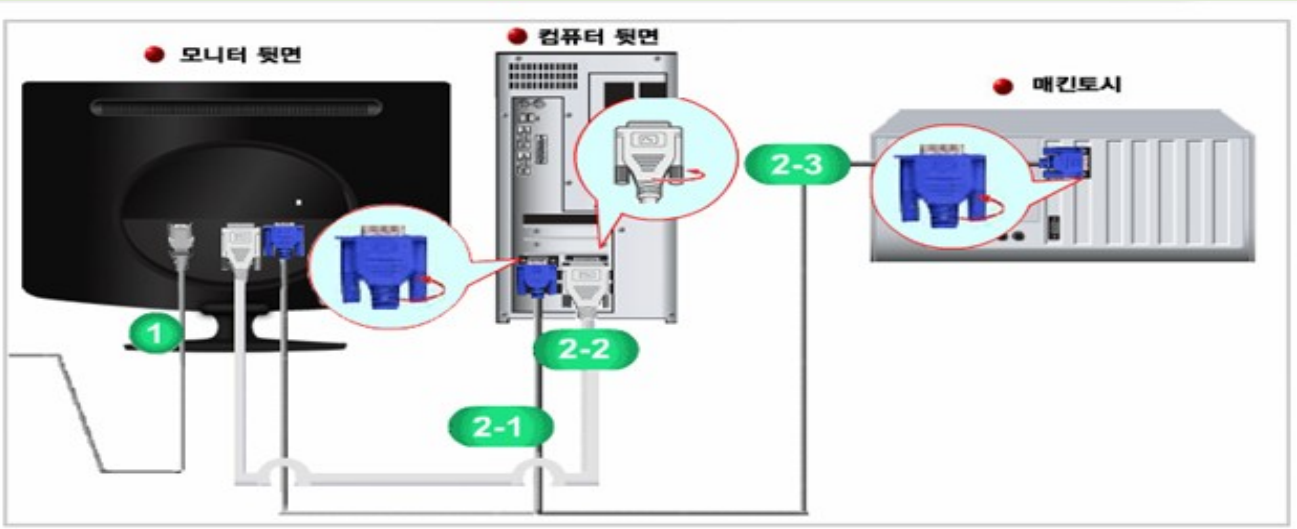
1. Product Overview (Magic Color)

Magic color
Intelligent Mode

Except Skin Tone

1. Product Overview (Connecting External Devices)



1. Connect the power cord for your monitor to the power port on the back of the monitor.
Plug the power cord for the monitor into a nearby outlet.

2-1. Using the D-sub (Analog) connector on the video card.
Connect the signal cable to the 15-pin, D-sub connector on the back of your monitor.

 [RGB]

2-2. Using the DVI (Digital) connector on the video card.
Connect the DVI Cable to the DVI Port on the back of your Monitor.

 [DVI(HDCP)]

2-3. Connected to a Macintosh.
- Connect the monitor to the Macintosh computer using the D-sub connection cable.

2-4. If you are using an old model Macintosh, connect the monitor and the Macintosh using a Macintosh adapter (sold separately).

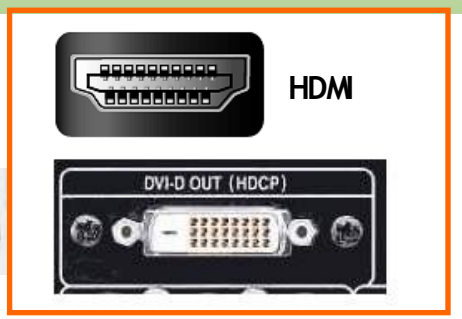
3. If the monitor and the computer are connected, you can turn them on and use them .

1. Product Overview (Connecting External Devices)

HDCP supported model

- The DVI (digital visual interface) delivers video images with very high resolution and
  essentially perfect quality
- You can enjoy digital contents with DVI interface (HDCP supported)

DVI - HDMI Adapter



DVD Player with HDCP Contents

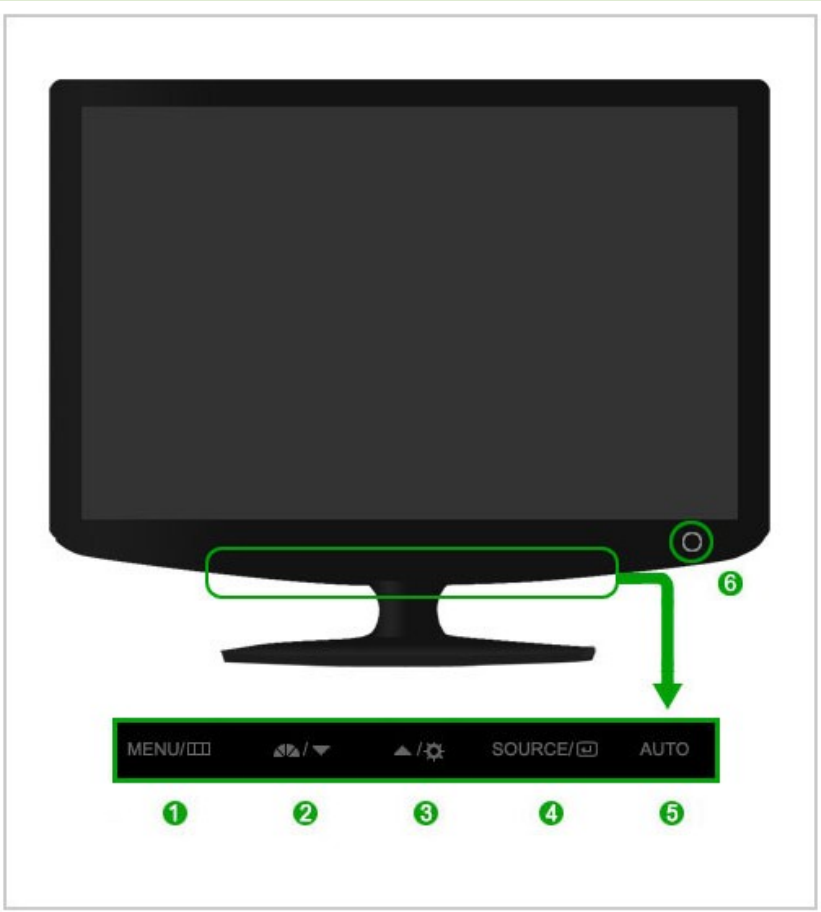
Support resolution

640 x 480p @50/60
720 x 480p @50/60
720 x 576p @50/60
1280 x 720p @50/60

1. Product Overview (Supported Display Modes)

Display Mode	Horizontal Frequency (kHz)	Vertical Frequency (Hz)	Pixel Clock (MHz)	Sync Polarity (H/V)
IBM, 640 x 350	31.469	70.086	25.175	+/-
IBM, 640 x 480	31.469	59.940	25.175	-/-
IBM, 720 x 400	31.469	70.087	28.322	-/+
MAC, 640 x 480	35.000	66.667	30.240	-/-
MAC, 832 x 624	49.726	74.551	57.284	-/-
MAC, 1152 x 870	68.681	75.062	100.000	-/-
VESA, 640 x 480	37.500	75.000	31.500	-/-
VESA, 640 x 480	37.861	72.809	31.500	-/-
VESA, 800 x 600	35.156	56.250	36.000	-/-
VESA, 800 x 600	37.879	60.317	40.000	+/+
VESA, 800 x 600	46.875	75.000	49.500	+/+
VESA, 800 x 600	48.077	72.188	50.000	+/+
VESA, 1024 x 768	48.363	60.004	65.000	-/-
VESA, 1024 x 768	56.476	70.069	75.000	-/-
VESA, 1024 x 768	60.023	75.029	78.750	+/+
VESA, 1152 x 864	67.500	75.000	108.000	+/+
VESA, 1280 x 1024	60.000	60.000	108.000	+/+
VESA, 1280 x 1024	79.976	75.025	135.000	+/+
VESA, 1680 x 1050	64.674	59.883	119.000	+/-
VESA, 1680 x 1050	65.290	59.954	146.250	-/+

1. Product Overview (OSD Functions)



1. MENU
2. MagicBright™ / Down
3. Brightness / Up Button
4. Enter / Source Button
5. Auto
6. Power Button

1. Product Overview (OSD Functions)

OSD Details

1. **MENU Button[ ]** Opens the OSD menu. Use this button to exit the OSD or go to the upper OSD menu.

2. **MagicBright™ Button [ ]** Press this button to adjust MagicBright™.
MagicBright™is a monitor that fits to various user environments such as editing documents, Internet use and watching movies, etc. It has more than double the brightness and screen quality of existing monitors. The dedicated buttons on the front of the monitor allow users to easily implement six (6) different sets of brightness and clearness settings that fit the environment.

   1) **Custom** The Custom mode provides refined brightness and clearness levels. However, it may not be comfortable on the eyes depending on the user's preferences. In this case, adjust the brightness and clearness using the menu.

   2) **Text** Text mode provides the same brightness level of general monitors appropriate for text editing.

   3) **Internet** Internet mode provides enhanced brightness while maintaining a level of text readability appropriate to the Internet environment where text and images are combined.

   4) **Game** Game mode provides a brightness level appropriate for playing games where there are a lot of graphics and fast screen switching.

   5) **Sports** Sports mode provides a brightness level appropriate for watching sports programs where there is a lot of movement.

   6) **Movie** Movie mode provides excellent brightness and cleanness levels for the entertainment (movies, DVD, TV, etc.) environment, at the same level as a TV.

   7) **Dynamic Contrast** Dynamic Contrast is to automatically detect distribution of inputted visual signal and adjust to create optimum contrast.)

1. Product Overview (OSD Functions)

OSD Details

3	Brightness Button[ ]	Use this button to adjust the brightness of the screen.
2,3	Adjustment Button[▼/▲]	Use this button to move around the OSD menu or change the value.
4	Enter / Source Button[ ]	Press this button to select a function.
5	AUTO Button	Press this button to perform auto adjustments.
6	Power Button	Press this button to turn the monitor on or off.

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1. Product Overview (OSD Tree)

 (Picture)	 (Color)	 (Image)	 (OSD)	 (Set Up)	 (Information)	 (Magic Bright)
- Contrast - Brightness	-MagicColor .off .Demo .Full .Intelligent .MagicZone - Color Tone .Cool .Normal .Warm .Custom - Color Control .Red .Green .Blue - Gamma .Mode1 .Mode2 .Mode3	- Coarse - Fine - Sharpness - H-Position - V-Position	- Language - H Position - V Position - Transparency - Display Time	- Auto Source - Image Reset - Color Reset -. RTA	- Source - Frequency - Resolution	- Custom - Text - Internet - Game - Sport - Movie -. Dynamic Contrast

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1. Product Overview (OSD Hidden Key)

No	Function	Operating method
1	User Delete	Select Brightness from the menu, and then hold down the Enter button for five (5) seconds while the menu is displayed.
2	Entering the Service Menu	Set both the brightness and the contrast to '0' on the menu, and then hold down the Enter button for five (5) seconds while the menu is displayed.
3	Color Calibration	Select OSD/Language English from the menu, and then hold down the Enter button for five (5) seconds while the menu is displayed. (The screen is in 16 gray colors.)
4	Menu Lock	Hold down the Menu button for five (5) seconds

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1. Product Overview (2032 Compatibility Evaluation Results)

대외비	LCD MONITOR/MFM CHECKLIST	Model	Tester
		LS22PEJ	H.C.KIM
보존기한 : 1년		Stage	Date
		PV	2007.04.27

■ 제품사양

Panel	CMO M220Z1-L03
Scaler	Mstar SE758MRH
MCU	Mstar SE758MRH
Code Version	M-PE22B0CDA-0805

■ 평가시료

No	Chip Maker	Card Name / Manufacturer	Overall Test Result	Remark
1	nVidia	GeForce PCX 6600 / Leadtech	PASS	-
2		GeForce PCX 7600 / EMTEK	PASS	-
3		GeForce PCX 6200 / Absolute	PASS	-
4	ATI	Radeon Xpress 200/JooyunTech	PASS	-
5		Radeon X800 / Bytel	PASS	-
6	Matrox	p650	PASS	-
7	Intel	i915G / IBM	PASS	-
8		i965G / DELL	PASS	-

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1. Product Overview (2232 Compatibility Evaluation Results)

대외비	LCD MONITOR/MFM CHECKLIST	Model	Tester
		LS22PEJ	H.C.KIM
보존기한 : 1년		Stage	Date
		PV	2007.04.27

■ 제품사양

Panel	CMO M220Z1-L03
Scaler	Mstar SE758MRH
MCU	Mstar SE758MRH
Code Version	M-PE22B0CDA-0805

■ 평가시료

No	Chip Maker	Card Name / Manufacturer	Overall Test Result	Remark
1	nVidia	GeForce PCX 6600 / Leadtech	PASS	-
2		GeForce PCX 7600 / EMTEK	PASS	-
3		GeForce PCX 6200 / Absolute	PASS	-
4	ATI	Radeon Xpress 200/JooyunTech	PASS	-
5		Radeon X800 / Bytel	PASS	-
6	Matrox	p650	PASS	-
7	Intel	i915G / IBM	PASS	-
8		i965G / DELL	PASS	-

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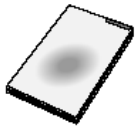
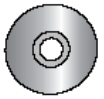
1. Product Overview (Specifications of Options)

Item	Item Name	CODE.NO	Remark
	Quick Setup Guide	BH68-00376L	
	Warranty Card (Not available in all locations)	BH68-00633A	
	User's Guide, Monitor Driver, Natural Color software, MagicTune™ software	BN59-00585N	
	D-Sub(15 Pin) Cable	BN39-00244B	
	Power Cord	3903-000042	
	Cleaning Cloth	BN63-02368A	(Black / High Glossy Model only)
	DVI Cable	BN39-00246F	Sold separately

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2. Circuit Description (Product Structure)

1. Panel Part

- See Product Specifications.

2. Main Board Part

- Receives external PC analog signals, and then outputs the video signals to the panel using a Scaler and also outputs the same signals as external input.

3. I P BOARD

- Inverter + SMPS BOARD

4. Function Button

Transfers the input signals where the Function button is used to the main board and displays the LED.

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2. Circuit Description (New Part)

- Scaler

  SE758MRH-LF

  Use a type of scaler with an embedded MCU core.

- Detailed Specifications
  - On-Chip Microcontroller
  - On-Chip OSD Controller
  - LVDS/RSDS Transmitters
  - 128-QFP Package

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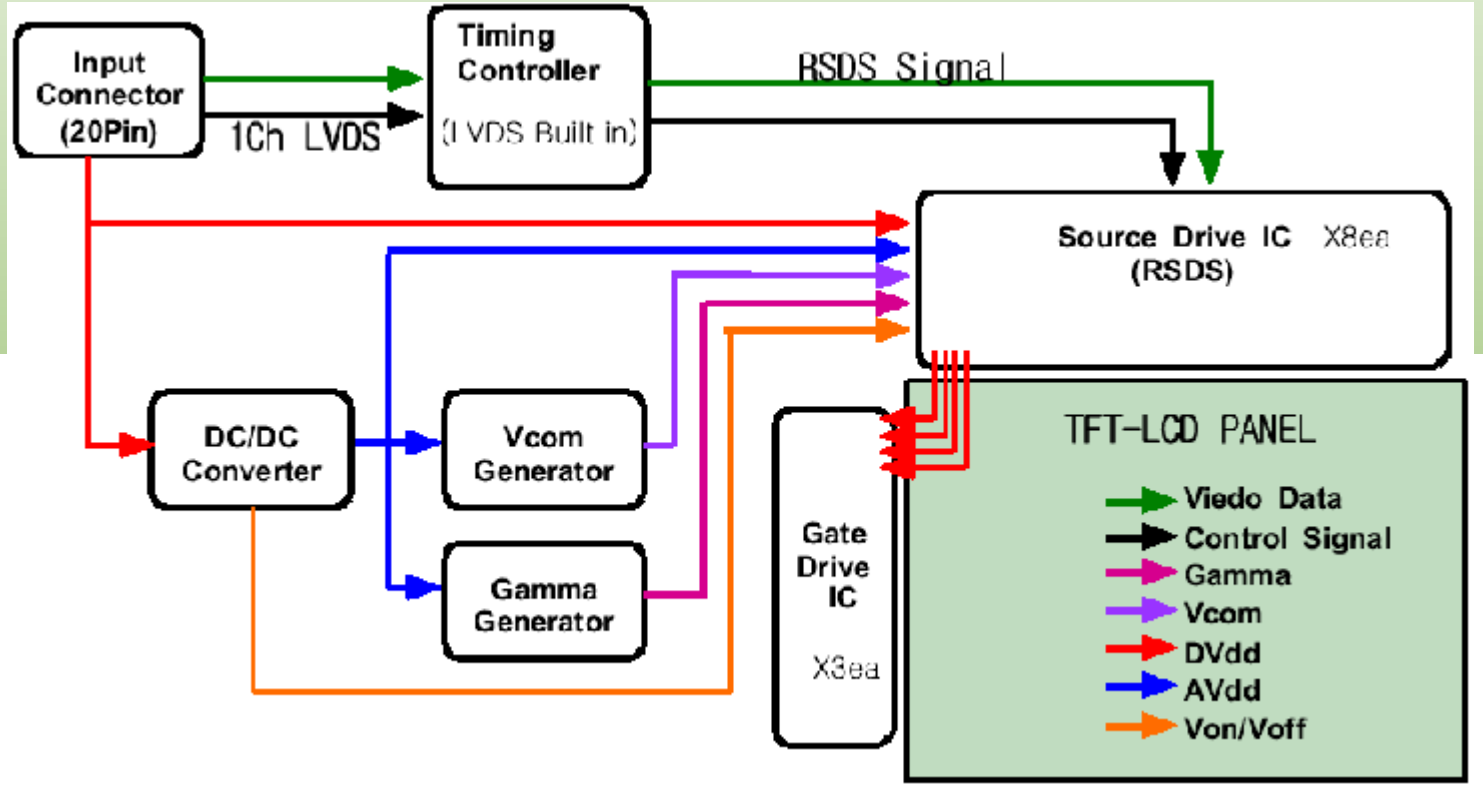
2. Circuit Description (Panel Part)



2. Circuit Description (Panel Part)

* PROTECTION*

- LAMP(Inverter) PROTECION

=> The protection is activated if there is no feedback because the lamp connector is disconnected or the lamp is cracked.

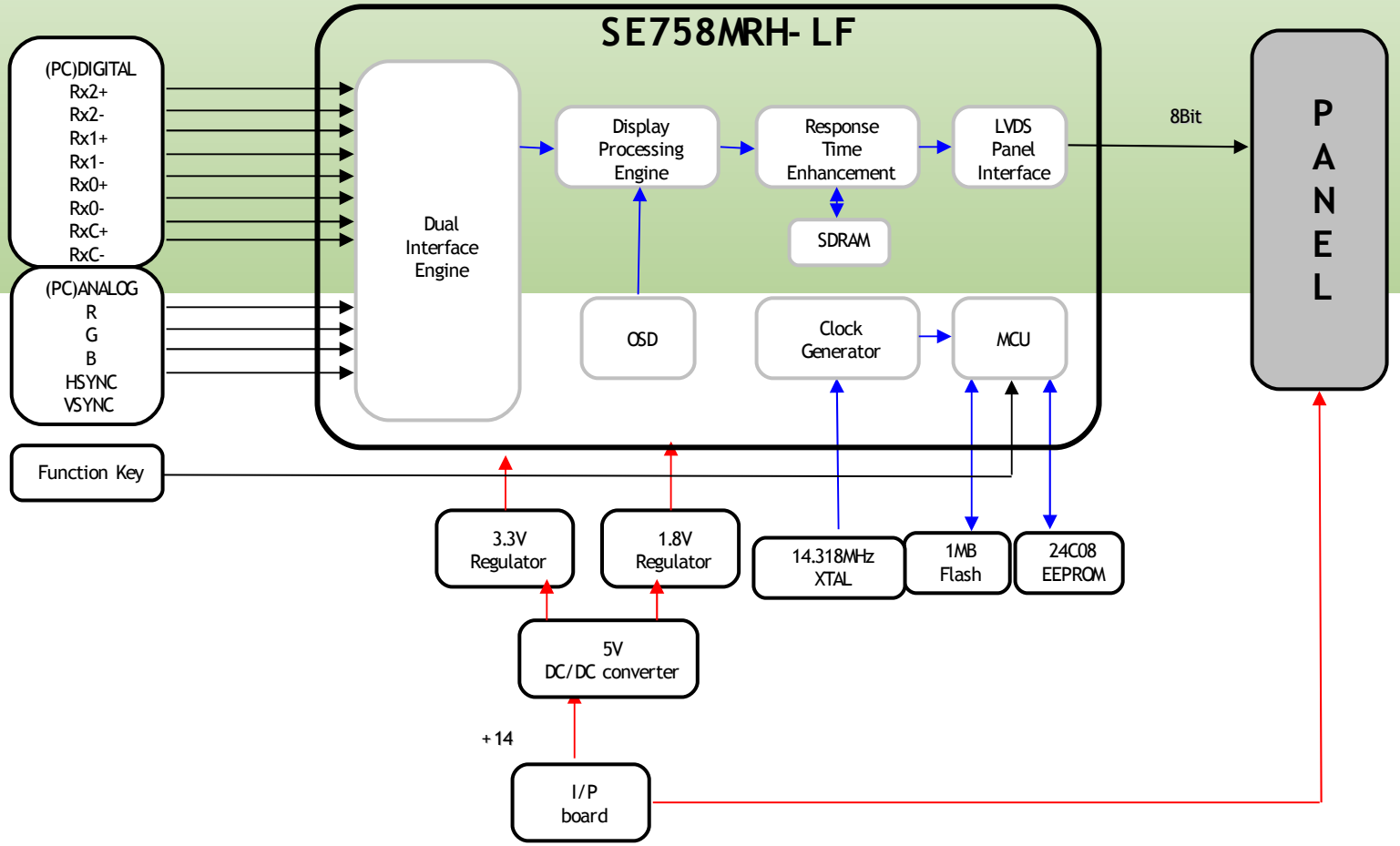
=> The over voltage protection starts as a lamp protection if the output voltage of the inverter transformer is high.

- Power Protection

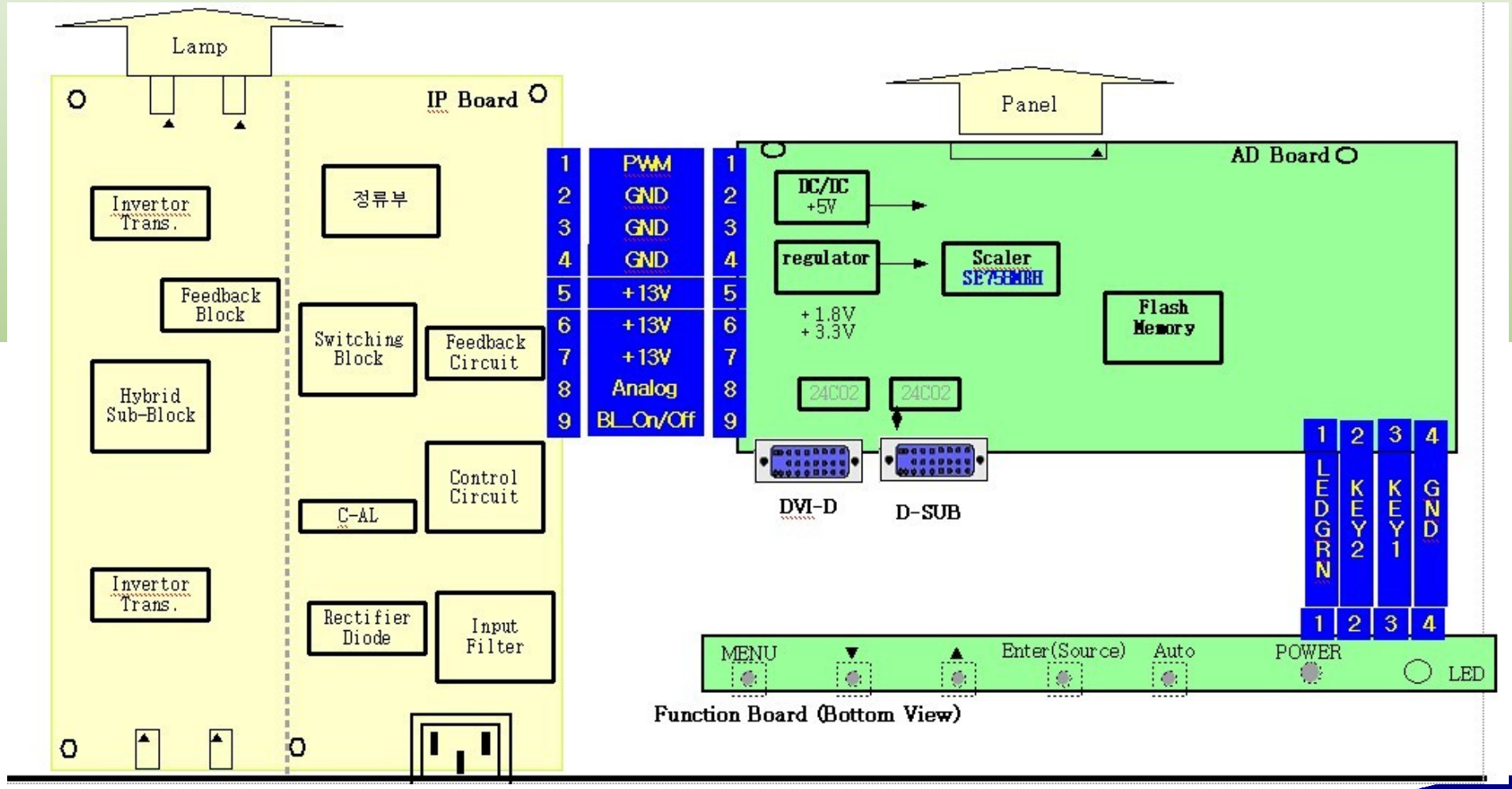
=> All panel protection (OVP/OCP) operates in Auto Recovery mode. When the panel is stopped temporarily due to a protection issue, it powers the panel on again to resume the operation after the problem is cleared.

However, as an exception, in the case of a thermal protection issue, the panel can only operate normally if the power is turned off and is fully discharged and turned on again. This is controlled by a function designed in the power IC.

2. Circuit Description (Scaler Part)



2. Circuit Description (Main Block Diagram)



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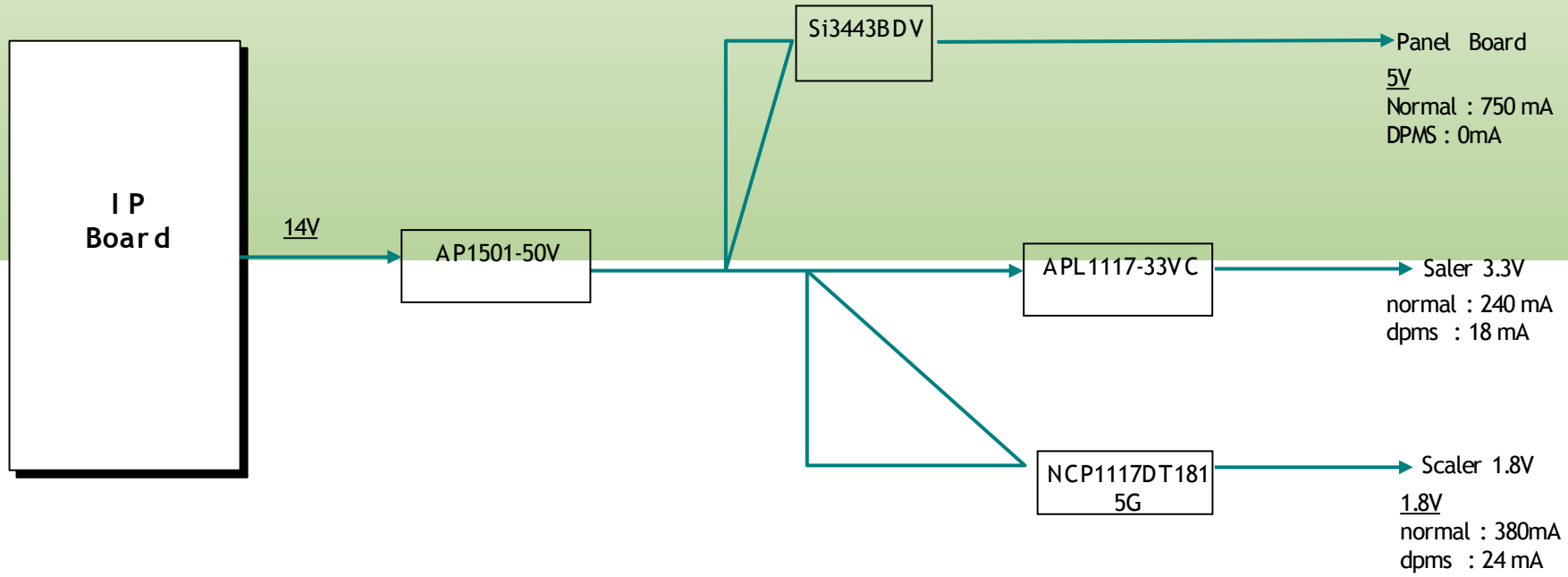
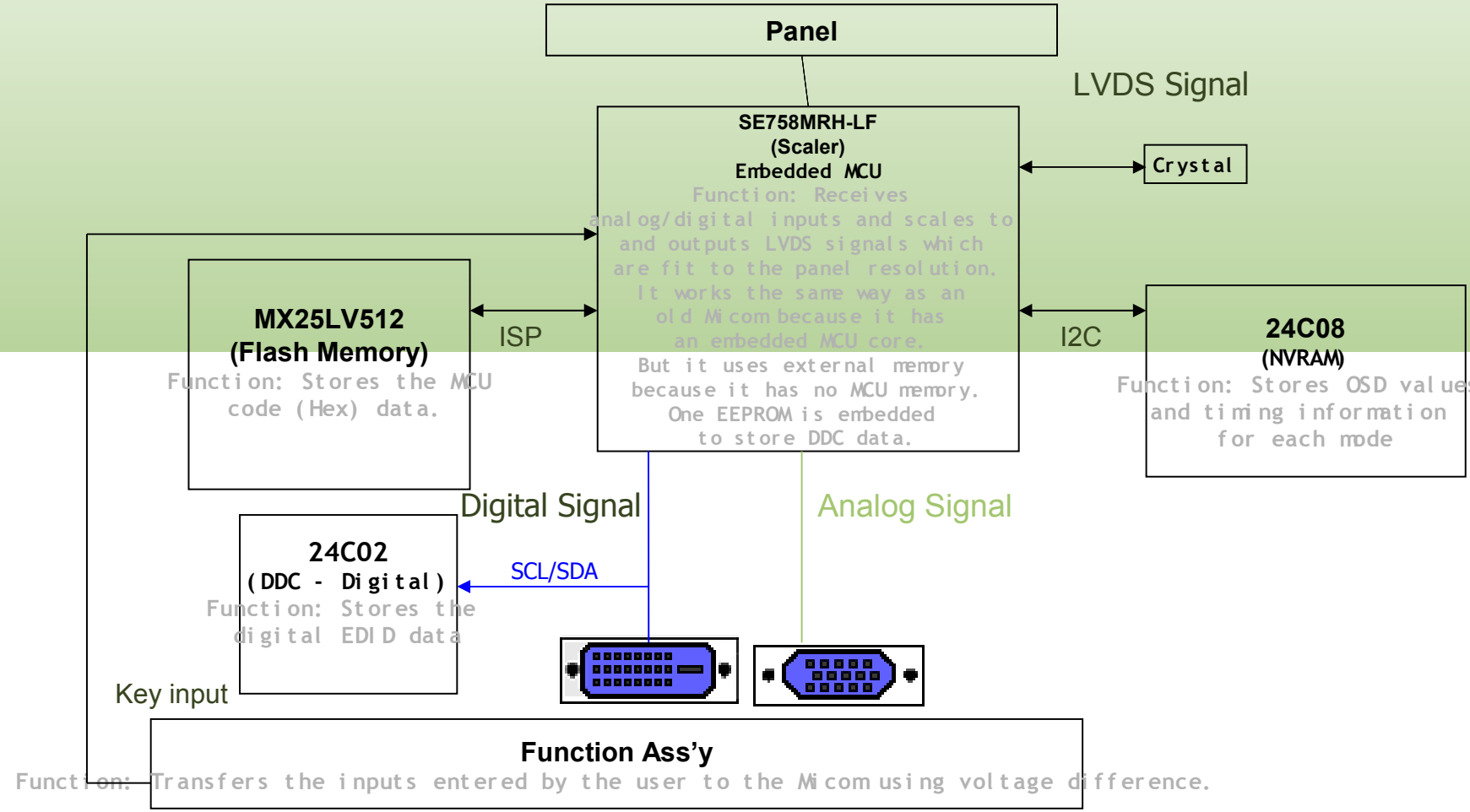
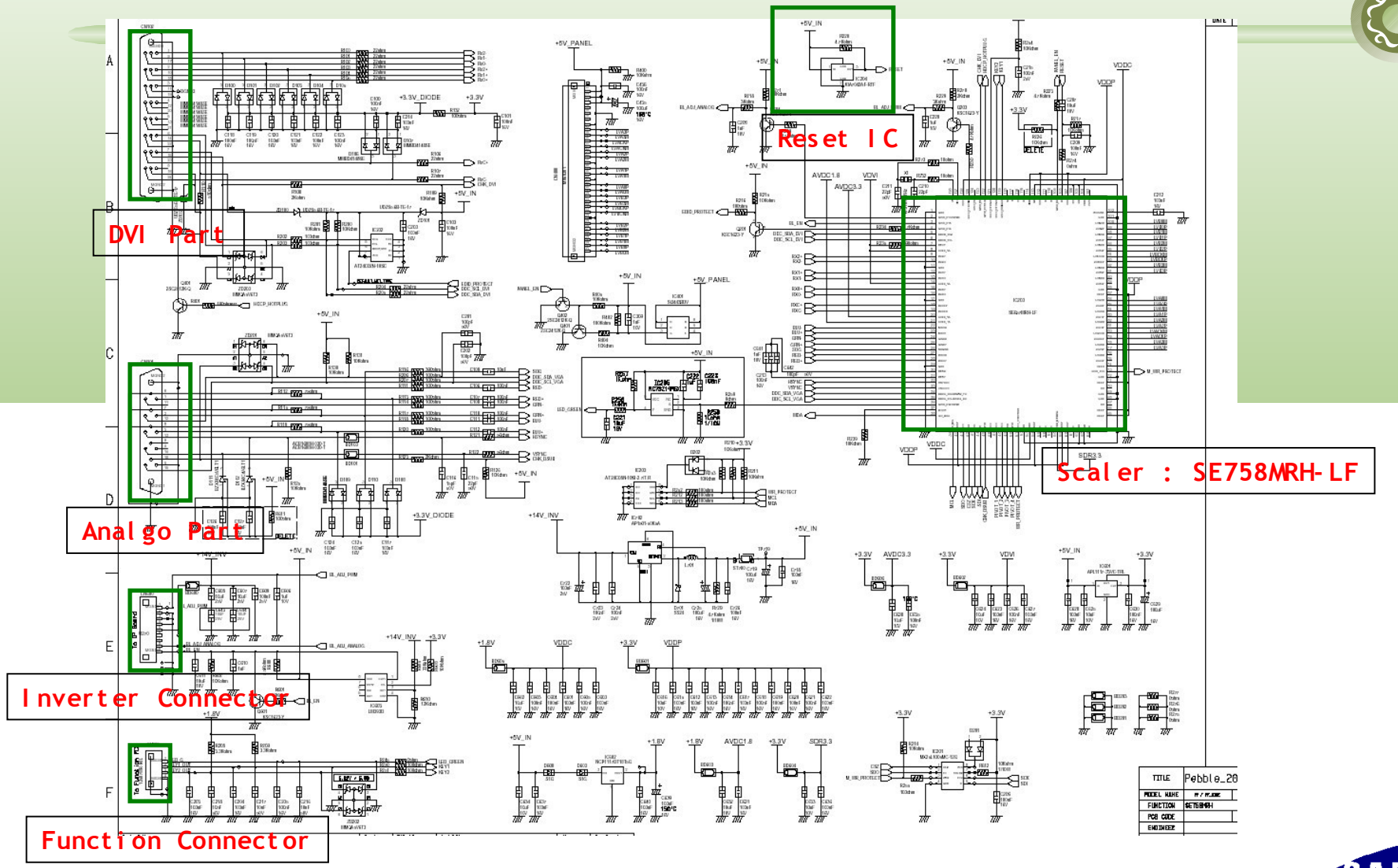
2. Circuit Description (Power Flow Chart)



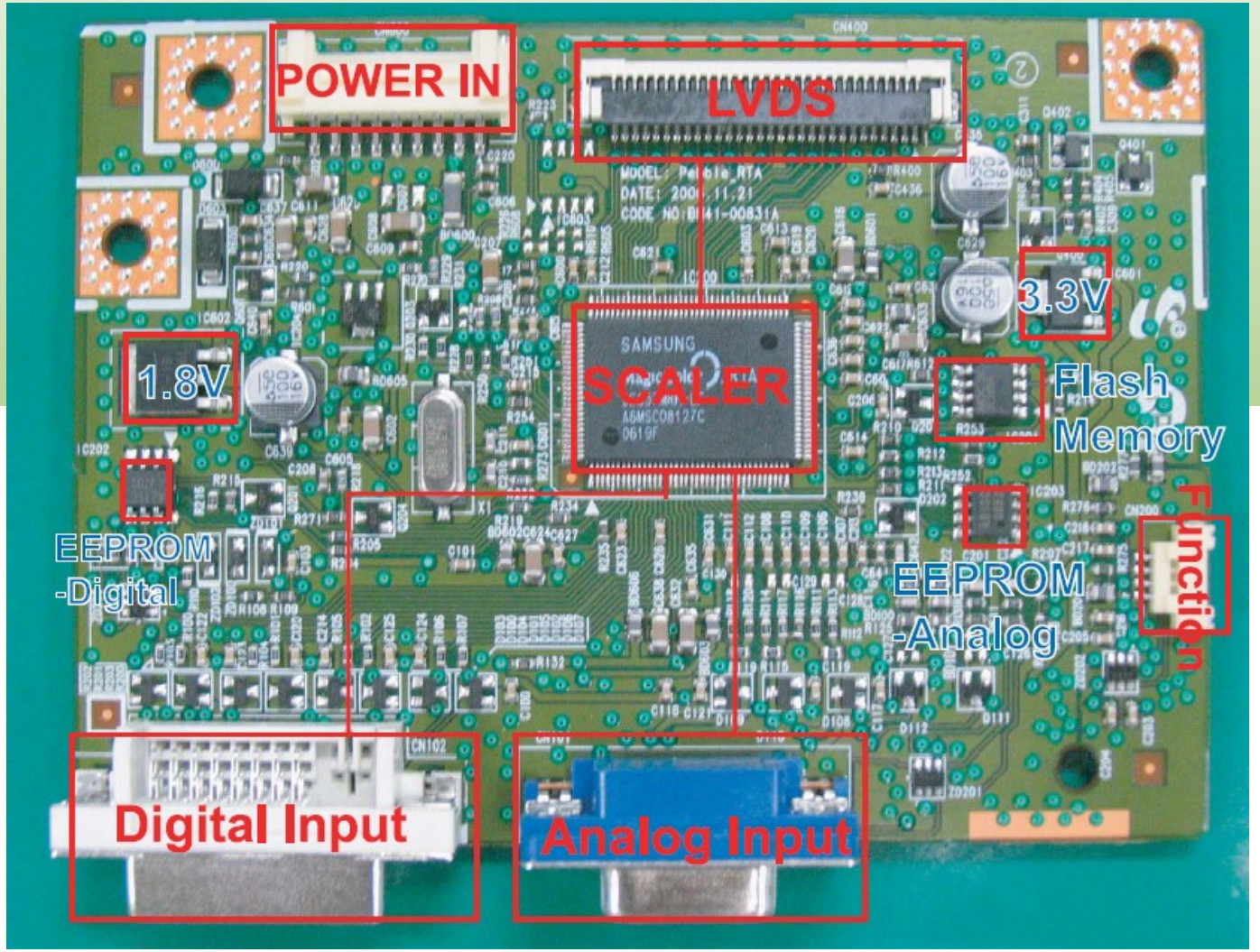
2. Circuit Description (Main Block Diagram)



2. Circuit Description (Circuit Diagram)



2. Circuit Description (Main PBA)



2. Circuit Description (Main PBA)

No	Block	Description	Remark
1	Scaler IC200	Besides the ADC, LVDS, and scaling part, an MCU is embedded as well. All of them are integrated into one chip.	SE657MRH-LF
2	Flash Memory IC201	Stores the MCU program embedded in the scaler. It is of a flash type and rewritable.	MX25LV512
3	IC203	Stores the OSD and various timing values.	24C08
4	IC202	The memory to which analog DDC data is input	24C02
5	Regulator	An IC that receives DC voltage inputs. It is used in circuits that stabilize the DC voltage.	NCP117DT18T5G APL1117-33VC

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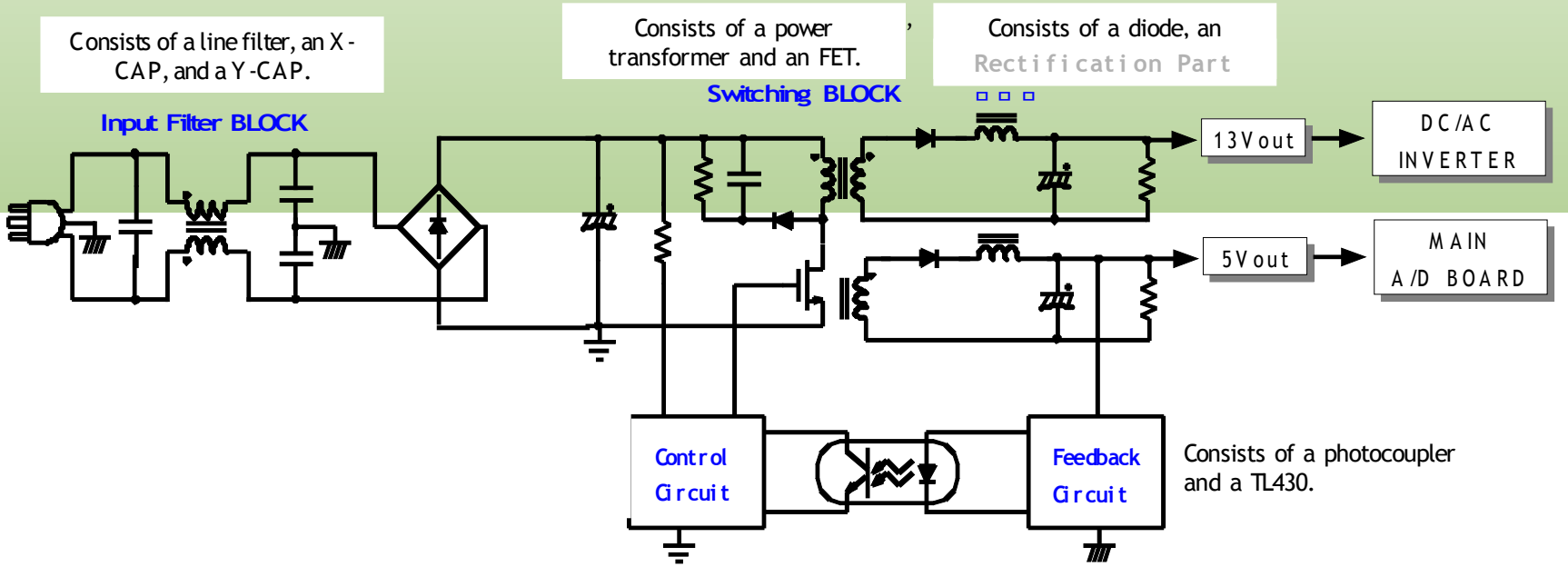
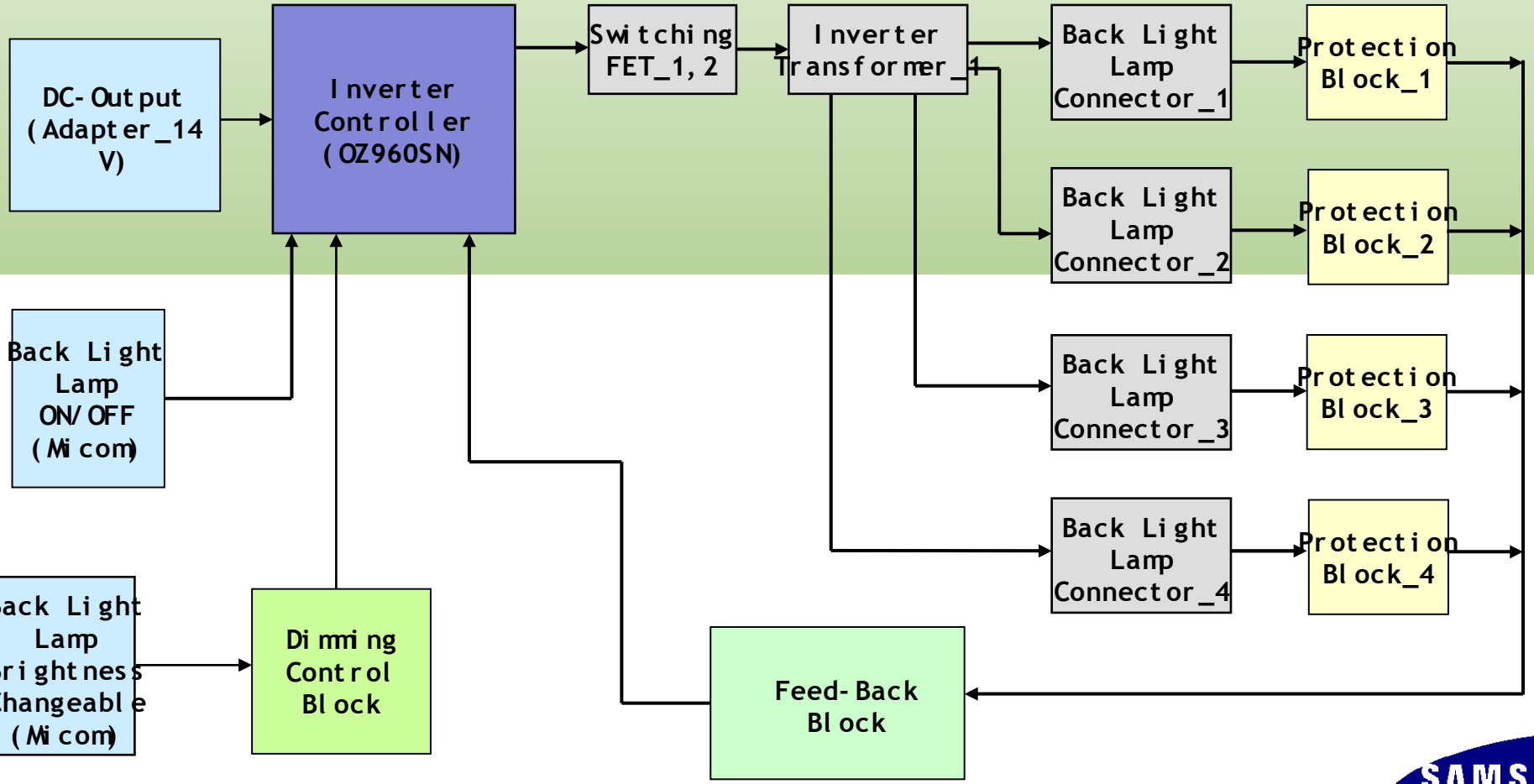
2. Circuit Description (IP Board)

SMPS Part



2. Circuit Description (IP Board Circuit Diagram)

Inverter Part



2. Circuit Description (IP Board - Dimming)

There are three methods. The Current Control method adjusts the size of the current entering the lamp. The PWM method turns the lamp on and off according to a specific frequency. The Complex method mixes those two methods.

Current Control (Analog Dimming)

- Dimming is possible with comparatively no effect on the panel.
- A minimum current is required with which no partial lightning occurs in the lamp at the minimum brightness.
- Low dimming ratio (Approx. 2:1)
- Because the inverter is optimized to the maximum brightness, the efficiency is degraded in the dimming state.

PWM Control (Burst Dimming) - The Piccolo model uses PWM fully from OSD 0 to 100.

- Dimming is achieved by turning the lamp on and off at a frequency of approx. 300 Hz to 1 kHz.
- Turning a large capacity of current on and off at a specific cycle causes ground instability and noise to the panel, which results in waterfalls on the screen.
- Because it operates at the maximum brightness when the lamp is on, the efficiency is high. It resolves the problem of partial lightning at minimum brightness, thus, displays a high dimming ratio (approx. 5:1).

Complex Control

- Removes the possibility that waterfalls can occur by using the analog method at the early stage of dimming.
- Heightens the dimming ratio by using the PWM method at the later stage of

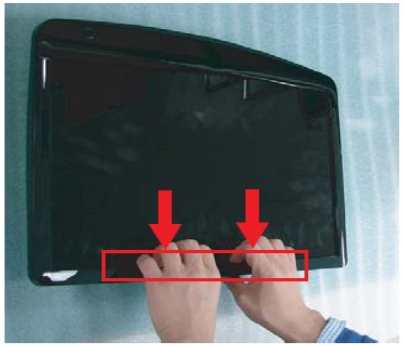
3. Assembly and Disassembly

Caution : 1. Make sure to turn off the monitor before starting the disassembly.

2. Never use metal tools other than the jig provided when disassembling the product.

3. For the disassembly, carefully follow the steps given below.

4. The jig for opening the back cover: BH81-00001A

Description	Picture Description
1. Place a soft cloth on the desk and place the monitor on the cloth upside down. Remove the stand in the direction of the arrow.	
2. Turn the monitor so the front section is facing upwards. Remove the marked parts from the front cover, as shown in the figure below.	

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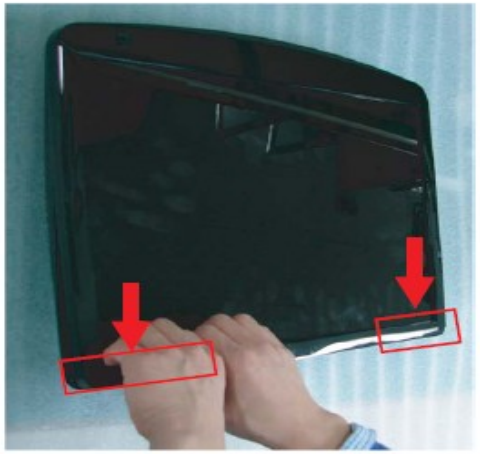
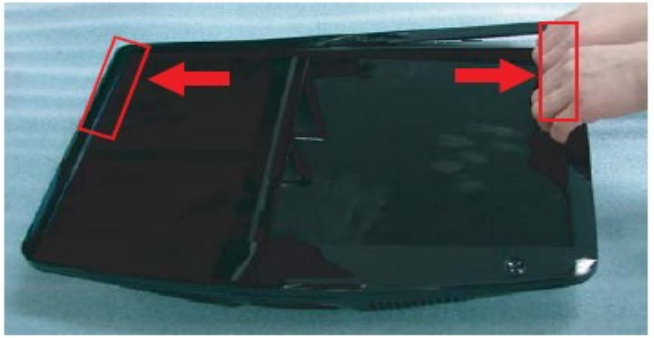
3. Assembly and Disassembly

Description	Picture Description
3. Remove the marked part from the top edge of the front cover, as shown in the figure below.	
4. Remove the marked parts from both sides of the front cover, as shown in the figure below.	

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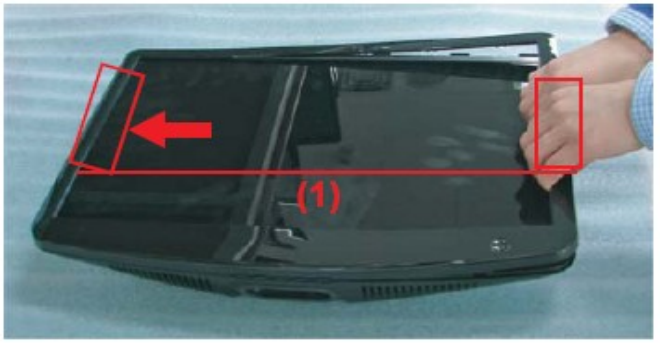
3. Assembly and Disassembly

Description	Picture Description
5. Remove the marked part from the front cover, as shown in the figure below. Caution: Do not lift the front cover over position (1), which may cause damage to it.	
6. Turn the monitor so the back of it is facing upwards. Lift up and remove the back cover.	

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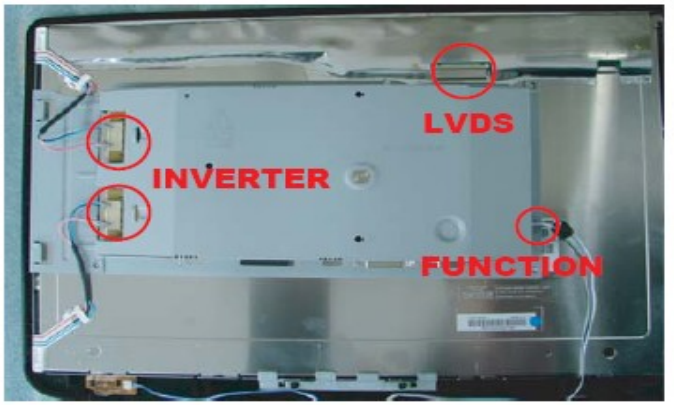
3. Assembly and Disassembly

Description	Picture Description
7. Use the jig to remove the shield lamp. (Be careful Shield.)	
8. Disconnect cables. (LVDS, INVERTER and FUNCTION cable)	

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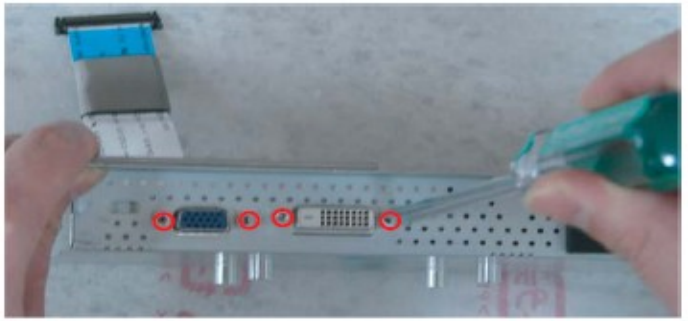
3. Assembly and Disassembly

Description	Picture Description
9. Lift up the LCD panel.	
10.Remove 4 screws.	

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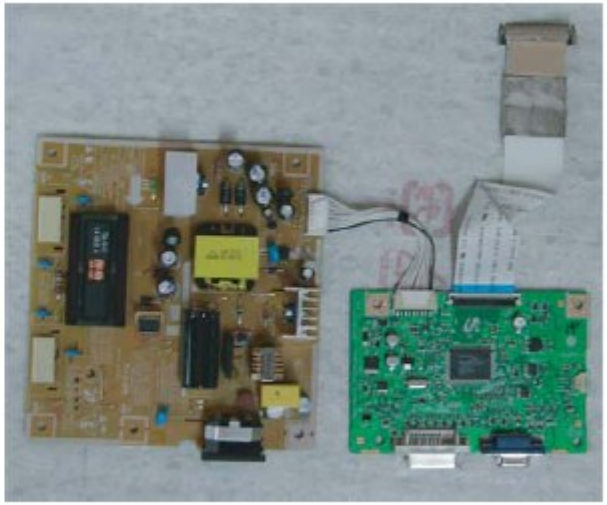
3. Assembly and Disassembly

Description	Picture Description
11. Remove 5 screws and Lift up the Bracket Support.	
12. Lift up the Main PCB and IB Board.	

3. Assembly and Disassembly

Description	Picture Description
13. Main PCB and IB Board	

4. Troubleshooting

❖ Checking Before Contacting a Service Center

- Check the power state and the cable connections.
  - . Check the connections of the power and signal cables.
  - . Check whether the function button operates normally.
- Check the following before beginning a repair:
  - . Resolution: 1280 x 720 at 60Hz
  - . Perform the auto adjustment.
  - . Reset to the factory defaults.
    - => To reset the monitor settings to the factory defaults, press the Menu button and then hold down the Enter button for more than five (5) seconds.
- Other simple diagnostics:
  - . If the lamp turns on and off shortly when the power is switched on, it means there is a problem in the lamp with the inverter or panel.
    - IP Board Protection ➔ Connect lamp & inverter wire and hard power OFF / ON.
  - . If the LED does not work, it means there is a problem in the inverter, Micom or function block.

4. Troubleshooting

Notes:

1. Before troubleshooting, setup the PC's display as below.
   - Resolution: 1024 x 720
   - H- frequency: 45 kHz
   - V- frequency: 60 Hz
2. If no picture appears, make sure the power cord is correctly connected.
3. Check the following circuits.
   - No raster appears: Function PBA, Main PBA, I/P PBA
   - 5V develop but no screen: Main PBA
   - 5V does not develop: I/P PBA
4. If you push and hold the "(Enter/Source)" button for more than 5 seconds, the monitor automatically returns to the factory preset.

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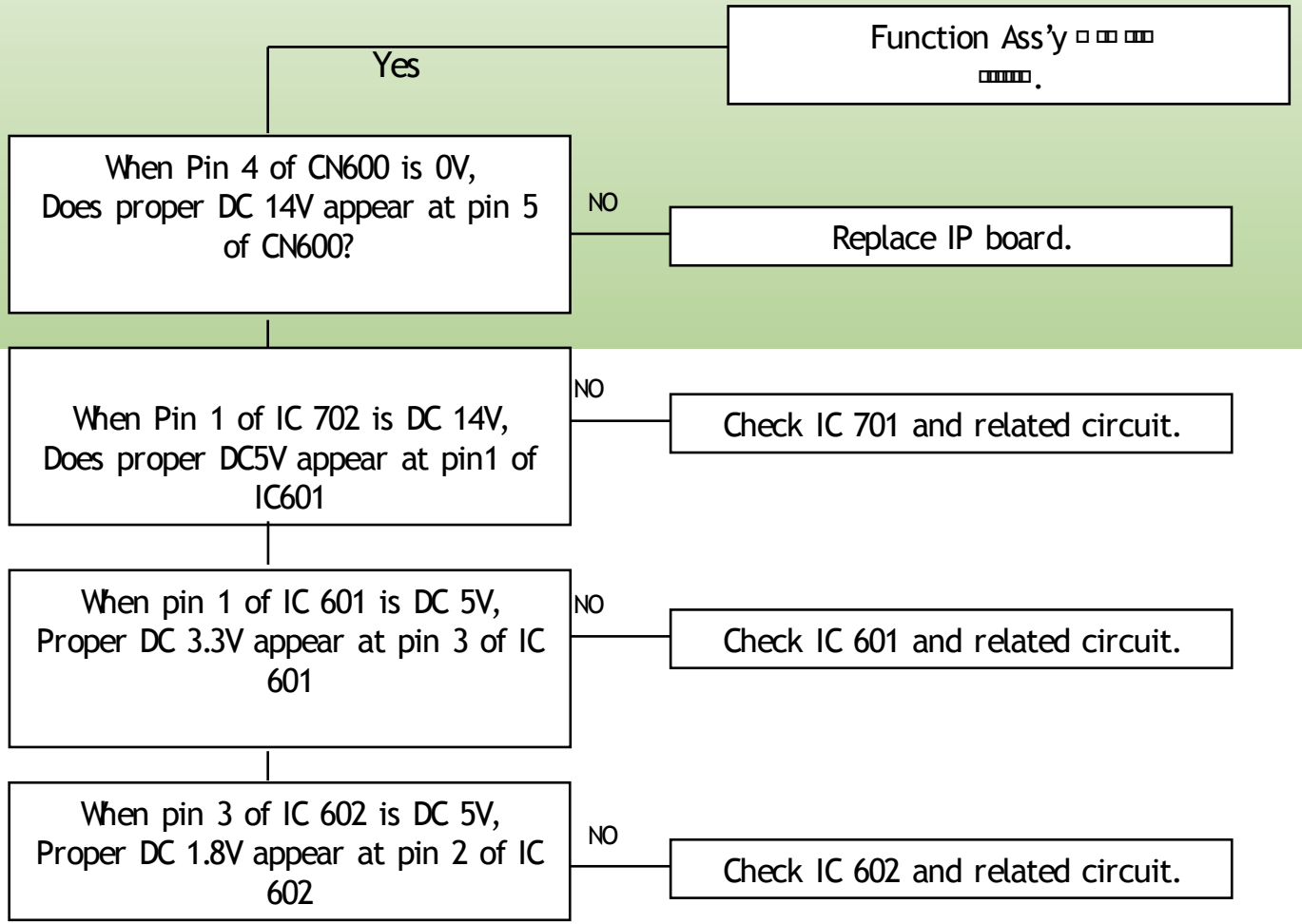
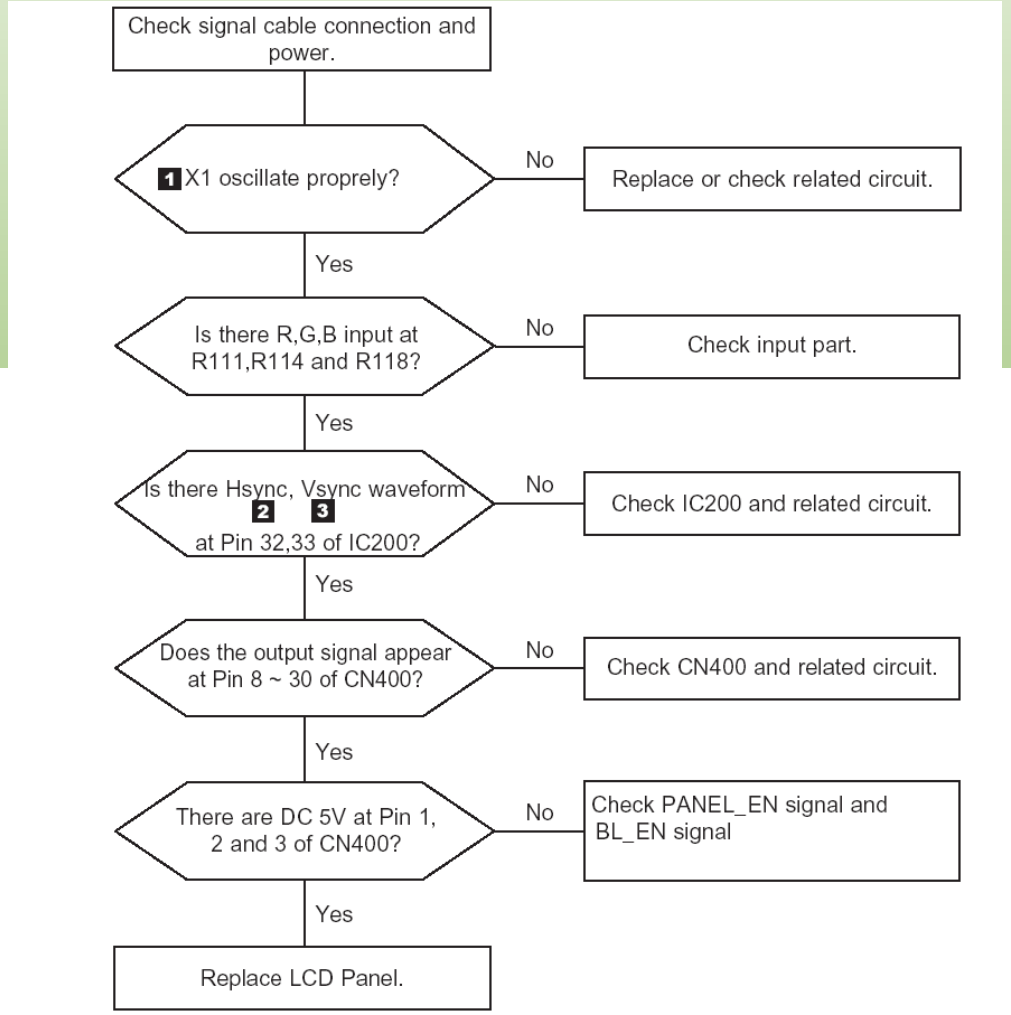
4. Troubleshooting

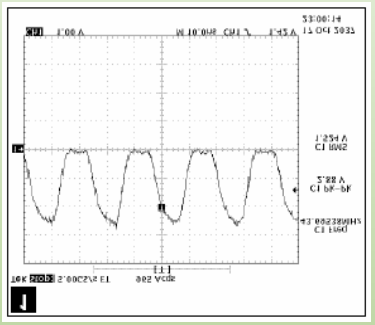
When the power does not turn on

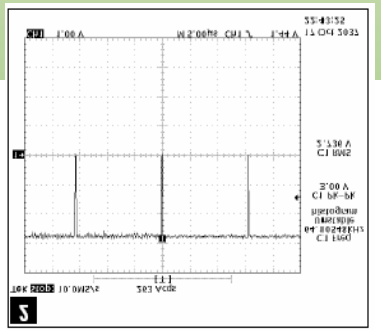


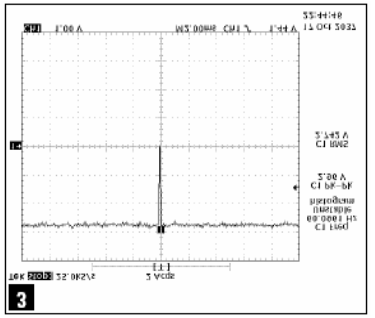
4. Troubleshooting

When no video screen appears (Analog)









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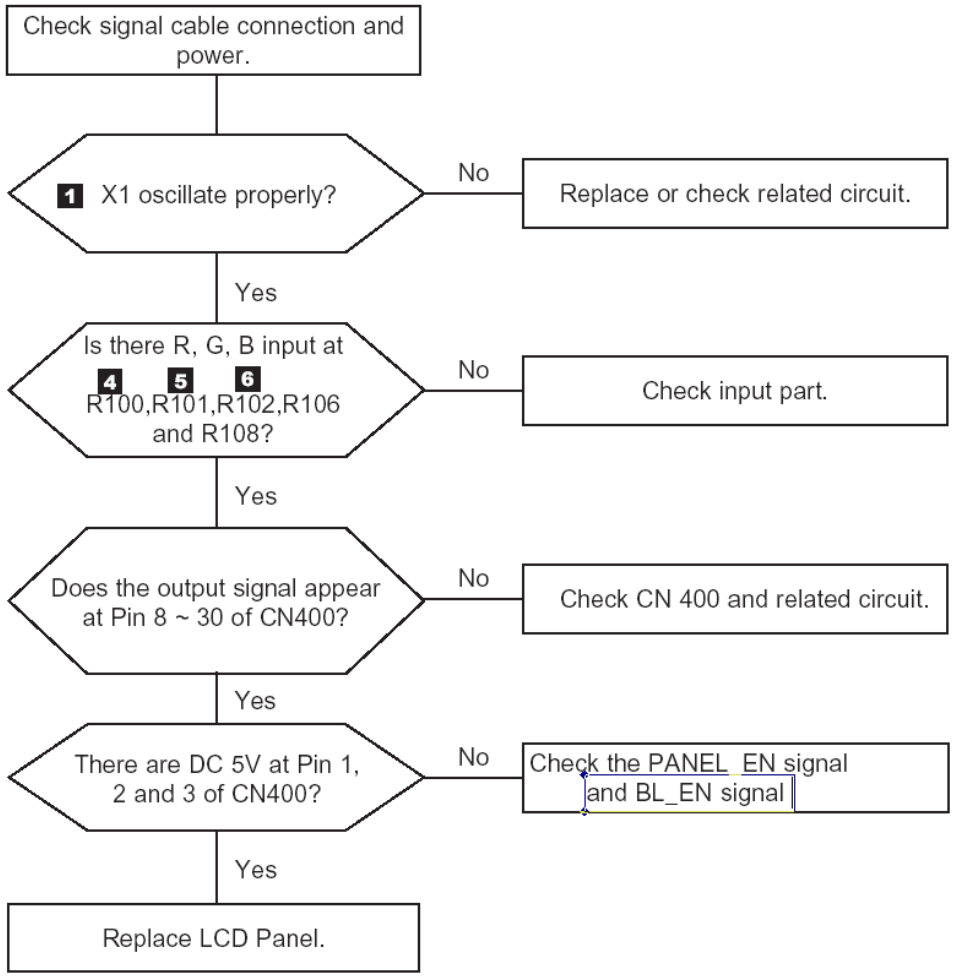
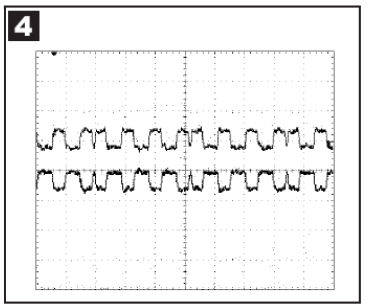
4. Troubleshooting

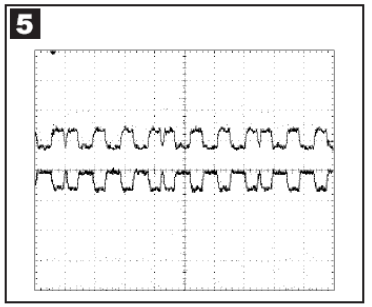
When no video screen appears (Digital)



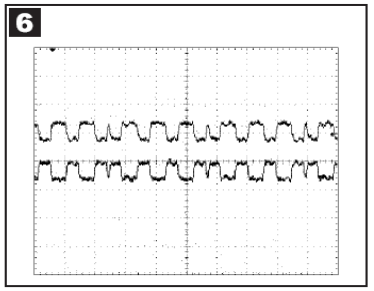
4



5



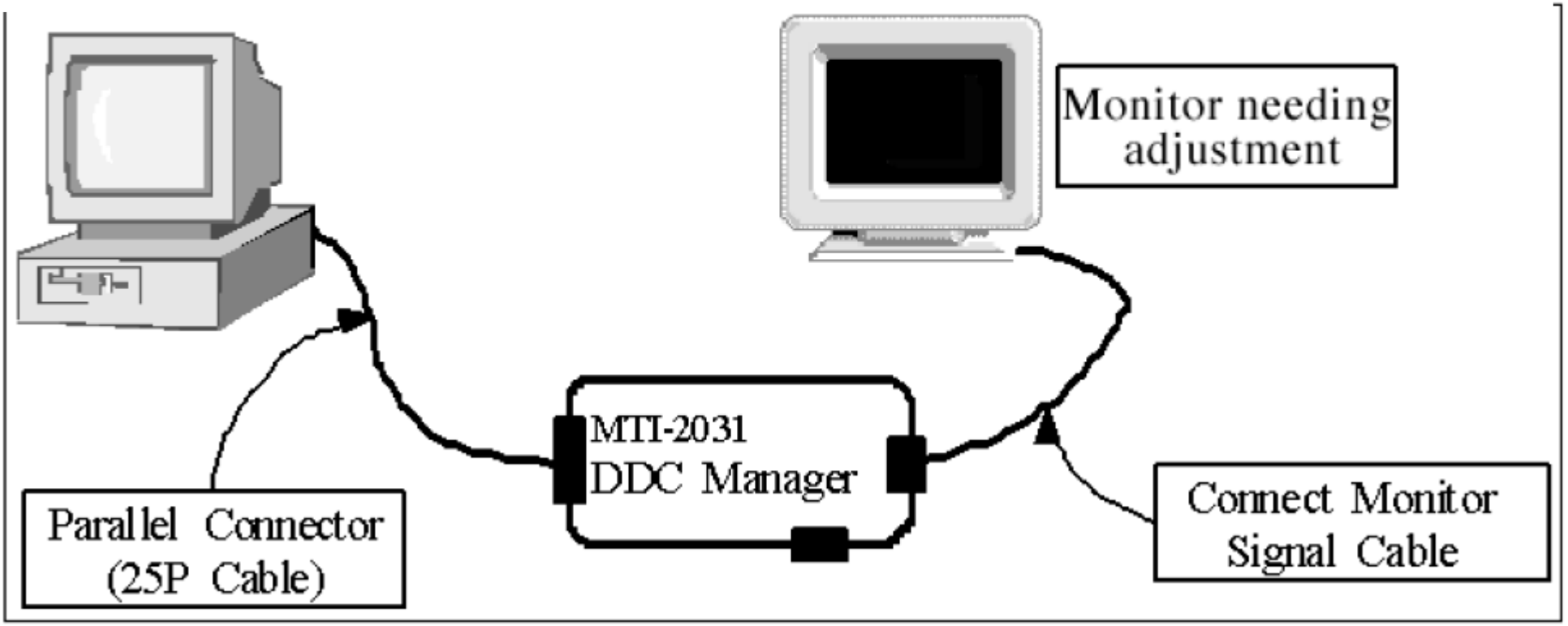
6



5. How to execute DDC

1. Enter the DDC EDID data when the AD board is replaced.

2. Download the DDC input program and the DDC file that corresponds to the model from the Quality Department of Samsung and install it using a jig as shown in the figure below, and then enter the data.



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5. How to execute DDC

1) Use DDC Manager MTI-2050 (or higher version).
2) Run the program and select the DDC file.

   Program: WinDDC BY SAMSUNG ELEC.Co. [Ver:4.65.12V] --- Modify : 20050425

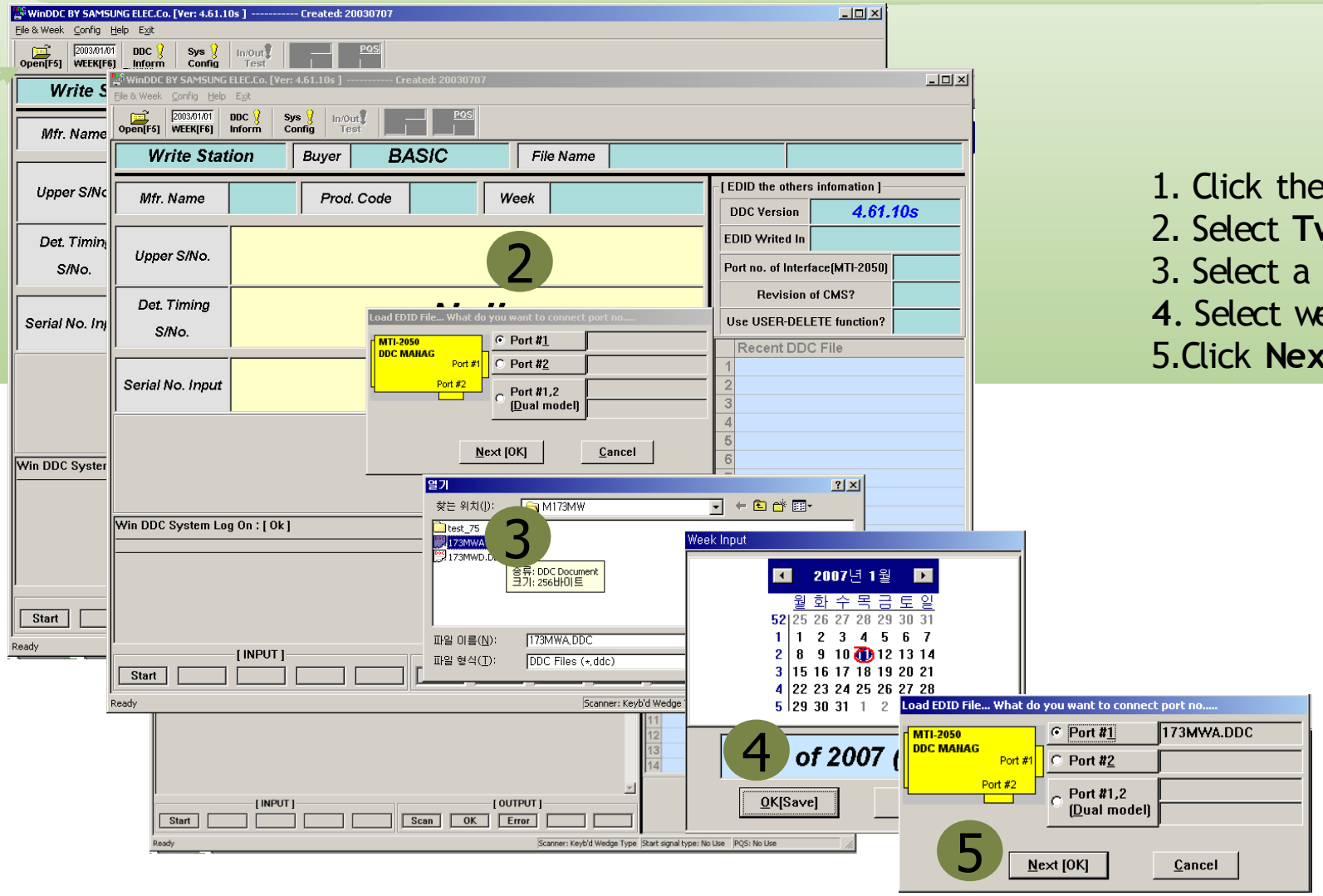
3) As for the existing dual model, connect the cable to port 1 (analog) of the DDC Manager and then enter and check the DDC data.
4) Then connect the cable to port 2 (digital) of the DDC Manager and enter and check the DDC data.


DDC Program


D:\ddc\32BW\2032_22:


D:\ddc\32BW\2032_22:

5. How to execute DDC



1. Click the **Open** icon
2. Select **Two EDI D**
3. Select a **DDC** file.
4. Select week
5. Click **Next (OK)**.

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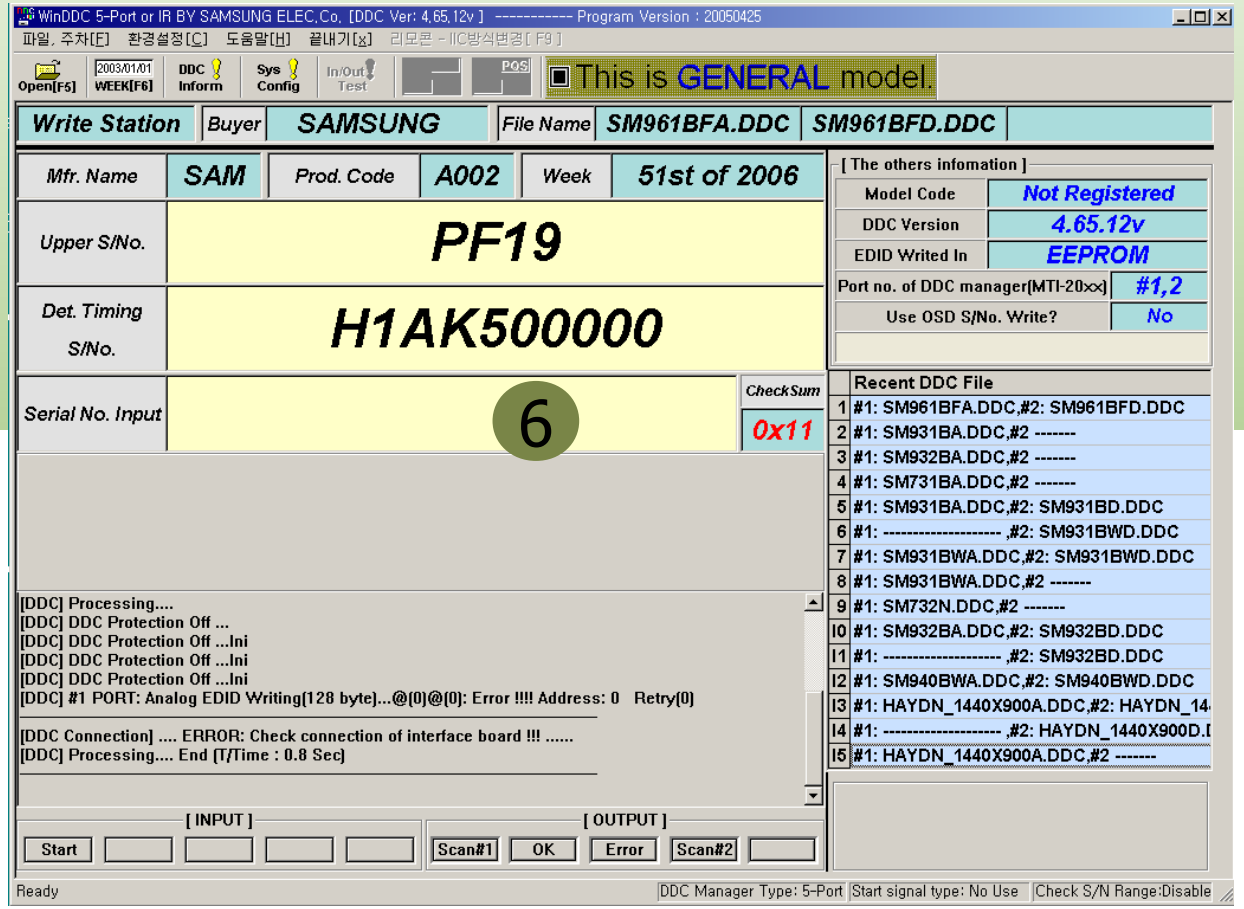
5. How to execute DDC



6: Enter the serial number and press the Enter key.

After entering the analog data, repeat the procedure above 2 to 5 times to enter digital data.

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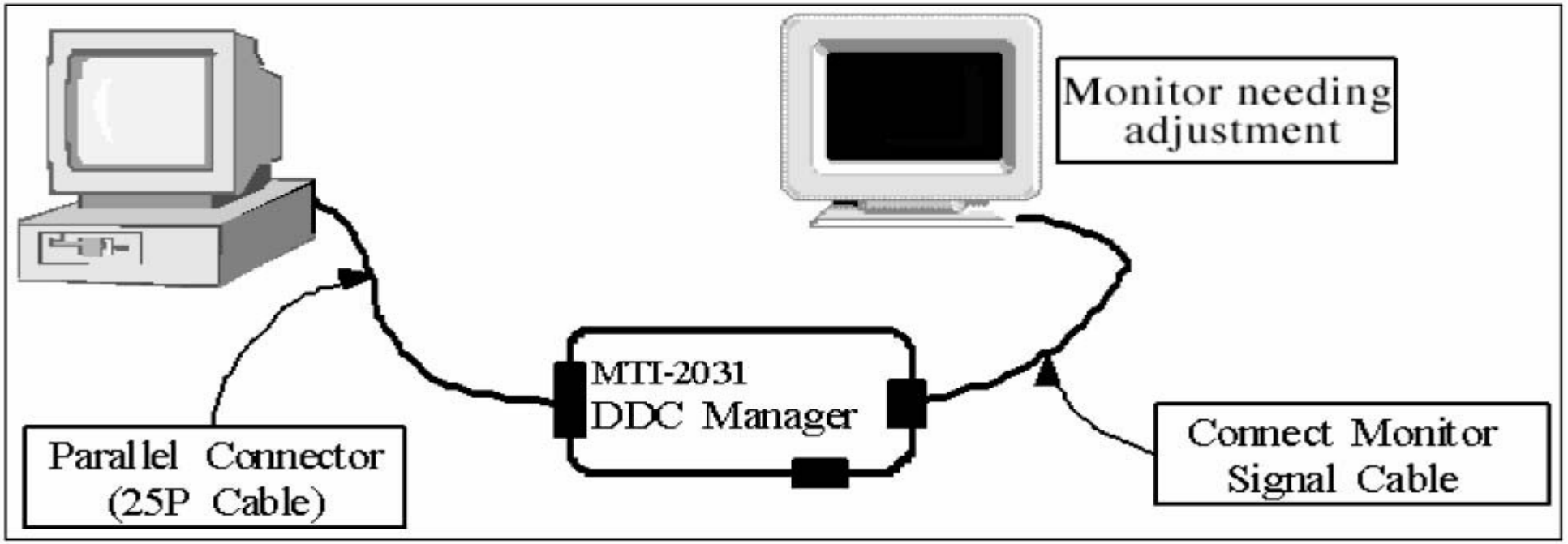
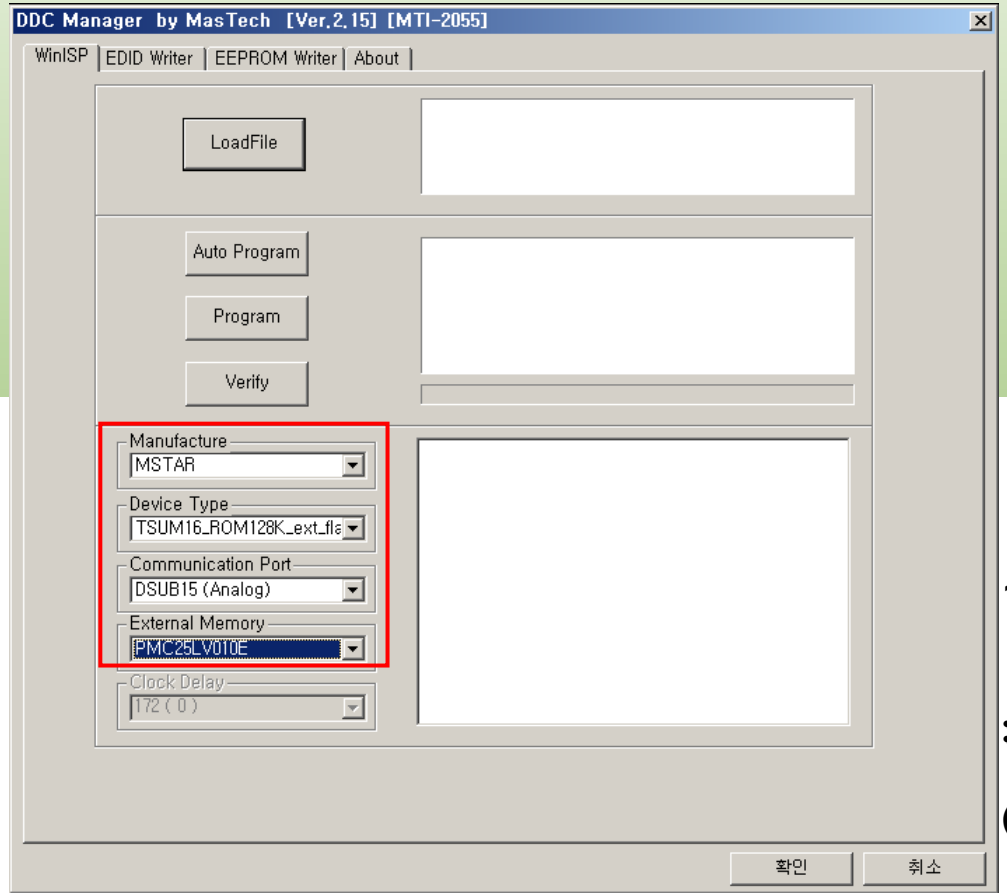
5. How to Execute MCU Code

1. Use this procedure to update the AD board code.
2. Download the WinDDC program and the hex file that corresponds to the model from the Quality Department of Samsung and install it using a jig, as shown in the figure below, and enter the data.



5. How to Execute MCU Code



Click to
wnload winDDC.

1. Options Checking.
   -. Manufacture : MSTAR
   -. Device Type
:TSUM16_ROM128K_ext_flash
   -. Communication Port : DSUB15
(Analog)
   -. External Memory : PMC25LV010E

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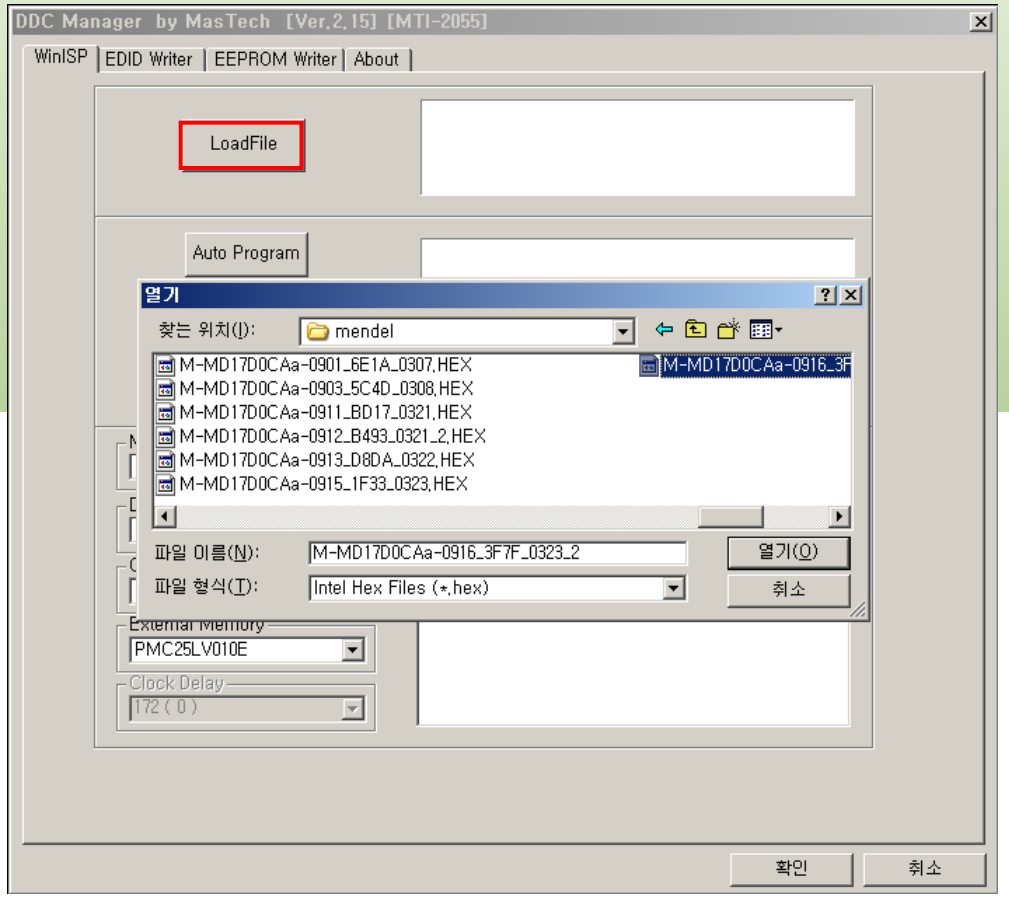
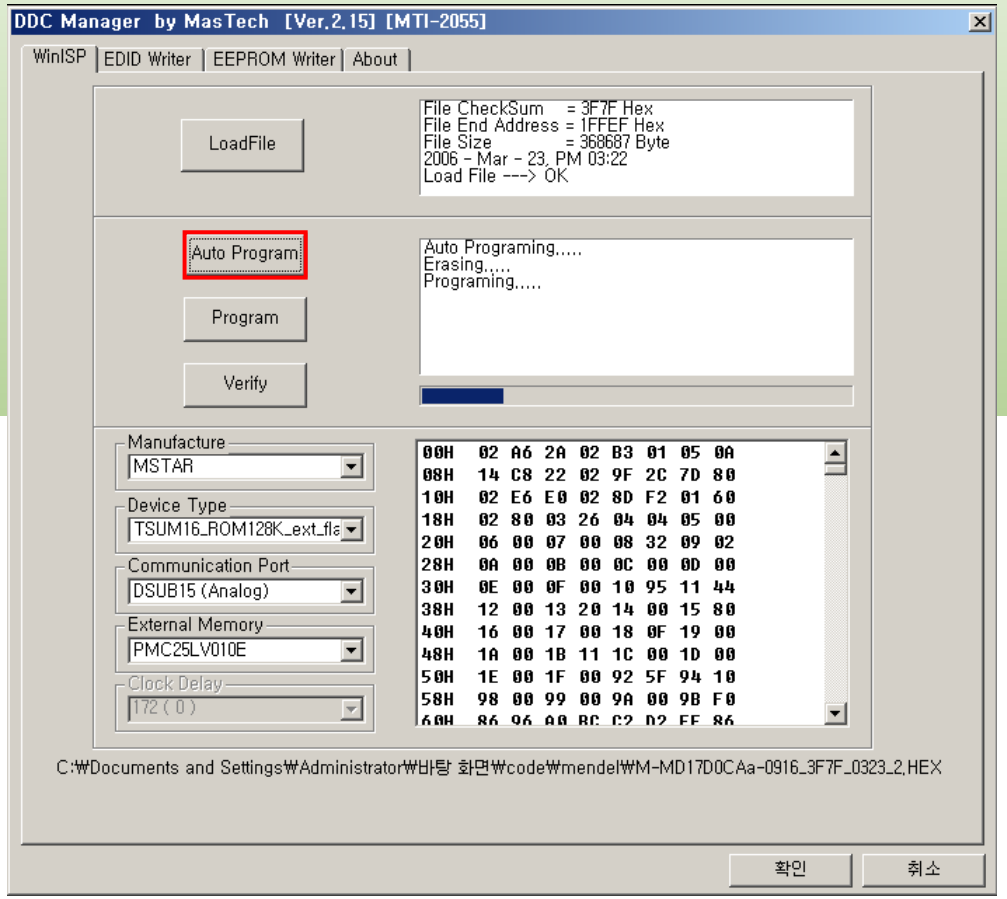
5. How to Execute MCU Code



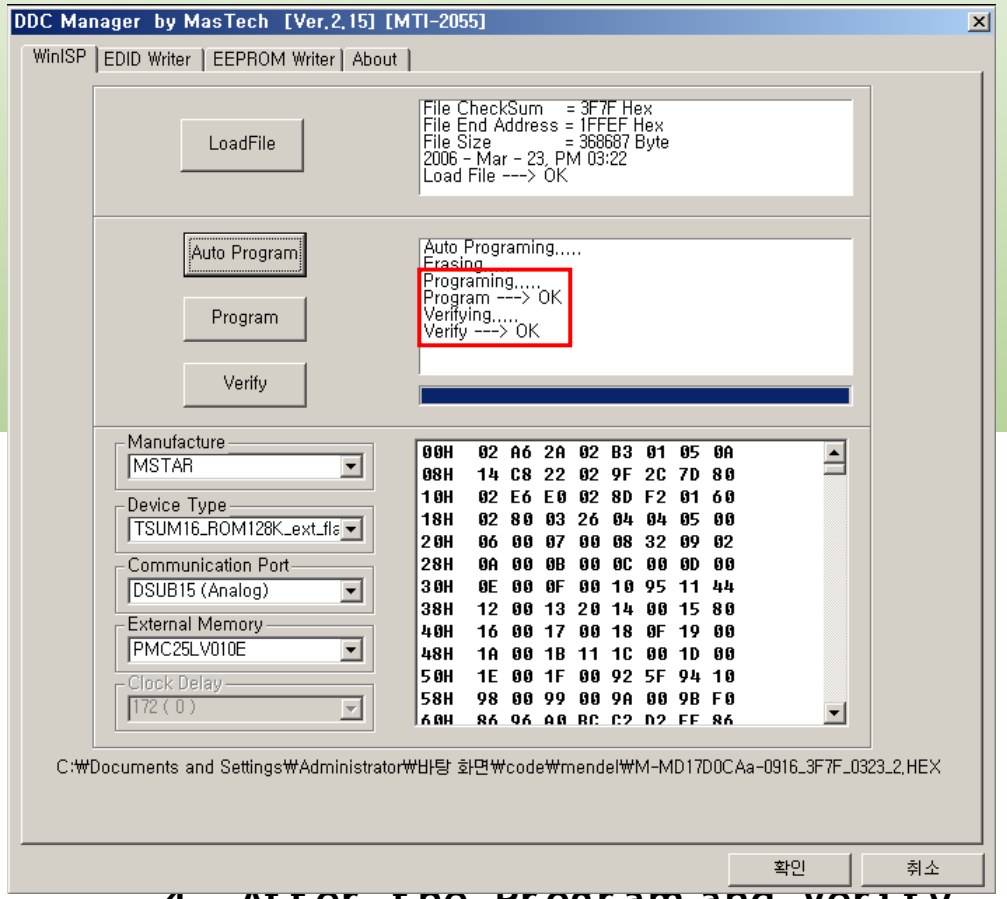
2. After click the 'LoadFile' button , choose MCU code.

5. How to Execute MCU Code



3. ‘Auto Program’ button choice.

5. How to Execute MCU Code

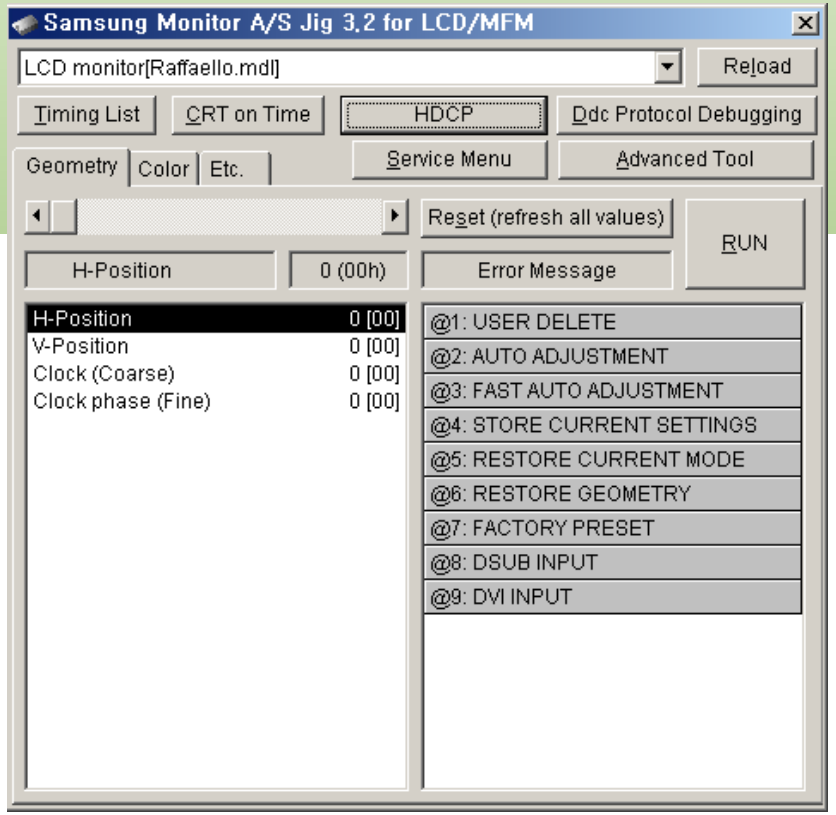


4. After the Program and Verify completed,
   execute hard power off/on.

5. How to Execute HDCP Code

HDCP:ONLY 961BW model

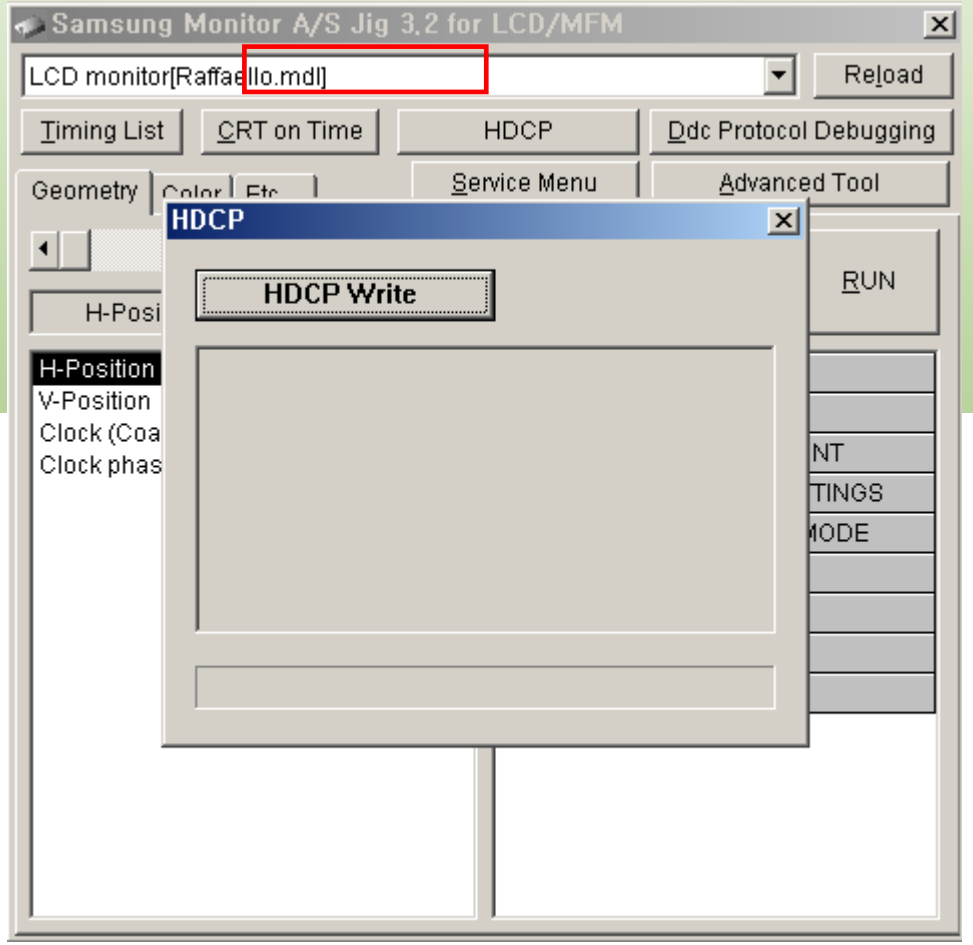
HDCP? HDCP is a specification developed by Intel Corporation to protect the video transmission between a DVI video transmitter (Tx) and a DVI video receiver



Click to
nload HDCP_test

1. Execute ‘service.exe’.

5. How to Execute HDCP Code



2. Click 'HDCP' button.

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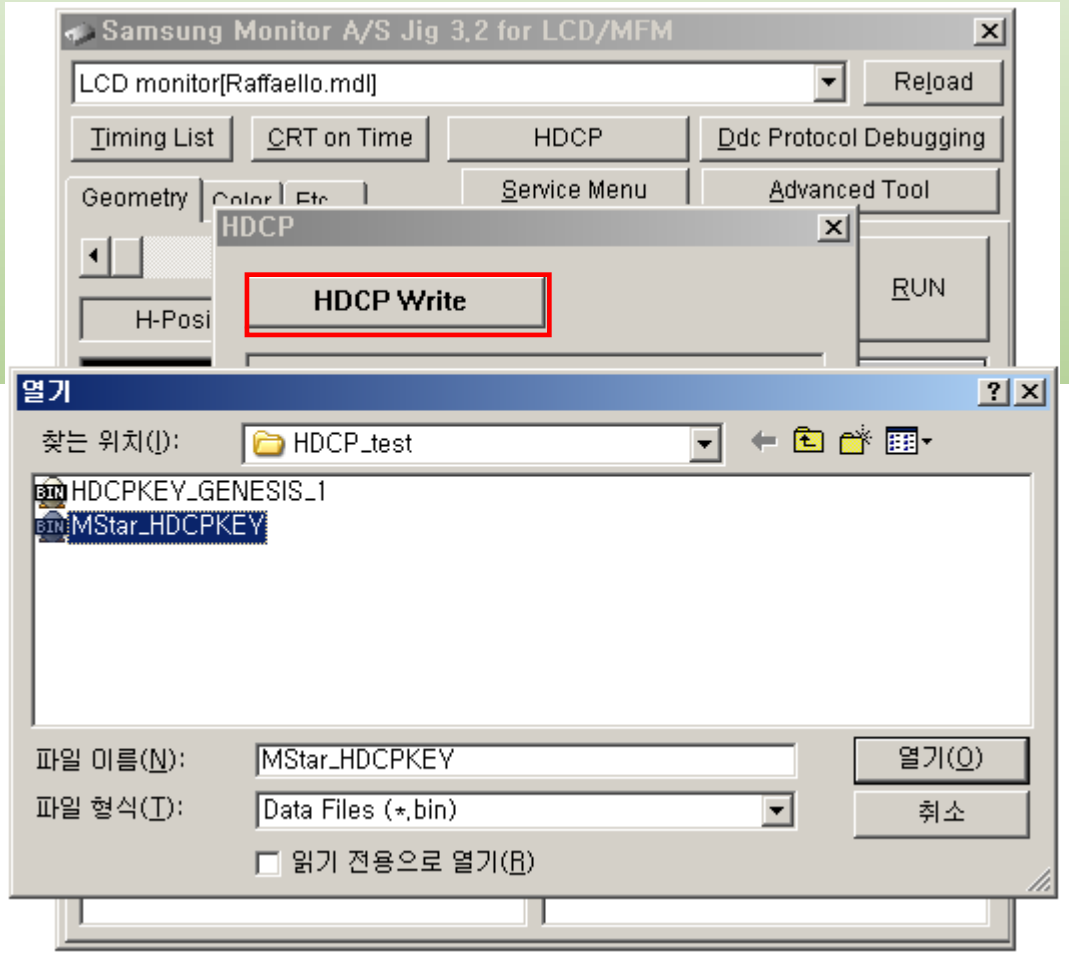
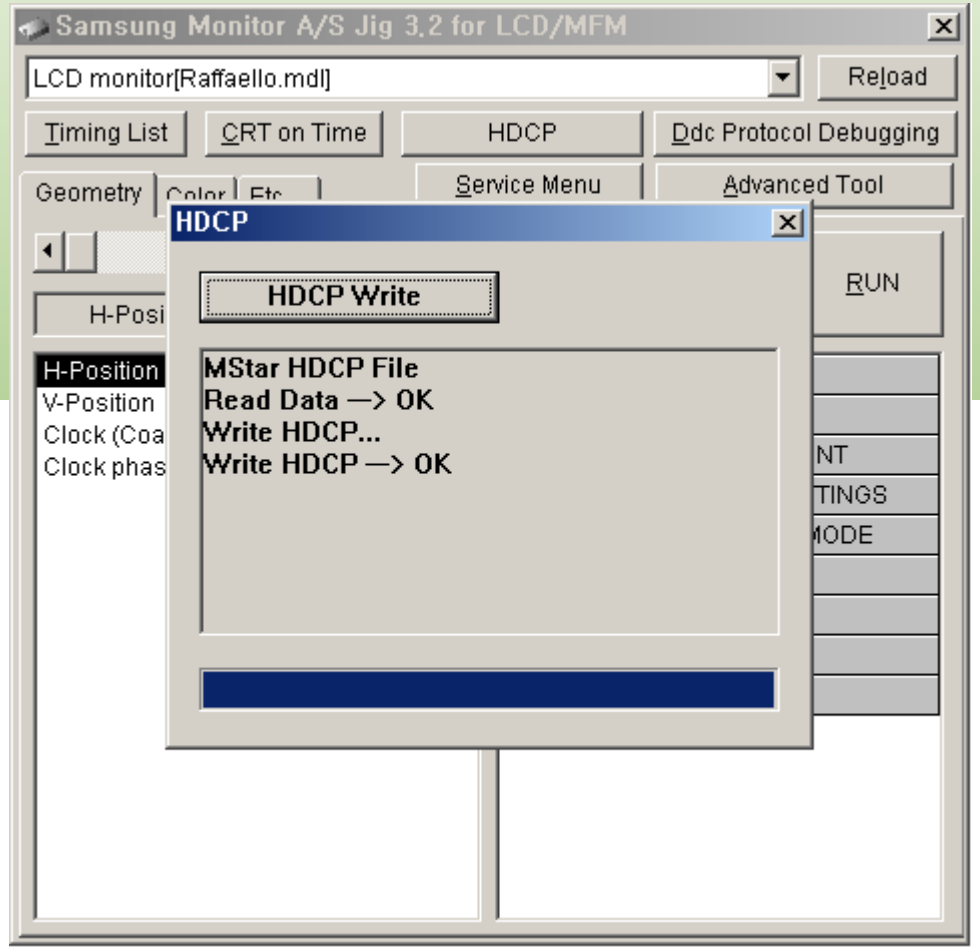
5. How to Execute HDCP Code



3. Click 'HDCP Write' button and select 'MStar_HDCPKEY'.

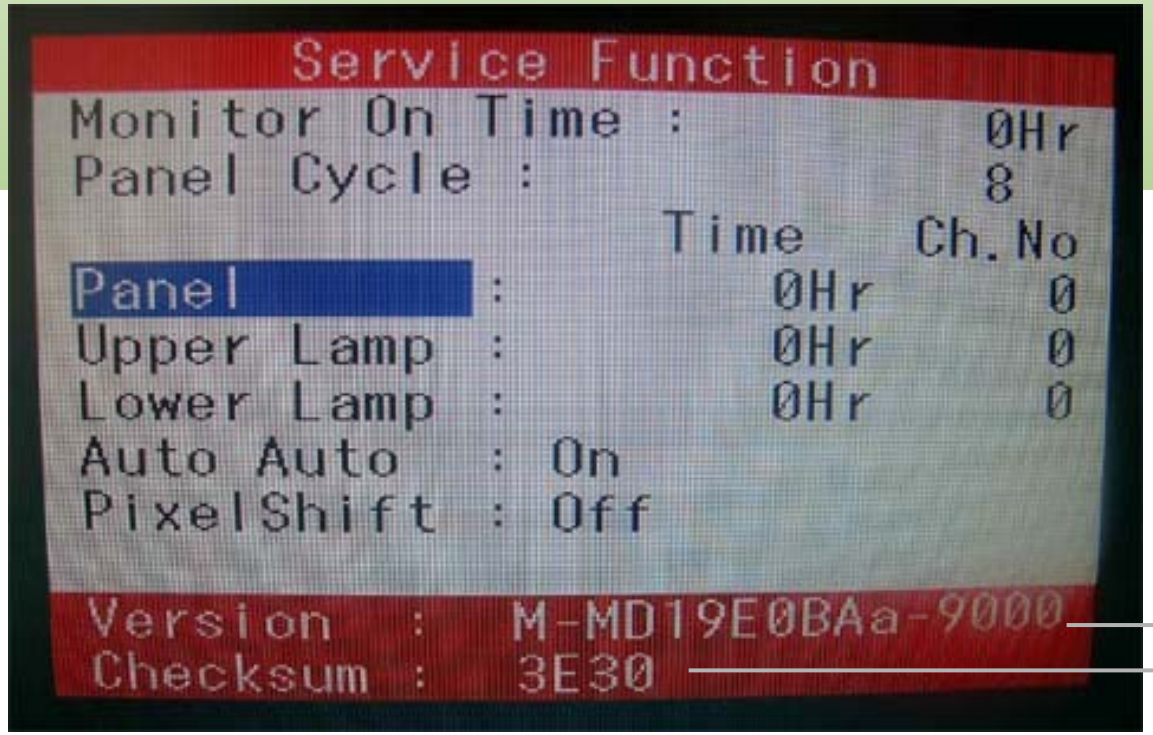
5. How to Execute HDCP Code



4. HDCP KEY writing is Complete.

6. Troubleshooting (MCU Code)

Checking the Code Version



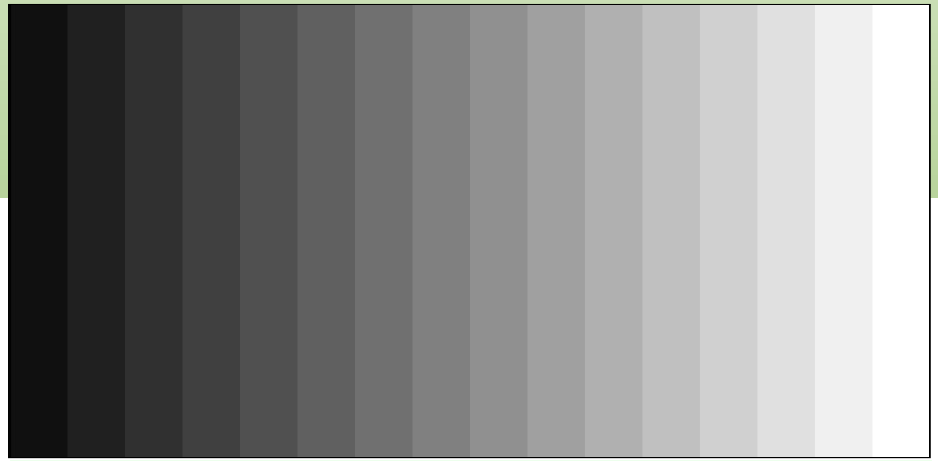
Enter SVC mode, and check the MCU code version and the checksum results.

For information on how to enter SVC mode, see pages 57 to 58.

6. Troubleshooting (Auto color)

Auto Color

- PC analog (1280X720 at 60 Hz): Tools to use: MSPG-3240L



PC Analog Control Pattern(16 GRAY)

- Select Language English on the OSD menu and then hold down the Menu button for five (5) seconds.

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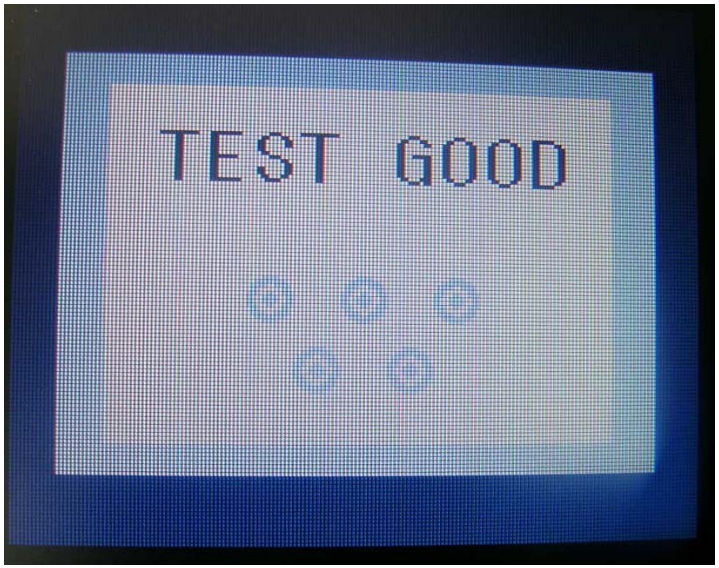
6. Monitor Self-Test

- **The Purpose and Function of the Self-Test**

  - A Self-Test has been added to easily recognize whether the monitor has a fault or not and consequently to minimize customer claims for non-malfunctions of the product.

- **How to Perform a Self-Test**

  - Press the **Menu** button in the **DPMS** state, and determine whether the monitor is normal or not.



No screen	Determine according to the output message.
Focus fault	Determine according to dimming level of the "TEXT GOOD" message.
Screen trembling	Determine according to trembling level of the message window.

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6. Service Mode / Safe Mode

❖ Entering Service Mode

- Set both the brightness and the contrast to 0.
- Hold down the Enter button for five (5) seconds.
- The SVC Function OSD will appear.
- To exit the SVC Function OSD, you have to turn off the power.

❖ Safe Mode

- If the frequency of the input signals is higher than the supported frequency, Safe mode gives a user a period of time (one (1) minute) to change the video card settings to a Recommended mode. For 17" monitors: Safe mode supports UXGA at 60Hz or 75Hz and displays a down-scaled screen for one (1) minute. However, it switches to Sync Out of Range immediately at a frequency higher than 85 Hz, which is a scheme to protect the panel from damage.

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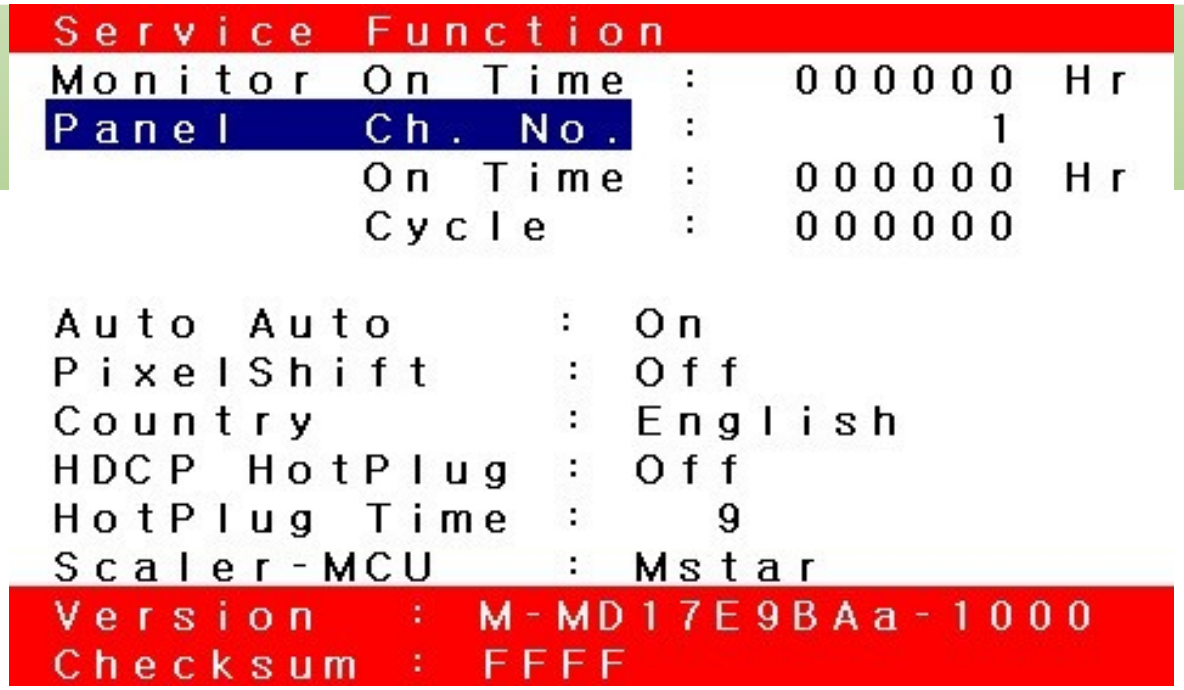
6. Service Mode (Entering)

1. **Set both the brightness and contrast to 0.**
2. Hold down the **<Button>(Enter, Source) button for five (5) seconds.**
3. The SVC Function OSD will appear.

* To exit the SVC Function OSD, you have to turn off the power.

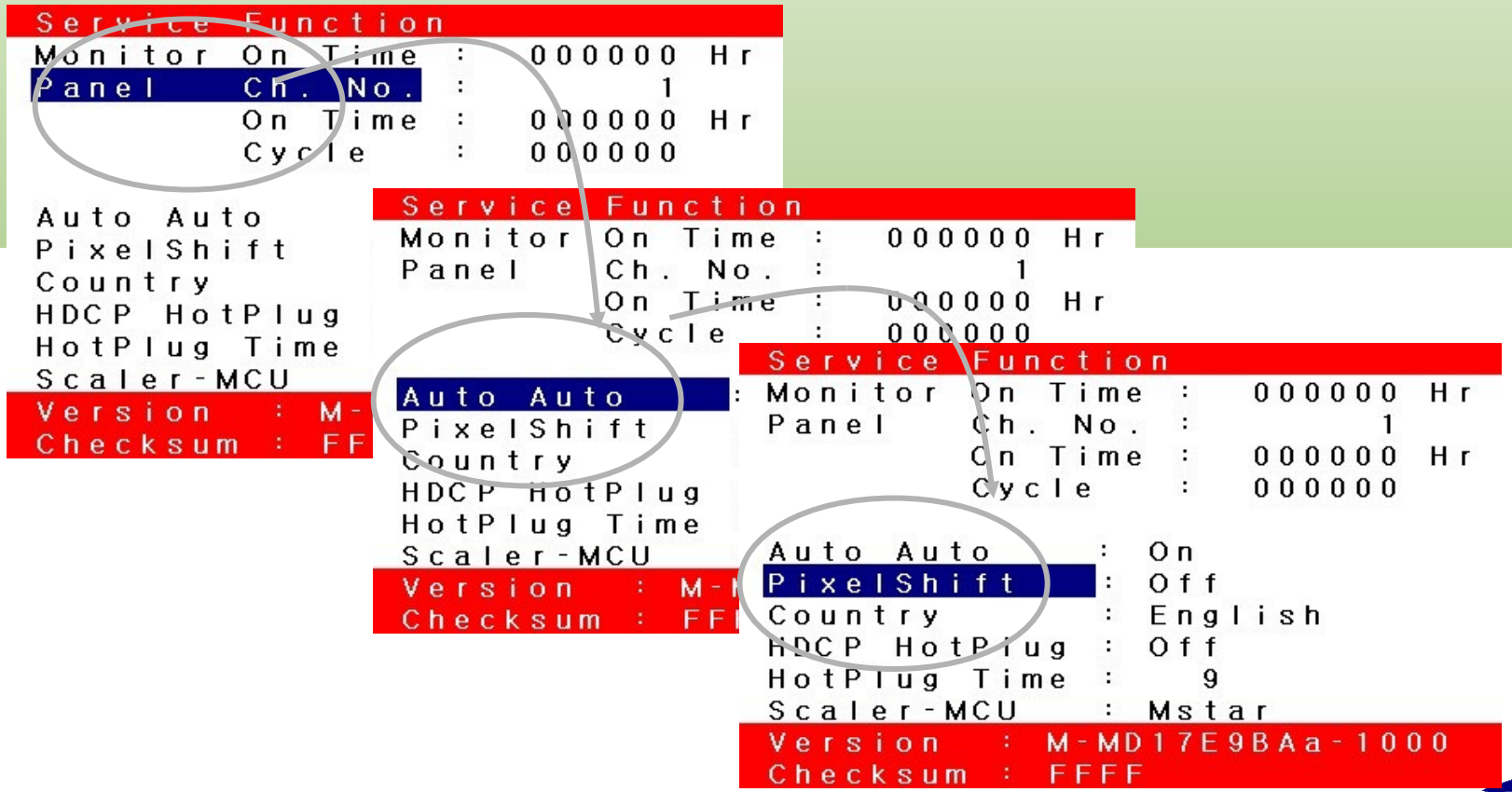


The SVC Function OSD consists of a 29 (width) X 12 (height) grid.

The SVC Function OSD shows the information, software version and Micom checksum.

6. Service Mode (Moving around)

1. Each time the + button is pressed, menu is selected. Then, you can adjust sub menu with - button

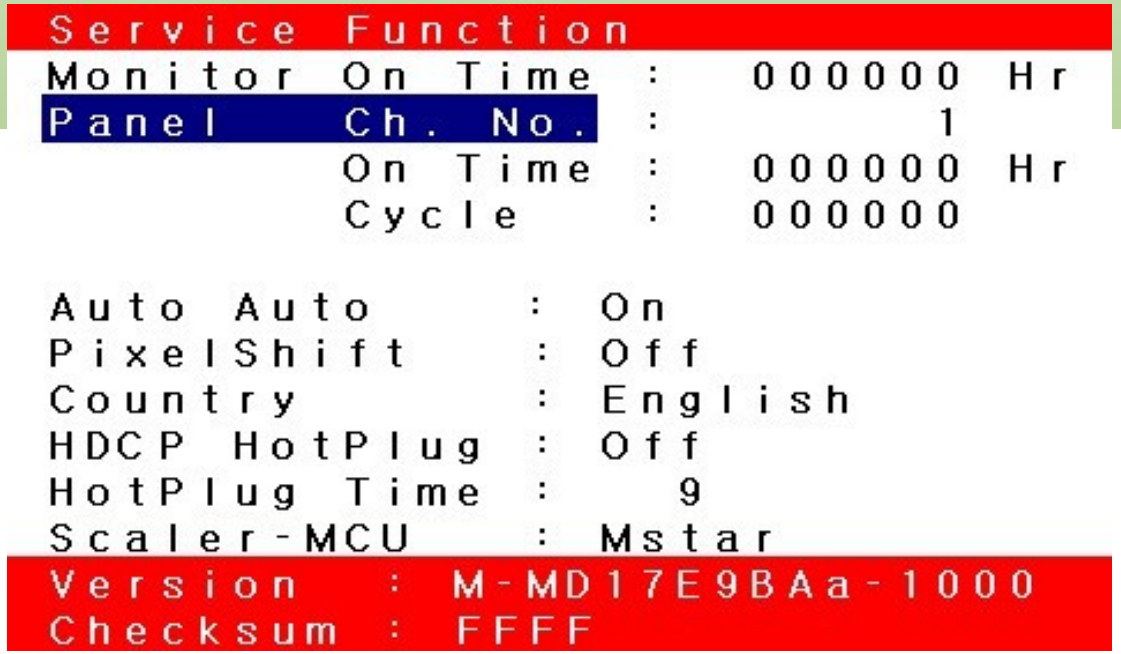


6. Service Mode (Replacing the Panel)

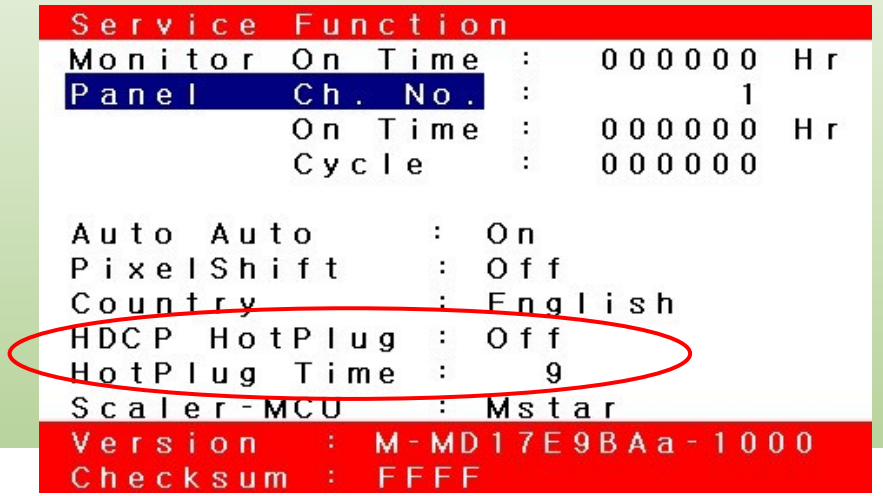
- **When replacing the panel**

After replacing the panel, select the Panel item and then hold down the Menu button for five (5) seconds.

The Ch. No. of the panel will increase by one (1) and the time information will change to 0.



6. Service Mode (Hot plug Menu)



- . HDCP Hotplug : used when HDCP Video contents are not displayed. In case that monitor is connected to some bad device which does not comply with standard.

- . HotPlug Time : If Hotplug is turn on, when monitor power off/on or changing to the DVI, hotplug pin goes to the low. This function controls this time duration.

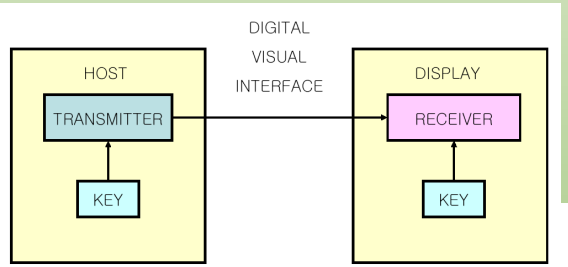
Though Hotplug is turn on monitor can't displayed, adjust this time duration

- . Default is 9(means 0.9 sec), can control 5 to 50.

HDCP Function

- HDCP : HDCP is designed to protect the video transmission between a DVI video transmitter and a DVI video receiver
- Diagram : The HDCP Authentication protocol is an exchange between a video transmitter and a video receiver that affirms to the transmitter that the receiver is authorized to receive the protected information.

  this affirmation is in the form of the receiver demonstrating knowledge of a set of secret device keys.



1. It takes about 2s to encrypt.
2. Encryption fail : Noise Display ➔ Check supported resolution.
   S/W power off, on.(for new encrypt)
   Rewrite HDCP.
   Check HDCP device
   &video card& Contents.

□□ □□□

640 x 480p @50/60
720 x 480p @50/60
720 x 576p @50/60
1280 x 720p @50/60
1920x 1080p @50/60

Contrast Ratio

Definition

- Contrast ratio : Ratio of the most bright point to most dark point
- The better contrast ratio, the more clear diplay

Contras`t Ratio **1500:1**

Resolution 1280 X 1024

Contras`t Ratio **1000:1**

Resolution 1280 X 1024

Contras`t Ratio **700:1**

Resolution 1280 X 1024

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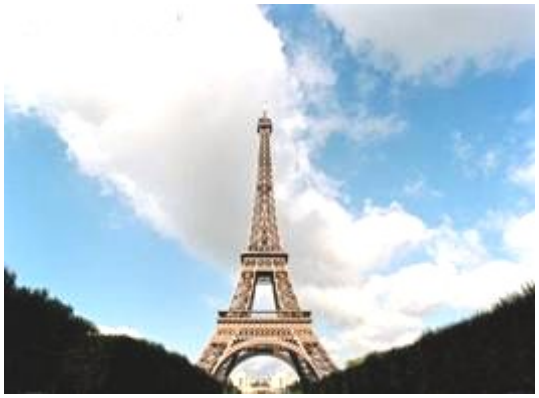
Dynamic Contrast Ratio

Definition

- In the Moving picture, making contrast ratio maximum
- As analyzing a input image, make madrker image is more darker, brighter image is more brighter
- So, Contrast Ratio change from 1000:1 to 3000:1



Back- light

Darker image is getting darker, Brighter image is getting brighter

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Must-Dos after Replacing a Board

- Check the state of the PC color adjustment.
- Enter the DDC data. (Enter both analog and digital data.)
- Check whether the MCU code that corresponds to the model has been entered.
- After completing your work in service mode, reset the monitor and switch it off.