



HD Analog to HDMI, CVBS Converter

SC-MAC02U

User's Manual



Precaution and Safety Guidelines

The content of this guideline is to protect the safety of users and prevent property damage.

Please be sure to read this user's manual thoroughly and use the device correctly.

Warning *(If you do not keep any of the below guidelines, you may get seriously injured or cause somebody's death.)*

■ **Be sure to install the product after unplugging power cord. Also, do not use many power plugs at the same time.**

- It may cause abnormal heat, fire and electric shock.

■ **Do not leave the device at any place that water falls or splashes. Also, do not put anything full of water such as a flower vase on the device.**

- It may cause malfunction or fire if liquid goes into the device

■ **Do not bend the power cord by excessive force. Make sure the power cord is not crushed by heavy things.**

- It may cause fire.

■ **Do not open the lid arbitrarily as this device has high voltage part inside. Never disassemble, repair or modify it.**

- By abnormal working, it may cause fire, electric shock and personal injury.

■ **Do not install this product in places with high humidity, dust, or soot.**

- It may cause electric shock and fire.

■ **Do not tug at the power cord section or unplug the power plug with wet hands. If the power cord is loose, do not plug in.**

- There may be a risk of fire and electric shock.

■ **Always keep the location of the appliance clean during or after installation to prevent dust. Especially when cleaning the device, wipe it with dry towel and do not use water, thinner or organic solvent.**

- It may damage the case of this device, and cause malfunction or electric shock.

■ **Keep the device in a cool place where doesn't let direct sunlight. Keep it at a proper temperature and avoid heating appliances like candle or heater. Also, keep the equipment or tools away from places where people come and go.**

- It may cause fire.

■ **Pay attention to possible hazards in the workplace, such as wet floor, ungrounded power extension cables, old power cords and a lack of safety earth. Consult your place of purchase or professional if problems arise.**

- It may cause fire and electric shock.

■ **Keep the back of the product more than 15cm and the sides more than 5cm from the wall. If you install the product too close to the wall, it can cause the cable to be bend, compressed too hard or break, as various external input/output ports such as power cords protrude from the back of the product.**

- It may cause fire, electric shock and personal injury.

■ **Concerning the input voltage for operating this device, a voltage range must be within 10% of rated voltage, and the power outlet must be grounded. Also, do not use a heat source such as a hair dryer, iron and refrigerator to the same power unit.**

- It may cause abnormal fire or electric shock.

Caution (If you do not keep any of the below guidelines, you may get injured or suffer property loss.)

- **Avoid installing near strong magnetic fields or radio waves and wireless devices such as radio or TV.**
 - Install in a place that is free from magnetic, radio, or excessive vibration.
- **Proper ambient temperature and humidity are recommended.**
 - Avoid extremely high temperatures(over 50°C) or low(below -10°C), and humid conditions.
- **Do not place heavy items on the product or let foreign substances enter inside the device.**
 - It may cause failure.
- **Install in well ventilated place, and avoid direct sunlight or heat appliance.**
- **Install at a flat and stable place. Do not use an upright or slanted position.**
 - It may not operate properly or might be dangerous due to the fall of the device.
- **Strong shock or vibration may cause device failure. Be careful when using the device.**
 - Install in a place without severe vibration.
- **If you notice any unusual noise or smell, unplug the power supply immediately and contact the place of purchase or service center.**
 - There may be a risk of fire and electric shock.
- **Rotate the air properly in the system operating room and secure the cover of the main body.**
 - It may be the cause of failure by environmental factors.
- **Refer the device to the service center and get regular checkup to maintain the performance of the system.**
 - We are not responsible for any damages caused by user's carelessness.
- **Place the power plug in a location that is easy to operate.**
 - If a failure of the product occurred, the power plug must be unplugged to power down completely. The power button on the main body does not completely disconnect power.
- **The transmission medium(CABLE) must be a coaxial cable**
- **Do not use this device in close proximity to a device that produces strong waves such as radio set(TRANSEIVER, Walkie-talkie, etc.) or repeater. It may affect video signal, cause disorders such as noise or crack on the screen, or cause malfunction to the product.**
- **Transmission distance may vary depending on the type of coaxial cable.**
- **Disconnect the power plug with care during thunder and lightning.**
- **Refer to the user's manual for problems or questions besides the above. Contact our service center if you need assistance from a professional technician.**
- **To extend or terminate the coaxial cables, the connection must be as the following way.**
 - BNC-M(Male) - BNC-JJ - BNC-M(Male): BNC Connection
- **The joint part of the connectors must be insulated to prevent the metal part from exposure.**



1. Introduction

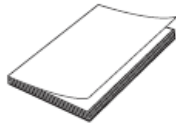
1-1. Overview

SC-MAC02U is a converter that converts HD Analog video signal into HDMI and CVBS signals. Through loop output port, the input video can be output without converting signal. Also, you can control the camera by connecting DVR or splitter to loop output port to send UCC signal to camera side.

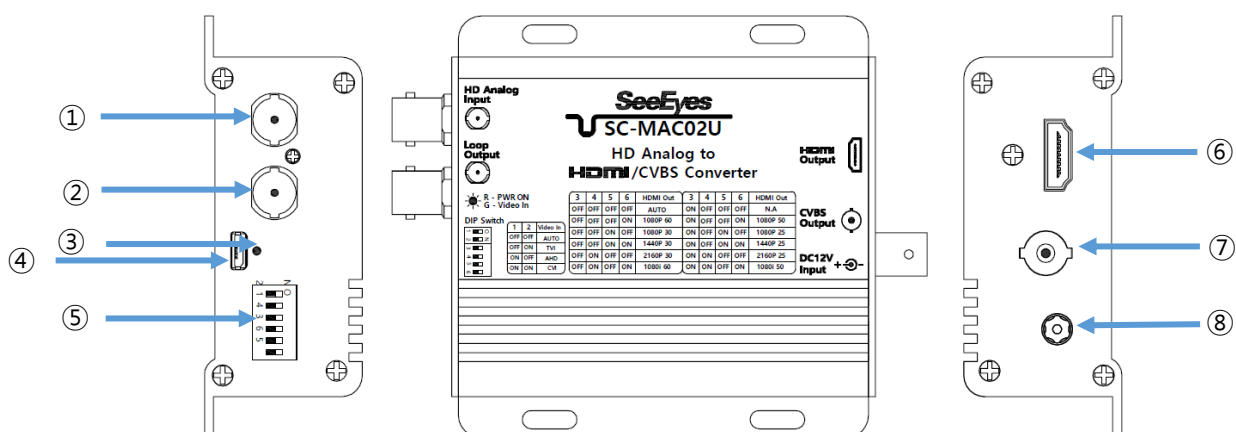
1-2. Features

- Converts HD Analog signal into HDMI, loop out and CVBS
- Camera control through loop output port
- Built-in surge protection circuit

2. Components

SC-MAC02U	User's Manual	DC 12V Adapter (Optional)
		

3. Product Parts & Functions



- ① **HD Analog Input** : HD Analog camera connection port.
- ② **Loop Output** : Video output port and UTC communication port.
- ③ **STATE LED** : LED to display video signal input status and power input information.

LED Color	State	Description
Red	ON	Power input
	OFF	No power input
Green	ON	Signal input

- ④ **Program update port (for manufacturer only)** : Port to update the product.
- ⑤ **Switch Setting** : Switch to select HD Analog input video and HDMI output resolution.
- ⑥ **HDMI Output** : HDMI video output port.
- ⑦ **CVBS Output** : Port to convert HDMI output video to CVBS video.
- ⑧ **DC 12V Input** : DC 12V power input port.

4. Switch Setting

DIP Switch			1	2	VIDEO In	3	4	5	6	HDMI Out	3	4	5	6	HDMI Out
1	☐	☐	OFF	OFF	AUTO	OFF	OFF	OFF	OFF	AUTO	ON	OFF	OFF	OFF	N.A
2	☐	☐	OFF	OFF	AUTO	OFF	OFF	OFF	ON	1080P 60	ON	OFF	OFF	ON	1080P 50
3	☐	☐	OFF	ON	TVI	OFF	OFF	ON	OFF	1080P 30	ON	OFF	ON	OFF	1080P 25
4	☐	☐	ON	OFF	AHD	OFF	OFF	ON	ON	1440P 30	ON	OFF	ON	ON	1440P 25
5	☐	☐	ON	OFF	AHD	OFF	ON	OFF	OFF	2160P 30	ON	ON	OFF	OFF	2160P 25
6	☐	☐	ON	ON	CVI	OFF	ON	OFF	ON	1080i 60	ON	ON	OFF	ON	1080i 50

4-1. Video Input Type Setting

Dip switch #1, #2 : Set the type of input video signal.

1) Auto Mode : Automatically set the type of input video.

Caution #1) Auto mode takes a little longer to display videos than Manual mode, since Auto mode searches video signal by type.

Caution #2) In Auto mode, the video may not be displayed properly.

In this case, change the mode into Manual.

2) Manual Mode (TVI, CVI, AHD Mode) : Manually set the type of input video.

Caution) If the input video type is different with the video type selected with dip switch, the video will not displayed properly. In this case, change the mode same as input video type, or change the mode into Auto.

3) In case of CVBS(NTSC, PAL) input, set to Auto mode.

4-2. Video Output Resolution Setting

With the dip switch #3~6 on the side of this product, It is possible to adjust HDMI output resolution to the resolution that you would like to display regardless of the input resolution. CVBS output is automatically displayed as NTSC or PAL according to the output resolution selected with the dip switch.

1) Select HDMI output resolution with dip switch #4~6.

2) Switch #3 adjusts the output resolution selected with switch #4~6 as NTSC or PAL.

Example) #3 : OFF, #4 : OFF, #5 : OFF, #6 : ON => 1080P 60

#3 : ON, #4 : OFF, #5 : OFF, #6 : ON => 1080P 50

3) You can select between two types of Auto modes.

a) Auto Mode with scaler

Set dip switch #3~6 as OFF.

Auto Mode with scaler automatically changes the HDMI output resolution according to the input resolution.

Example) If Auto Mode (scaler) is selected, the output resolution is changed as follows:

- If input resolution is CVBS, HD or FHD, the output resolution is FHD.
- If input resolution is 3MP, 4MP or 5MP, the output resolution is 4MP.
- If input resolution is 4K, the output resolution is 4K.

b) Auto Mode without scaler

Set dip switch #3 as ON, and #4~6 as OFF.

Auto Mode without scaler outputs as a higher resolution than the input resolution.

Example) Input resolution : 2048x1536(3MP18)

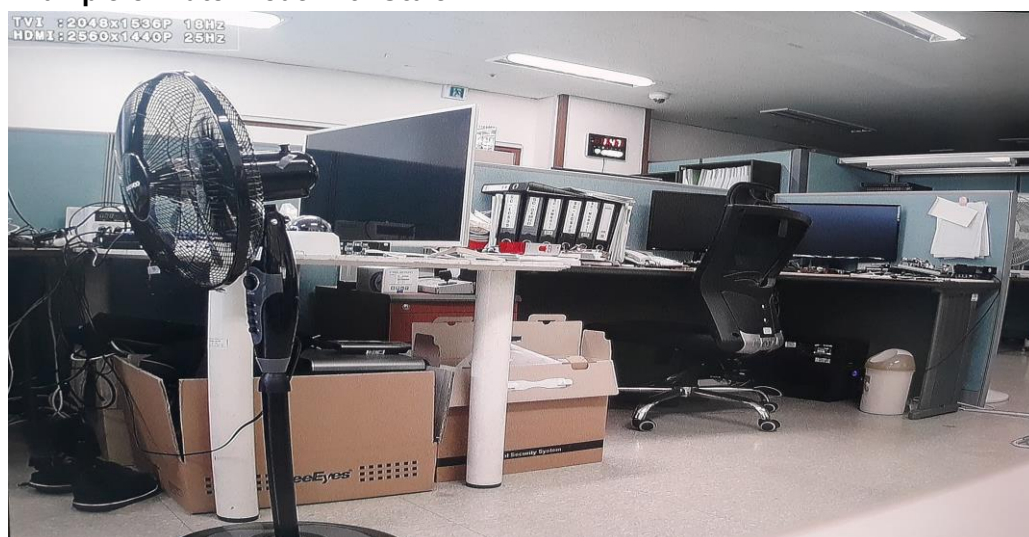
Output resolution : 8MP 25(3840x2160)

→ The different between input and output image may occur as the scaler is not used.

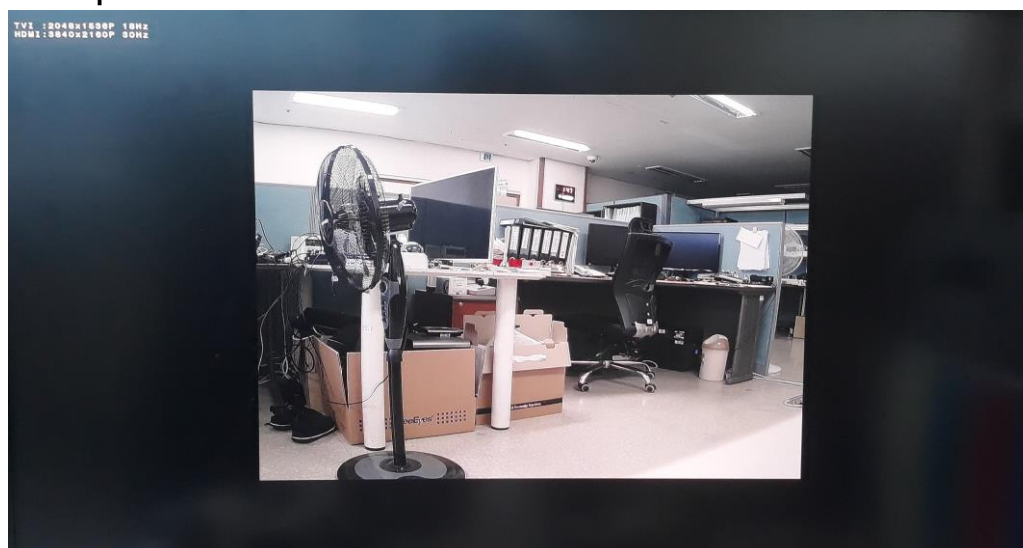
The different part is output as a black screen.

→ 8MP 25 resolution is used because the vertical line of 3MP 18 (1536) is higher than 4MP 25 (1440), even though 4MP 25 (2560x1440) is also a higher resolution than 3MP 18.

<Example of Auto Mode with Scaler>



<Example of Auto Mode without Scaler >



4-3. Video Information Display

When a video is input, the information of input video and HDMI output are displayed on the upper left of the HDMI screen.

The first line indicates the type and resolution of the input video, and the second line indicates the HDMI output resolution.

<Example of Display>

TVI : 2048x1536P 18Hz
HDMI:2560x1440P 30Hz

Video information is displayed for about 30 seconds.

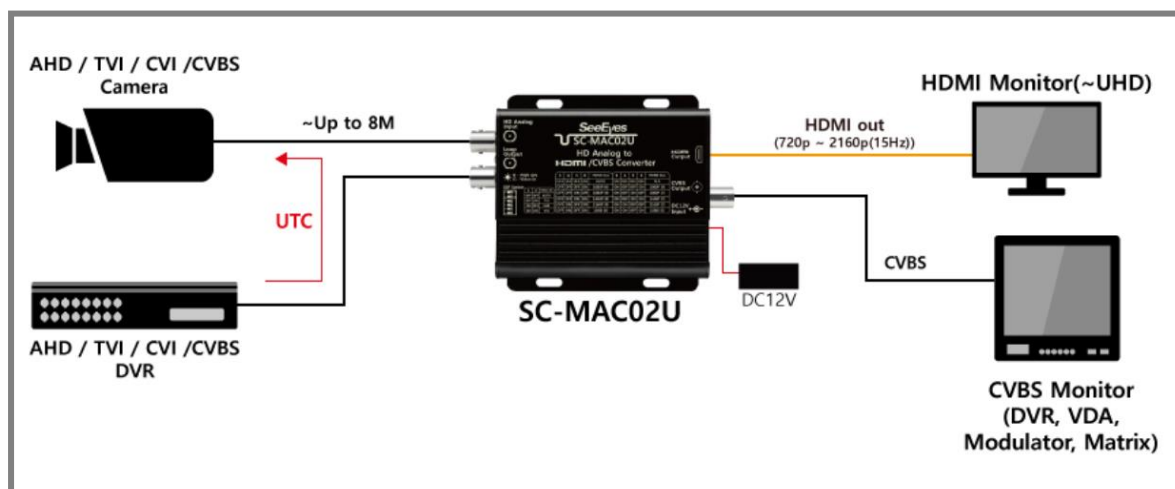
This information is displayed on the screen after recognizing the video when the input video is turned off/on or the output resolution is changed.

Caution) In other modes except Auto Mode, the video information is displayed in the video mode set by switch #1 and #2 regardless of input video.

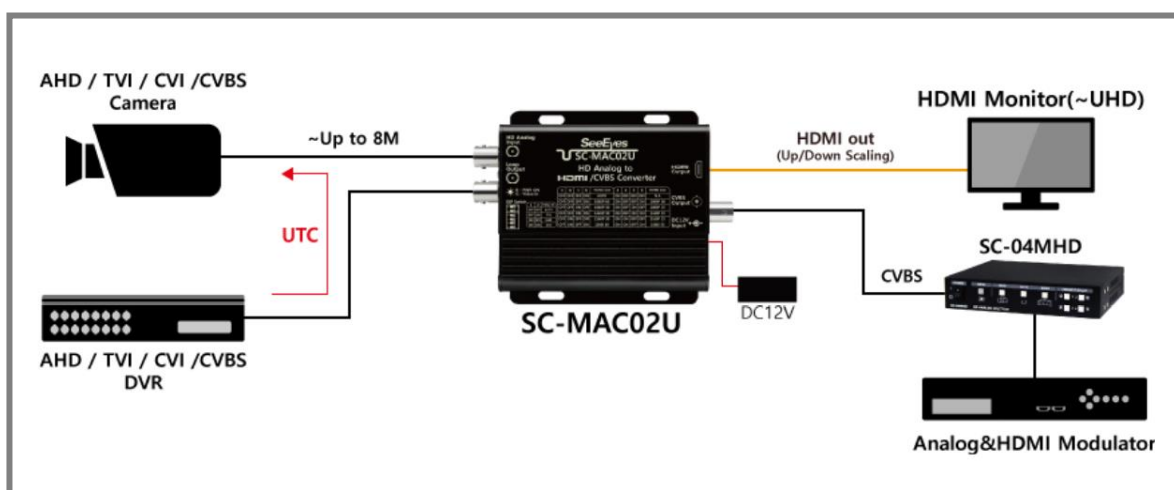
Example) Even if you input TVI video, the video information is displayed in AHD when the dip switch setting is set as AHD.

5. Connection Diagrams

5-1. Basic Connection



5-2. Connection with Quad Splitter (SC-04MHD)



- ※ Cable transmission distance may vary depending on specifications of camera, DVR, etc.
- ※ As AHD, TVI, CVI cameras are not standardized in signal format, the video may not be output properly or UTC control may not work properly depending on the manufacturer.

6. Transmission Distance

6-1. Video Transmission Distance (Example)

• RG-59 Coax. Cable

CAM Out - DVR In	CAM Out - HD Analog In	Loop Out - DVR In	SD/CVBS Out
300m	100m	200m	100m
	150m	150m	100m
	200m	100m	100m
	300m	1m	100m

• RG-6 Coax. Cable

CAM Out -DVR In	CAM Out - HD Analog In	Loop Out - DVR In	SD/CVBS Out
500m	300m	200m	200m
	350m	150m	200m
	400m	100m	200m
	500m	1m	200m

※ Cable transmission distance may vary depending on the specifications of the camera, DVR, etc.

Above transmission distance is based on 2MP camera. In case of cameras over 4MP resolution, the transmission distance may be decreased compared to 2MP camera.

※ Even the cable length is same, the video quality and UTC transmission distance may vary depending on the resolution of the input video.

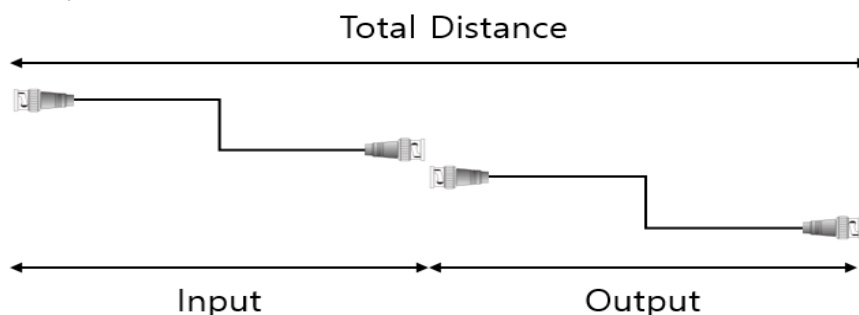
※ Total distance

= (Distance from camera to HD Analog input port) + (Distance from Loop output port to DVR)

It is recommended to use HD Analog input distance and Loop output distance within total transmission distance.

※ CVBS signal does not support UTC.

※ Example for Transmission Distance



7. Specifications

MODEL		SC-MAC02U
HD Analog Input		- SD/CVBS : NTSC, PAL - AHD : 720P25/30Hz, 1080P25/30Hz, 4MP15/25/30Hz, 5MP12/20Hz, 8MP12/15Hz - TVI : 720P25/30Hz, 1080P25/30Hz, 3MP18Hz, 4MP15/25/30Hz, 5MP12/20Hz, 8MP12/15Hz - CVI : 720P25/30Hz, 1080P25/30Hz, 4MP25/30Hz, 8MP12/15Hz
Loop Output Resolution		Same as input
HDMI Output Resolution		- 1080P25Hz, 1080P30Hz, 1080P50Hz, 1080P60Hz, 1080i50Hz, 1080i60Hz - 1440P25Hz, 1440P30Hz - 2160P25Hz, 2160P30Hz
SD/CVBS Output Resolution		NTSC, PAL
In/Output Transmission Distance	HD-Analog In/Out	Max. 400m over RG-59 (200m/20Ω, in case of 2MP camera) Max. 600m over RG-6 (300m/12Ω, in case of 2MP camera)
	HDMI Out	HDMI Cable 3m
	SD/CVBS Out	1Vp-p (75Ω Termination λ), 3C-2V Max. 100m)
Power Input / Power Consumption		DC 12V / 180mA (Max.)
Connection Port	HD Analog Input	BNC-F 75Ω
	Loop Output	BNC-F 75Ω
	HDMI Output	A Type
	SD/CVBS Output	BNC-F 75Ω
Switch	HD Analog Input	#1,2 (Select HD Analog input)
	HDMI Output	#3,4,5,6 (Select HDMI output resolution)
LED	RED	Power ON
	GREEN	Signal input ON
Temperature / Humidity		-10°C ~ +50°C / 0 ~ 80%
Case Body / Weight		Aluminum / 210g
Dimensions		93(W) x 34.7(D) x 92.5(H) mm

* 1920 x 1080i 60 HDMI resolution indicates 59.94i resolution.

60i resolution is an optional specification. Please consult with manufacturer to order it.

8. Trouble Shooting Method

Symptom	Checking Method
Power is not supplied.	• Check the adapter input state. • Check if the exclusive adapter (DC12V, over 500m) is used. • Check if the RED LED on the product is ON.
HDMI video is not displayed.	• Check if the GREEN LED on the product is ON. • Check if the input resolution is supported by the product. • Check the HDMI cable connection state. • Check if the resolution is supported by your monitor. • Check the length and performance of HDMI cable.
SD/CVBS is not displayed.	• Check if the GREEN LED on the product is ON. • Check if the input resolution is supported by the product. • Check the BNC connection state. • Check if the resolution is supported by your monitor. • Check the length and performance of BNC cable.
Video is not clear.	• Check if the cable is properly connected. • Check the cable connection state (length, type). • Check if the camera is compatible with DVR. • Check if the switch setting is properly done.
Camera control does not work.	• Check if the camera is compatible with DVR.

9. Warranty Certificate

Product No.		
Model No.		
Date of Purchase		
Place of Purchase		
Purchaser	Name	
	Address & Contact No.	
Distributor	Name	
	Address & Contact No.	
Warranty Period	Two(2) years from the date of purchase	

Any failure that occurs in the normal use for only two years after purchase will be repaired free of charge.

Contact the phone number listed on the user's manual for repair.

When reporting the failure, please inform the model name and condition of the product accurately. It is convenient to know the name and department of the person in charge.

Please check this user's manual again before reporting the failure.

Product shapes and circuits are subject to change without notice to improve performance.

Faults following will be treated as a charge:

- **Failure by user's handling without care**
- **Not connecting the rated power**
- **Disassembled or repaired arbitrarily by user**
- **When replacing consumables**
- **Failure caused by natural disaster(lightning, fire, flood, tsunami, etc.)**

[MEMO]

[MEMO]



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