



HDMI 2.0(HDCP 2.2) & MHL 2.0
Signal Generator

MSHG-800PLUS

User Manual
Edition 2

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10. Warranty

(One) Year Warranty

Master warrants products are to be free from defects in workmanship and materials, under normal use and service, for a period of one (1) year from the date of purchase from Master or its authorized resellers.

If a product does not work as warranted during the applicable warranty period, Master shall, at its option and expense, repair the defective product or part, deliver to customer an equivalent product or part to replace the defective item, or refund to customer the purchase price paid for the defective product.

All products that are replaced will become the property of Master.

Replacement products may be new or reconditioned.

Any replaced or repaired product or part has a ninety (90) day warranty or the remainder of the initial warranty period, whichever is longer.

Master shall not be responsible for any software, firmware, information, or Memory data of customer contained in, stored on, or integrated with any products returned to Master for repair under warranty or not.

Warranty Limitation and Exclusion

Master shall have no further obligation under the foregoing limited warranty if the product has been damaged due to abuse, misuse, neglect, accident, unusual physical or electrical stress, unauthorized modifications, tampering, alterations, or service other than by Master or its authorized agents, causes other than from ordinary use or failure to properly use the Product in the application for which said Product is intended.

1. Notice for Safe Usage

1. If the equipment is used in a manner not specified by the manufacture, the protection provided by the equipment may be impaired.
2. AC Power
 - Turn off power of signal distributor 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 signal distributor off.
 - Use the three-wire power supply code.
 - When not using the equipment for a long time, disconnect the AC power plug from the AC line outlet for safe consideration.
3. Paying attention to setting signal distributor up
 - Don't place heavy material on signal distributor.
 - Don't install signal distributor in dusty environment.
4. Paying attention to a vibration and impact
 - As signal distributor is precision instrument for high frequency.
 - A powerful vibration or impact could cause trouble.
5. Cleaning method
 - Wipe the cabinet with a dry cloth to eliminate dust.
6. Fuse replacement method
 - When replacing the fuse, use one of the same types and specifications. You can replace the fuse by yourself. To replace it, use the same type of fuse having the same rating. Be sure that the power switch is turned off and the power plug is disconnected from the AC line outlet before starting fuse replacement. If the new fuse also blows immediately, it may be caused by a trouble of the equipment. The fuse is a T2A 250V type.

7. International Electrical Symbols



2. Accessories Packed

① MSHG-800PLUS 1ea



② User Manual 1ea



③ RS-232 communication cable 1ea
(female-female / Pin No. 2&3 Cross type)



④ Power Cable 1ea



9. COMMAND CODE

6. MHL ↔ HDMI : 0x60

	START	DFT	SIGNAL	CH 5	MHL / HDMI	END
1	0x02	0x1C	0x60	0x35	0x31	0x03
2					0x30	

7. CHANGE TIME : 0x07

	Time Ex.	START	TIME	TIME (3digit)	TIME (2digit)	TIME (1digit)	END
1	Call 820	0x02	0x07	0x38	0x32	0x30	0x03
2	Call 7					0x37	

8. CHANGE PATTERN : 0x08

	Pattern Ex.	START	PATT.	PATT. (3digit)	PATT. (2digit)	PATT. (1digit)	END
1	Call45	0x02	0x08	0x30	0x34	0x35	0x03
2	Call 7					0x37	

9. CHANGE TIME & PATTERN AT ONCE : 0x09

Ex. Call Time 112& Pattern 235 at once

	START	TIME& PATT.	TIME (3digit)	TIME (2digit)	TIME (1digit)	TIME (3digit)	TIME (2digit)	TIME (1digit)	END
1	0x02	0x09	0x31	0x31	0x32	0x32	0x33	0x35	0x03

10. Model name & Firmware version Information : 0x56

	START	DFT	Information	END
1	0x02	0x1C	0x56	0x03

ACK(ASCII) : MSHG-800P,211130
(211130 is FIRMWARE version)

11. Firmware Version Information : 0x1A

	START	FIRMWARE	END
1	0x02	0x1A	0x03

ACK: 0x02 0x1A 0x32 0x31 0x31 0x31 0x33 0x30 0x03 → 211130 Version
(211130 is FIRMWARE version)

9. COMMAND CODE

1. COMMAND CODE

- ① On line : 0x05
- ② Start Code : 0x02
- ③ DFT Command : 0x1C
- ④ Start Code + DFT Command : 0x02 0x1C
- ⑤ End Code: 0x03
- ⑥ Off line : 0x04

2. HDCP : 0x50

	START	DFT	HDCP	ON / OFF	END
1	0x02	0x1C	0x50	0x31	0x03
2				0x30	

3. EDID : 0x51

	START	DFT	EDID	CHECK / PASS	END
1	0x02	0x1C	0x51	0x31	0x03
2				0x30	

4. CEC : 0x54

	START	DFT	CEC	ON / OFF	END
1	0x02	0x1C	0x54	0x31	0x03
2				0x30	

5. ARC : 0x55

	START	DFT	ARC	Ch 1~4	ON / OFF	END
1	0x02	0x1C	0x55	0x31	0x31	0x03
2				0x32		
3				0x33		
4				0x34		

3. Introduction

1. HDMI 2.0(HDCP 2.2) & MHL 2.0
 - ① Support HDMI 2.0Ver & HDCP 2.2Ver 4Port
 - ② Support HDMI 1.4Ver & MHL 2.0Ver 1Port
 - ③ Support ARC function(Chanel select 1~4)
2. TEST function
 - ① Support HDCP 2.2 & 1.4
 - ② Support EDID CHECK-PASS
 - ③ HDMI 1.4 ⇔ MHL 2.0 Switching
 - ④ Support ARC
3. Easy update with USB memory stick
 - ① Firmware & FPGA update with USB stick
 - ② Pattern & Time data update with USB stick
4. Various Pattern & Timing
 - ① Character, Color, Bar, Cross Hatch, Gray Scale and ETC
 - ② Max 3840x2160@60Hz



<Front>



<Rear>

4. Specification

1. MSHG-800PLUS Specification

Video Output	List	HDMI	MHL
	Compliant	HDMI Ver 2.0 HDMI Ver 1.4	MHL Ver 2.0
	Pixel Rate Range	HDMI 2.0 4Port : 25Mhz~600Mhz (3840x2160/60Hz) HDMI 1.4 1Port : 25Mhz~300Mhz (3840x2160/30Hz)	25Mhz ~148.5Mhz
	Available Timing	ANS/CEA-861-F(25~600MHz) VESA STANDARD 2008(25~300MHz)	480i,p/720p/1080i,p
	HDCP	HDCP 2.2(1.4)Ver 4Port	HDCP 1.4 1Port
	Sampling Mode	RGB 444, YCbCr 444, YCbCr 422, YCbCr 420	RGB 444, YCbCr444, YCbCr 422
	Data Bit	8, 10, 12 bit(25~300MHz)	8Bit
	Color Space	RGB, BT.601, BT.709, BT2020, xvYCC	
		MSHG-800PLUS Default	Available Spec. (needs conference)
Audio Output	Number of Channel	2Ch	8Ch
	Sample Rate	48Khz	32/44.1/48/88.2/96/176.4/192Khz
	Waveform	Sine Wave	
	Frequency Range	L 400Hz, R 1000Hz	20Hz~20KHz
	Level Range	18.0db(400mvrms)	0mV to 2.0V/ 100mV Step
	Special Control Mode	Fix	Fix, Sweep, Swap, Mute, ARC
Data Storage	Timing	Default Timing 1~999	User 1~500
	Pattern	Default Pattern 1~999	User 1~500
General Spec.	Power	AC 100~240VAC, 50/60Hz. 3.15A Fuse	
	Operating Conditions	Temperature0~40°C,80%Humidity,Non-Condensing	
	Dimension(WxLxH)	425x276x77 mm	
	Weight	4.12Kg	

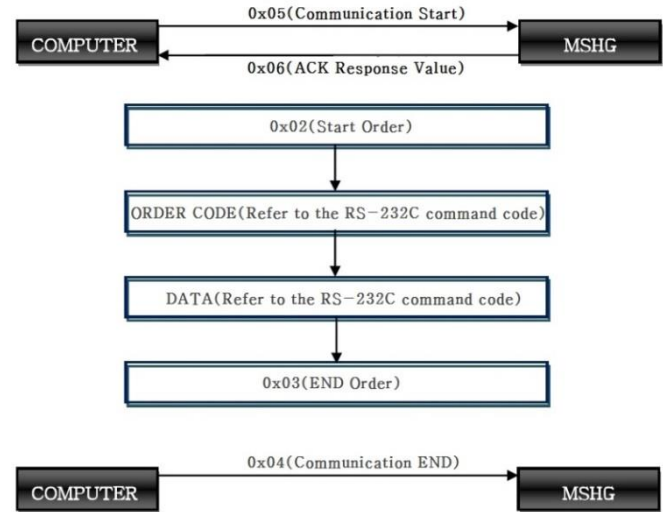
9. COMMAND CODE

※ Check before using command code

➤ Confirm User's computer and MSHG-800PLUS connection.



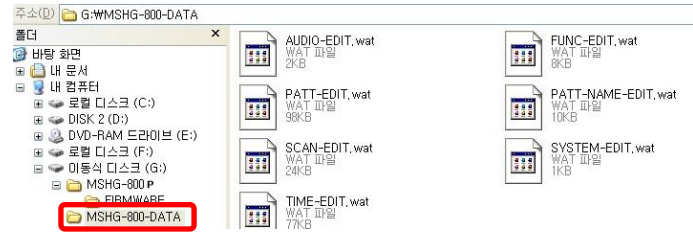
- Default settings of Baud Rate is 19200. (Data Bit = 8, Stop Bit = 1, Parity Bit = NONE)
- MASTER's option RS-232C cable made by PIN MAP no. 2 and 3 CROSS TYPE. So, recommend use MASTER's option cable.
- The order of RS-232C. Refer to the below Flow Chart RS-232C's communication process.



8. Update

③ Update from USB memory stick's Time Data(Pattern Data) to MSHG-800PLUS

a. Please un-zip and copy to USB memory stick. Copy to root folder and folder name is "MSHG-800-DATA"



- b. Connect USB memory stick to back panel's USB port of MSHG-800PLUS and turn on the MSHG-800PLUS.
- c. Push the Enter button while one second, it will be enter to File Control Mode.
- d. Push the Model Dn button, it will be enter to Time Data Download mode.
- e. Push the Pattern Up button for begin Data update.
- f. Image will be downloading.
- g. If download finished, MSHG-800PLUS will be showing "Please Power Turn Off and then ON !!" at the LCD screen, please turn off and on MSHG-800PLUS to finish data update.

④ Time Data(Pattern Data) back up to MSHG-800PLUS

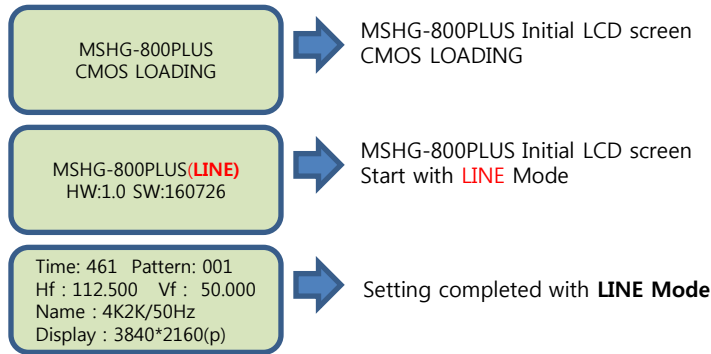
- a. Connect USB memory stick to back panel's USB port of MSHG-800PLUS. And turn on the MSHG-800PLUS.
- b. Push the Enter button while one second, it will be enter to file Control Mode.
- c. Push the Model Down button, it will be enter to Time Data Download.
- d. Push the Pattern Down dn button for begin Data back up.
- e. If download finished, MSHG-800PLUS will be showing "Please Power turn Off and then ON !!" at the LCD screen, please turn off and on MSHG-800PLUS to finish data back up.
- f. USB memory has new folder as "MSHG-800-DATA".

5. LINE Mode ← → DFT Mode setting

1. LINE Mode: CEC Line on, but do not checking to CEC Ping ACK

① LINE Mode(CEC Ping Check Off)

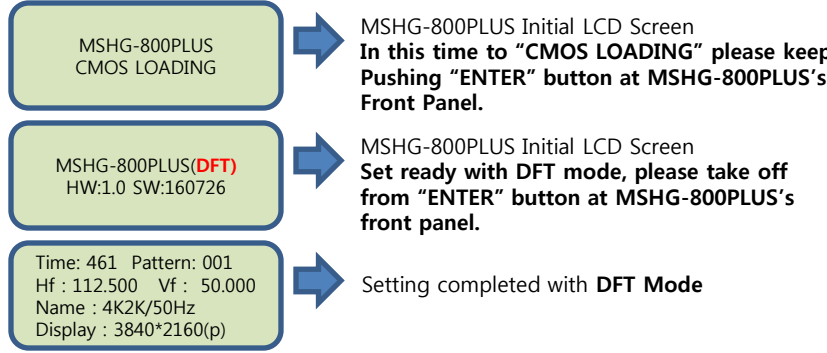
a. Front panel's Power Switch On.



2. DFT Mode: CEC Line on, checking to CEC Ping ACK. If CEC ping ACK fail, then MSHG-800PLUS's output will be stop(No Signal)

① DFT Mode(CEC Ping Check On)

a. Front panel's Power Switch On.

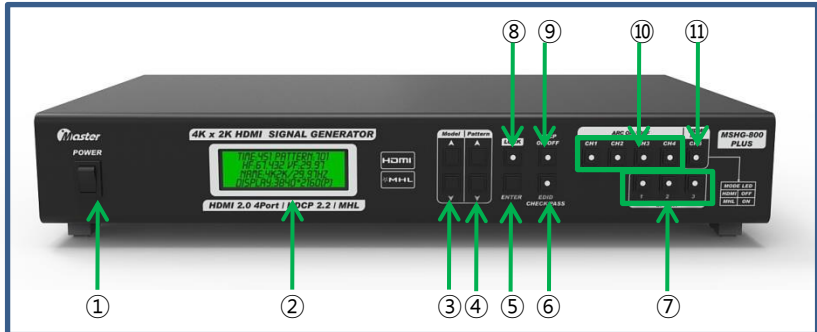


② When you set up the DFT Mode or LINE Mode, it will be maintained, even if you turn on and off the MSHG-800PLUS. If you want to change Line mode or DFT mode, you can set up as above.

6. Panel parts and their function

1. Front Panel

- ① Power Switch : Power ON/OFF switch
- ② LCD : Data information indication
- ③ Model : Timing Up/Down button
✓ And update select button
- ④ Pattern : Pattern Up/Down button
✓ And update select button
- ⑤ Enter : Selected item execute button
✓ And update select button
- ⑥ EDID : EDID CHECK/PASS button
- ⑦ OPTION : Not use
- ⑧ LOCK : Front panel button to lock button(press 2sec.)
✓ LED Off : Front panel button unlocking
✓ LED On : Front panel button locking
- ⑨ HDCP : Check to HDCP 1.4 & 2.2 button
✓ LED Off : HDCP check Pass
✓ LED On : HDCP 1.4 or HDCP 2.2 check
- ⑩ ARC : Audio Return Channel Test select 1~4Ch
- ⑪ MHL : Ch 5 MHL ↔ HDMI signal switching
✓ LED Off : Output to HDMI 1.4 signal
✓ LED On : Output to MHL 2.0 signal



8. Update

- ⑦ Update will be progress around three minute.
- ⑧ After three minute, it will be showing on the LCD screen. Please turn off the MSHG-800PLUS.

[Firmware Download]
 =====
 Please Power turn
 Off and then ON !!!

- ⑨ Please turn on the MSHG-800PLUS and check the program version.

2. Time Data(Pattern Data) Copy.

- ① Push the Enter button while one second, it will be enter to File Control Mode.

[File Control Mode]
 Firmware => M_Up Key
 Timedata => M_Dn Key

- ② Push the Model Down button, it will be enter to Time Data Download.

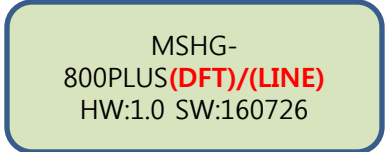
[TimeData Download]
 =====
 USB->800 : P_Up Key
 800->USB : P_Dn Key

- ✓ USB->800 : Push the Pattern Up button for update Time Data(Pattern Data) from USB to MSHG-800PLUS.
- ✓ 800->USB : Push the Pattern Dn button for back up Time Data(Pattern Data) from MSHG-800PLUS to USB memory stick.

8. Update

1. Firmware Update

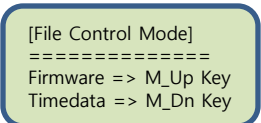
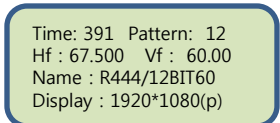
- ① When you turn on the MSHG-800PLUS, you can check the program version on the LCD screen.



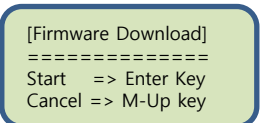
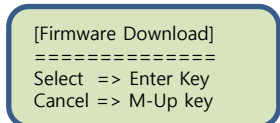
- ② Please make new folder at USB stick as below, and save to firmware. (MSHG-800P/FIRMWARE)



- ③ Connect to USB memory stick the MSHG-800PLUS's USB port. And turn on the MSHG-800PLUS.
- ④ Push the ENTER button while one second, it will be enter to File Control Mode.



- ⑤ Push the Model Up key, it will be enter to Firmware Download mode.

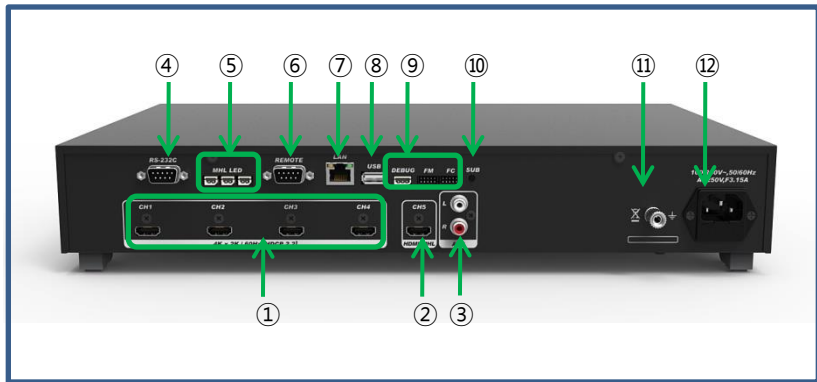


- ⑥ Push the Enter key two times to begin to firmware update.
 - ✓ If there are no USB memory stick or wrong firmware, it will be return to File Control Mode.

6. Panel parts and their function

2. Rear Panel

- ① HDMI 2.0Ver & HDCP 2.2Ver(ARC Audio) output 4Port
- ② HDMI 1.4Ver & MHL 2.0Ver & HDCP 1.4Ver output 1Port
- ③ Ch1~4 → ARC output port
- ④ RS-232C communication port
- ⑤ MHL 1,2,3 : Not use
- ⑥ Remote : MSRC-008L Remote port(optional)
- ⑦ LAN : Master Co., Ltd Debug port
- ⑧ USB : Firmware or Pattern & Timing update USB port
- ⑨ DEBUG, FM, FC : Master Co., Ltd Debug port
- ⑩ SUB : SAFETY MODE
 - ✓ If MSHG-800PLUS can not booting, please push the SUB button and turn on the MSHG-800PLUS. It will be enter to SAFETY MODE for re-update MSHG-800PLUS
- ⑪ FC Ground
- ⑫ Power Cable : AC 100~240VAC



7. How to Use

1. Model Change
 - ① Front panel's Model Up/Down button can be changed Timing(resolution).
 - ② Push the enter button, and it can be changed output the selected Timing(resolution).
 - ❖ Keep pressing the time button, time number will be change as 10 step.
2. Pattern Change
 - ① Front panel's Pattern Up/Down button can be changed Pattern without Enter button.
 - ❖ Keep pressing the pattern button, pattern number will be change as 10 step.
3. HDCP ON/OFF(High-bandwidth Digital Content Protection)
 - ① Port 1 ~ Port 4 : HDCP 2.2Ver check.
 - ② Port 5 : HDCP 1.4Ver check.
4. Lock Button : Front panel buttons locking & unlocking function.
 - ① LOCK LED on : buttons locking(press lock button 2sec.)
 - ② LOCK LED off : buttons unlocking(press lock button 2sec.)
5. EDID CHECK/PASS(Extended Display Identification Data)
 - ① EDID LED on : EDID check
 - ② EDID LED off : EDID pass
6. ARC SELECT(Audio Return Chanel)
 - ① ARC LED on : Converting digital audio to analog audio as L/R → ARC mode
 - ② ARC LED off : ARC pass → DVD mode

7. How to use

7. MHL ⇔ HDMI SELECT
 - ① MHL ⇔ HDMI SELECT
 - ✓ MHL LED On : MHL 2.0Ver Signal Output
 - ✓ MHL LED Off : HDMI 1.4Ver Signal Output