

## **MSPG-8000**

## SLOT TYPE MULTI VIDEO SIGNAL GENERATOR

User Guide

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Edition 14(Eng)





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# 1. Chapter One

## Safety notice

- 1.1 Foreword
- 1.2 Safety precautions
- 1.3 Notice for safe usage

## Chapter 1. Safety Notice

#### 1.1 Foreword

- Thank you for purchasing the MSPG-8000 video signal generator.
- This manual provides details on how to operate the MSPG-8000 and the precautions to be needed when doing so.
- Take the time to read through this manual before attempting to operate the MSPG-8000.
- After reading this manual, keep it in a safe place for your future reference.

#### 1.2 Safety precautions

- Improper handling may lead to accidents.
- We recommended you to read through following warning, precaution and information's without fail before attempting to operate the MSPG-8000.
- These instructions to ensure that you will operate the MSPG-8000 properly.
- Don't install signal generator in dusty environment.
- Attention before connect between video signal generator and display instrument.
  - ✓ Make sure to connect ground line to FG video signal generator.
  - ✓ Ground connection plays an important role in protecting internal IC's and elements of video signal generator.
  - Take special care when connecting the generator to display unit.
  - If these are not connect together, the generator may fail.
- Setup time for stable system
  - ✓ System needs about 5 minutes setup time for measuring precise data.
- Fuse re-placement: The fuse is a F3.15AL 250V "F" type.

#### 1.3 Notice for safe usage

If the equipment is used in a manner not specified by the manufacture, the protection provided by the equipment may be impaired.

#### 1.3.1 AC Power

- ✓ Turn off power of signal generator when inserting a power plug in a socket.
- ✓ Don't use harmed power cable and loose socket.
- ✓ Separate power cable from a heating apparatus.
- ✓ Please, use power switch if you want to turn off signal generator.
- $\checkmark$  Use the three-wire power supply code.
- ✓ If you use unlicensed Cable, the video signal generator can cause electric shock.

#### 1.3.2 The Power Cord

- ✓ Always take hold of the molded part of the plug when disconnecting the power cord.
- ✓ Use permissible AC Power and Connection Cable. If you use unlicensed Cable, the video signal generator can cause electric shock.
- ✓ Do not use force to bend the power cord or bunch it up for use. Doing so may cause fire.
- ✓ Do not place heavy objects on top of the power cord. Doing so may damage the cord causing a fire or electrical shock.

#### 1.3.2 The Generator

- ✓ Do not place the video signal generator at the ferromagnetic body area. The generator can cause electric shock as irregular working.
- ✓ Do not subject the generator to impact or throw it. Doing so may cause the generator to malfunction, explode or generate abnormally high levels of heat, possibly resulting in a fire.
- ✓ Do not use outdoors.
- ✓ Do not place the signal generator long time in a car on hot day or cold day. It is able to cause characteristic decrease, function inferiority and shape variation of outside parts. If you place the condition continuously, it can case electric shock and fire as short circuit or insulation.
- ✓ When you not using the video signal generator for a long time, disconnect AC Power plug from AC line outlet for safe consideration.
- ✓ Do clean the FAN regularly.
- ✓ Wipe the cabinet with a dry cloth to eliminate dust.
- ✓ Be clean with the cleaner. Do not use benzene. If you use the benzene, the video signal generator is changed shape variation of outside parts and the works is erased.
- ✓ This generator contains some high-voltage parts. If you touch them, you may receive an electric shock and burn yourself so do not attempt to disassemble, repair or remodel the generator.
- When occurring the malfunction or breakdown, don't disassemble the video signal generator by yourself.
   Contact our company promptly.
- ✓ Set the video signal generator more 10cm from wall. It can obstruct the flowing of air. And it causes fire because high temperature.

#### 1.3.3 Installation

- Install the generator in a stable location. Do not stand it on either of its side panels. Doing so may cause the generator's temperature to rise due to heat generation, possibly resulting in malfunctioning.
- ✓ Don't install signal generator vertically.
- ✓ Install signal generator at flat place.
- ✓ Do not spill liquids inside the generator or drop inflammable objects into it. Operating the generator under these conditions may cause a fire, electrical shock or malfunctioning.

1.3.4 International Electrical Symbols

~	AC : Alternating Current
÷	Earth Grounding
CE	Conforms to European Union directives
	High Definition Multimedia Interface
	Digital Visual Interface
RoHS	Directive on Restriction of the use of certain Hazardous Substances in EEE

#### In the unlikely event that trouble or malfunctioning should occur, first disconnect the power cable, and then contact your dealer

or Master technical sales department.

Tel : + 82-55-297-8880 / Fax : + 82-55-256-7388

E-mail: webmaster@Ltdmaster.com

www.Ltdmaster.com

www.Ltdmaster.com



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# 2. Chapter Two

## Appearance and specification of the MSPG-8000

- 2.1 Accessories packed with the MSPG-8000
- 2.2 Introduction to slots
- 2.3 Specification of the MSPG-8000
- 2.4 Panel parts and their functions

## Chapter 2. Appearance and specification of the MSPG-8000

### 2.1 Accessories packed with the MSPG-8000

1) MSPG-8000 main body x 1ea



2) MSPG-8000 main CPU slot x 1ea



- 3) User Manual x 1ea
- 4) Pattern & Timing sticker x 1ea
- 5) Power Cable 220V x 1ea
- 6) Optional slots and remote(Option)
  - ① MSRC-009L remote controller



- 2 MG-HDMI2.0/ARC: HDMI 2.0Ver slot and cable
- ③ MG-DISPLAYPORT1.3: DISPLAYPORT 1.3Ver slot and cable
- (4) MG-ANALOG/DVI: ANALOG/DVI slot and cable
- 5 MG-COMPONENT: Component slot and cable
- 6 MG-S-VIDEO/CVBS: S-VIDEO/CVBS slot and cable
- ⑦ MG-S-VIDEO/CVBS/SCART: S-VIDEO/CVBS/SCART slot and cable
- 8 MG-HDMI2.1/ARC-1: HDMI 2.0Ver slot and cable



### 2.2 Introduction to slots

- 1) "MG-HDMI2.0/ARC" : HDMI 2.0 4K/60Hz outputs & ARC outputs
  - ① Output signal: HDMI 2.0Ver x 2port & Optic ARC
  - ② Output Spec.: 25MHz~600MHz / 4Kx2K@60Hz (600MHz)
  - ③ Supports to HDCP 2.2, ARC 2Ch, HDR(HDR-10/HLG), EDID and CEC
  - ④ D/L: slot upgrade port



- 2) "MG-DISPLAYPORT1.3" : DISPLAYPORT 1.3Ver 4K/60Hz outputs
  - ① Output signal: DISPLAYPORT 1.3Ver x 2port
  - ② Output Spec.: 8Kx4K@30Hz (HBR3)
  - ③ Supports to HDCP 2.2 and EDID read
  - ④ D/L: slot upgrade port



- 3) "MG-ANALOG/DVI" : ANALOG, DVI DUAL, AUDIO outputs
  - ① Output signal: ANALOG x 1port & DVI DUAL x 1port & AUDIO 2Ch
  - ② Output Spec.
    - ✓ ANALOG(8~250MHz)
    - ✓ DVI DUAL(25~330MHz)
  - ③ Supports to DVI HDCP 1.3 and ANALOG/DVI EDID read
  - ④ D/L: slot upgrade port



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- 4) "MG-COMPONENT" : COMPONENT. AUDIO R/L outputs
  - ① Output signal: COMPONENT x 1port & AUDIO R/L
  - ② Output Spec.: COMPONENT: Y, Pb, Pr (480i/p, 576i/p, 720p, 1080i/p for ATSC and DVB Format)
  - ③ D/L: slot upgrade port



- 5) "MG-S-VIDEO/CVBS": S-VIDEO & CVBS & AUDIO R/L outputs
  - ① Output signal: S-VIDEO x 1port & CVBS x 1port & AUDIO R/L
  - ② Output Spec.
    - ✓ S-VIDEO & CVBS: NTSC M/J(3.58MHz), NTSC 443(4.4MHz),

PAL B/D/G/H/I(4.434MHz), SECAM (For=4.406Mhz/For=4.25MHz)

③ D/L: slot upgrade port



- 6) "MG-S-VIDEO/CVBS/SCART": S-VIDEO&CVBS&SCART & AUDIO R/L outputs
  - ① Output signal: S-VIDEO x 1port & CVBS x 1port & SCART x 2port & AUDIO R/L
  - ② Output Spec. (2slot size)
    - ✓ S-VIDEO & CVBS: NTSC M/J(3.58MHz), NTSC 443(4.4MHz),

PAL B/D/G/H/I(4.434MHz), SECAM (For=4.406Mhz/For=4.25MHz)

- ✓ SCART: PAL only
- ③ D/L: slot upgrade port



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- 7) "MG-HDMI2.1/ARC-1": HDMI 2.1 8K/60Hz outputs
  - ① Output signal: HDMI 2.1Ver x 1port
  - 2 Output Spec.: 100MHz~1.2GHz / 8Kx4K@60Hz
  - ③ Supports to HDCP 1.4 and 2.3
  - ④ D/L : Slot upgrade port



- 8) "MG-USB TYPE-C" : DISPLAYPORT 1.2
  - ① Output signal: DISPLAYPORT 1.2Ver
  - 2 Max resolution: 4Kx2K@60Hz
  - 3 Supports to HDCP 1.2 and 2.2
  - ④ D/L: slot upgrade port



⑤ POWER: The POWER port that can be connected to a separate MSPW-100W to power the display equipment.



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ICADER: The LOAD port that can be connected to a separate MSDL-100W to electric load the display equipment.





## 2.3 Specification of MSPG-8000

MG-HDMI2.0/ARC		
	Compliant	HDMI 2.0 Version
	Pixel Rate Range	25MHz~600MHZ/4Kx2K/60Hz(600MHz)
	Video Signal Type	RGB, YCbCr
	Pixel Encoding & Data	
	bit of RGB & YCbCr	4K@30Hz_KGB444(0, 10, 12 bit), 1CbCl444(0, 10, 12 bit), 1CbCl422(0, 10, 12 bit)
	Data bit of RGB	
HDMI 2.0 x 2port	&YCbCr	
	Color Space	RGB, BT-601, BT-709, BT-2020, xvYCC-601, xvYCC-709
	HDCP	Support HDCP 1.4 and 2.2 Version
	Output Connector	Type A, HDMI 2 Port (4K x 2K @60Hz 2Port, ARC 2Port)
	Note	Audio Return Channel (ARC) 2Port, CEC Support
		3D Video Formats (Frame Packing, Side by Side, Top & Bottom, Field Alternative)
	D/L port	Firmware & Data up-load port
	Digital Audio	2Ch Audio
Optic ARC x 2port	Digital Audio	SPDIF (Audio Return Channel)
		MG-DISPLAYPORT1.3
	Compliant	Displayport 1.3 Version
	Pixel Rate Range	8K x 4K@30Hz(7680x4320@30Hz), HBR3
	Video Signal Type	RGB, YCbCr
Displayport 1.3 x 2port	Color Space	RGB, BT-601, BT-709
Displayport 1.0 x 2port	HDCP	Support HDCP 1.3 and 2.2 Version
	Output Format	RGB444, YCbCr444(8, 10, 12 bit)
		YCbCr422(8, 10, 12 bit)
	Digital Audio	I2S, 48KHz, 2 Channels
MG-ANALOG/DVI		
	Pixel Rate Range	8~250MHz
Analog v 1port	Video Signal Type	R, G, B (Load 75 ohms, 0~1.0V Programmable)
Analog x Tport	Output Connector	15P D-Sub
	Separate Sync	HS, VS(3.0V~5.5Vp-p Programmable)
Analog Audio x 1port	Analog audio	Stereo L, R
DVI Dual x 1port	Compliant	DVI 1.0 Support
	Pixel Rate Range	* Dual Link: 25~330MHz
	Transfer Type	* Single TMDS 24 Bit Input Mode
		* Dual TMDS 12 Bit Input Mode
	HDCP	Support HDCP 1.3

	Video Signal Type	RGB
	Output Connector	DVI-D (DVI 1Ports, Single/Dual)
DVI Audio x 1port	Analog audio	Stereo L, R
		MG-S-VIDEO/CVBS
		* NTSC M,J (3.58MHz)
	Output Mode	* NTSC443 (4.4MHz)
	Output Mode	* PAL B, D, G, H, I (4.434MHz)
		* SECAM (For=4.406MHz / For=4.25MHz)
3-VIDEO/CVB3 x IPOIL	Subcarrier Stability	25ppm (±25Hz / 1MHz)
		Composite (BNC), S-Video
	Video Output	* Signal: CVBS (Connector: BNC)
		* Signal: Y/C (Connector: 4Pin-Mini Din)
S-VIDEO/CVBS		
Audio L/R	Analog audio	
		MG-S-VIDEO/CVBS/SCART
		Same as MG-S-VIDEO / CVBS slot
SCART X 1Port	Output Mode	PAL only
(Monitoring x 1port)	Output Connector	SCART 21pin
		MG-COMPONENT
COMPONENT(YPbPr) x	output mode	Y, Pb, Pr(480i/p, 576i/p, 720p, 1080i/p for ATSC and DVB Format)
1port	Output Connector	BNC
COMPONENT Audio	Analog audio	RCAL R
L/R		
		MG-HDMI2.1/ARC-1
	Compliant	HDMI2.1 Version
	Pixel Rate Range	25MHz~1.2GHz / 8Kx4K@60Hz
	Signal Type	TMDS, Fixed Rate Link (FRL – Maximum link : 10Gbps x4Lane
	Pixel Encoding & Date	8K@30Hz_RGB444(8/10bit), YCbCr444(8/10bit), YCbCr422(8/10/12bit)
	Bit of RGB & YCbCr	8K@60Hz_YCbCR420(8/10bit)
HDMI 2.1 X 1Port	Color Space	RGB, BT-601, BT-709, BT-2020, xvYCC-601, xvYCC-709
	HDCP	Support HDCP 1.4 and 2.3 Version
	Output Connector	Type A, HDMI 1 Port (8K x 4K @60Hz 1Port)
	Note	3D Video Formats (Frame Packing, Side by Side, Top & Bottom, Field Alternative)
	D/L port	Firmware & Data up-load port
	Digital Audio	8ch audio
Optic ARC X 1Port	Digital Audio	SPDIF ( Audio Return Channel)
		MG-USB TYPE-C

	Compliant	Displayport 1.2Ver
	Pixel Rate Range	Max 4K x 2K@60Hz Resolution
		HBR2(4Lanes)
	Pixel Encoding & Date	RGB444(8/10bit), YCbCr444(8/10bit), YCbCr422(8/10bit),
	bit of RGB & YCbCr	4K x 2K@60Hz RGB 444 8bit only
	HDCP	HDCP 1.4 and 2.2
	Color Space	RGB, BT-601, BT-709
		USB TYEP-A (Device)
USB TYPE-C X 1Port		USB TYEP-B (Host)
	Output Connector	USB TYEP-C (Dual role port)
		POWER : External power source connector to MSPS-100W
		LOAD : External electric load connector to MSDL-100W
	USB Pass-thru	USB3.1(5Gbps) and USB 2.0 passthru
	Power Delivery(Source)	Up to 20V/5A(100W) with external power test unit MSPS-100W (Optional)
	Power Delivery(Sink)	Up to 20V/5A(100W) with external load test unit MSDS-100W (Optional)
	D/L Port	Firmware & Data up-load port
	Digital Audio	I2S, 48KHz, 2Channels
		COMMON Spec.
	Sample Rate	32 / 44.1 / 48 / 88.2 / 96 / 176.4 / 192KHz
	Number of Channel	8 Channels
	Bit per Sample	24
Digital Audio	Waveform	Sine Wave
Common Spec.	Frequency Range	20Hz to 24KHz / 5Hz step
	Level Range	0dB to -110dB/ 0.5dB step
	External Audio Input	Optical, Coaxial
	Special Control Mode	Fix, Sweep, Swap, Optical, Mute
	Frequency Range	20Hz to 24KHz / 5Hz step
	Level Range	0mVrms to 900mVrms / 5mVrms, 0~18dB
Analog Audio	Waveform	Sine Wave
Common Spec.	Number of Channel	2 Channels
	Connector	RCA
	Special Control Mode	Fix, Sweep, Swap, Mute
Scan Storage		
	Scan Storage	99 Group (1 Group; 40 Step)
Function Storage	Scan Storage Function Storage	99 Group (1 Group; 40 Step) 99 Group (1 Group; 30 Step)
Function Storage	Scan Storage Function Storage Timing	99 Group (1 Group; 40 Step)         99 Group (1 Group; 30 Step)         999 Timing (User: 1~500, Default: 501~999)
Function Storage Data Storage	Scan Storage Function Storage Timing Pattern	99 Group (1 Group; 40 Step)         99 Group (1 Group; 30 Step)         999 Timing (User: 1~500, Default: 501~999)         999 Pattern (User: 1~500, Default: 501~999)

	D/L Mode	MSPG-8000 main firmware download mode switch
	REMOTE	MSRC-009L remote port
	RS-232C	RS-232C communication port & MSPG-8000 main firmware download port
General Spec.	Power Consumption	AC 100~240VAC, 50/60Hz Auto Switch
	Operating Conditions	* Temperature: 0~40 °C
		* 80% Humidity, Non-condensing
	Dimension & weight	319x350x150(162)Cm / 4.0Kg (Slot 0.3Kg)

\*All specifications are subject to change without any notice

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## 2.4 Panel parts and their functions

1) Front panel of MSPG-8000



- ① Power On/Off switch
- ② Touch Screen LCD
- ③ Slot select buttons 1~8
- ④ Function buttons
- S Number buttons
- 6 Cursor and ok(enter) buttons

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2) Front buttons

SLOT	<ul> <li>Slot select buttons 1 to 8 slots</li> <li>✓ LED OFF: No slots are installed</li> <li>✓ LED BLUE ON: Slots are installed</li> <li>✓ LED RED ON: Slots are installed and selected</li> </ul>
	Red(Pr), Green(y), Blue(Pb) on/off button on the display.
	MENU: Reverse pattern
FUNCTION	SHIFT: SCAN rolling pause, download mode setting
	HDCP(High-bandwidth Digital Content Protection) on/off button
	HDCP INFO.: HDCP and EDID information display on the screen
	SYSTEM: MSPG-8000 set up button
	TIME: Resolution(Timing) select button
	PATT: Pattern select button
	CEC: CEC on/off button
NUMBER (7) (8) (9) (4) (5) (6) (1) (2) (3) (0) () (mr)	Number and Enter button
PLAY STOP	PLAY: Play button with media player slot(will update) STOP: Stop button with media player slot(will update) Direction and enter button



3) Real panel



	From left No.1~8				
SLOT number	1 · ·   SLOT LAYOUT				
REMOTE	Optional: remote MSRC-009L port				
RS-232C	RS-232C PC communication port				
	USB: Firmware & Time/Pattern data update port				
	DEBUG: Master Co., Ltd debug port				
MG-CPU SLOT	SUB: safety mode button				
	LAN: Master Co., Ltd update port				
	CPLD: Master Co., Ltd update port				
Power	F3.15A 250V "F" TYPE 100~240V 50/60Hz, 1.5A				





# 3. Chapter Three

## Mounting slots and starting the MSPG-8000

## 3.1 Mounting slots to MSPG-8000

## Chapter 3. Mounting slots and starting the MSPG-8000

### 1.1 Mounting slots to MSPG-8000

- ① Turn off the MSPG-8000 and disconnect power cord from MSPG-8000.
- ② Use a cross screwdriver to loosen the empty slot cover or old slot.



- ③ Take out the empty slot cover or old slots from MSPG-8000.
- Insert the prepared new slot gently into the desired empty slot, as shown in the below picture.(\*Caution:
   Please check the orientation as it may be inserted upside down.)



- ⑤ Tighten the bolts to original position.
- (6) Turn on the MSPG-8000
- ⑦ The MSPG-8000 will automatically recognize to all installed slots.



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# 4. Chapter Four

## How to use

- 4.1 Touch screen
- 4.2 Time(resolution)
- 4.3 Pattern
- 4.4 Scan
- 4.5 Function
- 4.6 Audio
- 4.7 Program copy(firmware update)
- 4.8 Data copy(Pattern, Timing, Audio, Function, Scan and System update)
- 4.9 System option
- 4.10 User setting
- 4.11 Moving control



## Chapter 4. Mounting slots and starting the MSPG-8000

### 4.1 Touch screen

The MSPG-8000 can be controlled by using the front touch screen.

Vid	eo Name	Vid	Video Name			K/B
EIA/CEA-	861 <mark>73</mark> 0	TV Combin	TV Combination 601			
Resolution	1280x720(p)	Dot Frequency	74.250 MHz			
H Frequency	45.000 KHz	V Frequency	60.000 Hz	HDCP	HDCP INF0	B∕S
Func, Group	1 No. 1	Scan 1	Audio 1	CEC		Space
	1				-	
SLOT 1 H 2.0	SLOT 2 A/D	SLOT 3 D 1.3	SLOT 4 COMP	-	•	•
Timing 730	Timing 3	Timing 3	Timing 3		0	9
Pattern 601	Pattern 3	Pattern 3	Pattern 3	4	5	6
				1	2	3
				0		ENT
		HW	1.0 SW 7.25		MSW	0.7.16

- ① Video Name: Current displayed timing name and timing number.
- ② Pattern Name: Current displayed pattern name and pattern number.
- ③ Resolution: Current displayed timing's resolution.
- ④ Dot Frequency: Current displayed timing's Dot Frequency.
- (5) H-Frequency: Current displayed timing's Horizontal Frequency.
- (6) V-Frequency: Current displayed timing's Vertical Frequency.
- ⑦ Func. Group: Current setting Function Group and Function Number.
- (8) Scan: Current setting Scan Number.
- ③ Audio: Current setting Audio Number.
- 1 Slot 1 ~ 8: Each slot type, timing number and pattern number display.
  - a. Slot 1. HDMI 2.0 slot installed and selected
  - b. Slot 2. Analog/DVI slot installed.
  - c. Slot 3.Displayport 1.3 slot installed.
  - d. Slot 4.Component slot installed.
  - e. Slot 5~8 Slot has not installed.
- 1 HOME: Return to main screen button
- 2 K/B: Keyboard button
- (3 NUM, ABC, #?&
  - a. Num: RGB, HDCP, HDCP Info, Back Space, CEC, direction button and number button
  - b. ABC: Upper case or lower case
  - c. #?&: Special character
- ( HW, SW: Hardware and software version



### 4.2 Time(resolution)

### You can use various type timings and edit them yourself.

- 4.2.1 How to call timing
- 1) Timing call using the touch screen



- ① Select slot number which you want to change timing → Selected slot will change red and activate.
- ② Select Video Name box → Cursor will activate.
- ③ Check the timing sticker and select timing number.
- ④ Press "ENT" button to run → Selected timing will output to display equipment.
- 2) Timing call using keypad



- ① Select slot number which you want to change timing → Selected slot will change red and activate.
- ② Select TIME button  $\rightarrow$  TIME button will change to red.
- ③ Check the timing sticker and select timing number.
- ④ Press "OK" button to run → Selected timing will output to display equipment.

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#### 4.2.2 How to edit timing

#### 1) Timing edit using touch screen

1 Mode (VESA=0_HDM	I=1 DTV=2 TV=3)		1		
2. Dot_Frequency	(Mhz)	148	3.500		
3. HS_Frequency	(KHz)	67.	5000		PATTERINE
4. VS_Frequency	(Hz)	60	.000	2	
5. H_Total	(Dot/uS)	2200	14.815	SCAN CALL	FUNC. CA
6. H_Display	(Dot/uS)	1920	12.929		
7. Hfront_Porch	2	88	0.593		<u></u>
8. HS_Width		44	0.296	AUDIO EDIT	PRO. COP
9. V_Total	(Dot/uS)	1125	16.667	<b>R</b>	20
10. V_Display	(Lin/mS)	1080	16.000		
11.Vfront_Porch	(Lin/mS)	4	0.059	DATA COPY	SYSTEM C
12.VS_Width	(Lin/mS)	5	0.074	٤Ô٤	
SAVE HDM	I(EIA-861B)	320	SAVE		

- ① Press "K/B" button to activate edit list.
- ② Press "TIME EDIT" button to activate timing edit list.
- ③ Use direction button for change timing value as you wanted → Refer to manual page at 23~30
- ④ Change timing name as you wanted. Drag number 4. and press "K/B" button for character.
- (5) Change timing number as you wanted empty timing number at 1~700.
- 6 Password is "8880".

#### 2) Timing edit using keypad





### 4.2.3 Timing edit list

Common Option						
MODE	NO.	LIST	DESCRIPTION	SETTING		
С			Video mode setting	0~3		
0			ANALOG mode setting	ANALOG=0		
М	1	Mode	DIGITAL mode setting	DIGITAL=1		
М			COMPONENT mode setting	COMP=2		
0			CVBS mode setting	CVBS=3		
Ν	2	Dot_Frequency(MHz)	Input the Dot Frequency as MHz.	Number		
	3	HS_Frequency(KHz)	Input the Horizontal Frequency as KHz.	Number		
0	4	VS_Frequency (Hz)	Input the Vertical Frequency as Hz.	Number		
P T	5	H_Total (Dot/uS)	Input the data as Dot or Time for whole pixels of marking Horizontal 1 line.	Number		
0	6	H_Display (Dot/uS)	Input the data as Dot or Time for available pixels of marking Horizontal 1 line.	Number		
N	7	Hfront_Porch (Dot/uS)	Input the data as Dot or Time for one of the line that is not display from the right side of screen.	Number		
	8	HS_Width (Dot/uS)	Input the data as Dot or Time for Horizontal returning section.	Number		
	9	V_Total (Lim/mS)	Input the data as line or time for whole line of one frame.	Number		
	10	V_Display (Lim/mS)	All of Vertical display line frame except vertical front porch and back porch.	Number		
	11	Vfront_Porch(Lim/mS)	No video section of one frame at the bottom.	Number		
	12	VS_Width (Lim/mS)	Vertical recurrence period.	Number		
			Select the Polarity of Horizontal sync	0 or 1		
	13	HS_Polarity	Horizontal sync setting to negative "-"	Negative(-)=0		
			Horizontal sync setting to positive "+"	Positive(+)=1		
			Select the Polarity of Vertical sync	0 or 1		
	14	VS_Polarity	Vertical sync setting to negative "-"	Negative(-)=0		
			Vertical sync setting to positive "+"	Positive(+)=1		
			Interlace setting	0~2		
	45		Default / Interlace None setting(No=0)	No=0		
	15	Interlace	Interlace setting with Video Signal(S&V=1)	S&V=1		
			Interlace setting without Video Signal(S=2)	S=2		
			Current resolution display on the monitor or not.	0 or 1		
	16	Resolution Display	Default / Current resolution none display.	No = 0		
			Current resolution display on the monitor at the center below.	Yes = 1		



С			Current model name display on the monitor or not.	0 or 1	
ο	17	Model Name Display	Default / Current model name none display.	No = 0	
м	17	Model Name Display	Current model name display on the monitor at the center	Yes - 1	
м			upper.	169 = 1	
0			Set screen ratio.	0~2	
Ν	10	Accest Patio	Setting screen ratio to 4:3	4:3=0	
	10	Aspect Rallo	Default / Setting screen ratio to 16:9	16:9=1	
0			Setting screen ratio to 64:27	64:27=2	
Ρ			Set color matrix format.	0~3	
т			Default / Setting color matrix format to RGB	RGB=0	
I	19	Color Space	Setting color matrix format to BT.601	BT.601=1	
0			Setting color matrix format to BT.709	BT.709=2	
Ν			Setting color matrix format to BT.2020	BT.2020=3	
			Set of output Data Format.	0~3	
			Default / This signal is incarnate by only RGB Data without Y	RGB444=0	
	20	Color Format	The express method as base on the Y, Cb, Cr	YCbCr444=1	
			The express method as base on the Y, Cb, Cr	YCbCr422=2	
			The express method as base on the Y, Cb, Cr	YCbCr420=3	
			Set of Data Bit Format.	0~3	
			Setting to 6bit	6bit=0	
	21	Out Data Bit	Default / Setting to 8bit	8bit=1	
			Setting to 10bit	10bit=2	
			Setting to 12bit	12bit=3	
			Set of out range to full, limit or xvYCC	0~2	
	22	Out Dongo	Setting to full range	Full=0	
	22	Out Range	Default / Setting to limit range	Limit=1	
			Setting to xvYCC range	xvYCC=2	
	23	Audio Pattern Number	Change audio format at selected timing	1~32	
	24	Video Pattern Number	Change pattern at selected timing(will update)	Number	



			ANALOG MODE						
MODE	NO	LIST	LIST DESCRIPTION						
	25		Set up the G(Green) Video added horizontal,	vertical sync	No=0				
	20	Sync On Green	frequency or not		Yes=1				
	26	HS Out Terminal	Cot the Uprizontal Superpart with odding Varia	al Suma ar nat	No=0				
	20	<= CS	Set the Honzontal Sync port, with adding ventc	al Sync of not	Yes=1				
	07	VC Out Terminal Off	Cot the Vertical Sume part, with adding Vertical	Duna ar nat	No=0				
	21	vo out reiminai oli	Set the ventical Sync port, with adding ventical s	Sync of not.	Yes=1				
	28		Selecting the video signal output or not, when	the DPMS is	On=0				
	20		operating		Off=1				
					On=0				
	29	DPMS_Hsync	DPMS is a mode for power saving at the monito	L_Off=1					
				H_Off=2					
Α					On=0				
Ν	30	DPMS_Vsync	DPMS is a mode for power saving at the monitor	or	L_Off=1				
Α					H_Off=2				
L O G		DVI Out			D&A=0				
	31		Selecting the DVI output signal		Digital=1				
					Analog=2				
					Full=0				
М	32 DVI Range		Setting of the Digital output signal to Full/Limit F	Limit=1					
0				RBLv.240=2					
D	33	Video Level	Set video level mV	0~999mV					
E				r	(default 700mV)				
				Syn	c On=0				
				H-Sy	nc off=1				
	34	Sync Off	H/V/Sync & Data enable Off setting	V-Sy	nc off=2				
				Data er	nable off=4				
				H/V-S	ync off=3				
				Data enable 8	& H/V-Sync off=7				
				Defau	It Auto=0				
	35	Link Rate(DP)	Setting to DISPLAYPORT link rate	1.63G=1 / 2.	.7G=2 / 5.4G=3				
				6.75G=	4 / 8.1G=5				
	36	Link Count(DP)	Setting to DISPLAYPORT link count	Defau	It Auto=0				
			-	1Lane=1 / 2Lane=2 / 4Lane=3					



DIGITAL MODE								
MODE	NO.	LIST	DESCR	SETTING				
D			Setting to HDCP on/off settin	0~2				
Т	05		HDCP off when call timing	Off=0				
G	25	HDCP ON	HDCP on when call timing		On=1			
I.			HDCP on and HDCP information	on display when call timing	Info On=2			
т			Setting to HDCP version 1.4	or 2.x.	0 or 1			
Α	26	HDCP Version	Default / Setting to HDCP 1.4	version	1.4=0			
L			Setting to HDCP 2.x Version		2.x=1			
			Setting to audio format		0 or 1			
М	27	Audio Format	Default / Setting to SPDIF aud	SPDIF=0				
0			Setting to I2S audio(8Ch)		I2S=1			
D			Setting to audio sample rate		0~7			
E			Setting audio sample rate to m	Mute=0				
			Setting audio sample rate to 32	32Khz=1				
			Setting audio sample rate to 44	44.1Khz=2				
	28 Audio Sample Rate		Default / Setting audio sample	48Khz=3				
			Setting audio sample rate to 88	88.2Khz=4				
			Setting audio sample rate to 96	δKhz	96Khz=5			
			Setting audio sample rate to 17	176.4Khz=6				
			Setting audio sample rate to 19	92khz	192Khz=7			
			Setting to ARC(HDMI2.0)/eAF	RC(HDMI2.1 12G slot)				
				Default / Setting to ARC off	Off=0			
		ADC Sotting	MC LIDMI2 0 only	Setting to ARC Ch1 on	Ch1=1			
				Setting to ARC Ch2 on	Ch2=2			
	20			Setting to ARC Ch1&2 on	Ch1&2=3			
	25	eARC Setting	MG-HDMI2.1-12G only	Default / Setting to ARC off	Off=0			
		(MG-HDMI2.1-12G)	*All=5 Check the eARC first,	Setting to ARC Ch1 on	ARC=1			
		(	and if equipment does not	Setting to eARC Ch1 on	eARC=4			
			support eARC and then	Setting to eARC & ARC on	All=5			
			check the ARC		7.11-0			
	30	Reserved	(HDR option-> change option a	at 42~44)				
					0=Off			
	31	FRI Pato	Setting to EPI Pato		3G=3			
	JI	I IL Kale			6G=6			



				12G=12
D				3Lane=3
I.	32	FRL Lane	Setting to FRL Lane	4Lane=4
G			EDID Check → Read EDID on TV(Monitor) and if	SCDC Chk=0
I	33	FRL Mode	TV(monitor) not support to SCDC then no screen output	SCDC
т			EDID Pass → Screen output regardless of SCDC	non Chk.=1
Α			Setting to Displayport link rate	0~5
L			Default / Displayport link rate to auto setting	Auto=0
		<b>-</b>	Setting Displayport link rate to 1.62Gbps	1.62Gbps=1
м	34	Displayport	Setting Displayport link rate to 2.70Gbps	2.70Gbps=2
0		LINK Rate	Setting Displayport link rate to 5.40Gbps	5.40Gbps=3
D			Setting Displayport link rate to 6.75Gbps	6.75Gbps=4
E			Setting Displayport link rate to 8.10Gbps	8.10Gbps=5
			Setting to Displayport lane count	0~4
		Displayport	Default / Auto Displayport lane setting	Auto=0
	35		Setting Displayport to 1(one) lane	1lane=1
		Lane Count	Setting Displayport to 2(two) lane	2lane=2
			Setting Displayport to 4(four) lane	4lane=4
			Setting to Sync Off	
			Default / Setting to Horizontal & Vertical & DE sync on	On=0
	20	Que e e#	Setting to Horizontal sync off	H-sync off=1
	30	Sync on	Setting to Vertical sync off	V-Sync off=2
			Setting to Data Enable off	DE off=4
			Setting to Horizontal & Vertical sync & DE off	H&V&DE off=7
			2D or 3D setting	0 or 2
	37	Video Format	Default / 3D setting off	Off=0
			3D display setting	3D=2
			3D Type setting	0~8
			Frame Packing(3D data: 0000)	0
			Field Alternative(3D data: 0001)	1
			Line Alternative(3D data: 0010)	2
	38	3D Structure	Side-By-Side Full(3D data: 0011)	3
			Reserved	4
			Reserved	5
			Top and Bottom(3D data: 0110)	6
			Side-By-Side Half(3D data: 1000)	8
	39	3D Ext Data	3D Ext Data setting	0~7

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			Horizontal sub-sampling odd/left picture, odd/right picture	0
D			Horizontal sub-sampling odd/left picture, even/right picture	1
I.			Horizontal sub-sampling even/left picture, odd/right picture	2
G			Horizontal sub-sampling even/left picture, even/right picture	3
I			Quincunx matrix odd/left picture, odd/right picture	4
т			Quincunx matrix odd/left picture, even/right picture	5
Α			Quincunx matrix even/left picture, odd/right picture	6
L			Quincunx matrix even/left picture, even/right picture	7
	40 3D Vact_space/Vblank3 3D V Active Space setting		3D V Active Space setting	Line
м			Frame packing interlace setting	0 or 1
0	41	Frame packing interlace	Default / Frame packing interlace off	Off=0
D			Frame packing interlace on	On=1
E			Setting to HDR	0/2/3
			Setting to HDR off	Off=0
			Setting to HDR10 on Setting to HDR10 on	
			[HDR 10 default setting value]	
			a. On/Off HDR Metadata infoframe:1_On/Enable	
		HDR EOTF	<ul> <li>Type of HDR Metadata infoframe: 7_Fixed, un editable</li> </ul>	
			c. Version of HDR Metadata infoframe: 1_Version 1, Fixed, un editable	
			d. Select EOTF: 2_SMPTE ST 2048	
			e. Type of static Metadata Descriptor ID:0_Metadata type1	
			f. Set Display_Primaries_X[0]: 35000	
	42		g. Set Display_Primaries_Y[0]: 15000	
			h. Set Display_Primaries_X[1]: 7500	HDR10=2
			i. Set Display_Primaries_Y[1]: 40000	
			j. Set Display_Primaries_X[2]: 7000	
			k. Set Display_Primaries_Y[2]: 2500	
			I. Set White_point_X: 13550	
			m. Set White_point_Y: 13500	
			n. Set max_display_mastering_luminance: 10000	
			<ul> <li>Set min_display_metering_luminance: 70</li> </ul>	
			p. Set Maximum Content Light Level: 1000	
			Set Maximum Frame-average Light Level: 400	
			Setting to HLG on	HGL=3
	43	HDR Max CLL	Setting to HDR Max CLL	1~65535
	44	HDR Max FALL	Setting to HDR Max FALL	1~65535



	<u>COMPONENT MODE</u>							
MODE	NO	LIST	DESCRIPTION	SETTING				
			DTV serration on/off setting	0 or 1				
0	25	Serration On of DTV	DTV serration off	No=0				
			DTV serration on	Yes=1				
м			Serration pulse setting	0 or 1				
P	26	Serration Pulse	DTV serration setting to HS/2	HS/2=0				
0			DTV serration setting to HS	HS=1				
N	07	Number of EQP Pulse	Select the number of EQP pulse in vertical front	0.00				
Е	21	(Front EA)	porch	0~99				
N	29	Number of EQP Pulse	Select the number of EQP pulse in vertical back	0.00				
т	20	(Back EA)	porch	0~99				
			Select the sync signal with Pb & Pr	0 or 1				
М	29	Sync On(Pb⪻) with Y	Sync signal with Pb & Pr	0				
0			Sync signal without Pb & Pr	1				
D	30	(Pb & PR) Out Level	Set of Pb & Pr signal level	0~100%				
E	21	Sumo Sot	0=Tri Level: Output with antagonism sync	Tri Lev=0				
	31	Sync Set	1=Bi Level: Output with general sync	Bi Lev=1				

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	<u>CVBS MODE</u>								
MO DE	No	LIST	DESCRIPTION	SETTING					
			TV(CVBS) Time Mode Setting	1~8					
			Setting to NTSC-M	1					
			Setting to NTSC-J	2					
	~-		Setting to NTSC-0.43	3					
	25	IV Time Mode	Setting to PAL-BDFH	4					
			Setting to PAL-M	5					
			Setting to PAL-60	7					
			Setting to SECAM	8					
	26		Set of SCART output mode.	0~3					
			Setting to RF	RF=0					
		SCART	Setting to CVBS	CVBS=1					
			Setting to RGB	RGB=2					
С			Setting to Y/C	Y/C=3					
v			Set of display rate when SCART are displaying	0 or 1					
в	27	SCART Aspect Ratio	Setting to 4:3 SCART rate	4:3=0					
S			Setting to 16:9 rate	16:9=1					
	20	S-V Ratio	Set of display rate when S-Video are displaying.	0~2					
М			Setting to 4:3 S-VIDEO rate	4:3=0					
0	20		Setting to 4:3(L) S-VIDEO rate	4:3(L)=1					
D			Setting to 16:9 S-VIDEO rate	16:9=2					
Е	29	Video Filter	Function of reduce the Video signal noise.	0~7					
			Set of Video Black level.	0~3					
			Setting to default	Default=0					
	30	Video Black Level	Setting to 7.52 IRE	7.5IRE=1					
			Setting to 0 IRE_S	0 IRE_S=2					
			Setting to 0 IRE	0 IRE=3					
	31	Teletext	Set of Teletext on/off when PAL is displaying.	0~15					
		Closed Caption	Set of Closed Caption on/off when NTSC is displaying.	1~255					
		► CC1=Roll-UP	Characters are displayed by Roll-up style, from 4Rows to 2Rows.	CC1=1					
	32	► CC2=Pop-On	Characters are displayed by Pop-On Style, Up, Middle, Down.	CC2=2					
	52	►T1=Roll-Up(Default)	Characters are displayed complete sentences.	T1=4					
		► T2=Roll-Up(Default)	Displayed by one sentence's character	T2=8					
		►CC3=Paint-On	Font's background color changed and displaying by paint-on style.	CC3=16					

		► CC4=Roll-Up	Simplify, Disp	laying by 2Row	ing by 2Row Roll-up style.				CC4=	32	
		►T3=Roll-Up(Default)		It does display	character as T1,	aracter as T1, But The Character of each row is displayed as different color.				T3=64	
		► T4=Roll=Up(default)	Jp(default) It does display cha				he Character of each i	row is display	ed as different color.	T4=128	
		► Full On		All Closed Ca	aption functions a	are o	n.			FULL	=255
С		V-Chip		Set of V-0	Chip on/off	whe	en NTSC is dis	olaying.			
v		Canadian Ra	tings(l	English)		Canadian Rating(French)					
в		1.Exempt			20			1	.E		30
S		2.C			21			2	.G		31
		3.C			22			3.	8+		32
м		4.G			23			4.1	13+		33
ο		5.PG			24			5.1	16+		34
D		6.14+			25			6.	6.18+		35
E	33	7.18+		_	26						
		USA(Movie)			U	USA Rating USA			USA(TV)	(TV) Sub Rating	
		1.G	1		1.	1.A 10X		1.TV-Y	USA Rating+1		
		2.PG	2		2.D(Suggesti	ve D	ialogue)	11X	2.TV-Y7	USA	Rating+2
		3.PG-13	3		3.L(Coarse	Lang	guage)	12X	3.TV-G	USA	Rating+3
		4.R	4		4.S(Sexua	l Cor	ntent)	13X	4.TV-PG	USA	Rating+4
		5.NC-17	5		5.V(Vic	lenc	e)	14X	5.TV-14	USA Rating+5	
		6.X	6						6.TV-MA	USA	Rating+6
		7.NR	7		Ex.)"Coa	irse L	₋anguage" + "TV-G'	' = 123 //	"Violence" + "TV-Y	/" = 141	
					SCART	τν,	MORNITORING	G setting	1	0	or 1
					Output t	the	same signal exc	ept RF m	node by TV &	Sa	me=0
	34	34 SCART Monitoring			Monitoring port.						
					TV port	for	normal signal ar	nd Monito	pring port for	Re	turn=1
					returnin	g si	gnal output				
	35	WSS ASPECT RATIO C	ontro	ol	Setting	Setting WIDE SCREEN SIGNALING			6	6	)~7

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USB TYPE-C MODE + MSDL-100W + MSPW-100W				
MO DE	N O	LIST	DESCRIPTION	SETTING
	For testing Monitor's Type-C output port electric load(MSDL-100W_optional)			
USBTYPE-CMODE	1	Voltage	Type-C monitor's voltage set from 5V to 20V, 0.05V/unit.	0 or 5~20 (0=off)
	2	Current	Type-C monitor's current set from 0~5000mV, 10mA/unit.	0~5000
	3	Load On Voltage Tol.	Voltage error tolerance under the electric load. 0~2000mV, 1mV/unit	0~2000 (0=off)
	4	Load Off Voltage Tol.	Voltage error tolerance without the electric load. 0~1000mV, 1mV/unit	0~1000
	For sending Monitor's Type-C port to electric power(MSPW-100W_optional)			
	1	Voltage	The voltage sent to the Type-C monitor can be set to 0V, 5~20V. 0.05V/unit	0 or 5~20 (0=off)
	2	Current	The current sent to the Type-C monitor can be set to 0~5000mV. 10mA/unit	0~5000
	3	Volt Tol.	Voltage tolerance to monitor can be set to 0 to 2000mV (500mV~1000mV recommended)	0~2000
	USB Mode and DP LANE setting			
	1	USB Mode	USB Mode: Type-C USB mode setting	
			0=Host(DFP)	
			Connect a PC(Host) to a USB Type-B port to check USB working.	
			1= Device(UFP)	
			Confirm connecting memory device to USB Type-A port.	
	2	DP-Lane	DP-Lane Count: Displayport lane count setting	
			1-2 Displayport 4data lane use(USB3.0 does not Work)	
			work)	



1)How to use the MG-USB-TYPE C and ELECTRIC LOAD MSDL-100W

① Please connect MG-USB-TYPE C and MSDL-100W.



② Select MG-USB-TYPE C slot and press TIME EDIT button. Only time number 1~500 can be setup the electric load.



③ Press Type-C button to activate the Type-C setup window.
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④ Change the power delivery electric load value as below.



(5) Press OK to save.(Overwrite the changed value at the called timing number.)

TIME	CALL NUMBER	452	1/5 PAGE		
1. Mor	Type-C PD	Sink Settings			
2 Dat	Voltage[ range: 5~20 or 0(off), un	it: V ]	• 5		r and a second s
2. 000	Current[ range: 0~5000, unit: mA	]	0		PATTERNED
3. HS_	Load On Volt Tol.[ range: 0~2000,	unit: mV ]	1000	lana a	
4. VS_I	Load Off Volt Tol.[ range: 0~1000,	, unit: mV ]	1000		
5. H_T	Type-C PD S	ource Settings		SCAN CALL	FUNC. CAL
6. H_D	Voltage[ range: 5~20 or 0(off), un	it: V ]	0		
7 116-1	Current[ range: 0~5000, unit: mA	]	0		->
7. Hirc	Volt Tol.[ range: 0~2000, unit: mV	1	0		
8. HS_'	Type-C USB &	DP-Land Setting		AUDIOEDIT	PRO. COP
9. V_T	USB Mode [ 0: Host(DFP), 1: Devic	e(UFP) ]	0	<b>F</b>	20
10. V_I	DP-Land Count [ 0: 4, 1: 2(Support	t USB-3)]	0		
11.Vfr	OK Ca	incel	Reset	DATA COPY	SYSTEM O
12.VS_	LIN III.		V.V/+	5	
-	HDMI(FIA-861B)	452	SAVE		ولوثور
				USER SETTING	MOVINGCO

- TIME\_CALL\_NUMBER 452 1/5 PAGE Type-C PD Sink Settings Voltage[ range: 5~20 or 0(off), unit: V ] 0 Current[ range: 0~5000, unit: mA ] 0 3. H Load On Volt Tol.[ range: 0~2000, unit: mV ] 1500 Load Off Volt Tol.[ range: 0~1000, unit; 4. V 1000 Type-C PD Sour JS Voltage[ range: 5~20 or 0(off), unit: V ] 0 Current[ range: 0~5000, unit: mA ] 0 7. Hfr Volt Tol.[ range: 0~2000, unit: mV ] 0 Type-C USB & DP-Land Setting 9. V T USB Mode [ 0: Host(DFP), 1: Device(UFP) ] 0 10. V 0 DP-Land Count [ 0: 4, 1: 2(Support USB-3) ] OK Cancel SAVE HDMI(EIA-861B) 452 SAVE Type-C
- A. Ex.)Type-C electric load FULL AUTO Test.(recommend to production line)

The MSPG-8000 checks the voltage/current supported by monitor with PD communication, automatically

tests those values, and shows the result along with the pattern as below.



# All test result OK/FAIL the voltage/current.



B. Ex.)Type-C electric load 12V/5A(60W) only MANUAL Test.

TIME CALL NUMBER 1/5 RAGE						
1. Not		Type-C PD Sink Set	tings			
	Voltage[ range: 5~20 d		12	H		
2. Dot	Current[ range: 0~500	0, unit: mA ]		5000		
3. H <mark>S</mark> _	Load On Volt Tol.[ rang	ge: 0~2000, unit: m	V]	1500	E	
4. V <mark>6</mark> _I	Load Off Volt Tol.[ ran	ge: 0~1000, unit:		1000	F	
5. H_T	H.T. Type-C PD Sour B gs					
6. H_D	Voltage[ range: 5~20 d		0	ī		
7 116	Current[ range: 0~500	~	0	H		
7. HIII	Volt Tol.[ range: 0~200		0			
8. HS_	Ту	pe-C USB & DP-Land	d Setting			
9. V_Ti	USB Mode [ 0: Host(DI	FP), 1: Device(UFP)	]	0		
10. V_I	DP-Land Count [ 0: 4,	1: 2(Support USB-3)	]	0		
11.Vfr(	ок		Reset			
12.VS_	maai	(Ling in S)			2	
SAVE	HDMI(EIA-	861B)	452	SAVE		
Ту	Туре-С					

C. Ex.)Type-C voltage without electric load(MSDL-100W) AUTO Test.

TIME CALL NUMBER					
1. Not		Type-C PD Sink Settings			
	Voltage[ range: 5~20	0			
2. Dot	Current[ range: 0~500	0, unit: mA ]	0		
3. H <mark>S</mark> _	Load On Volt Tol.[ ran	ige: 0~2000, unit: mV ]	0		
4. V <mark>5_</mark> I	Load Off Volt Tol.[ ran	nge: 0~1000, unit: mV ]	1000		
5. H_T		Type-C PD Source Settings			
6. H_D	Voltage[ range: 5~20	or 0(off), unit: V ]	0		
7 116-	Current[ range: 0~5000, unit: mA ]				
7. Hirt	Volt Tol.[ range: 0~2000, unit: mV ]				
8. HS_'	Tv	pe-C USB & DP-Land Settin	a		
9. V_TI	USB Mode [ 0: Host(D	FP), 1: Device(UFP) 1	0		
10. V_I	DP-Land Count [ 0: 4,	1: 2(Support USB-3) ]	0		
11.Vfr	« OK Cancel Recet				
12.VS_	12.VS_vridvii (ciiv)iiica)				
SAVE	HDMI(EIA-	861B) 452	SAVE		
Тур	be-C				



2)How to use the MG-USB-TYPE C and TYPE-C POWER MSPW-100W.

① Please connect MG-USB-TYPE C and MSPW-100W.



② Select MG-USB-TYPE C slot and press TIME EDIT button. Only time number 1~500 can be setup the power supply.



③ Press Type-C button to activate the Type-C setup window.

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④ Set up the power delivery power as below.



- ⑤ Press OK to complete saving the settings.
- 6 Ex.)5V/3A(15W) Type-C power sending.

Voltage[ range: 5~20 or 0(off) unit: V ]	5
Current[ range: 0~5000, unit: mA ]	3000
Volt Tol [ range: 0~2000, unit: mV ]	500

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## 4.3 Pattern

### You can use various type patterns and edit them yourself.

- 4.3.1 How to call pattern
- 1) Pattern call using the touch screen



- ① Select slot number which you want to call pattern → Selected slot will change red and activate.
- ② Select Pattern Name box → Cursor will activate.
- ③ Check the pattern sticker and select pattern number. → Selected pattern will output to display equipment.

#### 2) Pattern call using the keypad



- ① Select slot number which you want to change pattern → Selected slot will change red and activate.
- ② Select PATTERN button → PATTERN button will change to red.
- ③ Check the pattern sticker and select pattern number. → Selected pattern will output to display equipment.

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- 4.3.2 How to edit pattern
- 1) Pattern edit using touch screen

1.Cross Hatch H Divide (2~64)	0	
2.Cross Hatch V Divide (2~48)	0	
3.H Dot width (1~10)	0	
4.V Line Width (1~10)	0	i 🧹 2 🖊 📑
5.Dot / Char Style (0~4)	0	SC. ALL FUNC. C
6.Small 5_Circle (0=Off, 1=On)	0	
7.Small / Medium Circle (0=Off, 1=Medium, 2=Small)	0	₽ →
8.Large Circle (0=Off, 1=On)	0	AUDIO EDIT PRO. CO
9.Color sel (0=Off, 1=3col, 2=8col)	0	
10.Outer Line (0=Off, 1=On)	0	- B X
11.Diagonal (0=Off, 1=On)	0	DATA COPY SYSTEM
		S I
SAVE CrossHatch(4*4)1V 40	SAVE	
SAVE CrossHatch(4*4)1V 40	SAVE	· · · · · · · · · · · · · · · · · · ·

- ⑦ Press "K/B" button to activate edit list.
- (8) Press "PATTERN EDIT" button to activate pattern edit list.
- (9) Use direction button for change pattern value as you wanted..
- <sup>®</sup> Change pattern name as you wanted. Drag number 4. and press "K/B" button for character.
- (f) Change pattern number as you wanted empty pattern number at 1~500.
- Password is "8880".

## 2) Pattern edit using keypad



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## 3) Pattern edit common list

All of pattern edit list are different, some patterns can have set value from 1 to 1, while others can have set value from 1 to 48. However all of patterns have same default options(35) from "Center Maker/Slash/box (0-11)" to "Add pattern number".

	Common Option					
MODE	NO.	LIST	DESCRIPTION	SETTING		
С				Based on		
0				Black pattern		
M			1: 9point center/border/edge			
ON			2: One line Cross line			
0			3:Center Cross point	×		
P T			4:X line	$\times$		
I O	1	Center Marker/Slash/Boy(0-11)	5:Inverted triangle with white			
N			6:Cross line with Circle			
			7:Black cross bar with white bar			
			8: Two line Cross line			
			9: Two vertical line			
			10: Cross line with center square box			
			11: Border line			
	2		If there is base color on the pattern, it can change			
	3	Base_R/G/B_Level(0-100%)	base color Red/Green/Blue level 0% to 100%.	0~100		
	4					
	5		If there is character on the nattern, it can character			
	6	Character R/G/B Level(0-100%)	color change Red/Green/Blue level 0% to 100%.	0~100		
	7					



С			0: None	Based on
M			1:美 Character at the bottom	Black pattern
Μ				ŤŤŤŤŤŤŤŤŤŤŤŤŤŤŤŤŤŤŤŤŤŤŤŤŤŤŤŤŤŤŤŤŤŤŤŤŤŤ
O N			2 :美 Character at the top	****
	8	OSD Display(0-6)	3 :美 Character at the top and bottom	英文英文英文英文英文英文文文文文 英文文文英文文文文文文文文文
O P			4: Boarder line character	
T I			5: X line character	$\mathbf{\mathbf{X}}$
O N			6: Boarder and X line character	
	9		If there are OSD on the pattern, it cans OSD color	
	10	OSD_R/G/B_Level(0-100%)	change Red/Green/Blue level 0% to 100%.	0-100
	11		-	
			0: None	0
			1: Automatically brightens and darkens repeatedly.	1
			2: Automatically red brightens and darkens repeatedly.	2
			3: Automatically brightens and darkens repeatedly with red.	3
			4: Automatically brightens and darkens repeatedly with blue.	4
			5: Automatically brightens and darkens repeatedly.	5
			6: Automatically brightens and darkens repeatedly with red and cyan	6
			7: Automatically brightens and darkens repeatedly with green	7
	12	Auto Bright Up & Down(0-12)	and magenta.	
			8: Automatically brightens and darkens repeatedly with blue	8
			and yellow.	
			9: Automatically brightens and darkens repeatedly.	9
			10: Automatically brightens and darkens repeatedly with red	10
			and magenta.	11
			11: Automatically brightens and darkens repeatedly with blue	
			and yellow.	12

13	Reverse On Time (0~999)/Vf	Set up the reverse on/off time to 0~900/Vertical Frequency.	
14		If you want to check reverse on/off pattern, you have to set up	0~900
14	Reverse OII Time (0~900)/ VI	on time and off time together	
		If there is character on the pattern, you can move only	
		character pattern to any direction.	
		*If you want to check moving pattern, you have to set up	
		"Moving Pixel Step (0~99)" to minimum "1".	
		0:none	0
		1: Moving only character right to left ←	1
15	Character Moving (0~8)	2: Moving only character left to right $\rightarrow$	2
		3: Moving only character down to up 1	3
		4: Moving only character up to down ↓	4
		5: Moving only character left/up to right/down 🍾	5
		6: Moving only character right/up to left/down ⊭	6
		7: Moving only character left/down to right/up 🗡	7
		8: Moving only character right/down to left/up 🥆	8
16	Reserved		0
		If there are color base on the pattern, you can move only color	
		base pattern to any direction.	
		*If you want to check moving pattern, you have to set up	
		"Moving Pixel Step (0~99)" to minimum "1".	
		0:none	0
	7 Color Moving (0~8)	1: Moving only color right to left ←	1
17		2: Moving only color left to right $\rightarrow$	2
		3: Moving only color down to up	3
		4: Moving only color up to down ↓	4
		5: Moving only color left/up to right/down 🍾	5
		6: Moving only color right/up to left/down 🖌	6
		7: Moving only color left/down to right/up ≯	7
		8: Moving only color right/down to left/up	8
18	Reserved		0
19	Moving Pixel Step (0~99)	Moving pixel step set up 0 to 99	0~99
20	Moving Frame Interval (0~99)	Moving frame interval set up 0 to 99	0~99
		Flicker on select to CH(Character), OSD(On screen display)	0.7
		and GL(Color) (bit combination)	0~7
21	Flicker On(CH, OSD, CL) (0~7)	0	none
		1: Flicker character only	1



		2: Flicker OSD only	2
		3: Flicker character and OSD	3
		4: Flicker color only	4
		5: Flicker character and color	5
		6: Flicker OSD and color	6
		7: Flicker character, OSD and color	7
22	Flicker on time (0~999)/Vf	Flicker on/off time set up to 0~999/Vertical frequency	0~999
		*If you want to check flicker pattern, you have to set up flicker	
23	Flicker off time (0~999)/Vf	on and off time together.	0~999
24	Gamma Correction (0~30)/10	Analog gamma correction (0~30)/10	0~30
05	$\lambda$ (dec $\mathbf{D}$ (Oe $0$ $0$ ) $0$ (( $1$ )		0=on
25	Video R (On=0, Off=1)	Video red on/off option	1=off
00			0=on
20	video G (On=0, Off=1)	o G (On=0, Off=1) Video green on/off option	
07	Video D (Or. 0, Off. 1)	Video blue en (14 entine	0=on
21	VIDEO B (ON=0, ON=1)		1=off
28	Video Level (0~999mV)	Video level set up	0~999
			1=RF
20	Coort		2=CVBS
29	29 Scart	Scart set up	3=RGB
			4=Y/C,+1
30	Reserved		
31	Reserved		
32	Reserved		
33	Reserved		
34	Reserved		



4) How to modify the pattern  $\rightarrow$  Call pattern No. xxx and press EDIT button.

~	
ന	Full white pattern No.503 edit value and result.
0	i an minto pattorn record date raide and recourt

Ref.no 503 Full White pattern				
1.Color box H start	100	100	100	50
2.Color box V start	100	100	100	0
3.Color box H size	100	100	50	100
4.Color box V size	100	100	50	100
5.Color Box R Level	255	255	0	255
6.Color Box G Level	255	0	255	0
7.Color Box B Level	255	0	0	0
8.Uniformity Position No.	0	0	0	0
9.Uniformity Position size	0	0	0	0
10.Lip_Sync on	0	0	0	0
11.Lip_Sync off	0	0	0	0
12.Cross Hatch H Divide	0	0	0	0

② Full white pattern No.505 edit value and result.

Ref.no 504 Gray Step pattern				
1.Color Step	256	8	8	8
2.Color Step Case	3	3	3	1
3.Red Color Level	255	255	0	0
4.Green Color Level	255	255	0	0
5.Blue Color Level	255	255	255	255



Ref.no 505 Line On/Off pattern				
1.On Size	1	5	5	5
2.Off Size	1	5	5	5
3.H/V Line, Dot Select	0	1	2	2
4.Color On R Level	255	255	255	255
5.Color On G Level	255	255	0	0
6.Color On B Level	255	255	0	0
7.Color Off R Level	0	0	0	255
8.Color Off G Level	0	0	0	255
9.Color Off B Level	0	0	0	0

## ③ Line on/off pattern No.505 edit value and result.

④ Chess pattern No.507 edit value and result.

Ref.no 507 Chess pattern				
1.H Divide	8	3	3	1
2.V Divide	6	3	3	1
3.Divide / Pixel select	0	0	0	1
4.Color On R Level	255	255	255	255
5.Color On G Level	255	255	0	255
6.Color On B Level	255	255	0	255
7.Color Off R Level	0	0	0	0
8.Color Off G Level	0	0	255	0
9.Color Off B Level	0	0	255	0



Ref.no 508 Color bar pattern				
1.Color Bar H/V divide	8	4	4	8
2.Gray Size	0	30	50	50
3.Gray Step by one color	2	2	2	2
4.Gray 1 level	255	255	255	255
5.Color 1 R Level	255	255	0	0
6.Color 1 G Level	255	255	0	0
7.Color 1 B Level	255	255	0	0
8.Color 2 R Level	255	255	255	0
9.Color 2 G Level	255	255	255	0
10.Color 2 B Level	0	0	0	0
11.Color 3 R Level	0	0	0	0
12.Color 3 G Level	255	255	255	0
13.Color 3 B Level	255	255	255	0
14.Color 4 R Level	0	0	0	0
15.Color 4 G Level	255	255	255	0
16.Color 4 B Level	0	0	0	0
17.Color 5 R Level	255	255	255	255
18.Color 5 G Level	0	0	0	255
19.Color 5 B Level	255	255	255	255
20.Color 6 R Level	255	255	255	255
21.Color 6 G Level	0	0	0	255
22.Color 6 B Level	0	0	0	255
23.Color 7 R Level	255	255	255	255
24.Color 7 G Level	0	0	0	255
25.Color 7 B Level	0	0	0	255
26.Color 8 R Level	0	0	0	255
27.Color 8 G Level	0	0	0	255
28.Color 8 B Level	0	0	0	255

(5) Color Bar pattern No.508 edit value and result.



	Port No. 1	Port No. 2
Ref.no 521/522/523 EDID pattern		
1.EDID Port No.	Port 1 = 0	Port 2=1

(6) EDID pattern No.521/522/523 edit value and result.

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## 4.4 SCAN

SCAN is designed for repeated output of timing and patterns. It can be applied to aging test or automation test.

#### 4.4.1 SCAN function.

1) How to call saved Scan list.

Vide	o Name	Patter	n Name	HOM		ΥР
EIA/CEA-8	61 730	TV Combina	tion 601	NUM	ABC	#?&
Resolution	1280x720(p)	Dot Frequency	74.250 MHz			
H Frequency	45.000 KHz	V Frequency	60.000 Hz	HDCP	HDCP INFO	B/S
Func. Group	1 No. 1	Scan 1	Audio 1	CEC		Spac
HINK HIN		012	CLOT 4	-	-	►
Timing 730	Timing 3	2 3	Timing 3	7	8	9
Pattern 601	Pattern 3	Pattern 3	Pattern	4	5	6
				1	2	3
						EN
	Vide EIA/CEA-8 Resolution H Frequency Eunc. Group Storr 1 H 2.0 Niming 730 Pottorn 601 SLOT 5 Timing	Video NameEIA/CEA-861730Resolution1280x720(p)H Frequency45.000 KHzFunc. Group1No.Stioff IH 2.0Minning730Pattern601SLOT 5SLOT 6Timing1	Video Name     Patter       EIA/CEA-861     730     TV Combina       Resolution     1280x720(p)     Dot Frequency       H Frequency     45.000 KHz     V Frequency       H Frequency     45.000 KHz     V Frequency       Eunc. Group     1     No. 1     Scan 1       SLOT 1     H 2.0     SLOT 2     A/D       Timing     3     Pattern     3       SLOT 5     SLOT 6     SLOT 7       Timing     Timing     Timing	Video Name       Pattern Name         ELA/CEA-861       730       TV Combination       601         Resolution       1280x720(p)       Dot Frequency       74.250 MHz         H Frequency       45.000 KHz       V Frequency       60.000 Hz         Eunc. Group       1       No.       1       Scan       1       Audio       1         SLOT 1       H 2.0       SLOT 2       A/D       2       D.3       SLOT 4       COMP         Timing       3       Pattern       3       Pattern       3       Pattern       3         SLOT 5       SLOT 6       SLOT 7       SLOT 8       Timing       Timing       Timing       Timing	Pattern Name         EIA/CEA-861       730       TV Combination       601       NUM         Resolution       1280x720(p)       Dot Frequency       74.250 MHz       HDCP         H Frequency       45.000 KHz       V Frequency       60.000 Hz       HDCP         Eunc. Group       1       No.       1       Scan       1       Audio       1       CEC         SLOT 1       H 2.0       SLOT 2       A/D       2       D 1.3       SLOT 4       COMP       7         Pattern       3       Pattern       3       Pattern       3       4         SLOT 5       SLOT 6       SLOT 7       SLOT 8       1       1       1         Timing       Timing       Timing       Timing       2       D 1.3       1       1       7         SLOT 5       SLOT 6       SLOT 7       SLOT 8       1       1       1         Timing       Timing       Timing       Timing       0       0       0       0       0	Pattern Name         EIA/CEA-861       730       TV Combination       601       NUM       ABC         Resolution       1280x720(p)       Dot Frequency       74.250 MHz       H       G         H Frequency       45.000 KHz       V Frequency       60.000 Hz       HDCP       HDCP       HDCP         Eunc. Group       1       No.       1       Scan       1       Audio       1           SLOT 1       H 2.0       SLOT 2       A/D       2       D       1.3       SLOT 4       COMP       7       8         Pattern       3       Pattern       3       Pattern       3       4       5         SLOT 5       SLOT 6       SLOT 7       SLOT 8       1       2         Timing       Timing       Timing       0       0       0       0

- 0 Select slot number which you want to change scan  $\Rightarrow$  Selected slot will change red and activate.
- ② Select Scan → Cursor will activate
- ③ Press "ENT" button to run → Set up the timing & pattern will repeat.

#### 2) How to edit Scan

0 Select slot number which you want to change scan  $\Rightarrow$  Selected slot will change red and activate.



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- K/B 1/2 PAGE SCAN CALL NUMBER 1 TIME. PATT. SEC. TIME PATT. SEC. TIME EDIT PATTERN EDIT STEP 1 0 0 351 STEP 11 0 STEP 2 352 STEP 12 0 2 0 ----STEP 3 352 STEP 13 0 3 5 0 0 FUNC. CALL STEP 14 0 STEP 15 1 2 3 0 0 0 EP 6 0 STEP 16 0 0 AUDIO EDIT PRO. COPY STEP 7 0 STEP 17 0 0 0 STEP 8 0 STEP 18 0 0 0 5 STEP 9 0 0 0 STEP 19 0 0 0 DATA COP SYSTEM OP STEP 10 STEP 20 0 0 0 ٤Ô}-. لخ SCAN GROUP SAVE NO SAVE MOVING CON USER SETTING MSW 0.7.12 4 Δ
- 2 Press "K/B" and "SCAN CALL" for scan edit.

- ③ Set up the "TIME", "PATT" and "SEC."
  - i. "TIME": Resolution number.

\*If you want to change only pattern, please set up the same timing number.

- ii. "PATT": Pattern number.
- iii. "SEC." Time & Pattern display time/Sec.

\*Please set up over 4~5 second, so our generator & display equipment can response the signal.

\*Above image example:

- ✓ Time 351 & Pattern 1 together display while 5 second.
- ✓ Time 352 & Pattern 2 together display while 10 second.
  - → Timing changed 351 to 352, so it will be flash to once.
- ✓ Time 352 & Pattern 3 together display while 5 second.
  - → Timing is same 352 to 352, so it just change pattern without flash.
- ④ Select save number 1~99 and press "SAVE" button.(password is "8880")
- ⑤ If you want to stop the SCAN, press time button and call new timing.

\*Press "SHIFT" button for pause scan rolling.

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## 4.5 Function

FUNCTION is designed for calling timing and patterns at once. This feature provides simple commands for frequently used inspection patterns and timings. It is more useful with MSRC-009L.

#### 4.5.1 Function

1) How to call saved Function list.



- ④ Select slot number which you want to change function → Selected slot will change red and activate.
- ⑤ Select Func. Group number → Cursor will activate
- ⑥ Select No. number → Set up the timing & pattern will calling.
- 2) How to edit Function
  - ① Select slot number which you want to change function → Selected slot will change red and activate.

FUNCG	ROUPC	ALL NUM				1	1PA	GE		8000
	TIME.	PATT.		TIME.	PATT.		TIME.	PATT.		Ķ
F 1	0	0	F11	0	0	F21	0	0	DIT PA	TTER
F 2	0	0	F12	0	0	F22		0		
F 3	0	0	F13	0	0	F23		0	<b>1</b> 888	
F4	0	0	F14	0		F24		0	SCAN CALL	
F 5	0)	0	F15	0	0	F25		0		÷
F 6	0	0	F16	0	0	F26		0		RO. C
F7	0	0	F17	0	0	F27		0		
F 8	0	0	F18	0	0	F28	0	0	s i s	3
F 9	01		F19		0	F29		0	DATA COPY S	STEN
F10	0	0	F20	0	0	F30		0		1
FUNC G	ROUPS	AVE NO.			1		S	AVE		

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FUNC G	ROUPC	ALL NUM.				1	1PA	GE		HOME	К/В
					-						Boond
	TIME.	PATT.		TIME.	PATT.		TIME.	PATT.		F	
F1	351	5	F11	0	0	F21	0	0		TIME EDIT	PATTERNEDI
F 2	355	111	F12	0	0	F22	0	0			
	0	0	F13	0	0	F23	0	0		SCAN CALL	FUNC CALL
1	2	0	F14	0	0	F24	0	0		Jerri Crite	
F5		0	F15	0	0	F25	0	0			
F6	0	0	F16	0	0	F26	0	0		AUDIO EDIT	PRO. COPY
F7	0	0	F17	0	0	F27	0	0			
F 8	0	0	F18	0	0	F28	0	0		s i	×
F 9	0	0	F19	0	0	F29	0	0		DATA COPY	SYSTEM OP
F10	0	0	F20	0	0	F30	0	0		1222	
FUNC G	ROUP SA	VE NO.			5		SI	AVE		NO C	لرلوهما
										USER SETTING	MOVINGCON
				3		4		SW 7.	25		1SW 0.7.12
				$\backslash$							

② Press "K/B" and "FUNC. CALL" for function edit.

- ③ Set up the "TIME" and "PATT".
  - i. "TIME": Resolution number.
  - ii. "PATT": Pattern number.
- ④ Select save number 1~99 and press "SAVE" button.(password is "8880")

\*If you have optional remote controller MSRC-009L, it is better easy to use.

Master MUMLOCK						MSRC-009L		
•	•	•	0	•	•	•		
SLOT	SLOT 2	SLOT 3	SLOT	SLOT 5	SLOT 6	SLOT	SLO 8	
							•	
TIME	PATT.	R	G	В	SCAN	FUNC.	SLO INF	
			•	•				
HDCP	HDCP 2.X	HDCP	REV	SHIFT	<b>F23</b> 7	<b>F24</b> 8	F2 9	
F12 F1	F13 F2	<b>F14</b> F3	F15 F4	<b>F16</b> F5	F26 4	<b>F27</b> 5	F21 6	
F17 F6	F18 F7	<b>F19</b> F8	F20 F9	F21 F10	F29 1	F30 2	F3 3	
F22					F32	NUM	INTE	

- i. Press FUNC. Button
- ii. Press F1~F11(NUM LOCK on F12~F30) → Calling saved timing and patter at once.



## 4.6 Audio

You can use various type audio and edit them yourself.

#### 4.6.1 Audio

- 1) How to call saved Audio list.
  - ① Press audio button to activate audio.
  - ② Press up/down or number button for change audio →The changed audio will applied equally to all slots.

					-		v /e
Vide	o Name		Pattern Name				N D
EIA/CEA-8	361 73	30 TV	Combination	601	NUM	ABC	#?8.
Resolution	1280x720	0(p) Dot Frequ	ency 74	4.250 MHz			
H Frequency	45.000	KHz V Frequen	cy	60.000 Hz	HDCP	HDCP INFO	B∕S ₩
Func. Group	1 No.	1 Scan	1 Auc	dio 1	CEC		Space
Constant and					•	~	►
SLOT 1 H 2.0 finning 730	SLOT 2 A Timing	<sup>7D</sup> SLOT 3 <sup>3</sup> Timing	3	g 3		8	9
Pattern 601	Pattern	3 Pattern	3 Patter	n 🔫	2 4	5	6
				8	1	2	3
	Pattern	Pattern	Patter		0		ENT
Master							



2) Saved Audio list.

User can edit audio number 1 to 20 and audio number 21 to 32 is default audio.

Name	Waveform	Setting	g Value
	$\land \land \land \land$	Audio Type (~9)	1
Audio		Audio CA(~49)	0
Audio		Min Freq.(Hz)	0
Pattern 21		Max Freq.(Hz)	0
		Interval (10ms)	0
		Audio Type (~9)	4
		Audio CA(~49)	0
Audio		Min Freq.(Hz)	0
Pattern 22		Max Freq.(Hz)	0
	RUU	Freq. Step(HZ)	0
		Audio Type (~9)	5
		Audio CA(~49)	0
Audio	100	Min Freq.(Hz)	0
Pattern 23		Max Freq.(Hz)	0
	R	Freq. Step(Hz)	0
		Interval (10ms)	7
		Audio Type (~9)	0
Audio		Min Freq.(Hz)	200
Pattern 24		Max Freq.(Hz)	3000
	R	Freq. Step(Hz)	400
		Interval (10ms)	10
		Audio Type (~9)	8
Audio		Audio CA(~49) Min Erog (Hz)	0
Dottorn 25		Max Freq.(Hz)	3000
Fallem 25	R	Freq. Step(Hz)	400
		Interval (10ms)	10
	$\square$	Audio Type (~9)	7
Audio	L + + + + + + + + + + + + + + + + + + +	Audio CA(~49)	0
		Max Freq. (Hz)	200
Pattern 26	B	Freq. Step(Hz)	40
		Interval (10ms)	10
		Audio Type (~9)	8
Audio	L	Audio CA(~49)	0
Audio		Min Freq.(Hz)	200
Pattern 27	B	Freq Step(Hz)	40
		Interval (10ms)	10
	IN A A A A A A A A A A A A A A A A A A A	Audio Type (~9)	9
Audio		Audio CA(~49)	0
Audio		Min Freq.(Hz)	200
Pattern 28	B	Freq. Step(Hz)	3000 40
		Interval (10ms)	10
	$\cap$	Audio Type (~9)	6
مناحي ٨	R	Audio CA(~49)	19
Audio	V	Min Freq.(Hz)	200
Pattern 29		Freq Stop(Hz)	3000 40
		Interval (10ms)	20
		Audio Type (~9)	7
- ۲: م		Audio CA(~49)	0
Audio		Min Freq.(Hz)	300
Pattern 30		Max Freq.(Hz)	750 1
		Interval (10ms)	1
	IN A SAMULA A BANKA A BASIN	Audio Type (~9)	7
		Audio CA(~49)	0
Audio	LA AAAAM A AAAAM A AAAAM A AAAAM	Min Freq.(Hz)	610
Pattern 31		Max Freq.(Hz)	690
		Interval (10ms)	3
		Audio Type (~9)	10
		Audio CA(~49)	0
Audio		Min Freq.(Hz)	0
Pattern 32		Max Freq.(Hz)	0
		Freq. Step(Hz)	0
l		interval (10ms)	50

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- 3) How to edit audio.
  - ① Press "K/B" button and press "AUDIO EDIT" button for activate audio edit list.

AUDIO CALL	NUMBER		1 1	PAGE	HOME K/B
	Frequency(Hz)	Volume(-dB)			
Channel 1	400	180	Audio Type (~9)	1	
Channel 2	1000	180	Audio CA (~49)	49	DIT PATTERNED
Channel 3	400	180	Min Freq. (Hz)	0	
Channel 4	1000	180	Max Freq. (Hz)	0	
Channel 5	400	180	Freq. Step (Hz)	0	SCAN CALL FUNC. CALL
Channel 6	1000	180	Interval (10ms)	0	
Channel 7	400	180			
Channel 8	1000	180			AUDIO EDIT PRO. COPY
AUDIO SAVE	NO.		1	2 SAVE	DATA COPY DATA COPY USERSETTING MOVING CO
			HW 1.0	SW 7.2	15 MSW 0.7.12

\*-dB is -dBfs(full scale)

\*The -0dBfs setting is the maximum that digital audio can produce.

\*.180(-dB) is actually same as -18dBfs.

② Press "K/B" button and press "AUDIO EDIT" button for activate audio edit list. \*Understanding about speaker placement.



Label	Location	1
FL	Front Left	1
FC	Front Center	
FR	Front Right	-2
FLC	Front Left Center	
FRC	Front Right Center	-
RL	Rear Left	3
RC	Rear Center	
RR	Rear Right	- 2
RLC	Rear Left Center	
RRC	Rear Right Center	
LFE	Low Frequency Effect	ŝ
FLW	Front Left Wide	
FRW	Front Right Wide	-3
FLH	Front Left High	
FCH	Front Center High	
FRH	Front Right High	
TC	Top Center	

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- ③ Change setting value.
  - a. Change to audio frequency(Hz) and volume (-dBfs) from audio Ch1 to Ch8. All default setting is 2Ch, such as Left & Right audio.

	Frequency(Hz)	Volume(-dB)
Channel 1	400	180
Channel 2	1000	180
Channel 3	400	180
Channel 4	1000	180
Channel 5	400	180
Channel 6	1000	180
Channel 7	400	180
Channel 8	1000	180

	Edit Audio No							
Channel No.	Frequency	Volume						
1CH (FL)	400Hz	(-) 18.0dBfs						
2CH (FR)	1000Hz	(-) 18.0dBfs						
3CH (LFE)	400Hz	(-) 18.0dBfs						
4CH (FC)	1000Hz	(-) 18.0dBfs						
5CH (RL/RC)	400Hz	(-) 18.0dBfs						
6CH (RR)	1000Hz	(-) 18.0dBfs						
7CH (RLC/RC)	400Hz	(-) 18.0dBfs						
8CH (RRC/TC)	1000Hz	(-) 18.0dBfs						
F : Front L : Left	R : Right C : Center							
R : Rear W : Wide	H : High T : Top							
LFE : Low Frequency Effect								

*b.* Setting the audio type (1~9)

Audio	Type (~9) 1				
Audio	Format	Description			
1	Static	L,R Fix mode			
2	Winker	L,R same time On/Off mode			
3	Alternate Winker	L,R individual On/Off mode			
4	Random	5Khz $\Rightarrow$ 6Khz $\Rightarrow$ 4Khz $\Rightarrow$ 2.5Khz $\Rightarrow$ 6.5Khz Rotation			
5	L/R Different	L,R individual			
	Random	(1Khz ⇒2Khz ⇒3Khz ⇒4Khz ⇒5Khz Rotation)			
6	Frequency Up	300Hz to 20Khz / step to100Hz			
7	Frequency Down	20Khz to 300Hz / step to 100Hz			
8	Continue Up	20Hz to 1Khz / step to 1Hz			
9	Continue Down	1Khz to 20Hz / step to 1Hz			



			C (bin	A ary)				CA (hex)			Cł	nannel	Numbe	r			MSPG-xxxx
7	6	5	4	3	2	1	0		8Ch	7Ch	6Ch	5Ch	4Ch	1Ch	2Ch	1Ch	CA(0~49)
0	0	0	0	0	0	0	0	0x00	-	-	-	-	-	-	FR	FL	0
0	0	0	0	0	0	0	1	0x01	-	-	-	-	-	LFE1	FR	FL	1
0	0	0	0	0	0	1	0	0x02	-	-	-	-	FC	-	FR	FL	2
0	0	0	0	0	0	1	1	0x03	-	-	-	-	FC	LFE1	FR	FL	3
0	0	0	0	0	1	0	0	0x04	-	-	-	BC	-	-	FR	FL	4
0	0	0	0	0	1	0	1	0x05	-	-	-	BC	-	LFE1	FR	FL	5
0	0	0	0	0	1	1	0	0x06	-	-	-	BC	FC	-	FR	FL	6
0	0	0	0	0	1	1	1	0x07	-	-	-	BC	FC	LFE1	FR	FL	7
0	0	0	0	1	0	0	0	0x08	-	-	RS	LS	-	-	FR	FL	8
0	0	0	0	1	0	0	1	0x09	-	-	RS	LS	-	LFE1	FR	FL	9
0	0	0	0	1	0	1	0	0x0A	-	-	RS	LS	FC	-	FR	FL	10
0	0	0	0	1	0	1	1	0x0B	-	-	RS	LS	FC	LFE1	FR	FL	11
0	0	0	0	1	1	0	0	0x0C	-	BC	RS	LS	-	-	FR	FL	12
0	0	0	0	1	1	0	1	0x0D	-	BC	RS	LS	-	LFE1	FR	FL	13
0	0	0	0	1	1	1	0	0x0E	-	BC	RS	LS	FC	-	FR	FL	14
0	0	0	0	1	1	1	1	0x0F	-	BC	RS	LS	FC	LFE1	FR	FL	15
0	0	0	1	0	0	0	0	0x10	RRC	RLC	RS	LS	-	-	FR	FL	16
0	0	0	1	0	0	0	1	0x11	RRC	RLC	RS	LS	-	LFE1	FR	FL	17
0	0	0	1	0	0	1	0	0x12	RRC	RLC	RS	LS	FC	-	FR	FL	18
0	0	0	1	0	0	1	1	0x13	RRC	RLC	RS	LS	FC	LFE1	FR	FL	19
0	0	0	1	0	1	0	0	0x14	FRC	FLC	-	-	-	-	FR	FL	20
0	0	0	1	0	1	0	1	0x15	FRC	FLC	-	-	-	LFE1	FR	FL	21
0	0	0	1	0	1	1	0	0x16	FRC	FLC	-	-	FC	-	FR	FL	22
0	0	0	1	0	1	1	1	0x17	FRC	FLC	-	-	FC	LFE1	FR	FL	23
0	0	0	1	1	0	0	0	0x18	FRC	FLC	-	BC	-	-	FR	FL	24
0	0	0	1	1	0	0	1	0x19	FRC	FLC	-	BC	-	LFE1	FR	FL	25
0	0	0	1	1	0	1	0	0x1A	FRC	FLC	-	BC	FC	-	FR	FL	26
0	0	0	1	1	0	1	1	0x1B	FRC	FLC	-	BC	FC	LFE1	FR	FL	27
0	0	0	1	1	1	0	0	0x1C	FRC	FLC	RS	LS	-	-	FR	FL	28
0	0	0	1	1	1	0	1	0x1D	FRC	FLC	RS	LS	-	LFE1	FR	FL	29
0	0	0	1	1	1	1	0	0x1E	FRC	FLC	RS	LS	FC	-	FR	FL	30
0	0	0	1	1	1	1	1	0x1F	FRC	FLC	RS	LS	FC	LFE1	FR	FL	31
0	0	1	0	0	0	0	0	0x20	-	TpFC	RS	LS	FC	-	FR	FL	32

## c. Setting the audio Channel(0~49)

www.Ltdmaster.com

0	0	1	0	0	0	0	1	0x21	-	TpFC	RS	LS	FC	LFE1	FR	FL	33
0	0	1	0	0	0	1	0	0x22	ТрС	-	RS	LS	FC	-	FR	FL	34
0	0	1	0	0	0	1	1	0x23	ТрС	-	RS	LS	FC	LFE1	FR	FL	35
0	0	1	0	0	1	0	0	0x24	TpFR	TpFL	RS	LS	-	-	FR	FL	36
0	0	1	0	0	1	0	1	0x25	TpFR	TpFL	RS	LS	-	LFE1	FR	FL	37
0	0	1	0	0	1	1	0	0x26	FRW	FLW	RS	LS	-	-	FR	FL	38
0	0	1	0	0	1	1	1	0x27	FRW	FLW	RS	LS	-	LFE1	FR	FL	39
0	0	1	0	1	0	0	0	0x28	ТрС	BC	RS	LS	FC	-	FR	FL	40
0	0	1	0	1	0	0	1	0x29	ТрС	BC	RS	LS	FC	LFE1	FR	FL	41
0	0	1	0	1	0	1	0	0x2A	TpFC	BC	RS	LS	FC	-	FR	FL	42
0	0	1	0	1	0	1	1	0x2B	TpFC	BC	RS	LS	FC	LFE1	FR	FL	43
0	0	1	0	1	1	0	0	0x2C	ТрС	TpFC	RS	LS	FC	-	FR	FL	44
0	0	1	0	1	1	0	1	0x2D	ТрС	TpFC	RS	LS	FC	LFE1	FR	FL	45
0	0	1	0	1	1	1	0	0x2E	TpFR	TpFL	RS	LS	FC	-	FR	FL	46
0	0	1	0	1	1	1	1	0x2F	TpFR	TpFL	RS	LS	FC	LFE1	FR	FL	47
0	0	1	1	0	0	0	0	0x30	FRW	FLW	RS	LS	FC	-	FR	FL	48
0	0	1	1	0	0	0	1	0x31	FRW	FLW	RS	LS	FC	LFE1	FR	FL	49
0	0	1	1	0	0	1	0	0x32									Reserved

d. Setting minimum frequency (Hz): Sweep mode minimum frequency setting.

e. Setting maximum frequency(Hz): Sweep mode maximum frequency setting.

*f.* Setting frequency step (Hz): Sweep mode step setting.

g. Setting the audio output interval(10ms)

\*Except static mode

- When you changed setting value completed, than save to empty audio number at 1~20.(password is "8880")
- ⑤ Turn to main LCD screen and call to changed audio call number again, than you can test new audio.

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4) Audio setting with current value

Reference Audio Value Settings in the 180dB 400mVrms.  $400mVrms = \sqrt[2]{2}X400 = 1130mV$ 

## Left Audio : Digital Audio Output Convers to Analog Audio data.

dB(decibel)	Output(mv)400Hz	1000Hz	2000Hz	4000	8000	10000	Refere	ence Value(mV)
480	37	36	36	36	37	37	36	
420	71	71	71	71	71	72	71	
360	141	141	141	141	141	141	142	
300	285	285	285	285	285	285	285	
240	566	569	566	566	566	566	570	
180(standard)	1136	1133	1133	1133	1133	1132	1140	400mVrms
120	2278	2278	2278	2277	2275	2270	2280	
60	4452	4454	4454	4453	4450	4444	4560	

Right Audio : Digital Audio Output Convers to Analog Audio data.

dB(decibel)	Output(mv)400Hz	1000Hz	2000Hz	4000	8000	10000	Refere	ence Value(mV)
480	36	36	36	36	36	36	36	
420	70	71	70	71	70	70	71	
360	141	141	141	141	141	141	142	
300	283	284	284	285	283	28283	285	
240	565	566	566	566	564	562	570	
180(standard)	1128	1132	1132	1134	1132	1129	1140	400mVrms
120	2258	2268	2269	2270	2270	2268	2280	
60	4445	4450	4450	4450	4447	4440	4560	



# 4.7 Program copy (firmware update), slot firmware/FPGA update guide You can use USB memory stick to update main program.

- 1) How to firmware update
  - ① Please receive firmware file from Master Co., Ltd and save to USB memory stick.
  - ② Connect USB stick to MSPG-8000's rear USB port and wait 5second for recognize USB.



③ Press the K/B button and press the PRO.COPY button.

File Browser		НОМЕ К/В
File Path: /Disk File Type ALL FILE (*.*)  Disk MSPG-8000-DATA USB0 1 4	MEMORY Add Copy Delete File Info View	
	Folder 396Byte	AUDIO EDIT PRO. COPY 3 OPY SYSTEM OP. USER SETTING MOVING CON

④ Press the K/B button, PRO.COPY and USB0\_1 buttons sequentially.

(Press 📓 button if you can't find "USB0\_1" on the list after connection)



(5) Select update file and press enter button to update.(pass word is "8880")

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- (6) Select update file and press enter button to update.(pass word is "8880")
- ⑦ Update will begin as below.



(a) After update please power off and then power on for finish update and checked update version.

		CIAL	1.0	CIAL 1 0 01
100	1.0	SVV	1.0	SVV 1.0.01

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- 2) How to update each slots(you tube guide: <u>https://www.youtube.com/watch?v=7jfydawgWZE&t=21s</u>)
  - Download and install the update program to PC at below download site. http://www.ltdmaster.com/son/MSPG-5000\_8000/flash\_loader\_demo\_v2.8.0.exe
  - ② Must completed MSPG-8000 power on first and then connect MSPG-8000's slot D/L port to PC's RS-232C port via RS-232C cable(Stereo to 9S cable)





③ Check the PC's com port number as below.



④ Run installed "flash\_loader\_demo\_v2.8.0.exe".

🛅 Seven Remix XP	•	Command Line
🛅 SMemo	•	🧼 Demonstrator GUI
m stmicroelectronics	🕨 🛅 FlashLoader	🕨 🛃 Uninstall



Set up the UART value as below.

C UART	lanu	 	-	
Port Name	COM1	 Panty	Even	-
Data Rite	0	 Echo Timoqutfel	Disabled	

- Press "SHIFT" button at keypad, it is set up to download mode to all slots.
- ⑦ And press "MENU" button for ready to update.
- (8) Click the next button.
- (9) When below screen showing, press "Next" button.(If not, try again from number 2.)

Fish Loader Demonstrator	ide.augmented
T arget is readable. Please click "Next" to proceed	Please. select your device in the target list           Target         [STM32F4_05_07_15_17_1024K           PID (h)         [0413           BID (h)         [3.1           Version         [3.1
Remove protection	Name         Start address         End address         Size           Sector0         0x 8000000         0x 8003FFF         0x4000 (16K)           Sector1         0x 8004000         0x 8003FFF         0x4000 (16K)           Sector2         0x 8008000         0x 8008FFF         0x4000 (16K)           Sector3         0x 8000000         0x 8008FFF         0x4000 (16K)           Sector3         0x 8000000         0x 800FFFF         0x4000 (16K)           Sector3         0x 8010000         0x 801FFF         0x10000 (16K)           Sector5         0x 8010000         0x 803FFFF         0x20000 (12)           Sector6         0x 8000000         0x 807FFFF         0x20000 (12)           Sector7         0x 80800000         0x 807FFFF         0x20000 (12)           Sector8         0x 80800000         0x 807FFFF         0x20000 (12)
Back Net Count One	Sector9         0x 80A0000         0k 80BFFFF         0x20000 [12           Sector10         0x 80C0000         0k 80DFFFF         0x20000 [12           Sector11         0x 80E0000         0k 80FFFF         0x20000 [12           Back         Next         Canval         Date

6 AI	C Selector		
Download to device Download from fi	e le		
Frase neces	sary pages 🔿 No Erass	Glob	oal Erase
@ (h) 800000		ump to the user	program
C Optimize (Re	move some FFs) 🔽 V	erify after down	load
I Apply option	bytes		
Upload from device	F		
an become and the state			-1
			- and the second s

(1) Check "Verify after download" and select file upload button.

(f) Change file type to hex.Files(\*.hex) and select "MSPG-8000\_HDMI\_1\_0.hex"

\*Please check the correct slot type with slot update program name. Below is HDMI slot and HDMI slot update program sample picture

Flash Loader Demonstrator			스타일
> 열기 ○ ○ ■ 바탕 화면 ▶	_	- 6	★ 바탕확면 검색 ♪
구성 ▼ 새 롤더			• •
★ 즐겨찾기 ▶ 다운로드 ■ 바탕 화면 월 최근 위치 금 라이브러리 과 문서 템 비디오 ■ 사진 ↓ 음악		ILE REAL ILE REAL ILE REAL ILE SERVER - IF E 77]	MSPG-SLOT_HD MI20_1_0.hex
[특 컴퓨터			
파일 이름(N): MSPG-	SLOT_HDMI20_1_0.hex	•	hex Files (*.hex) s19 Files (*.s19) hex Files (*.hex) Bin Files (*.bin)



2 Click "Next" button to update start.

🥟 Flash Loade	r Demonstrator			X
	5	life.au	ugmented	
C Erase				ī
		C Sel	ection	
Download t     Downloa     C:\Users	o device d from file \손무균\Desktop	\MSPG-SLC	T_HDMI20_	1_0.hex
€ Eras	e necessary page:	s C No	Erase (	Global Erase
@ (h) [ □ Optin □ Apply	8000000 👱 nize (Remove som option bytes 🔽	] e FFs)	Jump to the Unit of the Unit of the Unit of Unit of Unit of Units of Uni	ne user program er download
C Upload from Upload to	) device ) file			
C	E 💌	WRITE P	ROTECTION	
	Back	Next	Cancel	Close

(3) Click "Next" button to update start.

lash Loade	er Demonstrator	Flash Loader Demonstrator
	Life.augmented	Life.augmented
Target	STM32F4_05_07_15_17_1024K	Target STM32F4_05_07_15_17_1024K
Map file	STM32F4_05_07_15_17_1024K.STmap	Map file STM32F4_05_07_15_17_1024K.STmap
Deration	DOWNLOAD	Dorration DOWNEGAD
File name	\\File-server\생산제품\신호기류 \\MSPG-5000]\[04]Fimware\Slot\MSPG-8000_DISP_0_1.he>	File name \\File-server\생산제품\신호기류 \\MSPG-5000\\[04)Firmware\Slot\MSPG-8000_DISP_0_
File size	158.32 KB (162116 bytes)	File size 158.32 KB (162116 bytes)
Status	11.08 KB (11347 bytes) of 158.32 KB (162116 bytes)	Status 19.00 KB (19452 bytes) of 158.32 KB (162116 bytes)
Time	00:07	Time 00:30
	Downloading data 7%	Verifying downloaded data 12%
	Real New Court Orac	Back Next Cancel G



When you finished update than please power off the MSPG-8000.



(5) Disconnect the download cable from the MSPG-8000. The slot firmware update complete.

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- 3) How to slot FGPA update (you tube guide:<u>https://www.youtube.com/watch?v=ZOi0Gaay71M&t=93s</u>)
  - ① Prepare to 64bit system windows OS PC.

💻 I 星	2 📑 ╤   Ц РС			– 🗆 × 🚰
파일	컴퓨터 보기			^ O
	🛃 시스템			- 🗆 X
✓ 속성	← → ∽ ↑ 🔛 > 제어판 >	시스템 및 보안 → 시스템		▶ ◙ 제어판 검색 ♪
	제어판 홈	컴퓨터에 대한 기본	정보 보기	U
← -	🎈 장치 관리자	Windows 버전		
	👎 원격 설정	Windows 10 Home		
💉 t	▶ 시스템 보호 © 2019 Microsoft Corporation. All rights reserved.		Windows10	
<b>_</b> 0	ᠹ 고급 시스템 설정			
		시스템		
		프로세서:	Intel(R) Core(TM) i5-6200U CPU @ 2.30GHz 2.40 GHz	
-		설치된 메모리(RAM):	8.00GB(7.87GB 사용 가능)	
↓		시스템 종류:	64비트 운영 체제, x64 기반 프로세서	
		펜 및 터치:	이 디스플레이에 사용할 수 있는 펜 또는 터치식 입력이 없습니다.	
<b></b>				
				지원 정보
		컴퓨터 이름, 도메인 및 작업	그룹 설정	
<b>_</b>		컴퓨터 이름	DESKTOP-NR3T6R3	● 섬전 변경
<b>1</b>		전체 컴퓨터 이루	DESKTOP-NR3T6R3	•=0.20
💣 E		컴퓨터 설명:		
		작업 그릎	WORKGROUP	
		Windows 정품 인증		
		Windows 정품 인증을 받	!았습니다. Microsoft 소프트웨어 사용 조건 읽기	
	참고 항목	제품 ID: 00325-		●제품 키 변경
	보안 및 유지 관리			

② Please download program as below site and install to 64bit PC.

http://www.ltdmaster.com/son/UPDATE%20PROGRAM%20TOOL/QuartusProProgrammerSetup-

	Download-p	rogram   Special developing company for vio	deo signal inspecting equipment	flaster Co., Ltd.	
A	Here is Master's da	ata room.			Master.Co.,Ltd
wnload					
Center	Vou con	download on wooful dos	umont		www.u
catalogue	for the use of	f Master product.	ument		
	<ul> <li>Write</li> </ul>	admin			
	File	-			
	• Date	2016-07-05 오전 9:38:01	> Hit	1038	
	<ul> <li>Subject</li> </ul>	FIRMWARE UPDATE MANUAL	and PROGRAM TOOL		
Search	MSHG-500_500_E00PLUS_FIRM WARE UPDATE MSHG-500_500PLUS_TIME DATA UPDATE				
	MSHG-700_800 UPDATE MANUAL/DATA COPY & FIRMWARE MANUAL_MSHG-700_800				
	FIRMWARE FIRMWARE TIME DATA MSPG-323: with CF CA	EUPDATE MSPG_3233_4233_4600_61 EUPDATE MSPG_3233_4233_4600_61 A UPDATE MSPG-3233_4233_4600_6 3_4233_4600_6100 UPDATE MANUAL ARD	00_PS2 TYPE UPDATE 00_USB TYPE UPDATE 100 /MSPG-3233_4233_4600_6	:100 pattern&timing up	date guide
	FIRMWARE MANUAL_MSPG-7100_7600_7800 DATA COPY_MSPG-7100_7600_7800				
	MSPG-8100S DISPLAYPORT FPGA UPDATE MANUAL				
	MSPG-5000_8000 slot firmware update program				

19.3.0.222-windows.exe

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③ Turn off the MSPG-8100S and loosen the bolts as shown below.

④ Pull the slot slightly as shown below to separate it from the main body.





⑤ Prepare the FPGA download tool provided by the Master Co.

6 Connect FPGA download cable as below and USB cable connect to 64bit PC.




⑦ Insert it back into the MSPG-8000 main body while connected and then turn on the MSPG-8000.

8 Run the Quartus Programmer that you installed.





	٢	11000	Thure	marc	, octup	001001	001	ט כ	0101[0	00 0]	unu		10001			uttorn.		
😃 Quartus Prime Pro	grammer Pro Edition -	[Chain1.cdf]															- 0	×
<u>File Edit View Pr</u>	rocessing <u>T</u> ools <u>W</u> in	ndow <u>H</u> elp															Search Intel FPGA	•
-	7											_						_
Ardware Setup	USB-Blaster [USB-0]											Mode:	JTAG		-	Progress:		
Enable real-time IS	SP to allow background	programming	g when avail:	able														
	File	Dev	ice	Checksum	Usercode	Program/	Verify	Blanks	Evamine	Security	Frase	ISP						
▶ <sup>v</sup> bStart	The second	ber	nec .	checkaum	oscicode	Configure	veniy	Check	CABITITIC	Bit	List	CLAMP						
Stop			😃 Hardwa	re Setup							×							
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XDelete			Calcates		s i Ad Settings				This see									
💾 Add File			hardware	setup applies	only to No. H	p to use when	program		es. mis prog	anning								
Change File			Currently	selected hard	ware: USB-	Blaster (USB-0	01				h ⊨							_
Save File			Hardware	frequency:						H	iz							
Add Device				,,	Aut		Jency at c		ing									
1 <sup>th</sup> up			Available	hardware iten	ns													
<b>↓</b> <sup>™</sup> Down			Hardw	210		Server	Port		Adda	anduana								
			USB-B	laster		Local	USB-0	5	Add H	aruware								
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ssage																		
System Proce	essing														🔯 AhnLa	ab 내PC지키	0	

9 Press 'Hardware Setup', select 'USB-Blaster[USB-0] and then press the 'Close' button.

\*The installation of USB DRIVER is possible at the following path;

C:intelFPGA\_pro/19.3/qprogrammer/quartus/drivers

📑   🖸 🛄 🗢   drivers					- 🗆 X
파일 홈 공유 보기	내기 목사 가기붙여범기 위치 - 위치 - 위치 - 의사	[ 생 형목 · · · · · · · · · · · · · · · · · ·			^ <b>0</b>
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🗐 문서	1386	2020-02-06 오전 10:21 파일 폴더			
	sentinel	2020-02-06 오전 10:21 파일 폴더			
📰 사진	usb-blaster	2020-02-06 오전 10:21 파일 폴더			
A 음악	📑 usb-blaster-ii	2020-02-06 오전 10:21 파일 몰더			
🏪 로컬 티스크 (C:)	apu_usb	2019-09-24 오전 10:04 설치 정보	2KB		
\$Recycle.Bin	apu_usb.sys	2019-09-24 오전 10:04 시스템 파일	14KB		
5EGI8S	To DPInst	2019-09-24 오전 10:04 응용 프로그램	1,026KB		
cvavr2	DPInst	2019-09-24 오선 10:04 XML 문서	1KB		
Current driver	Or oemsetup	2019-09-24 오전 10:04 설시 성모	1KB		
Documents and Settings	pganaic.ali	2019-09-24 오전 10:04 등용 프로그램 학정	I DKB		
Documents and settings	pguncui	2013-03-24 12 10:04 88 1113 43	5 JEND		
intei					
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18.1					
19.3					
logs					
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bin64					
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drivers	1				
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usb-blaster					
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sopc_builder					
syscon					
uninstall					
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10 Setting as below.

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#### (f) Press 'Add File' button and select Master given FPGA file.

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	essaye															Message 10	
ages																	
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1 Press 'Program/Configure' and 'Verify'. And then press 'Start' to start FPGA update.

#### (3) The update will take about 4minutes and 30 seconds.

Quartus Prime Pro	ogrammer Pro Edition - I	Chain 1.cdf]*														- 0	×
e For Xiew h	Toors Win	oow Heb													Search	n Intel FPGA	
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1 Device	1 contains JTAG I	D code 0x02EE	BODD														20901
Config Start	Juration succeeded Serial Flash Loade	1 device(s r programming	s) configure J	d													1984
1 Device	1 silicon ID is 0	x20															20901 20904
1 Progra	mming device(s)	in device(3)															20902
Perfor     Fod So	ming CRC verificat	ion on device	e(s)														20902
1 Succes	sfully performed o	peration(s)															20901
1 Ended	Programmer operati	on at Mon Mar	9 16:27:1	1 2020													20906
See																	
System (12)	Processing																

When update finished, the display will be change as below.

- (5) Turn off the MSPG-8000 and disconnect all cables.
- 16 Insert FPGA updated slots again and turn on the MSPG-8000.
- 17 If you update FPGA with 'HDMI21\_200218\_1\_3.jic', then HW version will showing HW1.3.

Video Name	Patter	n Name	HO		
FRL:Y420/8Bit/L 830	8 Color Bar-V	(100%) 52	NUM	ABC	#78
Decolution 7/10/00/00/00	Dat Francisco				
16501000m /680x4320(p)	Docrrequency	2376.000 MHZ	HDCP	HDCP	B/S
H Frequency 264,000 KHz	V Frequency	60.000 Hz	CEC		Space
Func. Group 1 No. 1	Scan 1	Audio 1		-	-
			-	_	
Timing 830	Timing 558	Timing 288	7	8	9
Pattern Fattern 52	Pattern 7	Pattern 25	4	5	6
SLOT 5 CYRS SLOT 6 HD2.0	SLOT 7 DP1.4	SLOT 8	1	2	3
Timing 201 Timing 403	Timing 241	Timing			
Pattern 100) Pattern 1001	Pattern 501	Pattern	0		ENT
	HW 1	3 SW 1.5		MSW	1.0.20)

laster

- 4.8 Data copy (Pattern, Timing, Audio, Function, Scan and System update) You can use USB memory stick to update/back up all data, such as pattern, timing, audio, function, scan and system set up data.
  - 1) All data update from USB memory stick to MSPG-8000
    - Please receive firmware file from Master Co., Ltd and un-zip save to USB memory stick on root folder.
       \*Must save to ROOT folder, so MSPG-8000 can recognize.



② Connect USB stick to MSPG-8000's rear USB port and wait 5second for recognize USB.



③ Press the K/B button and press the DATA COPY button.



laster

- ④ Select the ALL Data for update all data.
  - a. All data: pattern, time, audio, function, scan and system data
  - b. Pattern data: Only pattern data
- c. Time data: Only timing data If there are "not exist" than d. Audio data: Only audio data please check to un-zip and Function data: Only function data e. root folder save on USB. f. Scan data: Only scan data System data: Only system data g. HOME K/B USB : Connected Pattern Data: exist Func Data: exist TIME EDIT PATTERNEDIT Time Data: exist Audio Data: exist Scan Data: exist System Data: exist FUNC. CALL SCAN CALL V V Ż V AUDIO EDIT PRO. COPY V V V V J SYSTEM OF Copy Setting Data : PG => USB Copy Setting Data : USB => PG Factory Mode Data COPY 0 ل ل خ MOVINGCON USER SETTING MSW 0.12.04
- Select the "Copy Setting Data: USB => PG", it means all USB data copy to MSPG-8000. Existing data will be overwritten.(Password is "8880")
- 6 MSPG-8000 will confirm to copy, press ok button.
- ⑦ After 5 second update will finish as below, please turn off and turn on the MSPG-8000 for finish update.

03	b . connecteu					0000
Pattern Time Da Audio D	Data: exist ita: exist ata: exist		Func Data: Scan Data: System Dat	exist exist Ia: exist		PATTER
V	All Data				SCAN CALL	FUNC.
V	Pattern Data		Data	Copy ta	∎ ∎	
V	Time Data		from Sto Power O	orage!! ff=>On	AUDIO EDIT	PRO. C
V	Audio Data		V	aystern wara		3
Сор	y Setting Data : PG => USB	Copy Sett USB =	ng Data : > PG	Factory Mode Data COPY	DATA COPY	SYSTER

Master

- 2) All data back up from MSPG-8000 to USB memory stick.
  - ① Connect USB stick to MSPG-8000's rear USB port and wait 5second for recognize USB.



② Press the K/B button and press the "DATA COPY" button.

Pattern Data: exist Time Data: exist Audio Data: exist	Func D Scan D System	Data: exist Data: exist D Data: exist	2 017	PATTER
All Data			SCAN CALL	FUNC.
Pattern Data		Function Data	<b>_</b>	
Time Data		Scan Data	AUDIO EDIT	PRO. 0
Audio Data		System Data		3
Copy Setting Data : PG => USB	Copy Setting Data USB => PG	Factory Mode Data COPY		SYSTER

- ③ Select the ALL Data for update all data.
  - a. All data: pattern, time, audio, function, scan and system data
  - b. Pattern data: Only pattern data
  - c. Time data: Only timing data
  - d. Audio data: Only audio data
  - e. Function data: Only function data
  - f. Scan data: Only scan data
  - g. System data: Only system data

USB : Connected				80003
Pattern Data: exist Time Data: exist	Func Data Scan Data	a: exist a: exist		PATTERN
Audio Data: exist	System D	lata: exist	SCAN CALL	FUNC. C
Attorn Data		Function Data		÷.
5 Time Data	V	Scan Date	AUDIO EDIT	PRO. CO
V Andio Data	$\mathbf{\nabla}$	System Data	B	×
Copy Setting Data : Co PG => USB	py Setting Data : USB => PG	Factory Mode Data COPY		SYSTEM

Master

④ Select the "Copy Setting Data: PG => USB", it means all MSPG-8000's set up data will back up to USB memory stick. Existing data will be overwritten to USB memory stick.(Password is "8880")

Pattern Data: exist Time Data: exist Audio Data: exist	iunc Data: exist Scan Data: exist System Data: exist	
V All Data		SCAN CALL FUNC. C
V Pattern Data	/ Function Data	_ <b>'</b> ₽ <u>~</u> _
V Time Data	/ Scan Data	AUDIO EDIT PRO. CO
Audio Data	/ System Data	
Copy Setting Data : PG => USB USB => 1	Data : Factory Mode PG Data COPY	

- (5) MSPG-8000 will confirm to copy, press "ok" button.
- After 5 second update will finish as below, this back up data can use to another MSPG-8000 for make same set up.
   After 5 second update will finish as below, this back up data can use to another MSPG-8000 for make
   same set up.
   After 5 second update will finish as below, this back up data can use to another MSPG-8000 for make
   same set up.
   After 5 second update will finish as below, this back up data can use to another MSPG-8000 for make
   same set up.



Master

## 4.9 System option

You can set up the default setting on MSPG-8000. Press the K/B button and press the SYSTEM OP. button.

1. Buzzer On Time Con (Off:0~Max:5)	0	НОМЕ К/В
2. EDID Check Option [Pass=0, Check=1]	0	
3. Sync Level [2000 ~ 5500]	0	
4. UARTs Setting Port [0=PC]	0	EDIT PATTERNEDIT
5. IP {Disable=0, Enable=1]	0	
6. Calibrate Configuration	0	
7. PassWD Input for NEW PASSWD	0	SCAN CALL FUNC. CALL
8. PassWD Check [Once=0, Always=1, None=2]	0	
9. Time Edit Change [None=0, Continue=1]	0	
10. Time Edit Reference [Ratio=0, Dot=1]	0	AUDIO EDIT PRO. COPY
11. Pattern Edit Reference [Ratio=0, Dot=1]	0	
12. Enter Key option [Need=0, Auto=1]	0	
13. HDCP Display [Normal=0, SAM=1]	0	DATA COPY SYSTEM OP.
14. LG 3D Time Data [Normal=0, LG 3D=1]	0	
		الراري 1
		TTING MOVING CON
		MSW 0.7.12

- ① Buzzer On: Button touch/press buzzer on/off setting
  - a. Buzzer off: 0
  - b. Buzzer on: 1
- ② EDID Check Option: EDID check function
  - a. EDID Pass[0]: Do not check EDID
  - b. EDID Check[1]: EDID check
    - ✓ EDID normal: Normal display with sound
    - ✓ EDID abnormal: No display or no sound
- ③ Sync Level [2000~5500]: Analog Horizontal and Vertical sync level setting, default is 4800

#### ④ UART setting Port[0]: Press OK/ENTER button for into set up

Connect PC to MSPG-8000's RS-232 port via RS-232(cross type) cable. Set up baud rate, data bit, stop bits and parity same as PC and UART setting.(password is "8880")



#### 5 IP [Disable=0, Enable=1]: Reserved

- (6) Calibrate Configuration: It can control proper location of touch screen in LCD screen.
- ⑦ PassWD Input for NEW PASSWD: Change new password.
  - a. Enter default password "8880" and press enter
  - b. Input new password 1~8 digit number.
  - c. Input same new password 1~8 digit number once more.



⑧ PassWD Check: Set password checking frequency

- a. Once[0]: MSPG-8000 power on and ask the password only once
- b. Always[1]: Ask the password always
- c. None[2]: Do not ask the password



- ③ Reserved 1
- 10 Reserved 2
- 1 Pattern Edit Reference
  - a. Ratio[0]: Set pattern to ratio
  - b. Dot[1]: Set pattern to dot
- 2 Enter key option
  - a. Need[0]: Timing change with Enter button
  - b. Auto[1]: Timing change without Enter button(apply more than three digits)
- (3) HDCP Display
  - a. Normal[0]: HDCP/EDID information display type A
  - b. SAM[1]: HDCP/EDID information display type B

Master

### 4.10 User setting

You can change the timing settings you called in real time. H-Freq & V-Freq are auto calculate.

- HOME K/B Dot Clock 148.500 MHz 1 PATTERN EDIT V-Freq. H-Freq. 67.500 Khz 60.000 Hz 1920 1080 SCAN CALL FUNC. CALL **H-Display** V-Display V-FP H-FP 148 36 AUDIO EDIT PRO. COPY H-SW 44 V-SW 5 ¢ **H**-Total 2200 V-Total 1125 DATA COPY SYSTEM OP \$... MOVINGCON 2
- 1) Press the K/B button and press the USER SETTING button.

- 2) You can change setting value of Dot Clock, Horizontal Display, Vertical Display, Horizontal front porch, Vertical Front porch, Horizontal Sync Width, Vertical Sync width, Horizontal Total and Vertical Total. Use the arrow up and down buttons or digit number.
- 3) The changed timing setting will showing the monitor, the changed timing will not be saved.

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#### 4.11 Moving control

Level adjuster: Each Red, Green and Blue level can be adjustment from -255 to +255.

Moving control: Each pattern of character, color, image and OSD can be moving to all of direction.

1) Press the K/B button and press the MOVING CON button.



- 2) Level Adjuster
  - ① Inc/Dec: Level step setting
  - 2 RED: Only red level can be adjustment -255 to +255.
  - ③ GREEN: Only green level can be adjustment -255 to +255.
  - ④ BLUE: Only blue level can be adjustment -255 to +255.
  - ⑤ Set each (or together) RED, GREEN and BLUE then use arrow up/down buttons for change value.
- 3) Moving Control
  - ① Char.: Pattern designed from character.
  - ② Color: Pattern designed from color.
  - ③ Image: Pattern designed from image.(will update)
  - ④ OSD: Pattern designed from OSD.
  - ⑤ Set each (or together) Char, Color, Image and OSD then use arrow buttons for moving selected option.
  - (6) Use the arrow up/down buttons can increase moving speed.





MSPG-8100S

# 5. Chapter Five

# How to control RS-232C communication

- 5.1 Prepare RS-232C communication
- 5.2 HEX code and ASCII code
- 5.3 HEX code RS-232C control example
- 5.4 ASCII code RS-232C control example



# Chapter 5. How to control RS-232C communication

### 5.1 Prepare RS-232C communication

1) Prepare to 9p to 9s.(Use the cable provided from Master Co., Ltd)



#### 2) Connect MSPG-8000's RS-232C port to PC via 9p to 9s cable.



- 3) MSPG-8000 communication setting value
  - ① Baud rate: 9600 or 19200 (Check the manual page at 80)
  - ② Data Bits: 8
  - ③ Stop Bits: 1
  - ④ Parity: None
  - 5 Device: User computer's comport number

#### 4) RS-232C flow chart



COMMAND	HEX CODE	ASCII CODE
On-Line	0x05	No need
Off-Line	0x04	No need
Start	0x02	No need
End	0x03	No need
Slot select	0x1F	run slot 1~8;
Time select	0x07	run time 1~999;
Pattern select	0x08	run pattern 1~999;
Time & Pattern select	0x09	In the future
Audio select	0x13	run audio 1~39;
HDCP ON/OFF select	0x12	run hdcp on; OR run hdcp off;
HDCP 1.4/2.2 on/off	0x15	run hdcp ver 1.4; OR run hdcp ver 2.2;
HDR select	0x16	In the future

# 5.2 HEX code and ASCII code

## 5.3 Hex code RS-232C control example

1) On line: 0x05 (★Be sure to send an on-line command(0x05) first to order communications)

Off line: 0x04 (Send it to end the communications)

Command	
On line	05
Of line	04

2) Slot select: 0x1F + Slot No. 0x31~0x38

Command	Start	Slot select	Slot No.	End
	02	1F	31~38	03
Slot No.1	00	45	31	03
Slot No.7	02	IF	37	03

3) Time change: 0x07 + Time No. 0x30~0x39 3code

Command	Start	Time select		Time No.			
	02	07		03			
Time No.98	02	07	30	39	38	02	
Time No.152	02	07	31	35	32	03	

4) Pattern change: 0x08 + Pattern No. 0x30~0x39 3code

Command	Start	Pattern select		End			
	02	08		03			
Pattern No.52	02	0.9	30	35	32	02	
Pattern No.1	02	08	30	30	31	- 03	

Start		T&P select	Time No.				Pattern No.	End	
Command	02	09	3x 3x 3x			3x 3x 3x			03
T.371&P.52	02	00	33	37	31	30	35	32	02
T.463&P.1	02	09	34	36	33	30	30	31	03

5) Time & Pattern change: 0x09 + Time No. 0x30~0x39 3code + Pattern No. 0x30~0x39 3code

### 6) Audio On/Off: 0x13 + audio on/off command 0x32 + audio off 0x30/audio on 0x31

Audio number select: 0x13 + Audio Type 0x30~0x31 / 0x31~0x39

Command	Start	Audio	Off/On	Audio	off 30	End	
Command	02	13	32	Audio	03		
Audio Off	00	10	22	3	0	03	
Audio On	02	13	32	31		03	
<b>0</b> 1	Start	Audio	Туре	Audio Number		End	
Commanu	02	13	31	3x 3x		03	
Audio No.2	00	10	24	30	32	03	
Audio No.25	02	13	31	32	35	03	

7) HDCP On/Off setting: 0x12 + HDCP OFF 0x30/HDCP ON 0X31

Command	Start	HDCP ON/OFF	HDCP ON/OFF	End
	02	12	30/31	03
HDCP OFF	02	10	30	03
HDCP ON	02	12	31	03

8) HDCP On/Off & Version setting: 0x15 + 0x30(off) / 0x31(on) + 0x30(HDCP1.4)/0x31(HDCP2.2)

Command	Start	HDCP select	HDCP ON/OFF	HDCP 1.4/2.2	End
	02	15	30(OFF)/31(ON)	30(1.4)/31(2.2)	03
HDCP 1.4 off			30	30	
HDCP 1.4 on	02	45	31	30	02
HDCP 2.2 off	02	15	30	31	03
HDCP 2.2 on			31	31	

9) HDR setting: 0x16 + 0x04(EOTF) + 0x32/33

Command	Start	HDR EOTF EOTF select		End	
	02	16	04	32~33	03
Reserved				Reserved	
Reserved	02	16	04	Reserved	02
HDR10	02	10	04	32	03
HLG				33	



#### 5.4 ASCII code RS-232C control example

- 1) Slot select: run slot 1~8;
  - ① Ex: Slot 5 select: run slot 5;
- 2) TIME change: run time 1~999;
  - ① Ex: Time 47 change: run time 47;
- 3) PATTERN change: run pattern 1~999;
  - ① Ex: Pattern 999 change: run pattern 999;
- 4) AUDIO change: run audio 1~40;
  - ① Ex: Audio 39 change: run audio 39;
- 5) HDCP on/off select: run hdcp on/off;
  - ① Ex: HDCP on: run hdcp on;
  - ② Ex: HDCP off: run hdcp off;
- 6) HDCP 1.4/2.2 on: run hdcp ver 1.4/2.2
  - ① Ex: HDCP 1.4 on: run hdcp ver 1.4;
  - ② Ex: HDCP 2.2 on: run hdcp ver 2.2;





# 6. Chapter Six

Default pattern and timing list

- 6.1 Two types user pattern list
- 6.2 Default pattern and option list
- 6.3 Default timing list



# Chapter 6. Default pattern and timing list

# 6.1 Two Types pattern

# MSPG series has two kinds patterns as below



[A Type]

MSPG-81	100S PATTI	ERN LIST		주식획식 <b>미[스</b> MASTER CO.,	Address: LTD Tel:+82-55-	1, Pyeongsan-ro 7/ 297-8880 Fax:+82-5:	0beon-gil, Uichang 5-256-7388 Http://w	gu, Changwon-si, ww.Ltdmaster.com	Gyeongsangnam-do, Korea, 51389 E-mail:webmaster@Ltdmaster.com	2016.12.19 Edition 1c
Geometry	Blue Diamond Zone	Combination	Regulation	Full Red	Cross & Circle & S Color	Vertical One Line on/off	16 Color Bar	8 Color Bar 75%	Delay Time pattern Sloping 256 Ramp	
1	13	25	37	49	61	73	85	101	323 335	EMPTY
Reverse Geometry	Black Diamond Zone	70% Size ABL W/B	Static Regulation	Full Green	Cross & 8 Color	Horizontal Line on/off	Moire	7 Color Bar 75%	Delay Time pattern Auto Bright Up & Down	
2	14	26	38	50	62	74	86	102	324 336 555	EMPTY
Full White	8 Color Bar 75%	Monoscope	Maire 40%	Full Blue	Cross & RGB	16Color 16Gray	Calibration	50% Power Consumption	Over Scan1 Moving Character	
3	15	27	39	51	63	75	87	103	325 337 337	EMPTY
Window B%ox 50	Samsung White Balance	Reverse Monoscope	32Gray 3D	Vertical One Line on/off	Cross Hatch (16*12)	me Black	Cross Hatch (12*12)	Analog Pattern	Vertical 8 Color 16 Gray Moving Character & Bright	
4	16	28 -	40	52	64	76	88	123	326 🚺 338 🛄	EMPTY
white Kectangular Zone	16 Gray Step	DLP Mirror White Box	16 Gray Step	Vertical two Line on/of	CoskOdekislorkOurster	70% Size Calibration	Size_Patterne	R-B-G-Black	Character 🛣 Gray Box	
5	17	29	41	53	65	77	89	301	327	EMPTY
Red Rectangular Zone	32 Gray Step	DLP Mirror Slash Zone	W, R, G, B 64 Step	32 Gray Step	Cross&Orde&Scolor&Do	Cross & Character	W, R, G, B 64 Step	Deep Color	Circle 16 Gray Red Box	
6	18	30	42	54	66	78	90	302	328 0 340	EMPTY
Green Rectangular Zone	64 Gray Step	DLP Mirror 2 Luminance	e One Dot on/off	64 Gray Step	White Box Dot Control	Stripe Regulation	CG_Patterne	Deep Color	Users DTV White Balance Green Box	
7	19	31	43	55	67	79	91	303	329 341	EMPTY
Blue Rectangular Zone	Full White (40IRE)	DLP Mirror 10 Gray	One Dot on/off (cyan)	256 Gray Step	White Box % Control	Combination	SSFPD_W/B	Deep Color	Black-R-W-B Blue Box	
8	20	32	44	56	68	80	92	304	330 342	EMPTY
Black Rectangular Zone	PDP Auto Color Gain	<b>DLP Mirror Full White</b>	Close for à SCalor for à 15 Gray	3D Color	Full Text me	One Dot on/off	Slip-Geometry		Window 16 Gray Consumption Power	
9	21	33	45	57 🚺	69	81	94	305 EMPTY	331 343	EMPTY
White Diamond Zone	1 Dot On/Off	DLP Mirror Chess	LBM Dot on/off	Full Text me	Cross Talk	3D Color	Geometry 3	EDID 128 Information	Magazine Pattern 10bit/8bit Gray	
10	22	34	46	58	70	82	95	306 ~ 313	332	EMPTY
Red Diamond Zone	DLP Full White	16 Color Bar	Full White	70% She Over Handi A.B. W/S	128 Reverse Gray	8 Color Bar 75%	Power Consumption	EDID 256 Read	Users 256 Ramp-Vertical Video Wall	
11	23	35	47	<sup>59</sup>	71	83	96	<sup>314</sup> <sup>~</sup> <sup>321</sup>	333 345	EMPTY
Green Diamond Zone	DLP Auto Color Gain	Line & Stripe Regulation	n Full Black	Cross & Dot	8Color 32Gray	W, R, G, B 64 Step	Yellow_16Gray	Delay Time pattern	5 Window Box Image	
12	24	36	48	60	72	84	98	322	334 701	EMPTY

[B type]



	-	-	
	Default No.	Pattern	
Pattern name	A type time No.	Imago	Option List
	B type time No.	inage	
Linearity check	Default 501		1.Position Box (0=Off, 1=On): Position Box setting On/off
pattern	7,15,17,24,30		2.Final Char (0=Off, 1=On):Character pattern setting on/off
	25.80		4.EDID Check (0=Off, 1=On)
	23,00		► HDMI/DVI EDID check pattern,
			if Display's EDID header and check sum value are correct $ ightarrow$ Video On(Display)
			if Display's EDID header and check sum value are wrong $ ightarrow$ Video Off(No Signal)
			4 ~38 Common option
Geometry check	Default 502		1.Cross Hatch H Divide (2~64): Horizontal line divide 2 to 64
pattern	38,39,40,41,		3.H Dot width (1~10): Horizontal line width setting 1 to 10
Deflection linearity	62.82		4.V Dot width (1~10): Vertical line width setting 1 to 10
	02,02		5.Dot / Char Style (0~6): Dot or Character pattern style change 0 to 6
check pattern	60,61,62,63,6		6.Small 5 Circle (0=off, 1=On): Small 5 circle line on/off
	4,65,66,78,88,		7.Small / Medium Circle (0=Off, 1=Medium, 2=Small): Center circle on/off
	89		8.Large Circle (0=Off, 1=On): Large circle on/off
			9.Large Circle size (0~100%): Large circle size setting 0 to 100%
			$\blacktriangleright 0. \text{ Color Off}$
			<ul> <li>► 1: Red. Green and Blue On</li> </ul>
			▶ 2: White, Yellow, Cyan, Green, Magenta, Red, Blue and Gray On
			11.Outer Line (0=Off, 1=On): Outer Line on/off
			12~46 Common option
Color Pattern	Default 503		1.Color Box H Start (0~100): Color Box Horizontal start setting 0 to 100
			2.Color Box V Start (0~100): Color Box Vertical start setting 0 to 100
	2,3,4,9,14,16,		3.Color Box H Size (0~100): Color Box Horizontal size setting 0 to 100
	23,34,35,36,3		4.Color Box V Size (0~100): Color Box Vertical size setting 0 to 100
	7,45,46,47,48,		6.Color Box G Level (0~255): Color Box Green level setting 0 to 255
	49,50,59,73,7		7.Color Box B Level (0~255): Color Box Blue level setting 0 to 255
	6 79 110 111 1		8.Background R Level (0~255): Background Red Level setting 0to 255
	0,70,110,111,1		9.Background G Level (0~255): Background Green Level setting 0to 255
	12,115,116		10.Background B Level (0~255): Background Blue Level setting 0to 255 11.Uniformity Position No. (5.9.10): Uniformity circle position setting
	3,20,33,39,47,		► 5: 5 uniformity point
	48,49,50,51,8		► 9: 6 uniformity point
	6.000		► 10: bigger 6 uniformity point
	0,338		12.Uniformity Position Size (H Size/x) (0~100): Uniformity size setting 0 to100
			13.Lip_Sync (on*100ms) (0 ~999): Video and audio On time setting 0 to 999
			14.LIP_Sync (off=100ms) (0 ~999): video and audio Off time setting 0 to 999
Grav/Calar	Dofault 504		1.Color/Grav Step (1~255): Grav Step setting 1 to 255
Gray/Color	Delault 504		2.H Divide (1~16): Horizontal divide 1 to 16
Scale Pattern	12		3.V Divide (1~16): Vertical divide 1 to 16
	32,71,335,336		4.Gray Direction (0~11): Gray Direction setting 0 to 11
	,: 1,000,000		5.Color Selector (0~1)
	,337		► 0: Gray Step ► 1: Color Step

# 6.2 Default pattern and option list

			6.Color 1 (0~15): Change color 1 0 to 15 7.Color 2 (0~15): Change color 1 0 to 15 8.Color 3 (0~15): Change color 1 0 to 15 9.Color 4 (0~15): Change color 1 0 to 15 10~44 Common option
Line On/Off Pattern	Default 505 10 22,43,44,46,5 2,53,73,74,81		<ul> <li>1.On Size (0~100): H/V line on size setting 1 to 100</li> <li>2.Off Size (0~100): H/V line of size setting 1 to 100</li> <li>3.Color/Character select (0=color, 1=Char): Color or Character select</li> <li>4.H/V Line, Dot Select (0=H, 1=V, 2=Dot)</li> <li>0: Horizontal line type</li> <li>1: Vertical line type</li> <li>2: Dot type</li> <li>5~7 Color On R,G,B Level (0~255): Color On R,G,B Level setting 0 to 255</li> <li>8~10 Color Off R,G,B Level (0~255): Color Off R,G,B Level setting 0 to 255</li> <li>11~45 Common option</li> </ul>
Purity check pattern Color matrix check pattern	Default 506 11,18,19,20,2 1,31,42,43,44, 54,55,58,63,6 4,66,68,80 4,29,37,67,68, 79,96,103,330		<ul> <li>1.Color Window H Start (0~100%): Color window horizontal setting 0 to 100%</li> <li>2.Color Window V Start (0~100%): Color window vertical setting 0 to 100%</li> <li>3.Color Window H Size (0~100%): Color window horizontal size setting 0 to 100%</li> <li>4.Color Window V Size (0~100%): Color window vertical size setting 0 to 100%</li> <li>5.Color window divide (0~14): Color window divide 0 to 14</li> <li>6.Color window H/V select (0~1): Color window select horizontal or vertical 7.Color 1 R level (0~255): Color 1 Red level setting 0 to 255</li> <li>48.Color 14 B level (0~255): Color 14 Blue level setting 0 to 255</li> <li>49~83 Common option</li> </ul>
Auto color gain adjustment check pattern	Default 507 79,113,114 24,34	****	<ul> <li>1.H Divide (0~255): Horizontal divide 0 to 255</li> <li>2.V Divide (0~255): Vertical divide 0 to 255</li> <li>3.Divide / Pixel Select (0=Divide, 1=Pixel)</li> <li>♦ 0: Divide by H and V</li> <li>♦ 1: Pixel: Divide unit is pixel</li> <li>4.Color On R Level (0~255): Color on Red level setting 0 to 255</li> <li></li> <li>9.Color On B Level (0~255): Color off Blue level setting 0 to 255</li> <li>10~44 Common option</li> </ul>
Color matrix check pattern	Default 508 8,32,33,51,52, 53,65 15,21,31,83,1 01,102,326		<ul> <li>1.Color Bar H/V Divide (1~8): Color Bar H or V divide 1 to 8</li> <li>2.H / V select (0=H, 1=V): Horizontal or Vertical select</li> <li>3.Gray Size (0~90%): Gray step size select 0 to 90%</li> <li>4.Gray Step by one color (0~16): Gray step select 0 to 16 depend on Color bar</li> <li>5.Gray 1 Level: Reserved</li> <li>6.Reserved</li> <li>7.Color 1 R level (0~255); Color 1 Red level setting 0 to 255</li> <li></li> <li>30. Color 8 B level (0~255); Color 8 Blue level setting 0 to 255</li> <li>31~65 Common option</li> </ul>
Geometry check pattern Aspect ratio format check pattern Over scan check pattern	Default 509 71,72 27,28		1~35 Common option



Character check pattern Character check	Default 510 none none Default 511		<ol> <li>1.Font Ascii Value (32–127): Font Ascii select 32 to 127</li> <li>2.Font H Space (0–99): Font horizontal space setting 0 to 99</li> <li>3.Font V Space (0–99): Font vertical space setting 0 to 99</li> <li>4.Font Size or Code (1–7): Font size or code select 1 to 7</li> <li>5~39 Common option</li> <li>1.Me Style Select(0~4): "ME" Character style select 0 to 4</li> <li>2.Pattern Select(0~1): Pattern type select</li> </ol>
patom	58,69,76		3~37 Common option
Character size	Default 512		1.Character font size (1~8): Character font size setting 1 to 8 2~36 Common option
check pattern	none		
	none	********	
Chinese font check	Default 513	29222222222222222222222222222222222222	1.Chinese Font select (0=Love, 1=Beautiful): Chinese Font select 愛 or 美 2~36 Common option
pattern	327	<u>&amp;</u>	
Color scale tracking	Default 514		1.Color Step (2~256): Color Step setting 2 to 256
check pattern	22		2.H Divide (1~4): Horizontal divide 1 to 4
	42,84,90		
Gray scale tracking	Default 515		1.Color Windows H Divide (0~20): Horizontal color windows divide 0 to 20
check pattern	28,29		2.Color Windows V Divide (0~20): Vertical color windows divide 0 to 20 3.Color Windows H Size (0~100%): Horizontal color windows divide 0 to
	none		100%
			5.Gray Level 1 (0~255): Gray level 1 setting 0 to 255
			 24.Gray Level 20 (0~255): Gray level 20 setting 0to 255
Convergence	Default 516		25~59 Common option       1.H Divide (0~255): Horizontal divide 0 to 255
adjustment check	61		2.V Divide (0~255): Vertical divide 0 to 255
pattern	301		
White balance	Default 517		1.Box H Start (0~100%): Box horizontal start position setting 0 to 100%
check pattern	13		2.Box V Start (0~100%): Box vertical start position setting 0 to 100% 3.Box H Size (0~100%): Box horizontal size setting 0 to 100%
	334		4.Box V Size (0~100%): Box vertical size setting 0 to 100%
			6.Box Full On/Off (0=Off, 1=On): Center box on/off setting
Grav scale tracking	Default 518		7~41. 1.Divide (1~64): Square box divide 1 to 64
pattern with square	None		2.Gray Type $(0 \sim 1)$ : Black or white type select
type	None		4~38 Common option
3D check pattern	Default 519	•	1.3D Struct Select (0=SSH, 1=TB): 3D pattern setting, 0=Side by side type /
(Side by side / Top	81,83	к	1=Top and bottom type 2~36 Common option
and bottom type)	None		
AVL W/B (70%)	Default 520		1.H Size (1~100%): Horizontal size setting 1 to 100%
pattern	none		3.Cross Hatch Width (0~30Pixels): Cross hatch width setting 0 to 30 pixels



EDID check pattern 256 Byte with diagram EDID check pattern Simple EDID data	26,59,92 Default 521 94,95 314,315 Default 522 86,87	<ul> <li>4.Side width (0~30Pixes): Side width setting 0 to 30 pixels</li> <li>5.Dot On/Off Color Level (0~255): Dot on/off color level setting 0 to 255</li> <li>6~40 Common option</li> <li>1.EDID Port No.</li> <li>0: Ch 1 EDID 255 DATA</li> <li>1: Ch 2 EDID 255 DATA</li> <li>2~36 Common option</li> <li>1.EDID Port No.</li> <li>0: Ch 1 EDID DATA</li> <li>1: Ch 2 EDID DATA</li> <li>1: Ch 2 EDID DATA</li> </ul>
EDID check pattern Detail EDID data	306,307 Default 523 102,103	2~36 Common option 1.EDID Port No. ► 0: Ch 1 EDID detail DATA ► 1: Ch 2 EDID detail DATA
3.Geometry check pattern with Circle	none Default 524 None	<ul> <li>2~36 Common option</li> <li>1.Large 1 Circle (0=Off, 1=On): Large circle on/off</li> <li>2.Large Circle width (0~10): Large circle width setting 0 to 10</li> <li>3 Middle 5 Circle (0=Off, 1=On): Middle circle on/off</li> </ul>
	none	<ul> <li>4.Middle Circle width (0~10): Middle circle width setting 0 to 10</li> <li>5.Cross 4 Circle (0=Off, 1=On): Cross circle on/off</li> <li>6.Cross Circle width (0~10): Cross circle width setting 0 to 10</li> <li>7.Small 5 Circle (0=Off, 1=On): Small circle on/off</li> <li>8.Small Circle width (0~10): Small circle width setting 0 to 10</li> <li>9~41 Common option</li> </ul>
1.Purity check pattern with square box	Default 525 none 5,6,7,8,9,10,1 1,12,13,14	<ol> <li>Color Box H Start(0~100):Color box horizontal start position setting 0 to 100</li> <li>Color Box V Start(0~100):Color box vertical start position setting 0 to 100</li> <li>Color Box H Size(0~100): Color Box horizontal size setting 0 to 100</li> <li>Color Box V Size(0~100): Color Box vertical size setting 0 to 100</li> <li>Color Box V Size(0~100): Color Box vertical size setting 0 to 100</li> <li>Color Box R,G,B level (0~255): Color Box level red, green and blue setting 0 to 255</li> <li>Color Rectangular H Start(0~100):Color Rectangular horizontal start position setting 0 to 100</li> <li>Color Rectangular V Start(0~100):Color Rectangular vertical start position setting 0 to 100</li> <li>Color Rectangular H Size(0~100): Color Rectangular vertical start position setting 0 to 100</li> <li>Color Rectangular H Size(0~100): Color Rectangular vertical size setting 0 to 100</li> <li>Color Rectangular V Size(0~100): Color Rectangular horizontal size setting 0 to 100</li> <li>Color Rectangular V Size(0~100): Color Rectangular vertical size setting 0 to 100</li> <li>Color Rectangular V Size(0~100): Color Rectangular vertical size setting 0 to 100</li> <li>Color Rectangular V Size(0~100): Color Rectangular vertical size setting 0 to 100</li> <li>Color Rectangular V Size(0~100): Color Rectangular vertical size setting 0 to 100</li> <li>Rectangular/Diamond/Box Select (0=Rectangular/1=Diamond/2=Box)</li> <li>Art Common option</li> </ol>
Color matrix check pattern with level adjustment	Default 526 None 35,85	<ul> <li>1.Color H Divide (1~8): Color horizontal divide 1 to 8</li> <li>2.Color V Divide (1~64): Color vertical divide 1 to 64</li> <li>3.H Size (1~100%): Horizontal size setting 1 to 100%</li> <li>4.V Size (1~100%): Vertical size setting 1 to 100%</li> <li>5.Reserved</li> <li>6.Reserved</li> <li>7.Color 1 R level (0~255): Color 1 red level setting 0 to 255</li> <li></li> <li>30.Color 30 B level (0~255): Color 8 blue level setting 0 to 255</li> <li>31~65 Common option</li> </ul>



Regulation check	Default 527		1.H Line space value (0~50%): Horizontal line space value setting 0~50%
pattern	None		2.H Box space value (0~50%): Horizontal box space value setting 0~50%
panoni			3.V Line space value (0~50%) Vertical line space value setting 0~50%
	36		4. V Box space value (0~50%) venical box space value setting 0~50%
Pogulation abook	Default 528	-	1 H Line Count (0~64%): Horizontal line count setting 0 to 64%
Regulation check	Delault 526		2.V Line Count (0~64%): Vertical line count setting 0 to 64%
pattern	none		3.H Line Position (0~100%): Horizontal line position setting 0 to 100%
	38	+	4.V Line Position (0~100%): Vertical line position setting 0 to 100%
			5.H Box Position (0~100%): Horizontal box position setting 0 to 100%
			6.V Box Position (0~100%): Vertical box position setting 0 to 100%
			7.Color Box R level (0~255)
			8.Color Box G level (0~255)
			9.Color Box B level (0~255)
3D check pattern	Default 529	2 * 1 × 1	1.3D Structure Type (0=SBS(Hair), 1=T&B) ► 0: Side by side balf type 3D
All of 3D type can	None		► 1. Top and bottom type 3D
be display with "3D"	40		2~36 Common option
be display with 5D	40		
character			
Auto color gain	Default 530		1.H Divide (1~8)
adjustment check	None		2.V Divide (1~20)
adjuotiment encort	None		3.8 Color Level (0~255)
pattern	45		4. Gray level (0~255)
Color matrix check			$6 \sim 40$ Common ontion
nattern			
pattern			
Color scale tracking	Default 531		1.V Divide (1~255)
pattern with vertical	none		6~40 Common option
type	57.82		
.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	57,62		
Cross talk check	Default 532		1.Color Box H Start (0~100): Color Box Horizontal start setting 0 to 100
pattern	None		2. Color Box V Statt (0~100): Color Box Ventical statt setting 0 to 100
			4.Color Box V Size (0~100): Color Box Vertical size setting 0 to 100
	70		5.Color Box R Level (0~255): Color Box Red level setting 0 to 255
			6.Color Box G Level (0~255): Color Box Green level setting 0 to 255
			7.Color Box B Level (0~255): Color Box Blue level setting 0 to 255
			8.Characte Line On(0~255)
			9.Characte Line Off(0~255)
			10.Character Box H Start (0~100%)
			11.Character Box V Start (0~100%)
			12. Character Box H End (0~100%)
10.0 - 1 1-	D ( 11 500		1. H. Divide (1-256): Horizontal step divide 1 to 256
13.Color scale	Default 533		2~36 Common option
tracking pattern with	None		
horizontal type	533		
13.Color scale	Default 534		1.H Divide (0~255): Horizontal divide 0 to 255
tracking pattern with	None		2.V Divide (0~16): Vertical divide 0 to 16
horizontal type	75		



3.Geometry check	Default 535		1.H Line Divide (0~64): Horizontal line add 0 to 64
			2.V Line Divide (0~64): Vertical line add 0 to 64
pattern	None		3.H Width (0~64): Horizontal line width setting 0 to 64
	1,2,94		4.V Width (0~64): Vertical line width setting 0 to 64
			5.H Line Position (0~100)
			6.V Line Position (0~100)
			7.Rectangular Full (0=Off, 1=On): Rectangular fill up or empty
			8.Rectangular H Size (0~100)
			9.Rectangular V Size (0~100)
			10~44Common option
Windows square	Default 537		1.Base R Color Level (1~100%)
			2.Base G Color Level (1~100%)
check pattern	None		3.Base B Color Level (1~100%)
	339.340.341.3		4.Center Box Size (1~100%)
	,,-		5.Center Box R Level (1~100%)
	42		6.Center Box G Level (1~100%)
			7.Center Box B Level (1~100%)
			8.Small Box Size (1~100%)
			9.Small Box R Level (1~100%)
			10.Small Box G Level (1~100%)
			11.Small Box B Level (1~100%)
			12~46 Common option
Windows square	Default 538		1.Color Windows H Start (1~100%)
			2.Color Windows V Start (1~100%)
check pattern with	none		3.Color Windows H Size (1~100%)
color	329		4.Color Windows V Size (1~100%)
			5.Color Windows H Divide (0~4)
			6.Color Windows V Divide (0~3)
			7.Color 1 R Level (0~255)
			45.Color 13 B Level (0~255)
			46~80 Common option
Uniformity check	Default 539	• • • •	1.Pattern Size (0~100%)
pattern	None	$\cdot$ $\cdot$ $\cdot$	2.Horizontal Divide (2~16)
F			3. Vertical Divide (2~12)
	77,87,91		4. Circle Size (1~32): Circle size setting 1 to 32
			5.Circle ratio (0=4:3, 1=16:9, 2=21:9): Circle ratio setting
			C.CIOI DUX K LEVEI (U~255)
			9. Thangle On/Oil (0=Oil, 1=Oil)
Grav rotate pattern	Default 542		1.Gray Rotate Step (0=16,1=256)
5			,
	None		4~38 Common option
	331		
Consumption Power	Default 543	*	1.Box H Size (0~100%)
check nattern	None		2.Box V Size (0~100%)
oneon pattern			3.Box 1_1 Level (0~100%)
	343		4.00X 1_2 LEVEI (U~ 100%)

			5.Box 1_3 Level (0~100%)
			6.Box 1_4 Level (0~100%)
			7.Box 2_1 Level (0~100%)
			8.Box 2_2 Level (0~100%)
			9.Box 2_3 Level (0~100%)
			10.Box 2_4 Level (0~100%)
			11~45 Common option
Color box Line	Default 545		1.Color Box 1 R Level (0~100%)
check pattern	None	a Cartha	 9.Color Box 3 B Level (0~100%)
	None	and the set	10~44Common option
Consumption Power	Default 546		1.Low Level Gray Box 1 (0~255)
abook pottorp	News		2.Low Level Gray Box 2 (0~255)
check pattern	None		3.Low Level Gray Box 3 (0~255)
	None		4.Low Level Gray Box 4 (0~255)
			5.High Level Gray Box 1 (0~255)
			6.High Level Gray Box 2 (0~255)
			7.High Level Gray Box 3 (0~255)
			8. Fligh Level Gray Box 4 ( $0$ ~255)
			10~44 Common option
DLP full white check	Default 615	•••	1~35 Common option
pattern	None		
	23		
Samsung W/B	Default 616		1~35 Common option
pattern	None		
P			
	16		
8.White balance	Default 617		1~35 Common option
check pattern	None		
Slash zone pattern	None		
Analog pattern	Default 620		1~35 Common option
14.Color matrix	None		
check pattern	None		
14.Color matrix	Default 621		1~35 Common option
check pattern	None		
	None		
13.Color scale	Default 630		1~35 Common option
tracking pattern	None		
	None		



- <Common option> 1.Center Marker/Slash/Box(0~11) ▶0: None ▶ 1: 9point center/border/edge ► 2: Cross line ► 3:Center Cross point ►4:X line ► 5:Inverted triangle with white ▶ 6:Cross line with Circle ▶ 7:Black cross bar with white bar ▶8: Cross line ▶9: Two vertical line ▶ 10: Cross line with center square box ▶ 11: Border line 2 ~ 4. Base R, G, B Level (0~100%) N/A(These pattern haven't base) 5 ~ 7. Character R, G, B Level (0~100%) N/A(These pattern haven't Character) 8. OSD Display (0~6): On Screen Display ▶ 1:美 Character at the bottom ▶2:美 Character at the top ▶3 :美 Character at the top and bottom ► 4:Boarder line character ► 5:X line character ▶ 6:Boarder and X line character 9 ~ 11 OSD R, G, B Level (0~100%) ▶ On Screen Display Red, Green and Blue level setting 0 to 100% 12. Auto Bright up & down (0~12) ►0:None ▶ 1: Auto Contrast up & down with Red, Green and Blue ▶ 2: Auto Contrast up & down Red only ▶ 3: Auto Contrast up & down Green only ▶ 4: Auto Contrast up & down Blue only ▶ 5: Auto Contrast up & down with Red, Green and Blue ▶6: Auto Contrast up & down Red only ▶ 7: Auto Contrast up & down Green only ▶ 8: Auto Contrast up & down Blue only ▶ 9: Auto Bright up & down with Red, Green and Blue ▶ 10: Auto Bright up & down Red only ▶ 11: Auto Bright up & down Green only ▶ 12: Auto Bright up & down Blue 13. Reverse On Time (0~999)/Vf ▶ Reverse pattern on time setting 0 to 999/Vertical Frequency
- 14. Reverse Off Time (0~999)/Vf
- Reverse pattern off time setting 0 to 999/Vertical Frequency
   15. Character Moving (0~8)
- ► 0:None
- ▶ 1:Character moving right to left
- ► 2:Character moving left to right
- ► 3:Character moving down to up
- ▶ 4:Character moving up to down
- ► 5:Character moving left up to right down
- ► 6:Character moving right up to left down
- ►7:Character moving left down to right up
- ▶ 8:Character moving right down to left up
- ▶ 9:Character moving right up to left down



- 16. Color Moving (0~12)
- ►0:None
- ▶1:Color moving right to left
- ► 2:Color moving left to right
- ► 3:Color moving down to up
- ► 4:Color moving up to down
- ▶ 5:Color moving left up to right down
- ► 6:Color moving right up to left down
- ► 7:Color moving left down to right up
- ▶8:Color moving right down to left up
- ▶ 9:Color moving right up to left down
- 17. Graphic Moving (0~8)
- ►0:None
- ▶ 1:Graphic moving right to left
- ► 2:Graphic moving left to right
- ► 3:Graphic moving down to up
- ► 4:Graphic moving up to down
- ► 5:Graphic moving left up to right down
- ► 6:Graphic moving right up to left down
- ► 7:Graphic moving left down to right up
- ▶ 8:Graphic moving right down to left up
- ▶ 9:Graphic moving right up to left down
- 18. Moving Pixel Step (0~99)
- Moving step setting 0 to 99 by pixel step
- 19. Moving Frame Interval (0~99)
- ▶ Moving frame interval setting 0 to 99, it is relate with 49. Moving Pixel step setting
- 20. Flicker On (CH, OSD, CL, GP) (0~15)
- Flicker on item to
- CH(1)=Character, OSD(2)=On Screen Display, CL(4)=Color, GP(8)=Graphic
- ►0=None
- ▶1=CH
- ►2=OSD
- ▶3=CH+OSD
- ▶4=CL
- ►5=CH+CL
- ▶6=OSD+CL
- ▶7=CH+OSD+CL
- ▶8=GP
- ▶9=CH+GP
- ▶10=OSD+GP
- ▶11=CH+OSD+GP
- ▶ 12=CL+GP
- ►13=CH+CL+GP
- ▶14=OSD+CL+GP
- ▶15=CH+OSD+CL+GP
- 21. Flicker On Time (0~999)/Vf
- ► Flicker on time setting to 0~999/Vertical Frequency
- 22. Flicker Off Time (0~999)/Vf
- ► Flicker off time setting to 0~999/Vertical Frequency
- 23. Gamma Correction (0~30)/10
- ► Gamma correction setting 0 to 30, default value is 10
- 24 ~ 26. Video R, G, B (On=1, Off=0)
- Each video off to Red, Green and Blue
- 27. Video Level (0~999mV)
- ► Analog(VGA) Video level setting to 0~999mv
- 28. RGB444=1, YCbCr444=2, YCbCr422=3



- ▶ Pattern RGB444, YCbCr444 or YCbCr422 setting
- 29.Scart 1=RF, 2=CVBS, 3=RGB, Y/C+1=4

► SCART setting 30~35. Reserved



## 6.3 Default timing list

MSPG-8000 has 1~700 user timings and 701~999 default timings.

(from MSW version 2.0.01, the slot also needs to be update)

Below has 701~999 default timing list and please contact to Master co., ltd for 1~700 timing list

*This table is a	standard timings	and may no	ot be supported	depending	on the slot.
	olandara iningo	and may no	or no capportoa		

Timo		Resolution	Dot	H.	V.	ц	Н.	H.	Н.	V	V.	V.	V.			
No	Mode	(Progressive	Clock	Freq.	Freq.	Total	Front	Back	Sync	v. Total	Front	Back	Sync	Н.	V.	Remark
140.		/ Interlace)	(MHz)	(KHz)	(Hz)	Total	Porch	Porch	Width	Total	Porch	Porch	Width			
701	CTA861	640x480p	25.175	31.469	59.94	800	16	48	96	525	10	33	2	-	-	HDMI/R444/8bit/Limit
702	CTA861	640x480p	25.200	31.500	60.00	800	16	48	96	525	10	33	2	-	-	HDMI/R444/8bit/Limit
703	CTA861	720x480i	13.500	15.734	59.94	858	19	57	62	525	9	30	6	-	-	HDMI/R444/8bit/Limit
704	CTA861	720x480i	13.514	15.751	60.00	858	19	57	62	525	9	30	6	-	-	HDMI/R444/8bit/Limit
705	CTA861	720x480i	27 000	31 469	119.88	858	19	57	62	525	9	30	6	-	-	HDMI/R444/8hit/Limit
706	CTA861	720×480i	27.000	31 500	120.00	858	10	57	62	525	0	30	6	_	_	HDMI/R444/8bit/Limit
700	CTA001	720,4001	Z7.027	62.027	220.00	050	10	57	62	525	0	20	0	-	-	HDMI/R444/Obit/Limit
707	CTA001	720x4601	54.000	62.937	239.76	000	19	57	62	525	9	30	0	-	-	HDIVII/R444/6DIL/LIMIL
708	CTA861	720x4801	54.054	63.000	2400.00	858	19	57	62	525	9	30	6	-	-	HDMI/K444/8Dit/Limit
709	CTA861	720x480p	27.000	31.469	59.94	858	16	60	62	525	9	30	6	-	-	HDMI/R444/8bit/Limit
710	CTA861	720x480p	27.027	31.500	60.00	858	16	60	62	525	9	30	6	-	-	HDMI/R444/8bit/Limit
711	CTA861	720x480p	54.000	62.937	119.88	858	16	60	62	525	9	30	6	-	-	HDMI/R444/8bit/Limit
712	CTA861	720x480p	54.054	63.000	120.00	858	16	60	62	525	9	30	6	-	-	HDMI/R444/8bit/Limit
713	CTA861	720x480p	108.000	125.874	239.76	858	16	60	62	525	9	30	6	-	-	HDMI/R444/8bit/Limit
714	CTA861	720x480p	108.108	126.000	240.00	858	16	60	62	525	9	30	6	-	-	HDMI/R444/8bit/Limit
715	CTA861	720x576i	13.500	15.625	50.00	864	12	69	63	625	5	38	6	-	-	HDMI/R444/8bit/Limit
716	CTA861	720x576i	27.000	31,250	100.00	864	12	69	63	625	5	38	6	-	-	HDMI/R444/8bit/Limit
717	CTA861	720v576i	54.000	62 500	200.00	864	12	60	63	625	5	38	6	_	_	HDMI/P444/8bit/Limit
710	CTA961	720x576p	27.000	21 250	200.00 E0.00	964	12	60	64	625	5	20	о г	-	_	HDMI/R444/8bit/Limit
710	CTA001	720x576p	27.000	51.250	50.00	004	12	60	64	625	5	39	5	-	-	HDIVII/R444/801/LIMIL
/19	C1A861	/20x5/6p	54.000	62.500	100.00	864	12	68	64	625	5	39	5	-	-	HDMI/R444/8bit/Limit
720	CTA861	720x576p	108.000	125.000	200.00	864	12	68	64	625	5	39	5	-	-	HDMI/R444/8bit/Limit
721	CTA861	1280x720p	59.341	17.982	23.98	3300	1760	220	40	750	5	20	5	+	+	HDMI/R444/8bit/Limit
722	CTA861	1280x720p	59.400	18.000	24.00	3300	1760	220	40	750	5	20	5	+	+	HDMI/R444/8bit/Limit
723	CTA861	1280x720p	74.250	18.750	25.00	3960	2420	220	40	750	5	20	5	+	+	HDMI/R444/8bit/Limit
724	CTA861	1280x720p	74.176	22.478	29.97	3300	1760	220	40	750	5	20	5	+	+	HDMI/R444/8bit/Limit
725	CTA861	1280x720p	74.250	22.500	30.00	3300	1760	220	40	750	5	20	5	+	+	HDMI/R444/8bit/Limit
726	CTA861	1280x720p	89.910	35,964	47.95	2500	960	220	40	750	5	20	5	+	+	HDMI/R444/8bit/Limit
727	CTA861	1280x720n	90.000	36,000	48.00	2500	960	220	40	750	5	20	5	+	+	HDMI/R444/8hit/Limit
728	CTA861	1280x720p	74.250	37 500	50.00	1080	440	220	40	750	5	20	5			HDMI/R444/8bit/Limit
720	CTA001	1200x720p	74.230	37.300	50.00	1000	110	220	40	750	5	20	5	т	+	LIDMI/R444/0bit/Limit
729	CTA661	1280x720p	74.176	44.955	59.94	1050	110	220	40	750	5	20	5	+	+	HDIVII/R444/6Dit/Limit
/30	C1A861	1280x720p	/4.250	45.000	60.00	1650	110	220	40	/50	5	20	5	+	+	HDMI/R444/8bit/Limit
731	CTA861	1280x720p	148.500	75.000	100.00	1980	440	220	40	750	5	20	5	+	+	HDMI/R444/8bit/Limit
732	CTA861	1280x720p	148.352	89.910	119.88	1650	110	220	40	750	5	20	5	+	+	HDMI/R444/8bit/Limit
733	CTA861	1280x720p	148.500	90.000	120.00	1650	110	220	40	750	5	20	5	+	+	HDMI/R444/8bit/Limit
734	CTA861	1680x720p	59.341	17.982	23.98	3300	1360	220	40	750	5	20	5	+	+	HDMI/R444/8bit/Limit
735	CTA861	1680x720p	59.400	18.000	24.00	3300	1360	220	40	750	5	20	5	+	+	HDMI/R444/8bit/Limit
736	CTA861	1680x720p	59.400	18.750	25.00	3168	1228	220	40	750	5	20	5	+	+	HDMI/R444/8bit/Limit
737	CTA861	1680x720p	59.341	22.478	29.97	2640	700	220	40	750	5	20	5	+	+	HDMI/R444/8bit/Limit
738	CTA861	1680x720n	59 400	22 500	30.00	2640	700	220	40	750	5	20	5	+	+	HDMI/R444/8hit/Limit
739	CT4861	1680x720p	98 901	35.964	47.95	2750	810	220	40	750	5	20	5	+	+	HDMI/R444/8bit/Limit
735	CTA001	1000x720p	00.000	20.000	47.55	2750	010	220	40	750	5	20	5	т	- T	LIDMI/R444/8bit/Limit
740	CTA001	1680x720p	99.000	30.000	46.00	2750	200	220	40	750	5	20	5	+	+	HDIVII/R444/6Dit/Limit
/41	CTA861	1680x720p	82.500	37.500	50.00	2200	260	220	40	750	5	20	5	+	+	HDMI/R444/8bit/Limit
/42	CIA861	1680x720p	98.901	44.955	59.94	2200	260	220	40	/50	5	20	5	+	+	HDMI/R444/8bit/Limít
743	CTA861	1680x720p	99.000	45.000	60.00	2200	260	220	40	750	5	20	5	+	+	HDMI/R444/8bit/Limit
744	CTA861	1680x720p	165.000	82.500	100.00	2000	60	220	40	825	5	95	5	+	+	HDMI/R444/8bit/Limit
745	CTA861	1680x720p	197.802	98.901	119.88	2000	60	220	40	825	5	95	5	+	+	HDMI/R444/8bit/Limit
746	CTA861	1680x720p	198.000	99.000	120.00	2000	60	220	40	825	5	95	5	+	+	HDMI/R444/8bit/Limit
747	CTA861	1920x1080i	74.250	28.125	50.00	2640	528	148	44	1125	5	30	10	+	+	HDMI/R444/8bit/Limit
748	CTA861	1920x1080i	74.176	33.716	59.94	2200	88	148	44	1125	5	30	10	+	+	HDMI/R444/8bit/Limit
749	CTA861	1920x1080i	74.250	33.750	60.00	2200	88	148	44	1125	5	30	10	+	+	HDMI/R444/8bit/Limit
750	CTA861	1920x1080i	148 500	56 250	100.00	2640	528	148	44	1125	5	30	10		+	HDMI/R444/8bit/Limit
751	CTAOCI	1020/1000	140.000	67 422	110.00	2040	00	140	44	1125	5	20	10			
752	CTAOCI	1020/1000	140.552	07.435	120.00	2200	00	140	44	1125	5	30	10	+	+	
/52	CIA861	1920x1080i	148.500	67.500	120.00	2200	88	148	44	1125	5	30	10	+	+	HDMI/K444/8bit/Limit
753	CTA861	1920x1080p	74.176	26.973	23.98	2750	638	148	44	1125	4	36	5	+	+	HDMI/R444/8bit/Limit
754	CTA861	1920x1080p	74.250	27.000	24.00	2750	638	148	44	1125	4	36	5	+	+	HDMI/R444/8bit/Limit
755	CTA861	1920x1080p	74.250	28.125	25.00	2640	528	148	44	1125	4	36	5	+	+	HDMI/R444/8bit/Limit
756	CTA861	1920x1080p	74.176	33.716	29.97	2200	88	148	44	1125	4	36	5	+	+	HDMI/R444/8bit/Limit
757	CTA861	1920x1080p	74.250	33.750	30.00	2200	88	148	44	1125	4	36	5	+	+	HDMI/R444/8bit/Limit
758	CTA861	1920x1080p	148.352	53.946	47.95	2750	638	148	44	1125	4	36	5	+	+	HDMI/R444/8bit/Limit

759	CTA861	1920x1080p	148.500	54.000	48.00	2750	638	148	44	1125	4	36	5	+	+	HDMI/R444/8bit/Limit
760	CTA861	1920x1080p	148.500	56.250	50.00	2640	528	148	44	1125	4	36	5	+	+	HDMI/R444/8bit/Limit
761	CTA861	1920x1080p	148.352	67.433	59.94	2200	88	148	44	1125	4	36	5	+	+	HDMI/R444/8bit/Limit
762	CTA861	1920x1080p	148.500	67.500	60.00	2200	88	148	44	1125	4	36	5	+	+	HDMI/R444/8bit/Limit
763	CTA861	1920x1080p	297.000	112.500	100.00	2640	528	148	44	1125	4	36	5	+	+	HDMI/R444/8bit/Limit
764	CTA861	1920x1080p	296.703	134.865	119.88	2200	88	148	44	1125	4	36	5	+	+	HDMI/R444/8bit/Limit
765	CTA861	1920x1080p	297.000	135.000	120.00	2200	88	148	44	1125	4	36	5	+	+	HDMI/R444/8bit/Limit
767	CTA861	2560x1080p	98.901	26.374	23.98	3750	998	148	44	1100	4	11	5	+	+	HDMI/R444/8bit/Limit
768	CTA861	2560x1080p	90.000	28.125	25.00	3200	448	140	44	1100	4	36	5	+	+	HDMI/R444/8bit/Limit
769	CTA861	2560x1080p	118.681	33.716	29.97	3520	768	148	44	1125	4	36	5	+	+	HDMI/R444/8bit/Limit
770	CTA861	2560x1080p	118.800	33.750	30.00	3520	768	148	44	1125	4	36	5	+	+	HDMI/R444/8bit/Limit
771	CTA861	2560x1080p	197.802	52.747	47.95	3750	998	148	44	1100	4	11	5	+	+	HDMI/R444/8bit/Limit
772	CTA861	2560x1080p	198.000	52.800	48.00	3750	998	148	44	1100	4	11	5	+	+	HDMI/R444/8bit/Limit
773	CTA861	2560x1080p	185.625	56.250	50.00	3300	548	148	44	1125	4	36	5	+	+	HDMI/R444/8bit/Limit
774	CTA861	2560x1080p	197.802	65.934	59.94	3000	248	148	44	1100	4	11	5	+	+	HDMI/R444/8bit/Limit
775	CTA861	2560x1080p	198.000	66.000	60.00	3000	248	148	44	1100	4	11	5	+	+	HDMI/R444/8bit/Limit
770	CTA861	2560x1080p	494 505	125.000	119.88	3300	548	140	44	1250	4	161	5	+	+	HDMI/R444/8bit/Liffilt
778	CTA861	2560x1080p	495.000	150.000	120.00	3300	548	148	44	1250	4	161	5	+	+	HDMI/R444/8bit/Limit
779	CTA861	3840x2160p	296.703	53.946	23.98	5500	1276	296	88	2250	8	72	10	+	+	HDMI/R444/8bit/Limit
780	CTA861	3840x2160p	297.000	54.000	24.00	5500	1276	296	88	2250	8	72	10	+	+	HDMI/R444/8bit/Limit
781	CTA861	3840x2160p	297.000	56.250	25.00	5280	1056	296	88	2250	8	72	10	+	+	HDMI/R444/8bit/Limit
782	CTA861	3840x2160p	296.703	67.433	29.97	4400	176	296	88	2250	8	72	10	+	+	HDMI/R444/8bit/Limit
783	CTA861	3840x2160p	297.000	67.500	30.00	4400	176	296	88	2250	8	72	10	+	+	HDMI/R444/8bit/Limit
784	CTA861	3840x2160p	593.407	107.892	47.95	5500	1276	296	88	2250	8	72	10	+	+	HDMI/R444/8bit/Limit
785	CTA861	3840x2160p	594.000	108.000	48.00	5500	1276	296	88	2250	8	72	10	+	+	HDMI/R444/8bit/Limit
787	CTA861	3840x2160p	593 407	134 865	59.94	4400	1030	290	88	2250	8	72	10	+	+	HDMI/R444/8bit/Limit
788	CTA861	3840x2160p	594.000	135.000	60.00	4400	176	296	88	2250	8	72	10	+	+	HDMI/R444/8bit/Limit
789	CTA861	4096x2160p	297.000	54.000	24.00	5500	1020	296	88	2250	8	72	10	+	+	HDMI/R444/8bit/Limit
790	CTA861	4096x2160p	297.000	56.250	25.00	5280	968	128	88	2250	8	72	10	+	+	HDMI/R444/8bit/Limit
791	CTA861	4096x2160p	297.000	67.500	30.00	4400	88	128	88	2250	8	72	10	+	+	HDMI/R444/8bit/Limit
792	CTA861	4096x2160p	594.000	108.000	48.00	5500	1020	296	88	2250	8	72	10	+	+	HDMI/R444/8bit/Limit
793	CTA861	4096x2160p	594.000	112.500	50.00	5280	968	128	88	2250	8	72	10	+	+	HDMI/R444/8bit/Limit
794	CTA861	4096x2160p	594.000	135.000	60.00	4400	88	128	88	2250	8	72	10	+	+	HDMI/R444/8bit/Limit
795	CTA861	5120x2160p	396.000	52.800	24.00	7500	1996	296	88	2200	8	22	10	+	+	HDMI/R444/8bit/Limit
797	CTA861	5120x2100p	396.000	66.000	30.00	6000	664	128	88	2200	8	22	10	+	+	HDMI/R444/8bit/Limit
798	CTA861	3840x2160p	594.000	135.000	60.00	4400	176	296	88	2250	8	72	10	+	+	HDMI/Y444/8bit/Limit
799	CTA861	3840x2160p	594.000	135.000	60.00	4400	176	296	88	2250	8	72	10	+	+	HDMI/Y420/8bit/Limit
800	CTA861	3840x2160p	1188.000	270.000	120.00	4400	176	296	88	2250	8	72	10	+	+	HDMI/Y420/8bit/Limit
801	CTA861	1920x1080p	297.000	112.500	100.00	2640	528	148	44	1125	4	36	5	+	+	FRL/R444/8bit/Limit
802	CTA861	1920x1080p	297.000	135.000	120.00	2200	88	148	44	1125	4	36	5	+	+	FRL/R444/8bit/Limit
803	CTA861	3840x2160p	297.000	54.000	24.00	5500	1276	296	88	2250	8	72	10	+	+	FRL/R444/8bit/Limit
804	CTA861	3840x2160p	297.000	56.250	25.00	5280	1056	296	88	2250	8	72	10	+	+	FRL/R444/8bit/Limit
806	CTA861	3840x2160p	594.000	108.000	48.00	5500	1276	296	88	2250	8	72	10	+	+	FRL/R444/8bit/Limit
807	CTA861	3840x2160p	594.000	112.500	50.00	5280	1056	296	88	2250	8	72	10	+	+	FRL/R444/8bit/Limit
808	CTA861	3840x2160p	594.000	135.000	60.00	4400	176	296	88	2250	8	72	10	+	+	FRL/R444/8bit/Limit
809	CTA861	3840x2160p	1188.000	225.000	100.00	5280	1056	296	88	2250	8	72	10	+	+	FRL/R444/8bit/Limit
810	CTA861	3840x2160p	1188.000	270.000	120.00	4400	176	296	88	2250	8	72	10	+	+	FRL/R444/8bit/Limit
811	CTA861	4096x2160p	297.000	54.000	24.00	5500	1020	296	88	2250	8	72	10	+	+	FRL/R444/8bit/Limit
812	CTA861	4096x2160p	297.000	56.250	25.00	5280	968	128	88	2250	8	72	10	+	+	FRL/R444/8bit/Limit
813	CTA861	4096x2160p	297.000	67.500	30.00	4400	88	128	88	2250	8	72	10	+	+	FRL/R444/8bit/Limit
014 815	CTA861	4096x2160p	594.000	112 500	46.00	5280	068	128	00 88	2250	0	72	10	+	+	FRL/R444/8bit/Limit
816	CTA861	4096x2160p	594.000	135.000	60.00	4400	88	128	88	2250	8	72	10	+	+	FRL/R444/8bit/Limit
817	CTA861	4096x2160p	1188.000	225.000	100.00	5280	800	296	88	2250	8	72	10	+	+	FRL/R444/8bit/Limit
818																
819	CTA861	5120x2160p	396.000	52.800	24.00	7500	1996	296	88	2200	8	22	10	+	+	FRL/R444/8bit/Limit
820	CTA861	5120x2160p	396.000	55.000	25.00	7200	1696	296	88	2200	8	22	10	+	+	FRL/R444/8bit/Limit
821	CTA861	5120x2160p	396.000	66.000	30.00	6000	664	128	88	2200	8	22	10	+	+	FRL/R444/8bit/Limit
822	CTA861	5120x2160p	742.500	118.800	48.00	6250	746	296	88	2475	8	297	10	+	+	FRL/R444/8bit/Limit
823	CTA861	5120x2160p	742.500	112.500	50.00	6600	1096	296	88	2250	8	72	10	+	+	FRL/R444/8bit/Limit
824 825	C1A861	5120X2160p	/42.500	135.000	00.00	5500	104	128	రర	2250	ŏ	12	TÜ	+	+	rkl/k444/ödit/Limit
826																
827	CTA861	7680x4320p	1188.000	108.000	24.00	11000	2552	592	176	4500	16	144	20	+	+	FRL/R444/8bit/Limit
828	CTA861	7680x4320p	1188.000	110.000	25.00	10800	2352	592	176	4400	16	44	20	+	+	FRL/R444/8bit/Limit
829	CTA861	7680x4320p	1188.000	132.000	30.00	9000	552	592	176	4400	16	44	20	+	+	FRL/R444/8bit/Limit
830	CTA861	7680x4320p	2376.000	264.000	60.00	9000	552	592	176	4400	16	44	20	+	+	FRL/Y420/8bit/Limit



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900	SMPTE	710x484i	13 500	15 734	59.94	858	20	65	63	525	7	28	6		-	
902	SMPTE	702x576i	13.500	15.625	50.00	864	20	79	63	625	4	40	5	-	-	COMPONENT

903	SMPTE	720x483p	27.000	31.469	59.94	858	16	59	63	525	6	30	6	+	+	
904	SMPTE	720x483p	27.000	31.469	59.94	858	16	59	63	525	6	30	6	+	+	
905	SMPTE	720x576p	27.000	31.250	50.00	864	12	68	64	625	5	39	5	+	+	
906	SMPTE	1280x720p	74.250	45.000	60.00	1650	70	220	80	750	5	20	5	+	+	
907	SMPTE	1280x720p	74.176	44.955	59.94	1650	70	220	80	750	5	20	5	+	+	
909	SMPTE	1280x720p	74.250	22,500	30.00	3300	1720	220	80	750	5	20	5	+	+	
910	SMPTE	1280x720p	74.174	22.477	29.97	3300	1720	220	80	750	5	20	5	+	+	
911	SMPTE	1280x720p	74.250	18.750	25.00	3960	2380	220	80	750	5	20	5	+	+	
912	SMPTE	1280x720p	74.250	18.000	24.00	4125	2545	220	80	750	5	20	5	+	+	
913	SMPTE	1280x720p	74.176	17.982	23.98	4125	2545	220	80	750	5	20	5	+	+	DTV
914	SMPTE	1920x1080i	74.250	33.750	60.00	2200	44	148	88	1125	5	30	10	-	-	COMPONENT
915	SMPTE	1920x1080i	74.175	33.716	59.94	2200	44	148	88	1125	5	30	10	-	-	
916	SMPTE	1920x1080i	74.250	28.125	50.00	2640	484	148	88	1125	5	30 69	10	-	-	
918	SMPTE	1920x1035i	74.175	33.716	59.94	2200	44	148	88	1125	11	69	10	-	-	
919	SMPTE	1920x1080p	148.500	67.500	60.00	2200	44	148	88	1125	4	36	5	-	-	
920	SMPTE	1920x1080p	148.350	67.432	59.94	2200	44	148	88	1125	4	36	5	-	-	
921	SMPTE	1920x1080p	148.500	56.250	50.00	2640	484	148	88	1125	4	36	5	-	-	
922	SMPTE	1920x1080p	74.250	33.750	30.00	2200	44	148	88	1125	4	36	5	+	+	
923	SMPTE	1920x1080p	74.175	33.716	29.97	2200	44	148	88	1125	4	36	5	+	+	
924	SMPTE	1920x1080p	74.250	28.125	25.00	2640	484	148	88	1125	4	36	5	+	+	
925	SMPTE	1920x1080p	74.250	27.000	24.00	2750	594	140	88	1125	4	36	5	+	+	
927	SIMILIE	1520,1000p	74.170	20.575	23.50	2750	334	140	00	1125	-	50	5			
928																
929																
930																
931	TV	710x484i	13.500	15.734	59.94	858	21	64	63	525	7	28	6	-	-	NTSC-M
932	TV	710x484i	13.500	15.734	59.94	858	21	64	63	525	7	28	6	-	-	NTSC-J
933	TV	702x576i	13.500	15./34	59.94	858	21	64 70	63	525 625	/	28	5	-	-	NISC-4.43
935	TV	710x484i	13.500	15.734	59.94	858	20	65	63	525	7	28	6	-	-	PAL-M
936	TV	702x576i	13.500	15.625	50.00	864	20	79	63	625	4	40	5	-	-	PAL-N
937	TV	710x484i	13.500	15.734	59.94	858	20	65	63	525	7	28	6	-	-	PAL-60
938	TV	702x576i	12 500	15.005	F0.00	0.04		70					-			
			13.300	15.025	50.00	864	21	/8	63	625	4	40	5	-	-	SECAM
939			13.300	15.625	50.00	864	21	/8	63	625	4	40	5	-	-	SECAM
939 940 941	VESA	640x350p	31 500	37.861	85.08	832	32	96	63	625 445	32	40	60	-	-	SECAM
939 940 941 942	VESA VESA	640x350p 640x400p	31.500 31.500	37.861 37.861	85.08 85.08	864 832 832	21 32 32	96 96	63 64 64	625 445 445	4 32 1	40 3 41	5 60 3	- + -	- +	SECAM
939 940 941 942 943	VESA VESA VESA	640x350p 640x400p 720x400p	31.500 31.500 35.500	37.861 37.927	85.08 85.08 85.04	864 832 832 936	21 32 32 36	78 96 96 108	63 64 64 72	625 445 445 446	4 32 1 1	40 3 41 42	5 60 3 3	- + -	- + +	SECAM
939 940 941 942 943 944	VESA VESA VESA VESA	640x350p 640x400p 720x400p 640x480p	31.500 31.500 35.500 25.175	37.861 37.927 31.469	85.08 85.08 85.04 59.94	864 832 832 936 800	21 32 32 36 16	78 96 96 108 48	63 64 64 72 96	625 445 445 446 525	4 32 1 1 2	40 3 41 42 41	5 60 3 3 2	+	- + +	SECAM
939 940 941 942 943 944 945	VESA VESA VESA VESA VESA	640x350p 640x400p 720x400p 640x480p 640x480p	31.500 31.500 35.500 25.175 31.500	37.861 37.861 37.927 31.469 37.861	85.08 85.08 85.04 59.94 72.81	864 832 832 936 800 832	21 32 32 36 16 24	78 96 96 108 48 128	63 64 64 72 96 40	625 445 445 446 525 520	4 32 1 1 2 1	40 3 41 42 41 36	5 60 3 3 2 3	+	- + +	SECAM
939 940 941 942 943 944 945 946	VESA VESA VESA VESA VESA	640x350p 640x400p 720x400p 640x480p 640x480p 640x480p	31.500 31.500 35.500 25.175 31.500 31.500 31.500	37.861 37.861 37.927 31.469 37.861 37.500	85.08 85.08 85.04 59.94 72.81 75.00	864 832 832 936 800 832 840	21 32 32 36 16 24 16	78 96 96 108 48 128 120	63 64 64 72 96 40 64	625 445 445 446 525 520 500	4 32 1 1 2 1 1 1	40 3 41 42 41 36 16	5 60 3 3 2 3 3 3	- + - -	- + +	SECAM
939 940 941 942 943 944 945 946 947	VESA VESA VESA VESA VESA VESA	640x350p 640x400p 720x400p 640x480p 640x480p 640x480p 640x480p 840x480p	31.500 31.500 35.500 25.175 31.500 31.500 36.000	37.861 37.861 37.861 37.927 31.469 37.861 37.500 43.269	85.08 85.08 85.04 59.94 72.81 75.00 85.01	864 832 832 936 800 832 840 832	21 32 32 36 16 24 16 56	78 96 96 108 48 128 120 80	63 64 64 72 96 40 64 56 72	625 445 445 446 525 520 500 509	4 32 1 1 2 1 1 1 1 1	40 3 41 42 41 36 16 25	5 60 3 3 2 3 3 3 3 3 2	- + - - -	- + +	SECAM
939 940 941 942 943 944 945 946 947 948 949	VESA VESA VESA VESA VESA VESA VESA	640x350p 640x400p 720x400p 640x480p 640x480p 640x480p 640x480p 640x480p 800x600p	31.500 31.500 35.500 25.175 31.500 31.500 31.500 36.000 36.000	37.861 37.861 37.861 37.927 31.469 37.861 37.500 43.269 35.156 37.879	85.08 85.08 85.04 59.94 72.81 75.00 85.01 56.25 60.32	864 832 832 936 800 832 840 832 1024 1056	21 32 32 36 16 24 16 56 24 40	78           96           96           108           48           128           120           80           128           88	63 64 64 72 96 40 64 56 72 128	625 445 445 446 525 520 500 509 625 628	4 32 1 1 2 1 1 1 1 1 1 1	40 3 41 42 41 36 16 25 22 22 23	5 60 3 3 2 3 3 3 3 3 2 4	- + - - - - + +	- + + + +	SECAM
939 940 941 942 943 944 945 946 947 948 949 949	VESA VESA VESA VESA VESA VESA VESA	640x350p 640x400p 720x400p 640x480p 640x480p 640x480p 640x480p 640x480p 800x600p 800x600p 800x600p	31.500 31.500 35.500 25.175 31.500 31.500 36.000 40.000 50.000	13.623 37.861 37.861 37.861 37.927 31.469 37.861 37.500 43.269 35.156 37.879 48.077	30.00 85.08 85.08 85.04 59.94 72.81 75.00 85.01 56.25 60.32 72.17	864 832 832 936 800 832 840 832 1024 1056 1040	21 32 32 36 16 24 16 56 24 40 56	78           96           96           108           48           128           80           128           88           64	63 64 64 72 96 40 64 56 72 128 120	625 445 445 525 520 500 509 625 628 666	4 32 1 1 2 1 1 1 1 1 1 1 37	40 3 41 42 41 36 16 25 22 23 23	5 60 3 3 2 3 3 3 3 2 4 6	- + - - - + + + + +	- + + - - + + + + + +	SECAM
939 940 941 942 943 944 945 944 945 946 947 948 949 950 951	VESA VESA VESA VESA VESA VESA VESA VESA	640x350p 640x400p 720x400p 640x480p 640x480p 640x480p 640x480p 640x480p 800x600p 800x600p 800x600p 800x600p	31.500 31.500 35.500 25.175 31.500 36.000 36.000 40.000 50.000 49.500	37.861 37.861 37.927 31.469 37.500 43.269 35.156 37.879 48.077 46.875	30.00 85.08 85.08 85.04 59.94 75.00 85.01 56.25 60.32 72.17 75.00	864 832 832 936 800 832 840 832 1024 1056 1040 1056	21 32 32 36 16 24 16 56 24 40 56 16	78           96           96           108           48           128           80           128           88           64           160	63 64 64 72 96 40 64 64 56 72 128 120 80	625 445 445 525 520 500 509 625 628 666 625	4 32 1 1 2 1 1 1 1 1 1 37 1	40 3 41 42 41 36 16 25 22 23 23 23 21	5 60 3 2 3 3 3 3 2 4 6 3	- + - - - + + + + + +	- + + - - + + + + + + +	SECAM
939 940 941 942 943 944 945 946 947 948 949 950 951 952	VESA VESA VESA VESA VESA VESA VESA VESA	640x350p 640x400p 720x400p 640x480p 640x480p 640x480p 640x480p 640x480p 800x600p 800x600p 800x600p 800x600p 800x600p	13.300 31.500 35.500 25.175 31.500 31.500 36.000 36.000 40.000 50.000 49.500 56.250	13.623 37.861 37.861 37.861 37.861 37.861 37.861 37.861 37.500 43.269 35.156 37.879 48.077 46.875 53.674	30.00 85.08 85.08 85.04 59.94 72.81 75.00 85.01 56.25 60.32 72.17 75.00 85.06	864 832 936 800 832 840 832 1024 1056 1040 1056 1048	21 32 32 36 16 24 16 56 24 40 56 16 32	78           96           96           108           48           128           80           128           88           64           160           152	63 64 64 72 96 40 64 56 72 128 120 80 64	625 445 445 525 520 500 625 628 666 625 631	4 32 1 1 2 1 1 1 1 1 1 37 1 1	40 3 41 42 41 36 16 25 22 23 23 21 27	5 60 3 3 2 3 3 3 3 3 2 4 6 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	- + - - - - + + + + + +	- - + + + - - + + + + + + + + + + + + +	SECAM
939 940 941 942 943 944 945 946 947 948 949 950 951 952 953	VESA VESA VESA VESA VESA VESA VESA VESA	640x350p 640x400p 720x400p 640x480p 640x480p 640x480p 640x480p 640x480p 800x600p 800x600p 800x600p 800x600p 800x600p 800x600p 848x480p	13.500 31.500 35.500 25.175 31.500 36.000 36.000 40.000 50.000 49.500 56.250 33.750	37.861 37.861 37.861 37.927 31.469 37.861 37.500 43.269 35.156 37.879 48.077 46.875 53.674 31.020	30.00 85.08 85.08 85.04 59.94 72.81 75.00 85.01 56.25 60.32 72.17 75.00 85.06 59.99	864 832 832 936 800 832 840 832 1024 1056 1040 1056 1048 1088	21 32 32 36 16 24 16 56 24 40 56 16 32 16	78           96           96           108           48           128           80           128           88           64           160           152           112	63 64 64 72 96 40 64 56 72 128 120 80 64 112	625 445 445 525 520 500 509 625 628 666 625 631 517	4 32 1 2 1 1 1 1 1 1 1 37 1 1 1 6	40 3 41 42 41 36 16 25 22 23 23 21 27 23	5 60 3 3 2 3 3 3 3 3 2 4 6 3 3 3 8	- + - - - - + + + + + + +	- + + + + + + + + + + + + + + + + + +	SECAM
939 940 941 942 943 944 945 946 947 948 949 950 951 952 953 954	VESA VESA VESA VESA VESA VESA VESA VESA	640x350p 640x400p 720x400p 640x480p 640x480p 640x480p 640x480p 840x480p 800x600p 800x600p 800x600p 800x600p 800x600p 848x480p 1024x768p	13.500 31.500 35.500 25.175 31.500 36.000 36.000 40.000 50.000 49.500 56.250 33.750 44.900	13.623 37.861 37.861 37.927 31.469 37.861 37.500 43.269 35.156 37.879 48.077 46.875 53.674 31.020 35.522	30.00 85.08 85.08 85.04 59.94 72.81 75.00 85.01 56.25 60.32 72.17 75.00 85.06 59.99 43.48	864 832 832 936 800 832 840 832 1024 1056 1040 1056 1048 1088 1264	21 32 32 36 16 24 16 56 24 40 56 16 32 16 32 16 8	78           96           96           108           48           128           80           128           84           160           152           112           56	63 64 64 72 96 40 64 56 72 128 120 80 64 112 176	625 445 445 525 520 500 509 625 628 666 625 631 517 817	4 32 1 2 1 1 1 1 1 37 1 1 6 0	40 3 41 42 41 36 16 25 22 23 23 21 27 23 45	5 60 3 3 2 3 3 3 3 2 4 6 3 3 8 8 4	- + - - - + + + + + + +	- + + + + + + + + + + +	SECAM
939 940 941 942 943 944 945 946 947 948 949 950 951 952 953 954 955	VESA VESA VESA VESA VESA VESA VESA VESA	640x350p 640x400p 720x400p 640x480p 640x480p 640x480p 640x480p 800x600p 800x600p 800x600p 800x600p 800x600p 800x600p 848x480p 1024x768p 1024x768p	13.300           31.500           31.500           35.500           25.175           31.500           31.500           31.500           31.500           31.500           36.000           36.000           40.000           50.000           49.500           56.250           33.750           44.900           65.000	37.861 37.861 37.927 31.469 37.861 37.500 43.269 35.156 37.879 48.077 46.875 53.674 31.020 35.522 48.864 31.020	30.00 85.08 85.08 85.04 59.94 72.81 75.00 85.01 56.25 60.32 72.17 75.00 85.06 59.99 43.48 60.00 70.07	864 832 832 936 800 832 840 832 1024 1056 1040 1056 1048 1088 1264 1340	21 32 32 36 16 24 16 56 24 40 56 16 32 16 8 24 24	78           96           96           108           48           128           80           128           88           64           160           152           112           56           160	63 64 64 72 96 40 64 56 72 128 120 80 64 112 176 136	625 445 445 525 520 500 509 625 628 666 625 631 517 817 806	4 32 1 1 2 1 1 1 1 1 1 37 1 1 6 0 3 2	40 3 41 42 41 36 25 22 23 23 21 27 23 45 29 20 20	5 60 3 3 2 3 3 3 3 2 4 6 3 3 8 8 4 6 6 5	- - - - - - - + + + + + + + - -	- + + - + + + + + + + + + + + + + + +	SECAM
939 940 941 942 943 944 945 946 947 948 949 950 951 952 953 9554 9556 9556	VESA VESA VESA VESA VESA VESA VESA VESA	640x350p 640x400p 720x400p 640x480p 640x480p 640x480p 640x480p 800x600p 800x600p 800x600p 800x600p 800x600p 800x600p 848x480p 1024x768p 1024x768p	13.300           31.500           31.500           35.500           25.175           31.500           31.500           31.500           31.500           31.500           36.000           36.000           40.000           50.000           49.500           56.250           33.750           44.900           65.000           75.000           78.750	37.861 37.861 37.927 31.469 37.861 37.500 43.269 35.156 37.879 48.077 46.875 53.674 31.020 35.522 48.636 56.476 60.023	30.00 85.08 85.08 85.04 59.94 72.81 75.00 85.01 56.25 60.32 72.17 75.00 85.06 59.99 43.48 60.00 70.07 75.02	864 832 832 936 800 832 840 832 1024 1056 1040 1056 1048 1088 1264 1344 1328	21 32 36 16 24 16 56 24 40 56 16 32 16 8 24 24 24 24	78 96 96 108 48 128 120 80 128 80 128 88 64 160 152 112 56 160 144 176	63 64 64 72 96 40 64 56 72 128 120 80 64 112 176 136 96	625 445 445 525 520 500 509 625 628 666 625 631 517 817 817 806 806 800	4 32 1 1 2 1 1 1 1 1 1 37 1 1 6 0 3 3 3 1	40 3 41 42 41 36 16 25 22 23 23 21 27 23 45 29 29 28	5 60 3 3 2 3 3 3 3 2 4 6 3 3 8 4 6 6 6 3			VESA
939 940 941 942 943 944 945 944 945 944 945 947 948 949 950 951 952 953 954 955 955 955	VESA VESA VESA VESA VESA VESA VESA VESA	640x350p 640x400p 720x400p 640x480p 640x480p 640x480p 640x480p 640x480p 800x600p 800x600p 800x600p 800x600p 800x600p 800x600p 800x600p 800x600p 800x600p 81024x768p 1024x768p 1024x768p	13.300           31.500           31.500           35.500           25.175           31.500           31.500           31.500           31.500           31.500           36.000           40.000           50.000           49.500           56.250           33.750           44.900           65.000           75.000           78.750           94.500	37.861 37.861 37.927 31.469 37.861 37.500 43.269 35.156 37.879 48.077 46.875 53.674 31.020 35.522 48.3637 56.473	30.00 85.08 85.08 85.04 59.94 72.81 75.00 85.01 56.25 60.32 72.17 75.00 85.06 59.99 43.48 60.00 70.00 75.02 85.00	864 832 832 936 800 832 840 832 1024 1056 1040 1056 1048 1088 1264 1344 1344 1312 1376	21 32 32 36 16 24 16 56 24 40 56 16 32 16 32 16 8 24 24 16 48	78           96           96           108           48           120           80           128           88           64           160           152           112           56           160           144           176           208	63 64 64 72 96 40 64 56 72 128 120 80 64 112 176 136 136 96 96	625 445 445 525 520 500 509 625 628 666 625 631 517 817 817 806 806 800 808	4 32 1 1 2 1 1 1 1 1 1 1 37 1 1 6 0 3 3 3 1 1	40 3 41 42 41 36 16 25 22 23 23 21 27 23 45 29 29 29 28 36	5 60 3 3 2 3 3 3 3 3 3 2 4 6 3 3 8 4 6 6 3 3 3 3		- + + + + - - + + + + + + + + + + + + +	VESA RGB444
939 940 941 942 943 944 945 944 945 944 945 947 948 949 950 951 952 953 954 955 955 955 955 955	VESA VESA VESA VESA VESA VESA VESA VESA	640x350p 640x400p 720x400p 640x480p 640x480p 640x480p 640x480p 640x480p 800x600p 800x600p 800x600p 800x600p 800x600p 800x600p 800x600p 800x600p 800x600p 800x600p 81024x768p 1024x768p 1024x768p 1024x768p 1024x768p	13.300           31.500           31.500           35.500           25.175           31.500           31.500           31.500           31.500           31.500           36.000           40.000           50.000           49.500           56.250           33.750           44.900           65.000           78.750           94.500           108.000	37.861 37.861 37.927 31.469 37.861 37.500 43.269 35.156 37.879 48.077 46.875 53.674 31.020 35.522 48.363 56.476 60.023 56.8677 67.500	30.00 85.08 85.08 85.04 59.94 72.81 75.00 85.01 56.25 60.32 72.17 75.00 85.06 59.99 43.48 60.00 70.00 75.02 85.00 75.00	864 832 832 936 800 832 840 832 1024 1056 1040 1056 1048 1088 1264 1348 1312 1376 1600	21 32 32 36 16 24 16 56 24 40 56 16 32 16 8 24 24 16 8 24 16 48 64	78           96           96           108           48           120           80           128           88           64           160           152           112           56           160           144           176           208           256	63 64 64 72 96 40 64 56 72 128 120 80 64 112 176 136 136 96 96 96 128	625 445 445 525 520 500 509 625 628 666 625 631 517 817 817 806 806 800 808 809	4 32 1 1 2 1 1 1 1 1 1 1 1 37 1 1 0 3 3 3 1 1 1 1 1 1	40 3 41 42 41 36 16 25 22 23 23 21 27 23 45 29 29 28 36 32	5 60 3 3 2 3 3 3 3 3 2 4 6 3 3 8 4 6 6 3 3 3 3 3 3 3 3			VESA RGB444 8BIT
939 940 941 942 943 944 945 944 945 944 945 947 948 949 950 951 952 953 954 955 955 955 955 955 955 955 955	VESA VESA VESA VESA VESA VESA VESA VESA	640x350p 640x400p 720x400p 640x480p 640x480p 640x480p 640x480p 640x480p 800x600p 800x600p 800x600p 800x600p 800x600p 800x600p 848x480p 1024x768p 1024x768p 1024x768p 1024x768p 1152x864p	13.300           31.500           31.500           35.500           25.175           31.500           31.500           31.500           31.500           31.500           36.000           40.000           50.000           49.500           56.250           33.750           44.900           65.000           78.750           94.500           108.000           68.250	3.623           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           35.156           37.879           48.077           46.875           53.674           31.020           35.522           48.363           56.476           60.023           68.677           67.500           47.396	30.00 85.08 85.08 85.04 59.94 72.81 75.00 85.01 56.25 60.32 72.17 75.00 85.06 59.99 43.48 60.00 70.07 75.02 85.00 75.00 59.99	864 832 832 936 800 832 840 832 1024 1056 1040 1056 1048 1088 1264 1344 1342 1376 1600 1440	21 32 32 36 16 24 16 56 24 40 56 16 32 16 8 24 24 16 8 24 16 48 64 48	78           96           96           108           48           120           80           128           88           64           160           152           112           56           160           144           176           208           256           80	63 64 64 72 96 40 64 56 72 128 120 80 64 112 176 136 136 96 96 96 128 32	625 445 445 525 520 500 509 625 628 666 625 631 517 817 817 806 806 806 800 808 800 808 800 790	4 32 1 1 2 1 1 1 1 1 1 1 1 1 1 0 3 3 3 1 1 1 1 1 3	40 3 41 42 41 36 16 25 22 23 23 21 27 23 45 29 29 28 36 32 12	5 60 3 3 2 3 3 3 3 3 2 4 6 3 3 3 8 4 6 6 3 3 3 3 3 7		- + + + + + + + + + + + + + + + + + + +	VESA RGB444 8BIT
939           940           941           942           943           944           945           946           947           948           949           950           951           952           953           954           955           955           957           958           959           960           961	VESA VESA VESA VESA VESA VESA VESA VESA	640x350p 640x400p 720x400p 640x480p 640x480p 640x480p 640x480p 640x480p 800x600p 800x600p 800x600p 800x600p 800x600p 800x600p 1024x768p 1024x768p 1024x768p 1024x768p 1152x864p 1152x864p	13.300           31.500           31.500           35.500           25.175           31.500           31.500           31.500           31.500           31.500           31.500           31.500           36.000           40.000           50.000           49.500           56.250           33.750           44.900           65.000           75.000           78.750           94.500           108.000           68.250           79.500	3.623           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.879           48.077           46.875           53.674           31.020           35.522           48.36476           60.023           68.677           67.500           47.396           47.776	30.00 85.08 85.08 85.04 59.94 72.81 75.00 85.01 56.25 60.32 72.17 75.00 85.06 59.99 43.48 60.00 70.07 75.02 85.00 75.00 59.99 59.87	864 832 832 936 800 832 840 832 1024 1056 1040 1056 1048 1088 1264 1348 1312 1376 1600 1440 1664	21 32 32 36 16 24 16 56 24 40 56 24 40 56 16 32 16 8 24 24 16 8 24 16 48 64 48 64	78           96           96           108           48           120           80           128           88           64           160           152           112           56           160           144           176           208           256           80           192	63           64           64           72           96           40           64           56           72           128           120           80           64           112           176           136           96           92           128           32           128	625 445 445 525 520 500 509 625 628 666 625 631 517 817 817 806 806 806 800 808 800 808 900 790 798	4 32 1 1 2 1 1 1 1 1 1 1 37 1 1 0 0 3 3 1 1 1 1 1 3 3 3	40 3 41 42 41 36 16 25 22 23 23 21 27 23 45 29 29 29 28 36 32 12 20	5 60 3 3 2 3 3 3 3 3 2 4 6 3 3 8 4 6 6 6 3 3 3 3 7 7 7	- - - - - - - - - - - - - - - - - - -		VESA RGB444 8BIT
939           940           941           942           943           944           945           944           945           947           948           949           950           951           952           953           954           955           955           957           958           959           960           961           962	VESA VESA VESA VESA VESA VESA VESA VESA	640x350p 640x400p 720x400p 640x480p 640x480p 640x480p 640x480p 640x480p 800x600p 800x600p 800x600p 800x600p 800x600p 800x600p 1024x768p 1024x768p 1024x768p 1024x768p 1024x768p 1024x768p 1152x864p 1152x864p 1280x768p	13.300           31.500           31.500           35.500           25.175           31.500           31.500           31.500           31.500           31.500           31.500           36.000           40.000           50.000           49.500           56.250           33.750           44.900           65.000           75.000           78.750           94.500           108.000           68.250           79.500           102.250	3.623           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.879           48.077           46.875           53.674           31.020           35.522           48.677           60.023           68.677           67.500           47.396           47.776           60.289	30.00 85.08 85.08 85.04 59.94 72.81 75.00 85.01 56.25 60.32 72.17 75.00 85.06 59.99 43.48 60.00 70.07 75.02 85.00 75.00 59.99 93.438 60.00 75.00 59.99 59.87 74.89	864 832 832 936 800 832 840 832 1024 1056 1040 1056 1048 1088 1264 1328 1312 1376 1600 1440 1664 1696	21 32 32 36 16 24 16 56 24 40 56 24 40 56 16 32 16 32 16 8 24 24 16 48 64 48 64 48 64 80	78           96           96           108           48           128           80           128           84           160           152           112           56           160           144           176           208           256           80           192           208	63           64           64           72           96           40           64           56           72           128           112           176           136           96           92           128           32           128           128           128	625 445 445 525 520 500 509 625 628 666 625 631 517 817 817 806 806 806 800 808 900 790 798 805	4 32 1 1 2 1 1 1 1 1 1 1 1 1 1 1 1 1	40 3 41 42 41 36 16 25 22 23 23 21 27 23 45 29 29 29 28 36 32 12 20 27 27	5 60 3 3 2 3 3 3 3 3 2 4 6 3 3 8 4 6 6 3 3 3 7 7 7 7 7			VESA RGB444 8BIT
939 940 941 942 943 944 945 946 947 948 949 950 951 952 953 955 955 955 955 955 955 955 955 956 957 958 959 960 961 962 962	VESA VESA VESA VESA VESA VESA VESA VESA	640x350p 640x400p 720x400p 640x480p 640x480p 640x480p 640x480p 840x480p 800x600p 800x600p 800x600p 800x600p 800x600p 800x600p 800x600p 1024x768p 1026x768p 1280x768p	13.300           31.500           31.500           35.500           25.175           31.500           31.500           35.500           25.175           31.500           31.500           36.000           36.000           40.000           50.000           49.500           56.250           33.750           44.900           65.000           78.750           94.500           108.000           68.250           79.500           102.250           117.500	37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.879           48.077           46.875           53.674           31.020           35.522           48.363           56.476           60.023           68.677           67.500           47.396           47.776           60.289           68.631	30.00 85.08 85.08 85.04 59.94 72.81 75.00 85.01 56.25 60.32 72.17 75.00 85.06 59.99 43.48 60.00 70.07 75.02 85.00 70.07 75.02 85.00 75.00 59.99 59.87 74.89 84.84 54.55 59.55 50	864 832 832 936 800 832 840 832 1024 1056 1040 1056 1040 1056 1048 1088 1264 1328 1312 1376 1600 1440 1664 1696 1712	21 32 32 36 16 24 16 56 24 40 56 24 40 56 16 32 16 32 16 8 24 24 16 48 64 48 64 48 64 80 80 80 80 80 80 80 80 80 80	78           96           96           108           48           120           80           128           88           64           160           152           112           56           160           124           176           208           256           80           192           208           216	63 64 64 72 96 40 64 56 72 128 120 80 64 112 176 136 136 96 96 128 32 128 128 128 128 128 128 128 12	625 445 445 520 500 509 625 628 666 625 631 517 806 806 806 800 808 900 790 798 805 805	4 32 1 1 2 1 1 1 1 1 1 1 1 1 1 1 1 1	40 3 41 42 41 36 16 25 22 23 23 21 27 23 45 29 29 29 29 28 36 32 12 20 27 31 27 23 23 23 21 27 23 23 23 21 27 23 23 23 21 27 23 23 23 21 27 23 23 23 23 21 27 23 23 23 23 21 27 23 23 23 23 23 23 23 23 23 23	5 60 3 3 2 3 3 3 3 2 4 6 3 3 3 8 4 6 6 3 3 3 3 7 7 7 7 7 7 7 7			VESA RGB444 8BIT
939 940 941 942 943 944 945 946 947 948 949 950 951 952 953 955 955 955 955 955 955 955 955 955	VESA VESA VESA VESA VESA VESA VESA VESA	640x350p 640x400p 720x400p 640x480p 640x480p 640x480p 640x480p 640x480p 800x600p 800x600p 800x600p 800x600p 800x600p 800x600p 800x600p 810x4768p 1024x768p 1024x768p 1024x768p 1024x768p 1024x768p 1152x864p 1152x864p 1280x768p 1280x768p 1280x768p 1280x768p	13.300           31.500           31.500           35.500           25.175           31.500           31.500           35.500           25.175           31.500           31.500           36.000           36.000           40.000           50.000           49.500           56.250           33.750           44.900           65.000           78.750           94.500           108.000           68.250           79.500           102.250           117.500           128.000	37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.879           48.077           46.875           53.674           31.020           35.522           48.363           56.476           60.023           68.677           67.500           47.396           47.776           60.289           68.633           60.000	30.00 85.08 85.08 85.04 59.94 72.81 75.00 85.01 56.25 60.32 72.17 75.00 85.06 59.99 43.48 60.00 70.07 75.02 85.00 75.00 59.99 93.85 72.85 72.85 75.00 75	864           832           832           936           800           832           840           832           1024           1056           1040           1056           1040           1056           1044           1056           1044           1056           1044           1328           1312           1376           1600           1440           1664           1696           1712           1800	21 32 32 36 16 24 16 56 24 40 56 24 40 56 16 32 16 8 24 24 16 48 64 48 64 48 64 80 80 96 64 44 56 56 56 56 56 56 56 56 56 56	78           96           96           108           48           120           80           128           88           64           160           152           112           56           160           144           176           208           256           80           192           208           216           312	63           64           64           72           96           40           64           56           72           128           120           80           64           112           1176           136           96           92           128           32           128           32           128           126	625 445 445 525 520 500 509 625 628 666 625 631 517 817 817 806 806 806 800 808 900 790 798 805 809 1000	4 32 1 1 2 1 1 1 1 37 1 1 37 1 1 3 3 3 3 3 3 3 1 1 1 1 1 1 1 1 1 1 1 1 1	40 3 41 42 41 36 16 25 22 23 23 21 27 23 45 29 29 28 36 32 12 20 27 31 36 47	5 60 3 3 2 3 3 3 2 4 6 3 3 3 8 4 6 6 3 3 3 3 7 7 7 7 7 7 7 7 7 7 3 3			VESA RGB444 8BIT
939 940 941 942 943 944 945 946 947 948 949 950 950 951 952 953 955 955 955 955 955 955 955 955 955	VESA VESA VESA VESA VESA VESA VESA VESA	640x350p 640x400p 720x400p 640x480p 640x480p 640x480p 640x480p 640x480p 800x600p 800x600p 800x600p 800x600p 800x600p 800x600p 800x600p 812x768p 1024x768p 1024x768p 1024x768p 1024x768p 1024x768p 1024x768p 1024x768p 1152x864p 1280x768p 1280x768p 1280x768p 1280x768p 1280x768p 1280x768p 1280x768p 1280x768p 1280x768p	13.300           31.500           31.500           35.500           25.175           31.500           31.500           35.500           25.175           31.500           31.500           36.000           36.000           40.000           50.000           49.500           56.250           33.750           44.900           65.000           78.750           94.500           108.000           68.250           79.500           102.250           117.500           108.000           148.500	3.523           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.879           48.077           46.875           53.674           31.020           35.522           48.363           56.476           60.023           68.677           67.500           47.396           47.776           60.289           68.633           60.000           85.938           63.941	30.00 85.08 85.08 85.04 59.94 72.81 75.00 85.01 56.25 60.32 72.17 75.00 85.06 59.99 43.48 60.00 70.07 75.02 85.00 75.00 59.99 93.85,00 75.00 59.99 94.84 85.00 75.00 59.99 59.87 74.89 84.84 60.00 60.02 85.00	864 832 832 936 800 832 840 832 1024 1056 1040 1056 1040 1056 1040 1056 1048 1264 1328 1312 1376 1600 1440 1664 1696 1712 1800 1728	21 32 32 36 16 24 16 56 24 40 56 24 40 56 16 32 16 8 24 24 16 48 64 48 64 48 64 48 64 48	78           96           96           108           48           128           80           128           80           128           56           160           144           176           208           256           80           192           208           216           312           224           248	63           64           64           72           96           40           64           56           72           128           120           80           64           112           1176           136           96           92           128           32           128           32           128           136           136           136           121           160           112	625 445 445 520 500 509 625 628 666 625 631 517 817 806 806 806 800 808 900 790 798 805 809 1000 1011 1066	4 32 1 1 2 1 1 1 1 37 1 1 37 1 1 3 3 3 3 3 1 1 1 1 1 1 1 1 1 1 1 1 1	40 3 41 42 41 36 16 25 22 23 23 21 27 23 45 29 29 28 36 32 12 20 27 31 36 47 38	5 60 3 3 2 3 3 3 2 4 6 3 3 4 6 3 3 3 4 6 3 3 7 7 7 7 7 7 3 3 3 3 3 3 3 3 3 3 3 3 3			VESA RGB444 8BIT
939 940 941 942 943 944 945 946 947 948 949 950 951 952 953 955 955 955 955 955 955 955 955 955	VESA VESA VESA VESA VESA VESA VESA VESA	640x350p 640x400p 720x400p 640x480p 640x480p 640x480p 640x480p 640x480p 800x600p 800x600p 800x600p 800x600p 800x600p 800x600p 800x600p 1024x768p 1024x768p 1024x768p 1024x768p 1024x768p 1024x768p 1024x768p 1024x768p 1152x864p 1280x768p 1280x768p 1280x768p 1280x768p 1280x768p 1280x768p 1280x768p	13.300           31.500           31.500           35.500           25.175           31.500           31.500           35.500           25.175           31.500           31.500           36.000           36.000           36.000           40.000           56.250           33.750           44.900           65.000           75.000           78.750           94.500           108.000           68.250           79.500           102.250           117.500           108.000           148.500           108.000           135.000	3.7.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.879           48.077           46.875           53.674           31.020           35.522           48.363           56.476           60.023           68.677           67.500           47.396           47.776           60.289           68.633           60.000           85.9381           79.976	30.00 35.00 85.08 85.08 85.04 59.94 72.81 75.00 85.01 56.25 60.32 72.17 75.00 85.06 59.99 43.48 60.00 70.07 75.02 85.00 75.00 59.99 59.87 74.89 84.84 60.00 85.00 75.02 85.00 75.02 85.00 75.02 85.00 75.00 75.02 85.00 75.02 85.00 75.00 75.02 85.00 75	864           832           832           936           800           832           936           800           832           936           800           832           936           800           832           936           800           832           936           800           832           1024           1056           1040           1056           1040           1056           1040           1056           1040           1056           1344           1328           1312           1376           1600           1440           1664           1696           1712           1800           1728           1688           1688	21 32 32 36 16 24 16 56 24 40 56 24 40 56 16 32 16 8 24 24 16 48 64 48 64 48 64 80 96 64 48 16	78           96           96           108           48           120           80           128           88           64           160           152           112           56           160           144           176           208           256           80           192           208           216           312           224           248	63           64           64           72           96           40           64           56           72           128           120           80           64           112           176           136           96           92           128           32           128           128           128           121           120           121           124	625 445 445 520 500 509 625 628 666 625 631 517 817 806 806 806 800 808 900 790 798 805 809 1000 1011 1066 1066	4 32 1 1 2 1 1 1 1 1 1 1 1 3 3 3 3 3 1 1 1 1 1 1 1 1 1 1 1 1 1	40 3 41 42 41 36 16 25 22 23 23 23 21 27 23 45 29 29 28 36 32 12 20 27 31 36 47 38 38	5 60 3 3 2 3 3 3 3 2 4 6 3 3 3 3 4 6 6 3 3 3 3 7 7 7 7 7 7 7 7 7 7 3 3 3 3			VESA RGB444 8BIT
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939           940           941           942           943           944           945           946           947           948           949           950           951           952           953           954           955           956           957           958           959           960           961           962           963           964           965           966           967           968           969	VESA VESA VESA VESA VESA VESA VESA VESA	640x350p 640x400p 720x400p 640x480p 640x480p 640x480p 640x480p 640x480p 800x600p 800x600p 800x600p 800x600p 800x600p 800x600p 1024x768p 1024x768p 1024x768p 1024x768p 1024x768p 1024x768p 1024x768p 1024x768p 1152x864p 1280x768p 1280x768p 1280x768p 1280x768p 1280x768p 1280x768p 1280x768p 1280x768p 1280x768p	13.500           31.500           35.500           25.175           31.500           31.500           35.500           25.175           31.500           31.500           36.000           36.000           36.000           36.000           40.000           56.250           33.750           44.900           65.000           75.000           78.750           94.500           108.000           68.250           79.500           102.250           117.500           108.000           135.000           135.000           157.500	13.623           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.879           48.077           46.875           53.674           31.020           35.522           48.363           56.476           60.023           68.677           67.500           47.396           47.776           60.289           68.633           60.000           85.9381           79.976           91.146           47.712	30.00 85.08 85.08 85.04 59.94 72.81 75.00 85.01 56.25 60.32 72.17 75.00 85.06 59.99 43.48 60.00 70.07 75.02 85.00 75.02 85.00 75.02 85.00 75.99 59.87 74.89 84.84 60.00 60.00 75.02 85.00 75.02 85.00 75.02 85.00 75.02 85.00 75.02 85.00 75.02 85.00 75.00 85.00 75.00 75.02 85.00 75.02 85.00 75.02 85.00 75.02 85.00 75.02 85.00 75.02 85.00 75.02 85.00 75.02 85.00 75.02 85.00 75.02 85.00 75.02 85.00 75.02 85.00 75.02 85.00 75.02 85.00 75.02 85.00 75.02 85.02 75.02 75	864           832           832           936           800           832           936           800           832           936           800           832           936           800           832           936           800           832           936           800           832           1024           1056           1040           1056           1040           1056           1040           1056           1040           1056           1324           13376           1600           1440           1664           1696           1712           1800           1728           1688           1728           1792	21 32 32 36 16 24 16 56 24 40 56 24 40 56 16 32 16 8 24 24 16 48 64 48 64 48 64 48 64 48 64 64 64 64 64 64	78           96           96           108           48           120           80           128           88           64           160           152           112           56           160           144           176           208           256           80           192           208           216           312           224           248           224           256	63           64           64           72           96           40           64           56           72           128           120           80           64           112           176           136           96           92           128           32           128           128           121           160           112           160           112	625 445 445 520 500 509 625 628 666 625 631 517 817 806 806 806 800 790 798 805 809 1000 1011 1066 1072 795	4 32 1 1 2 1 1 1 1 1 1 1 1 1 1 1 1 1	40 3 41 42 41 36 16 25 22 23 23 21 27 23 45 29 29 28 36 32 12 20 27 31 36 47 38 38 44 18	5 60 3 3 3 2 3 3 3 2 4 6 3 3 3 4 6 3 3 3 3 7 7 7 7 7 7 7 7 7 7 7 7 3			VESA RGB444 8BIT
939           940           941           942           943           944           945           946           947           948           949           950           951           952           953           954           955           956           957           958           960           961           962           963           964           965           966           967           968           969           960           961           962           963           964           965           966           967           968           969           970	VESA VESA VESA VESA VESA VESA VESA VESA	640x350p 640x400p 720x400p 640x480p 640x480p 640x480p 640x480p 800x600p 800x600p 800x600p 800x600p 800x600p 800x600p 800x600p 1024x768p 1024x768p 1024x768p 1024x768p 1024x768p 1024x768p 1024x768p 1024x768p 1280x768p	13.500           31.500           31.500           35.500           25.175           31.500           31.500           35.500           25.175           31.500           31.500           36.000           36.000           36.000           40.000           50.000           49.500           56.250           33.750           44.900           65.000           75.000           78.750           94.500           108.000           68.250           79.500           102.250           117.500           185.000           135.000           157.500	13.623           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.879           48.077           46.875           53.674           31.020           35.522           48.363           56.476           60.023           68.677           67.500           47.396           47.776           60.289           68.633           60.000           85.938           79.976           91.146           47.712           64.744	30.00 85.08 85.08 85.04 59.94 72.81 75.00 85.01 56.25 60.32 72.17 75.00 85.09 99.99 43.48 60.00 70.07 75.02 85.00 75.00 59.99 59.87 74.89 84.84 60.00 25.9.99 59.87 74.89 84.84 60.00 25.9.99 59.87 74.89 84.84 60.00 25.9.99 59.87 75.00 59.99 59.87 75.00 59.99 59.87 75.00 59.99 59.87 75.00 59.99 59.87 75.00 59.99 59.87 75.00 59.99 59.87 75.00 59.99 59.87 75.00 59.99 59.87 75.00 59.99 59.87 75.00 59.99 59.87 75.00 59.99 59.87 75.00 59.99 59.87 75.00 59.99 59.87 75.00 59.99 59.87 75.00 59.99 59.87 75.00 59.99 59.87 75.00 50.00 59.99 59.87 75.00 59.99 59.87 75.00 59.99 59.87 75.00 50.00 59.99 59.87 75.00 50.00 59.99 59.87 75.00 50.00 59.99 59.87 75.00 50.	864           832           832           936           800           832           936           800           832           936           800           832           936           800           832           936           800           832           936           800           832           1024           1056           1040           1056           1040           1056           1040           1056           1040           1056           1312           13376           1600           1440           1664           1696           1712           1800           1728           1688           1688           1688           1688           1688           1688           1696           1728           17292           1560	21 32 32 36 16 24 16 56 24 40 56 24 40 56 16 32 16 8 24 24 16 48 64 48 64 48 64 48 16 64 64 48 16 64 64 48 56 64 48 56 64 64 64 64 64 64 64 64 64 6	78           96           96           108           48           120           80           128           88           64           160           152           112           56           160           144           176           208           256           80           192           208           216           312           224           248           224           256           80	63           64           64           72           96           40           64           56           72           128           120           80           64           112           176           136           96           92           128           32           128           136           112           160           112           160           112           32	625 445 445 520 500 509 625 628 666 625 631 517 817 806 800 808 900 790 798 805 809 1000 1011 1066 1072 795 1080	4 32 1 1 2 1 1 1 1 1 3 7 1 1 3 3 3 3 1 1 1 1 3 3 3 3 3 3 3 3 3 3 3 3 3	40 3 41 42 41 36 16 25 22 23 23 21 27 23 45 29 29 28 36 32 12 20 27 31 36 47 38 38 44 18 23	5 60 3 2 3 3 3 2 4 6 3 3 3 4 6 3 3 3 7 7 7 7 7 7 7 7 3 3 3 3 3 4 6 6 6 3 3 3 5 6 6 6 6 6 7 7 7 7 7 7 7 7 3 3 3 3 6 6 6 6 6 7 7 7 7 7 7 7 7 7 7 7 7 7			VESA RGB444 8BIT
939           940           941           942           943           944           945           946           947           948           949           950           951           952           953           954           955           956           957           958           960           961           962           963           964           965           966           967           968           969           970           971	VESA VESA VESA VESA VESA VESA VESA VESA	640x350p 640x400p 720x400p 640x480p 640x480p 640x480p 640x480p 800x600p 800x600p 800x600p 800x600p 800x600p 800x600p 800x600p 810x4768p 1024x768p 1024x768p 1024x768p 1024x768p 1024x768p 1024x768p 1024x768p 1280x768p	13.500           31.500           31.500           35.500           25.175           31.500           31.500           35.500           25.175           31.500           31.500           36.000           36.000           36.000           40.000           50.000           49.500           56.250           33.750           44.900           65.000           75.000           78.750           94.500           108.000           68.250           79.500           102.250           117.500           135.000           135.000           135.000           135.000           121.750	13.623           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.879           48.077           46.875           53.674           60.023           68.677           67.500           47.766           60.289           68.633           60.023           63.981           79.976           91.146           47.712           64.744	30.00 85.08 85.08 85.04 59.94 72.81 75.00 85.01 56.25 60.32 72.17 75.00 85.02 59.99 43.48 60.00 70.07 75.02 85.00 75.00 59.99 59.87 74.89 84.84 60.00 25.99 59.87 74.89 84.84 60.00 25.99 59.87 74.89 84.84 60.00 25.99 59.87 75.00 85.00 60.02 75.02 85.00 85	864           832           832           936           800           832           936           800           832           936           800           832           936           800           832           936           800           832           936           800           832           1024           1056           1040           1056           1040           1056           1312           13376           1660           1440           1664           1696           1712           1800           1728           1688           1688           1728           1660           1728           1688           1688           1688           1684	21 32 32 36 16 24 16 56 24 40 56 24 40 56 16 32 16 8 24 24 16 48 64 48 80 80 80 80 80 80 80 80 80 8	78           96           96           108           48           120           80           128           88           64           160           152           112           56           160           144           176           208           256           80           192           208           216           312           224           256           80           212           224           256           80           212           224           256           80           212           224           256           80           224           256           80           224           256           80           232	63           64           64           72           96           40           64           56           72           128           120           80           64           112           176           136           96           92           128           32           128           136           136           136           1212           128           136           1212           128           132           144           160           112           32           144	625 445 445 520 500 509 625 628 666 625 631 517 817 806 800 808 900 790 798 805 809 1000 1011 1066 1072 795 1080 1089	4 32 1 1 2 1 1 1 1 1 1 1 3 3 3 3 1 1 1 1 3 3 3 3 3 3 3 3 3 3 3 3 3	40 3 41 42 41 36 16 25 22 23 23 21 27 23 45 29 29 28 36 32 12 20 27 31 36 47 38 38 44 18 23 32 32	5 60 3 2 3 3 3 2 4 6 3 3 3 4 6 3 3 3 7 7 7 7 7 7 7 7 3 3 3 3 3 4 4 6 6 3 3 3 3 5 6 6 6 6 6 7 7 7 7 7 7 7 7 7 7 7 7 7			VESA RGB444 8BIT
939 940 941 942 943 944 945 946 947 947 949 950 951 952 953 955 955 955 955 955 955 955 956 957 958 959 960 961 962 963 964 965 966 965 966 967 968 969 970 971 972	VESA VESA VESA VESA VESA VESA VESA VESA	640x350p 640x400p 720x400p 640x480p 640x480p 640x480p 640x480p 800x600p 800x600p 800x600p 800x600p 800x600p 800x600p 800x600p 800x600p 1024x768p 1024x768p 1024x768p 1024x768p 1024x768p 1024x768p 1280x768p 1	13.300           31.500           31.500           35.500           25.175           31.500           31.500           35.500           25.175           31.500           31.500           36.000           36.000           40.000           56.250           33.750           44.900           65.000           75.000           78.750           94.500           108.000           68.250           79.500           102.250           117.500           135.000           157.500           85.500           101.000           121.750           156.000	13.623           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.879           48.077           46.875           53.674           60.023           68.677           67.500           47.766           60.289           68.633           60.023           63.981           79.976           91.146           47.712           64.744           65.317           82.278	30.00 85.08 85.08 85.04 59.94 72.81 75.00 85.01 56.25 60.32 72.17 75.00 85.00 75.00 59.99 43.48 60.00 70.07 75.02 85.00 75.00 59.99 59.87 74.89 84.84 60.00 25.99 59.87 74.89 84.84 60.00 25.99 59.87 74.89 84.84 60.00 25.99 59.87 74.89 84.84 60.00 25.99 59.97 74.89 84.84 60.00 25.99 59.97 74.89 84.84 60.00 25.99 59.97 75.00 59.99 59.87 75.00 85.00 75.00 59.99 59.87 74.89 84.84 60.00 25.00 59.99 59.87 75.00 85.00 59.99 59.87 74.89 84.84 60.00 85.00 60.02 75.02 85.00 75.02 85.00 75.02 85.00 75.00 75.00 75.99 75.92 85.00 75.99 75.99 75.99 75.99 75.99 75.92 85.00 75.92 85.00 75.99 75.92 85.99 75.92 85.99 75.99 75.99 75.92 75.99 75.99 75.99 75.99 75.92 75.99 75.92 75.99 75.99 75.92 75.99 75.92 75.99 75.99 75.92 75.99 75.92 75.99 75	864 832 832 936 800 832 840 832 1024 1056 1040 1056 1056 1040 1056 10	21 32 32 36 16 24 16 56 24 40 56 24 40 56 16 32 16 8 24 24 16 48 64 48 64 48 64 48 64 48 64 48 64 48 64 48 64 64 64 64 64 64 64 64 64 64	78           96           96           108           48           120           80           128           88           64           160           152           112           56           160           144           176           208           256           80           192           208           216           312           224           226           80           2122           224           256           80           212           224           256           80           212           224           256           80           232           248           232           248	63           64           64           72           96           40           64           56           72           128           120           80           64           112           176           136           96           92           128           32           128           136           136           136           1212           128           136           112           128           132           144           160           112           32           144           160           112           32           144           144	625 445 445 520 500 509 625 628 666 625 631 517 817 806 800 808 900 790 798 805 809 1000 1011 1066 1072 795 1080 1089 1099	4 32 1 1 2 1 1 1 1 1 1 1 1 1 1 1 1 3 3 3 1 1 1 1 1 3 3 3 3 3 3 3 3 3 3 3 3 3	40 3 41 42 41 36 16 25 22 23 23 21 27 23 45 29 29 28 36 32 12 20 27 31 36 47 38 38 44 18 23 32 45 29 29 29 28 36 32 45 29 29 29 28 36 32 45 29 29 29 28 36 32 45 29 29 29 28 36 32 45 29 29 28 36 32 45 29 29 28 36 32 45 29 29 28 36 32 45 29 29 28 36 32 45 29 29 28 36 32 12 20 27 23 36 32 32 32 32 32 32 32 32 32 32	5 60 3 2 3 3 3 2 4 6 3 3 3 4 6 3 3 3 7 7 7 7 7 7 7 7 7 3 3 3 3 3 6 4 4 4 4 4 4 4 4 4 4 4 4 4			VESA RGB444 8BIT
939 940 941 942 943 944 945 946 947 947 949 950 951 952 953 955 955 955 955 955 955 955 955 956 957 958 959 960 961 962 962 963 964 965 966 965 966 967 968 969 970 971 972 972	VESA VESA VESA VESA VESA VESA VESA VESA	640x350p 640x400p 720x400p 640x480p 640x480p 640x480p 640x480p 800x600p 800x600p 800x600p 800x600p 800x600p 800x600p 800x600p 800x600p 800x600p 800x600p 800x600p 800x600p 1024x768p 1024x768p 1024x768p 1024x768p 1024x768p 1280x768p 1400x1050p 1400x1050p 1400x1050p	13.300           31.500           31.500           35.500           25.175           31.500           31.500           35.500           25.175           31.500           36.000           36.000           36.000           40.000           56.250           33.750           44.900           65.000           75.000           78.750           94.500           108.000           68.250           79.500           102.250           117.500           135.000           135.000           157.500           85.500           101.000           121.750           156.000           179.500	13.623           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.861           37.879           48.077           46.875           53.674           60.023           68.677           67.500           47.766           60.289           68.633           60.003           63.981           79.976           91.146           47.712           64.744           65.317           82.278           93.81	30.00 85.08 85.08 85.04 59.94 72.81 75.00 85.01 56.25 60.32 72.17 75.00 85.00 75.00 59.99 43.48 60.00 70.07 75.02 85.00 75.00 59.99 43.48 60.00 70.07 75.02 85.00 75.02 85.00 75.00 59.99 59.87 74.89 84.84 60.00 60.02 75.02 85.00 60.02 75.02 85.00 60.02 75.02 85.00 60.02 75.02 85.00 60.02 75.02 85.00 60.02 75.02 85.00 60.02 75.02 85.00 60.02 75.02 85.00 60.02 75.02 85.00 60.02 75.02 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    1896           1912	21 32 32 36 16 24 16 56 24 40 56 56 24 40 56 56 24 40 56 56 24 40 56 56 56 56 56 56 56 56 56 56	78           96           96           108           48           120           80           128           80           128           84           160           152           160           144           176           208           256           80           192           208           216           312           224           248           224           256           80           212           248           224           256           80           2224           248           224           256           80           232           248           256           80           232           248           256           80           232           248           256           80           232	63           64           64           72           96           40           64           56           72           128           120           80           64           112           176           136           96           96           128           128           128           128           128           1212           160           112           144           160           112           144           144           144           144           144	625 445 445 520 500 509 625 628 666 625 631 517 806 806 800 808 900 790 798 805 809 1000 1011 1066 1072 795 1080 1089 1099 1099	4 32 1 1 2 1 1 1 1 1 1 1 1 1 1 1 3 3 3 1 1 1 1 3 3 3 3 3 3 3 3 3 3 3 3 3	40 3 41 42 41 36 16 25 22 23 23 21 27 23 45 29 29 28 36 32 12 20 27 23 36 32 12 20 27 31 36 47 38 38 44 18 23 32 42 42 43 32 42 43 32 44 12 45 29 29 28 36 32 45 29 29 28 36 32 45 29 29 28 36 32 45 29 29 28 36 32 45 29 29 28 36 32 12 20 27 23 36 32 32 32 32 32 36 32 32 32 32 32 36 32 32 32 32 36 32 32 36 32 36 32 36 32 36 32 36 37 36 37 36 37 36 47 38 38 38 44 18 23 36 47 38 38 38 44 18 23 32 45 29 29 29 28 36 47 32 47 31 36 47 38 38 38 44 18 23 32 45 29 29 29 29 29 28 36 47 31 36 47 38 38 32 42 32 36 47 38 38 32 42 32 44 38 38 38 44 18 23 32 45 38 38 38 44 18 23 32 45 29 29 29 29 29 29 29 29 29 29	5 60 3 2 3 3 3 2 4 6 3 3 3 3 4 6 6 3 3 3 7 7 7 7 7 7 7 7 7 7 7 7 3 3 3 3 6 4 4 4 4 4 4 4 4 6 6 6 6 6 6 7 7 7 7 7 7 7 7 7 7 7 7 7			VESA RGB444 8BIT

975	VESA	1440x900p	106.500	55.935	59.89	1904	80	232	152	934	3	25	6	-	+
976	VESA	1440x900p	136.750	70.635	74.98	1936	96	248	152	942	3	33	6	-	+
977	VESA	1440x900p	157.000	80.430	84.84	1952	104	256	152	948	3	39	6	-	+
978	VESA	1600x1200p	162.000	75.000	60.00	2160	64	304	192	1250	1	46	3	+	+
979	VESA	1600x1200p	175.500	81.250	65.00	2160	64	304	192	1250	1	46	3	+	+
980	VESA	1600x1200p	189.000	87.500	70.00	2160	64	304	192	1250	1	46	3	+	+
981	VESA	1600x1200p	202.500	93.750	75.00	2160	64	304	192	1250	1	46	3	+	+
982	VESA	1600x1200p	229.500	106.250	85.00	2160	64	304	192	1250	1	46	3	+	+
983	VESA	1680x1050p	119.000	64.674	59.88	1840	48	80	32	1080	3	21	6	+	-
984	VESA	1680x1050p	146.250	65.290	59.95	2240	104	280	176	1089	3	30	6	-	+
985	VESA	1680x1050p	187.000	82.306	74.89	2272	120	296	176	1099	3	40	6	-	+
986	VESA	1680x1050p	214.750	93.859	84.94	2288	128	304	176	1105	3	46	6	-	+
987	VESA	1792x1344p	204.750	83.640	60.00	2448	128	328	200	1394	1	46	3	-	+
988	VESA	1792x1344p	261.000	106.270	75.00	2456	96	352	216	1417	1	69	3	-	+
989	VESA	1856x1392p	218.250	86.333	59.99	2528	96	352	224	1439	1	43	3	-	+
990	VESA	1856x1392p	288.000	112.500	75.00	2560	128	352	224	1500	1	104	3	-	+
991	VESA	1920x1200p	154.000	74.038	59.95	2080	48	80	32	1235	3	26	6	+	-
992	VESA	1920x1200p	193.250	74.556	59.88	2592	136	336	200	1245	3	36	6	-	+
993	VESA	1920x1200p	245.250	94.038	74.93	2608	136	344	208	1255	3	46	6	-	+
994	VESA	1920x1200p	281.250	107.184	84.93	2624	144	352	208	1262	3	53	6	-	+
995	VESA	1920x1440p	234.000	90.000	60.00	2600	128	344	208	1500	1	56	3	-	+
996	VESA	1920x1440p	297.000	112.500	75.00	2640	144	352	224	1500	1	56	3	-	+
997	VESA	2560x1600p	330.013	106.250	59.99	3106	168	146	232	1771	2	159	10	-	+
998	VESA	2560x1600p	348.500	99.458	59.99	3504	192	472	280	1658	3	49	6	-	+
999	VESA	2560x1600p	268.499	98.713	59.97	2720	48	80	32	1646	3	37	6	-	+



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