IVC Installation Manual

P1.68	P2.10
LH**016**IVC***/**	LH**021**IVC***/**

Revised history

SAMSUNG

Revision	Year / Month / Day	
Draft	2023/06 /16	First created
1.0	2023/06/23	Ver 1.0
1.1	2023/07/20	Update Caution Guide (p30, p51)
1.2	2023/07/27	Change SPACER-PET code (p30)
1.3	2023/08/03	Circuit, S-BOX Contents - Technical Sales Request Update (Connection, typo)
1.4	2023/11/01	Add LED damage caution material
1.5	2023/12/05	Add precaution for iron dust and LED damage materials

Dehumidification Guide - In use

This is something that the customer who runs the screen should recognize, so please print it out by the installer and deliver it to the customer (user).

- If moisture penetrates the LED device, a short circuit in the device may occur in the long term, resulting in a line-type error.
- Please note below to keep the product in the best condition during installation.
  - When installing the product, dehumidify if any of the following conditions are met, and never turn on the screen before dehumidification.
    - When air is introduced due to damage to vacuum packaging;
    - Installation environment is out of room temperature 0~40 degrees and humidity 10~80%
    - Even if the installation environment is satisfied, the vacuum packaging is dismantled and a week has elapsed.
    - Even if the vacuum packaging is not unwrapped, if it is 6 months after manufacturing
    - Volatile products such as oil paint and thinner are used around the installation site (Detailed information can be found in 'Product information and installation precautions'.)
    - When installing a screen that requires dehumidification, you must follow the installation method on the next page

Dehumidification Guide - In use

This is something that the customer who runs the screen should recognize, so please print it out by the installer and deliver it to the customer (user).

- Installation when dehumidification is required

※ Do not play or use other content before the instructions on the next page are completed

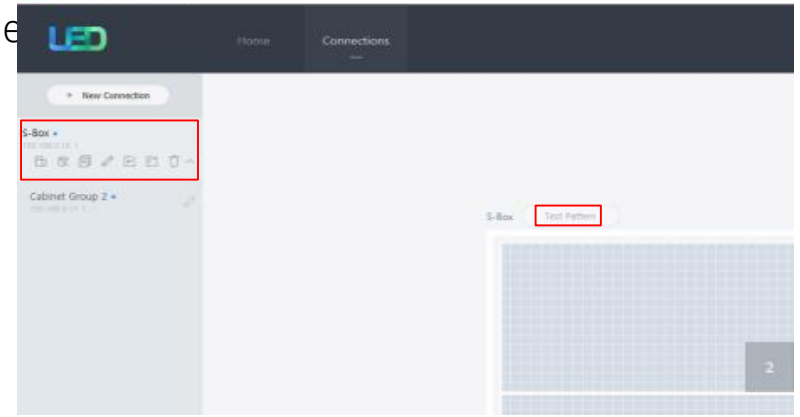
※ In humid areas, it is effective to use a dehumidifier to reduce moisture

(When the night air conditioner does not work, moisture increases, which can be a factor in line effect.)

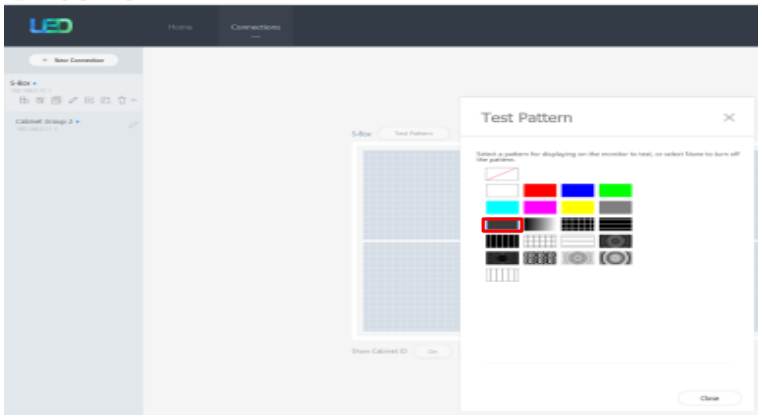
※ Please make sure that the cold air of the air conditioner does not directly touch the screen

※ If you use a temperature / humidity meter during the installation period, you can analyze the cause in case of a problem.

1. Check the cabinet with a darker monochromatic pattern (W/R/G/B) and turn off the cabinet.
(Inspection of each pattern should be within 30 seconds, and for more information, refer to screen che



① After selecting S-Box, run Test Pattern



② Run a darker gray pattern among patterns

2. When installing the cabinet, connect the S-box and run a specific pattern on the LSM.
(If a different pattern is used, it may be a cause of line defect.)

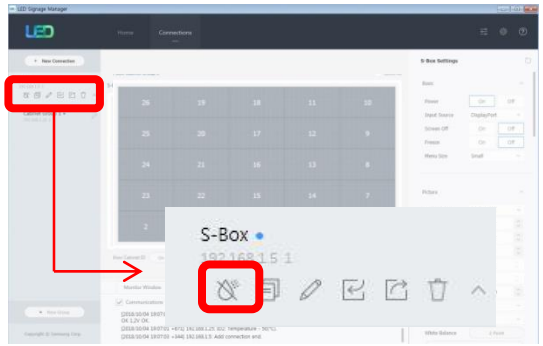
Dehumidification Guide – in use

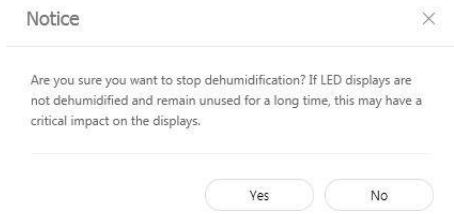
This is something that the customer who runs the screen should recognize, so please print it out by the installer and deliver it to the customer (user).

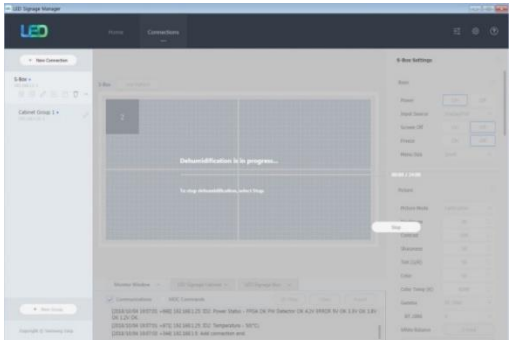
- Installation when dehumidification is required



3. During cabinet installation, play only the pattern in S-Box
   - Check that the pattern is played through the monitor connected to the S-Box service port.
   - Make sure that the pattern is played in the cabinet every time you connect the cabinet.
   - You can check if the data cable is connected correctly.
   - Before turning off the S-Box, please turn off the cabinet first.
   - Please check that this pattern is played in S-Box, and turn on cabinet.
4. When the cabinet installation is completed, please start dehumidifying 24hrs.







5. 24hr dehumidification is completed, and please correct the edge or module.

Dehumidification Guide – in use

This is something that the customer who runs the screen should recognize, so please print it out by the installer and deliver it to the customer (user).

- **In-device short circuits due to moisture can also occur during product use.**
- **During use, please note below to maintain product quality.**
  - If any of the following conditions are met during the operation of the product, please dehumidify it.
    - If the usage environment exceeds our product operation specifications (indoor temperature 40 degrees, humidity 80%
    - If the screen has not been used for more than 10 days even in an environment equivalent to our product operation specifications
    - If the surrounding environment exceeds our product operating specifications, we do not provide product warranty service.
  - If you are using the product, or if there is interior design or other construction at the place, dehumidify it according to the installation standards.
  - Even in the environment within our operating specifications, rapid inflow of hot and humid air from the outside may cause condensation on the surface of the product. If condensation occurs on the surface of the product, dry the moisture completely and dehumidify it.

Condensation due to overcooling

This is something that the customer who runs the screen should recognize, so please print it out by the installer and deliver it to the customer (user).

- **When the product surface is cooled too cold for ambient air temperature, or when hot and humid air meets the product surface while the surface is cooled, condensation can occur.**

  (cf : The principle of water forming on the surface of a glass with ice)

- **Condensation can cause product failure if the product is condensed. In this case, you can't get our service guarantee.**

Prevention of Condensation by A/C

This is something that the customer who runs the screen should recognize, so please print it out by the installer and deliver it to the customer (user).

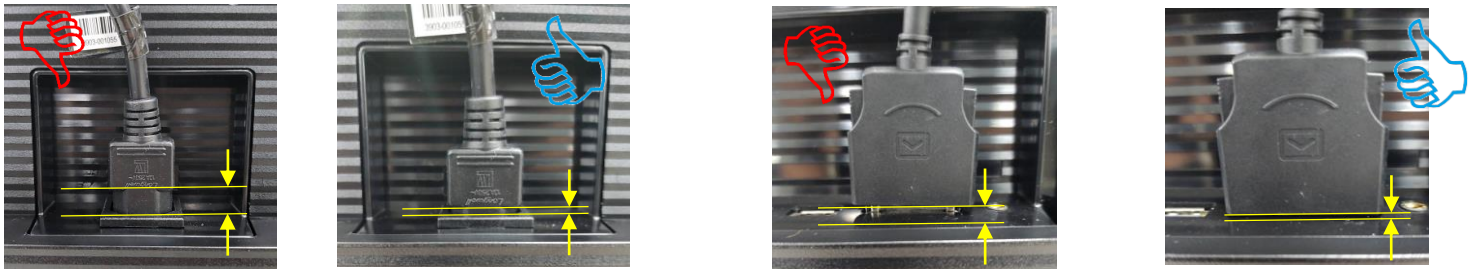
- **Please make sure that the cold wind doesn't directly touch the screen..**
  - When the cold wind from the screen surface A / C directly touches, condensation may occur depending on the ambient humidity and the temperature of the screen..
  - If the A/C and the screen are close, please install a wind screen as shown below to prevent condensation.



Required guide before installation

IMPORTANT

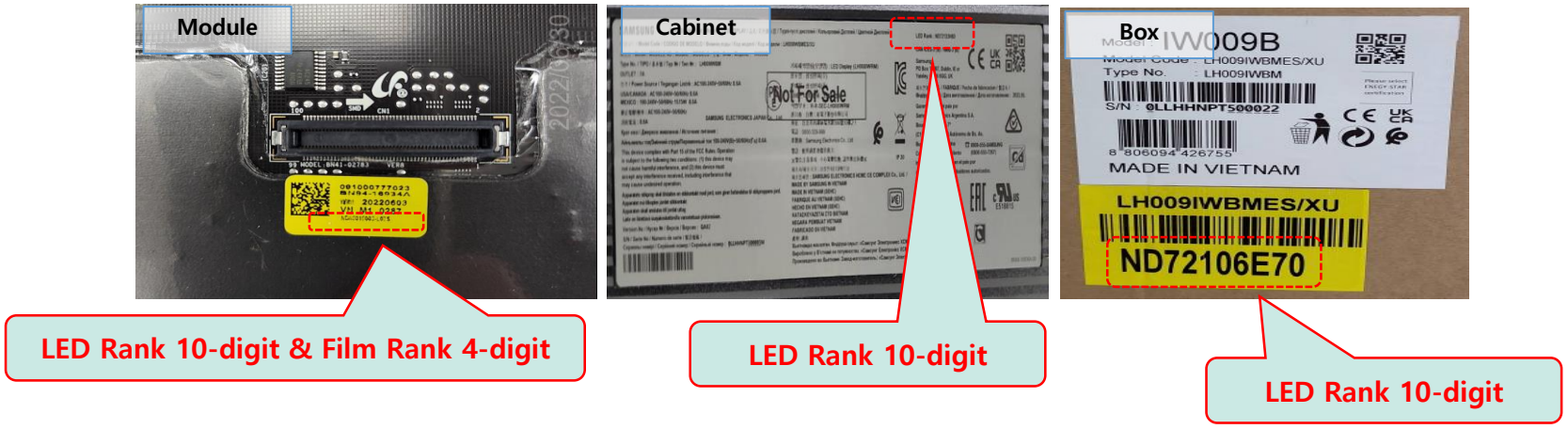
- The power cable and OCM cable must be firmly inserted.



- **When installing the cabinet (IVC), do not use the cabinet with different LED rank and film rank.**.

  Each cabinet has its own LED/Film Rank information It must be installed as a set of the same rank..

※ Module : LED Rank, Film Rank can be checked
Cabinet : LED Rank can be checked
Box : LED Rank can be checked



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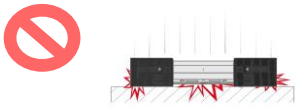
	Index	PAGE
1	Product information and handling precautions	11
2	Preparing for and Precautions for Installation	26
3	FRAME Installation	29
4	SET Installation	33
5	SERVICE	77
6	S-BOX Installation and Connection	131
7	LSM Configuration and Usage	163

- Precautions for Handling



[External impact, fall caution]
After removing the protective bracket, be careful not to impact or vibrate the product.



[LED damage caution]
Be careful not to shock or vibrate the product while lying down.



[Edge damage caution]
Be careful not to damage the edge of the set in particular.



[LED damage caution]
Never place the LED face in the bottom direction after removing the product protection bracket.



[LED damage cuation due to static electricity]
Do not touch the product without wearing antistatic gloves.



[Caution of LED damage due to metal foreign matter attachment]
Be careful not to get metal foreign substances on the front of the LED. When attaching a metal foreign object, separate the module and remove the foreign object using a magnet.

- Precautions for Handling



[Caution for LED Damage by Liquid]

When water or various chemicals touch the LED, the inside of the LED can be damaged

①**Water, dew, air conditioner condensate, sprayer, sweat, and saliva** do not directly contact the product.

- Handling should be taken care of so that sweating does not occur on the product. (※ Keep proper temperature so that you do not sweat)
- Be careful not to saliva the product, and it is recommended to wear a mask.
- When installing near the beach, be careful because a large amount of LEDs can be defective due to salt water caused by sea breezes.
- Places where water can be reached, such as swimming pools and amusement parks, require special protection. (e.g. with waterproof glass for isolation)

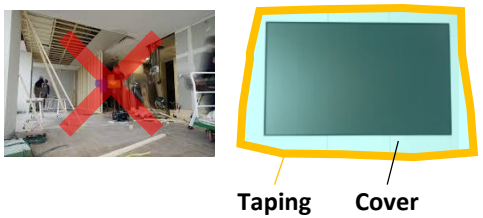
② The following substances and their steam should not cause problems in the product.

- **Detergents or disinfectants**: strong disinfectants such as carpet cleaning detergents, glass cleaners, halogen-based disinfectants (84 disinfectants, bleaching powders, chlorine-containing disinfectants, chlorine-containing antiseptics, etc.), and peroxide disinfectants (chlorine dioxide, hydrogen peroxide, peracetic acid, etc.)
  (※ When cleaning floors or walls with detergent or water, it is recommended to install a shield so that it does not touch the product)
- **Various chemicals**: surfur, paint, mosquito repellent, cinna, benzene, toluene, solvent, surfactant, HALOGEN (chlorine, bromine) and material containing same

③ spills liquid into the product;

- If there is water, turn off the product immediately, dry it for more than a day, and then run dehumidification mode for removing moisture inside the LED
- If there is no liquid other than water, remove it with alcohol and run dehumidification mode.

- Precautions for Handling



[Precautions on Construction]

① If the product is installed at the construction site, the product must be installed after construction and cleaning are completed.

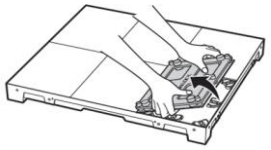
② If the construction is inevitable in the space where the product is installed, take the following measures.

- Seal and protect the entire product so that it is not exposed to dust and liquids. Install the shield so that it can be covered.
- Operate video or 100 gray scale image for more than 2 hours every day.
- After the completion of the construction, after removing enough dust, various liquids and steam, remove the shield and run dehumidification mode

- Precautions for Handling



[PKG product surface dust]



[Module desorption]



[Antistatic brush / Vacuum cleaner]



[Cleaning direction]

[Installation precautions (Metal foreign body)]

- LED Signage products should not be installed where metal dust is generated.

. If there is metal dust in the air, metal dust may stick to the magnet position on the screen surface.

→ **Measures to prevent the inflow of metal dust** and screen dust removal are required.

. If you install it in a special place such as a railroad, subway station, train station, etc. where iron dust can occur, where there is a lot of other fine dust, where chemicals are used, where the temperature is too high or low, or where there is a lot of moisture, please be guided by the company.

- Metal dust removal

. Remove dust in the following order so that there is no damage to the module surface.

① Remove the module from the screen using a magnet jig.

② Cover the magnet with an antistatic cloth to remove metal dust first.

③ The residual foreign matter is turned over with the LED surface facing the floor, Clean using a soft antistatic brush.

④ Or it is cleaned using an antistatic brush + vacuum cleaner.

※ Risk of LED device damage when cleaning only in horizontal / vertical direction and diagonal direction

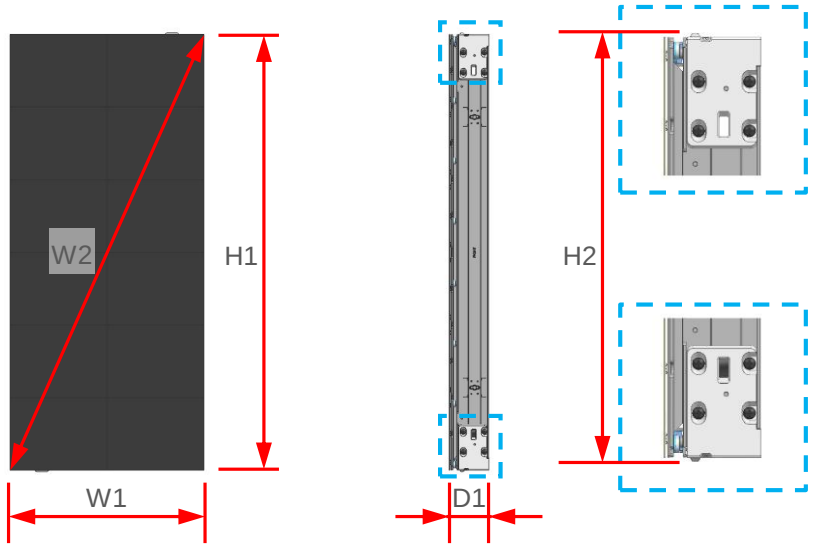
- SPECIFICATION

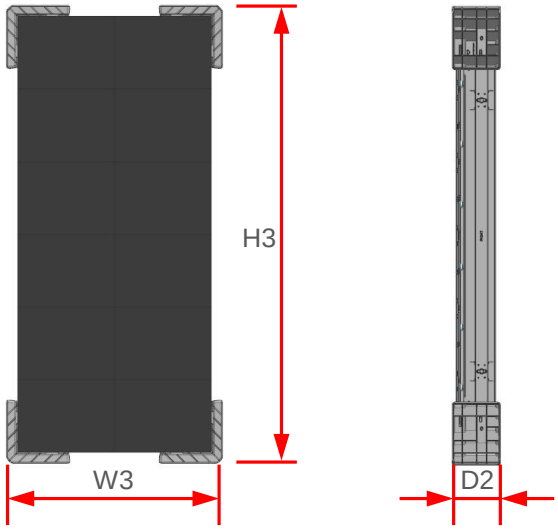
		Unit	IVC	
Model code		-	LH016IVCMVS/**	LH021IVCMVS/**
Pitch		mm	1.68	2.10
Brightness	**Max**	nit	1,500	1,500
Dimention (W × H × D)		mm	403.1 × 907.0 × 83.0	
		Inch	15.87 × 35.71 × 3.27	
Weight	**Set**	kg (lbs)	13.3 (29.3)	
	Packing	kg (lbs)	17.3 (38.1)	
	Hanging Kit	kg (lbs)	2.3 (5.1)	
	Stacking Kit	kg (lbs)	2.4 (5.3)	
Installation specification	**Flat**	-	○	
	Concave	-	○ (Max. 4˚)	
	Convex	-	×	
	Hanging	Max. row	10	
	Stacking	Max. row	15	
Module	**Array (Quantity)**	-	2 × 6 (12)	

- SPECIFICATION

		Unit	IVC	
Model Code			LH016IVC***/**	LH021IVC***/**
Basic	Pitch	mm	1.68	2.10
	LED Bin	nit	1,500	1,500
	Resolution	-	240 x 540	192x 432
	LED Type	-	Flip-chip, CoB	Flip-chip, CoB
Picture	Brightness	nit	1500 nit	1500 nit
	Contrast Ratio	-	31000 : 1	35000 : 1
	Bit Depth	bit	16	16
	Regeration	Hz	12288	12288
	Calibration	-	Module / Cabinet / Edge	
Module	Resolution	-	120 × 90	96 × 72
Power	Input Power	-	100~240 VAC, 50/60 Hz	100~240 VAC, 50/60 Hz
	Power Consumption (MAX)	W/Set	189	180
Operating	Operating Temperature	-	0℃~+40℃/10~80%RH	0℃~+40℃/10~80%RH
	IP Rating	-	N/A	N/A
Specification	Safety	-	60950-1	60950-1
	EMC	-	Class A	Class A

- DIMENSION (SET)

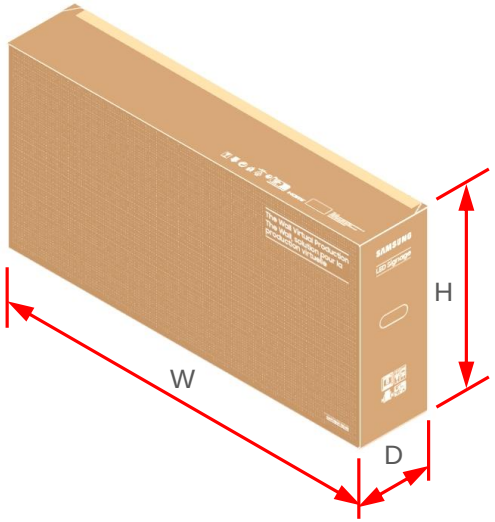




Without Protective materials				
	mm		inch	
W1	≒	403.1	≒	15.87
W2	≒	992.5	≒	39.1
H1	≒	907.0	≒	35.71
H2	≒	913.0	≒	35.94
D1	≒	83.0	≒	3.27

Including Protective materials				
	mm		inch	
W3	≒	449.1	≒	17.68
H3	≒	953.0	≒	37.52
D2	≒	98.8	≒	3.89

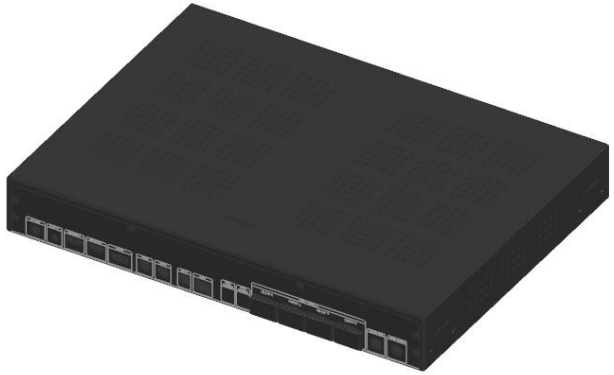
- DIMENSION (PACKAGING)



	mm	inch
W	≒ 1,044.0	≒ 41.10
H	≒ 533.0	≒ 20.98
D	≒ 204.0	≒ 8.03

- S-BOX / IG

S-BOX
MODEL CODE : SBB-CV4BPGS/**

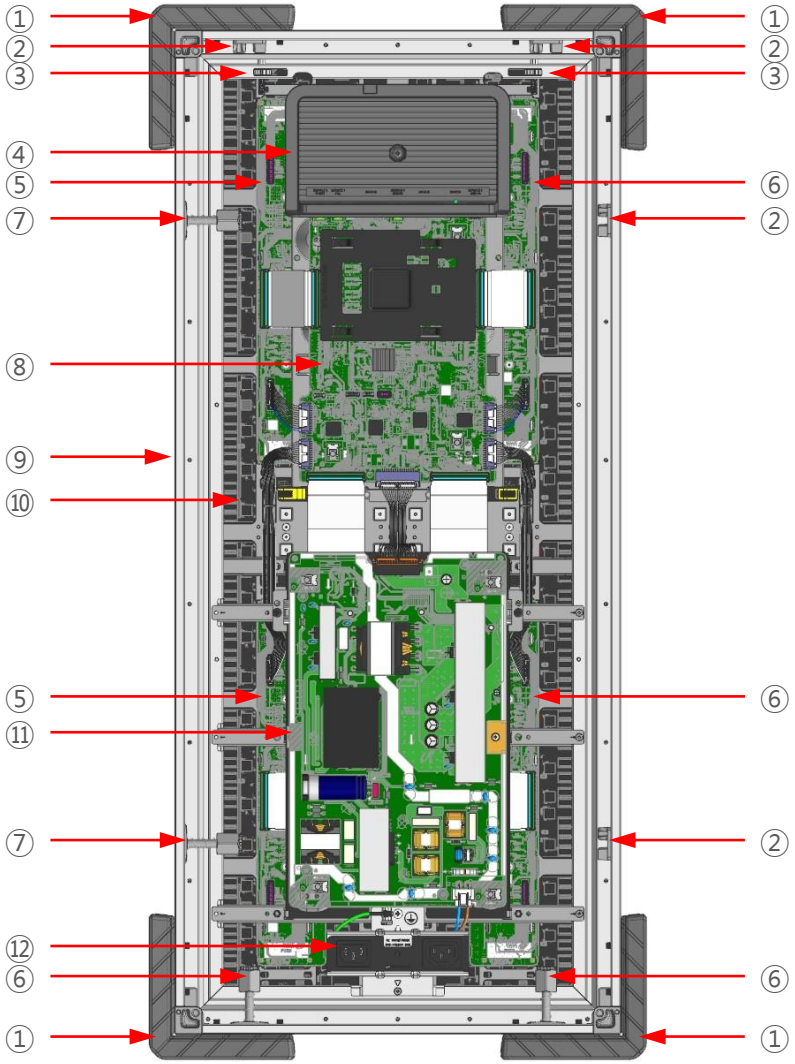


I/G (Interface Gender Card)



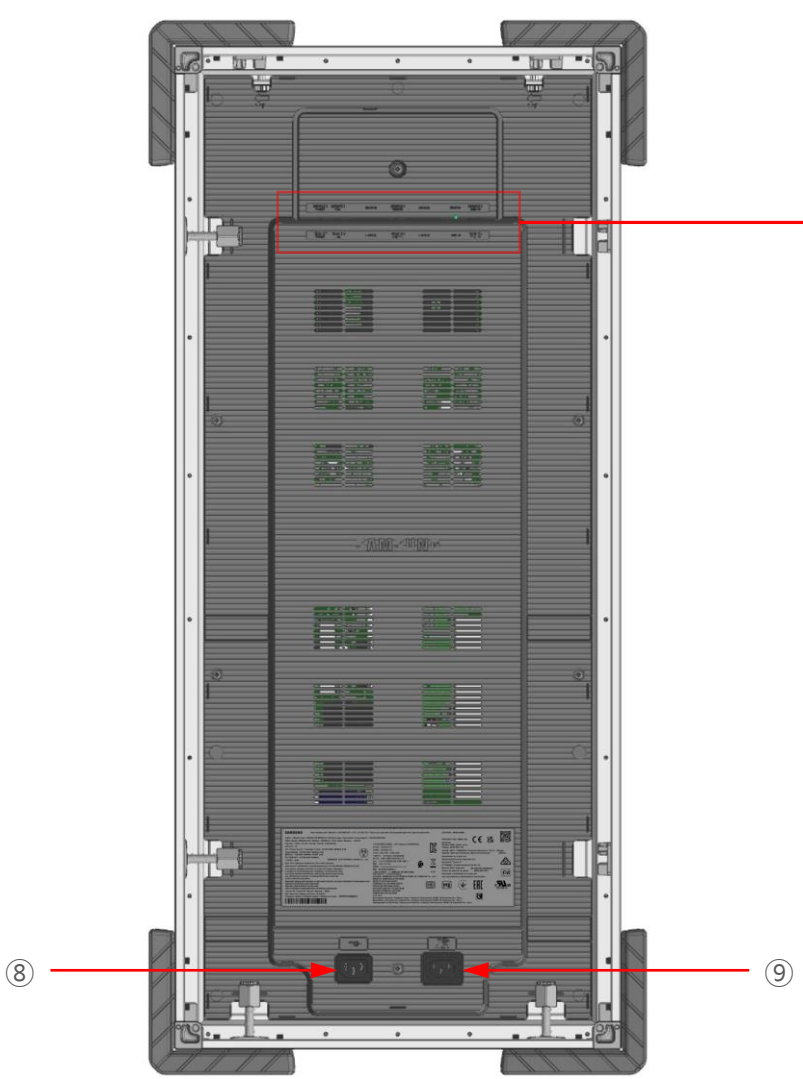
Item		SBB-CV4BPGS/**
Supported model		IFR/IEA, IWA-VP, IVC
SOC		Pontus-M
Front-end IC		PS196(DP)
FPGA		KU060, K200T
Max Screen Resolution		4k(3840x2160)
Connectivity	Input	HDMI(2), DP(1), USB(2)
	Audio Out	Optical (2CH, PCM only)
	Video Out	QSFP+ x4EA
Output Bit-depth (bit)		10bit (RGB 4:4:4)
Power		78W, DC 19V, 4.1A
OS		TIZEN 6.5
Magic Info		MagicINFO S10
Refresh Rate		60Hz
Sensor		Eco
IR		외장
LAN		RJ45
Standards		Class B
Working Temperature (℃)		0°C~40°C (32°F to 104°F)
Operation Humidity		10% ~ 80%

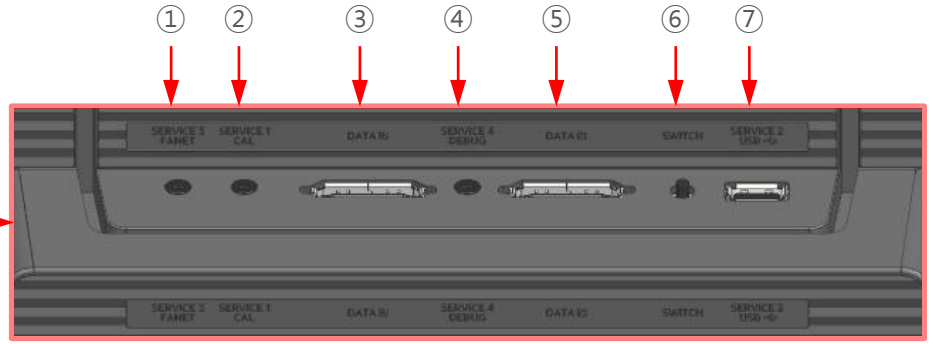
- SET Main Configuration



①	COVER CORNER
②	LATCH (FEMALE)
③	HEIGHT ADJUST NUT
④	COVER TERMINAL
⑤	BRIDGE BOARD LEFT
⑥	BRIDGE BOARD RIGHT
⑦	LATCH (MALE)
⑧	T-CON
⑨	FRAME
⑩	MODULE
⑪	SMPS
⑫	AC POWER

- SET Main Configuration



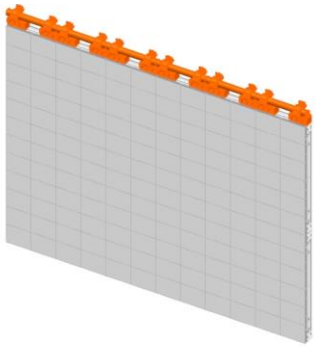


①	SERVICE 3 FANET
②	SERVICE 1 CAL
③	DATA IN
④	SERVICE 4 DEBUG
⑤	DATA OUT
⑥	SWITCH
⑦	SERVICE 2 USB
⑧	POWER IN
⑨	POWER OUT

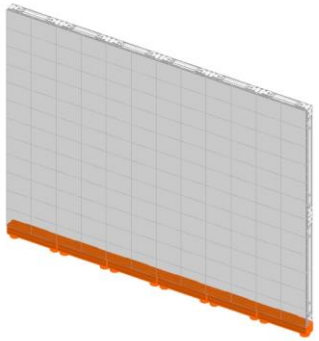
- Installation method / * CONVEX is not supported

[Note]
- FLAT + CONCAVE combination can be installed

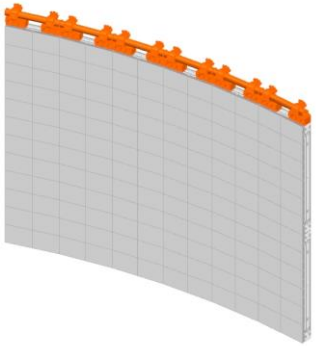
- HANGING / FLAT



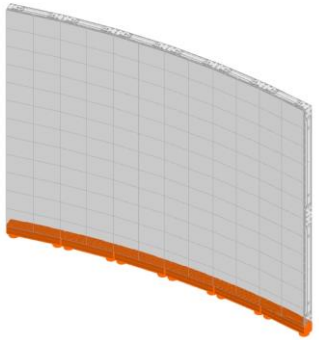
- STACKING / FLAT



- HANGING / CONCAVE



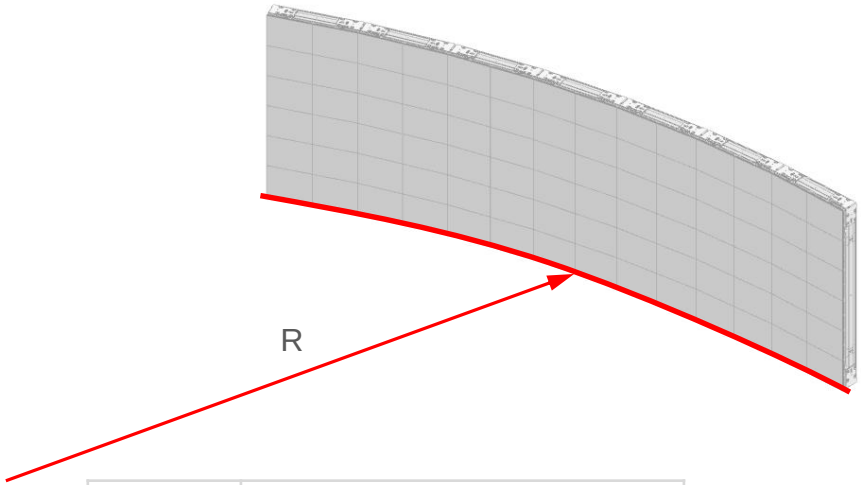
- STACKING / CONCAVE



- R (RADIUS) value by angle when installing CONCAVE / * CONVEX is not supported

[Note]

- 0 degrees / 1 degree / 2 degrees / 3 degrees / 4 degrees can be purchased separately (other angles need to be processed separately)

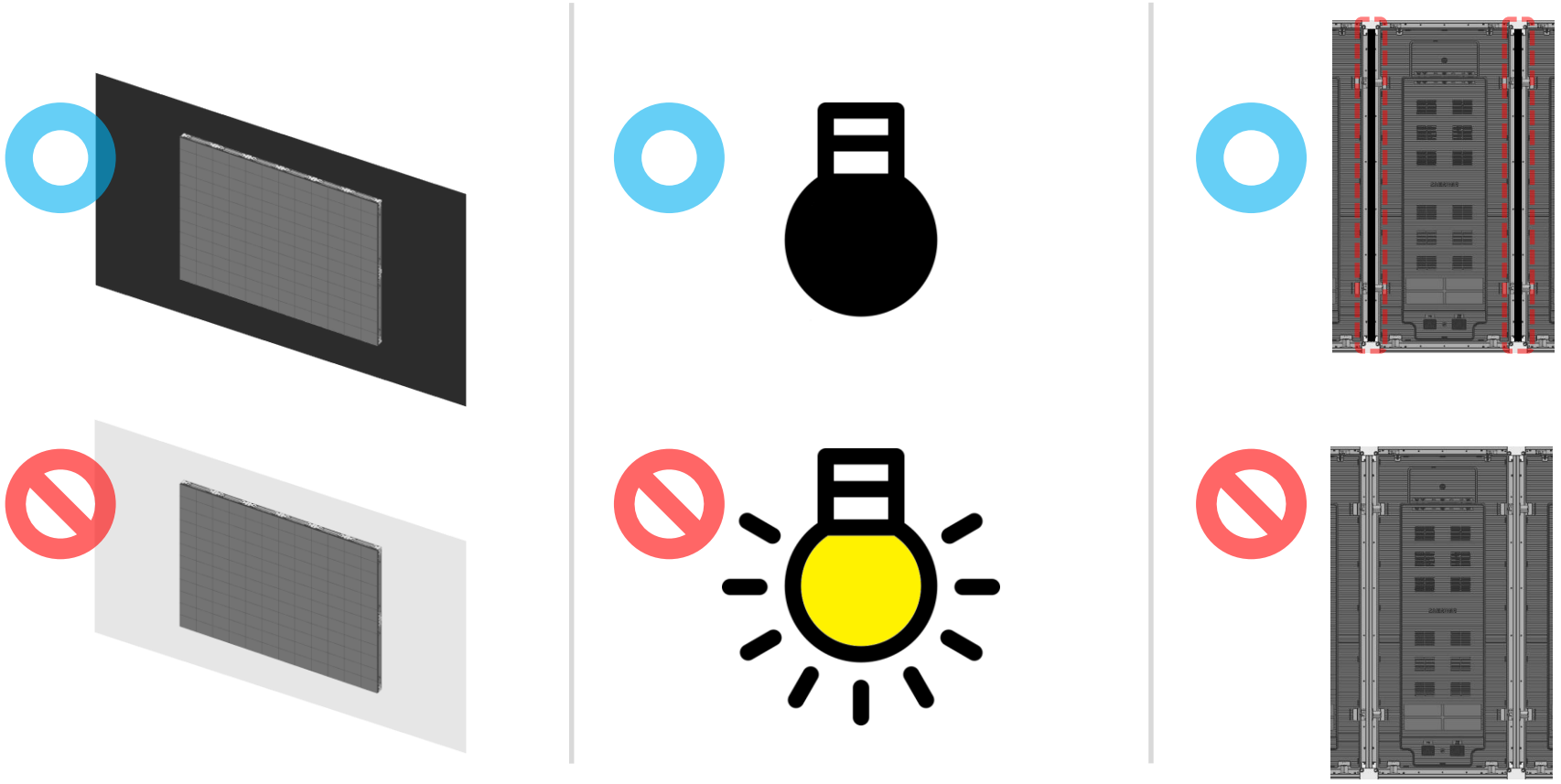


	Radius	
Degree	**mm**	**inch**
0°	-	-
1°	≒ 23,103	≒ 909.6
2°	≒ 11,551	≒ 454.8
3°	≒ 7,700	≒ 303.1
4°	≒ 5,774	≒ 227.3

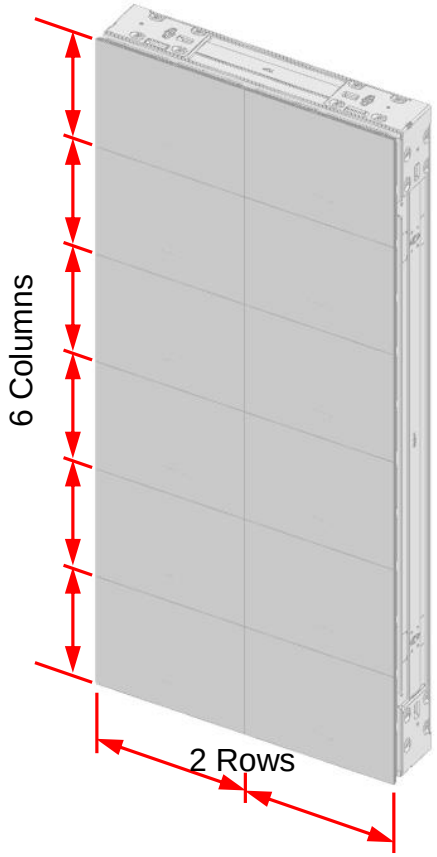
- Precautions for Product Installation

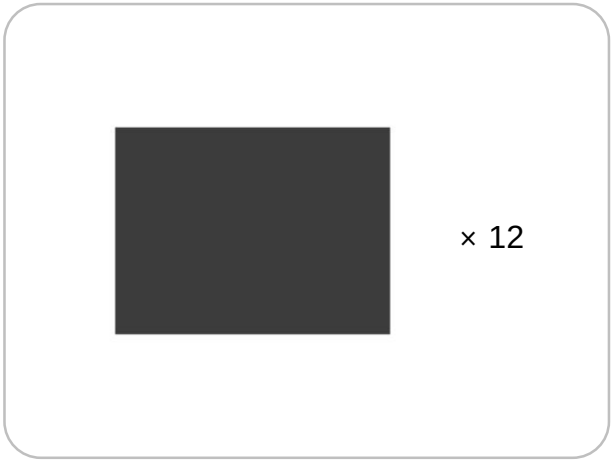
[Caution]

- Light leakage may occur through the gap in the SET connection, so finish the back wall of the SET with MATT BLACK.
- SET rear lighting should not work when using SCREEN
- Attach BLACK TAPE vertically to the FRAME boundary on the back of SET so that there is no light leakage.



- Module arrangement





2. Preparing for and Precautions for Installation

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- Basic tools and protective equipment for installation



CORDLESS DRIVER



SPANNER



WRENCH
(19 mm / 17 mm)



CROSS HEAD DRIVER
(TYPE : PH 1 / PH2)



CROSS RECESSED
HEAD BIT
(TYPE : PH 1 / PH 2)



SLOTTED DRIVER
(Φ 3 mm)



HEX BIT
(5 mm)



HEX WRENCH SET



BOX BEAM LEVEL



SUCTION CUP
VA82-01114A
[CY-WJCPVP]

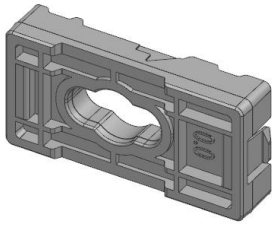


PROTECT GLOVES

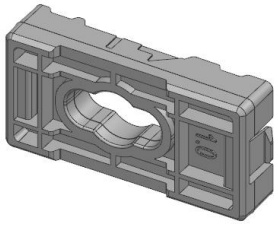
2. Preparing for and Precautions for Installation

SAMSUNG

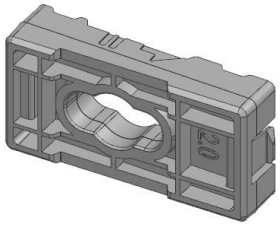
- Installation related materials / * to be purchased according to the installation environment



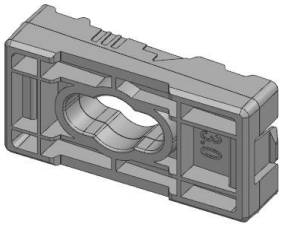
COVER-HOLDER (0º)
BN63-20736A
[VG-LBCA0SAV]



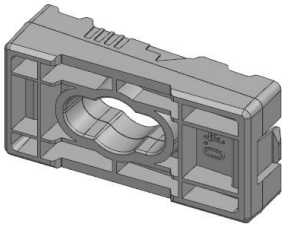
COVER-HOLDER (1º)
BN63-20736B
[VG-LBCA1SAV]



COVER-HOLDER (2º)
BN63-20736C
[VG-LBCA2SAV]



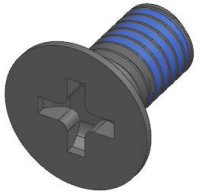
COVER-HOLDER (3º)
BN63-20736D
[VG-LBCA3SAV]



COVER-HOLDER (4º)
BN63-20736E
[VG-LBCA4SAV]



BRACKET-SUPPORT
BN61-19564A
[Included in VG-LFCH1SSV]
[Included in VG-LFCH1SHV]



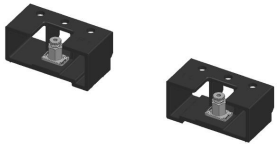
SCREW / M4 / L8
6001-003041
[Included in VG-LFCH1SSV]
[Included in VG-LFCH1SHV]



SCREW / M4 / L20
6009-002436
[Included in VG-LFCH1SSV]
[Included in VG-LFCH1SHV]



STACKING KIT
[VG-LFCH1SSV]



HANGING KIT
[VG-LFCH1SHV]

◆ Pre-prepare before installation

◇ Connect the power cable to the SET to check whether the LED is damaged or not and display the screen.

① After applying AC power, press the rear switch for 1 second to release the power standby mode. Ten seconds after NO VIDEO appears, press and remove the switch for more than 3 seconds.

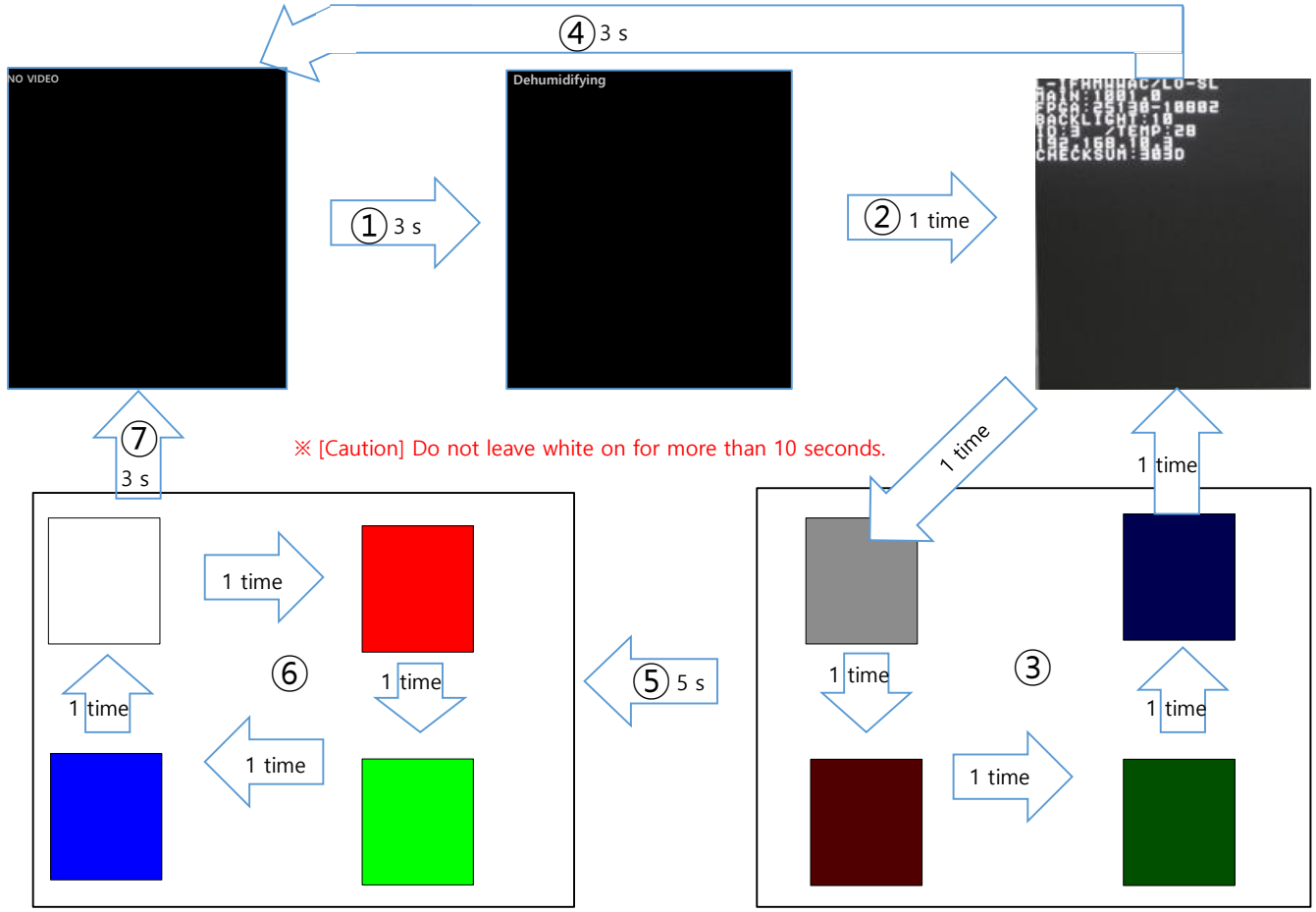
② On the Dehumidifying screen, if you press the switch again, the factory Info window appears. Whenever you press the switch in the factory Info window, it changes in the order of gray, dark red, dark green, and dark blue..

③ If you press and remove the switch from the factory Info window for more than 3 seconds, go to 'NO VIDEO'.

④ If a bright pattern is required, press and remove the switch in a dark pattern (gray, dark red, dark green, dark blue) for more than 3 seconds.

⑤ When changed to a bright pattern, each time you press the switch, it changes in the order of white, bright red, bright green, and bright blue..

⑥ If you press and remove the switch for more than 3 seconds in a bright pattern, go to 'NO VIDEO'.



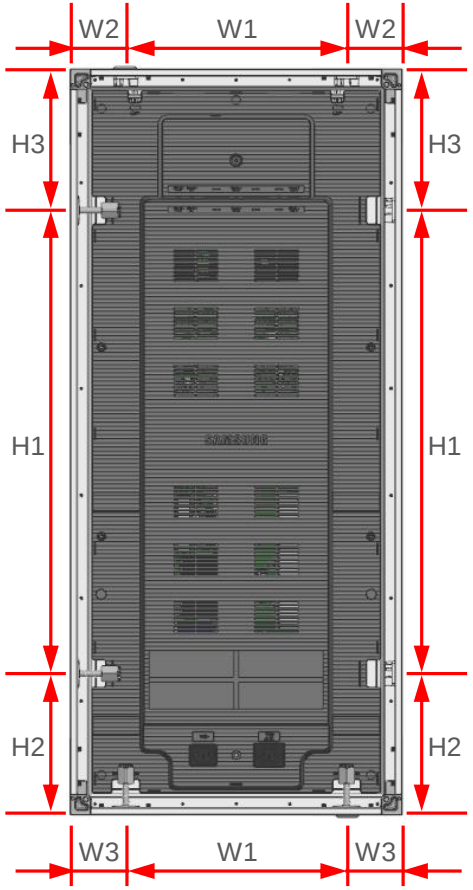
※ [Caution] If you press the switch for more than 10 seconds, it will be factory reset. , be careful.

3. FRAME Installation

- SET connection dimension

[Note]

- LATCH location



	mm	inch
W1	≒ 268.00	≒ 10.55
W2	≒ 67.57	≒ 2.66
H1	≒ 563.00	≒ 22.17
H2	≒ 172.00	≒ 6.77
H3	≒ 172.00	≒ 6.77

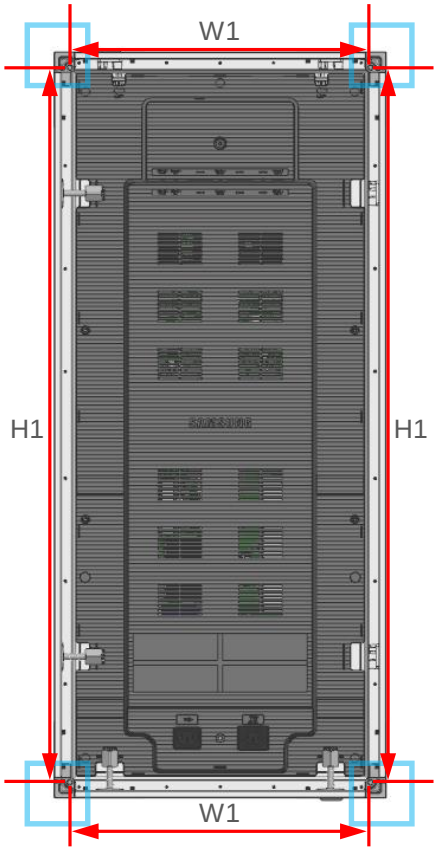
3. FRAME Installation

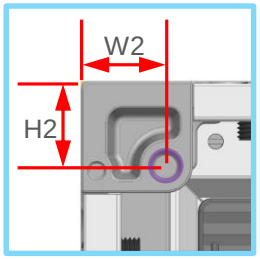
SAMSUNG

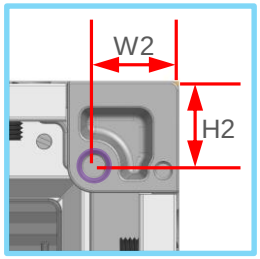
- SET connection dimension

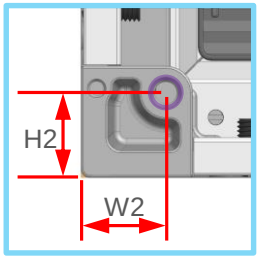
[Note]

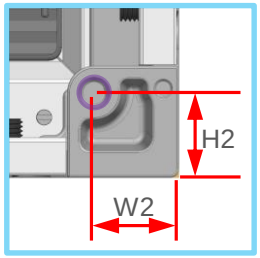
- ◯ SCREW location / M6 / PITCH 1.0

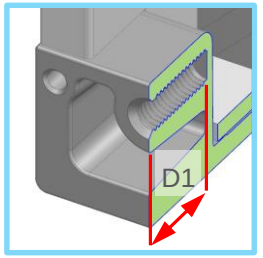












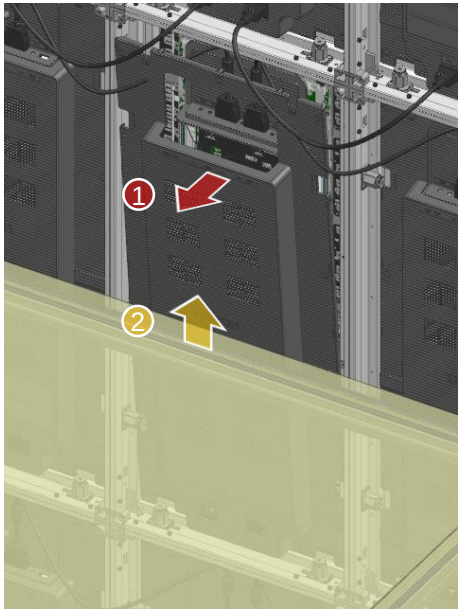
	mm		inch
W1	≒	365.14	≒ 14.38
W2	≒	19.00	≒ 0.75
H1	≒	869.00	≒ 34.21
H2	≒	19.00	≒ 0.75
D1	≒	16.00	≒ 0.63

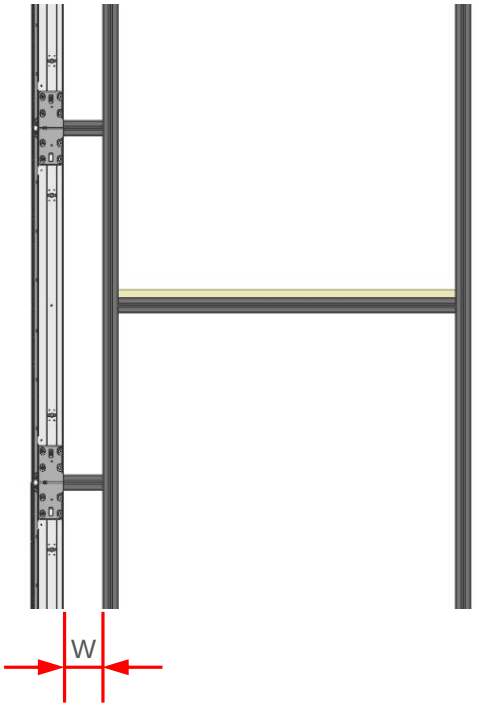
- Precautions for Installation FRAME Design

[Caution]

- Installation FRAME shall be manufactured in accordance with national or state standards
- If relevant equipment is added, it shall be installed in accordance with the standards
- Secure DATA CABLE, POWER CORD connection, and COVER-REAR cracking space between SETs.







	mm	inch
W (Min.)	≒ 100.0	≒ 3.94

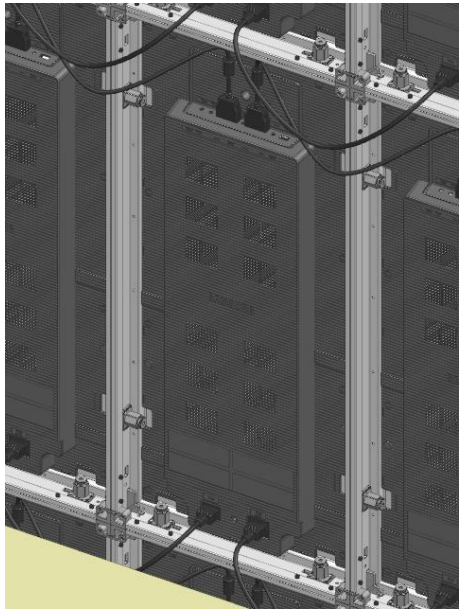
3. FRAME Installation

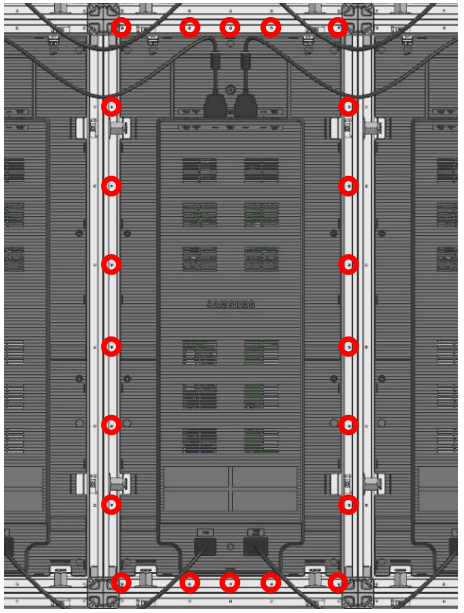
SAMSUNG

- Precautions for Installation FRAME Design

[Caution]

- Installation FRAME shall be manufactured in accordance with national or state standards
- If relevant equipment is added, it shall be installed in accordance with the standards
- Be careful not to cover the installation FRAME ◯ SEAM control area



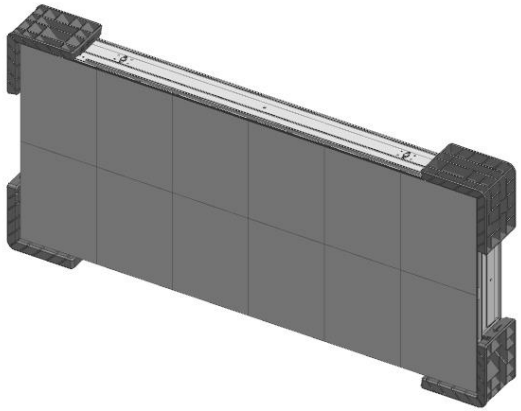


- SPACER Attachment * Attach only to CONCAVE installations

1. Check the assembly location

[Caution]

- Attached when installing CURVED to prevent damage to MODULE EDGE part



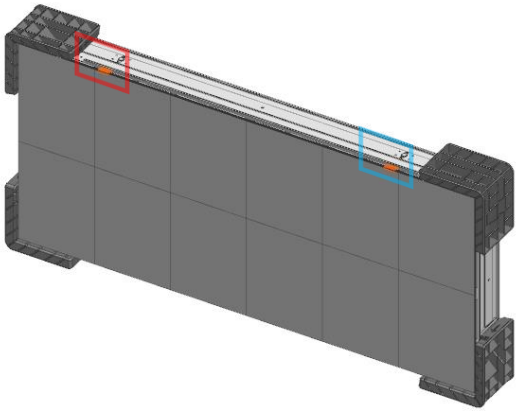
2. □ □ Attach to LATCH MALE part direction after removing release paper

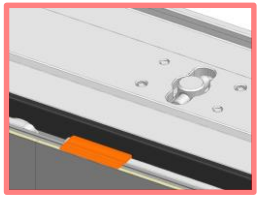
[Note]

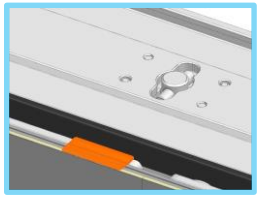
- Enclosed in ACCESSORY

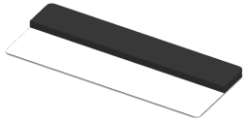
[Caution]

- Do not over the Edge of Module







SHAPE	CODE
	BN60-01718A

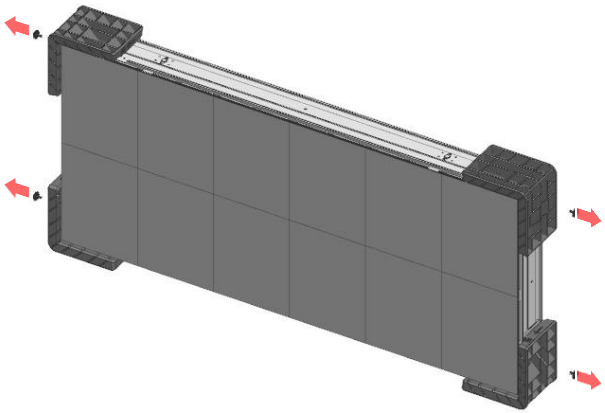
SAMSUNG

- COVER-CORNER Separation

1. Check the assembly location

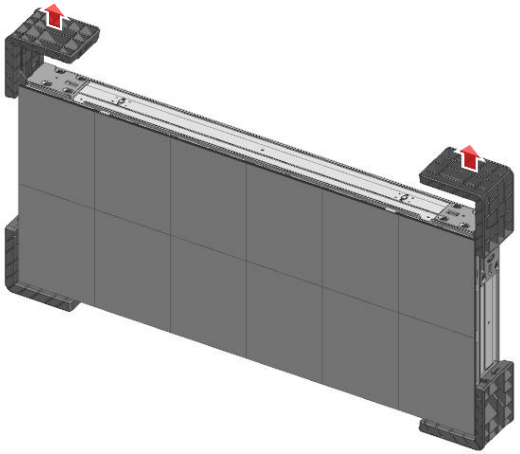
[Caution]

- Check if there is any abnormality before installation and remove COVER-CORNER.
- Remove 4 side SCREWs



SCREW CODE	SPECIFICATION	SHAPE
6003-001748	M4 / L10 / BLACK	

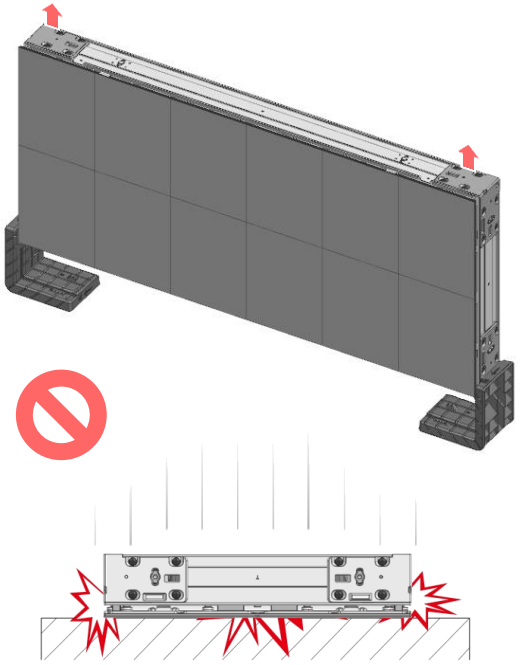
2. Separate only upper COVER-CORNER



3. When the SET is lifted, the lower COVER-CORNER is naturally separated.

[Caution]

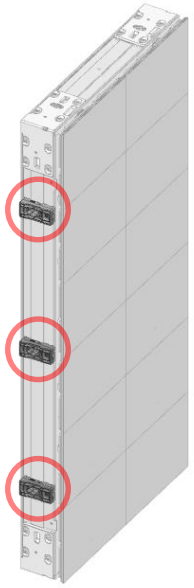
- Never place the LED surface in the floor direction after removing the COVER-CORNER

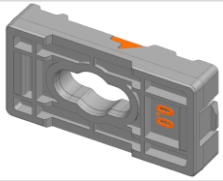
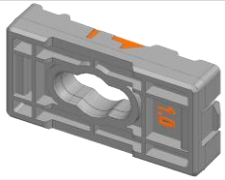
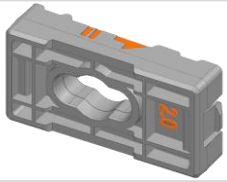
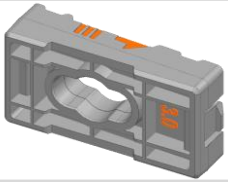
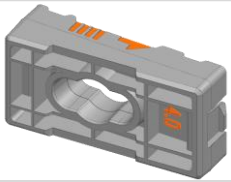


- COVER-HOLDER (angle BRACKET)

[Caution]
- Since the angle cannot be changed after installation, make sure to check the angle before assembly and assemble it.

[Note]
Assemble COVER-HOLDER by angle on the left side of SET
0 degrees / 1 degree / 2 degrees / 3 degrees / 4 degrees can be purchased separately
(Other angles need to be processed separately)

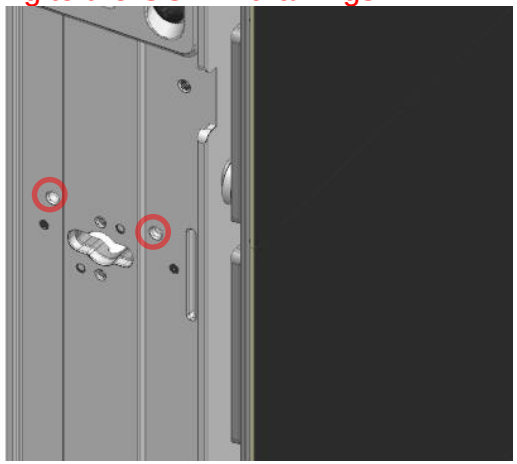


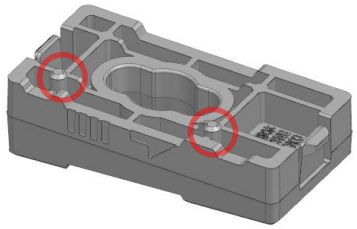
SHAPE	CODE
	BN63-20736A (0º)
	BN63-20736A (1º)
	BN63-20736A (2º)
	BN63-20736A (3º)
	BN63-20736A (4º)

SAMSUNG

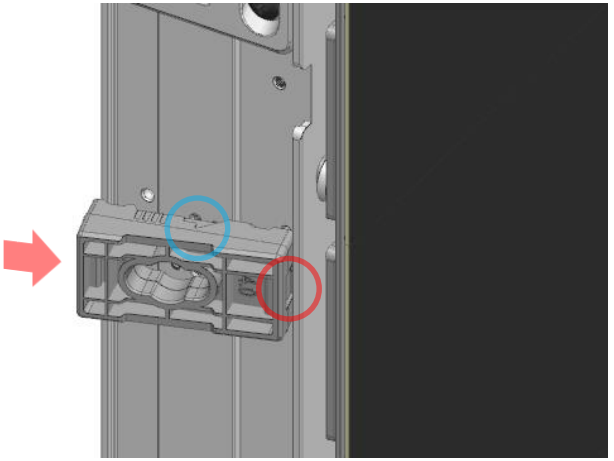
- COVER-HOLDER (angle BRACKET)

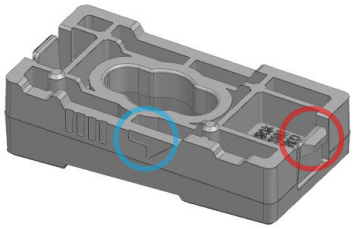
1. Check the assembly location
[Note]
FLAT Instaillation (0 degree) /
CONCAVE (1 ~ 4 degeree) Assembly during installation /
* Other angles are made separately by referring to the GUIDE drawings



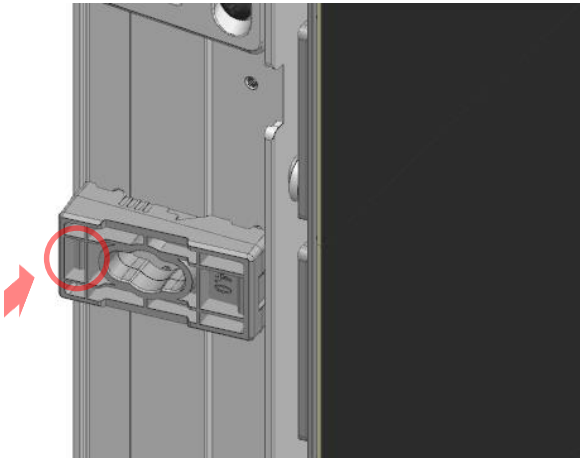


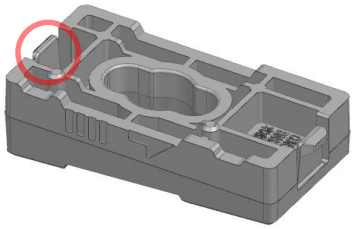
2. Assembly COVER-HOLDER
○ Assemble with arrows facing the front
Frontward HOOK Insertion





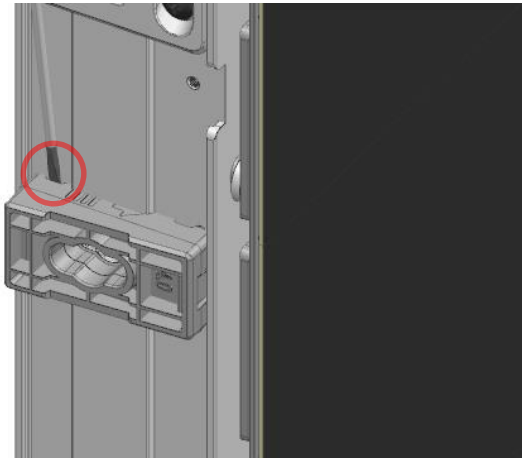
3. Assembly COVER-HOLDER
Backward HOOK Insertion

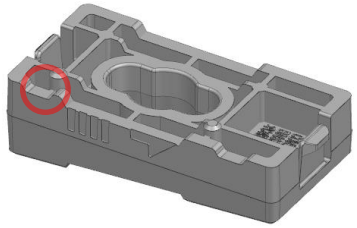




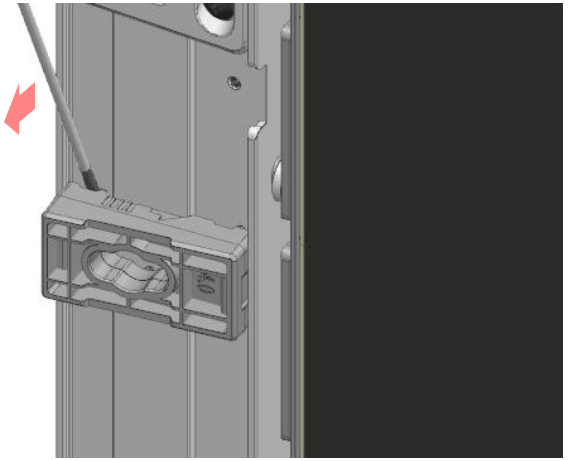
- COVER-HOLDER (angle BRACKET)

1. Insert Slotted DRIVER

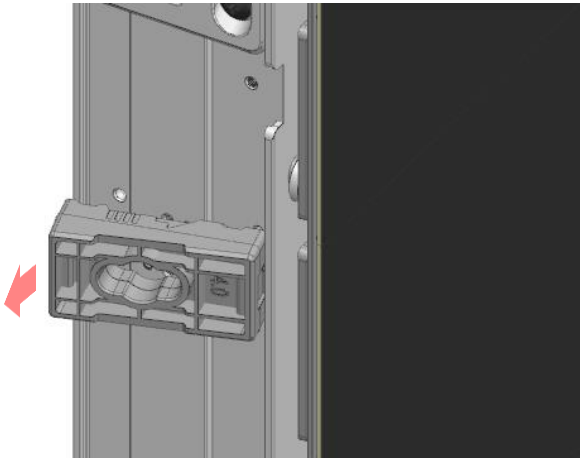




2. Lean back – (Slotted) DRIVER



3. Separate COVER-HOLDER

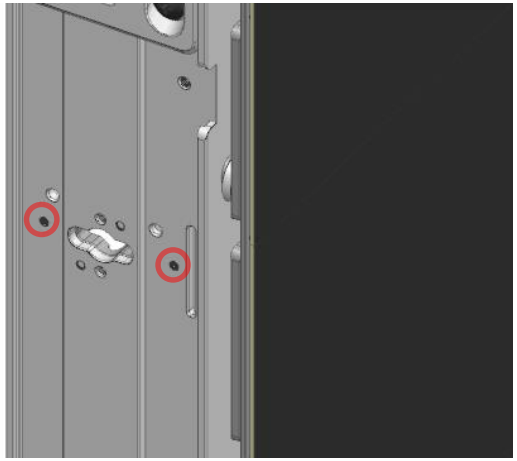


- Unprovided COVER-HOLDER (angle BRACKET) assembly

[Note]

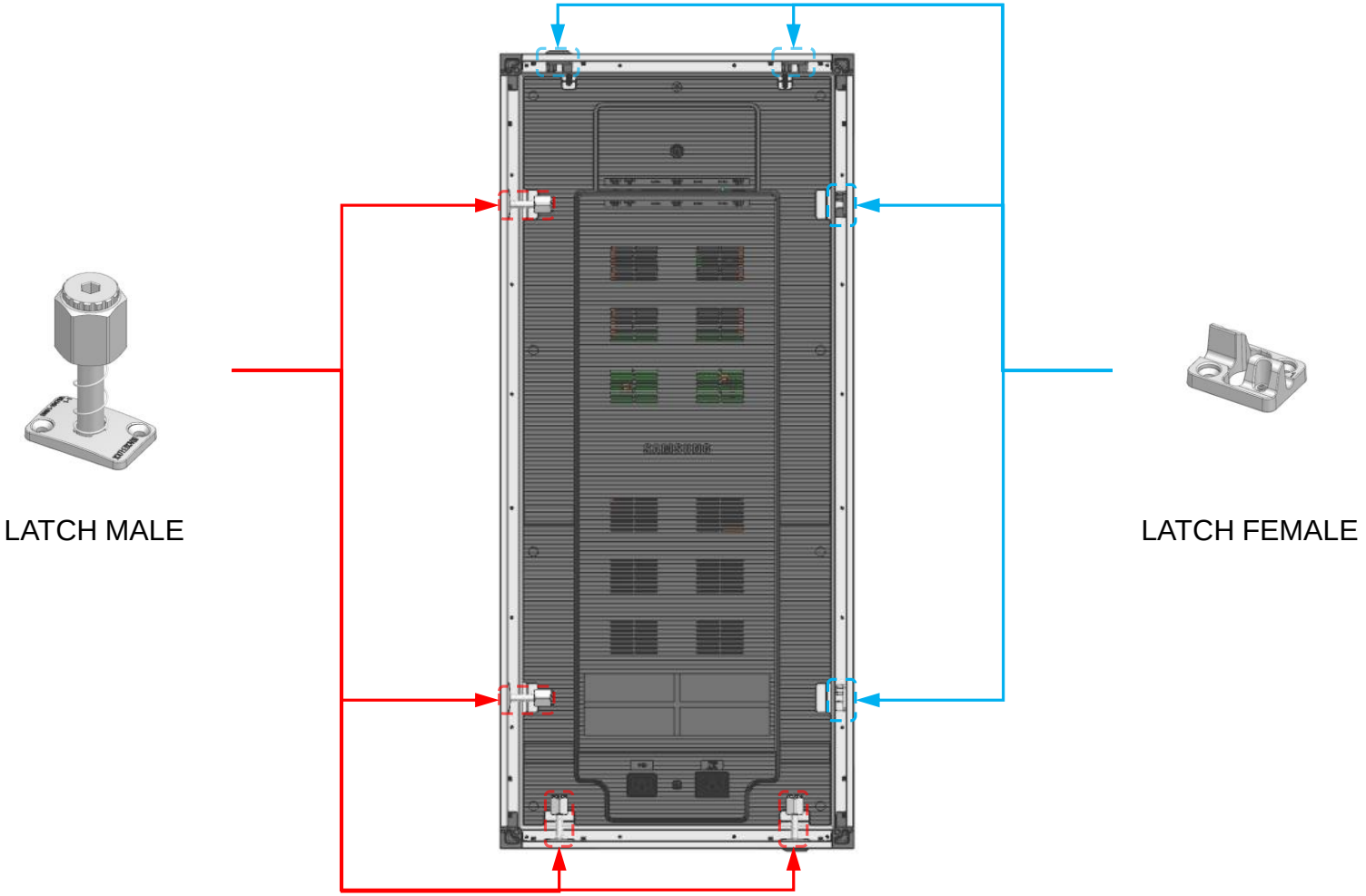
○ Assembly position / M3 / PITCH 0.5

* Unprovided angles are made separately by referring to the GUIDE drawings



SAMSUNG

- SET-to-SET connection
  - LATCH: Parts for SET-to-SET coupling
  - The LATCH MALE is inserted into the LATCH FEMALE to combine the SET.

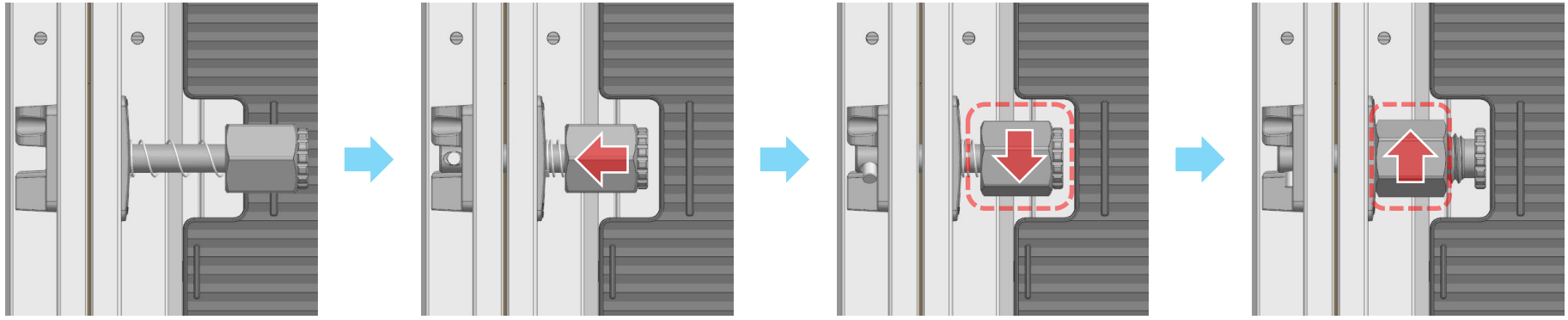


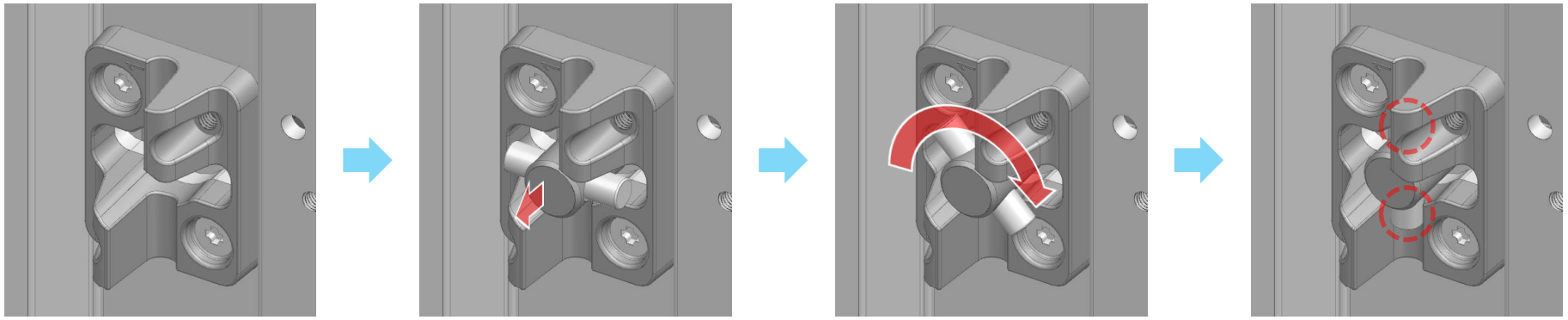
SAMSUNG

- Connection between SETs (Horizontal)

[Caution]

◯ The PIN of the LATCH MALE must be fully coupled to the LATCH FEMALE

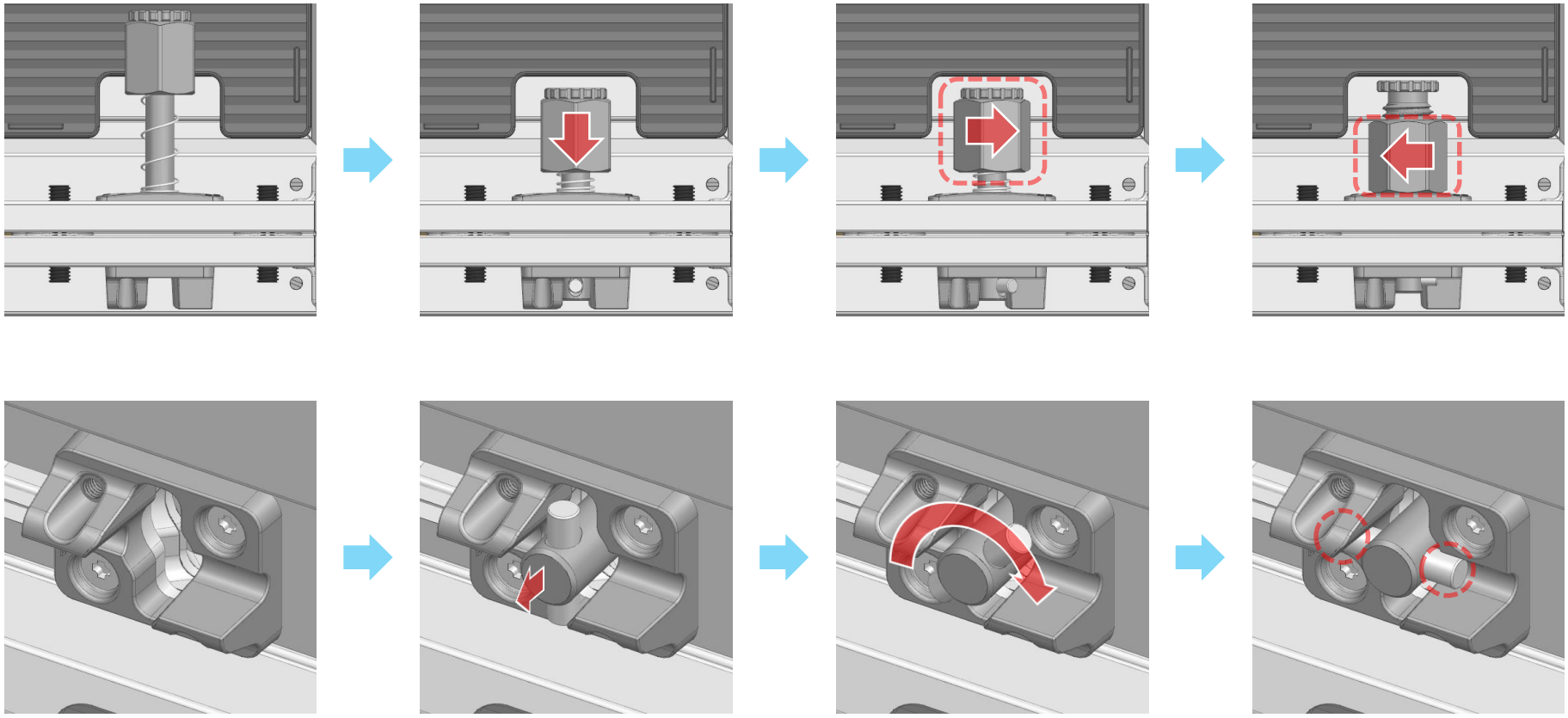




- Connection between SETs (Vertical)

[Caution]

◯ The PIN of the LATCH MALE must be fully coupled to the LATCH FEMALE



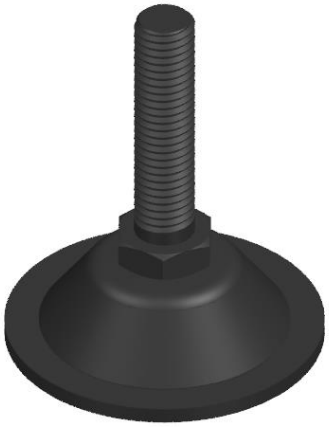
- STACKING KIT Specification

[Caution]

- Leveler should be applied according to the site situation after reviewing the load applied to the STACKING FRAME
- Basic LEVELER Allowed Load: 300 kg / 2ea
- After reviewing the load and safety coefficient, replace it with another product if necessary.
- ◯ Assemblyable thread specification: M12 / PITCH: 1.75 mm
- ◯ Assemblyable thread specification: M8 / PITCH: 1.25 mm



STACKING KIT

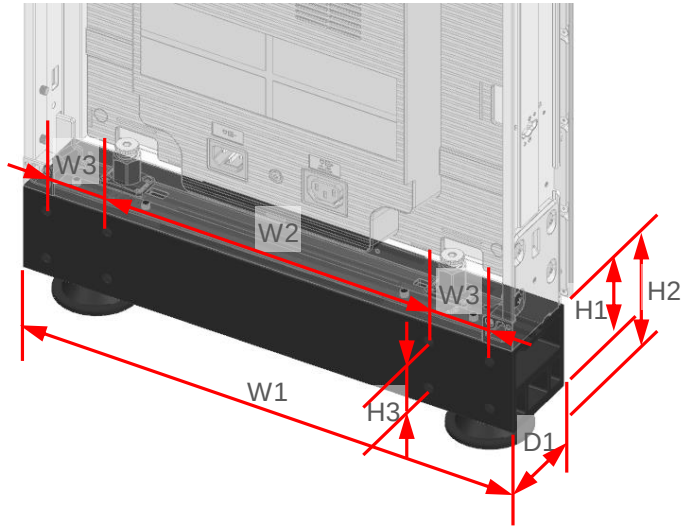


LEVELER

- STACKING KIT Specification

[Note]

- Dimensions in assembly state



	mm	inch
W1	≒ 399.57	≒ 15.73
W2	≒ 265.14	≒ 10.44
W3	≒ 50.00	≒ 1.97
H1	≒ 70.00	≒ 2.76
H2 (Min.)	≒ 95.70	≒ 3.77
H2 (Max.)	≒ 109.10	≒ 4.30
H3	≒ 40.00	≒ 1.57
D1	≒ 69.82	≒ 2.75

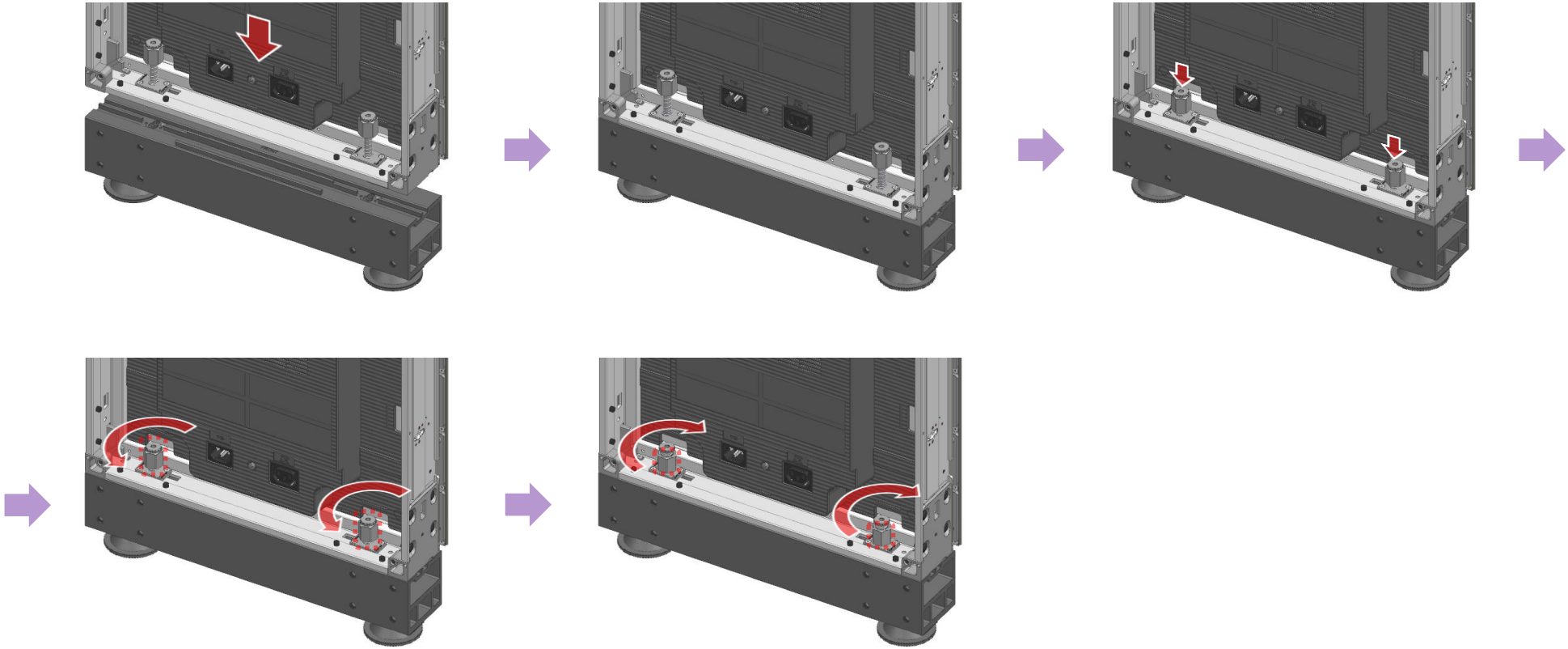
- Connecting STACKING KIT

[Caution]

- Connect one pair of L / R per row (L on the left side and R on the right side based on screen direction)
- Connect CLAMP after connecting STACKING KIT

[Note]

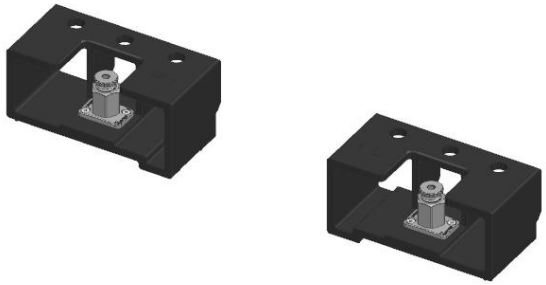
- The following example shows only the connection with STACKING KIT, and the connection with the rear structure is omitted.



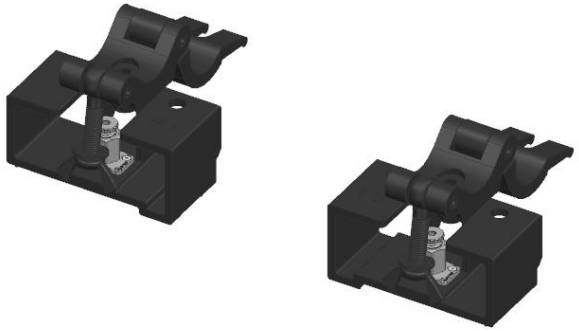
- Precautions for HANGING Installation

[Caution]

- CLAMP shall not be provided and shall be purchased and used appropriately for the installation site.
- Apply 2 per column of SET
- CLMAP minimum * SWL: 500 kg / 1ea more (* SAFETY WORKING LOAD) should be applied
- Assemblyable BOLT diameter: M10
- Maximum number of HANGING-enabled SETs per HANGING FRAME: Up to 10 SETs



HANGING KIT



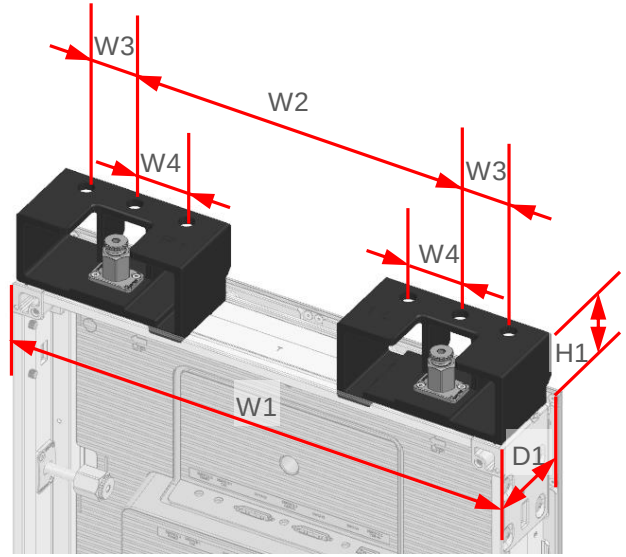
After assemble CLAMP

	mm	inch
W	≒ 1,044.0	≒ 41.10
H	≒ 533.0	≒ 20.98
D	≒ 260.0	≒ 8.03

- Precautions for HANGING Installation

[Note]

- Dimensions in assembly state



	mm	inch
W1	≒ 400.00	≒ 15.75
W2	≒ 268.00	≒ 10.55
W3	≒ 40.00	≒ 1.57
W4	≒ 42.75	≒ 1.68
H1	≒ 58.00	≒ 2.28
D1	≒ 67.02	≒ 2.64

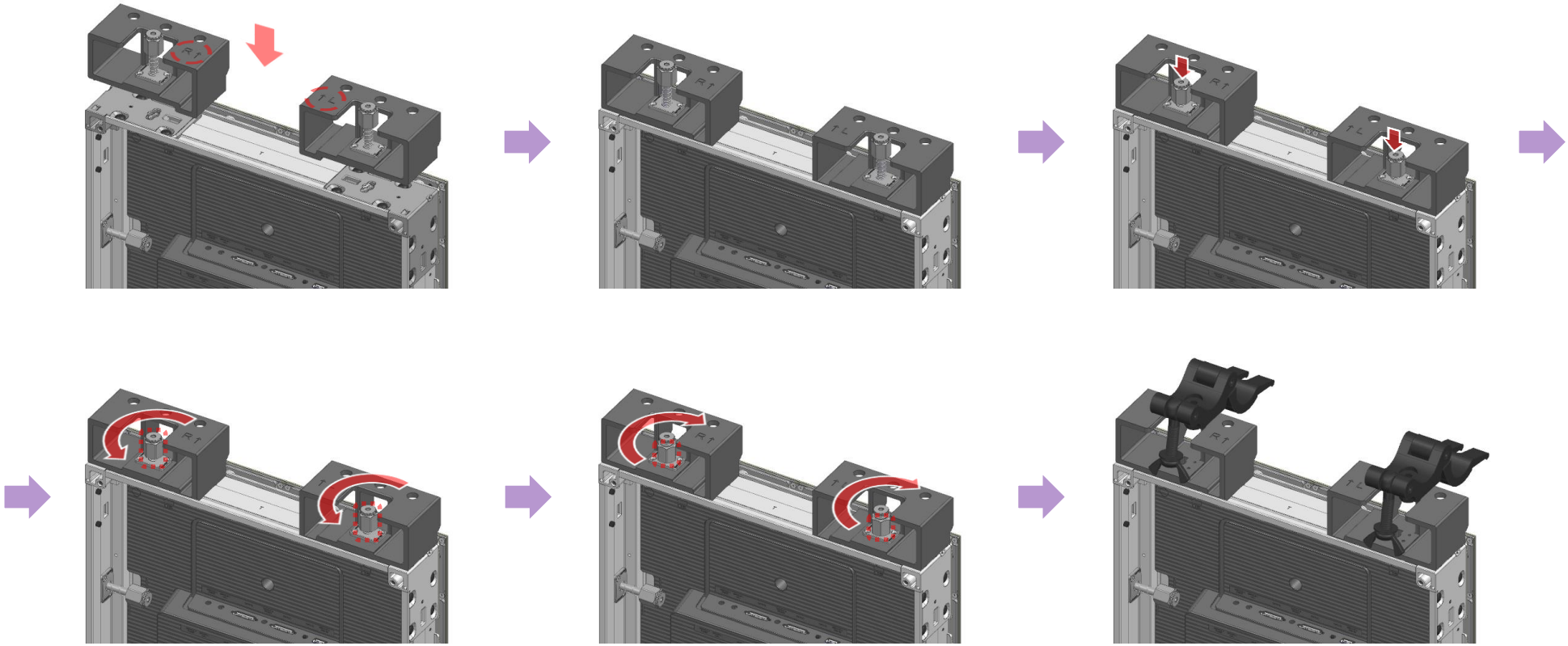
- Connecting HANGING KIT

[Caution]

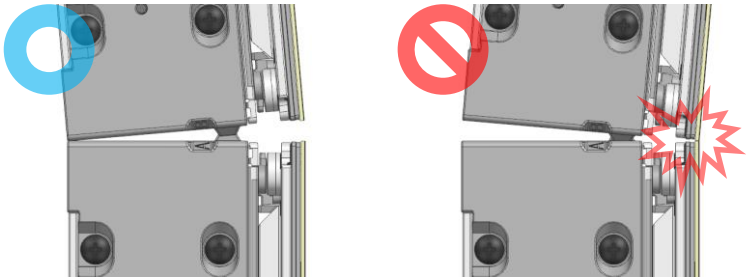
- Connect one pair per row (L / R) (◯ Screen direction standard left side L / right side R)
- Connect to CLAMP after connecting HANGING KIT

[Note]

- The following example shows only the connection with HANGING KIT, and the connection with the structure is omitted.

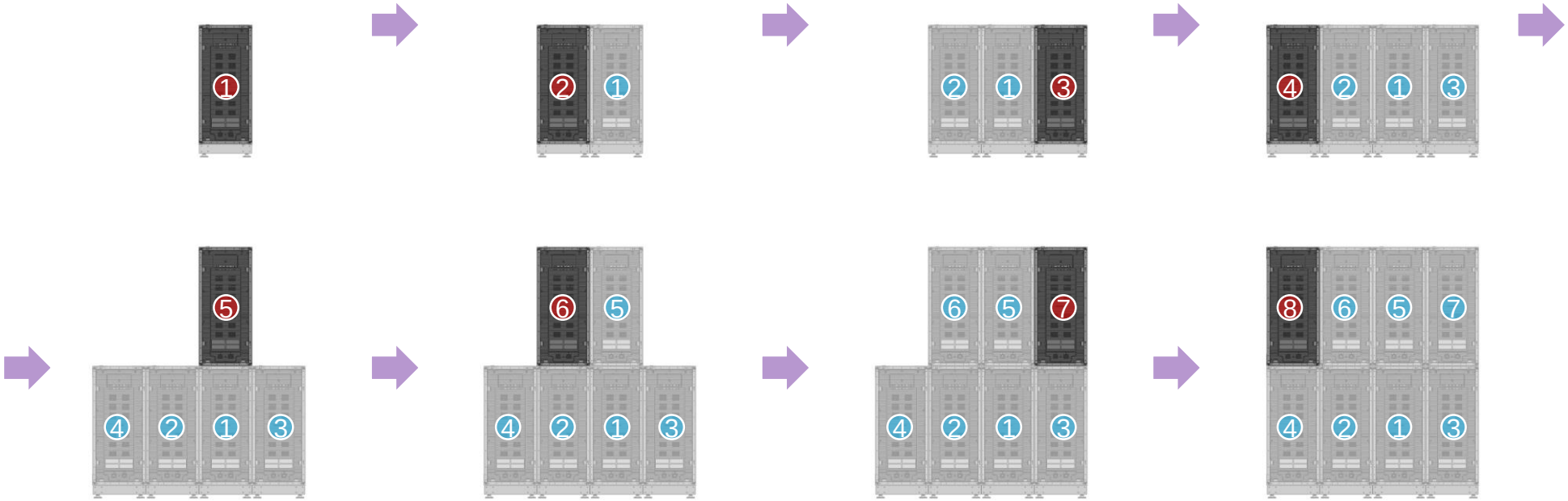


- SET Installation Sequence (STACKING)



[Caution]
- Install from center to outside for load balancing
- GAP between SETs: 0.1 mm or less
- The rear frame must be touched first when installing to prevent damage to the module

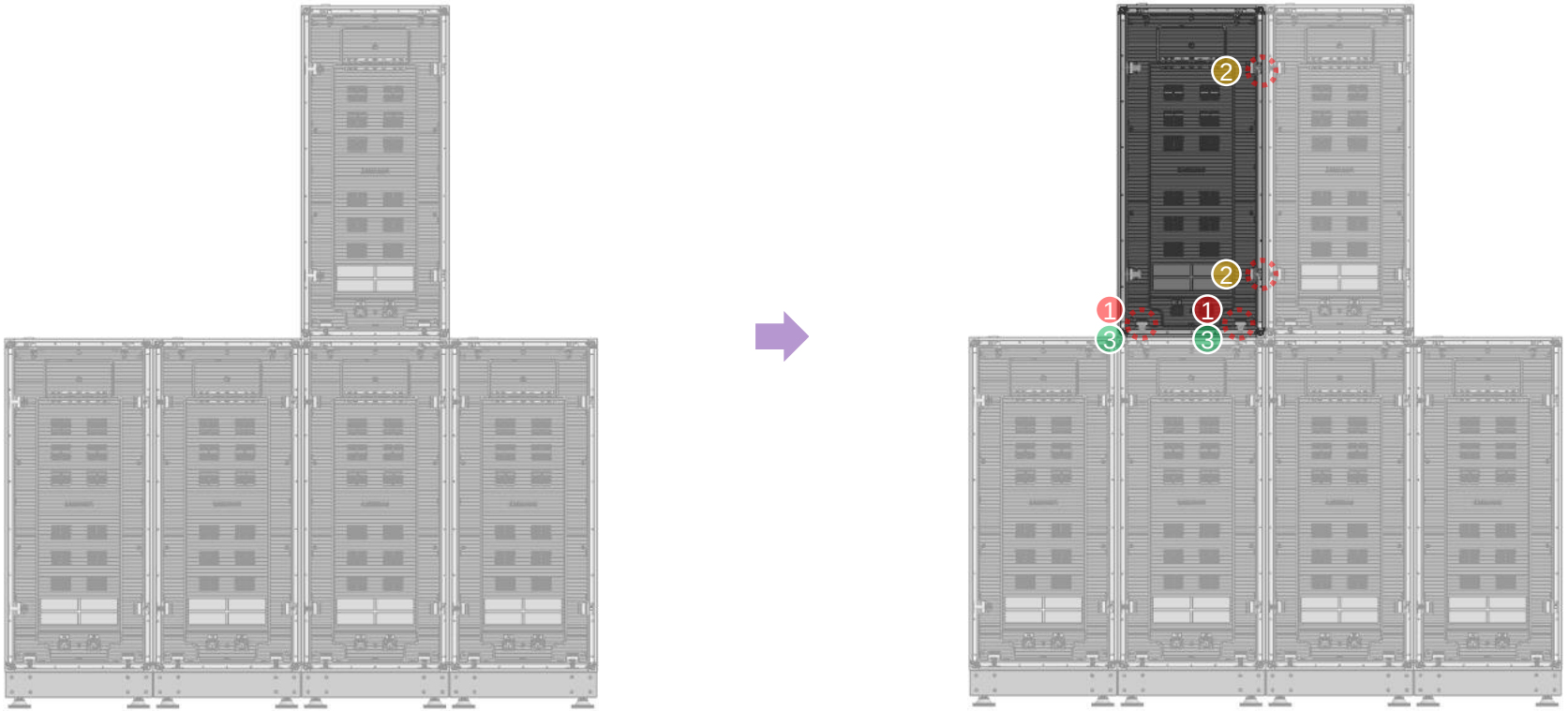
[Note]
- In the example below, the installation order is briefly expressed



- SET Installation Sequence (STACKING)

[Caution]

- ① Connect Vertical LATCH → ② Connect horizontal LATCH and Assemble completely → ③ Assemble Vertical LATCH completely



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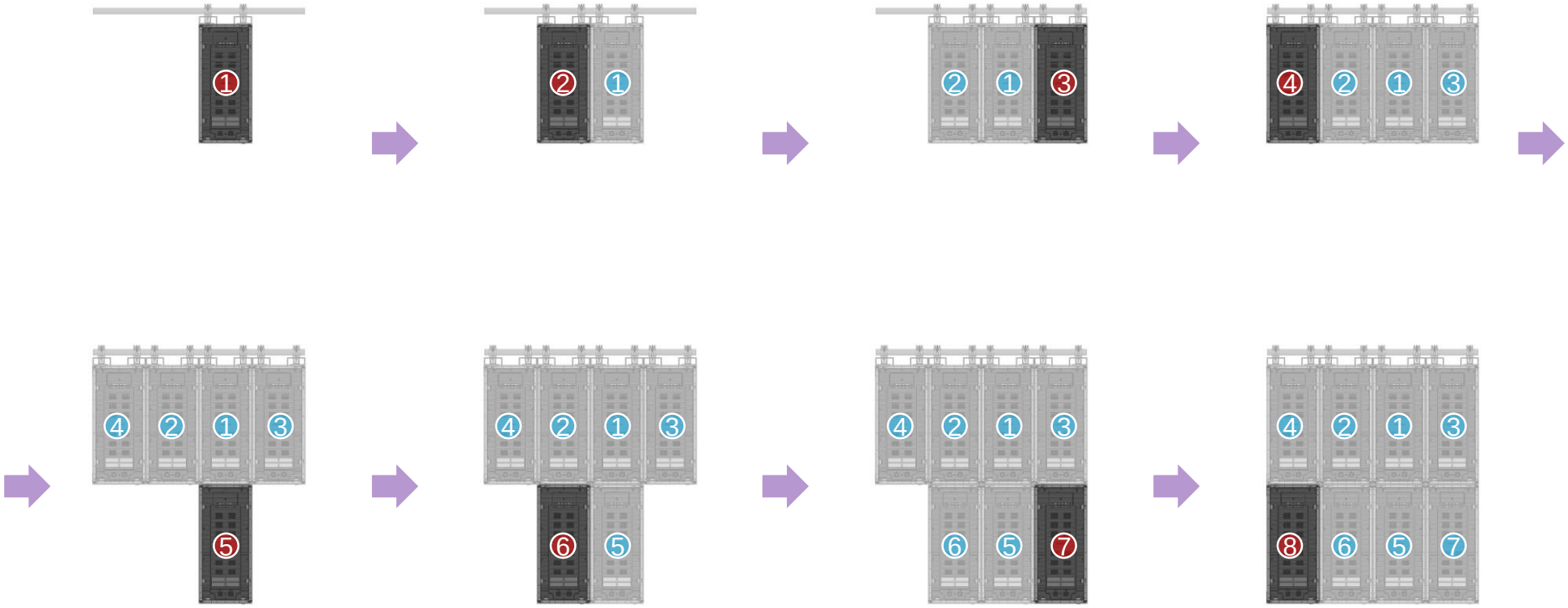
- SET Installation Sequence (HANGING)

[Caution]

- Install from center to outside for load balancing
- GAP between SETs: 0.1 mm or less

[Note]

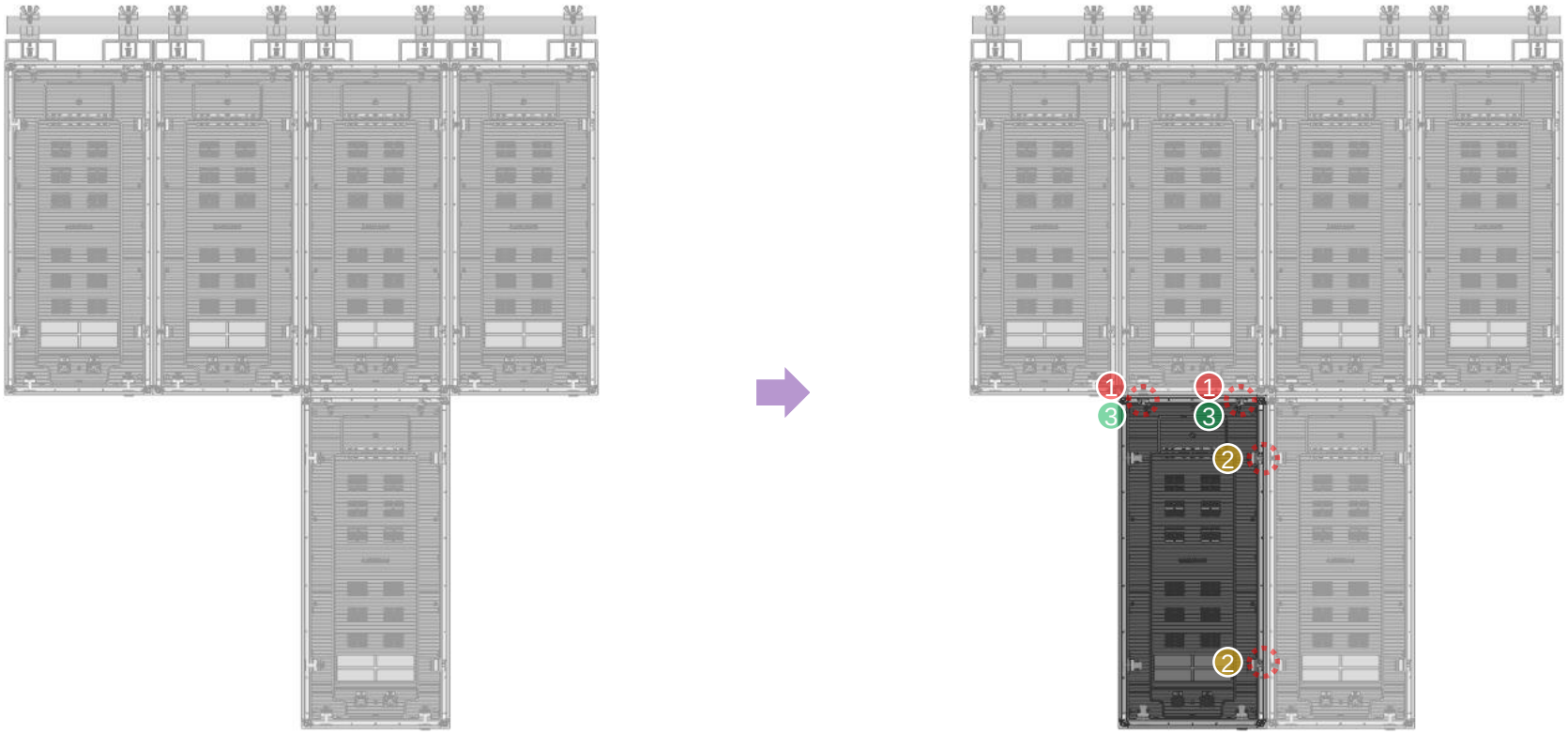
- In the example below, the installation order is briefly expressed



- SET Installation Sequence (HANGING)

[Caution]

- ① Connect vertical LATCH → ② Connect horizontal LATCH and Assemble completely → ③ Assemble viertical LATCH completely



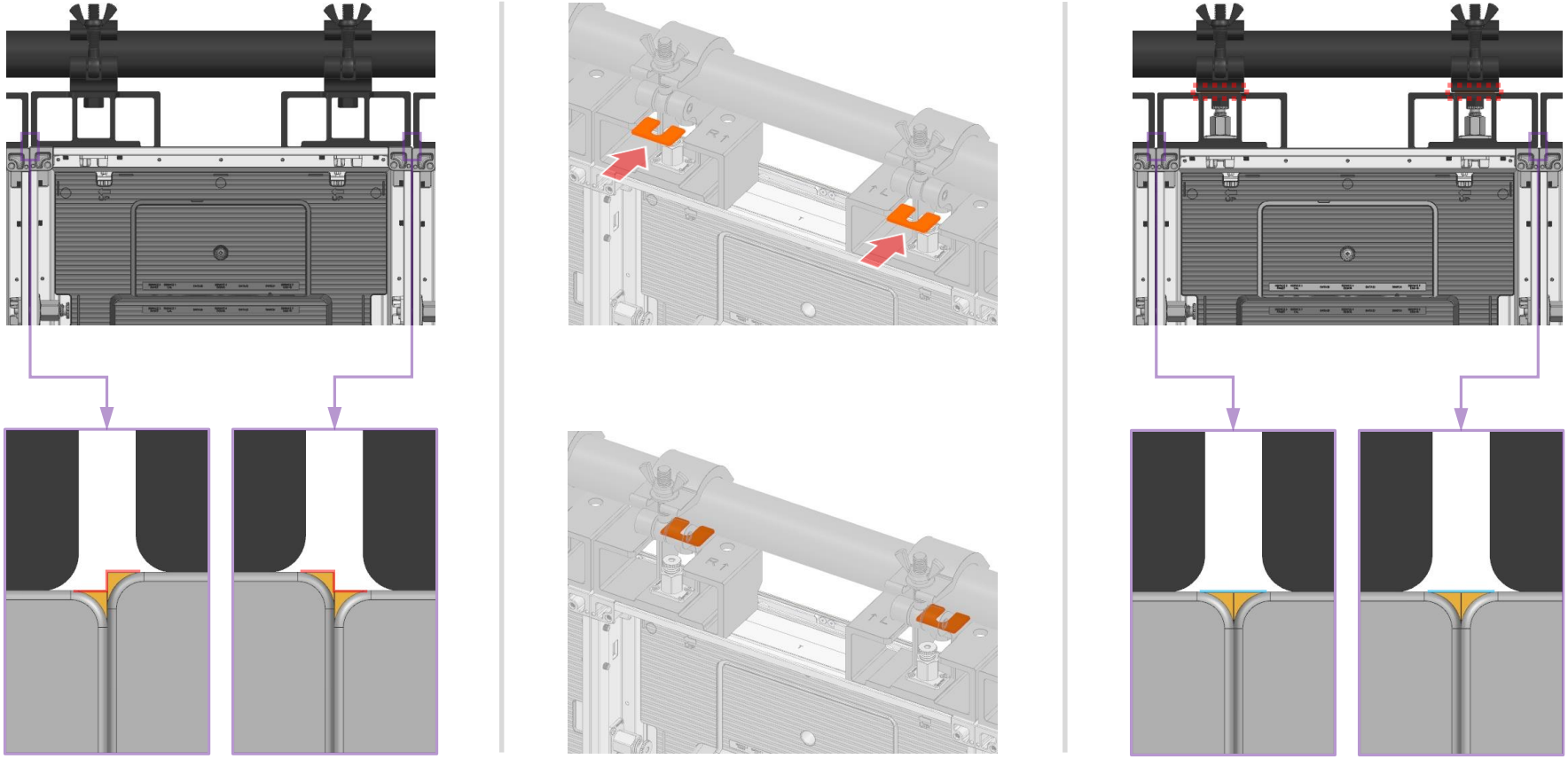
- Height calibration method for HANGING installation

[Caution]

- In case of height difference between SETs, adjust height by inserting SPACER (SHIM PLATE) between CLAMP and HANGING KIT

[Note]

-The SPACER (SHIM PLATE) is not provided in a SET and HANGING KIT.



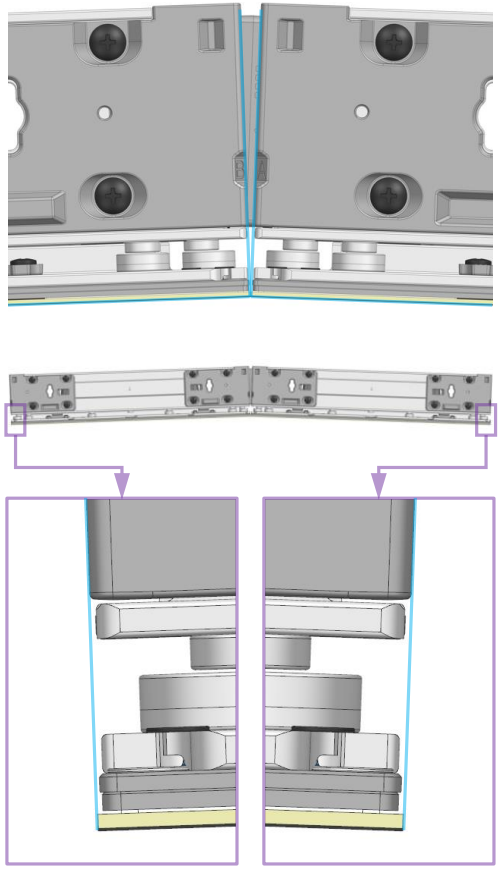
- Precautions for Product Installation

[Caution]

- If the installation frame affects the COVER-HOLDER angle, it may affect the interval between screens.

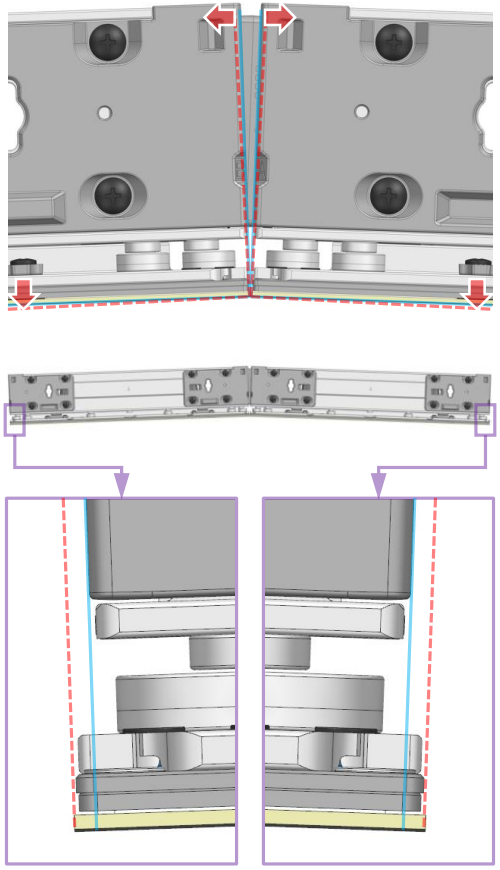
Install angle = COVER-HOLDER angle

FRONT = REAR FRAME



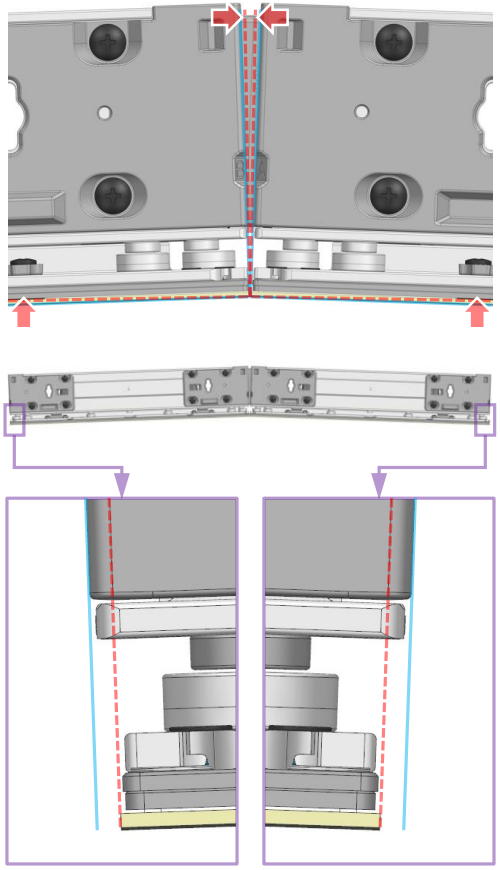
Install angle > COVER-HOLDER angle

Front protruding



Install angle < COVER-HOLDER angle

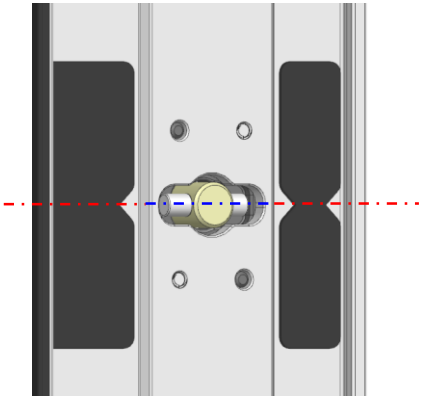
REAR FRAME protruding



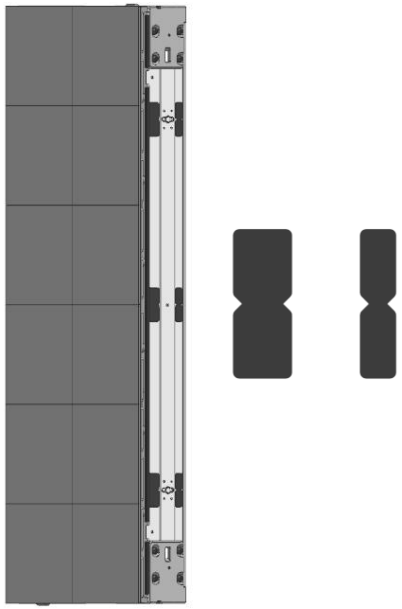
- Dimension correction method

[Caution]
- Must be attached to the right side of the reference (LATCH MALE) of the SET SCREEN
- Match the Center of LATCH MALE and Neck of SHEET

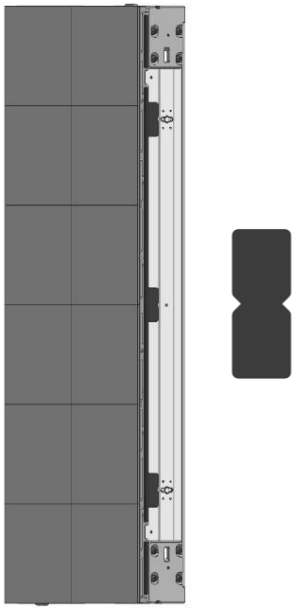
[Note]
- Use only when dimensional calibration is required
- Included in HANGING KIT / STACKING KIT



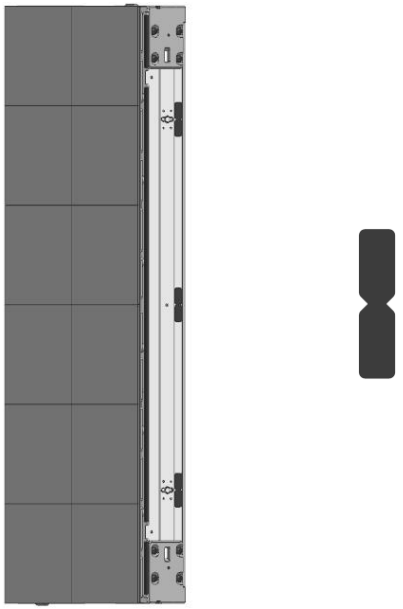
To widen the overall gap between SETs



When correcting FRONT protrusion



When correcting REAR FRONT protrusion

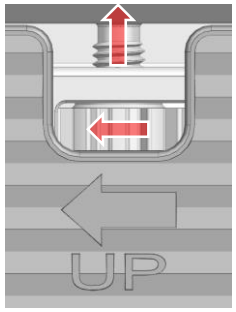


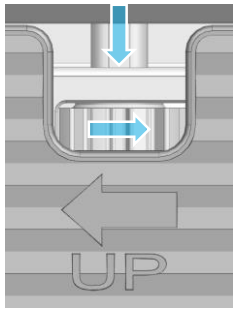
- SEAM adjustment (TOP / BOTTOM)

[Caution]
- Install in groups of two to prevent MODULE damage
- Upward movement: right → left rotation, downward movement: left → right rotation

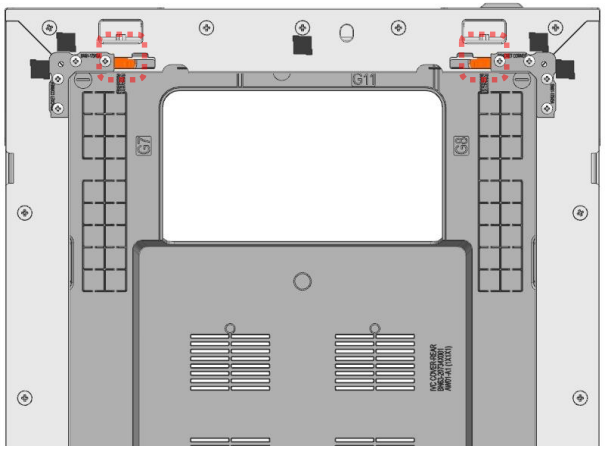
[Note]
- When adjusting Use – (SLOTTED) DRIVER to adjust



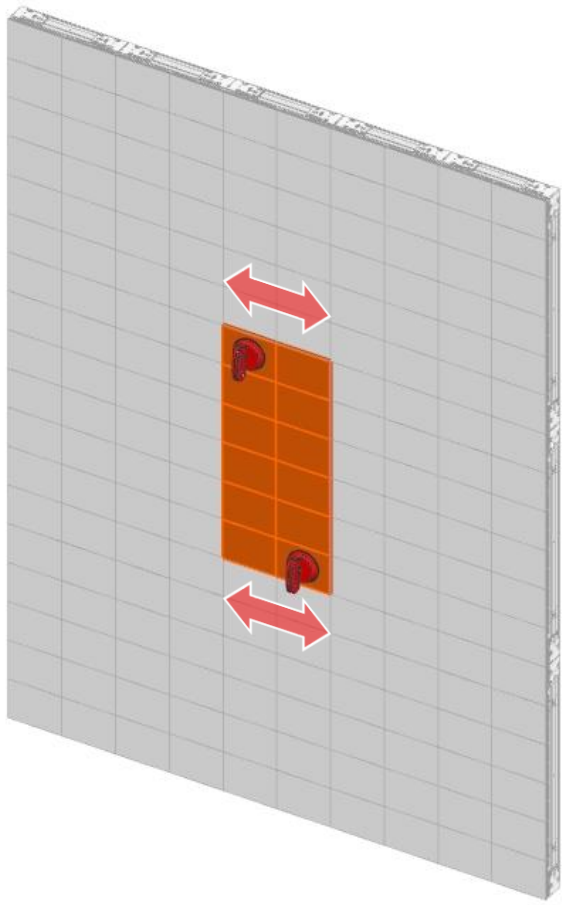




[Note]
- ◯ When adjusting from the front, move in the same direction as the rear height adjustment direction (upward movement: right → left, downward movement left → right)



- SEAM adjustment (LEFT / RIGHT)

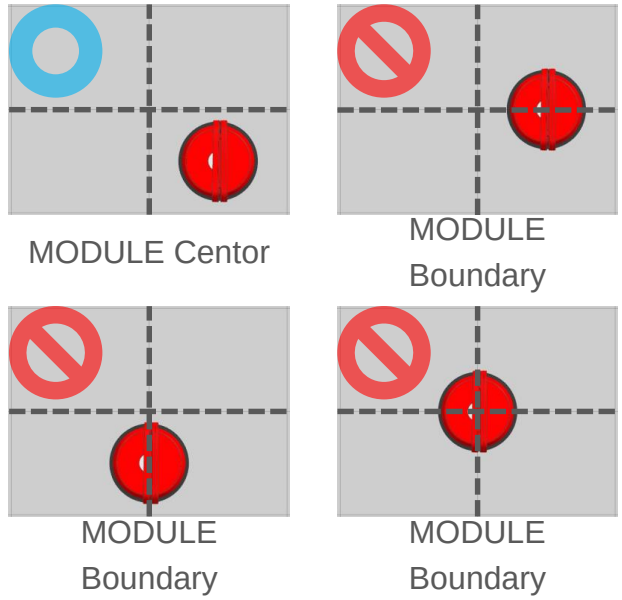


[Note]

- Move using adsorber (CY-WJCPVP) on the front of SET

[Caution]

- Cannot maintain vacuum when adsorber is located at MODULE boundary
- Adsorber should be located in the center of MODULE
- To prevent MODULE damage and deformation, remove the adsorber immediately after SEAM adjustment is completed.

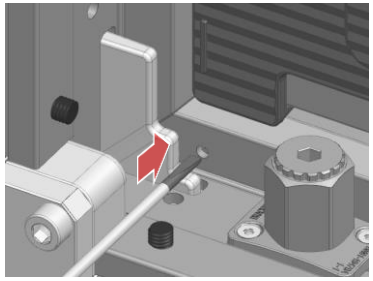


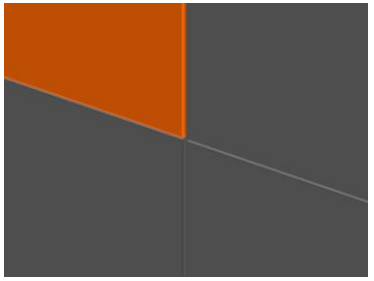
- SEAM adjustment

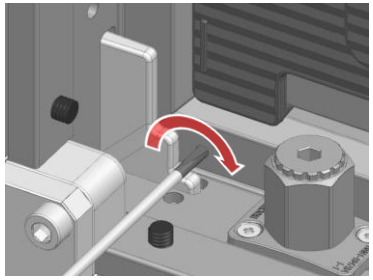
Adjust from the back if protrusion is required compared to the surrounding MODULE

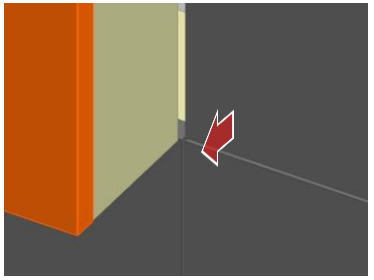
[Note]

- Use Φ 3 mm / – (SLOTTED) DRIVER



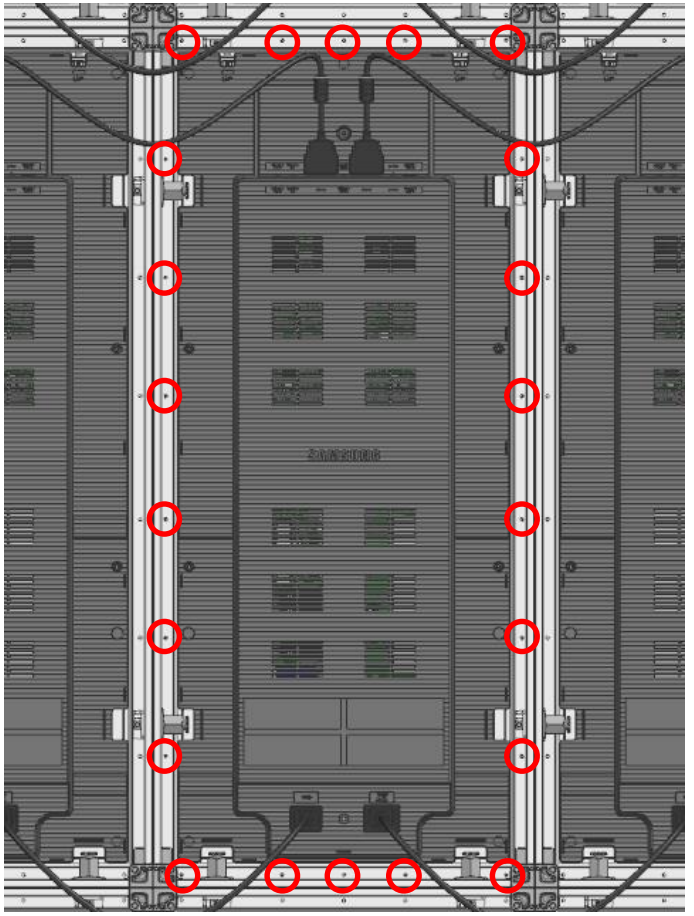






[Note]

- ◯ Rear control position



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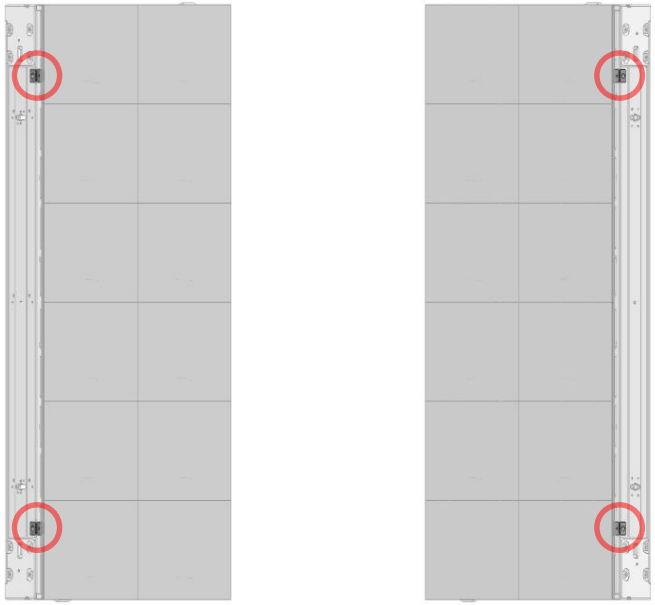
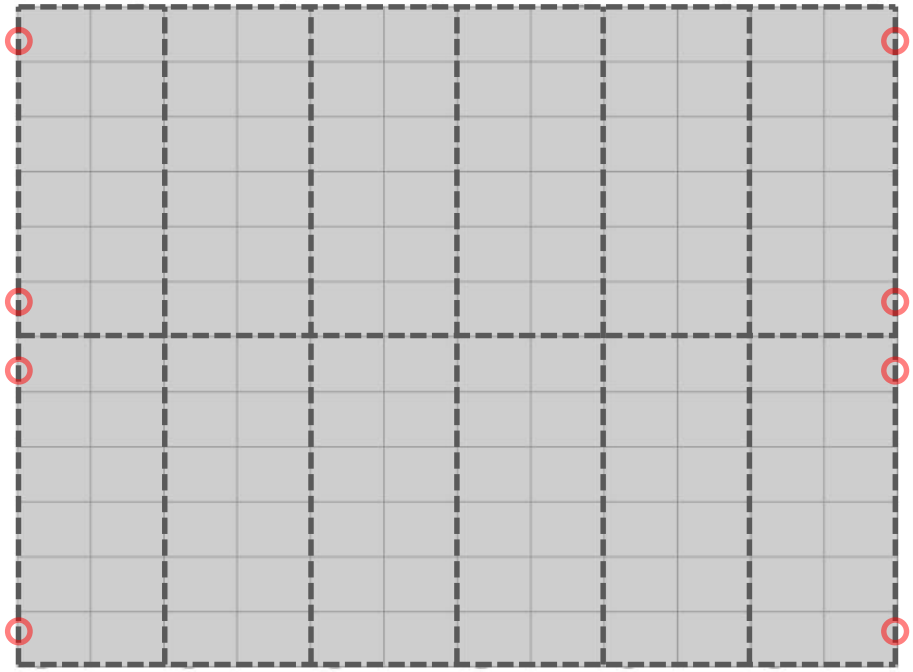
- BRACKET-SUPPORT Assembly

[Note]
- Assemble on the left/right side of SET
- ◯ Assembly position



[Caution]
- ◯ Assemble only on the outermost left / right side of SCREEN

SHAPE	CODE
	BN61-19564A



- BRACKET-SUPPORT Assembly

1. Check the assembly location

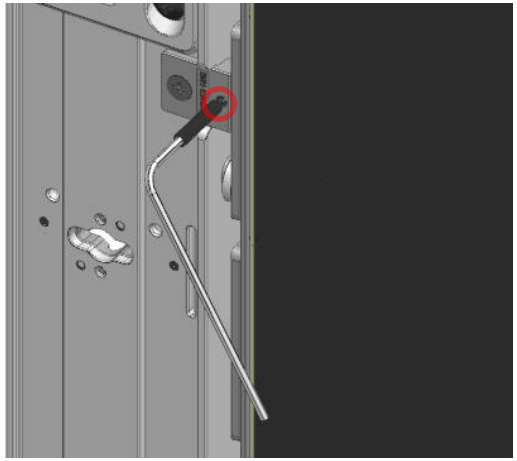


2. Assembly BRACKET-SUPPORT



SCREW CODE	SPECIFICATION	SHAPE
6001-003041	M4 / L10 / BLACK	

3. Insert SCREW-SPECIAL



SCREW CODE	SPECIFICATION	SHAPE
6009-002436	M4 / L10 /Black	

- BRACKET-SUPPORT Assembly

4. Fix ASSY FRONT by turning SCREW-SPECIAL clockwise



- Connection specifications according to AC input power

[Caution]

- When connecting a cabinet, connect it to the maximum number of cabinets that can be connected per AC power cable.
- When connecting in excess of the maximum number that can be connected, the power breaker due to overcurrent may go down or the product may be damaged, so be sure to connect below the recommended quantity.
- We are not responsible for problems that occur when connecting in excess of the recommended quantity

Model		IVC	
LED Pitch		P1.68	P2.1
Power Consumption (Max.)		189 W	180 W
Maximum number of connections	110 V	3 EA	
	220 V	7 EA	

[Note]

- Check the rated power of the product in the LABLE attached to the back of the product and the rated current value of the



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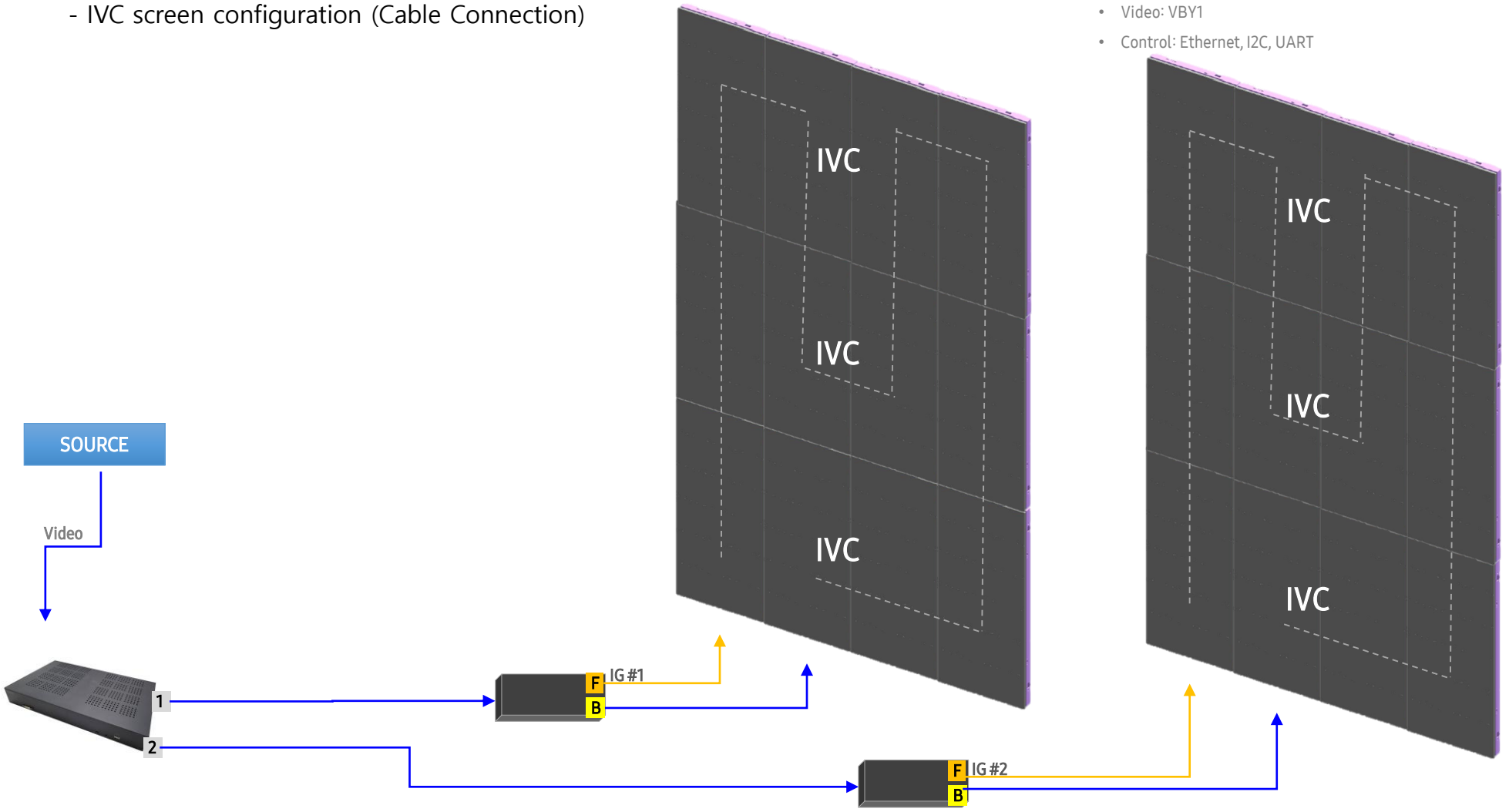
❑ S-BOX installation order (I/G and Cabinet connection)

※ The following connection diagram is a video redundancy specification, and the backward direction does not support data path for control operation.

- IVC screen configuration (Cable Connection)



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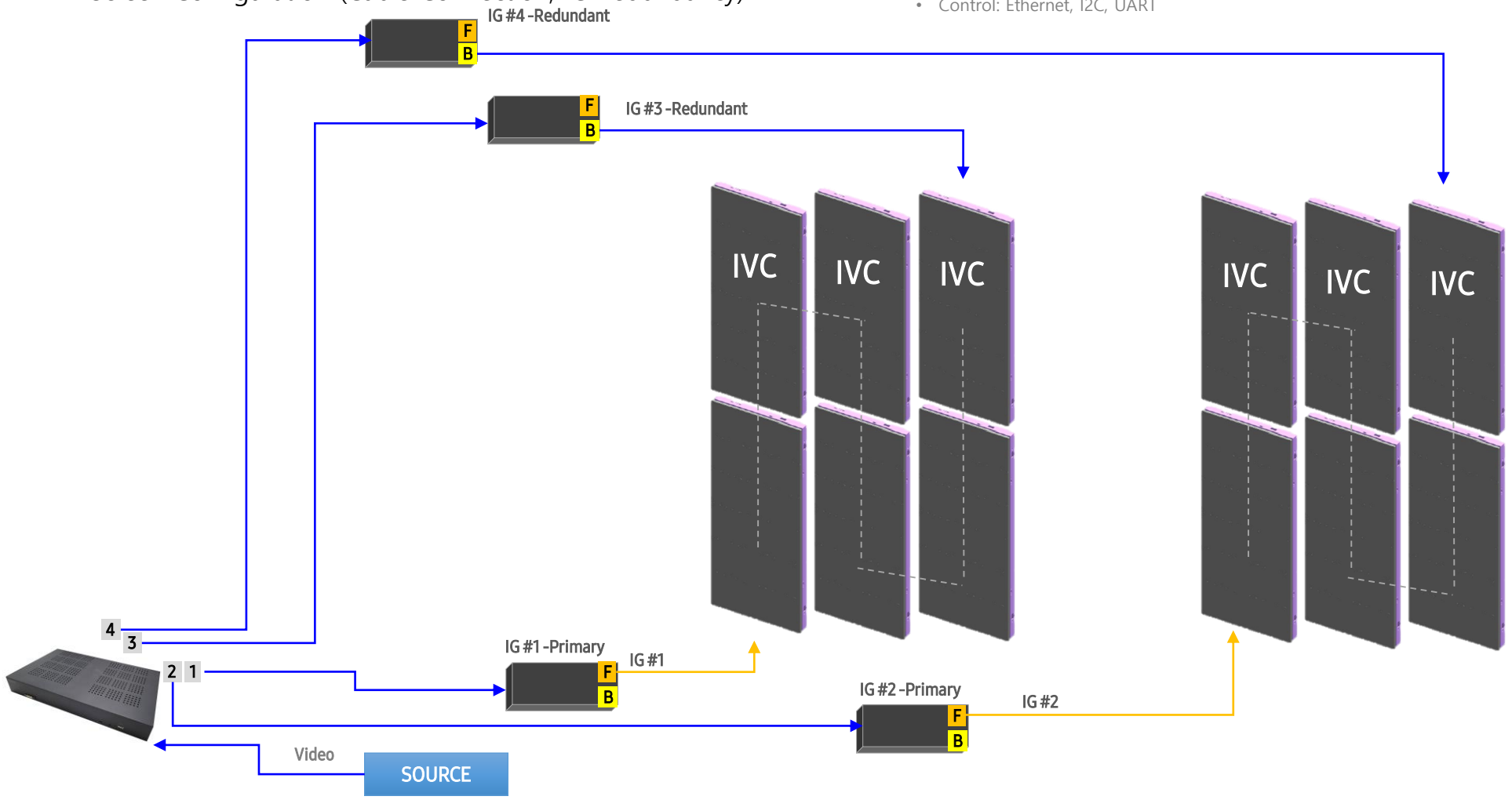
❑ S-BOX installation order (I/G and Cabinet connection)

※ The following connection diagram is a video redundancy specification, and the backward direction does not support data path for control operation.

- Screen Configuration (Cable Connection, IG Redundancy)

- Video: VBY1
- Control: Ethernet, I2C, UART



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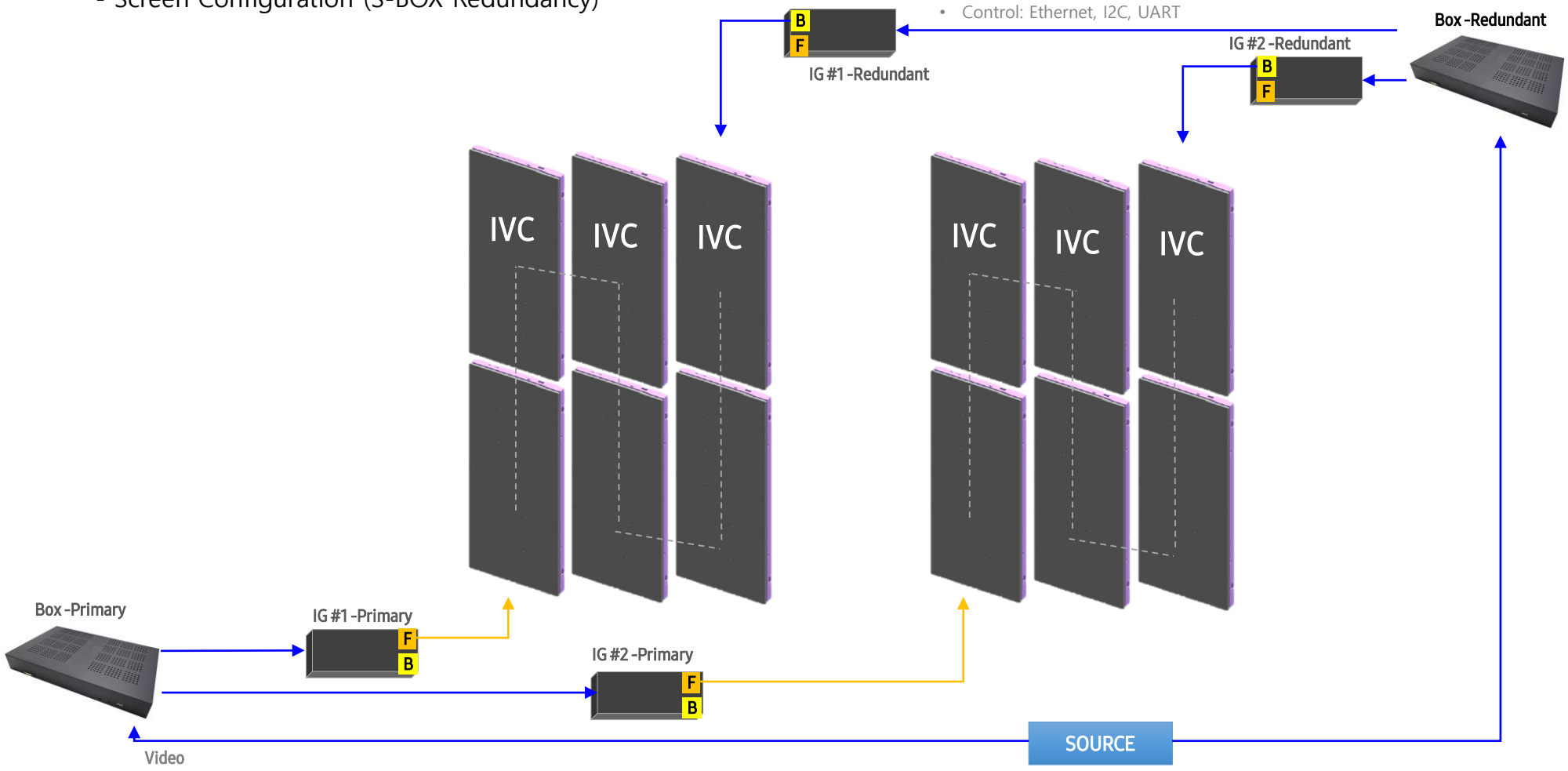
❑ S-BOX installation order (I/G and Cabinet connection)

※ The following connection diagram is a video redundancy specification, and the backward direction does not support data path for control operation.

- Screen Configuration (S-BOX Redundancy)



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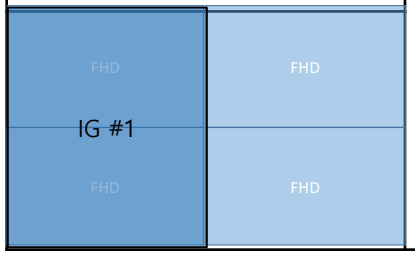
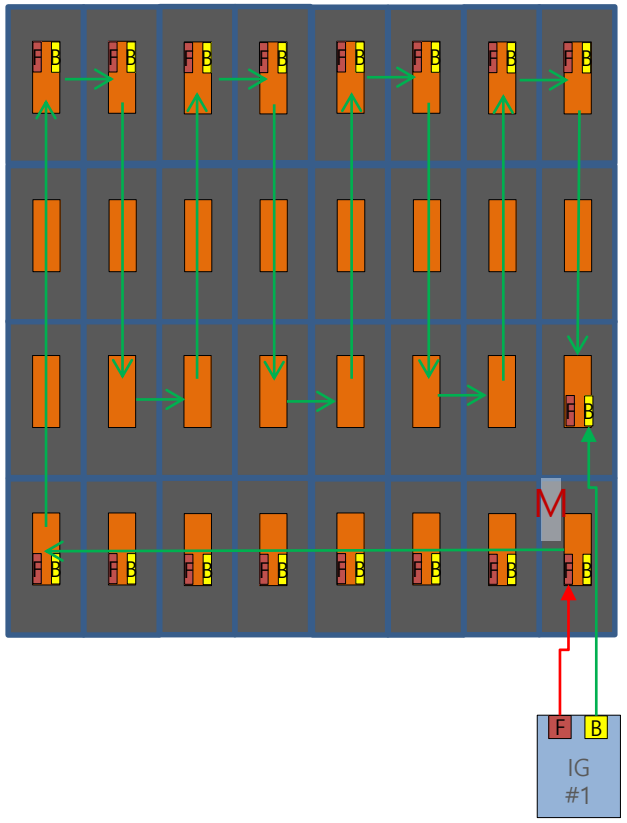
Resolution-specific connection configuration diagram

Model	Pitch	P1.68
	Resolution	240 x 540
Screen	Size	Basic support resolution
	Resolution	1920 x 2160
	Cabinet	8 x 4 = 32
Installation type		Cable
Redundancy	IG Backward	O
	Add IG	X
	Add S-BOX	X
Number of connecting devices	IG	1
	S-Box	1

■ Basic cable connection structure





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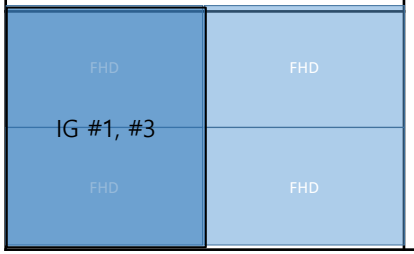
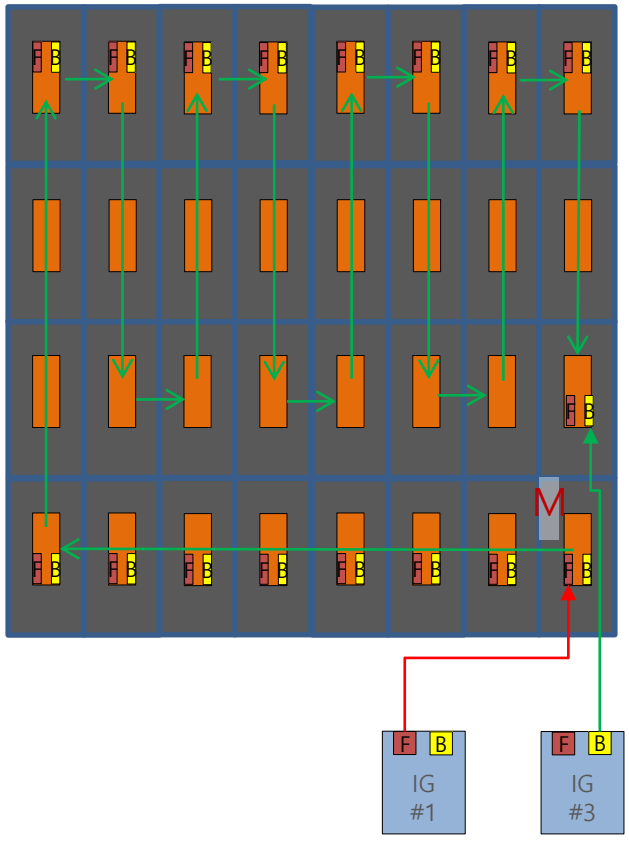
Resolution-specific connection configuration diagram

Model	Pitch	P1.68
	Resolution	240 x 540
Screen	Size	Basic support resolution
	Resolution	1920 x 2160
	Cabinet	8 x 4 = 32
Installation type		Cable
Redundancy	IG Backward	O
	Add IG	O
	Add S-Box	X
Number of connecting devices	IG	2
	S-Box	1

■ Video Redundancy (IG)



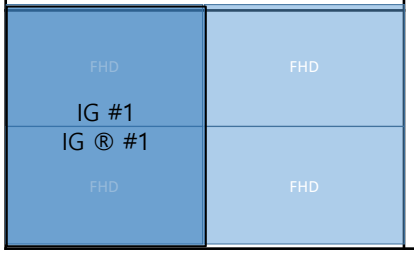


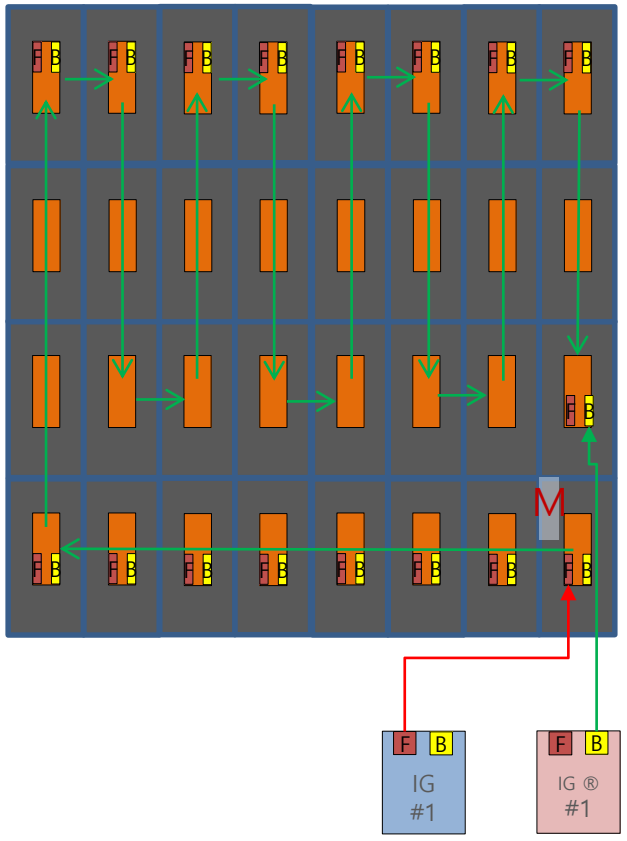
SAMSUNG

Resolution-specific connection configuration diagram

Model	Pitch	P1.68
	Resolution	240 x 540
Screen	Size	Basic support resolution
	Resolution	1920 x 2160
	Cabinet	8 x 4 = 32
Installation type		Cable
Redundancy	IG Backward	O
	Add IG	O
	Add S-Box	X
Number of connecting devices	IG	2
	S-Box	2

■ Video Redundancy (S-BOX)



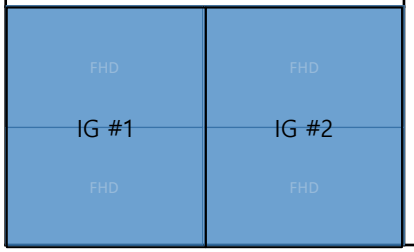


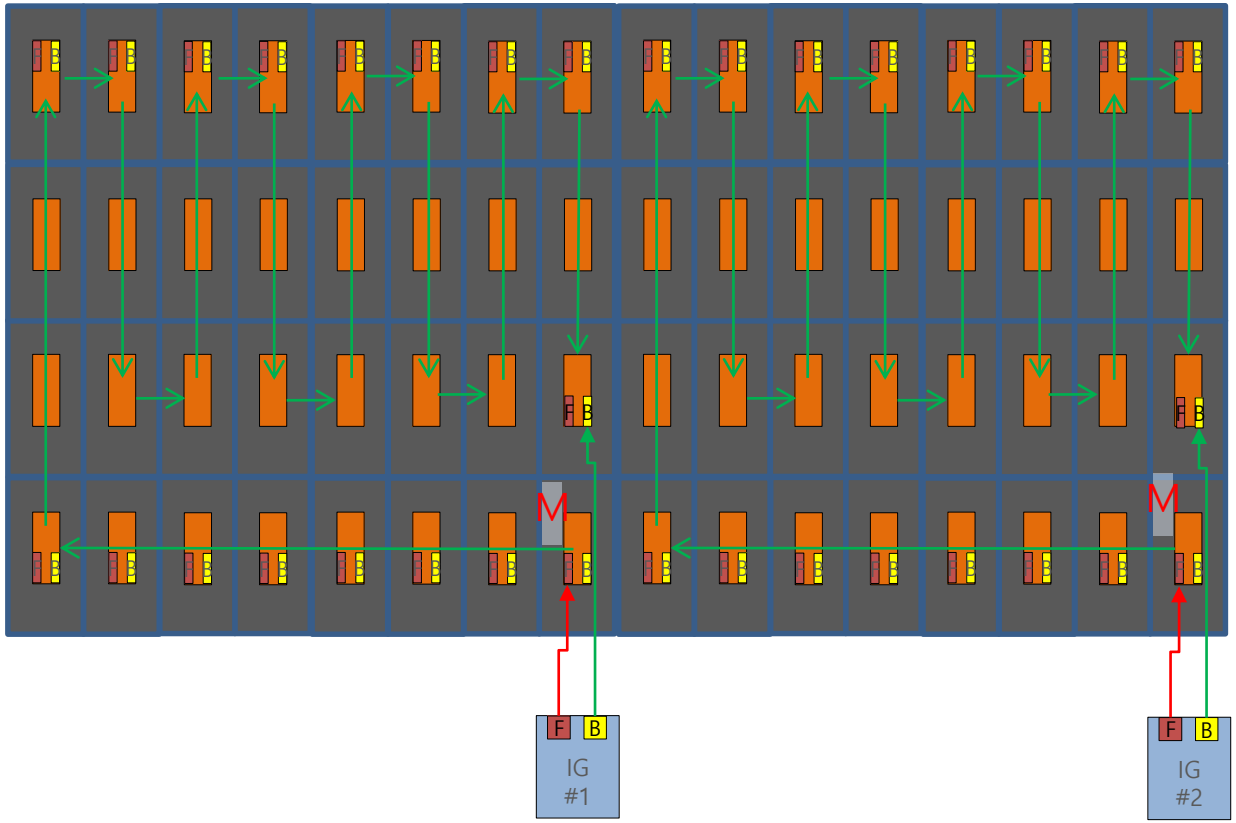
SAMSUNG

Resolution-specific connection configuration diagram

Model	Pitch	P1.68
	Resolution	240 x 540
Screen	Size	UHD
	Resolution	3840 x 2160
	Cabinet	16 x 4 = 64
Installation type		Cable
Redundancy	IG Backward	O
	Add IG	X
	Add S-Box	X
Number of connecting devices	IG	2
	S-Box	1

■ Basic cable connection structure



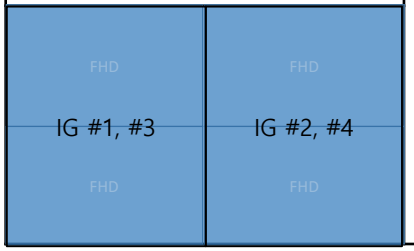


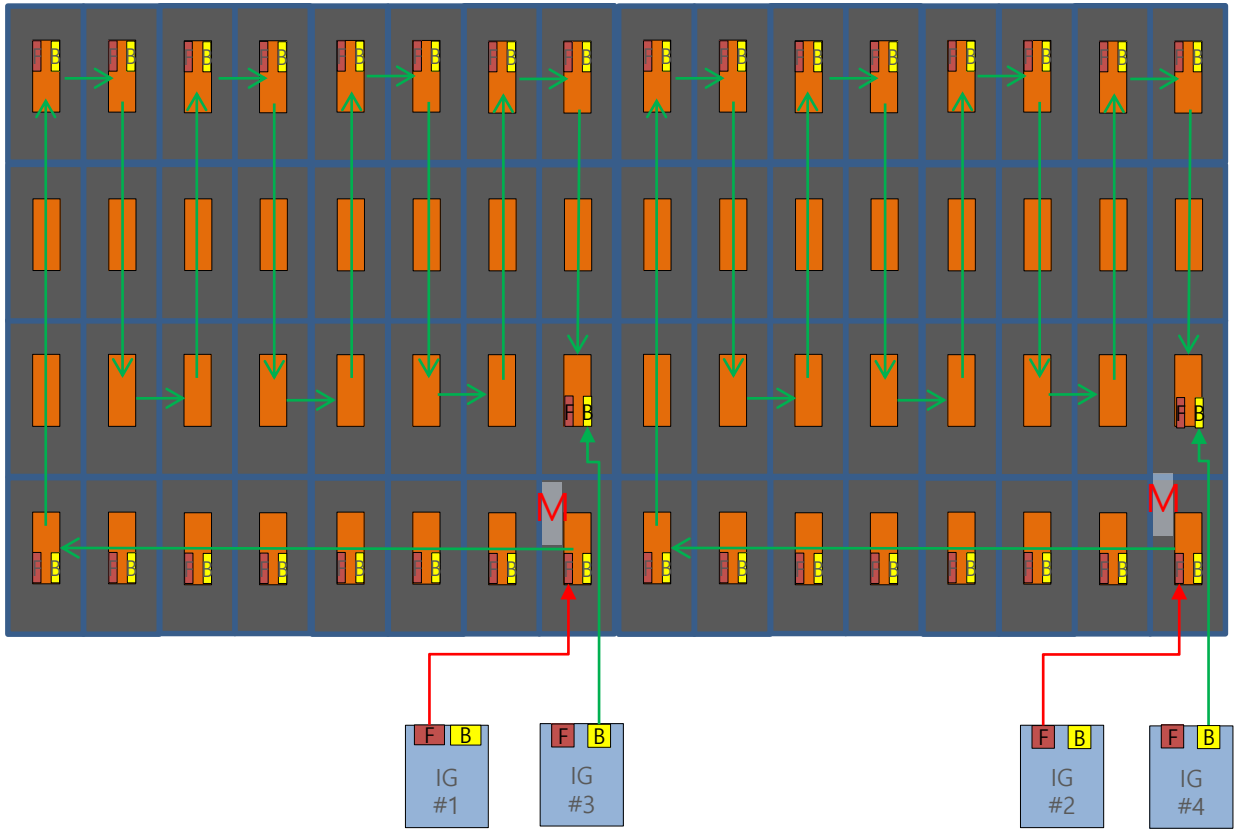
SAMSUNG

Resolution-specific connection configuration diagram

Model	Pitch	P1.68
	Resolution	240 x 540
Screen	Size	UHD
	Resolution	3840 x 2160
	Cabinet	16 x 4 = 64
Installation type		Cable
Redundancy	IG Backward	O
	Add IG	O
	Add S-Box	X
Number of connecting devices	IG	4
	S-Box	1

■ Video Redundancy (IG)



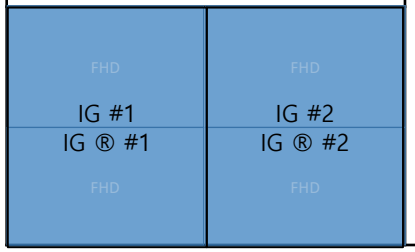


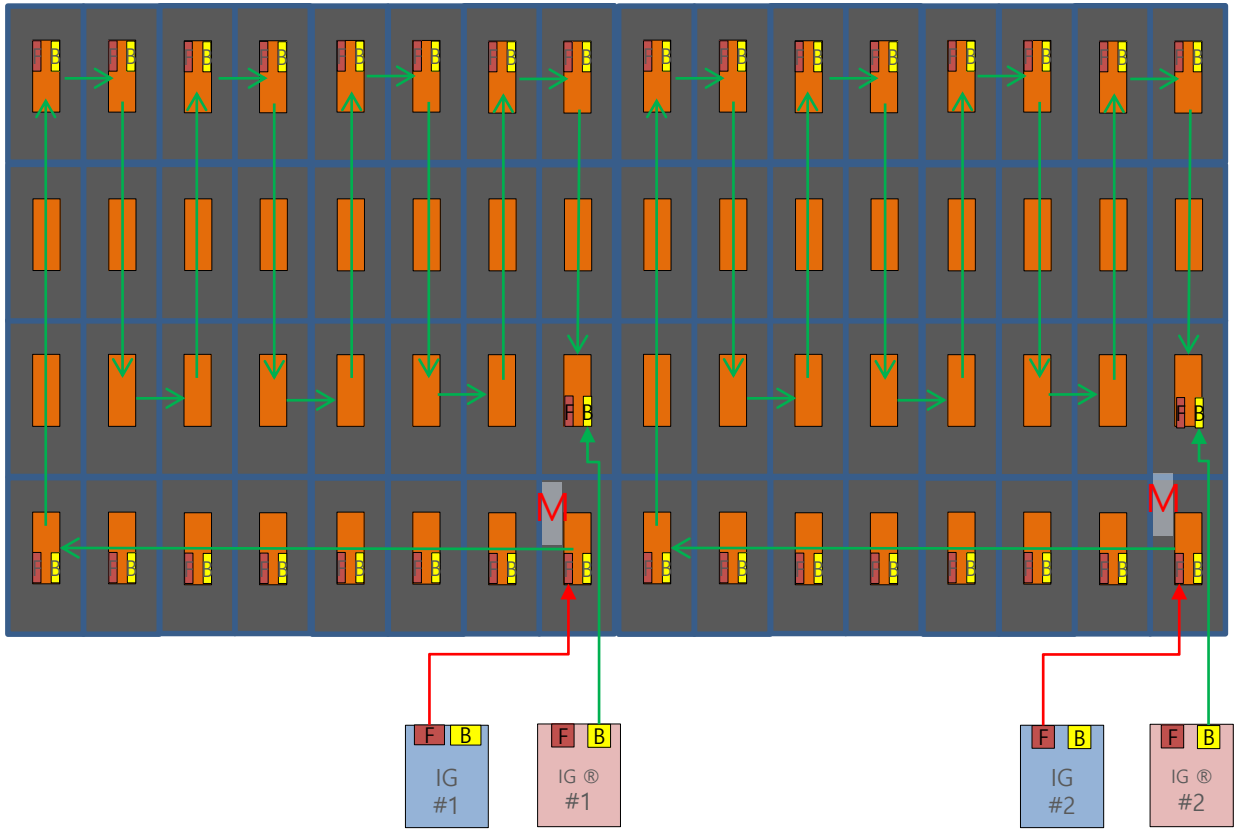
SAMSUNG

Resolution-specific connection configuration diagram

Model	Pitch	P1.68
	Resolution	240 x 540
Screen	Size	UHD
	Resolution	3840 x 2160
	Cabinet	16 x 4 = 64
Installation type		Cable
Redundancy	IG Backward	O
	Add IG	O
	Add S-Box	O
Number of connecting devices	IG	4
	S-Box	2

■ Video Redundancy (S-BOX)



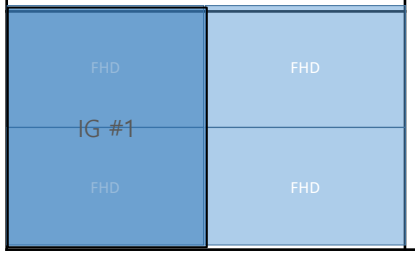


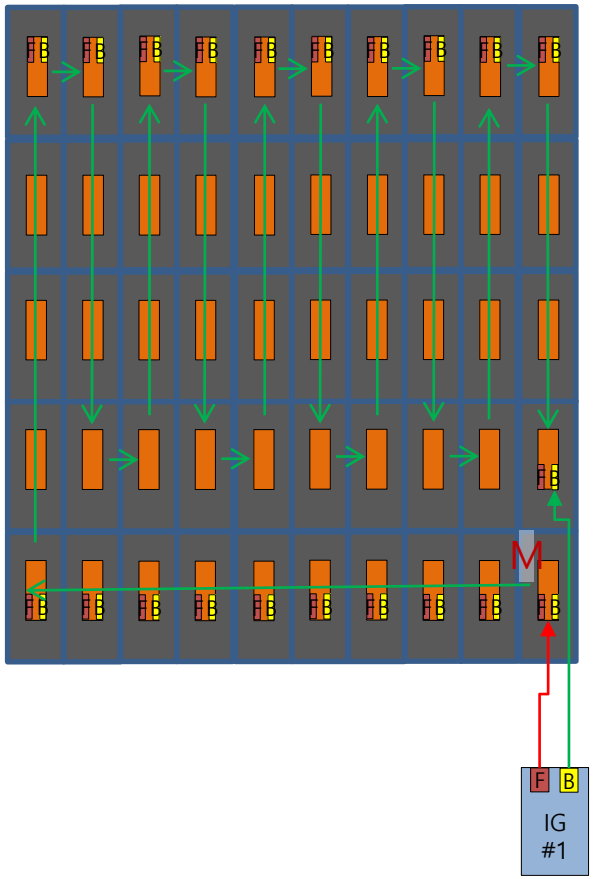
SAMSUNG

Resolution-specific connection configuration diagram

Model	Pitch	P2.1
	Resolution	192 x 432
Screen	Size	Basic support resolution
	Resolution	1920 x 2160
	Cabinet	10 x 5 = 50
Installation type		Cable
Redundancy	IG Backward	O
	Add IG	X
	Add S-Box	X
Number of connecting devices	IG	1
	S-Box	1

■ Basic cable connection structure



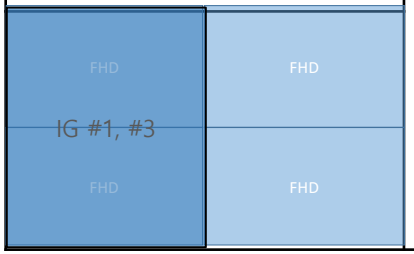


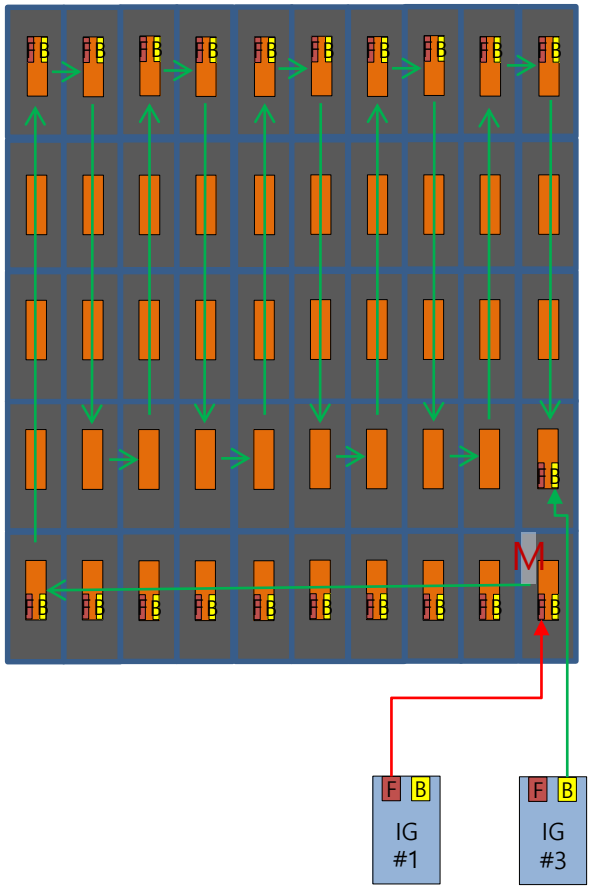
SAMSUNG

Resolution-specific connection configuration diagram

Model	Pitch	P2.1
	Resolution	192 x 432
Screen	Size	Basic support resolution
	Resolution	1920 x 2160
	Cabinet	10 x 5 = 50
Installation type		Cable
Redundancy	IG Backward	O
	Add IG	O
	Add S-Box	X
Number of connecting devices	IG	2
	S-Box	1

■ Video Redundancy (IG)



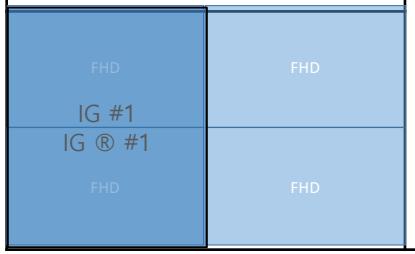


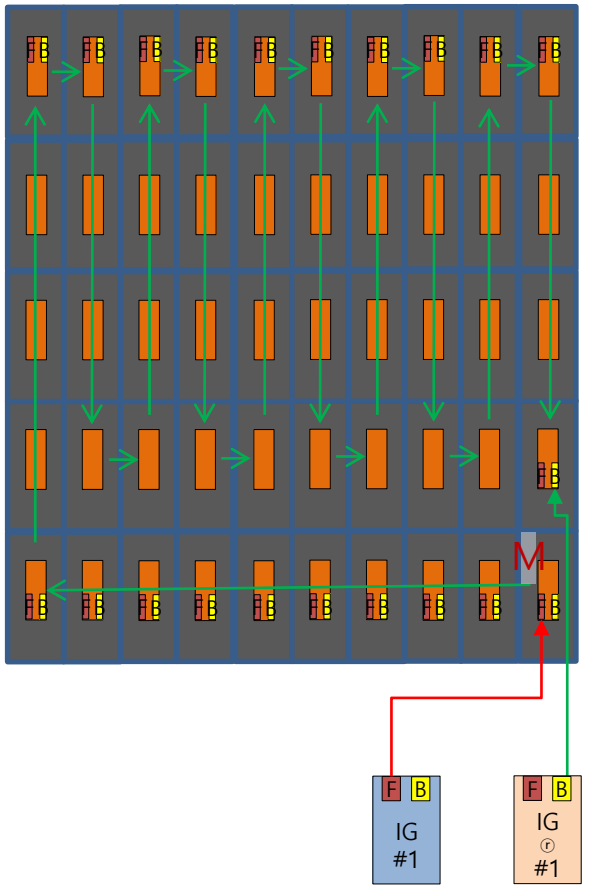
SAMSUNG

Resolution-specific connection configuration diagram

Model	Pitch	P2.1
	Resolution	192 x 432
Screen	Size	Basic support resolution
	Resolution	1920 x 2160
	Cabinet	10 x 5 = 50
Installation type		Cable
Redundancy	IG Backward	O
	Add IG	O
	Add S-Box	O
Number of connecting devices	IG	2
	S-Box	2

■ Video Redundancy (S-BOX)



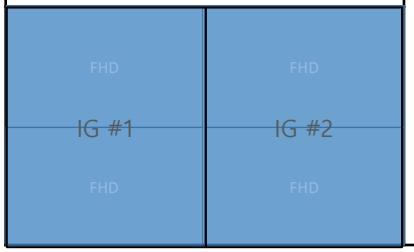


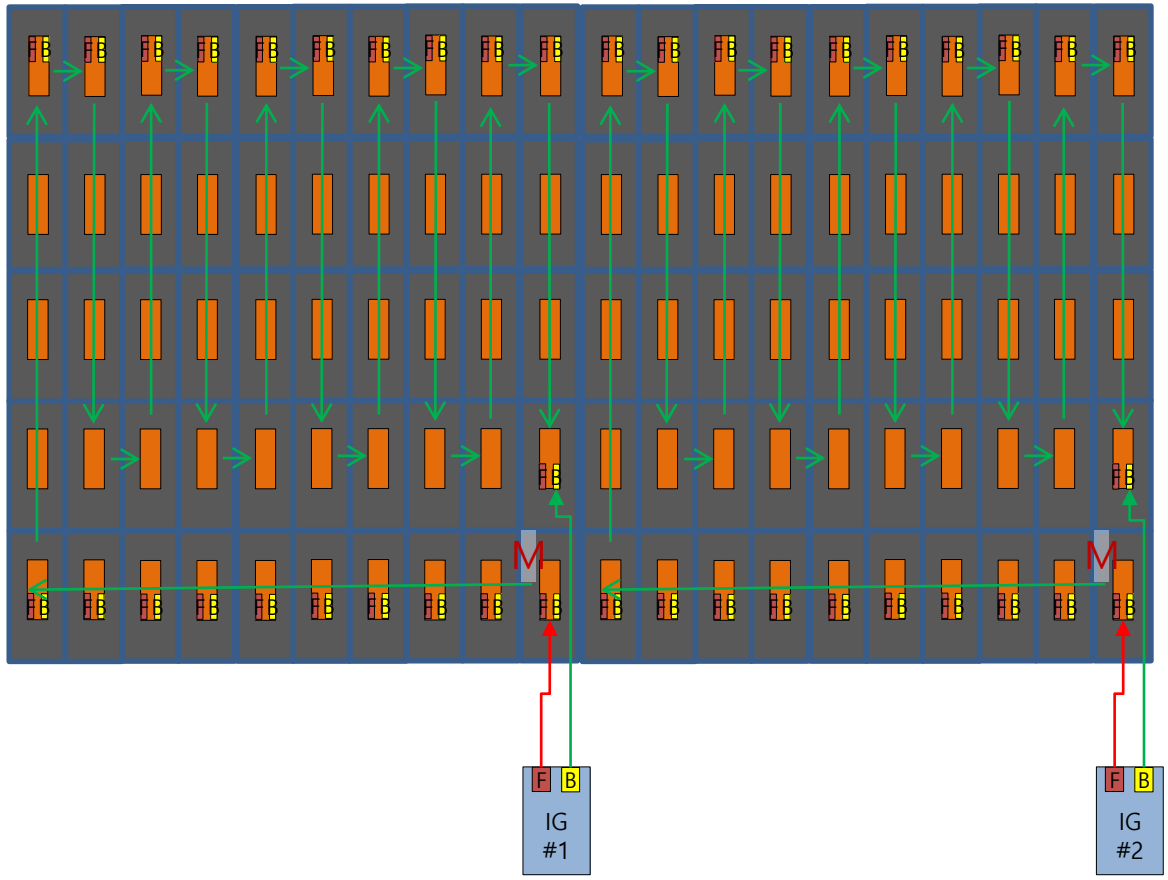
SAMSUNG

Resolution-specific connection configuration diagram

Model	Pitch	P2.1
	Resolution	192 x 432
Screen	Size	UHD
	Resolution	3840 x 2160
	Cabinet	20 x 5 = 100
Installation type		Cable
Redundancy	IG Backward	O
	Add IG	O
	Add S-Box	X
Number of connecting devices	IG	2
	S-Box	1

■ Basic cable connection structure



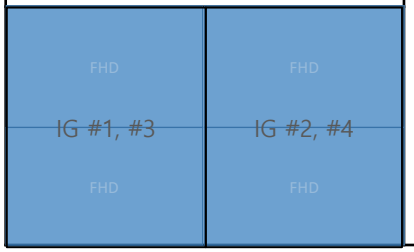


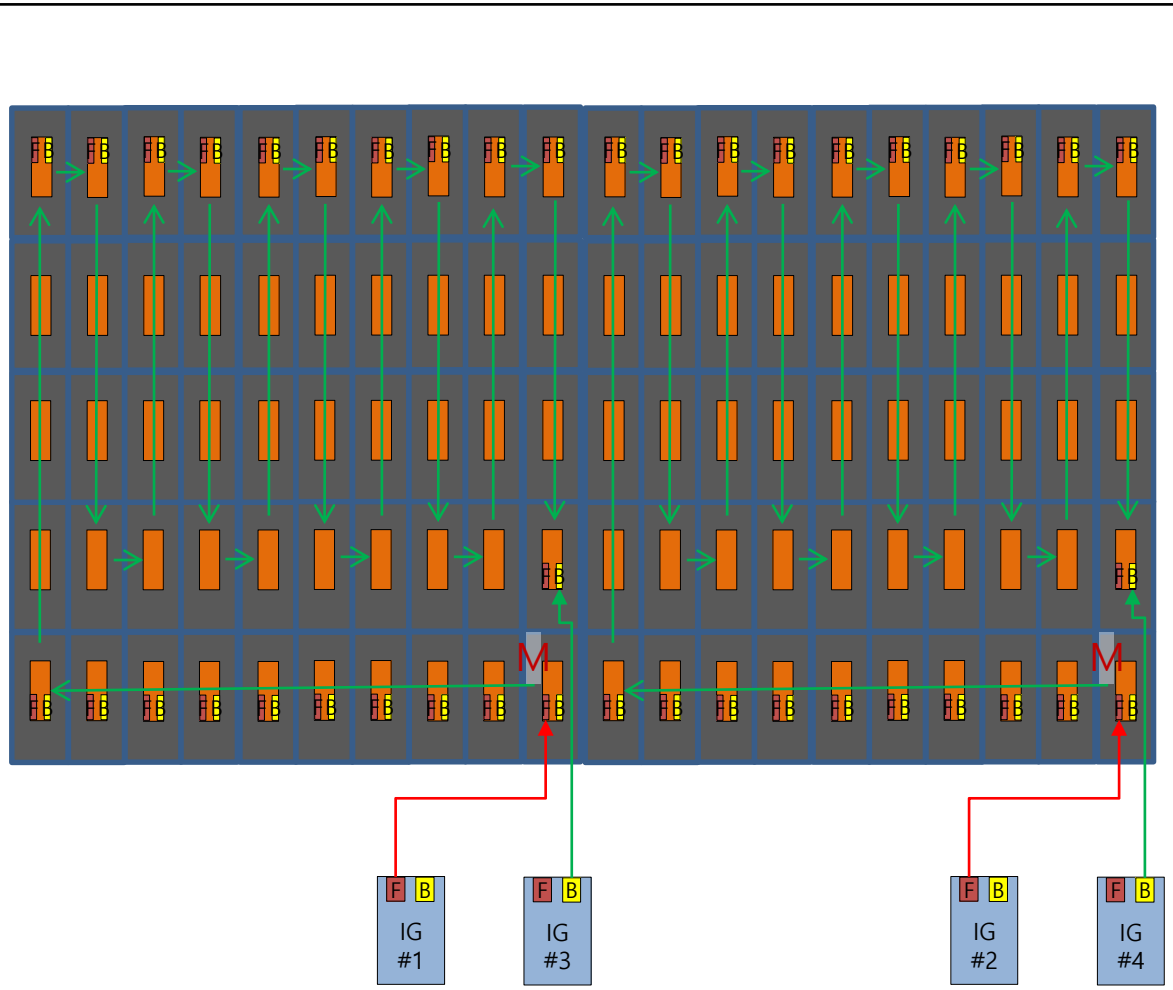
SAMSUNG

Resolution-specific connection configuration diagram

Model	Pitch	P2.1
	Resolution	192 x 432
Screen	Size	UHD
	Resolution	3840 x 2160
	Cabinet	20 x 5 = 100
Installation type		Cable
Redundancy	IG Backward	O
	Add IG	O
	Add S-Box	X
Number of connecting devices	IG	4
	S-Box	1

■ Video Redundancy (IG)





SAMSUNG

Resolution-specific connection configuration diagram

Model	Pitch	P2.1
	Resolution	192 x 432
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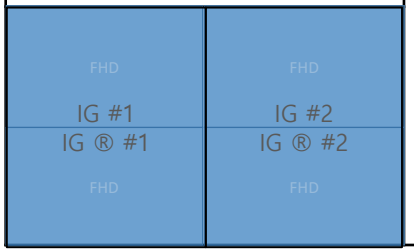
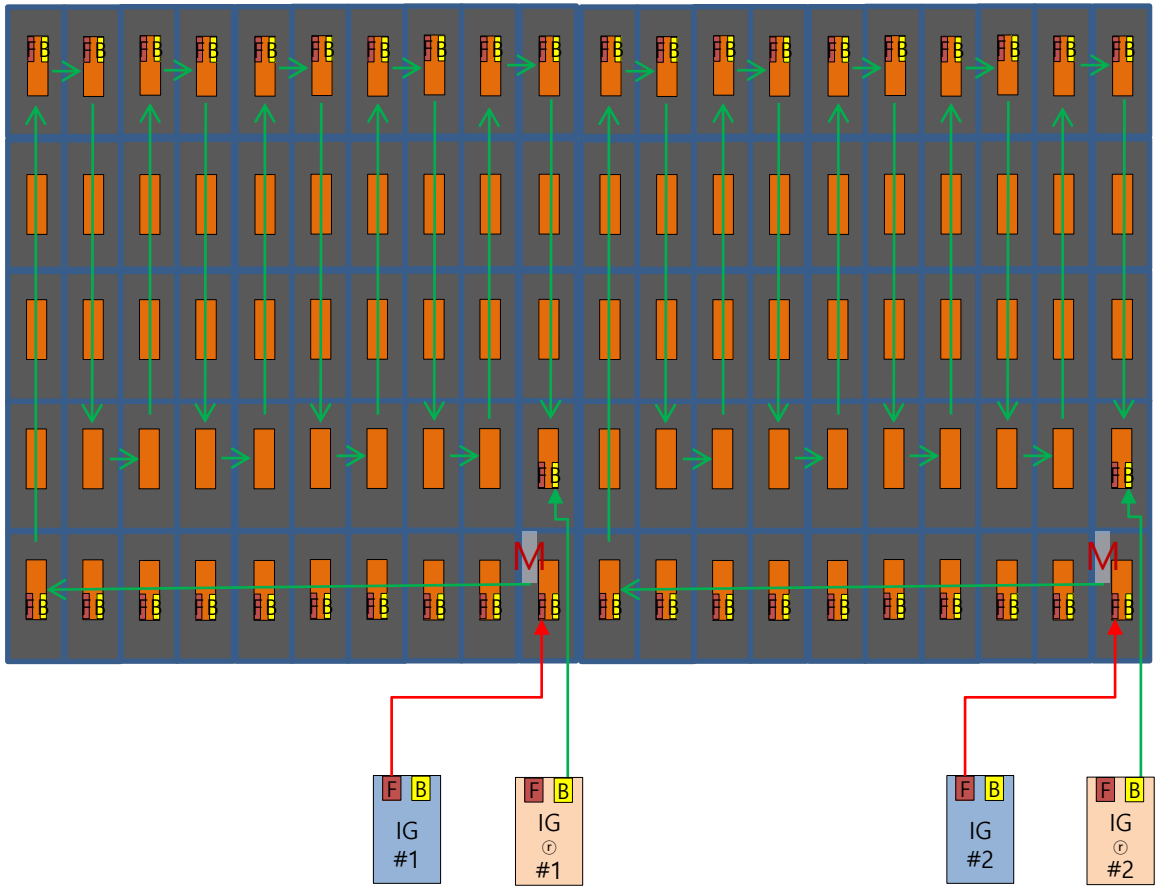
	Resolution	3840 x 2160
	Cabinet	20 x 5 = 100
Installation type		Cable
Redundancy	IG Backward	O
	Add IG	O
	Add S-Box	O
Number of connecting devices	IG	4
	S-Box	2

■ Video Redundancy (S-BOX)



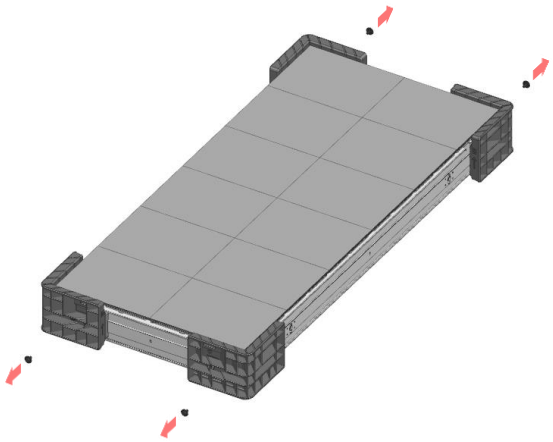


- ASSY FRONT Separation (single item status)

1. Separate SCREW

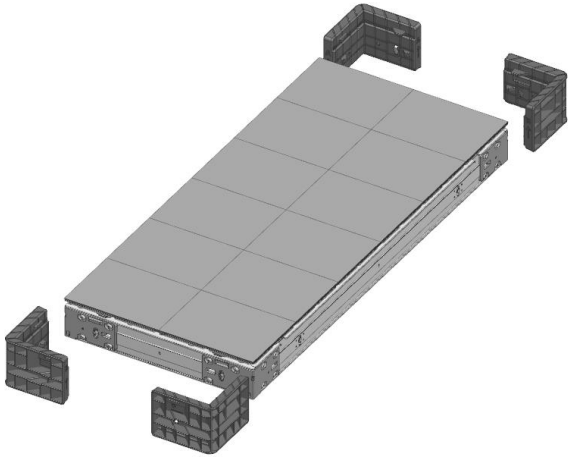
[Caution]

To prevent MODULE damage, separate the MODULE facing the sky.



Screw Code	Specification	Shape
6003-001748	M4 / L10 / Black	

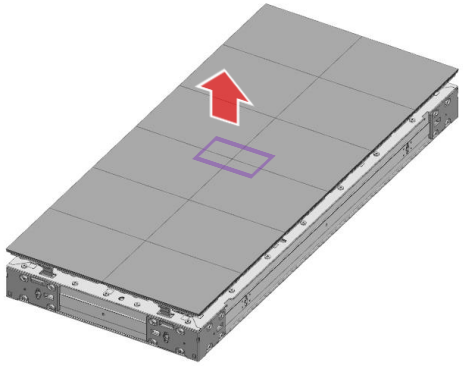
2. Separate COVER CORNER

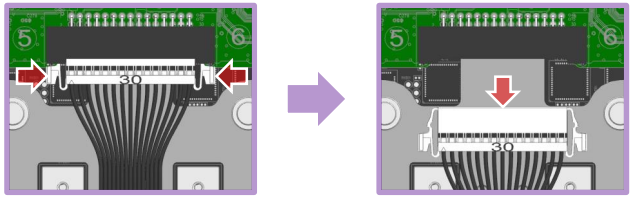


3. Separate ASSY FRONT

[Caution]

T-CON ↔ SMPS power WIRE separation is required when separating ASSY FRONT





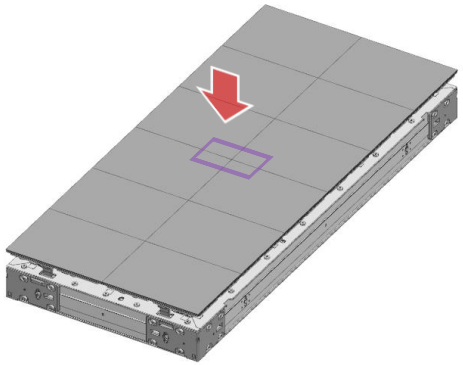
- ASSY FRONT Separation (single item status)

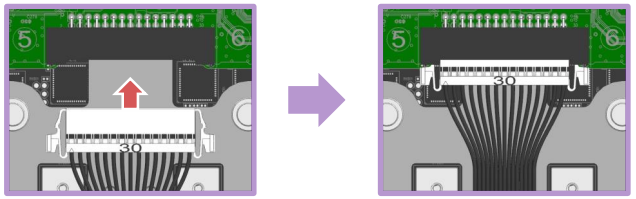
1. Assemble ASSY FRONT

[Caution]

To prevent MODULE damage, separate the MODULE facing the sky.

T-CON ↔ SMPS power WIRE connection is required when assembling ASSY FRONT

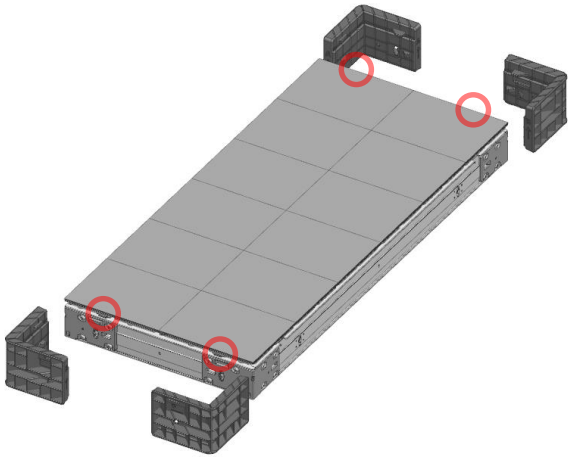


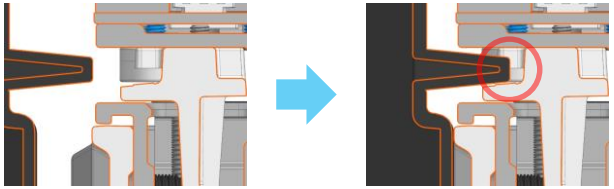


2. Assemble COVER-CORNER

[Caution]

Assemble so that the protrusions of COVER-CORNER are inserted between BRACKET-SUPPORT grooves to prevent ASSY FRONT departure



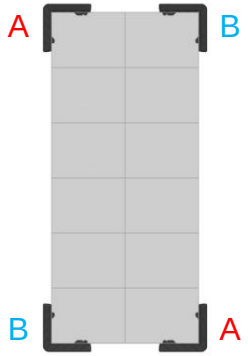


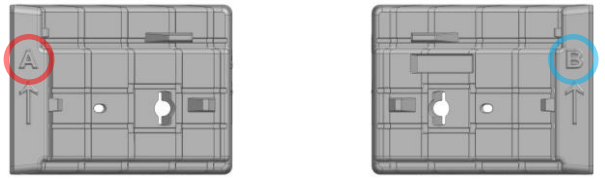
[Note]

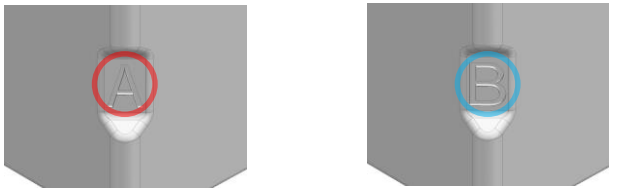
Assemble the COVER-CORNER by referring to the code imprint of the BRACKET-CORNER.

A : Lower right / upper left

B : Lower left / upper right

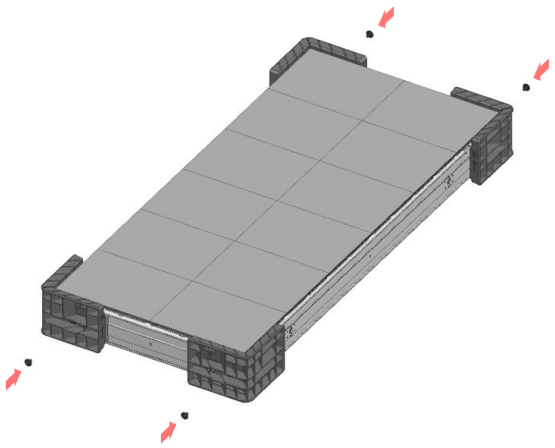






- ASSY FRONT Separation (single item status)

3. Assemble SCREW



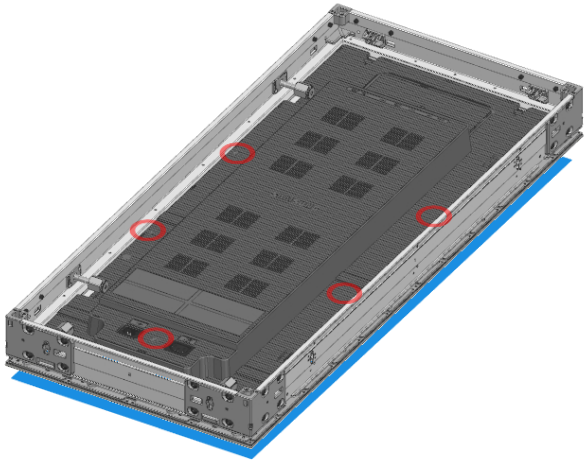
SCREW CODE	SPECIFICATION	SHAPE
6003-001748	M4 / L10 / BLACK	

- COVER-REAR Separation (single item status)

1. Separate SCREW 5ea

[Note]

- Work with a soft cloth on the floor to protect MODULE and prevent deformation.
- Be careful not to contact SMPS that is not completely discharged due to electric shock accident

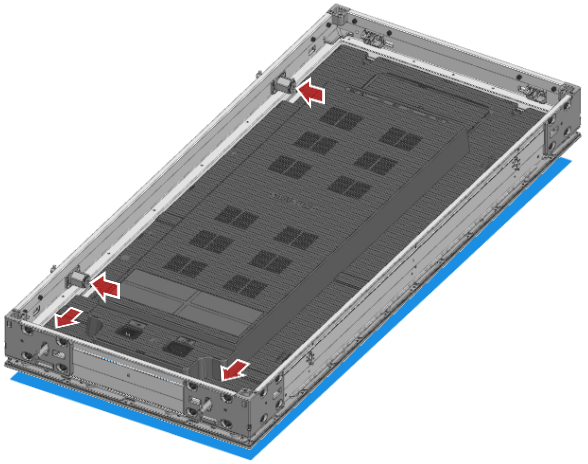


SCREW CODE	SPECIFICATION	SHAPE
6001-002755	M3 / L6 / BLACK	

2. Push LATECH MALE 4ea

[Note]

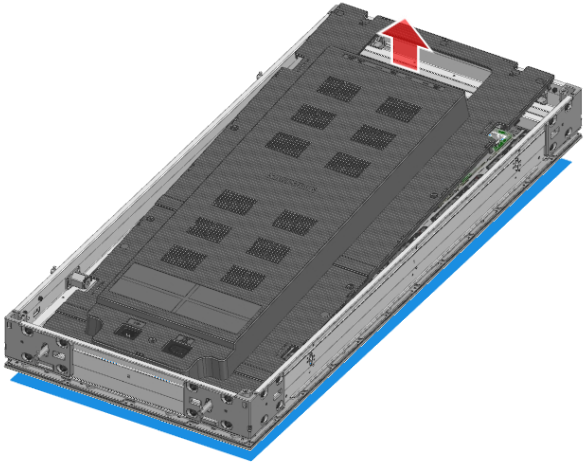
- If it is difficult to keep it pressed, fix it using tape, etc.



3. Separate from the upper side of COVER REAR

[Caution]

- Be careful of COVER REAR HOOK damage



- COVER-REAR Assembly (single item status)

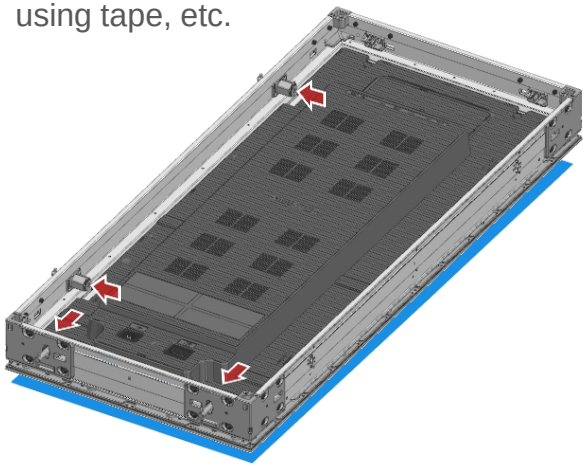
1. Push LATECH MALE 4ea

[Caution]

- Work with a soft cloth on the floor to protect MODULE and prevent deformation.

[Note]

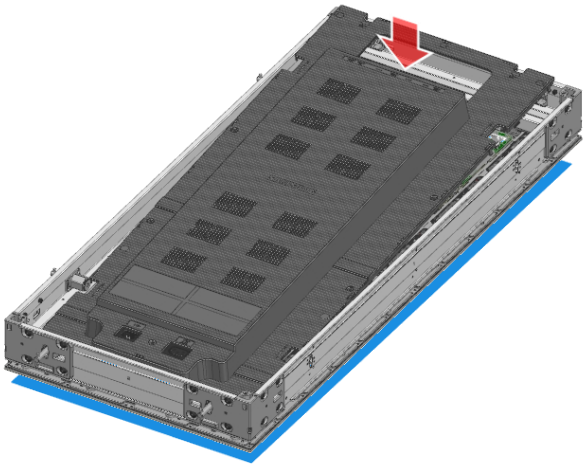
- If it is difficult to keep it pressed, fix it using tape, etc.



2. Assemble the lower side of COVER REAR

[Caution]

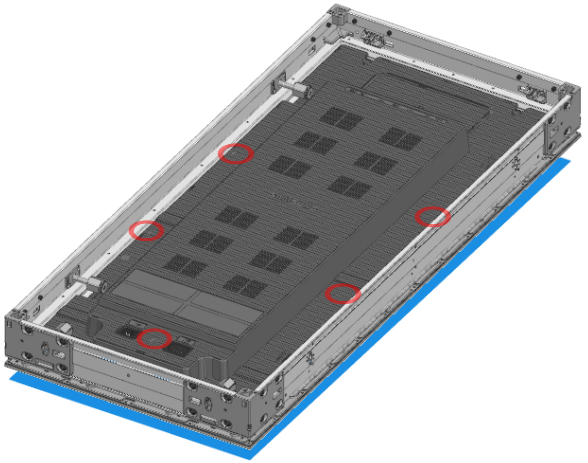
- Be careful of COVER REAR HOOK damage



3. Assemble 5 SCREW locations and check HOOK assembly

[Caution]

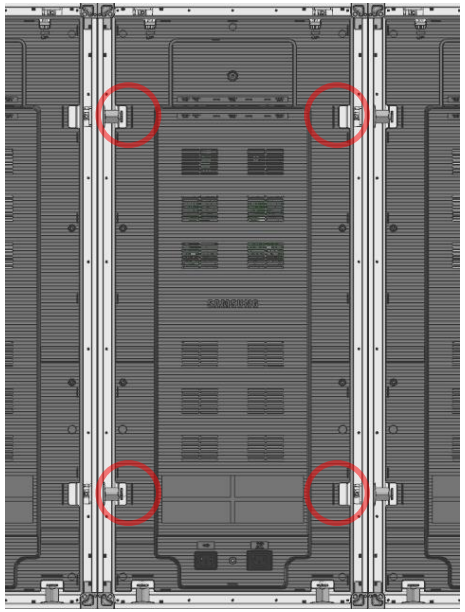
- Make sure that the COVER REAR HOOK is fully assembled



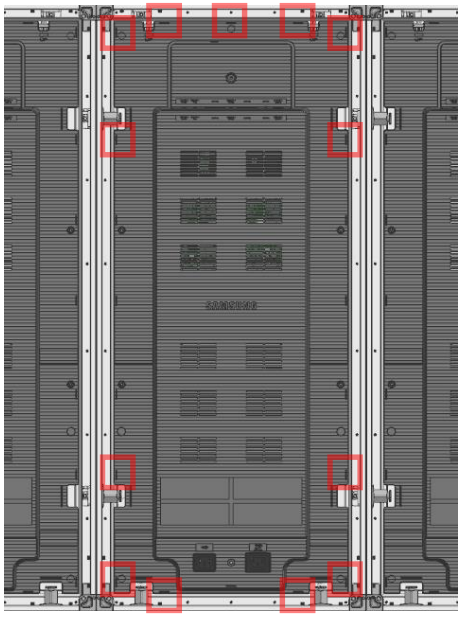
SCREW CODE	SPECIFICATION	SHAPE
6001-002755	M3 / L6 / BLACK	

- COVER-REAR Separation method and HOOK assembly position

[참고]
- ○ – (SLOTTED) DRIVER Insertion location



[참고]
- □ HOOK assembly location

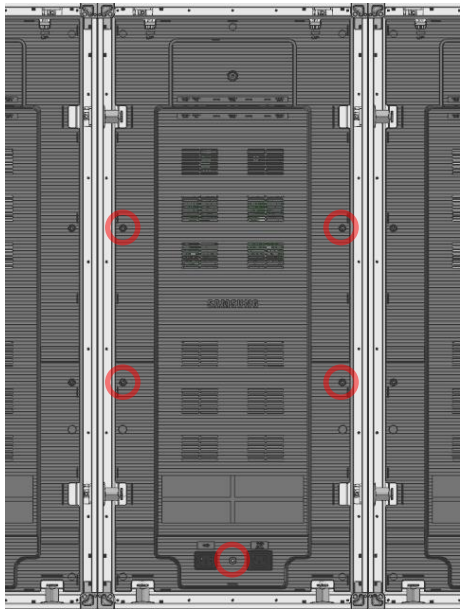


- COVER-REAR Separation method and HOOK assembly position

1. ◯ Separate SCREW 5ea

[Caution]

- Make sure to separate SCREW before COVER REAR separation

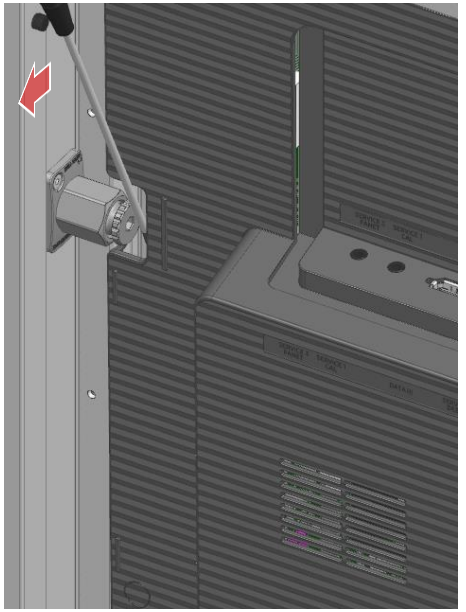


SCREW CODE	SPECIFICATION	SHAPE
6001-002755	M3 / L6 / BLACK	

2. Insert – (SLOTTED) DRIVER to COVER REAR LATCH



3. Lean back – (SLOTTED) DRIVER

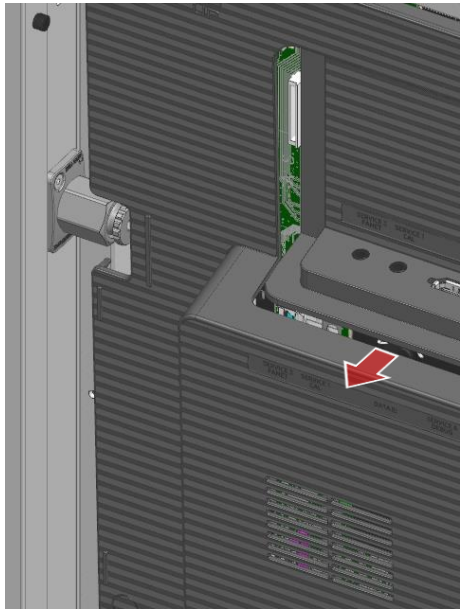


- COVER-REAR Separation method and HOOK assembly position

4. Hold the gap and separate the COVER REAR.

[Caution]

- Be careful of COVER REAR HOOK damage

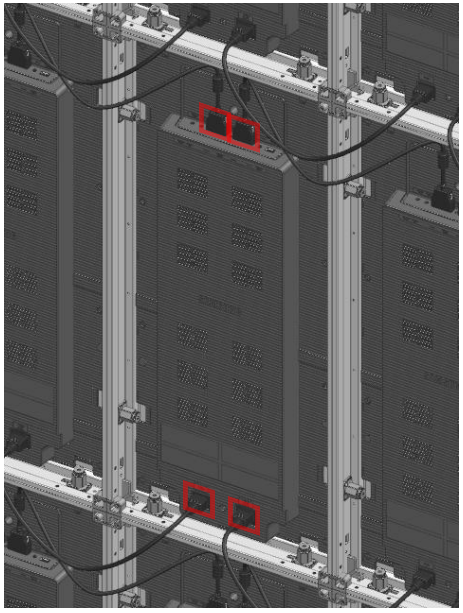


- COVER-REAR separation (Intallation status)

1. □ DATA CABLE, POWER CORD separation

[Caution]

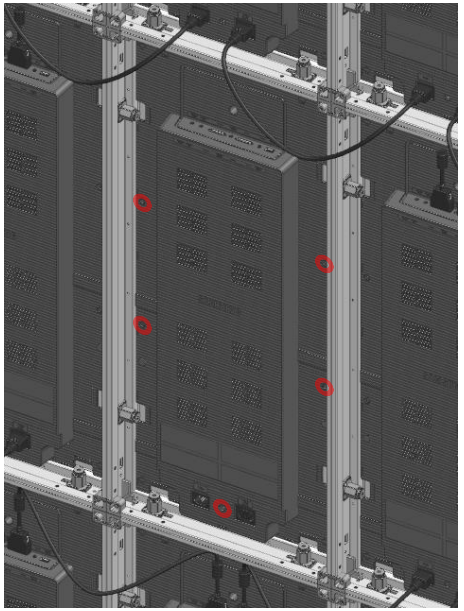
- DATA CABLE can damage the T-CON part when separated without separation



2. ○ SCREW 5ea separation

[Caution]

- Be careful of SCREW loss

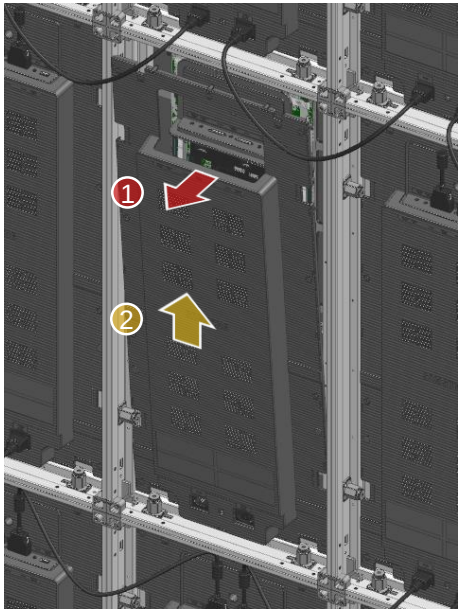


SCREW CODE	SPECIFICATION	SHAPE
6001-002755	M3 / L6 / BLACK	

3. Separate from the top of COVER REAR

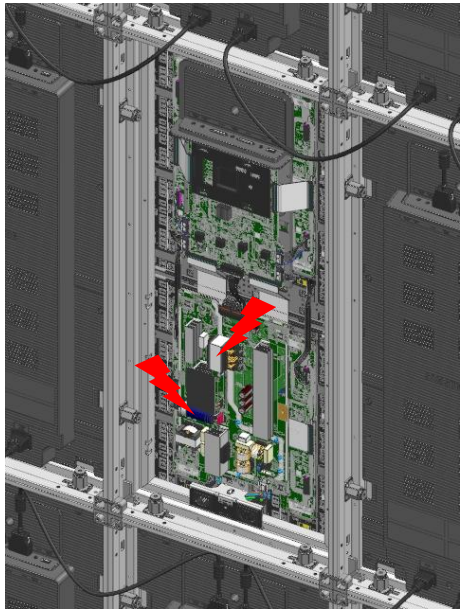
[Caution]

- Be careful of COVER REAR HOOK damage



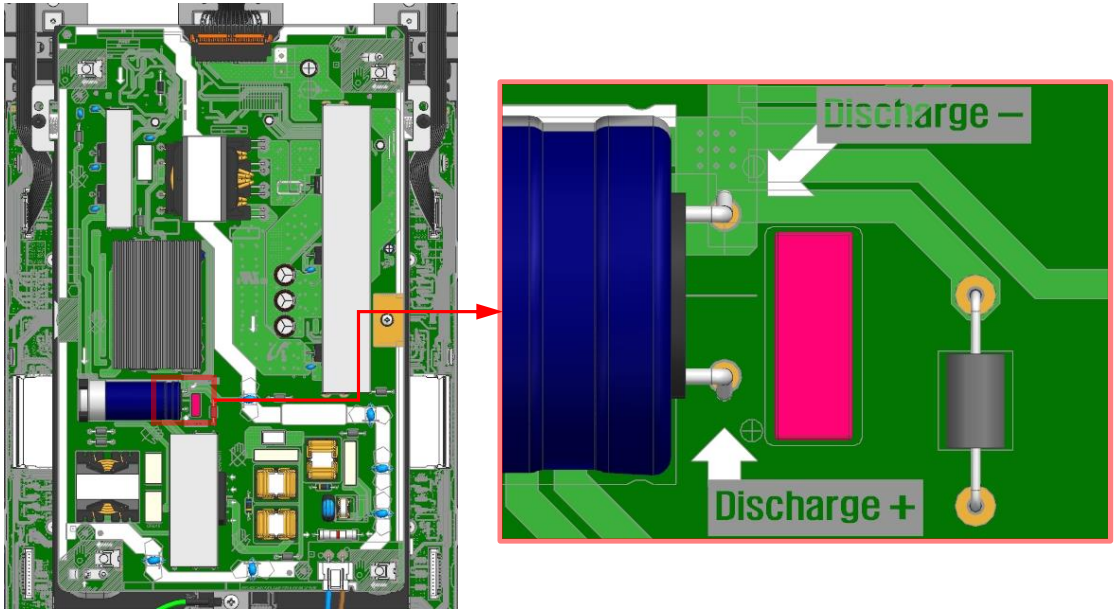
- Cautions in COVER-REAR Separation Status

[Caution]
- Be sure to wear protective gloves when contacting internal parts



[Caution]
- If SMPS contact is required, discharge it completely and work on it.

[Note]
- □ DISCHARGE location

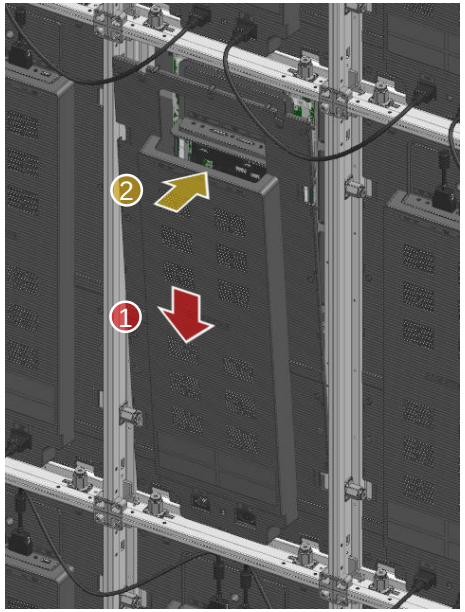


- COVER-REAR assembly (installation status)

1. Assemble from the bottom of COVER REAR

[Caution]

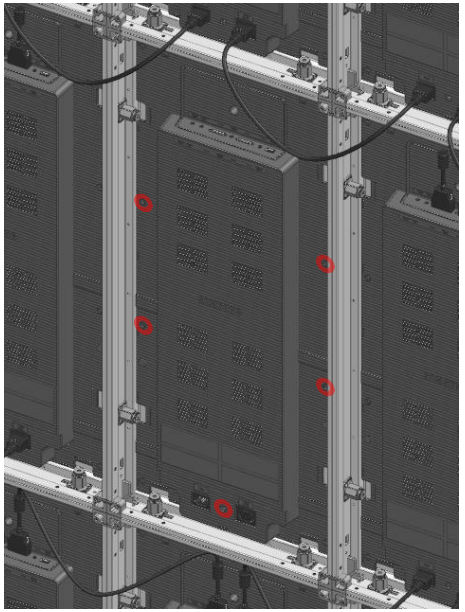
- Be careful of COVER REAR HOOK damage



2. ◯ Assemble 5 SCREW locations and check HOOK assembly

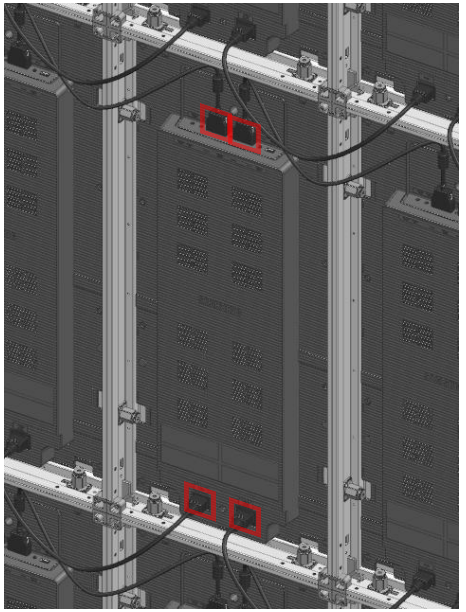
[Caution]

- Make sure that the COVER REAR HOOK is fully assembled



SCREW CODE	SPECIFICATION	SHAPE
6001-002755	M3 / L6 / BLACK	

3. □ Connect DATA CABLE, POWER CORD



SAMSUNG

- SMPS Separation

1. □ Separate WIRE

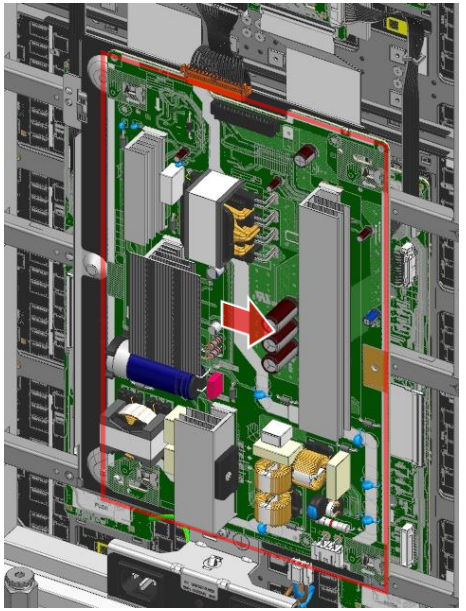


2. ○ Separate SCREW 1ea



SCREW CODE	SPECIFICATION	SHAPE
6003-000264	M3 / L6 / WHITE	

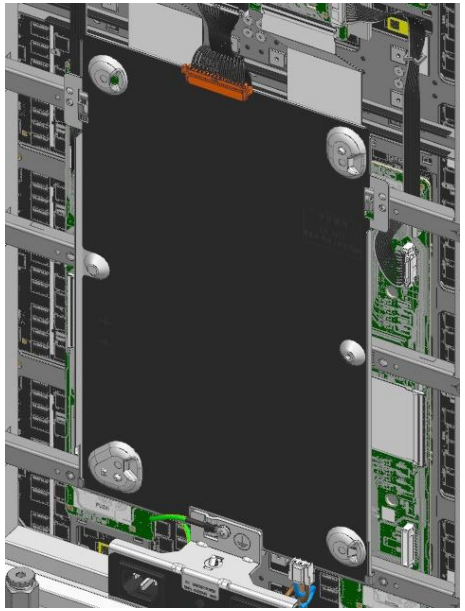
3. □ Separate SMPS from left to right



- SMPS Separation

[Note]

- SMPS separated state

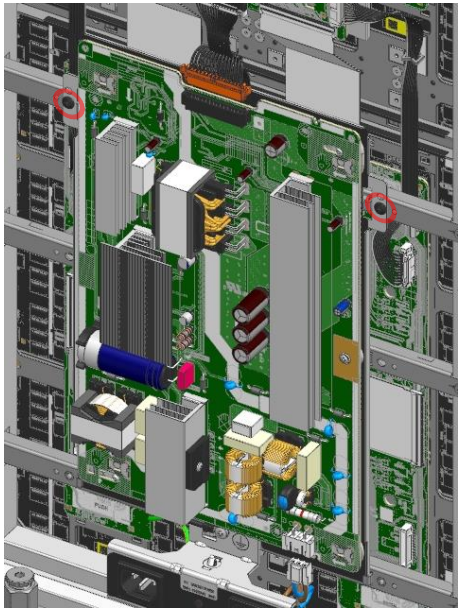


- Separate SMPS and BRACKET PCB together

1. □ Separate WIRE

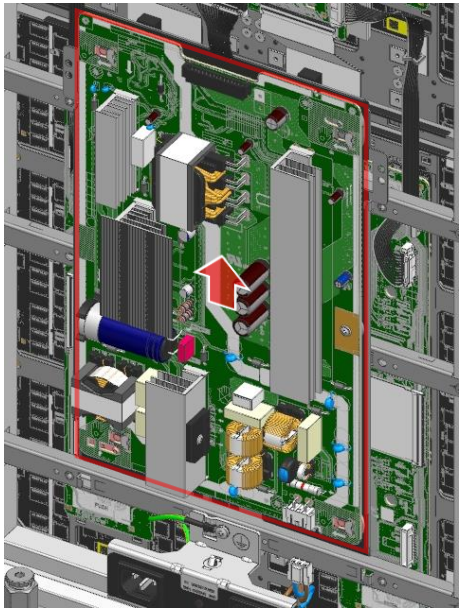


2. ○ Separate SCREW 2ea



SCREW CODE	SPECIFICATION	SHAPE
6001-002610	M4 / L6 / BLACK	

3. □ Separate the SMPS and BRACKET PCBs from the lower side to the upper side.



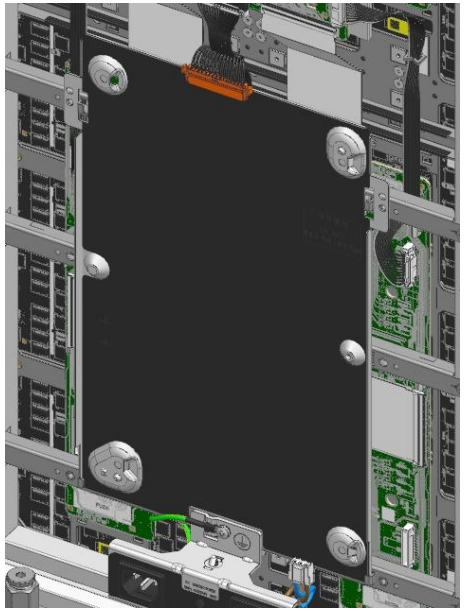
- Separate SMPS and BRACKET PCB together

[Note]
- SMPS and BRACKET PCBs are separated together

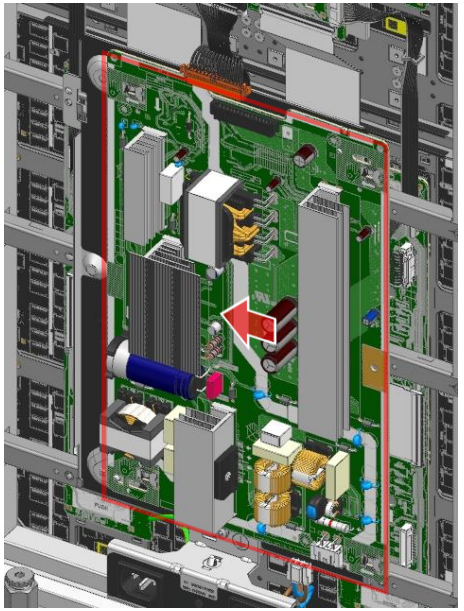


- SMPS Separation

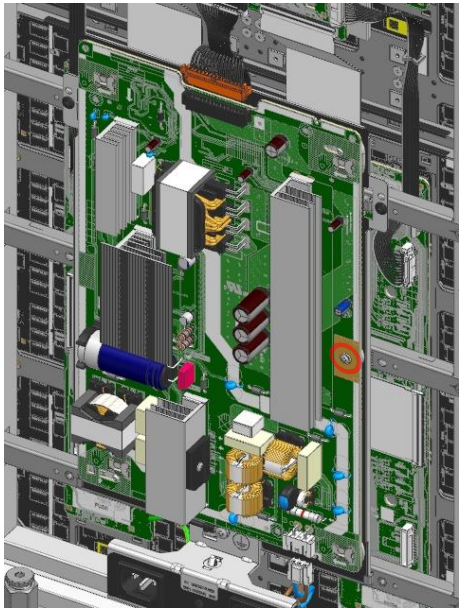
1. SMPS separated state



2. □ Assemble SMPS from right to left



3. ○ Assemble SCREW 1ea



SCREW CODE	SPECIFICATION	SHAPE
6003-000264	M3 / L6 / WHITE	

- SMPS Separation

4. □ Connect WIRE



- Assemble SMPS and BRACKET PCB together

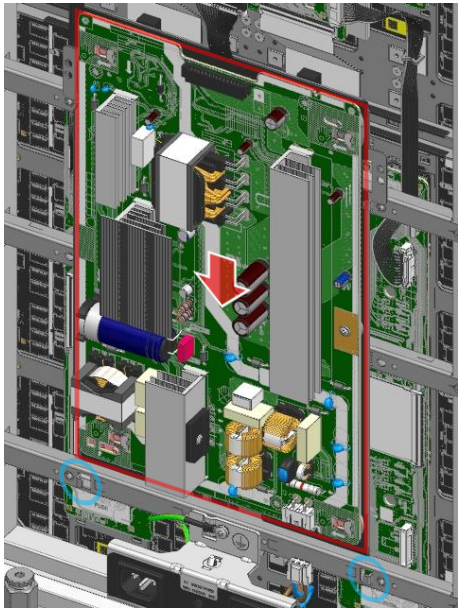
1. SMPS and BRACKET PCBs are separated together

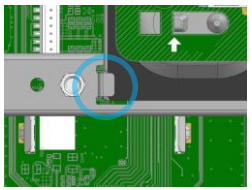


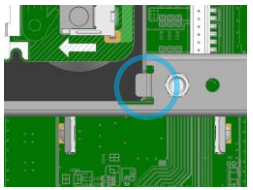
2. □ Assemble SMPS and BRACKET PCBs from upper side to lower side

[Caution]

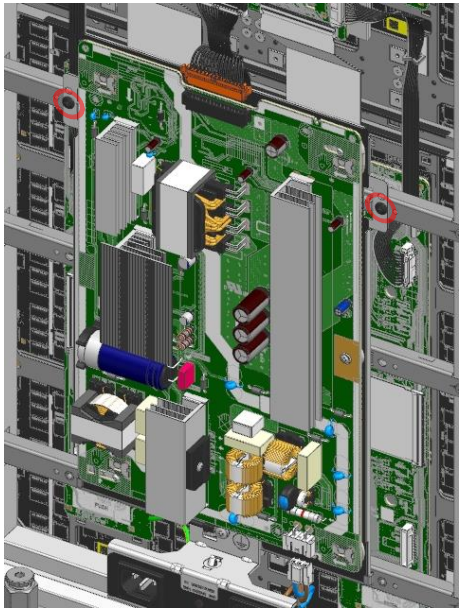
○ Assemble to insert BRACKET PCB into BRACKET SUPPORT HOOK







3. ○ Assemble SCREW 2ea



SCREW CODE	SPECIFICATION	SHAPE
6001-002610	M4 / L6 / BLACK	

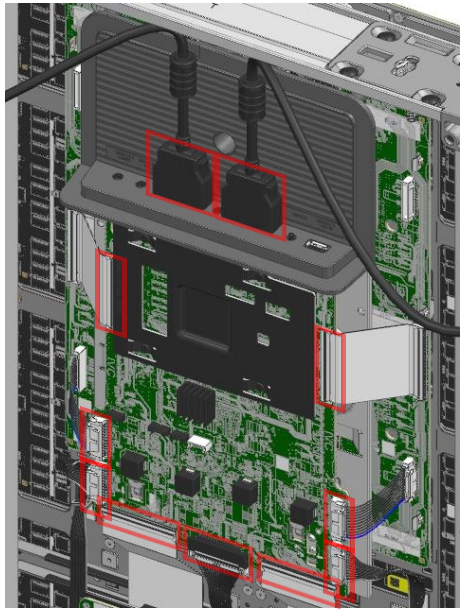
- Assemble SMPS and BRACKET PCB together

4. ☐ Connect WIRE

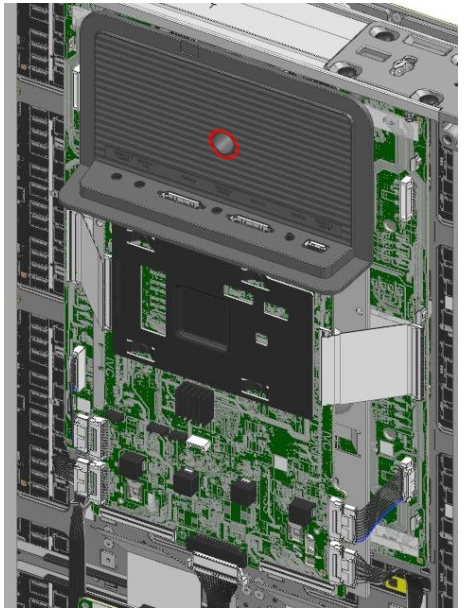


- T-CON Separation

1. □ Separate DATA CABLE and Power WIRE

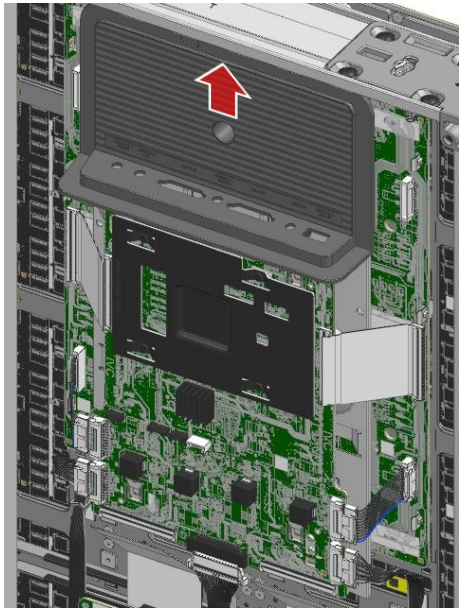


2. ○ Separate SCREW 1ea



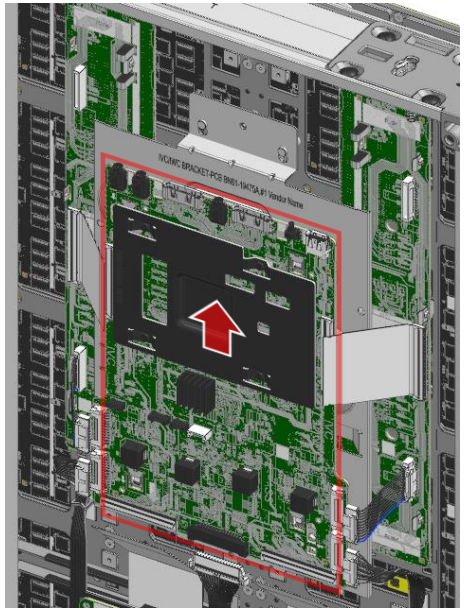
SCREW CODE	SPECIFICATION	SHAPE
6001-002755	M3 / L6 / BLACK	

3. Separate COVER TERMINAL from the lower side to the upper side



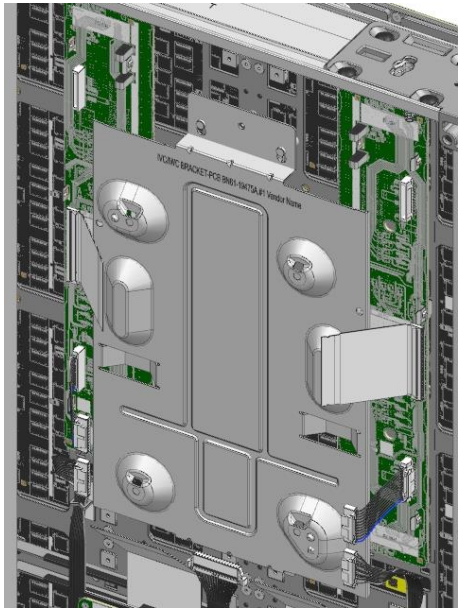
- T-CON Separation

4. ☐ Separate T-CON from the lower side to the uppser side



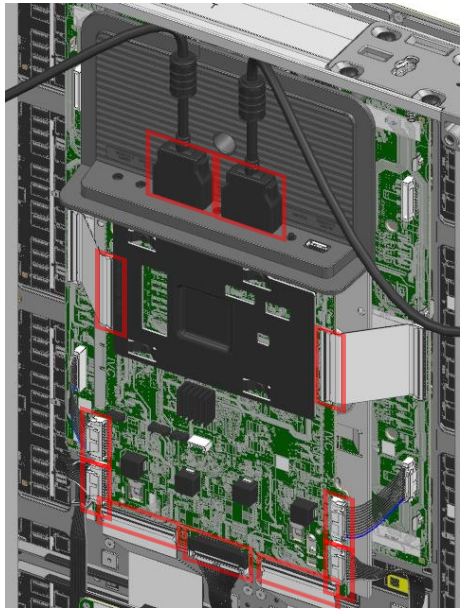
[Note]

- T-CON separated state

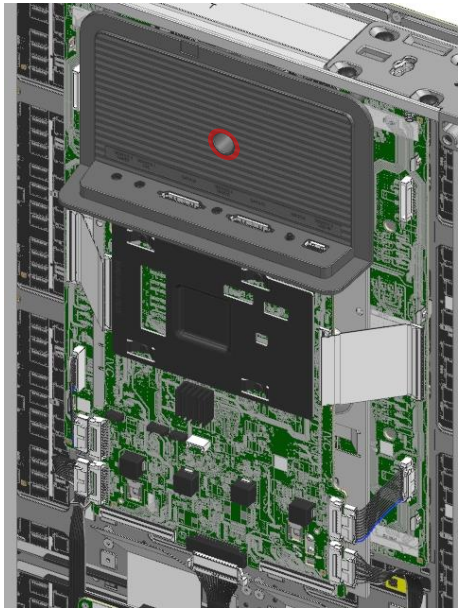


- Separate T-CON and BRACKET PCB together

1. □ Separate DATA CABLE

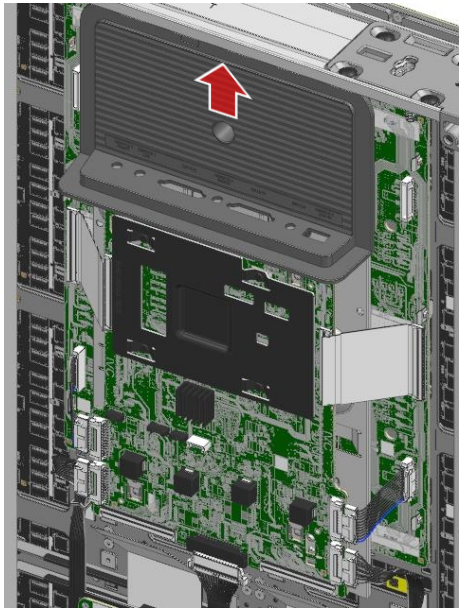


2. ○ Separate SCREW 1ea



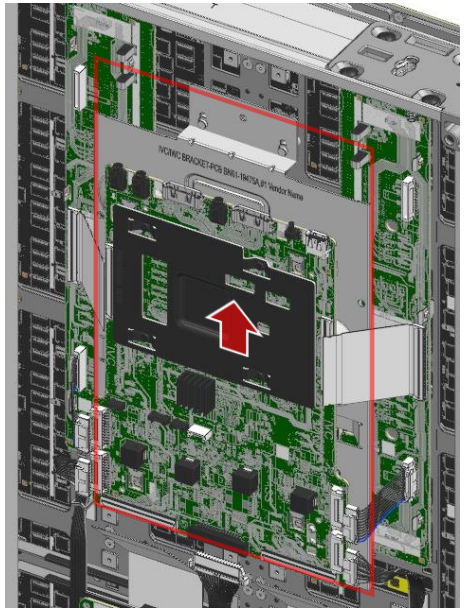
SCREW CODE	SPECIFICATION	SHAPE
6001-002755	M3 / L6 / BLACK	

3. Separate COVER TERMINAL from the lower side side to the upper side



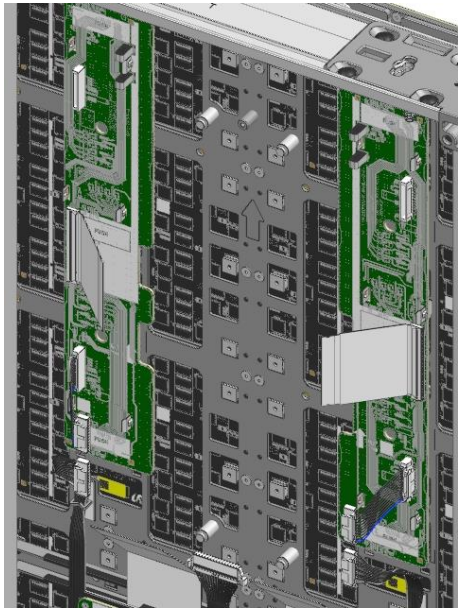
- Separate T-CON and BRACKET PCB together

4. ☐ Separate the T-CON and BRACKET PCBs from the lower side to the upper side together



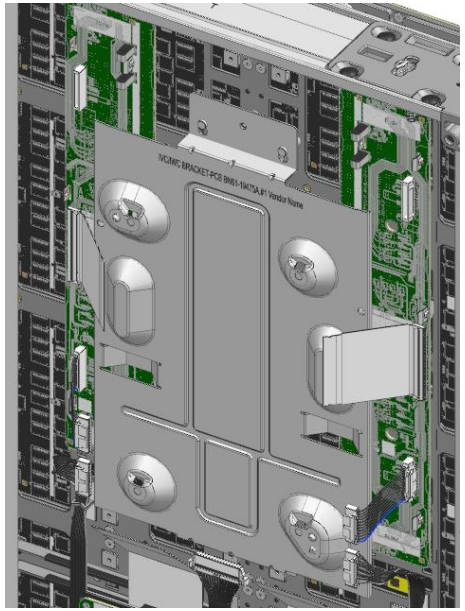
[Note]

- T-CON and BRACKET PCB are separated together



- T-CON Assembly

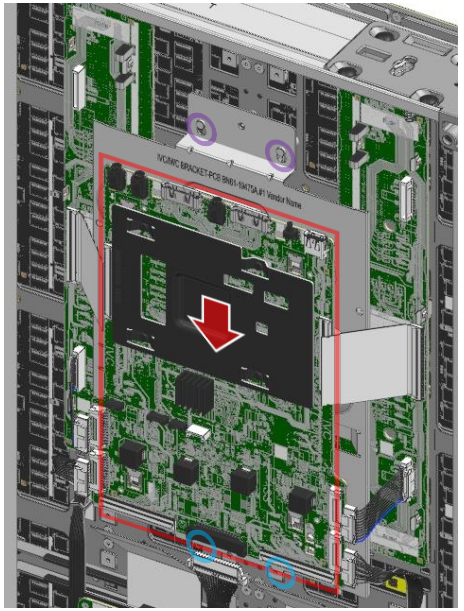
1. T-CON separated state

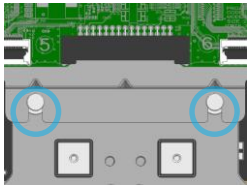


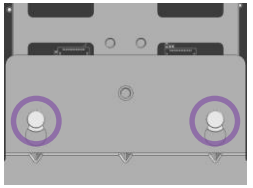
2. □ Assemble the T-CON from the upper side to the lower side

[Caution]

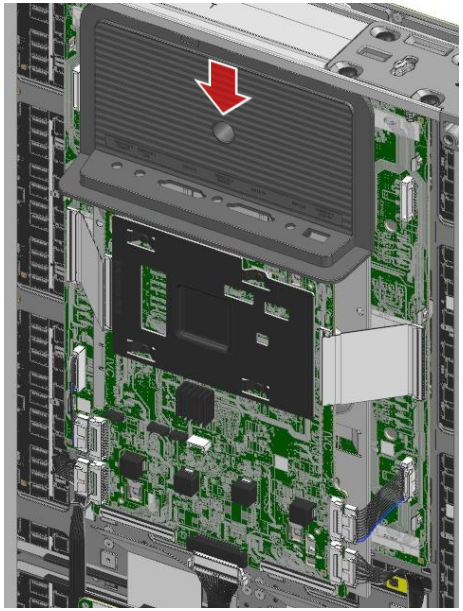
○ ○ Assemble the BRACKET PCB to be inserted into the STUD





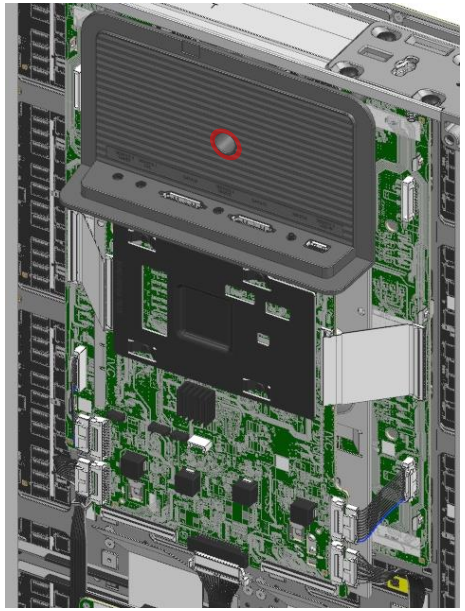


3. Assemble COVER TERMINAL from top to bottom



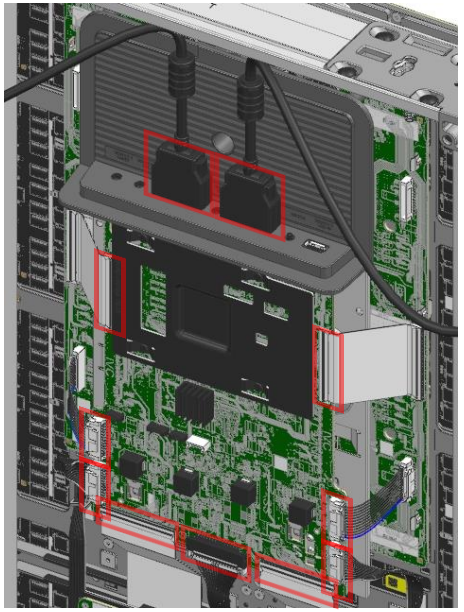
- T-CON Assembly

4. ◯ Assemble SCREW 1ea



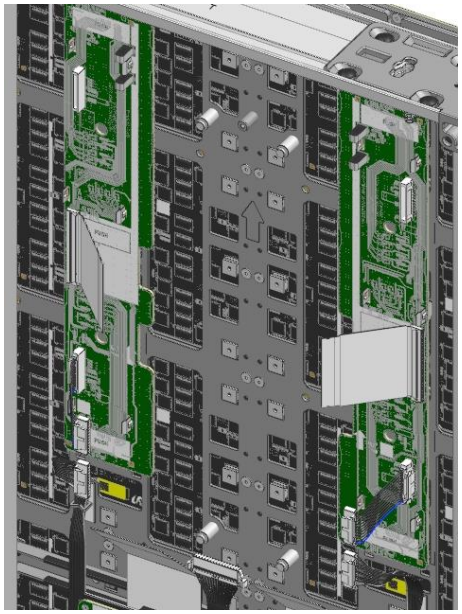
SCREW CODE	SPECIFICATION	SHAPE
6001-002755	M3 / L6 / BLACK	

5. □ Connect DATA CABLE and Power WIRE



- Assemble T-CON and BRACKET PCB together

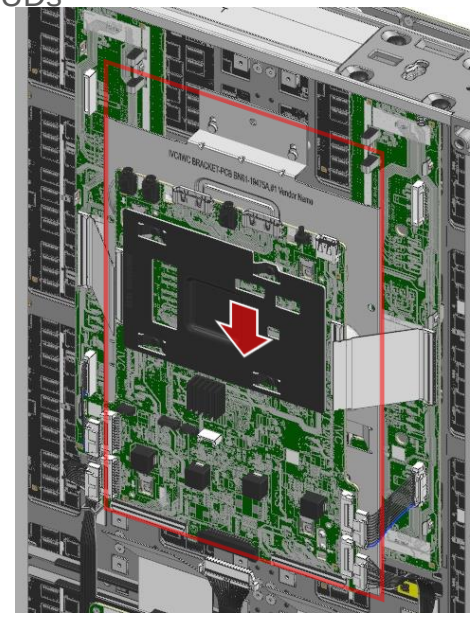
1. T-CON and BRACKET PCB are separated together



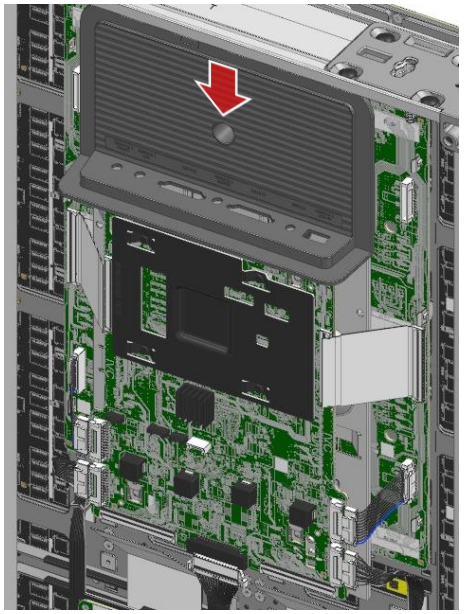
2. ☐ Assemble the T-CON and BRACKET PCBs from the upper side to the lower side together

[Caution]

Assemble the BRACKET PCB to be inserted into the upper and lower STUDs

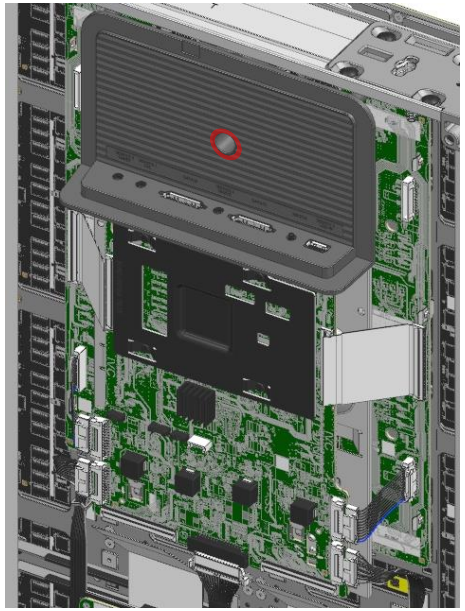


3. Assemble COVER TERMINAL from top to bottom



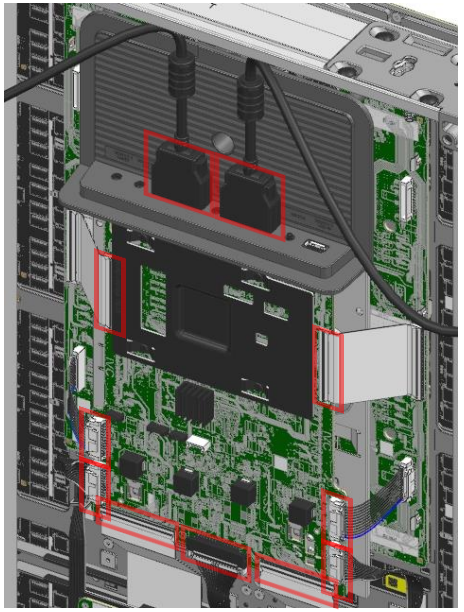
- Assemble T-CON and BRACKET PCB together

4. ◯ Assemble SCREW 1ea



SCREW CODE	SPECIFICATION	SHAPE
6001-002755	M3 / L6 / BLACK	

5. □ Connect DATA CABLE and Power WIRE



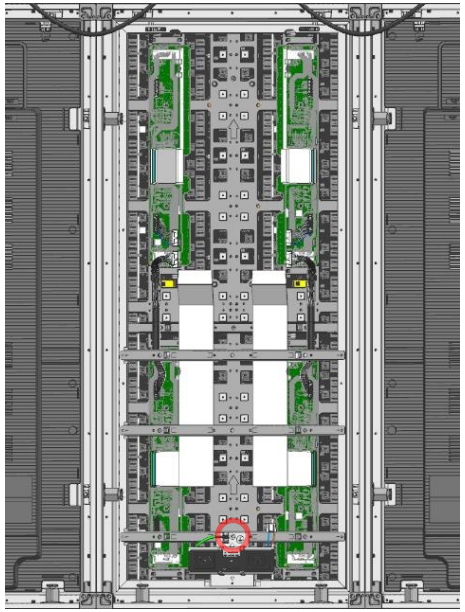
SAMSUNG

- BRIDGE BOARD Replacement

1. ◯ Separate SCREW 1ea

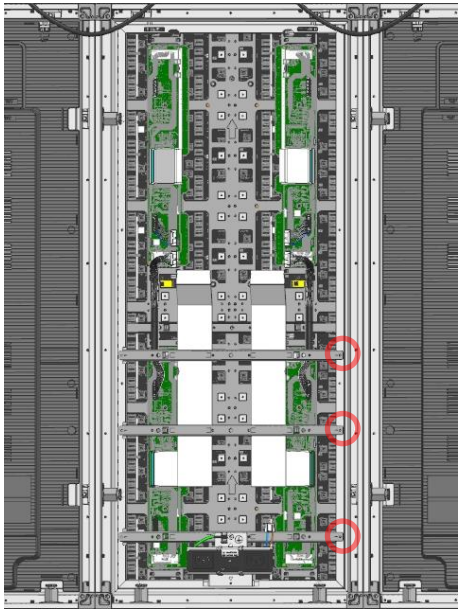
[Note]

- Separate the T-CON, SMPS, and BRACKET PCBs and work on them.



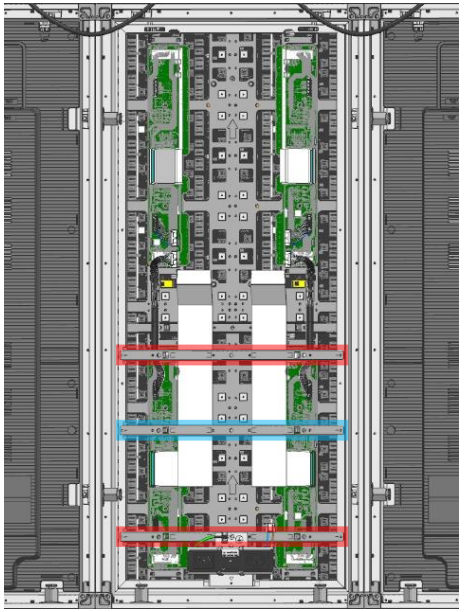
SCREW CODE	SPECIFICATION	SHAPE
6001-002789	M4 / L6 / WHITE	

2. ◯ Separate SCREW 3ea



SCREW CODE	SPECIFICATION	SHAPE
6001-003005	M3 / L6 / WHITE	

3. □ □ Separate BRACKET SUPPORT

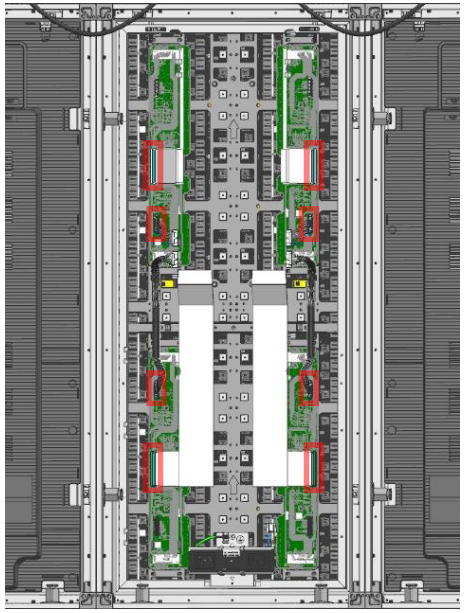


- BRIDGE BOARD Replacement

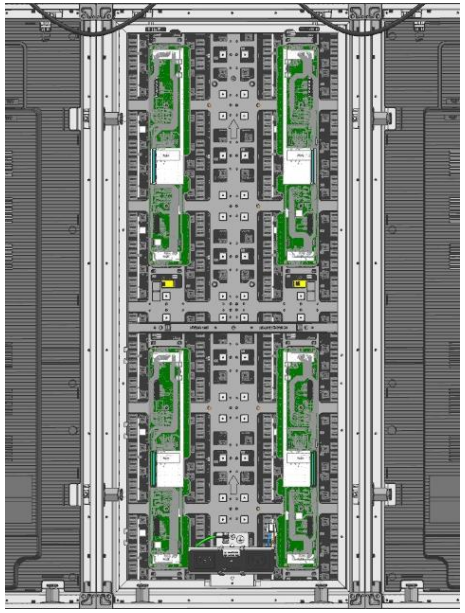
4. □ Separate DATA CABLE and Power WIRE

[Caution]

- If excessive force is applied, there is a risk of falling the front MODULE, so be careful.

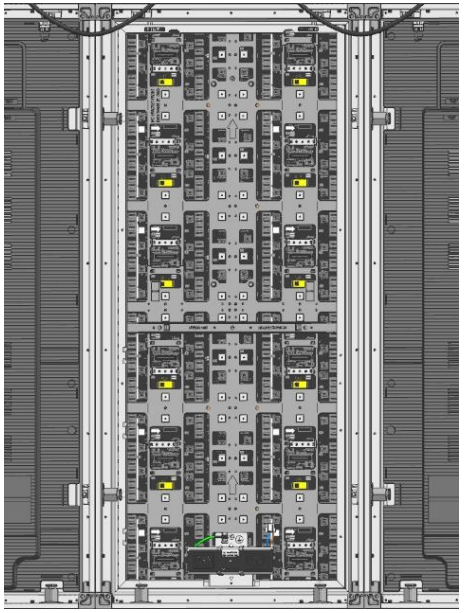


5. Replace BRIDGE BOARD



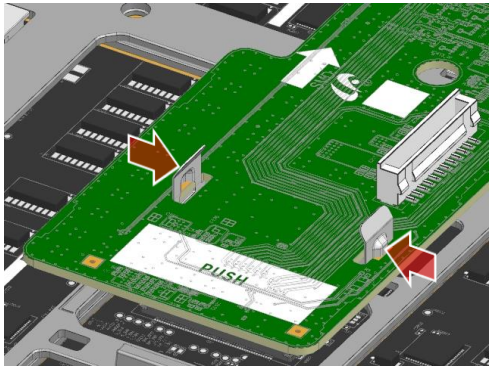
[Note]

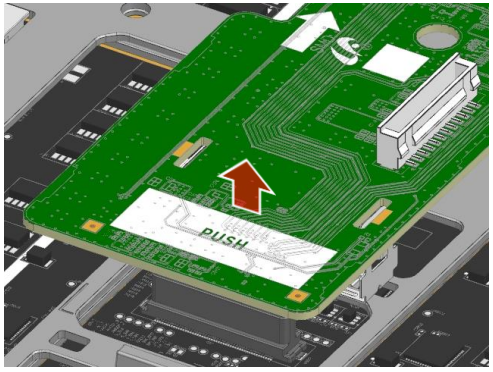
- BRIDGE BOARD separation status



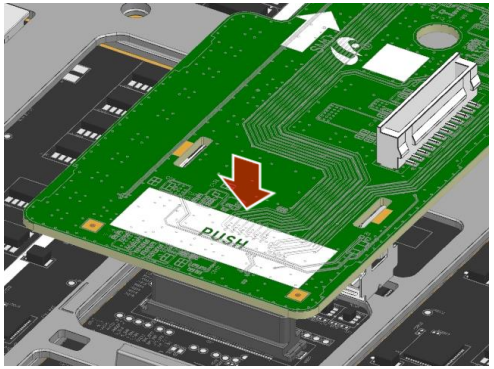
- BRIDGE BOARD Replacement

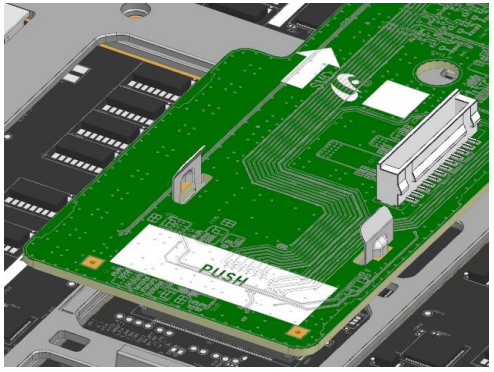
[Note]
- BRIDGE BOARD Separation





[Note]
- BRIDGE BOARD Assembly



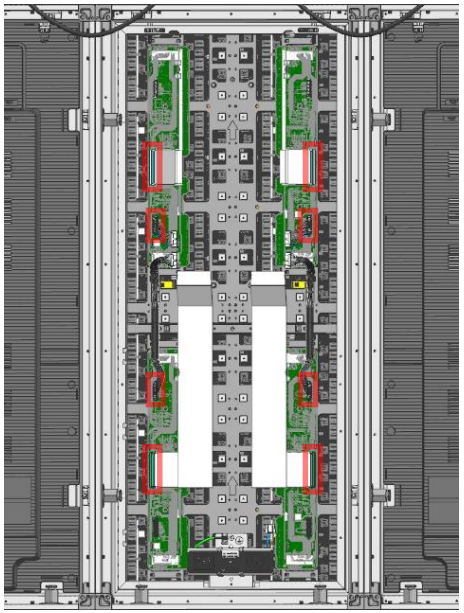


- BRIDGE BOARD Replacement

6. ☐ Connect DATA CABLE and Power WIRE

[Caution]

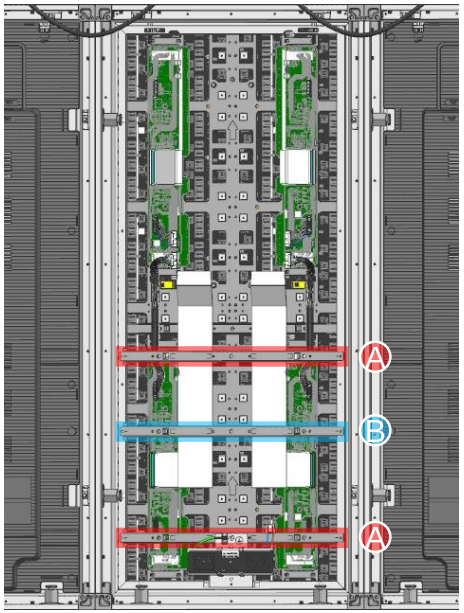
- If excessive force is applied, there is a risk of falling the front MODULE, so be careful.



7. ☐ ☐ Assemble BRACKET SUPPORT

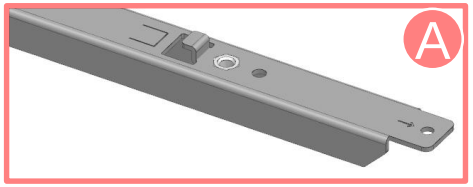
[Caution]

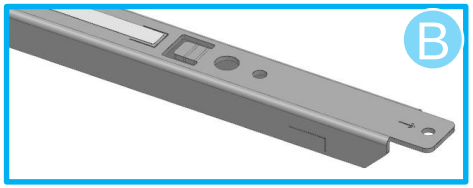
- It shall be assembled by dividing the shape
- A : 2ea (top / bottom)
- B : 1ea (middle)



[Note]

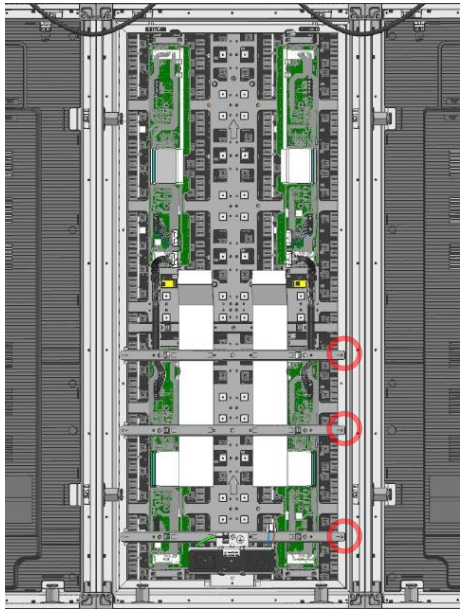
- A : BN61-19478A
- B : BN61-19478B





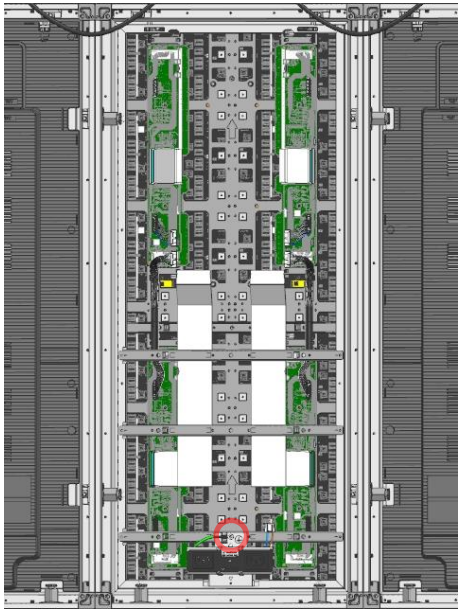
- BRIDGE BOARD Replacement

8. ◯ Assemble SCREW 3ea



SCREW CODE	SPECIFICATION	SHAPE
6001-003005	M3 / L6 / WHITE	

9. ◯ Assemble SCREW 1ea

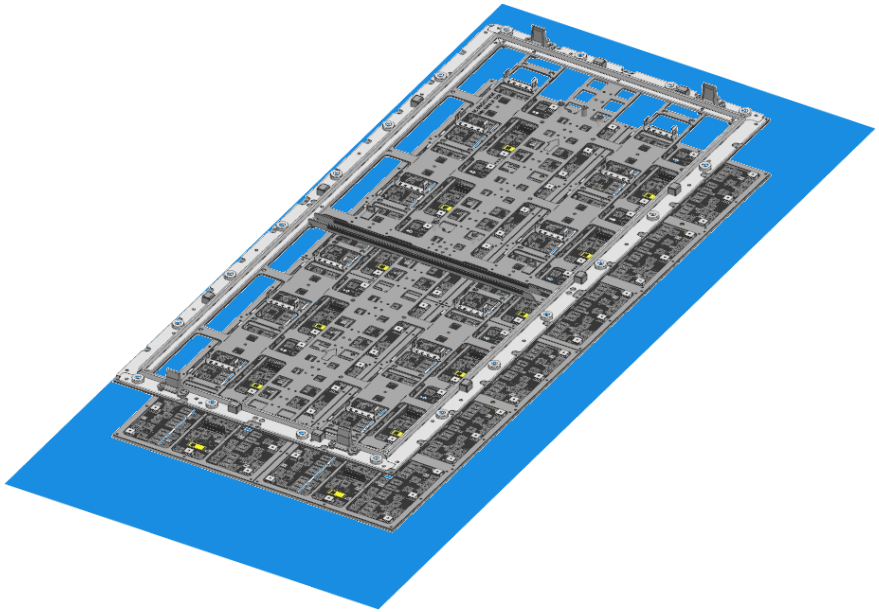


SCREW CODE	SPECIFICATION	SHAPE
6001-002789	M4 / L6 / WHITE	

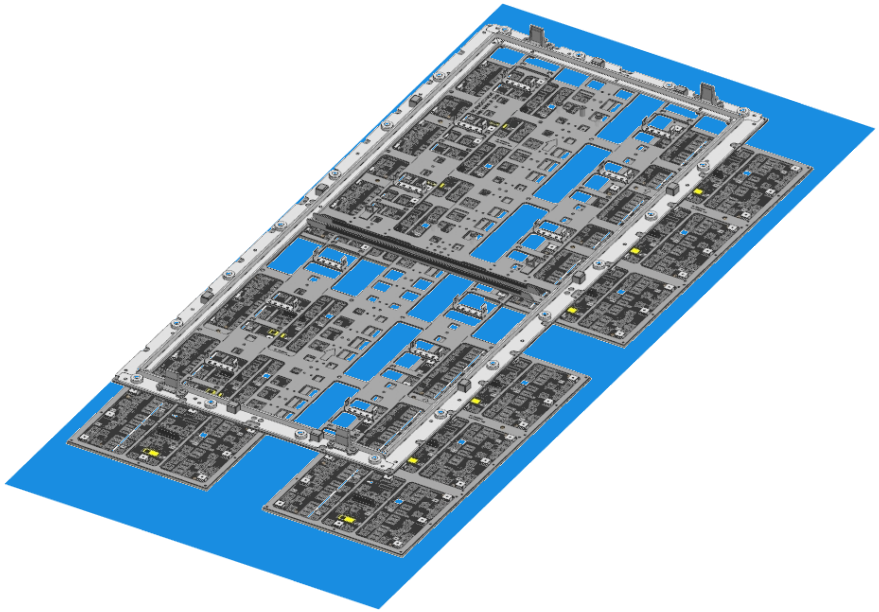
3. Separate COVER TERMINAL

- MODULE Separation

- MODULE Fixed Full SCREW Separation

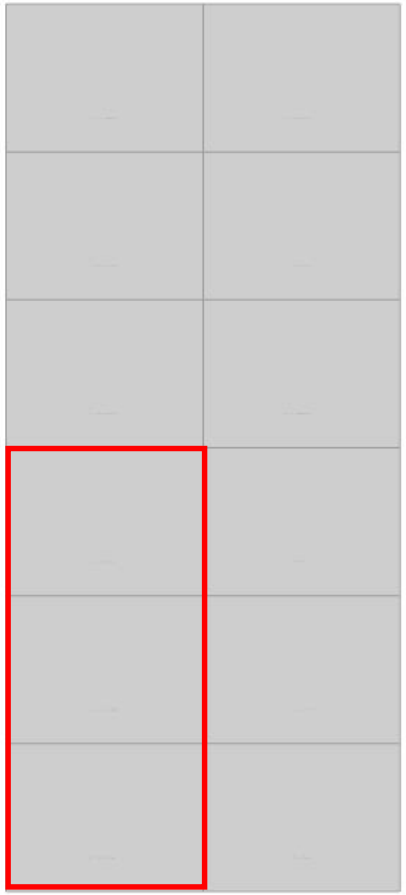


- Separation into 4 SERVICE MODULE units (1 × 3)

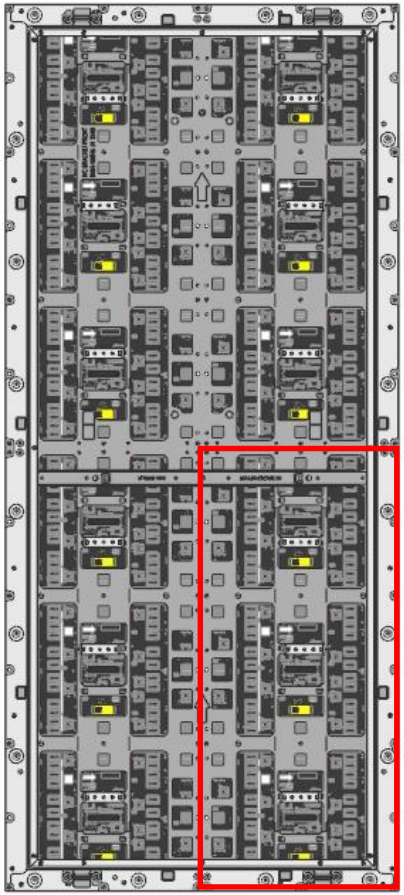


- MODULE Separation

- Check the replacement target MODULE



- Separate replacement target MODULE SCREW



- MODULE Separation

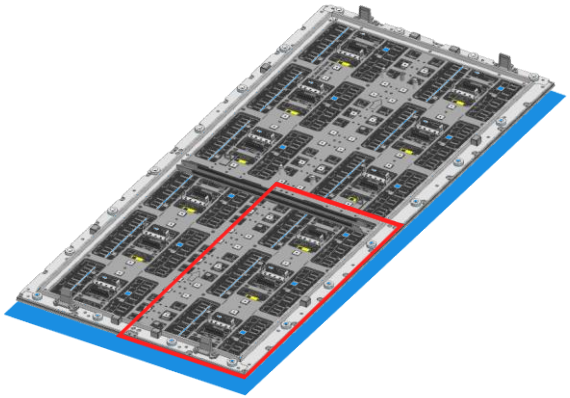
1. Separate SCREW

[Caution]

- Work with a soft cloth on the floor to protect MODULE and prevent deformation.

[Note]

- 18 SCREWs per SERVICE MODULE unit (1 × 3)

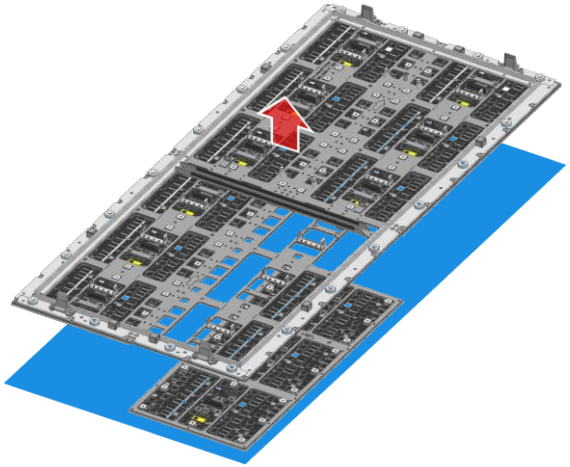


SCREW CODE	SPECIFICATION	SHAPE
6001-003399	M3 / L3 / WHITE	

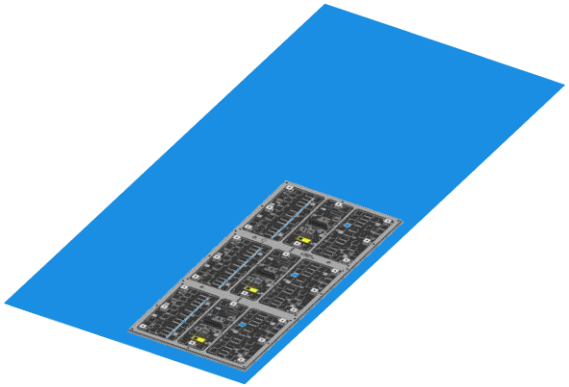
2. Separate MODULE from FRONT

[Caution]

- To prevent MODULE damage, lift the FRONT vertically from the floor and separate it.



3. Collect MODULE

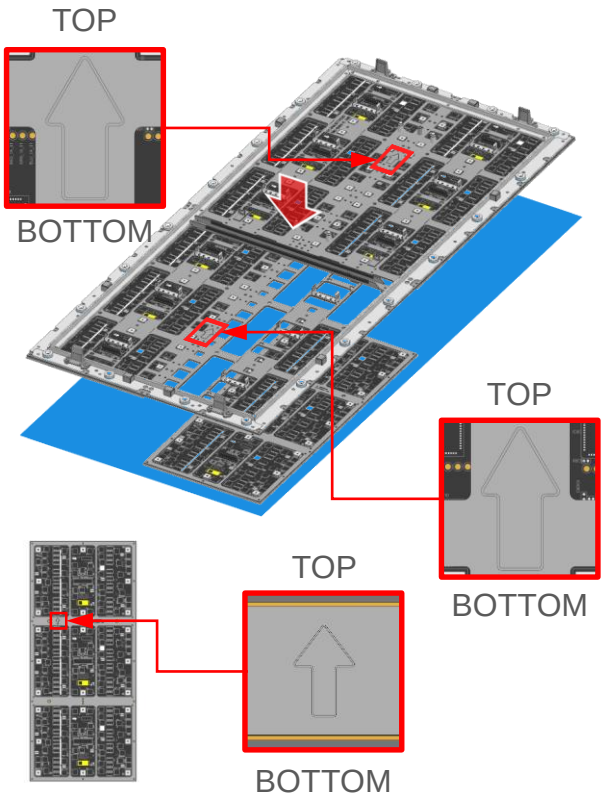


- MODULE Assembly

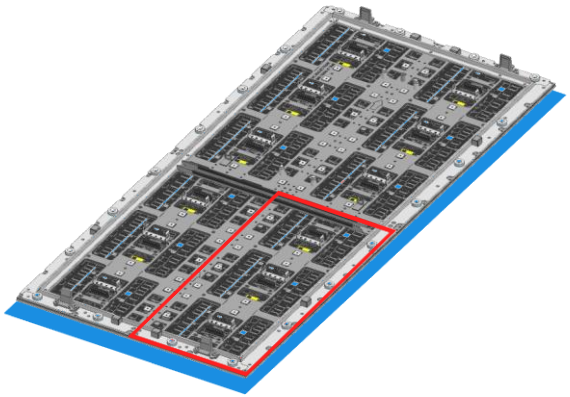
1. Assemble MODULE with FRONT

[Caution]

- To prevent MODULE damage, lower FRONT vertically and assemble
- Must be assembled separately by MODULE TOP / BOTTOM



2. Assemble SCREW

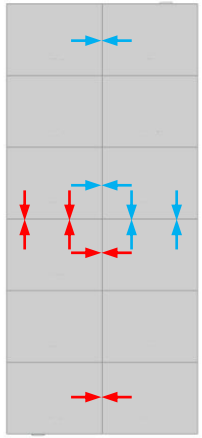


SCREW CODE	SPECIFICATION	SHAPE
6001-003399	M3 / L3 / WHITE	

3. Check GAP between MODULEs

[Caution]

- Check whether the GAP (→←) between the reassembled MODULE and the surrounding MODULE is equal to the GAP (→←) between the surrounding MODULE that is not separated. If there is an abnormality, re-regulate.

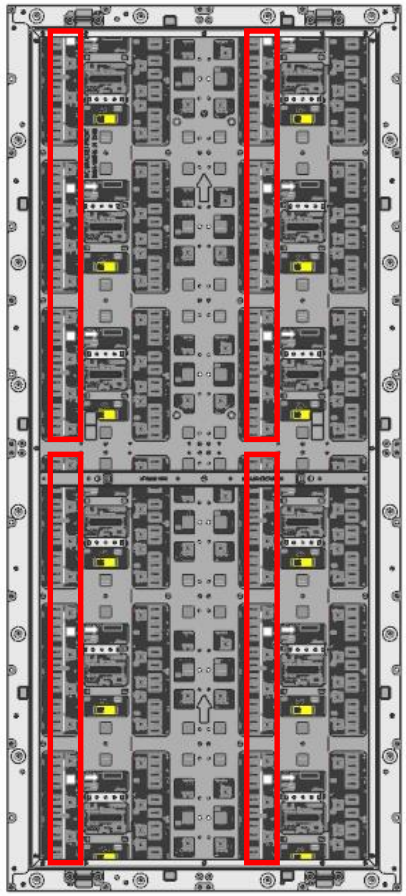


SAMSUNG

- MODULE Assembly

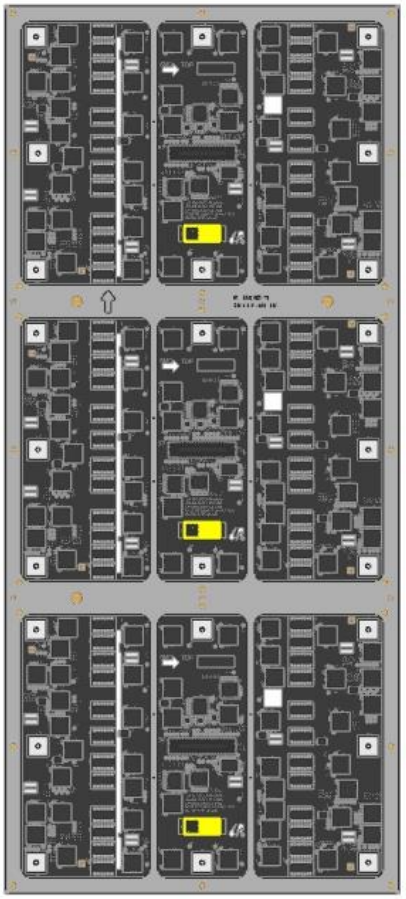
[Note]

- When assembled in the correct position, the position of the white line of MODULE matches.



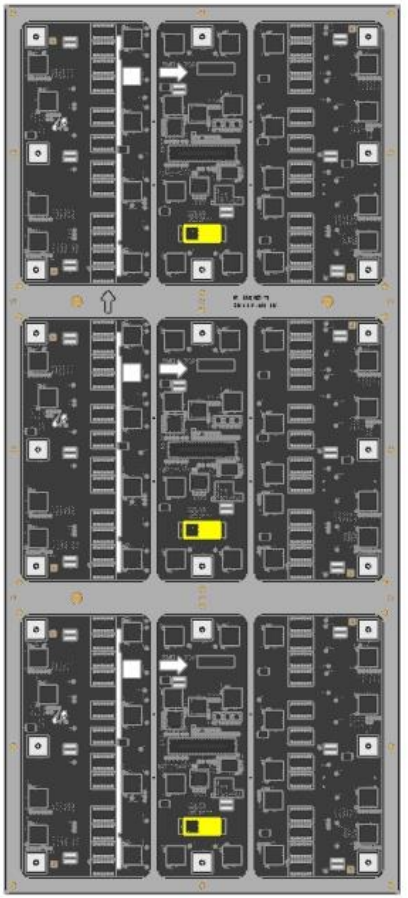
LH016IVC***/**

MODULE CODE : BN94-18214A



LH021IVC***/**

MODULE CODE : BN94-18214B

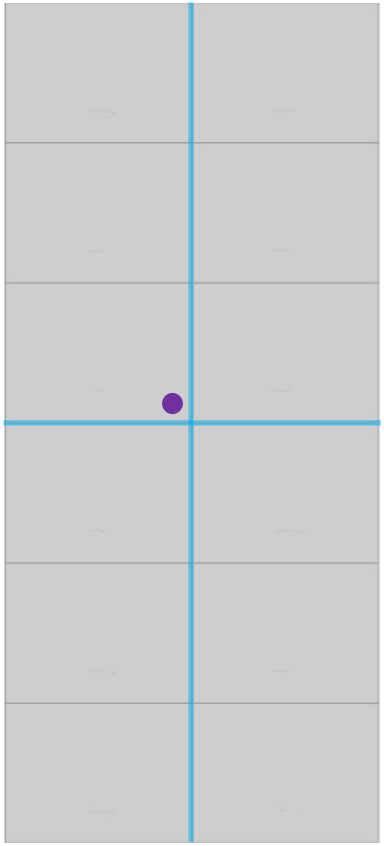


- MODULE step adjustment (single item status)

1. Check the peripheral MODULE and step control parts from the front

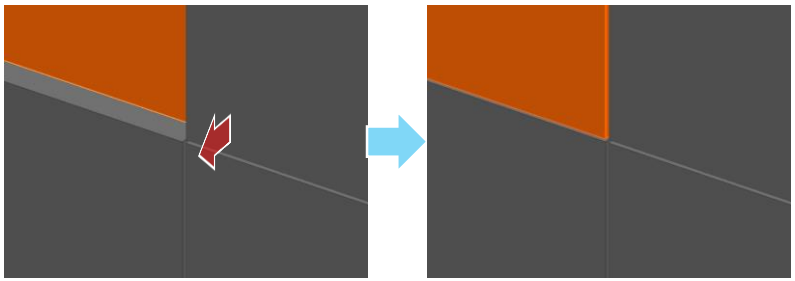
[Note]

- ● MODULE, which is lower in height than the surrounding MODULE



[Note]

- Step control using M3/L3 SCREW



Front movement required

Step adjustment complete state

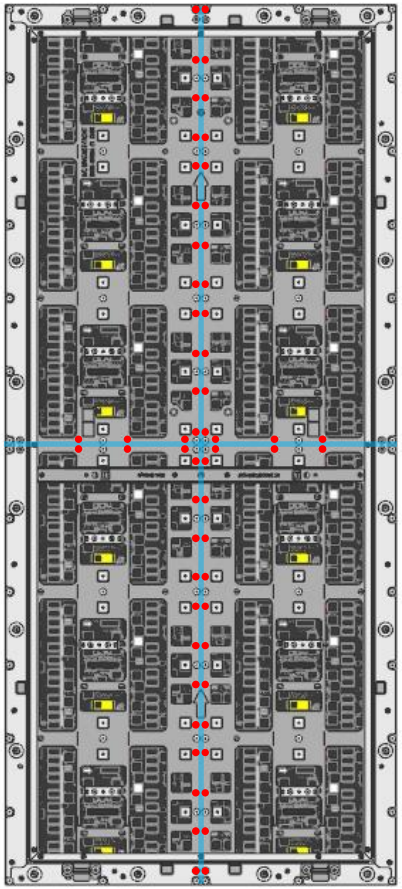
SCREW CODE	SPECIFICATION	SHAPE
6001-003168	M3 / L5 / BLACK	

- MODULE step adjustment (single item status)

2. Adjust the step by assembling SCREW from the back in the position confirmed from the front

[Note]

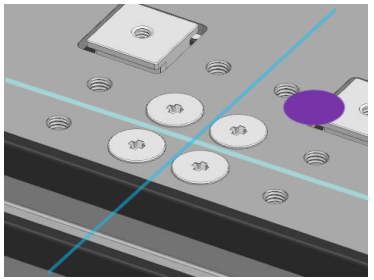
● SCREW addable location



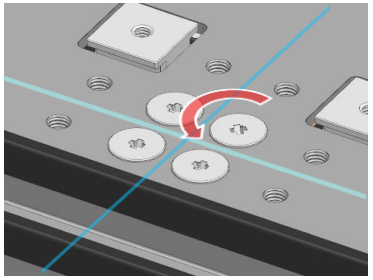
[Note]

Step control using M3/L3 SCREW

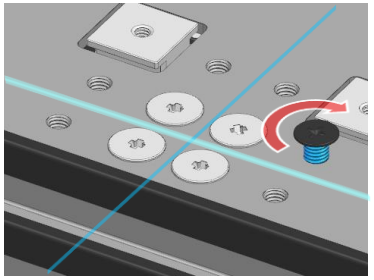
● MODULE, which is lower in height than the surrounding MODULE



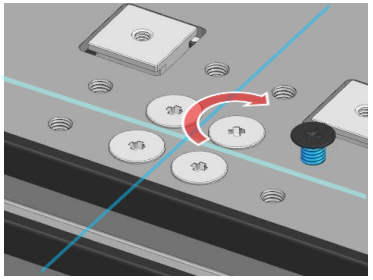
1. Check MODULE SCREW position required for adjustment



2. Release SCREW counterclockwise



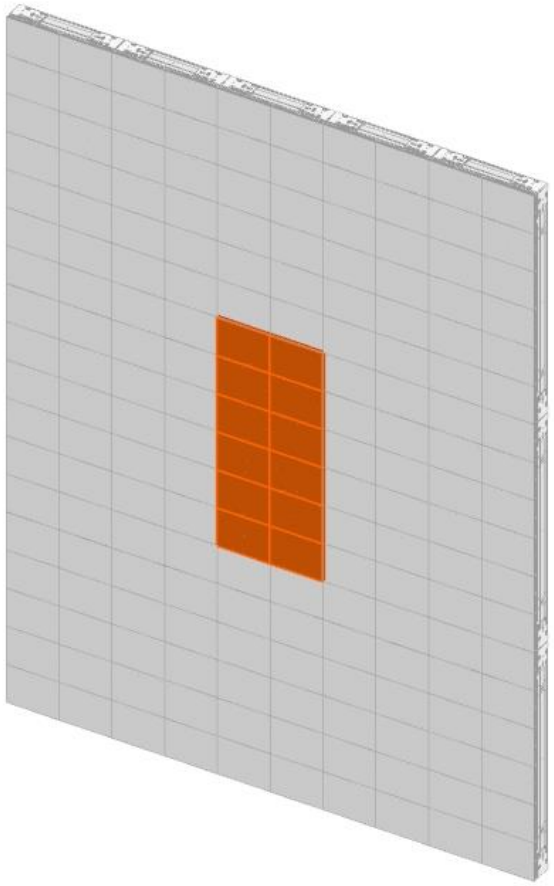
3. Adjust height by assembling SCREW



4. Re-fix MODULE SCREW

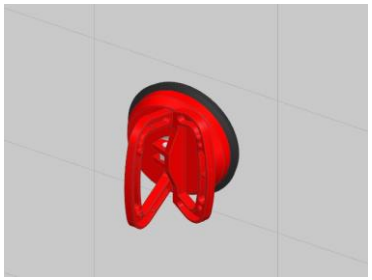
- ASSY FRONT separation (installation status)

1. Check the separation area (separated by MODULE 2 × 6 units)

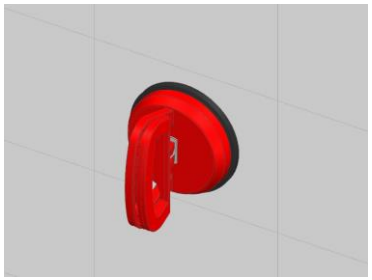


[Caution]
Work on the front to prevent MODULE damage / drop

[Note]
Separation using absorber (CY-WJCPVP) at the front of SET



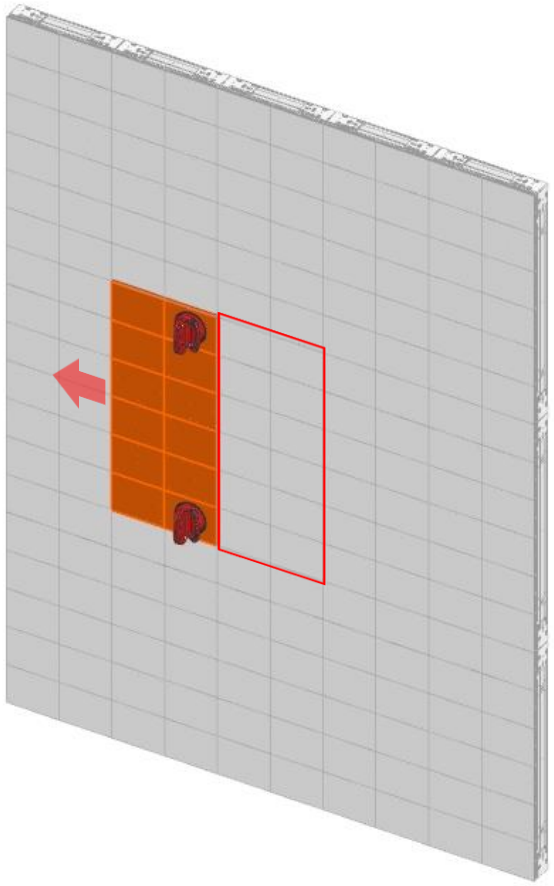
RELEASE

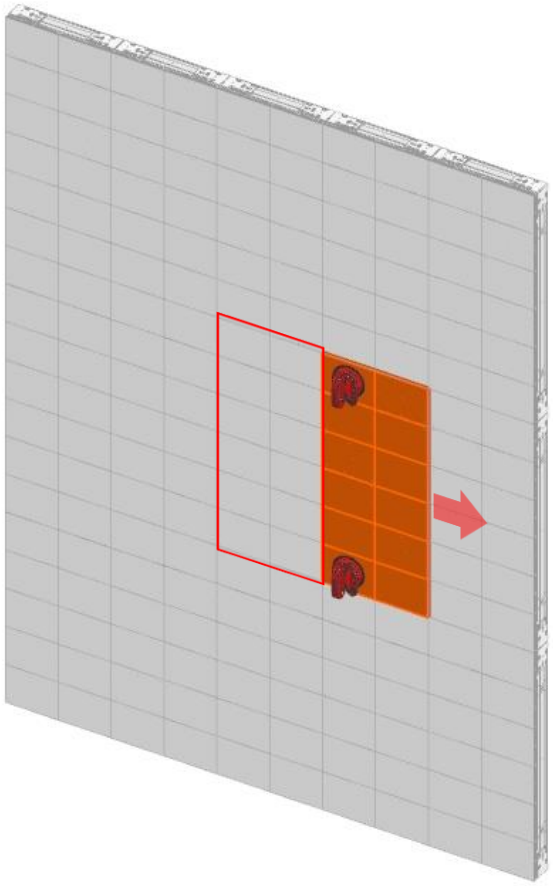


SUCTION

- ASSY FRONT separation (installation status)

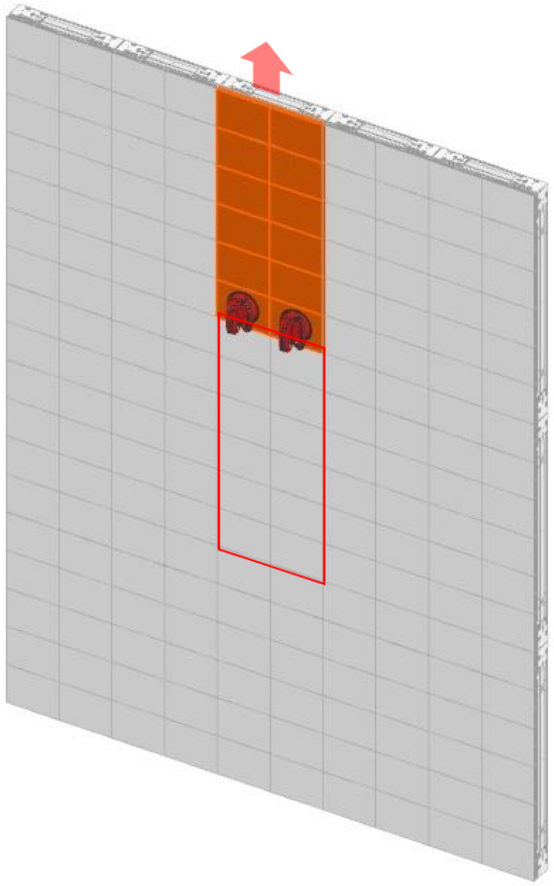
2. Secure left/right GAP to prevent MODULE damage

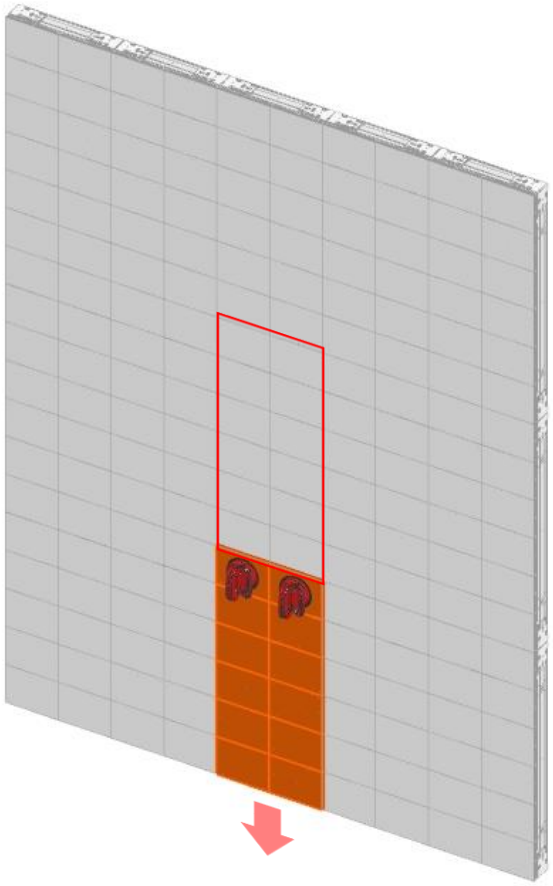




- ASSY FRONT separation (installation status)

3. Obtain upper / lower GAP to prevent MODULE damage





- ASSY FRONT separation (installation status)

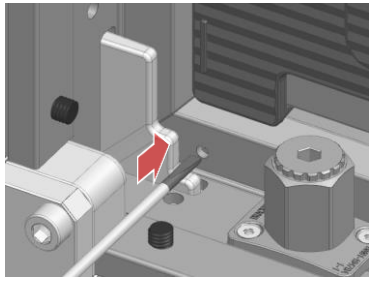
4. Adjust from the back so that it protrudes compared to the surrounding MODULE before separation

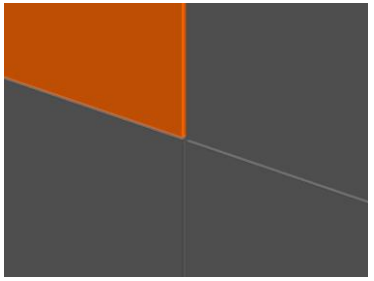
[Caution]

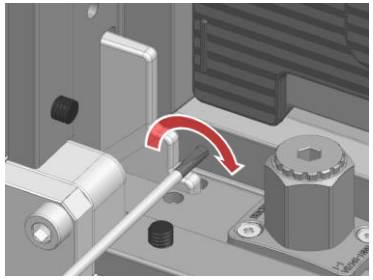
Must protrude evenly to prevent drop / deformation

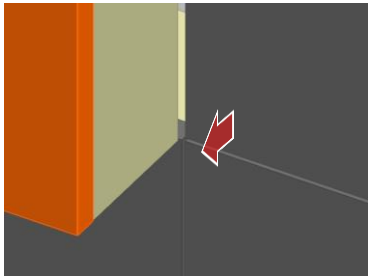
[Note]

Φ 3 MM / – (SLOTTED) DRIVER used



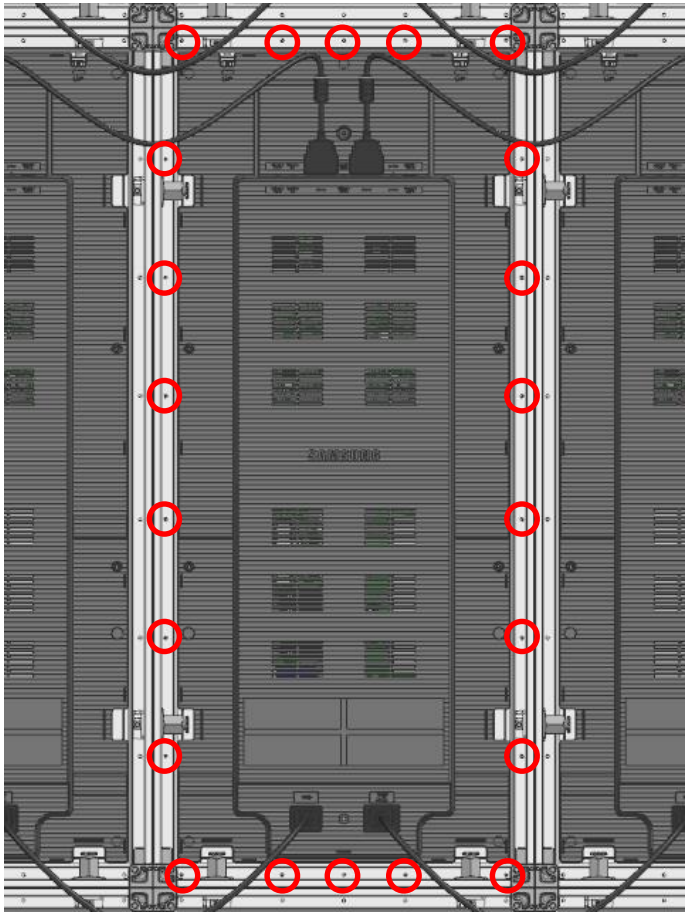






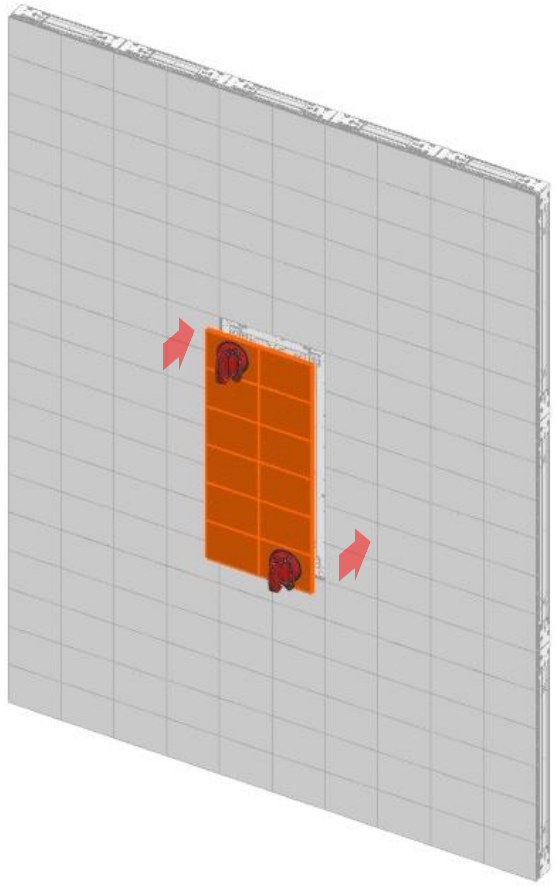
[Note]

◯ Rear control position



- ASSY FRONT separation (installation status)

5. Separate vertically to prevent MODULE damage

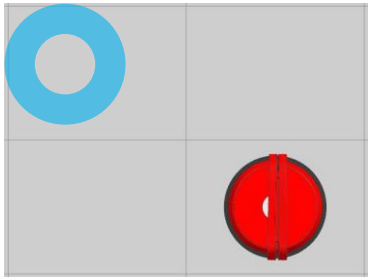


[Note]

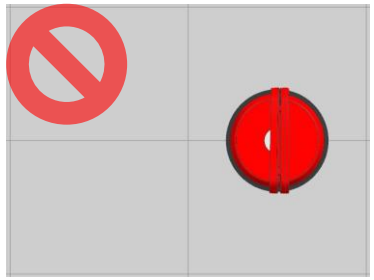
Separation using absorber (CY-WJCPVP) at the front of SET

[Caution]

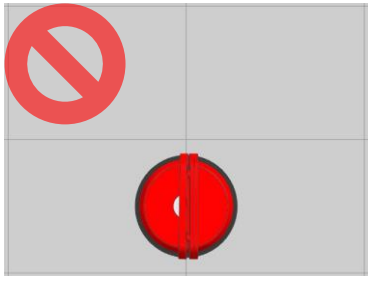
When the absorber is located at the MODULE boundary, the vacuum cannot be maintained, so there is a risk of product damage and casualties due to falling. Be sure to place the adsorber in the center of the MODULE



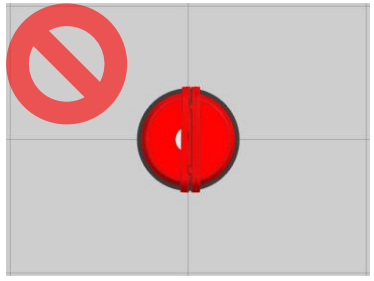
MODULE Middle



MODULE Boundary



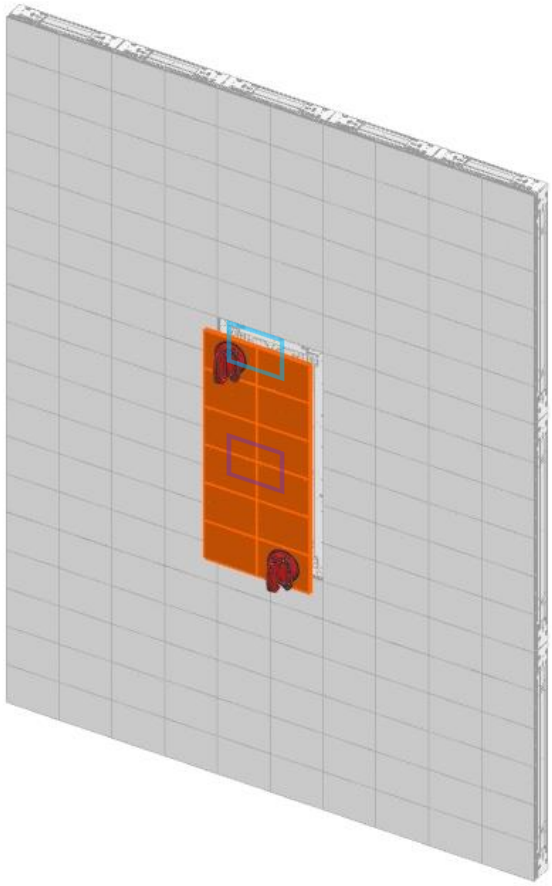
MODULE Boundary



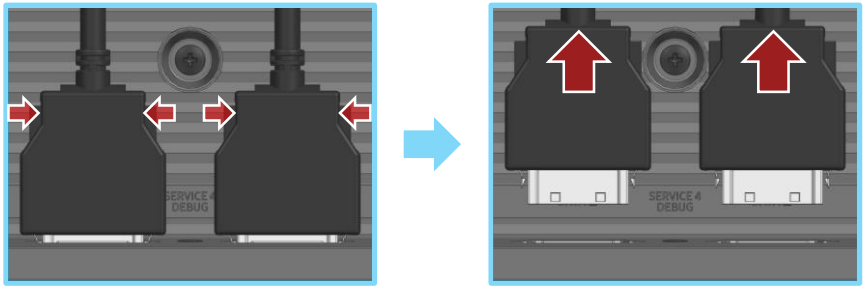
MODULE Boundary

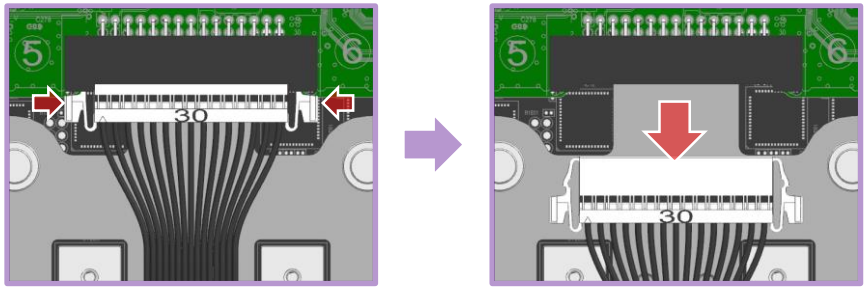
- ASSY FRONT separation (installation status)

6. ☐ DATA CABLE Separation
   ☐ T-CON ↔ SMPS Power WIRE Separation



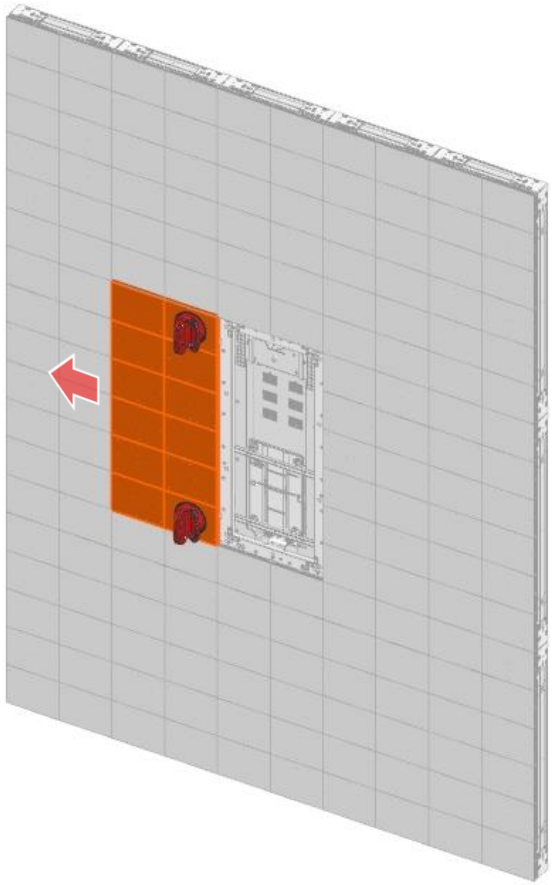
[Note]
Separation using absorber (CY-WJCPVP) at the front of SET
[Caution]
When the absorber is located at the MODULE boundary, the vacuum cannot be maintained, so there is a risk of product damage and casualties due to falling. Be sure to place the adsorber in the center of the MODULE

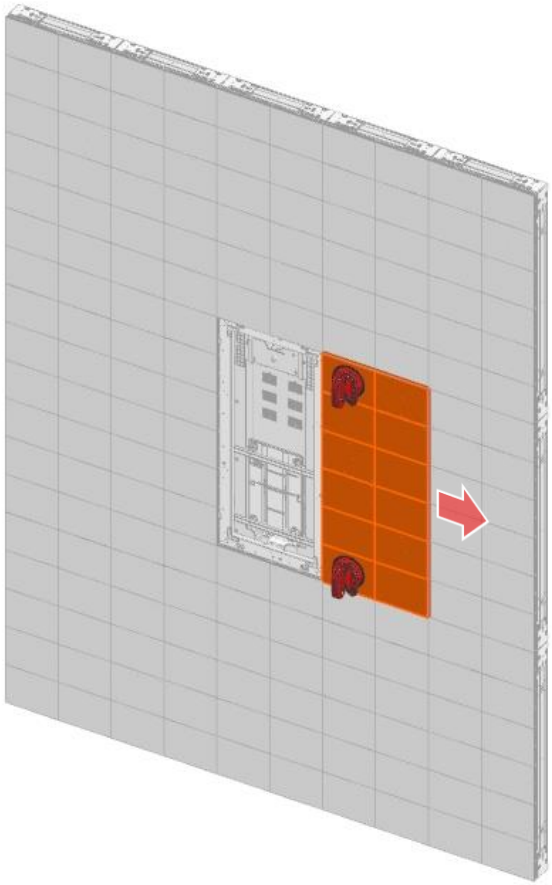




- Assembling ASSY FRONT (Installation status)

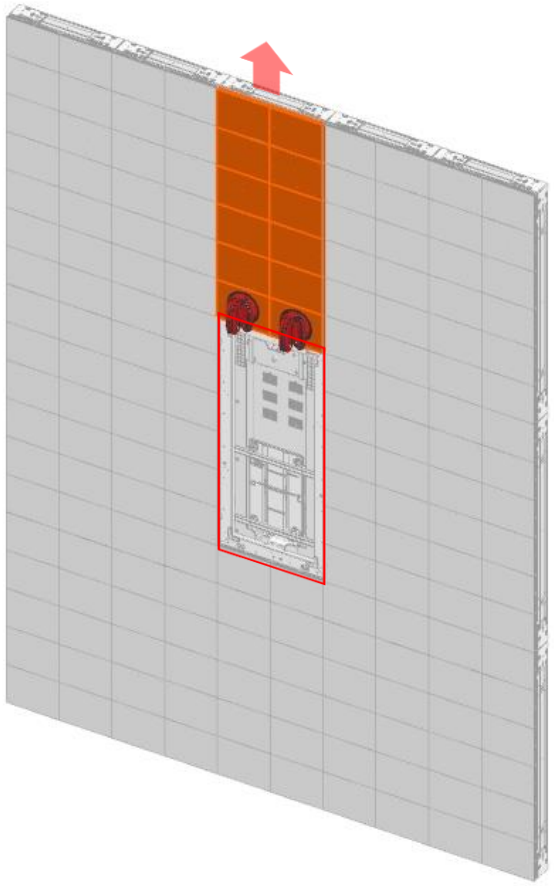
1. Secure left/right GAP to prevent MODULE damage

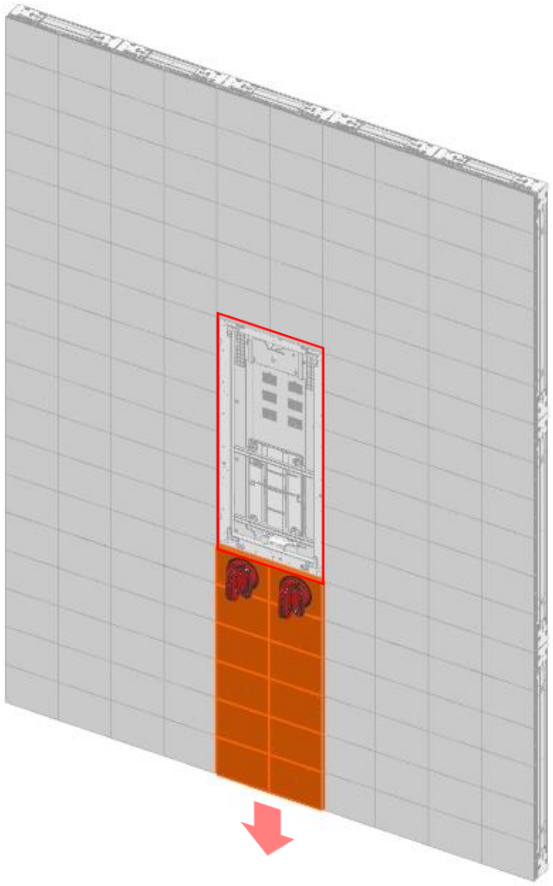




- Assembling ASSY FRONT (Installation status)

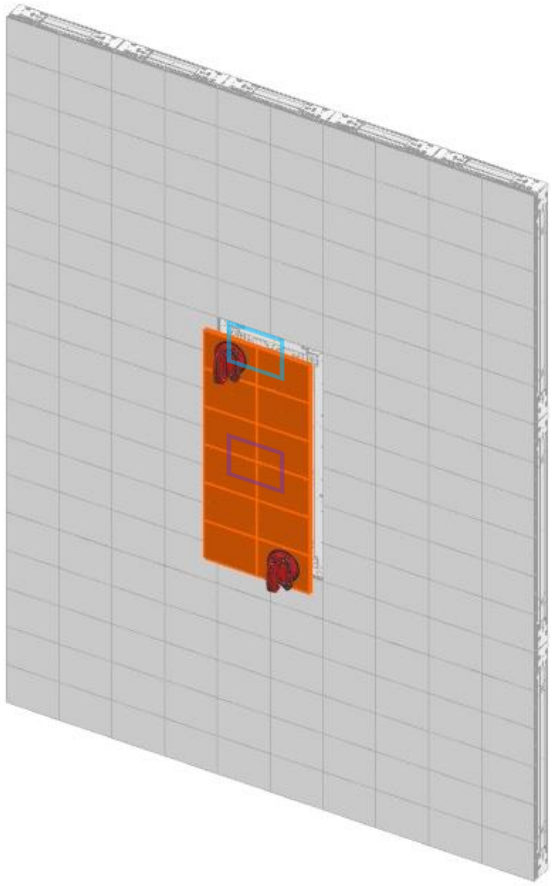
2. Obtain upper / lower GAP to prevent MODULE damage

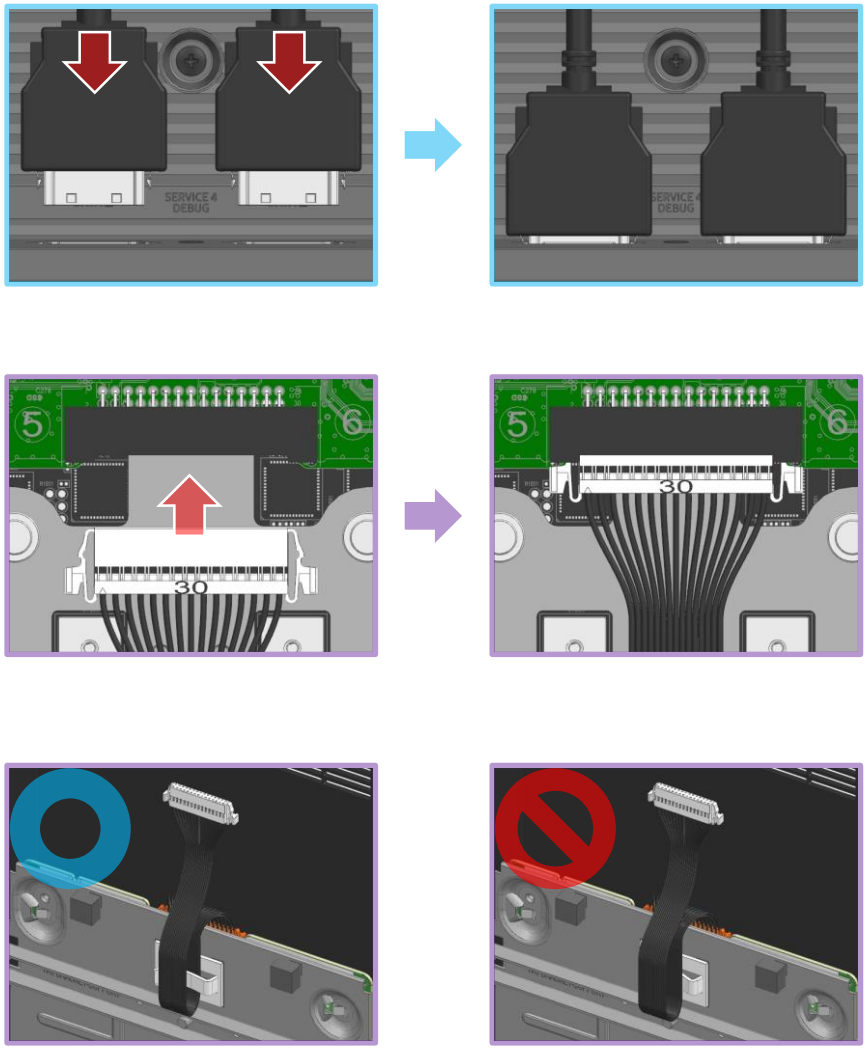




- Assembling ASSY FRONT (Installation status)

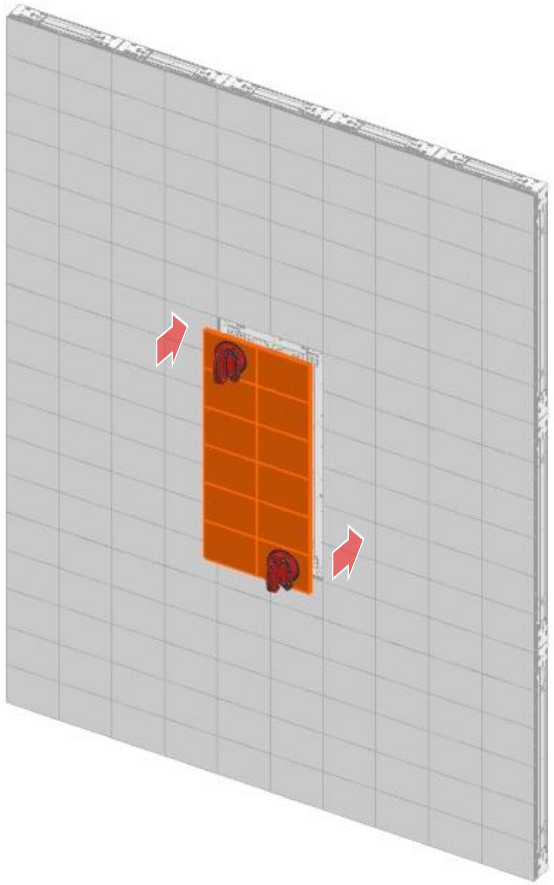
3. ☐ DATA CABLE Connection, ☐ T-CON ↔ SMPS Power cable connection





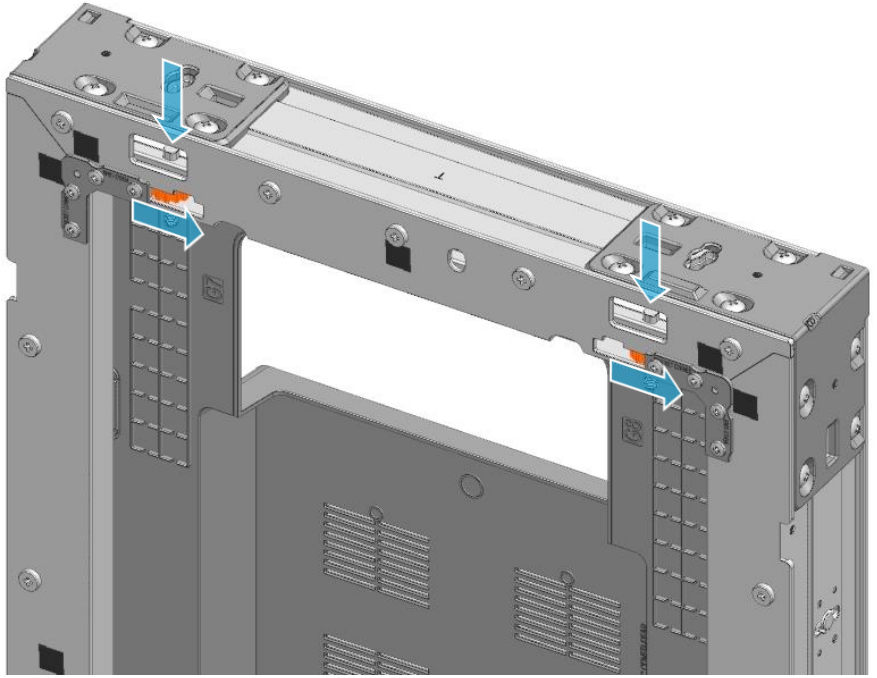
- Assembling ASSY FRONT (Installation status)

4. Assemble vertically to prevent MODULE damage



[Note]

- Assemble using adsorber (CY-WJCPVP) on the front of SET
- If it is difficult to assemble due to height adjustment BOLT, move the height adjustment BOLT downward (left → right rotation) and assemble

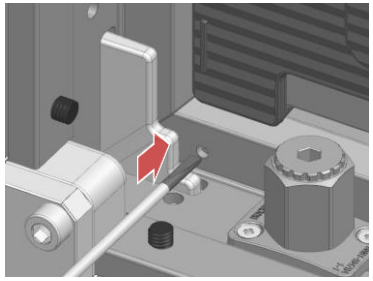


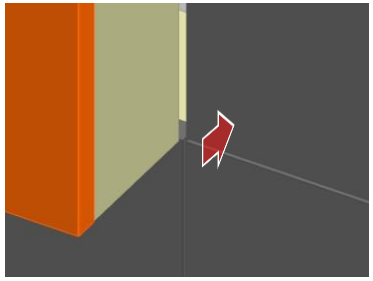
- Assembling ASSY FRONT (Installation status)

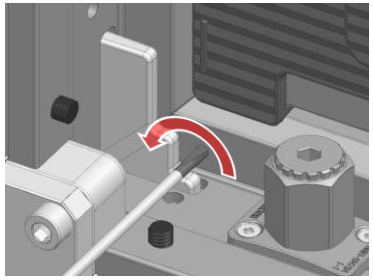
5. Adjust from the back so that it protrudes at the same level as the surrounding MODULE after assembly

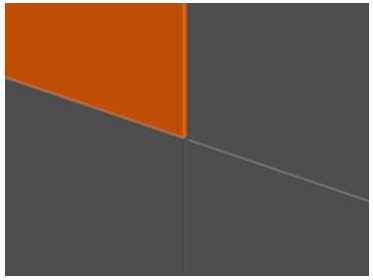
[Note]

Φ 3 mm / – (SLOTTED) DRIVER used



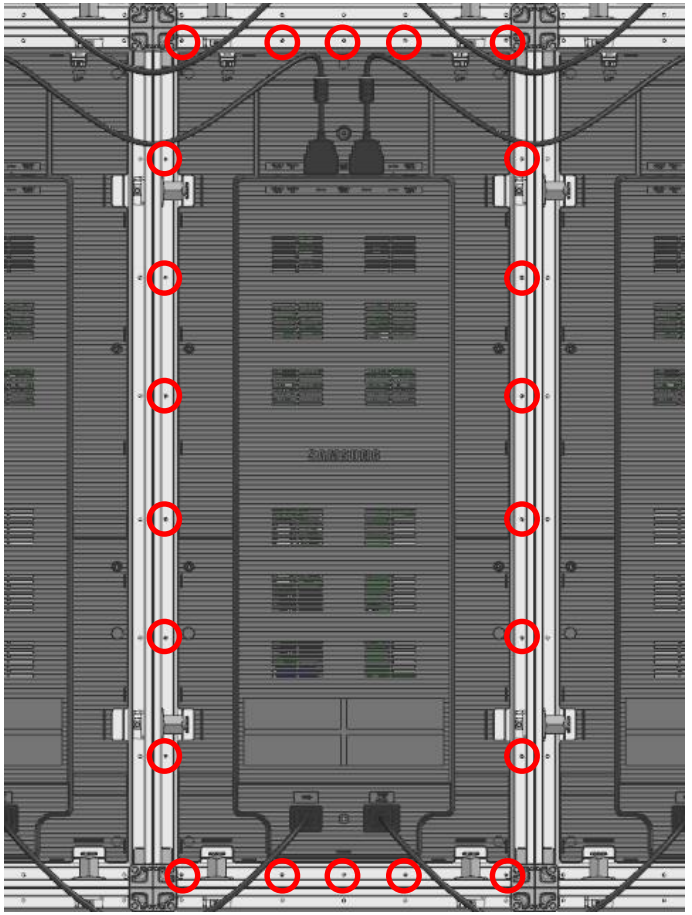






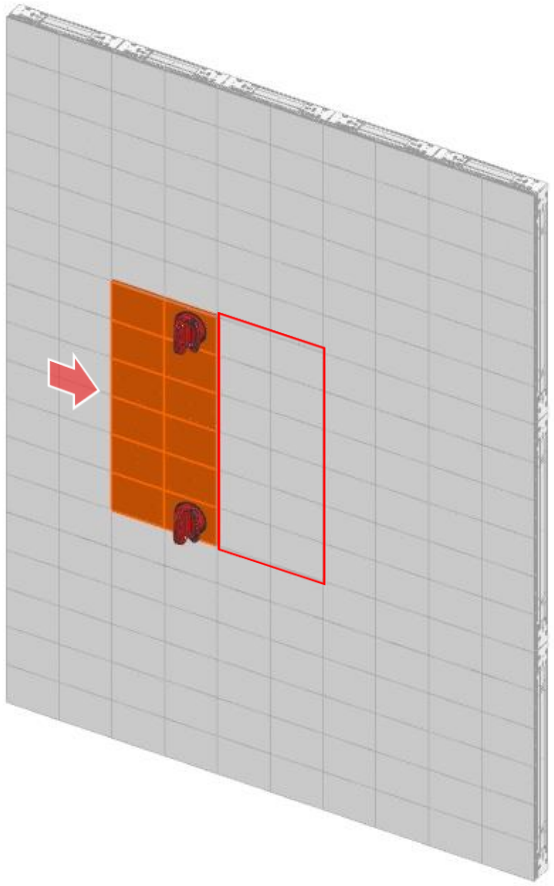
[Note]

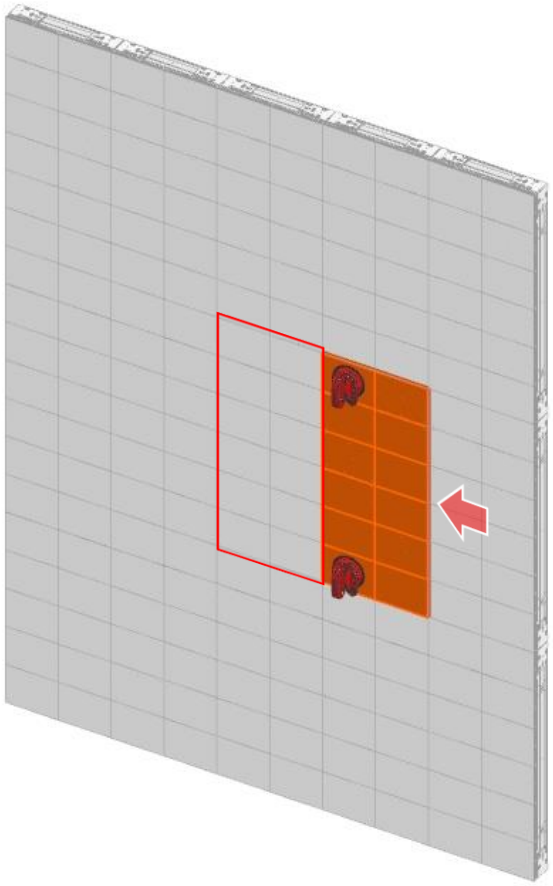
◯ Rear control position



- Assembling ASSY FRONT (Installation status)

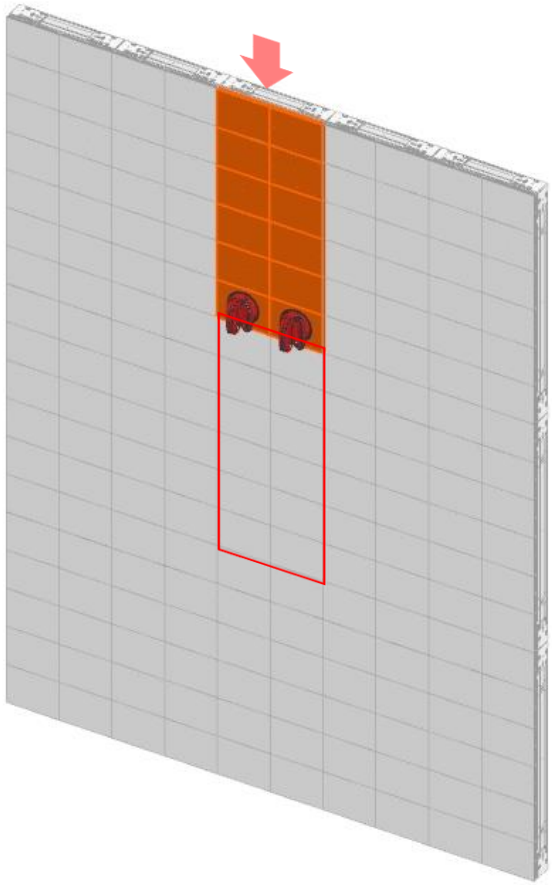
6. Left/right SEAM control

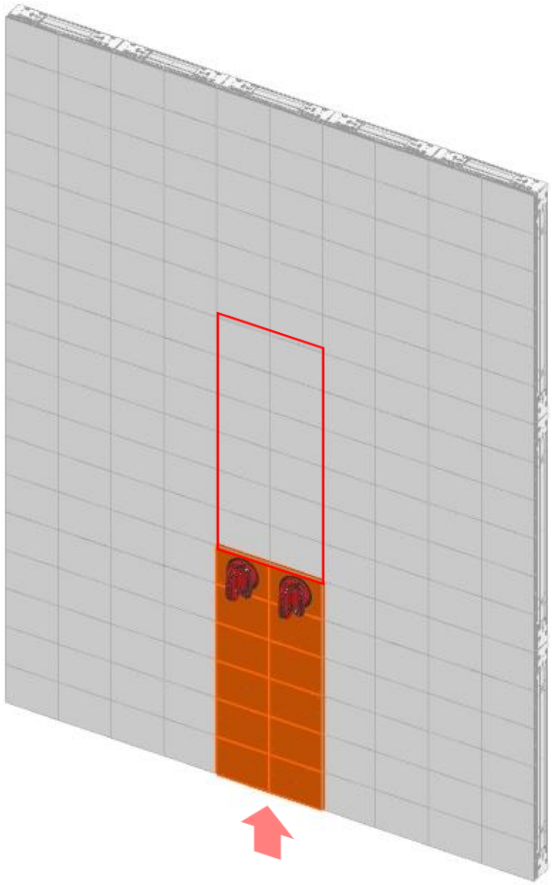




- Assembling ASSY FRONT (Installation status)

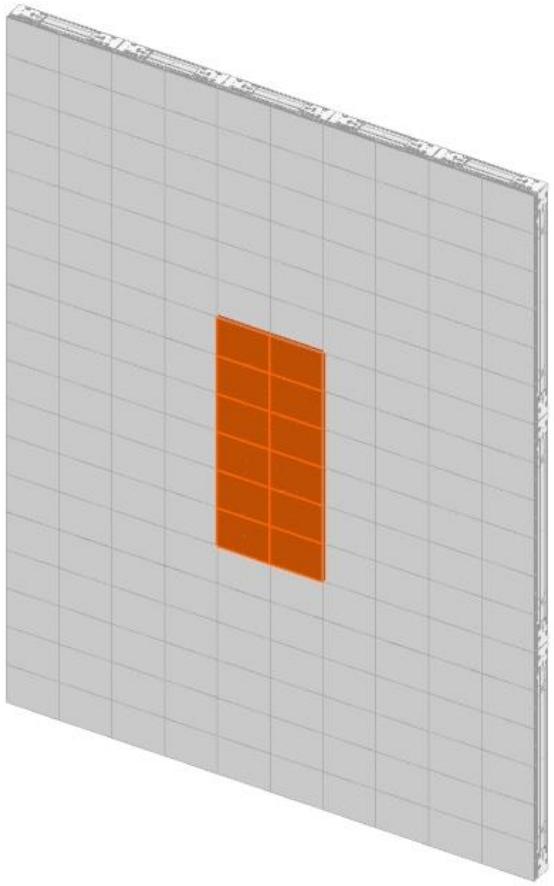
7. Upper/lower SEAM control





- Assembling ASSY FRONT (Installation status)

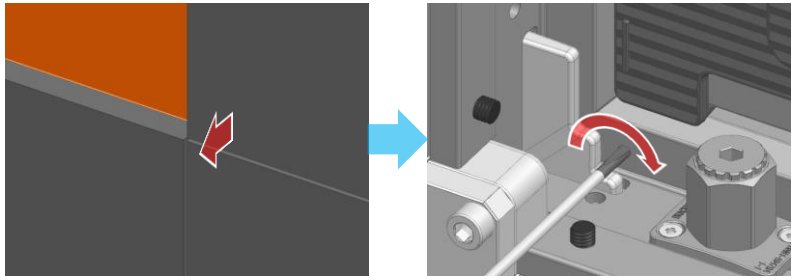
8. Adjust the step difference with the surrounding ASSY FRONT



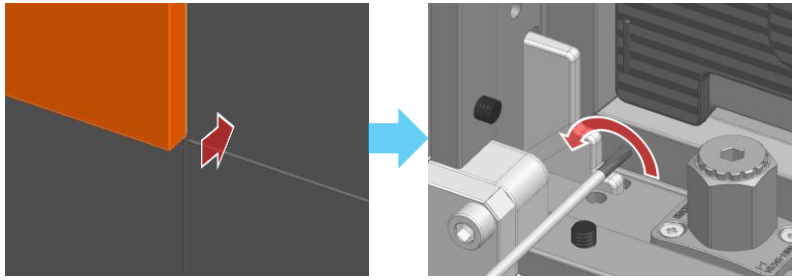
[Note]

Φ 3 mm / – (SLOTTED) DRIVER to control step

Move MODULE to the front when rotating clockwise and to the back counterclockwise



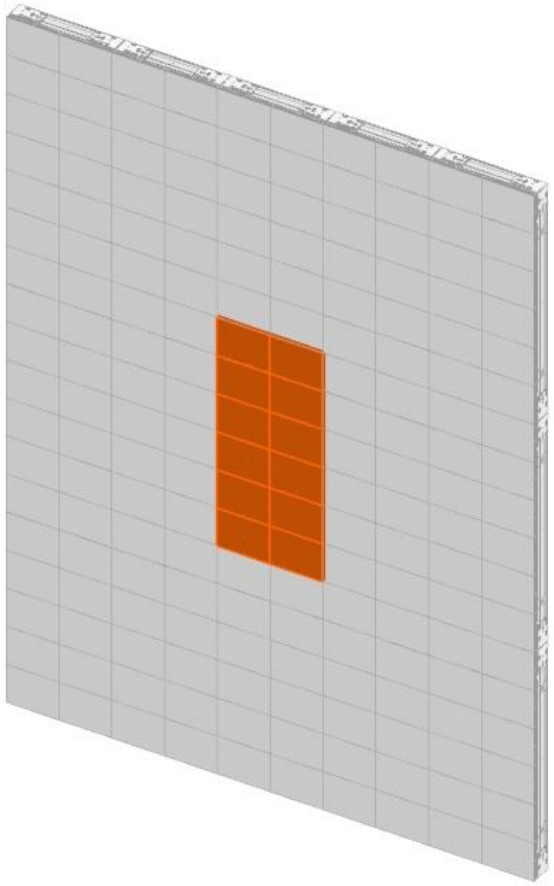
전면 이동 필요 시계방향 회전



후면 이동 필요 반시계방향 회전

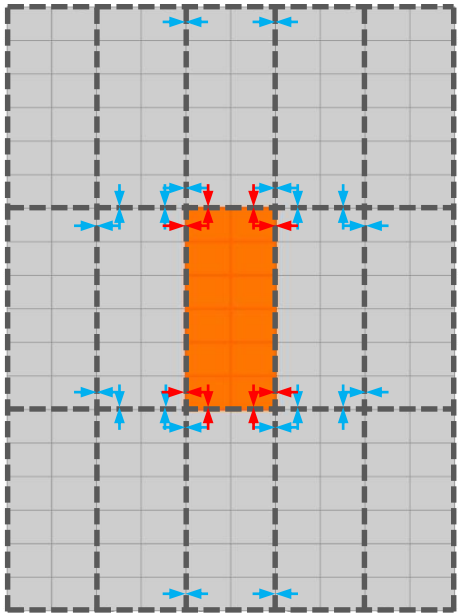
- Assembling ASSY FRONT (Installation status)

9. Check the surrounding ASSY FRONT and GAP



[Caution]

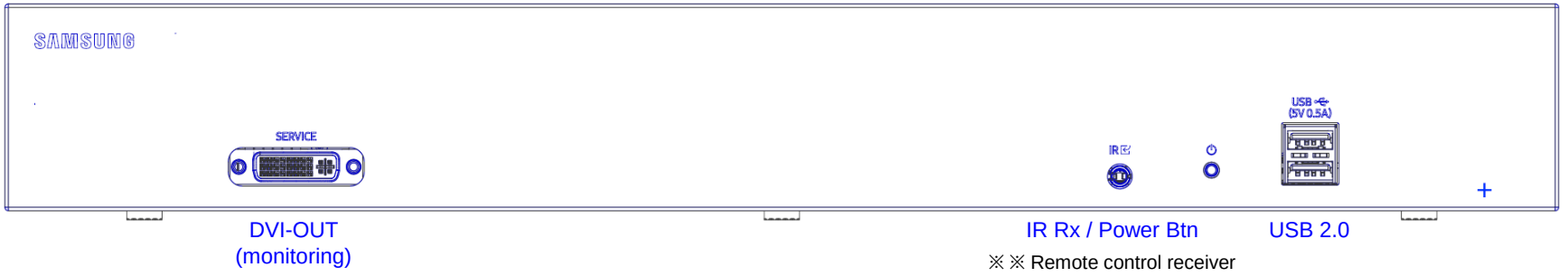
Check whether the GAP (→←) between the reassembled ASSY FRONT and the surrounding ASSY FRONT is equal to the GAP (→←) between the undecomposed ASSY FRONT. If there is an abnormality, re-regulate.



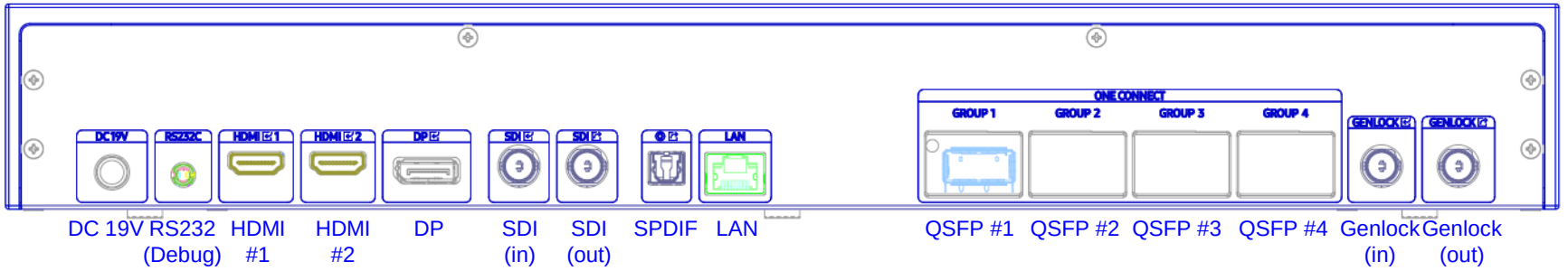
• S-BOX Connection (CV4B)

※ Name of each part before / after SET

- - Please refer to the image below the name of each part of the front and rear of the set.
- **- Front**

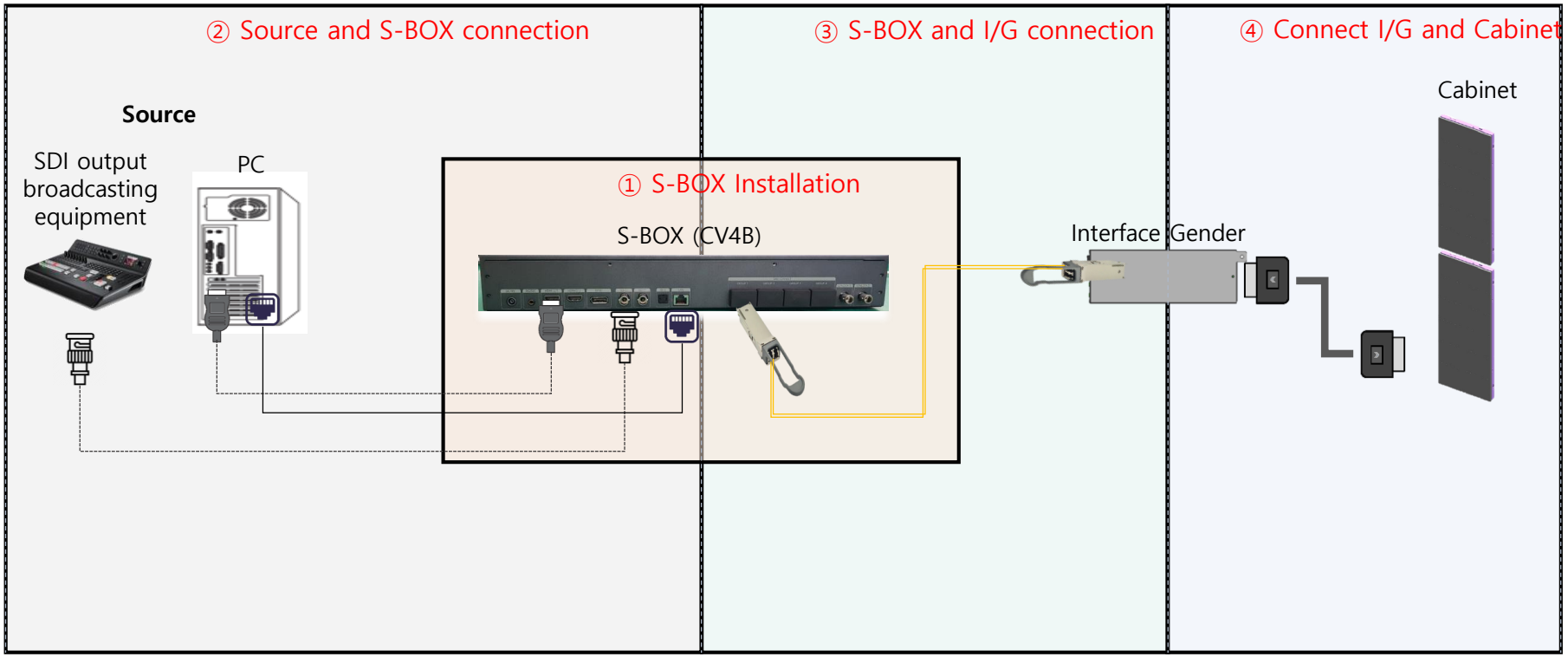


- **- Rear**



❑ S-BOX installation order

- The SBOX installation order proceeds in four steps as follows.



- S-BOX installation order (① S-BOX installation)

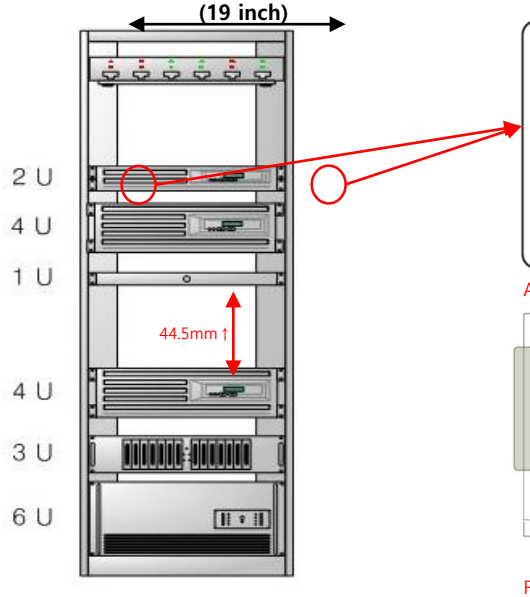
- The SBB-CV4B model is designed to meet the 19-inch standard server rack. It is recommended to install on the standard server rack when installing.

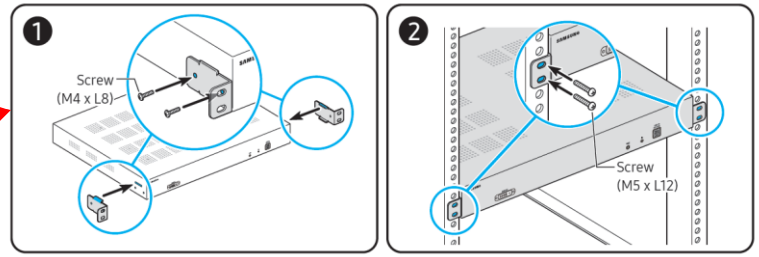
※ When installed on the wall, the product must be more than 10mm away from the wall, up, down, left and right, and in the case of cable port, install it more than 50mm away to connect the cable.

- Keep the residual heat inside the rack below 35°C.
- Install the vents so that they are open, and install them so that they do not turn sideways or flip over..

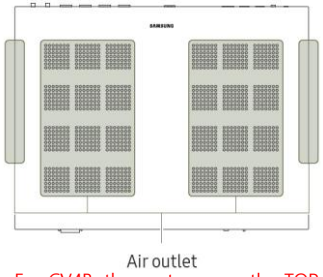
※ If you block the vent, the product may overheat, so be careful..

- When installing multiple S-BOXs, install them to be at least 1U (44.45mm) away from the top product.
- Be careful not to let liquids, etc. into the vents of the product.





Assemble using the screw, mounting bracket in the accessory.

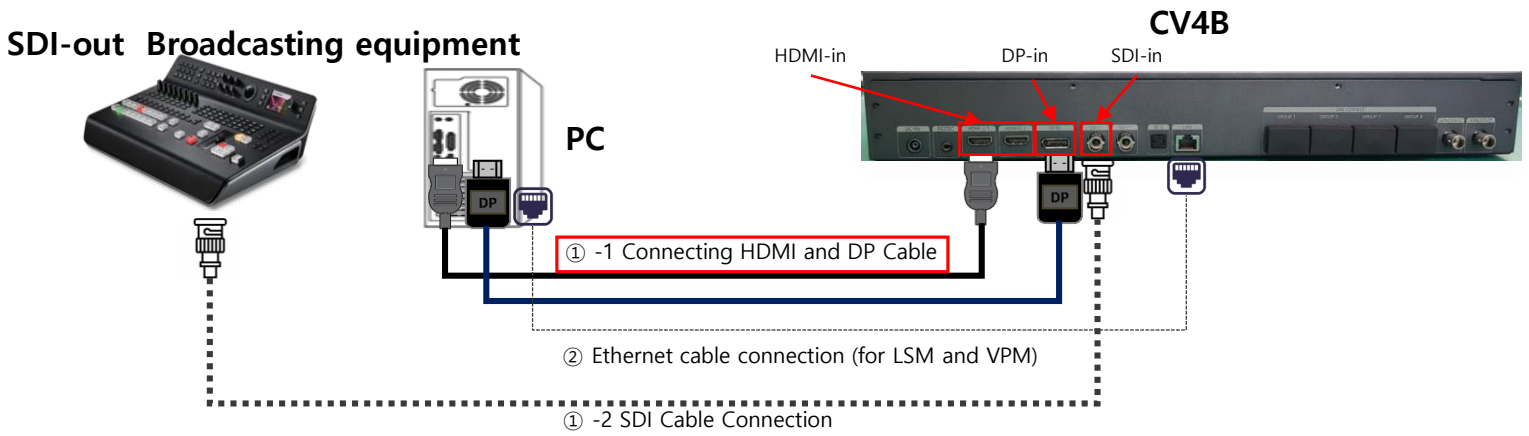


For CV4B, the vents are on the TOP side, left/right side. You should be careful not to get stuck. ,

- S-BOX installation order (② Source and S-BOX connection)

- The SBB-CV4B model is an S-BOX that can receive HDMI, DP (Display Port), and SDI (Serial Digital Interface) signals.

①-1) If you receive an input signal from HDMI/DP using a PC, etc., the HDMI cable should be connected using a cable that supports 2.1 specifications / the DP cable should be connected using a cable that supports 1.4 specifications



- S-BOX installation order (② Source and S-BOX connection) –cont'd

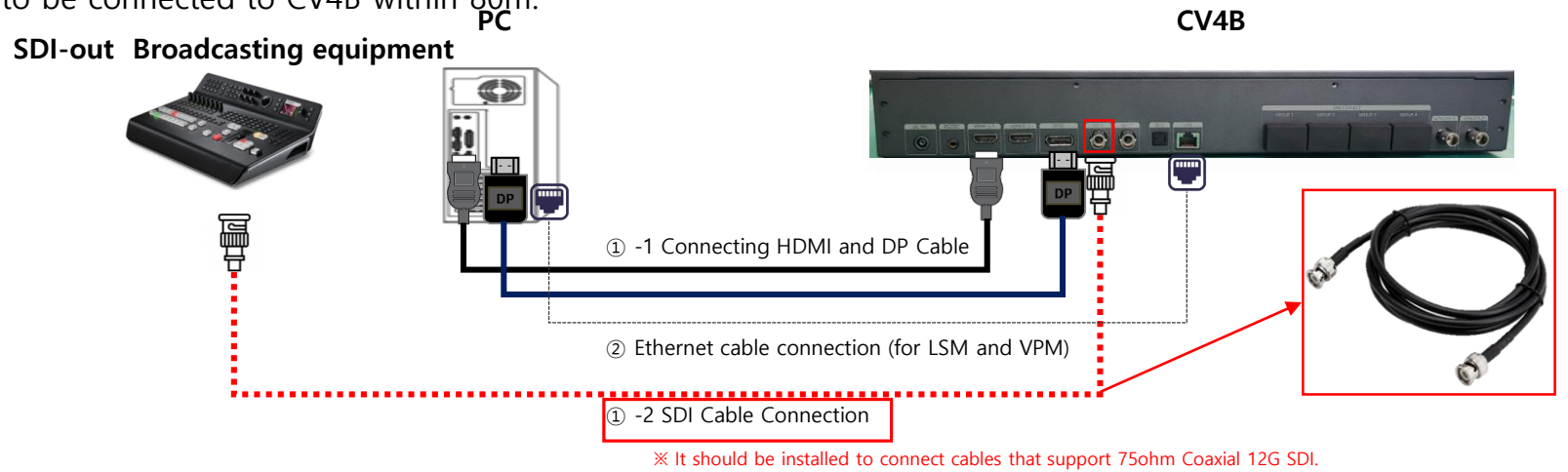
①-2) When receiving SDI signal through SDI output broadcasting equipment, it must be connected using SDI cable that supports 75 Ω Coaxial, 12G SDI specification.

< Note - Supportable resolution for each cable type >

Standard	Cable type	Bitrates	Video formats
SMPTE 259M	SD-SDI	270 Mbit/s, 360 Mbit/s, 143 Mbit/s, and 177 Mbit/s	480i, 576i
SMPTE 292M	HD-SDI	1.485 Gbit/s, and 1.485/1.001 Gbit/s	480p, 576p
SMPTE 424M	3G-SDI	2.970 Gbit/s, and 2.970/1.001 Gbit/s	1080p60
SMPTE ST 2081	6G-SDI	6 Gbit/s	1080p120, 2160p30
SMPTE ST 2083	12G-SDI	12 Gbit/s	2160p60

※ CV4B is a 4K 60Hz support device. It must be installed using 12G SDI specification support cable.

- Canare's L-5.5CUHD (0.391db/m) is recommended as a cable that supports 12G SDI specifications, and is installed to be connected to CV4B within 80m.



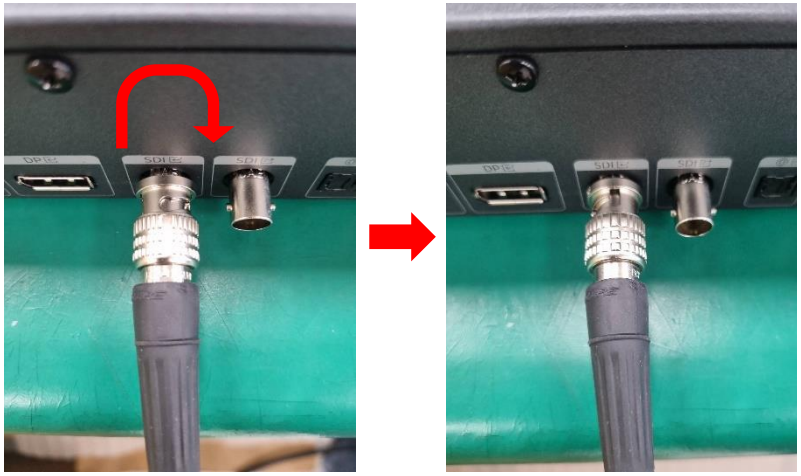
※ It should be installed to connect cables that support 75ohm Coaxial 12G SDI.

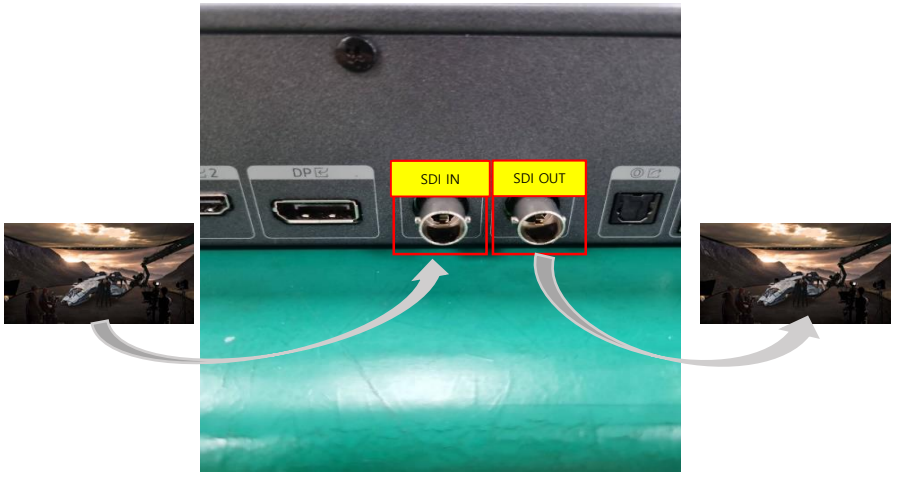
- S-BOX installation order (② Source and S-BOX connection) –cont'd

① -2) If you receive SDI signal through SDI output broadcasting equipment, you must connect using SDI cable that supports 75 Ω Coaxial, 12G SDI specification.

- The SDI Out side connector provides the same image signal as the SDI signal received toward In. When using multiple S-BOX, connect using SDI cable.

※ When connecting the SDI cable, turn the connector to engage the groove.





<SDI Cable SBOX Connection >

- S-BOX installation order (② Source and S-BOX connection) –cont'd

② Since the 1920x1080 output is a model with a default output specification, the CV4B model must change the IG resolution setting when connecting to the 1920x2160 resolution support cabinet. . (Supportability of 1920x1080 for IFR/IEA and 1920x2160 for IWA-VP/IWC/IVC)

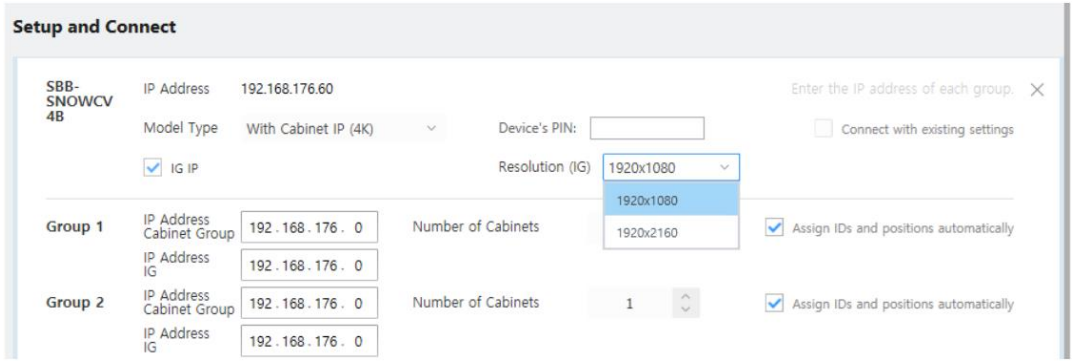
<Support resolution for each cabinet>

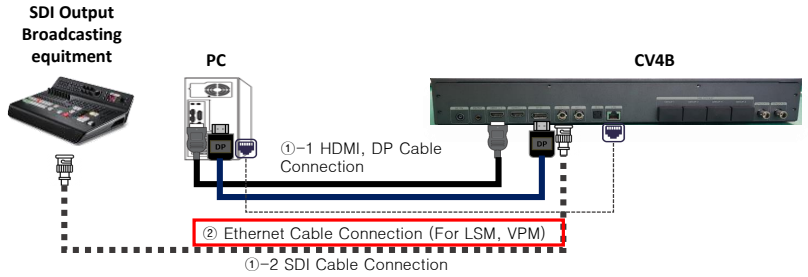
Cabinet		IFR			IEA			IWA			IWC			IVC	
Pitch		P2	P2.5	P4	P2	P2.5	P4	P0.84	P1.26	P1.68	P0.84	P1.26	P1.68	P1.68	P2.1
IG Output	Scanning rate	60Hz			60Hz			60Hz			60Hz			60Hz	
	Resolution	1920x1080			1920x1080			1920x**2160**			1920x**2160**			1920x**2160**	
	Compression status	X			X			O			O			O	

1) Connect PC and CV4B using Ethernet cable (Cat7 or higher) and connect PC and S-BOX through LSM.
(For detailed LSM connection guide, refer to page 176)

2) In the "Setup and Connect" menu in the LSM, modify the IG Resolution to match the resolution of the connected cabinet.

<Menu in LSM>





- S-BOX installation order (② Source and S-BOX connection) –cont'd

※ If IG Resolution value is set not to match the supported resolution

If the support resolution of the cabinet connected to the IG Resolution value does not match, the screen may be broken as shown in the picture on the left.

→ This phenomenon works normally for both S-BOX / Cabinet, and the screen is broken according to the specifications, so it is not a failure symptom.

→ 134p. If you change the IG Resolution through LSM according to the Cabinet resolution according to the guide, you can output the normal screen as shown in the picture on the right..

Example: S-BOX shipment specification (1920x1080) and IVC (1920x2160 resolution) connection



<When connecting S-BOX shipment specification and IVC>

1920x1080

Change IG Resolution to 1920x2160 through LSM



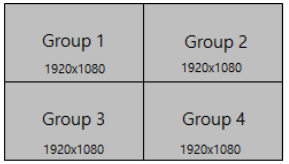
<When IVC is connected after applying 1920x2160>

- S-BOX installation order (② Source and S-BOX connection) –cont'd

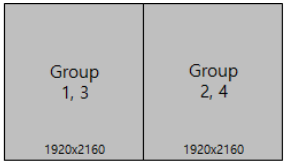
※ Note (1/2)

Please refer to the following picture for the output specification according to the IG Resolution value.





< IG Resolution = 1920×1080 >



< IG Resolution = 1920×2160 >

① When Output Resolution is UHD

1) IG Resolution : 1920x1080



2) IG Resolution : 1920x2160



- S-BOX installation order (② Source and S-BOX connection) –cont'd

※ Note (2/2)

Please refer to the following picture for the output specification according to the IG Resolution value..

② When Output Resolution is FHD



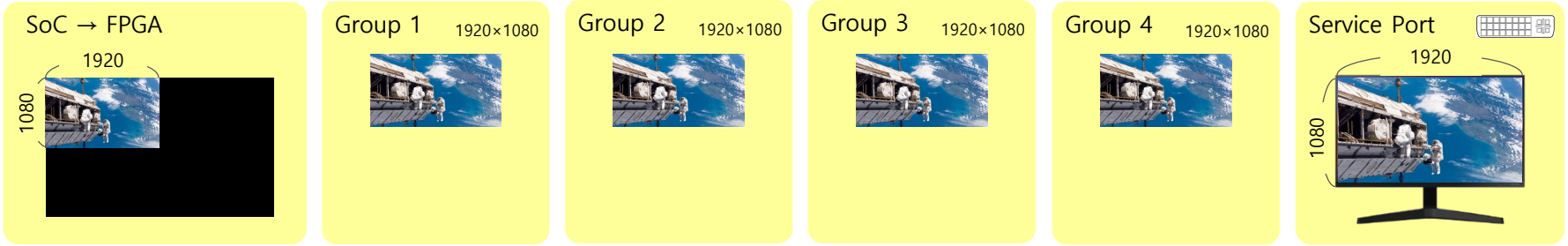
Group 1 1920x1080	Group 2 1920x1080
Group 3 1920x1080	Group 4 1920x1080

< IG Resolution = 1920×1080 >

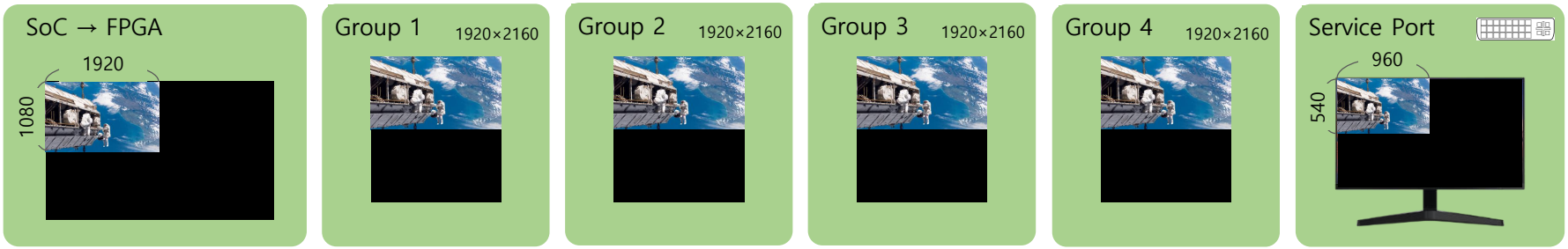
Group 1, 3 1920x2160	Group 2, 4 1920x2160

< IG Resolution = 1920×2160 >

1) IG Resolution : 1920x1080

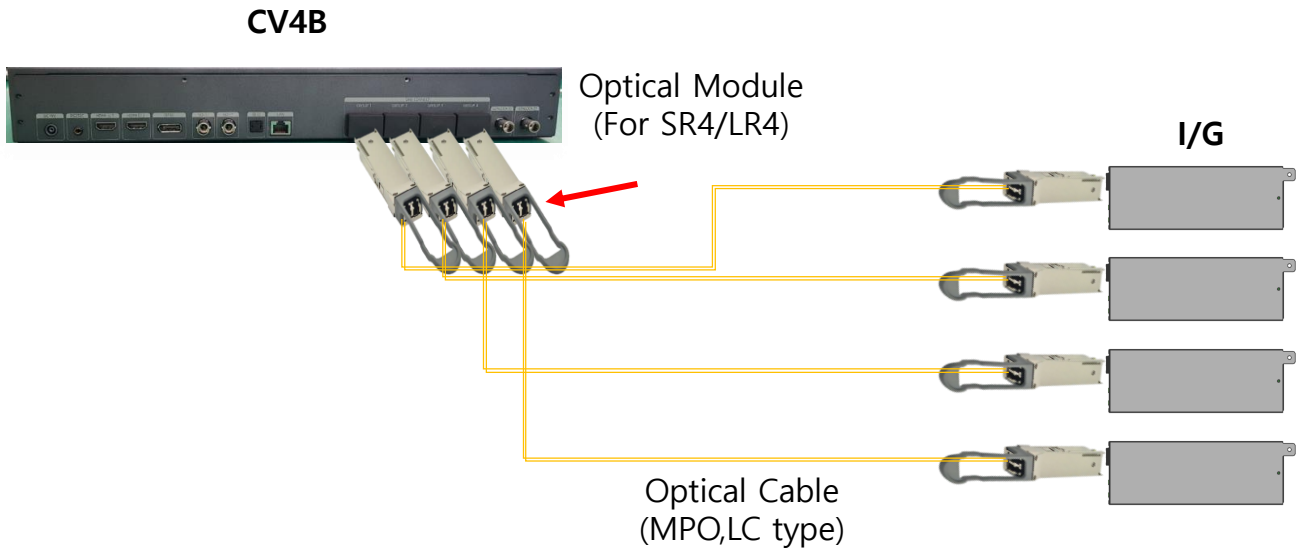


2) IG Resolution : 1920x2160



- S-BOX installation order (③ I/G and Cabinet connection) – cont'd

  - Connect S-BOX and I/G using optical module (for SR4/LR4) and optical cable (MPO,LC type).



- S-BOX installation order (③ I/G and Cabinet connection) – cont'd

① Optical module connection

- CV4B is a product that can be connected using optic transceiver (optic module) that supports 40G QSFP+ specification.

- Connect the optical module to the S-BOX and I/G connectors using the optical module (for SR4 or LR4).

Short-range transmission (100m) 10km for long-distance transmission

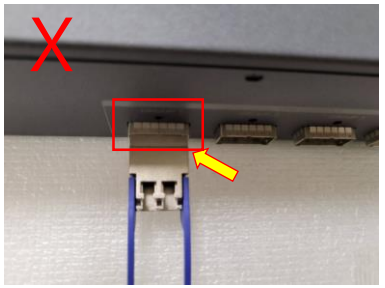
LR4

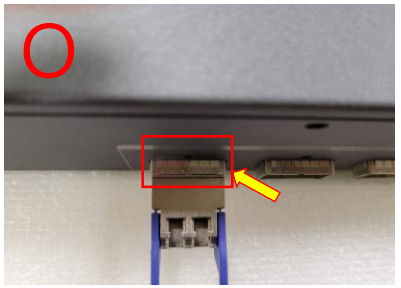


SR4



<Photo of optical module and SBOX connection>





※ When connecting the optical module, push it until it clicks.

LR4

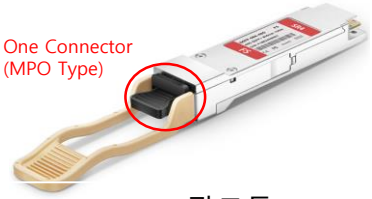


SR4

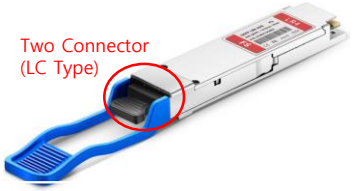


<Photo of optical module and I/G connection>

※ CV4B is compatible with both QSFP + SR4 / LR4 optical modules.



<SR4 광모듈>



<LR4 광모듈>

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- S-BOX installation order (③ I/G and Cabinet connection) – cont'd

① Optical Module Connection - Precaution

- The optical module specification compatible with CV4B is QSFP+40GBASE-LR4/SR4, and it does not work when connecting optical modules of other specifications..
- The following list is an optical module compatible with the CV4B model, so it is recommended to use the optical module by referring to the following list.

MAKER	PART NUMBER	CATEGORY	WAVELENGTH	REACH	INTERFACE	FIBER TYPE
FIBERATE	QSMM854T01D	SR4	850nm	100m	MPO	MM
FIBERATE	QSSL274T10D	LR4	1310nm	10km	LC	SM
FS	QSFP-SR4-40G	SR4	850nm	100m	MPO	MM
FS	QSFP-LR4-40G	LR4	1310nm	10km	LC	SM
RUIGU	40GBASE-LR4	LR4	1310nm	10km	LC	SM
RUIGU	40GBASE-SR4	SR4	850nm	100m	MPO	MM
EXA	EXA-40G-QC01	SR4	850nm	100m	MPO	MM
Finisar	QSFP-SR4-40G	SR4	850nm	100m	MPO	MM
MENTECH	QSFP-SR4-40G	SR4	850nm	100m	MPO	MM
MENTECH	QSFP-LR4-40G	LR4	1310nm	10km	LC	SM

- S-BOX installation order (③ I/G and Cabinet connection) – cont'd

① Optical Cable Connection – Notes

- For LR4 / SR4 specifications, refer to the following IEEE 802.3ba specifications.

Parameter		Min.	Typ.	Max.	Unit	Reference
Supply voltage		3.135	3.3	3.465	V	3.3V ± 5%
Power consumption		-	-	3.6	W	1.15A
LR4	Tx average launch power, each lane	-7	-	2.3	dBm	802.3ba 87.7.1
	Tx optical modulation amplitude, each lane	-4	-	3.5	dBm	802.3ba 87.7.1
	Rx average receive power, each lane	-13.7	-	2.3	dBm	802.3ba 87.7.2
	Rx receive sensitivity(OMA), each lane	-	-	-11.5	dBm	802.3ba 87.7.2
SR4	Tx average launch power, each lane	-7.6	-	2.4	dBm	802.3ba 86.7.1
	Tx optical modulation amplitude, each lane	-5.6	-	3	dBm	802.3ba 86.7.1
	Rx average receive power, each lane	-9.5	-	2.4	dBm	802.3ba 86.7.2
	Rx receive sensitivity(OMA), each lane	-	-	-5.4	dBm	802.3ba 86.7.2

※IEEE 802.3ba specification

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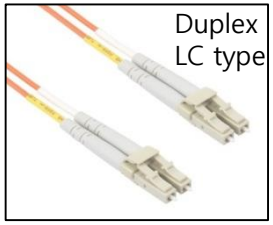
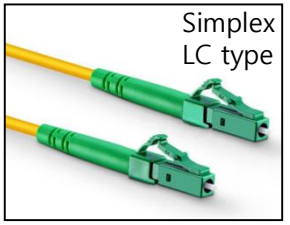
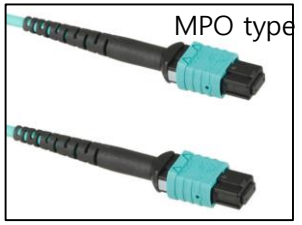
- S-BOX installation order (③ I/G and Cabinet connection) – cont'd

② Optical cable connection

- When installing the optical module with LR4 specification, connect it using LC Type SMF (Single Mode Fiber) specification optical cable..
- When installing the optical module with SR4 specification, connect using MPO Type MMF (Multi Mode Fiber) specification optical cable.
- - When connecting using LC type, release the locking structure when connecting using Duplex type cable and connect one by one like Simplex.



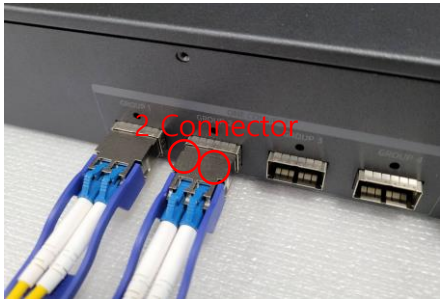




- Be careful not to contaminate the end of the cable before insertion and connect it with a soft cloth for cleanliness.



<Prevention of contamination at the end of cable>



Connect two connectors when connecting LC type



Connect one connector when connecting MPO type

- S-BOX installation order (③ I/G and Cabinet connection) – cont'd

② Optical cable connection (connection example))

When connecting LR4



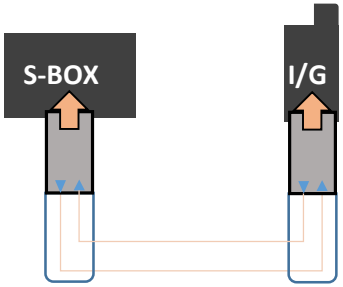
When connecting SR4







<S-BOX Connection image>



When connecting to the LC type cable, the transmission/reception unit of the S-BOX and IG optical modules must be checked and connected.

TRANSMISSION UNIT OF S-BOX OPTICAL MODULE -> RECEIVING UNIT OF IG OPTICAL MODULES
RECEIVING UNIT OF S-BOX OPTICAL MODULE -> TRANSMITTING UNIT OF IG OPTICAL MODULE

※ If the screen is not turned on or communication is not smooth, change the left and right of the LC Type connector inserted into the optical module.



<I/G Connection Image>

- S-BOX installation order (③ I/G and Cabinet connection) – cont'd

② Optical Cable Connection - Precaution

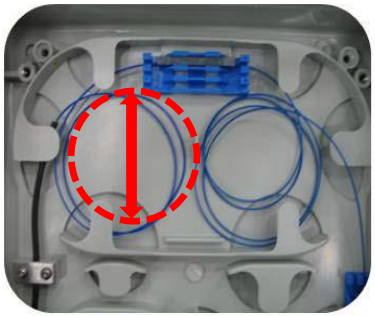
- When connecting a signal using an optical cable, handling defects may occur, so it should be installed in consideration of the following optical cable handling specifications.

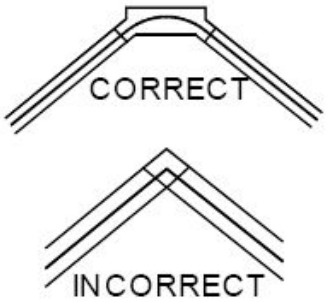
- Avoid contact devices with sharp or rough ends.
- Do not wipe the optical cable with coarse material or dissolving agent.

Tensile force characteristics vary depending on the specifications of the cable used. Please refer to the cable specifications you use.

- Unconnected fiber optic cable connectors must use a protective cap and inspect and clean the connectors before connection.
- Install the cable so that the minimum force is applied to the optical fiber in consideration of the pulling force..
- Optical cables should not be stepped on with feet or pressed by heavy water. There is a concern that the cable may be damaged by the weight..
- Cable ties, etc. should not be used when installing. Loss or fiber optic disconnection due to compression and flexion may occur.
- Bending the optical cable above the allowable bend radius causes optical loss, so it must be installed below the allowable bend radius. (Refer to the figure)
- Be careful not to bend or twist at right angles. (Refer to the figure)

The allowable bend radius varies depending on the specifications of the cable used. Please refer to the cable specification.







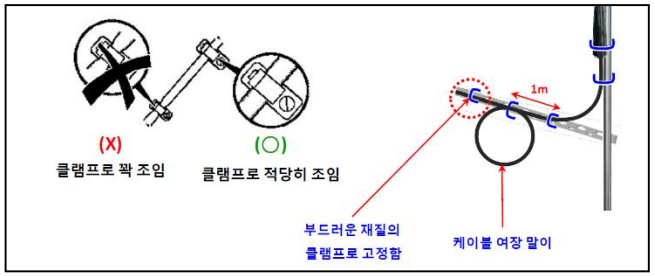
- S-BOX installation order (③ I/G and Cabinet connection) – cont'd

② Optical Cable Connection - Precuation

- When connecting a signal using an optical cable, handling defects may occur, so it should be installed in consideration of the following optical cable handling specifications..

Compression characteristics vary depending on the specifications of the cable used. Please refer to the cable specifications you use.

- When used by fixing it to Tray, etc., fix it smoothly so that it is not pressed directly on the optical cable.
- The clamp spacing used for fixing is recommended to be less than 1m..
- Do not impact the optical cable. The impact load of a typical optical cable is 7J or less, but the impact characteristics should be referred to each cable specification.
- Be careful not to cause cable torsion. If the cable twists, it can cause damage to the fiber optics..





- When using FDF (light distributor), there may be deterioration of the signal due to connection loss and reflection loss, so the product does not guarantee it..



FDF, 광분배기

- S-BOX installation order (③ I/G and Cabinet connection) – cont'd

② Optical Cable Connection - Precaution

- The CV4B model is a model that supports 40G BASE-SR4/LR4..

- When transmitting an optical signal using the SR4 optical module, it must be connected using the Multi-Mode OM3 Cable (MPO Type). (MAX installation length: 100m)

- - When transmitting an optical signal using the LR4 optical module, it must be connected using a single mode cable (LC type). (MAX installation length: 10km)

- - Please refer to the following table for cable related specifications..

Interface Type	Fiber Optic Patch Cable Type
1000BASE-SX	Multimode OM1, OM2 Cable
1000BASE-LX	Single-mode Cable
1000BASE-EX	Single-mode Cable
1000BASE-ZX	Single-mode Cable
10GBASE-SR	Multimode OM3, OM4 Cable
10GBASE-LR	Single-mode Cable
10GBASE-ER	Single-mode Cable
10GBASE-ZR	Single-mode Cable
40GBASE-SR4	Multimode OM3, OM4 Cable
40GBASE-LR4	Single-mode Cable
40GBASE-ER4	Single-mode Cable
100GBASE-SR10	Multimode OM3, OM4 Cable
100GBASE-SR4	Multimode OM3, OM4 Cable
100GBASE-LR4	Single-mode Cable
100GBASE-SR4	Single-mode Cable

<Cable type that can be connected by interface>

Mode	Catagory	100M (FX)	1G (SX)	10G (SR)	40G SR4	100G (SR10)
Single Mode	OS1	10~120Km				
		1dB / km미만				
	OS2	10~120km				
		0.4dB / km미만				
Multi Mode	OM1	2Km	275m	33m	X	X
	OM2		550m	82m	X	X
	OM3			300m	100m	100m
	OM4			400m	150m	150m
	OM5					

<Transmission distance by cable type>



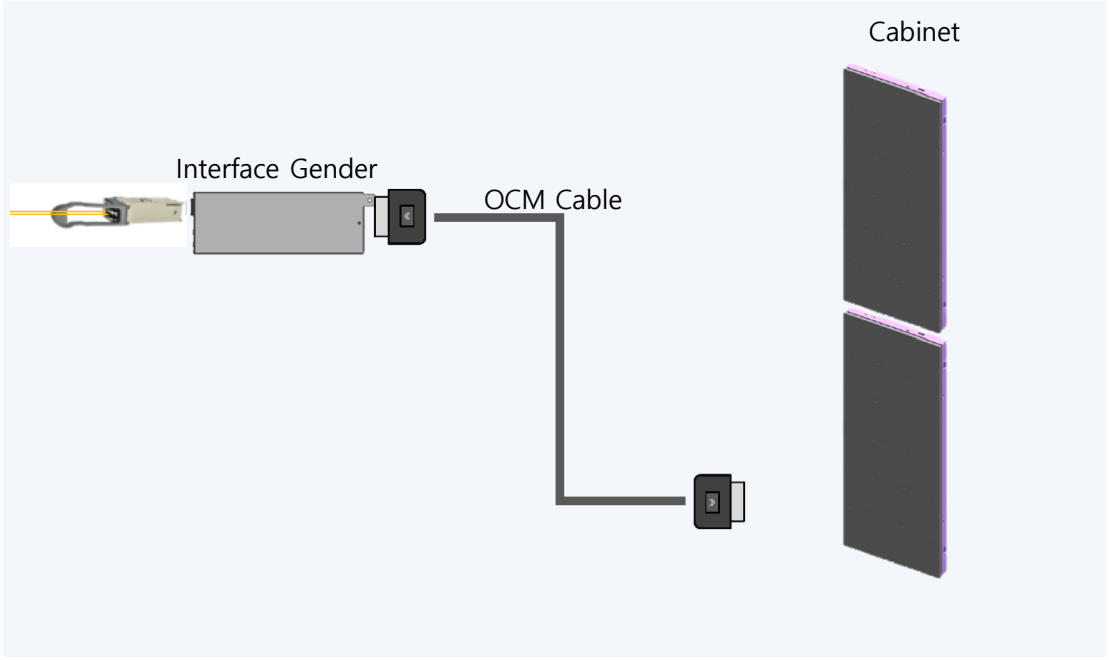
Single Mode Fiber (LC Type)



Multi Mode Fiber (MPO Type)

- S-BOX installation order (④ I/G and Cabinet connection)

- The CV4B model is an S-BOX compatible with IVC, IWA-VP (P1.68), IFR, and IEA Cabinet.
- Connect the I/G and cabinet using the OCM cable in the accessory box.
- I/G is a specification that is installed in the cabinet frame together. Connect the optical cable first and then connect it to the frame so that it can be installed. ※ For detailed installation specifications, refer to the LED Cabinet manual.



- S-BOX installation order (④ I/G and Cabinet connection)

- I / G factory shipment Dip Switch specification is 0000. (Refer to the following "shipping mode" photo)
- When installing with LED cabinet, connect standby pin 4 should be turned on and installed with 0001 specification to enter ON mode at all times (Refer to the following "Always ON mode" photo)

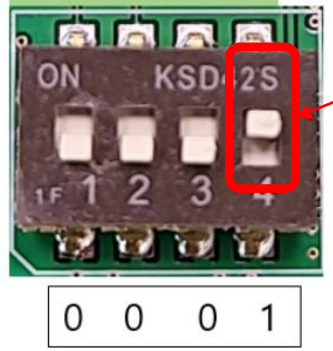
출하모드



When in shipment mode, enter stand by mode according to the signal of S-BOX..

※ If the signal is not received from the SBOX for 5 minutes after the cabinet power is applied in the shipment mode, it enters the standby mode..

상시 ON 모드



Connection Standby Pin

In the always-on mode, it enters the always-on state regardless of whether there is an S-BOX signal or not.

※ Consumer installation recommended specifications

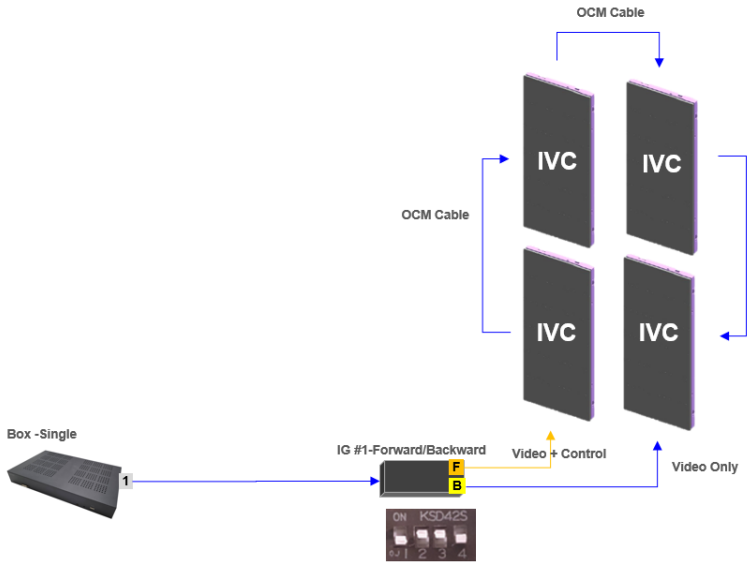
6. S-BOX Installation and Connection

SAMSUNG

- S-BOX installation order (④ I/G and Cabinet connection)

Screen structure	IG Setting	Dip SW Setting	IG Port	Video (Vx1)	No.1		No.2	No.3	No.4	Usage
					Ethernet	STB_EN	Redundancy SW (UART)	PILLAR_DET	Always On	
Cable	FWD/BWD IG same		FWD	O	O	O	O	N/C	 Shipping Mode	Cable Installation FWD/BWD Configuration
			BWD	O	X	X	X	X	 Always On	

- Video : Vby1
- Control : Ethernet, I2C, UART
- When Use Multi BOX, Picture quality mode : Calibration
  Menu → Picture → Picture mode : Calibration
- Video Wall mode : On
  Home → Video Wall → Video Wall : On



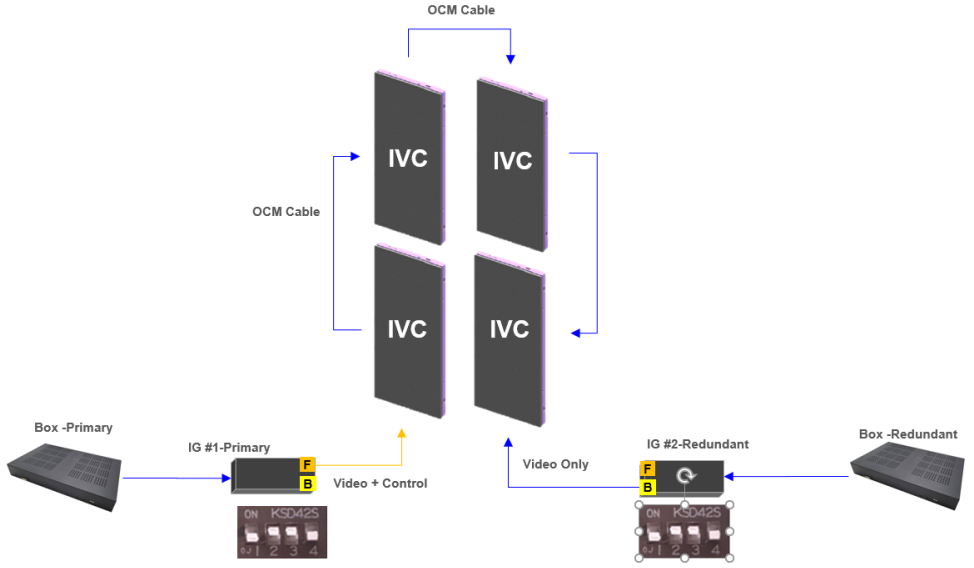
6. S-BOX Installation and Connection

SAMSUNG

- S-BOX installation order (④ I/G and Cabinet connection)

Screen structure	IG Setting	Dip SW Setting	IG Port	Video (Vx1)	No.1		No.2	No.3	No.4	Usage
					Ethernet	STB_EN	Redundancy SW (UART)	PILLAR_DET	Always On	
Cable	FWD/BWD IG same		FWD	O	O	O	O	N/C	 Shipping Mode	Cable Installation FWD/BWD Configuration
			BWD	O	X	X	X	X	 Always On	

- Video : Vby1
- Control : Ethernet, I2C, UART
- When Use Multi BOX, Picture quality mode : Calibration
  Menu → Picture → Picture mode : Calibration
- Video Wall mode : On
  Home → Video Wall → Video Wall : On



6. S-BOX Installation and Connection

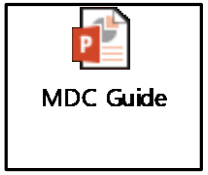
SAMSUNG

- S-BOX installation order (④ I/G and Cabinet connection) – I/G Setting

- IG setting can be adjusted through MDC command.
- Use MDC Debug Tool V20110622. exe

4th pin	MDC Command (Always on mode)	Operating specification
	Not Supported	Always On Setting
	0 : AA d0 02 02 54 00	Shipment mode (Standby mode entry spec.)
	1 : AA d0 02 02 54 01	Always On Setting

■ If pin 4 is off, Always on / off control is possible through MDC Command.
※ If pin 4 is on, it works in Always On mode. (MDC is not supported)
※ Refer to MDC Guide.





6. S-BOX Installation and Connection

SAMSUNG

- S-BOX installation order (④ I/G and Cabinet connection) - IG POWER Case

[CASE 1] IG DIP Switch – Always ON Mode (IG 4th Dip Switch ON) ※Recommended installation specifications



Always ON Mode

S-BOX/IG POWER OFF → Cabinet Group OFF → IG Power Always ON → S-BOX POWER ON → Cabinet Group ON

- In case of CASE 1, IG enters Always on state regardless of S-BOX signal.

[CASE 2] IG DIP Switch – Always OFF Mode (IG 4th Dip Switch OFF)



Shipping Mode

S-BOX/IG POWER OFF → Cabinet Group OFF → IG Power OFF → S-BOX POWER ON → Cabinet Group OFF

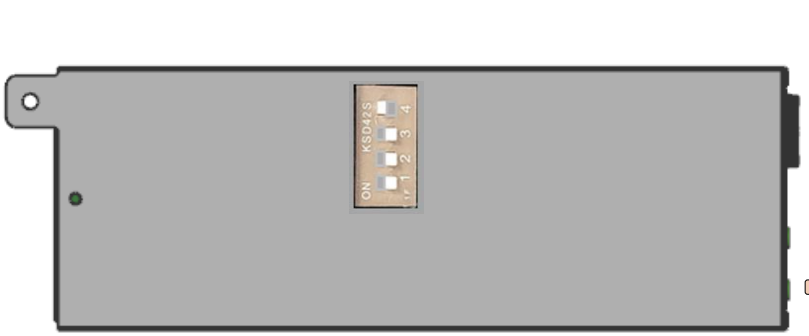
- In case of CASE 2, if there is no signal of S-BOX, IG enters standby mode.
- To turn on the cabinet group, there is a way to connect IR to the cabinet AC power off/on or each IG. (Refer to p150, 151)

6. S-BOX Installation and Connection

SAMSUNG

- S-BOX installation order (④ I/G and Cabinet connection) – [CASE 1]

- In the case of CASE 1, since the power of the IG is always on, there is no need to connect the IR for the front to turn on each IG (Forward).
- You can use IR for one front to control the OSD menu.

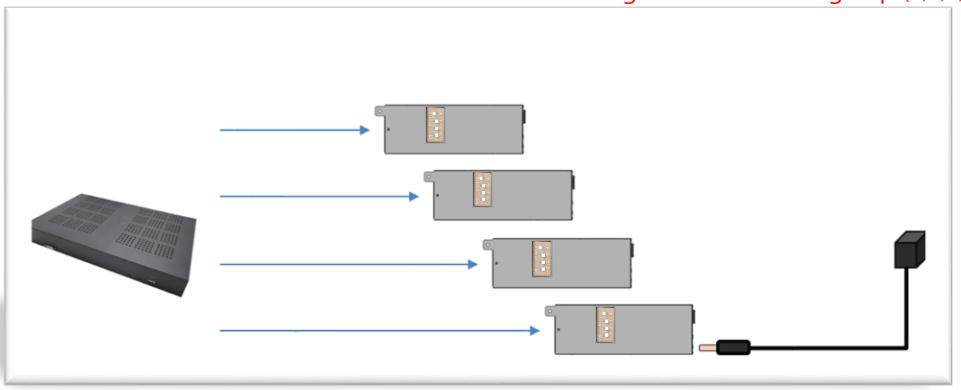


BN39-01899A

(※ In case of front IR, separate purchase is required)



※ Connect IG and Front IR regardless of S-BOX group (1,2,3,4)

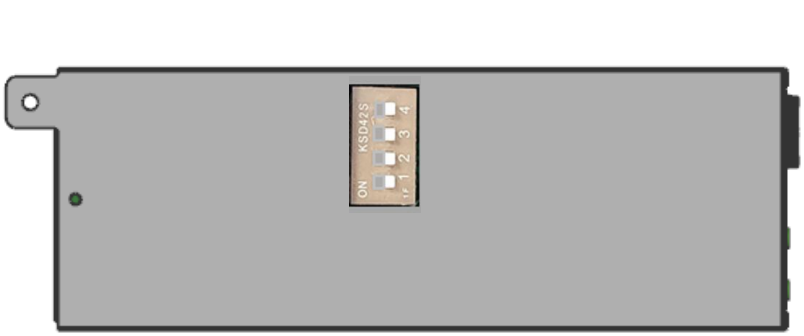


6. S-BOX Installation and Connection

SAMSUNG

- S-BOX installation order (④ I/G and Cabinet connection) – [CASE 2]

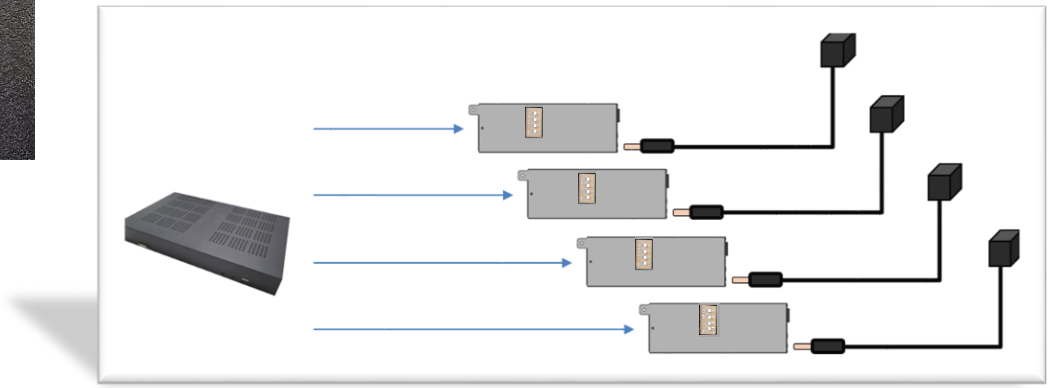
- In case of CASE 2, AC power of Cabinet must be turned off -> ON to turn on power of IG.
- If the above method is difficult, you can apply power by connecting IR for Front to the installed S-BOX and each IG (Forward). (Note: See p150)



BN39-01899A

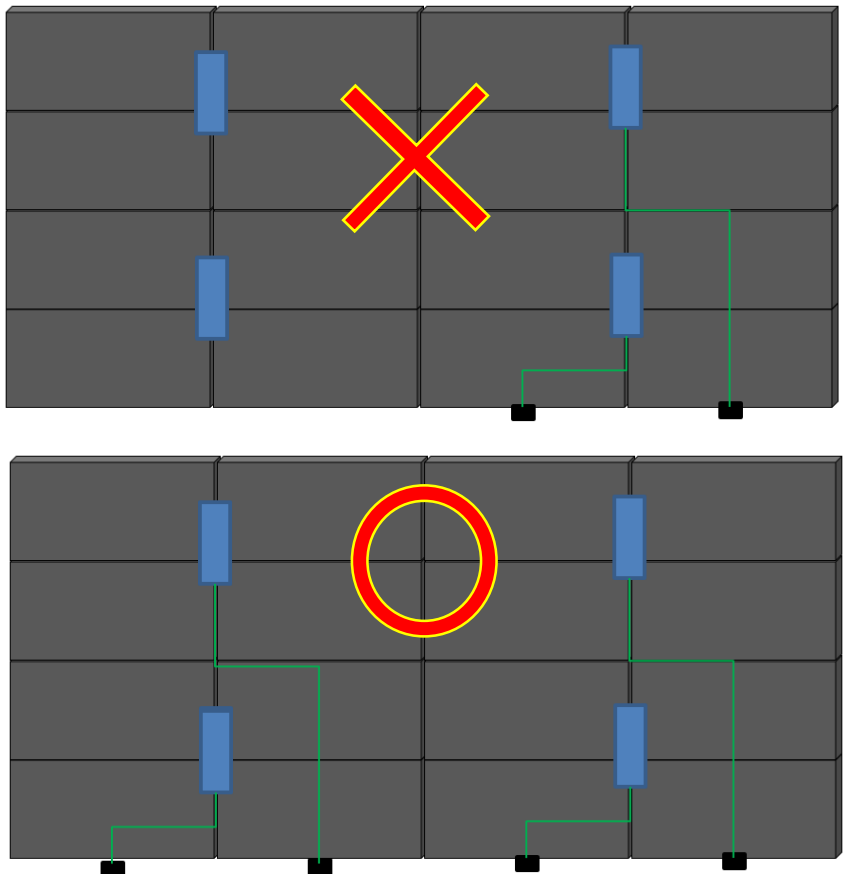
(※ In case of front IR, separate purchase is required)





- S-BOX installation order (④ I/G and Cabinet connection) –cont'd

※ For front IR installation, the screen is not turned on when IR power is on in the cabinet group where IR is not installed, so be careful.





6. S-BOX Installation and Connection

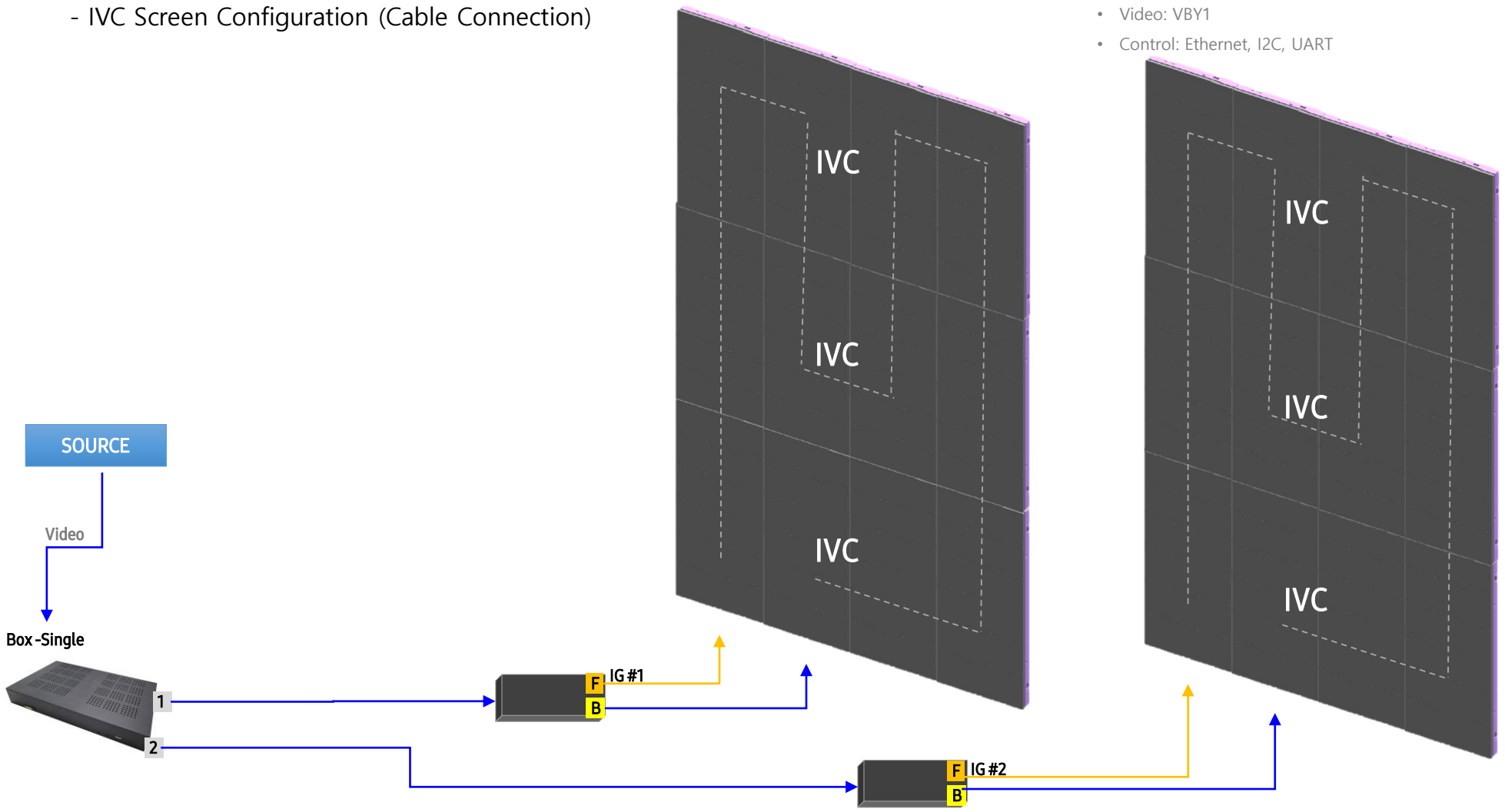
SAMSUNG

※ The following connection diagram is a video redundancy specification, and the backward direction does not support data path for control operation.

- S-BOX installation order (④ I/G and Cabinet connection) – cont'd

- IVC Screen Configuration (Cable Connection)

- Video: VBY1
- Control: Ethernet, I2C, UART



6. S-BOX Installation and Connection

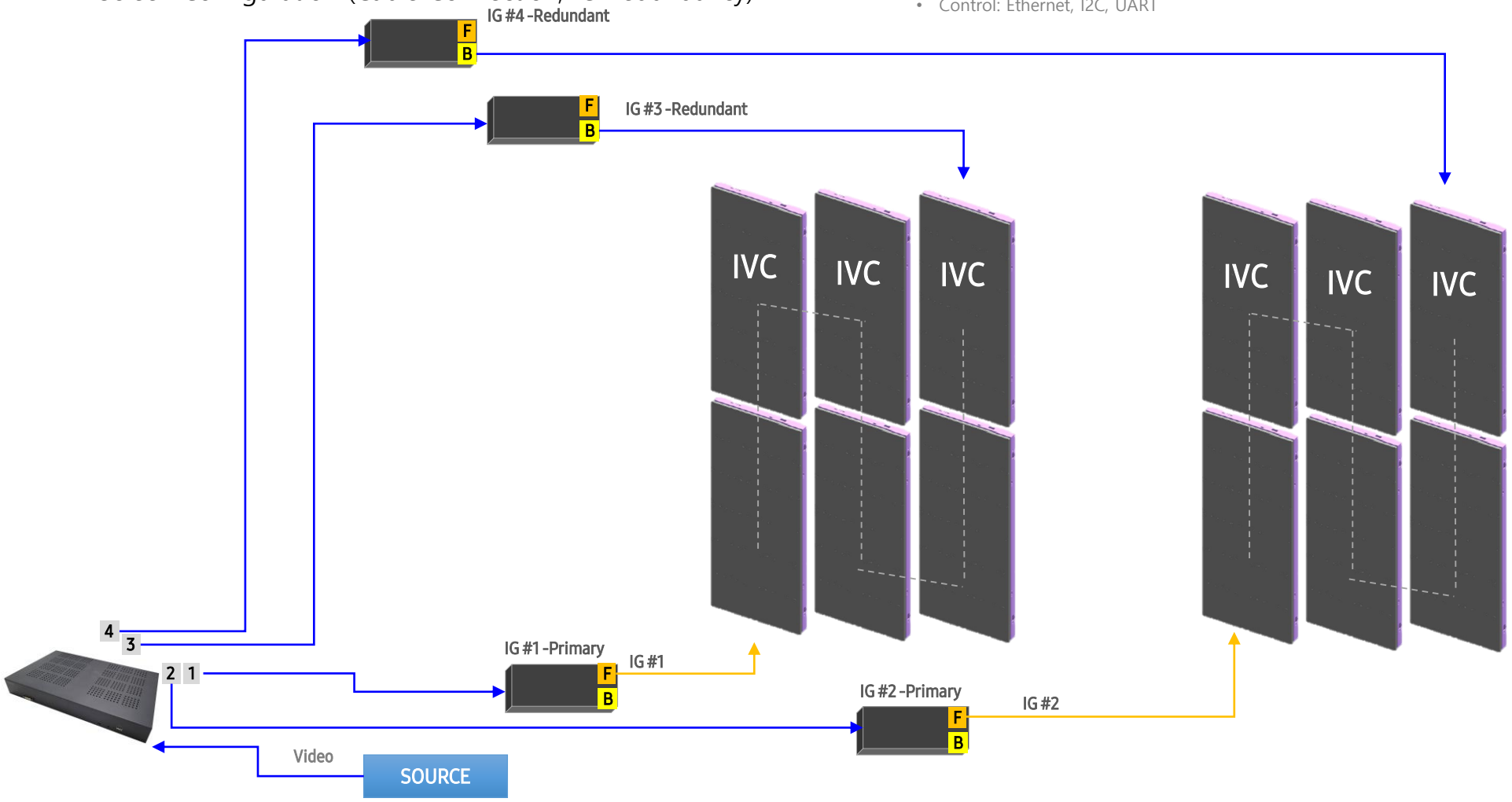
SAMSUNG

※ The following connection diagram is a video redundancy specification, and the backward direction does not support data path for control operation.

- S-BOX installation order (④ I/G and Cabinet connection) – cont'd

  - Screen Configuration (Cable Connection, IG Redundancy)

    - Video: VBY1
    - Control: Ethernet, I2C, UART



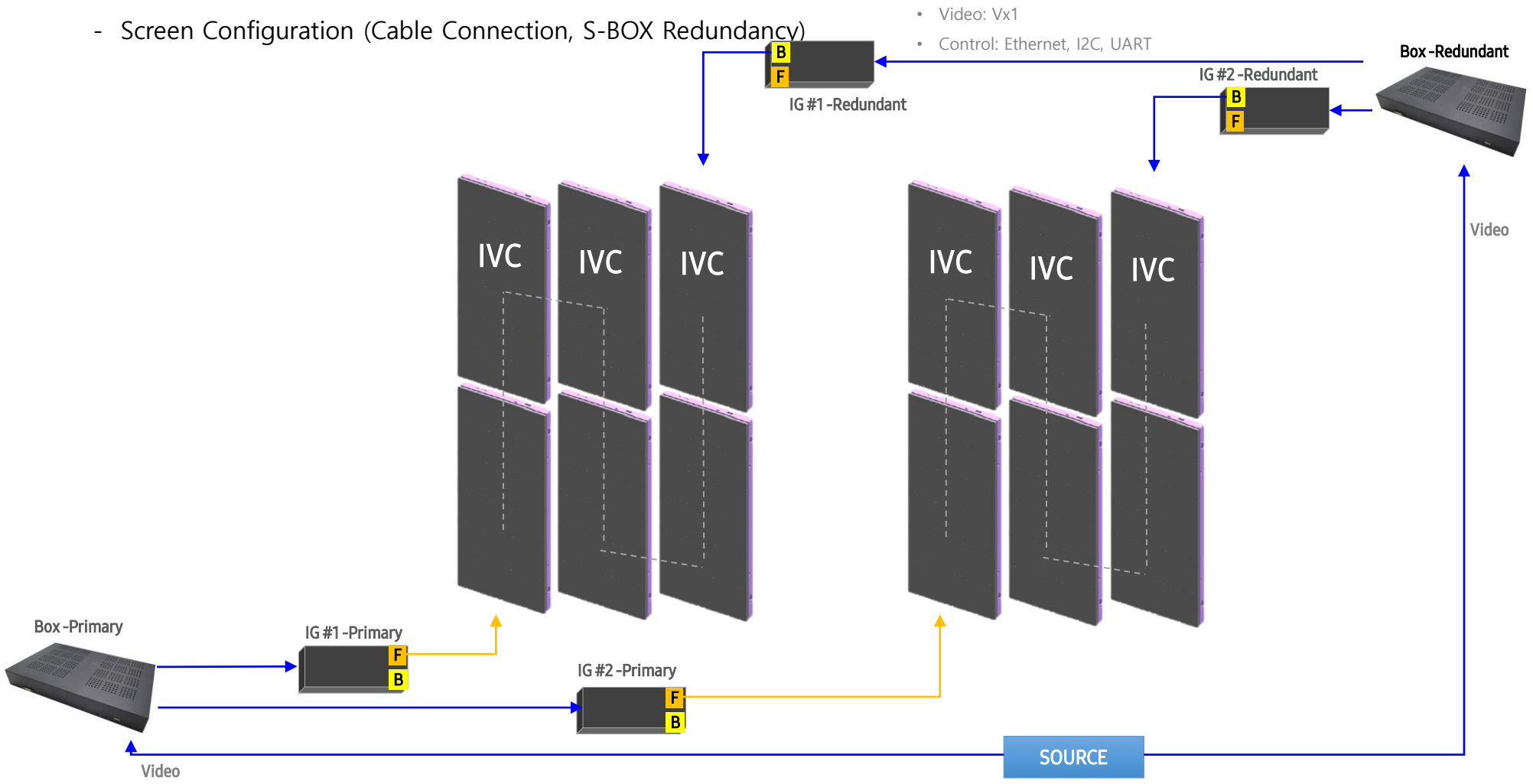
6. S-BOX Installation and Connection

SAMSUNG

※ The following connection diagram is a video redundancy specification, and the backward direction does not support data path for control operation.

- S-BOX installation order (④ I/G and Cabinet connection) – cont'd

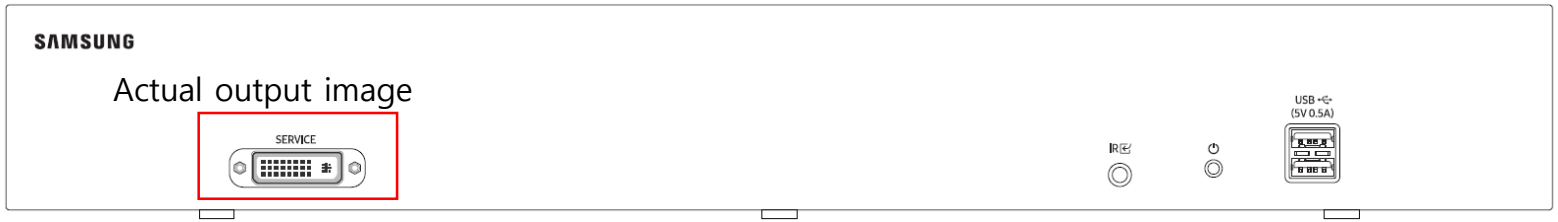
  - Screen Configuration (Cable Connection, S-BOX Redundancy)

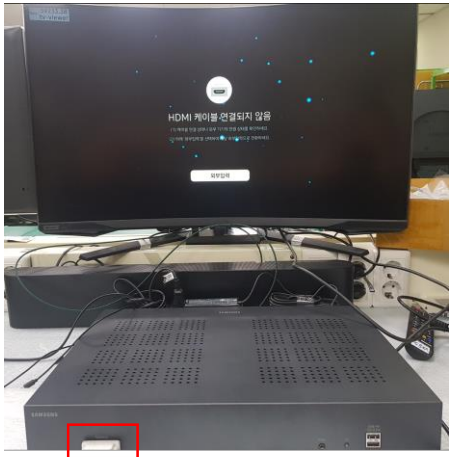


❑ Notes) DVI output function for service

- The DVI-OUT on the front of the product is a port used for service purposes. This port can only be used in output devices that support HDCP.
- The resolution of the port is FHD (1920*1080 @ 60Hz), and screen blinking and breaking may occur when entering the source of UHD resolution into the S-BOX, but this is a phenomenon in which the port output is fixed down scaling without a specific scaling algorithm and has nothing to do with the actual LED cabinet screen output.
- - Connect the monitor to use the SERIVCE port.

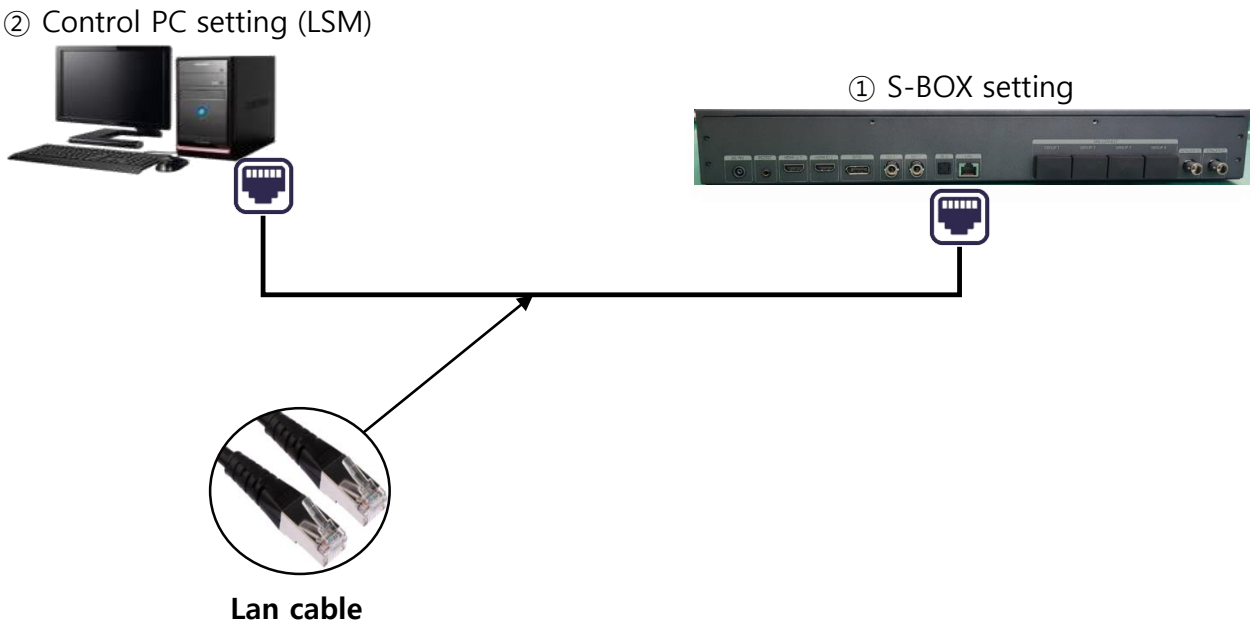
※ This port is for service only, and there is no function for user.





❑ Setting Order

- Set ① S-BOX setting ② Control PC setting (LSM) in order to use S-BOX
- When connecting the Lan cable between S-BOX ↔ Control PCs, connect using the Lan cable (Shielded)

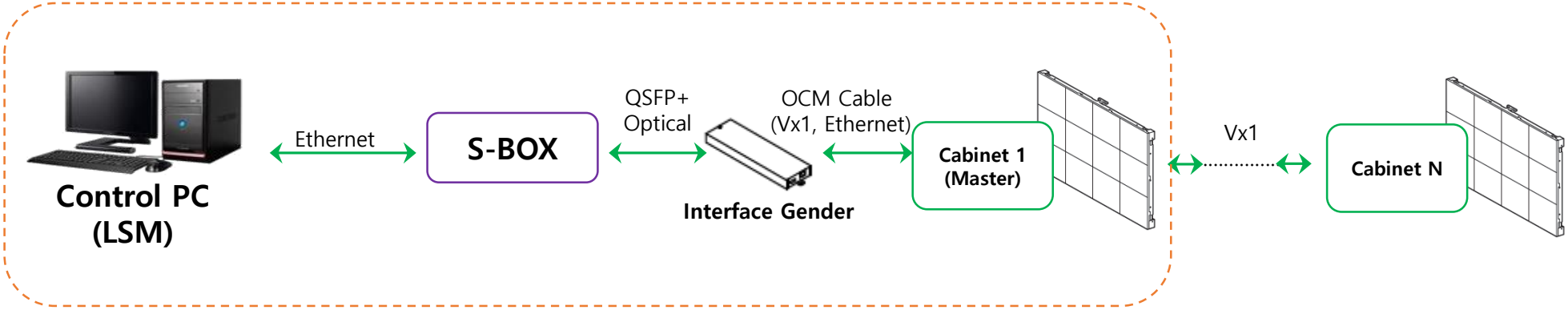


❑ Precautions before setting

- S-BOX shipment quality setting is optimized for cabinet specifications and factory shipment, and control PC ↔ S-BOX ↔ IG must be set for optimal image quality

※ Color may be unnatural when cabinet is lit after LSM is not connected between S-BOX and LED display.

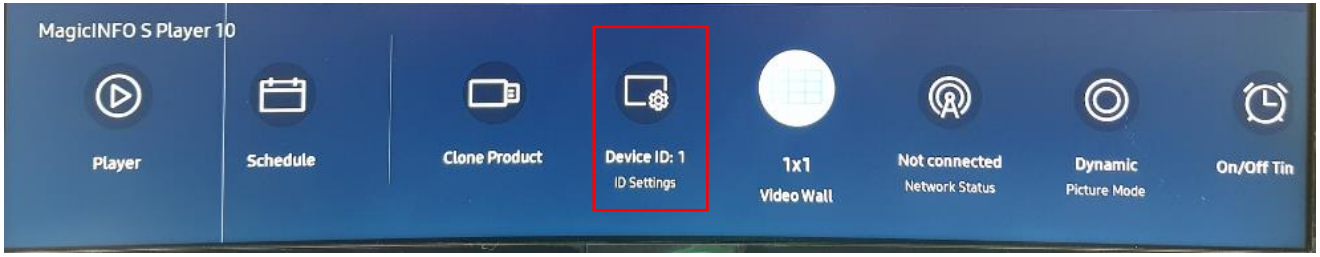
- The image quality setting criteria are set based on the Master Cabinet model connected to Group1 of S-BOX.

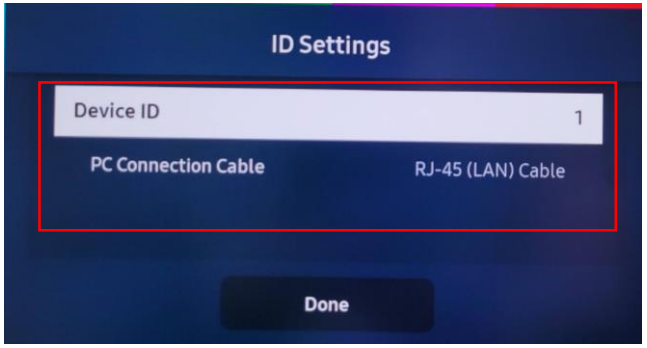


① S-BOX Settings – Network Settings

- Enter the Home key → Device ID using the remote controller.
- Change the device ID to "1" and the PC Connection Cable to "RJ-45 (LAN) Cable".

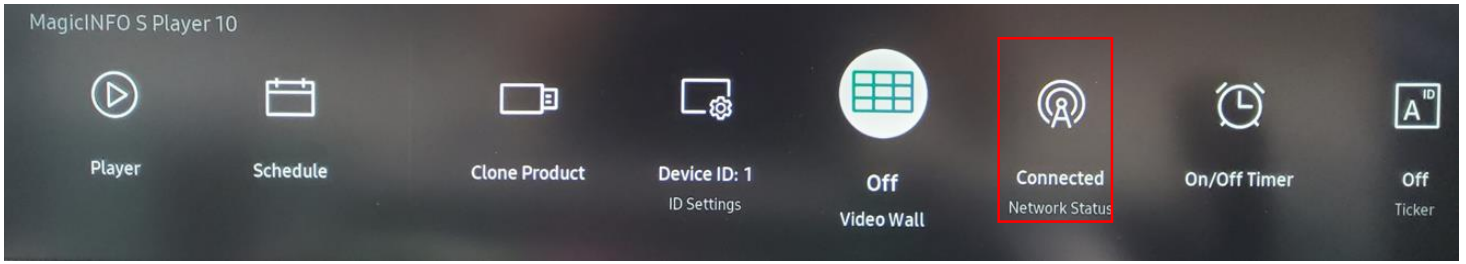
For the SBB model, the device ID is always 1.

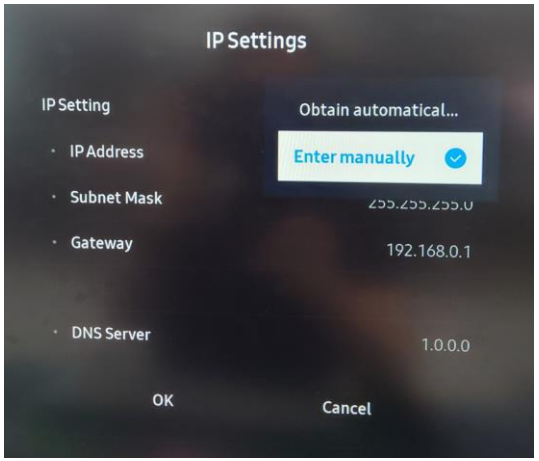




① S-BOX Settings – Network Settings

- Use Remote Controller to enter Home key → Network Status..
- Automatic IP or manual IP can be set through IP Setting. Set the IP according to the control PC and network environment you use.



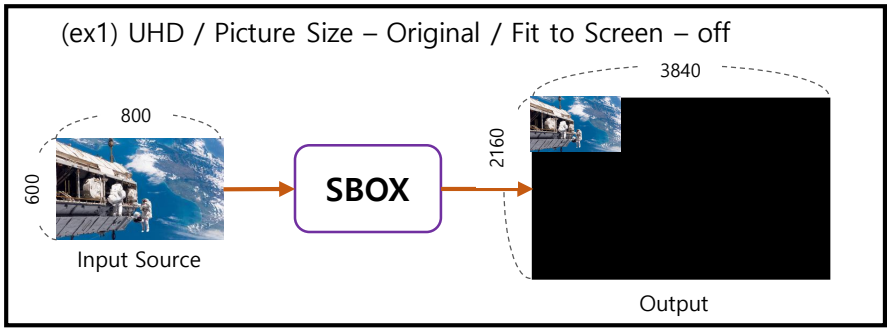


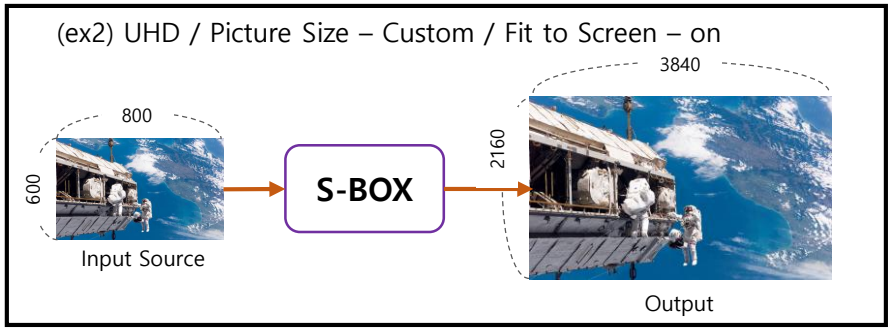
① S-BOX Setting – Picture Setting

- You can set Menu → Picture specifications using Remote Controller.
- You can set the screen size to display as Cabinet through "LED Picture Size Settings".

<LED Picture Size Settings>

Output Resolution	UHD	Select UHD/FHD to match the resolution of the source entered by the Control PC.
	FHD	
LED Picture Size	Original	Output resolution is set to match the source ratio of the input source.
	Custom	Output resolution is set by setting the desired width/height (ratio).
Fit to Screen	Off	Regardless of the LED cabinet size, it is displayed according to the original ratio of the input source.
	On	Edit and print the image ratio to fit the LED size..





① S-BOX Setting – Picture Setting (Precation)

- Picture Size of S-BOX does not provide overscan / crop function by default.
- If the LED Picture Size is Original or Fit to Screen is Off, the original ratio is maintained. If it is Fit to Screen On, the screen is displayed with Up scaling/Down scaling according to the LED Picture Size.
- If the input resolution is 4096x2160, the output resolution is set by cropping the following exceptions.

< Exceptions >

Case 1

Output Resolution : UHD (3840 x 2160)

LED Picture size : Original

→ Copy the horizontal size and output it.

(Crop size : (4096-256) x 2160)

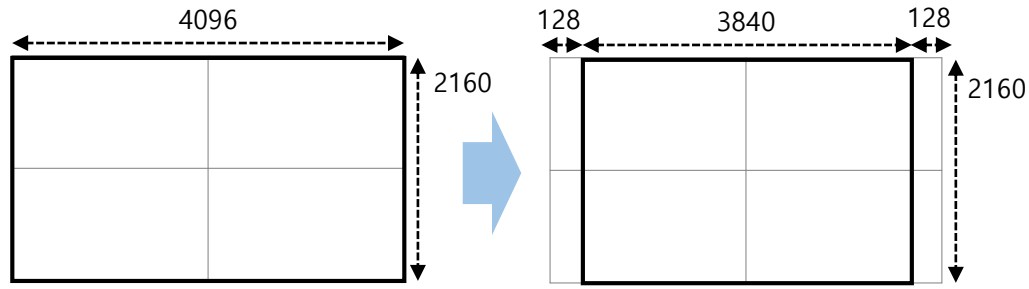
Case 2

LED Picture Size : Custom (3840 x 2160)

Fit to Screen : Off

→ Copy the horizontal size and output it.

(Crop size : (4096-256) x 2160)



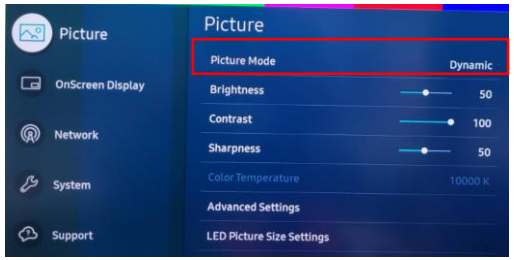
[Input Resolution] [Screen Output Resolution]

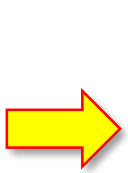
① S-BOX Setting – Grouping Setting

- You can configure a single screen using multiple S-BOXs using the grouping function of S-BOX.
- To use the grouping function, change the image quality settings of multiple S-BOXs to OFF except for "Picture Mode" – "Calibration" as follows.

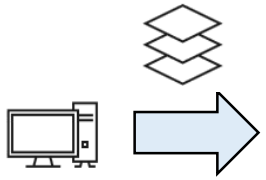
※ The following setting is to synchronize the output of the source device input to a plurality of S-BOXs. Screen may not be uniform when not set.

Menu	2nd	3rd	Value
Picture	Picture Mode	Calibration	Calibration
	Advanced Settings	Picture Enhancer	OFF
	Picture Options	Color Tone	OFF
		HDMI Black Level	OFF
		Auto Motion Plus Settings	OFF
System	Power and Energy Saving	Brightness Optimization	OFF









Synchronization



① S-BOX Setting – Grouping Setting

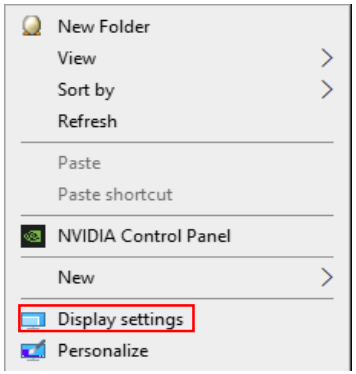
- Select Home → Video Wall mode using Remote Controller..
- Select Video Wall Mode as “ON”.

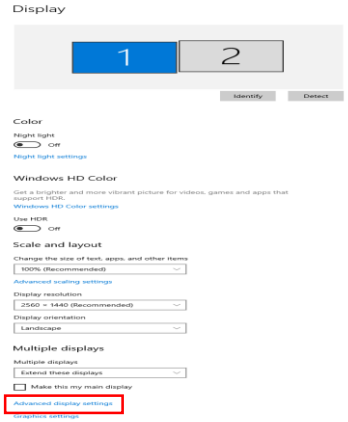


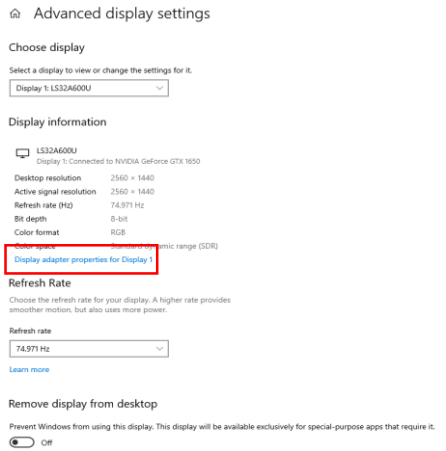
① Video Source Setting – Change output frequency (PC)

- Change the output frequency of the PC as follows.

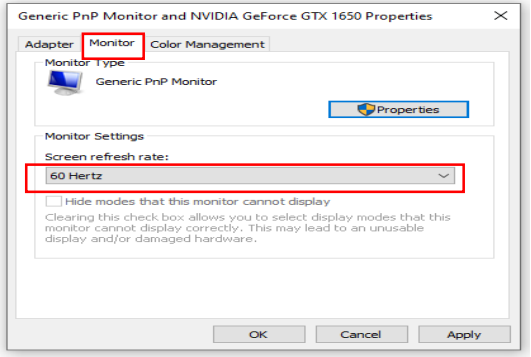
• Right-click PC mouse → Select screen resolution → Click Advanced Settings







• Click Monitor Tap → Monitor Settings → Change screen playback frequency to 60Hz



① Video Source Setting – Change output frequency (1/4)

- Support frequency of CV4B is as follows. Change the output frequency of the PC to match the corresponding support frequency.

Resolution	Horizontal Frequency (kHz)	Vertical Frequency (Hz)	Pixel Clock (MHz)	Sync Polarity (H/V)	HDMI 1~2	DP	SDI(SBB-CV4B model only)	S-BOX Grouping Supported
IBM/VESA, 640 x 480	31.469	59.94	21.175	N / N	O	O	X	-
Mac, 640 x 480	35	66.667	30.24	N / N	O	O	X	-
VESA 640 x 480	37.861	72.809	31.5	N / N	O	O	X	-
VESA, 640 x 480	37.5	75	31.5	N / N	O	O	X	-
IBM, 720 x 400	31.469	70.087	28.322	N / P	O	O	X	-
VESA, 800 x 600	37.879	60.317	40	P / P	O	O	X	-
VESA, 800 x 600	48.077	72.188	50	P / P	O	O	X	-
VESA, 800 x 600	46.875	75	49.5	P / P	O	O	X	-
Mac, 832 x 624	49.726	74.551	57.284	N / N	O	O	X	-
VESA, 1024 x 768	48.363	60.004	65	N / N	O	O	X	O

※ When entering a resolution that does not support grouping, the cabinet screen may not be visible or screen noise may occur.

※ The interlaced mode does not support S-BOX grouping.

① Video Source Setting – Change output frequency (2/4)

- Support frequency of CV4B is as follows. Change the output frequency of the PC to match the corresponding support frequency.

Resolution	Horizontal Frequency (kHz)	Vertical Frequency (Hz)	Pixel Clock (MHz)	Sync Polarity (H/V)	HDMI 1~2	DP	SDI(SBB-CV4B model only)	S-BOX Grouping Supported
VESA, 1024 x 768	56.476	70.069	75	N / N	O	O	X	-
VESA, 1024 x 768	60.023	75.029	78.75	P / P	O	O	X	-
VESA, 1152 x 864	67.5	75	108	P / P	O	O	X	-
VESA, 1280 x 720	45	60	74.25	P / P	O	O	O	O
VESA, 1280 x 800	49.702	59.81	83.5	N / P	O	O	X	-
VESA, 1280 x 1024	63.981	60.02	108	P / P	O	O	X	O
VESA, 1280 x 1024	79.976	75.025	135	P / P	O	O	X	-
VESA, 1440 x 900	55.935	59.887	106.5	N / P	O	O	X	-
VESA, 1600 x 900	60	60	108	P / P	O	O	X	O
VESA, 1680 x 1050	65.29	59.945	146.25	N / P	O	O	X	-
VESA, 1920 x 1080	67.5	60	148.5	P / P	O	O	O	O
VESA, 2560 x 1440	88.787	59.951	241.5	P / N	O	O	X	-
VESA, 3840 x 2160	67.5	30	297	P / P	X	O	O	-
VESA, 3840 x 2160	133.312	59.997	533.25	P / N	O	X	X	-
CEA-861 VIC 3, 720x480	31.469	59.94	27	N / N	O	O	O	-
CEA-861 VIC 4, 1280x720	45	60	74.25	P / P	O	O	O	O
CEA-861 VIC 5, 1920x1080i	33.75	60	74.25	P / P	O	O	O	-
CEA-861 VIC 7, 720(1440)x480i	31.469	59.94	27	P / P	O	O	O	-
CEA-861 VIC 16, 1920 x 1080	67.5	60	148.5	P / P	O	O	O	O
CEA-861 VIC 18, 720x576	31.25	50	27	N / N	O	O	O	O
CEA-861 VIC 19, 1280x720	37.5	50	74.25	P / P	O	O	O	O

① Video Source Setting – Change output frequency (3/4)

- Support frequency of CV4B is as follows. Change the output frequency of the PC to match the corresponding support frequency.

Resolution	Horizontal Frequency (kHz)	Vertical Frequency (Hz)	Pixel Clock (MHz)	Sync Polarity (H/V)	HDMI 1~2	DP	SDI(SBB-CV4B model only)	S-BOX Grouping Supported
CEA-861 VIC 20, 1920x1080i	28.125	50	47.25	P / P	O	O	O	-
CEA-861 VIC 22, 720(1440)x576i	31.25	50	27	P / P	O	O	O	-
CEA-861 VIC 31, 1920x1080	56.25	50	148.5	P / P	O	O	O	O
CEA-861 VIC 32, 1920x1080	27	24	74.25	P / P	O	O	O	-
CEA-861 VIC 33, 1920x1080	28.125	25	74.25	P / P	O	O	O	-
CEA-861 VIC 34, 1920x1080	33.75	30	74.25	P / P	O	O	O	-
CEA-861 VIC 93, 3840x2160	54	24	297	P / P	O	O	O	-
CEA-861 VIC 94, 3840x2160	56.25	25	297	P / P	O	O	O	-
CEA-861 VIC 95, 3840x2160	67.5	30	297	P / P	O	O	O	-
CEA-861 VIC 96, 3840x2160	112.5	50	594	P / P	O	X	X	O
CEA-861 VIC 97, 3840x2160	135	60	594	P / P	O	X	X	O
CEA-861 VIC 98, 4096x2160	54	24	297	P / P	O	O	O	-
CEA-861 VIC 99, 4096x2160	56.25	25	297	P / P	O	O	X	-
CEA-861 VIC 100, 4096x2160	67.5	30	297	P / P	O	O	O	-
CEA-861 VIC 101, 4096x2160	112.5	50	594	P / P	O	X	X	-
CEA-861 VIC 102, 4096x2160	135	60	594	P / P	O	X	X	-

① Video Source Setting – Change output frequency (4/4)

- Support frequency of CV4B is as follows. Change the output frequency of the PC to match the corresponding support frequency.

SMPTE (Data rate)	Resolution	Pixel format	Color depth (bit)	Frame rate (Hz)	Reference SMPTE standard
292M (1.5G)	1920x1080	YCbCr 4:2:2	8, 10	24p, 25p, 30p, 50i, 60i	ST 274
424M (3G) Level A	1920x1080	YCbCr 4:2:2	8, 10	50p, 60p	ST 274
		RGB 4:4:4	8, 10, 12	24p, 25p, 30p, 50i, 60i	
		YCbCr 4:4:4	8, 10, 12	24p, 25p, 30p, 50i, 60i	
		YCbCr 4:2:2	8, 10, 12	24p, 25p, 30p, 50i, 60i	
ST-2081 (6G)	1920x1080	RGB 4:4:4	8, 10, 12	50p, 60p	ST 274
		YCbCr 4:4:4	8, 10, 12	50p, 60p	
		YCbCr 4:2:2	8, 10, 12	50p, 60p	
	3840x2160	YCbCr 4:2:2	8, 10	24p, 25p, 30p	ST 2036-1
ST-2082 (12G)	3840x2160	RGB 4:4:4	8	24p, 25p, 30p	ST 2036-1
		YCbCr 4:4:4	8	24p, 25p, 30p	
		YCbCr 4:2:2	12	24p, 25p, 30p	
		YCbCr 4:2:2	8,10	50p, 60p	
		YCbCr 4:2:0	8, 10	50p, 60p	

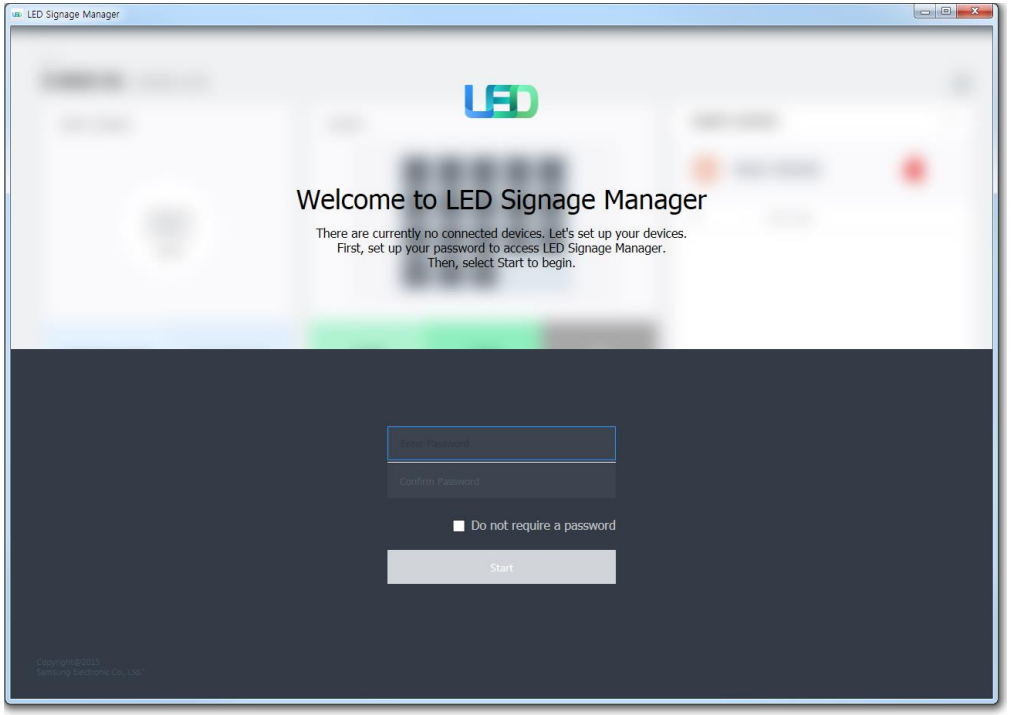
② Control PC Setting – LSM

- LSM: Windows Application Software for remotely adjusting the layout of LED cabinets
- LSM download path : Samsung Display Solutions (https://displaysolutions.samsung.com)
  Solutions > LED Signage Solution > LED Signage Manager
  ※ Partner login is required to download the program.



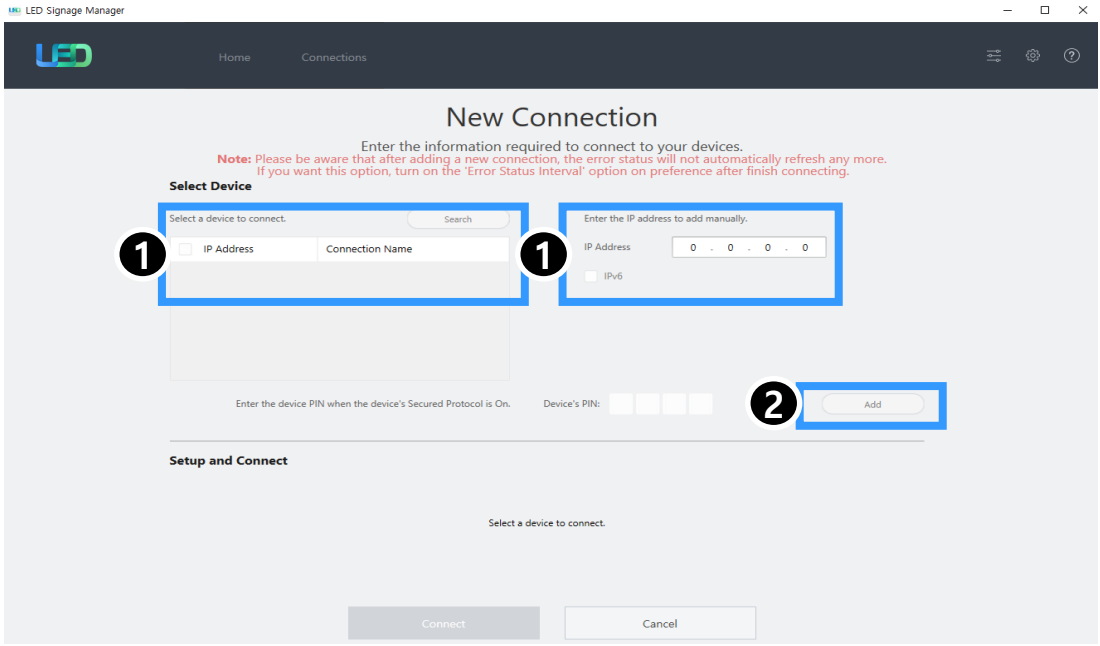
② Control PC Setting – LSM

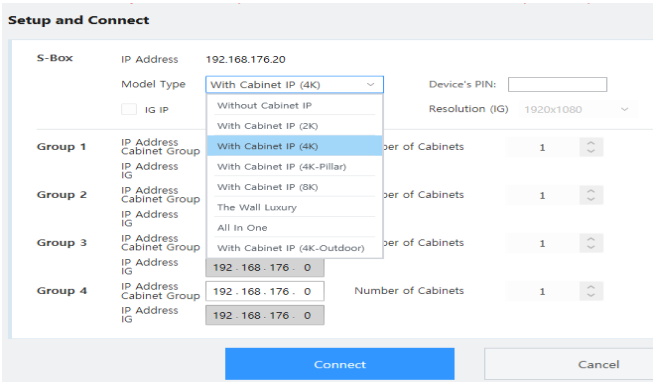
1. When LSM is executed for the first time, a page that sets the password appears.
2. To set the password, the user must enter the same password twice and click the Start button.
3. If you don't want to use password, check Don't use password option. In this case, password input is no longer required when LSM is executed.



② Control PC Setting – Connect LSM

1. To add connection information, you can enter Search or IP address directly. When you click the Search button, the IP address of the connectable S-BOX on the same network appears. If you know the IP address of S-BOX, you can also enter it directly.
2. When you click the Add button, the connection information is added to Setup and Connect.
3. The user can select the model type of S-BOX. A total of 8 model types are provided. For SBB-CV4B connection, you can select With Cabinet IP (4K) according to the connection type.





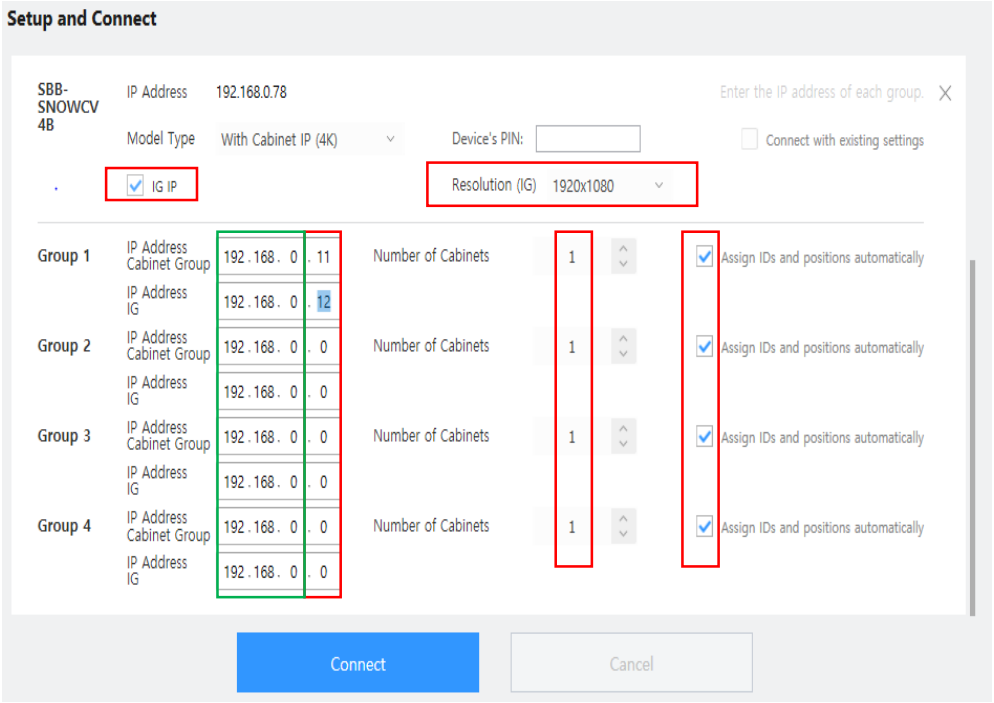
[★ Caution!!]
Fixed IP settings are recommended when setting up an LED cabinet network..
If IP is changed when using DHCP, LSM connection may be disconnected..
192.168.10. the x band is used for internal communication of LED cabinet.
Please use IP except for the band.
Do not allocate IP arbitrarily, but allocate IP for LED through IT manager.

② Control PC Setting – Connect LSM

1. You can select With Cabinet IP (4K) according to the connection method of LED Cabinet. You must specify the IP address of the LED cabinets connected to each port. Sets the number of connections.
2. Check or change Resolution (IG) by checking the connected cabinet. (Refer to page 134)
3. The IP address of the IG connected to each port must be specified. Set the number of connections and click Connect.

※ If the IP is already set in the LED cabinet, you can check the "Connect with Existing Settings" option and connect quickly.

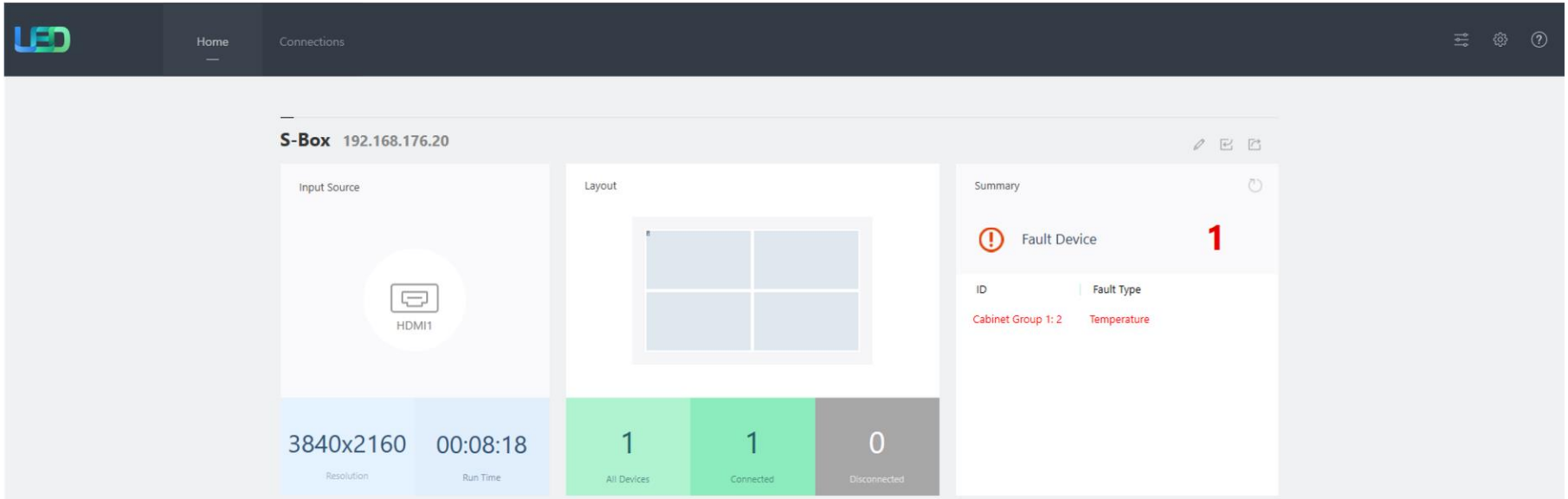
※ You can enter the IP address only in the Cabinet Group that needs actual use.



② Control PC Setting – LSM HOME Screen

[★ Caution!]
For internal communication between S-BOX and LED Cabinet, use ports 1515, 48484, 48485, and 58585.
During firewall/security network use, the port must be enabled between S-BOX and LED.

It Shows the information, input source, cabinet configuration, and error devices of the devices connected through the home screen.



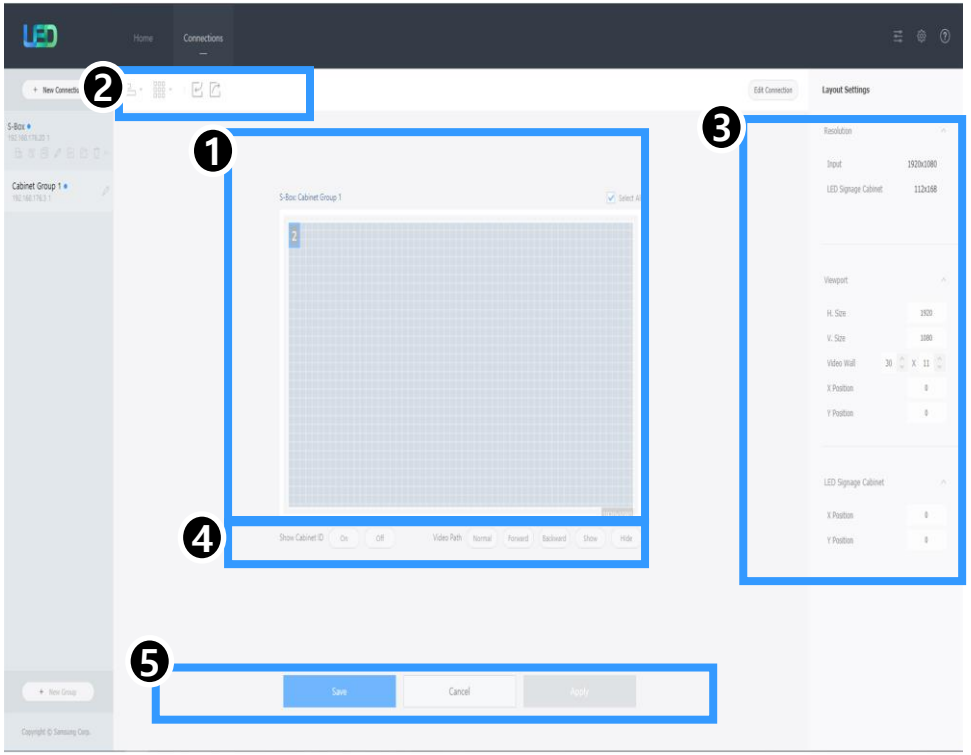
② Control PC Setting – Edit Connection

1. Connection layout: Adjust the location and layout of each LED cabinet in the output source area of the S-BOX.
2. Feature View: Feature View: Provides an Edit button to modify connection information and automatic alignment of LED cabinets.
3. Device Information/Setting View:
   It shows the LED cabinet information according to the categories below.

(i) Resolution: Input source resolution information

(ii) ViewPort: landscape/vertical size, video wall matrix, x/y coordinate setting

(iii) LED Signage Cabinet: x/y coordinate setting of LED cabinets

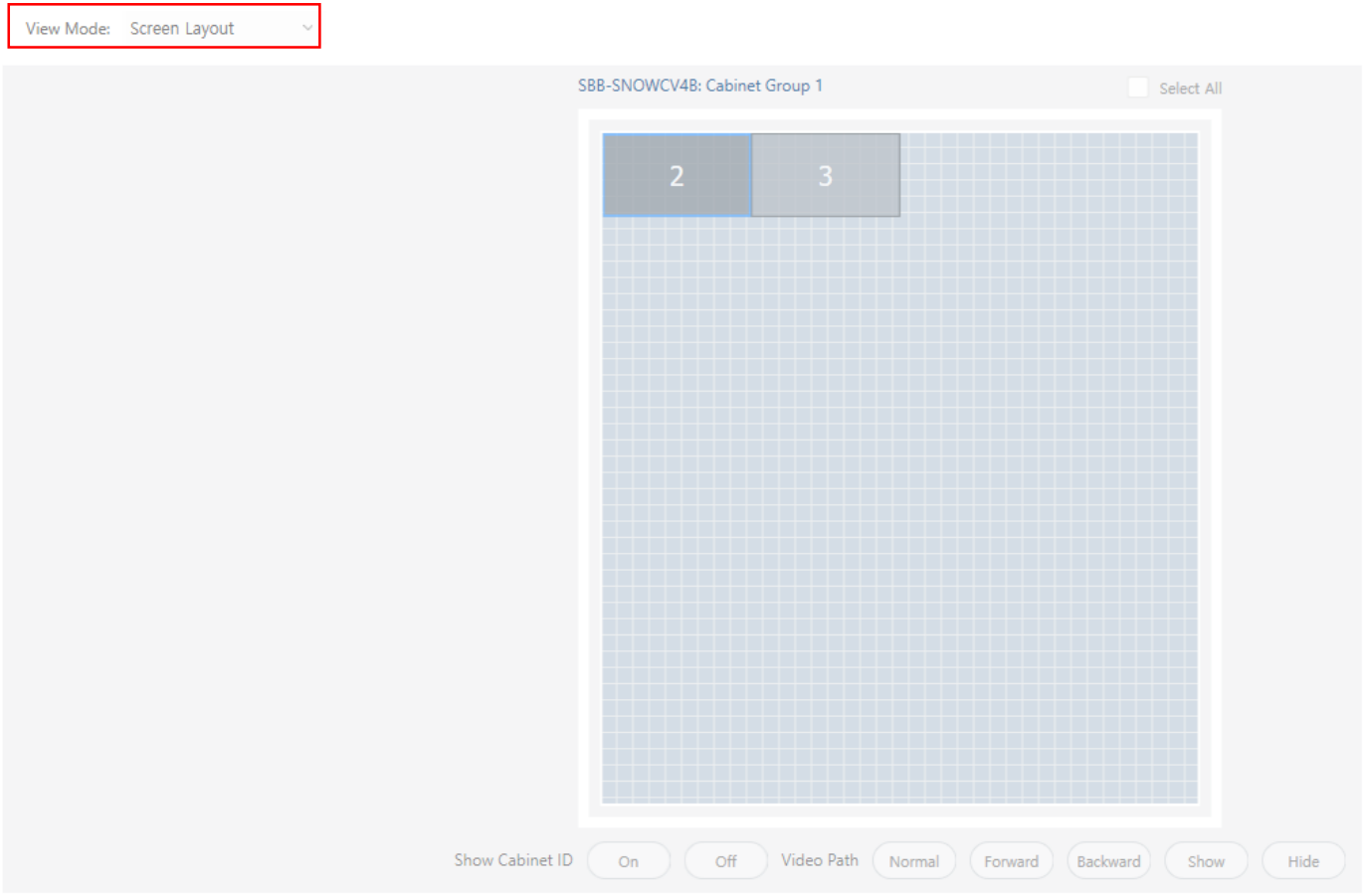


4. Show ID: When selected, displays each ID in all connected LED cabinets. Video Path: You can check the video path setting and current FW/BW status of each cabinet of LED.

5. Press the Save button to save the status of 1 to 4.

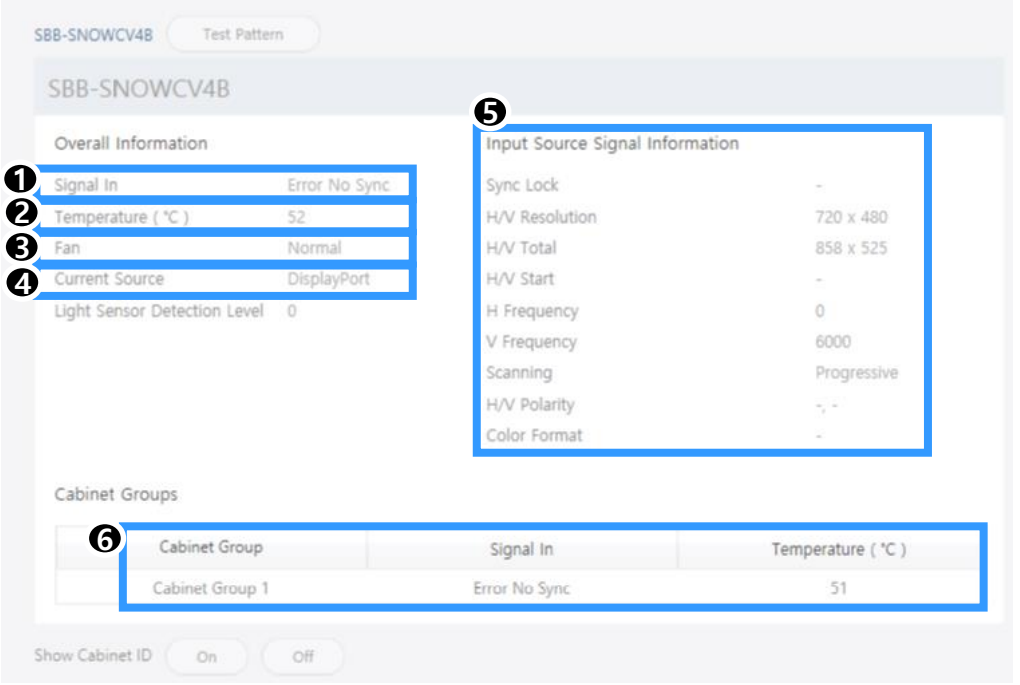
② Control PC Setting – Diagnostic Status

Change View Mode to “Diagnostic Status” to check the diagnostic function of LSM.



② Control PC Setting – Diagnostic Status (S-BOX)

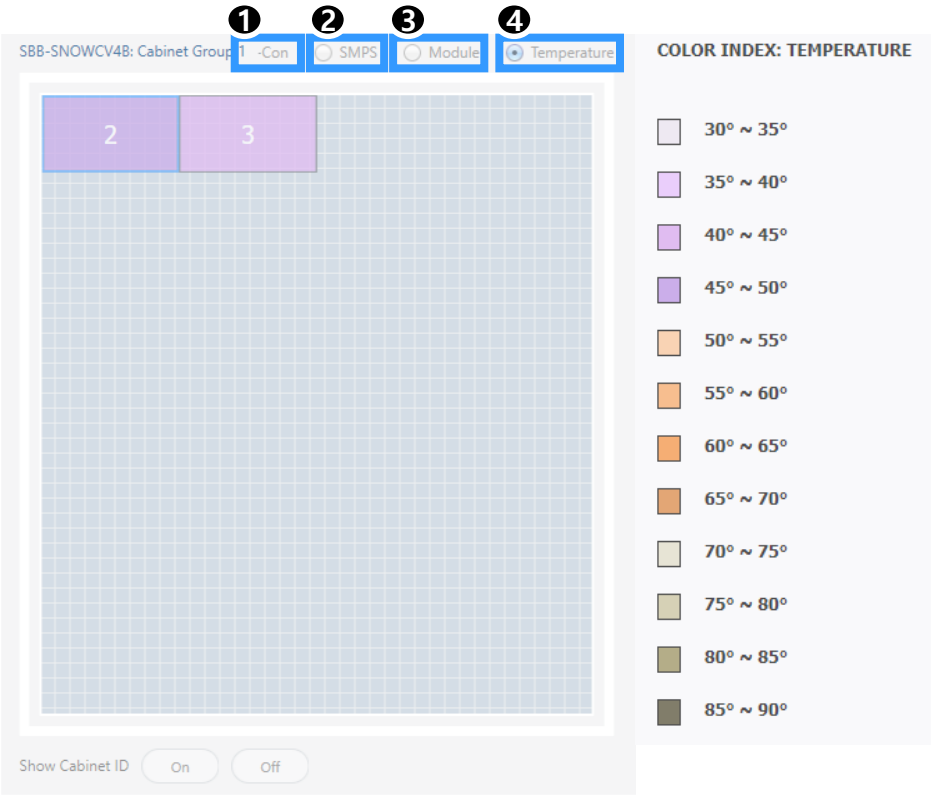
1. Signal In: Signal In: Check if the input video signal is received normally.
2. Temperature (℃): Shows the current temperature of S-BOX..
3. FAN : Check if Fan is operating normally. Displays “Normal” when normal and “Error” when abnormal..
4. Current Source: Displays which source the current input source is.
5. Input Source Information: Current Source: Displays which source the current input source is.
6. Cabinet Groups : Displays the input signal and temperature of the connected IG.



② Control PC Setting – Diagnostic Status (Cabinet)

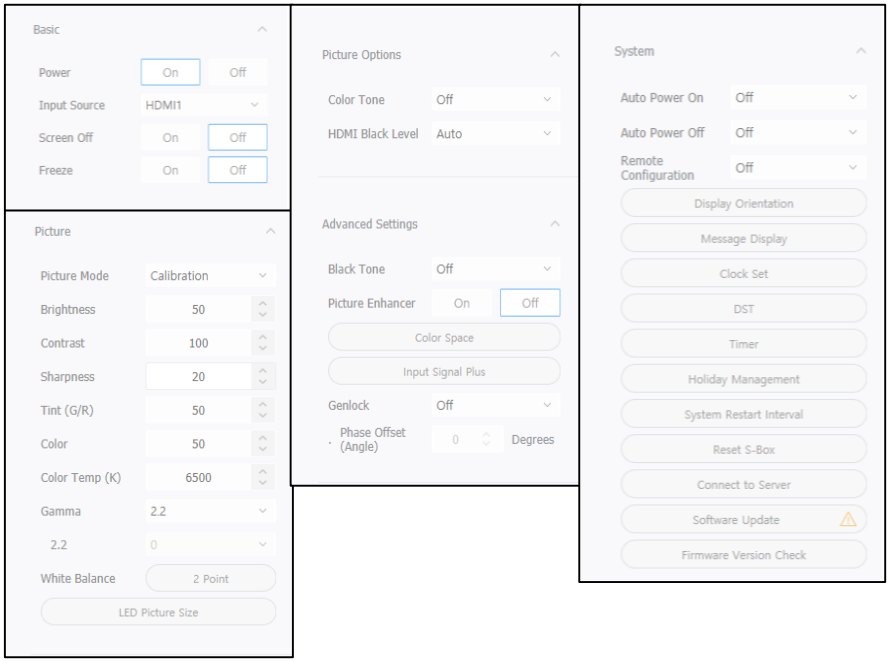
1. T-CON: it shows whether T-CON of Cabinets works normally
2. SMPS: It shows SMPS status (ON/OFF) of Cabinets
3. Module : it shows whether Module works normally
4. Temperature: The current temperature of the cabinet is shown in the figure..

   (Color differences by temperature section)



② Control PC Setting – Device Information/Setting View

1. Basic :
   . On/Off, change input source, Screen Mute / Freeze
2. Picture
   . Picture Mode Change (CV4B is fixed to calibration),
   Brightness / Contrast / Sharpness, Color, Tint(G/R), Color Temp(K),
   Gamma, White Balance Adjustment and so on
3. Picture Options
   . Color Tone, HDMI Black Level
4. Advanced Settings
   . Black Tone, Picture Enhancer, Color Space, Input Signal Plus
5. System
   . Auto Power On/Off, Standby Control
   Clock, Timer, System Restart Interval
   Software Update

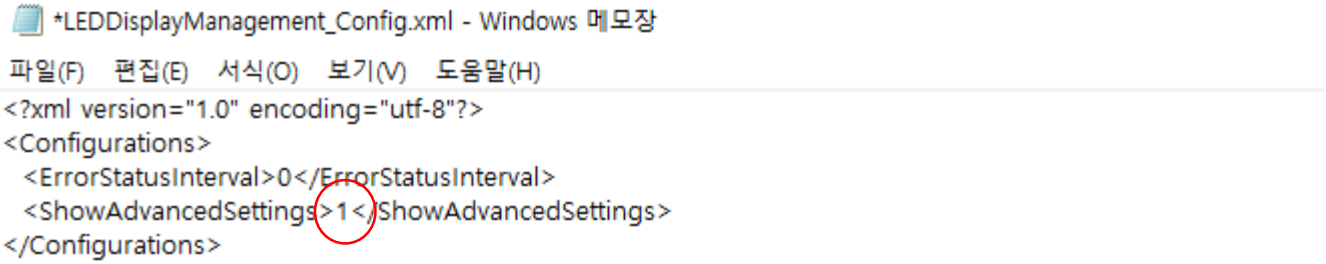


- Enable Advanced Mode

By activating the advanced mode, you can set up additional cabinet setting and calibration.

Open "LEDDisplayManagement_Config.xml" in the LSM installation folder as a notepad and change the red letters below to "0" → "1".

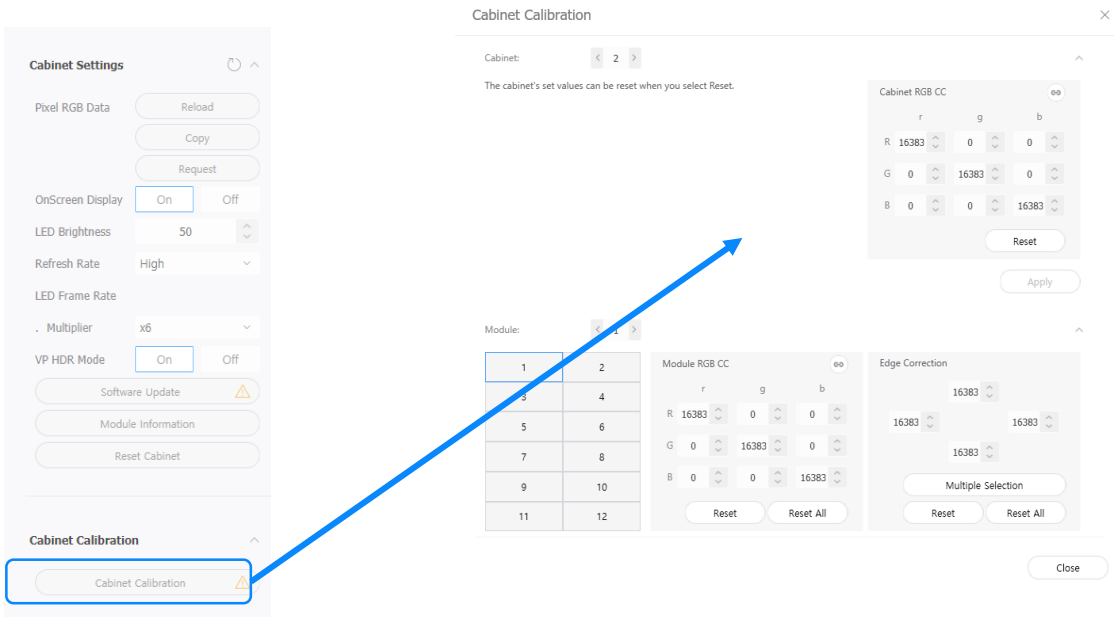
"<ShowAdvancedSettings>**1**</ShowAdvancedSettings>"



② Control PC Setting – Device Information/Setting View (Advanced Mode Disable)

6. Cabinet Settings
   . Pixel RGB Data Reload / Copy /Request
   . OnScreen Display On / Off
   . LED Brightness Adjustment
   . Refresh Rate Adjustment
   . LED Frame Rate and VP HDR Mode Adjustment
   . Software Update function

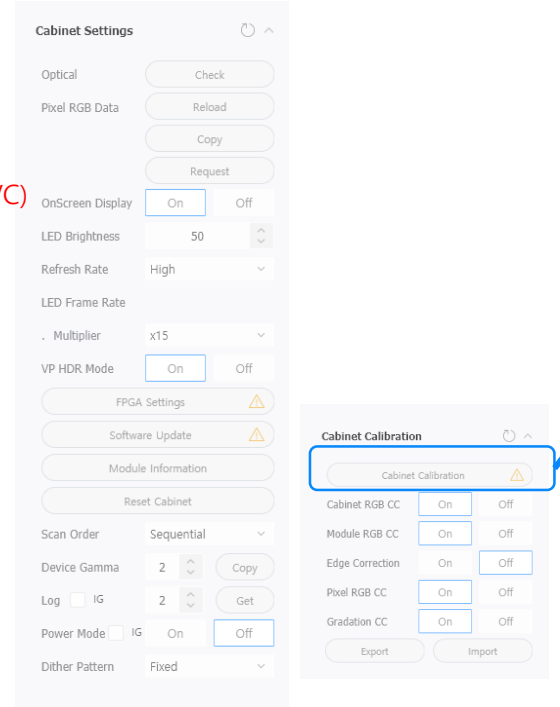
7. Cabinet Calibration
   . Cabinet / Module / Edge Adjustment

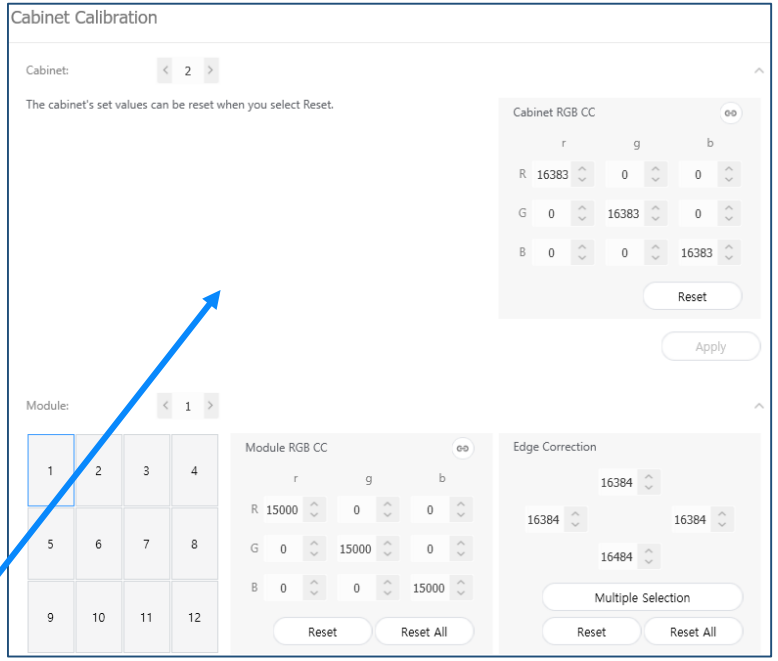


② Control PC Setting – Device Information/Setting View (Advanced Mode Enable)

6. Cabinet Settings
   - . Pixel RGB Data Reload / Copy /Request
   - . OnScreen Display On / Off
   - . LED Brightness Adjustment
   - . Refresh Rate Adjustment
   - . LED Frame Rate and VP HDR Mode Adjustment
   - . Scan Order Adjustment ('Sequential' is fixed in IVC)
   - . Device Gamma Copy
   - . Dither Pattern Adjustment ('Fixed' is fixed in IVC)
   - . Software Update Function

7. Cabinet Calibration
   - . Cabinet / Module / Edge Adjustment
   - . Gradation Adjustment





② Control PC Setting – Detailed function description

※ Caution

- Be careful not to terminate Cabinet, S-BOX, and LSM during Pixel Copy and Gamma Copy functions.

Pixel RGB Data Copy

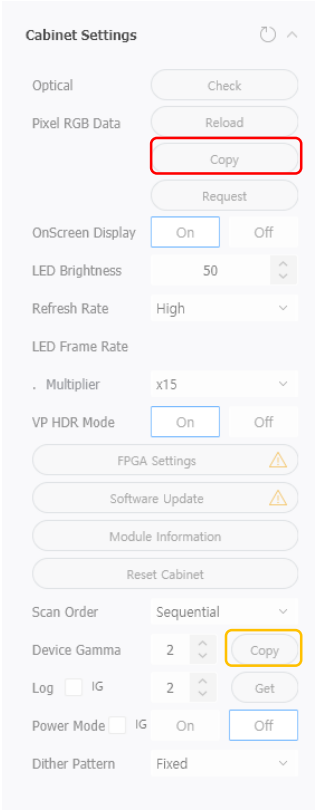
. Copy Pixel Data in Module Cal Flash to Tcon Cal Flash

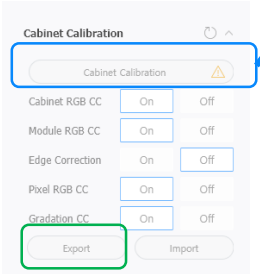
Device Gamma Copy

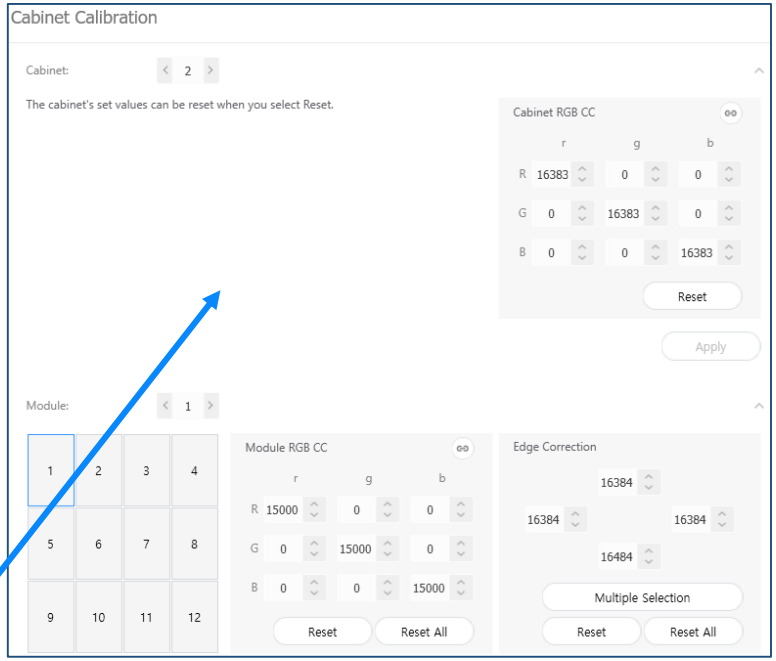
. Copy the gamma/NVRAM value of the clicked cabinet to the cabinet entered.

Export

. Saves the user cal value of the selected cabinet to the control PC.







❑ ② Control PC Setting – T-con data copying method

■ GAMMA / NVRAM data backup method when replacing Tcon B'D

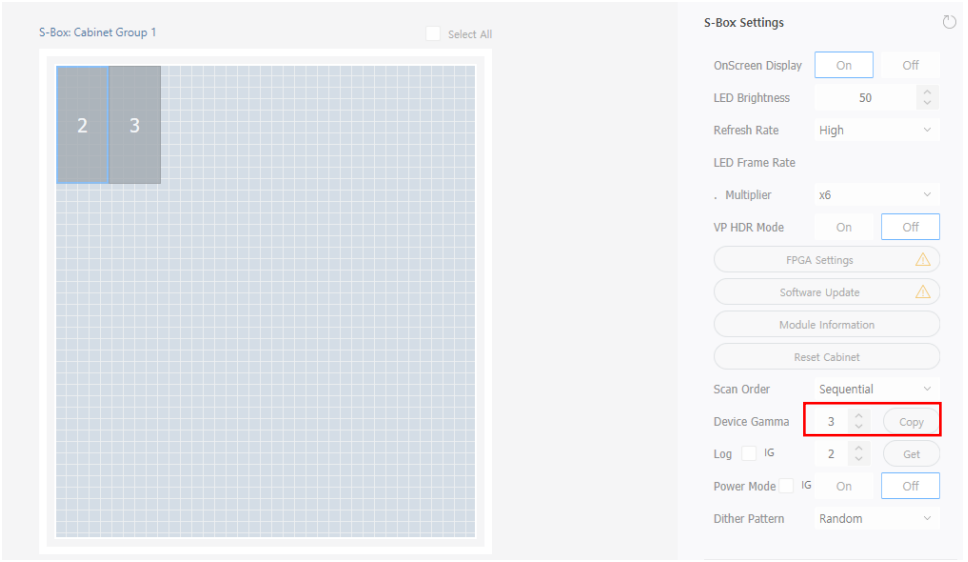
※ Caution
- Be careful not to terminate Cabinet, S-BOX, and LSM during Pixel Copy and Gamma Copy functions.

1) Connect LSM after replacing Tcon B'D.

Open "LEDDisplayManagement_Config.xml" in the LSM installation folder as a notepad and change the red letters below to "0" → "1".

(=Activating Advanced Mode)

"<ShowAdvancedSettings>1</ShowAdvancedSettings>"



2) With the LSM connected, click Cabinet to copy. Write the Cabinet ID value that replaced Tcon B'D next to the right menu "Cabinet Setting" → "Device Gamma" and press the "Copy" button to back up Gamma and NVRAM data.

ex. Copy the Gamma/NVRAM value of cabinet 2 to cabinet 3



3) When Copy is completed, "COPY SUCCESS" appears on the Cabinet screen.

❑ ② Control PC Setting – T-con data copying method

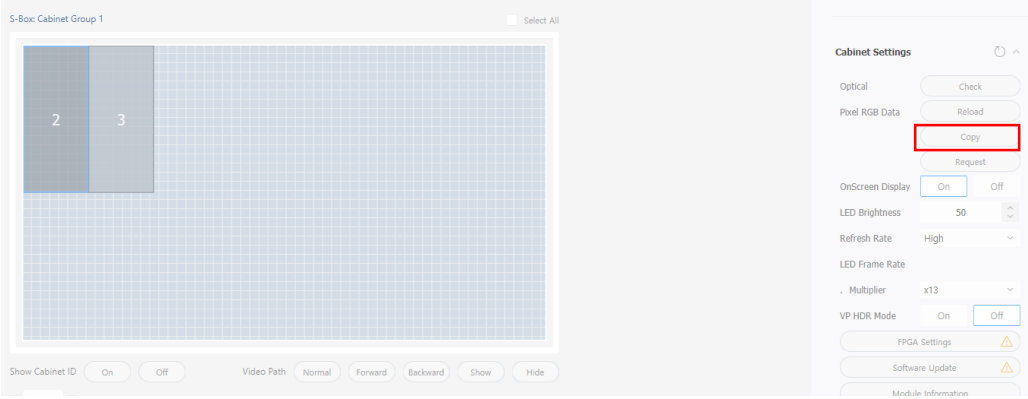
■ How to copy module calibration data when replacing Tcon B'D

1) To copy the calibration data to the Tcon in the LED module, click the cabinet that replaced the Tcon B'D and then press the "Cabinet Setting" → "Pixel RGB Data" → "Copy" button on the right.

※ Even when replacing the module, the calibration data in the module must be copied to Tcon. (Gamma and NVRAM values do not need to be copied.)

2) When the progress status is displayed on the LSM and the progress is completed, turn the set off or press the "Cabinet Setting" → "Pixel RGB Data" → "Reload" button to retrieve the calibration data.

※ Caution
- Be careful not to terminate Cabinet, S-BOX, and LSM during Pixel Copy and Gamma Copy functions.



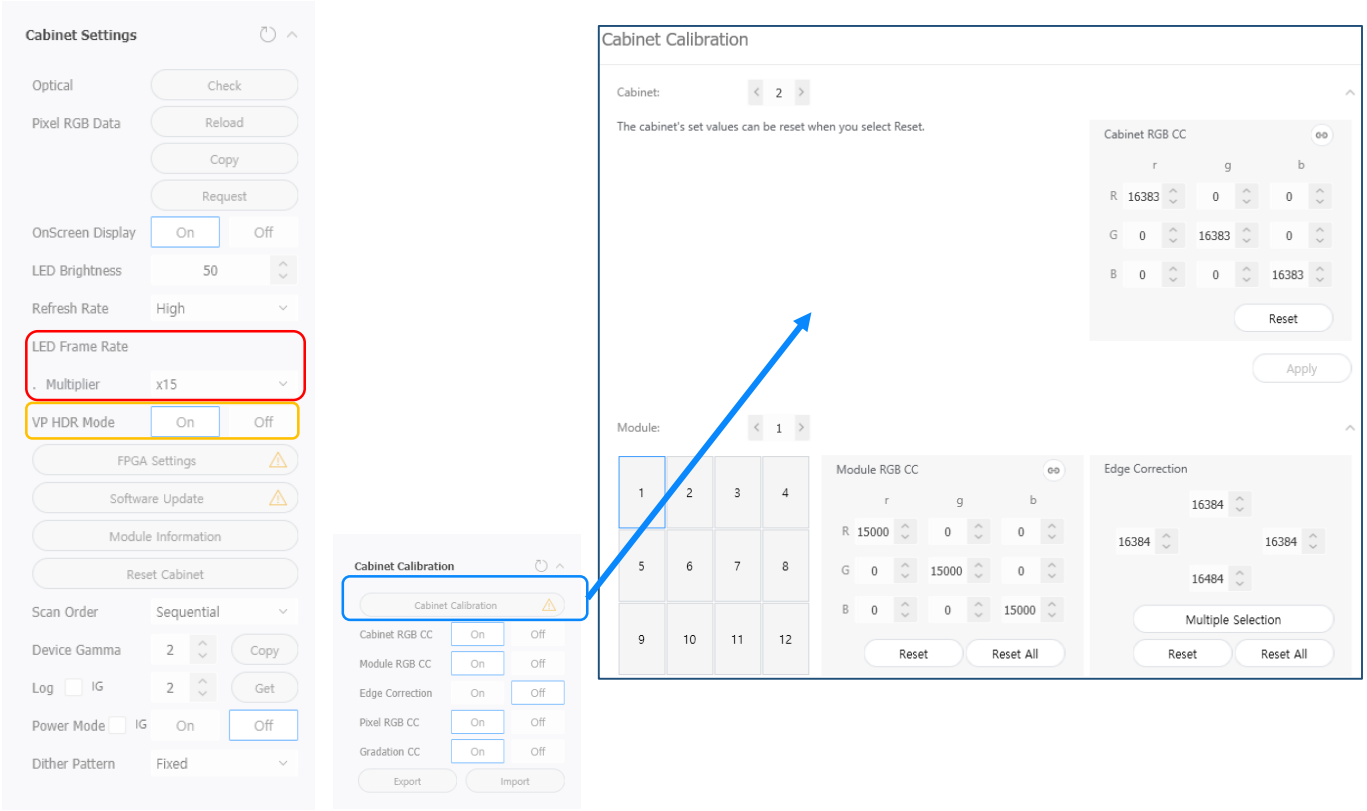
❑ ② Control PC Setting – Detailed function description

Multiplier

. Displays up to 16 times the output according to the studio-based input frequency

VP HDR Mode

. Dedicated HDR mode optimized for studio environment

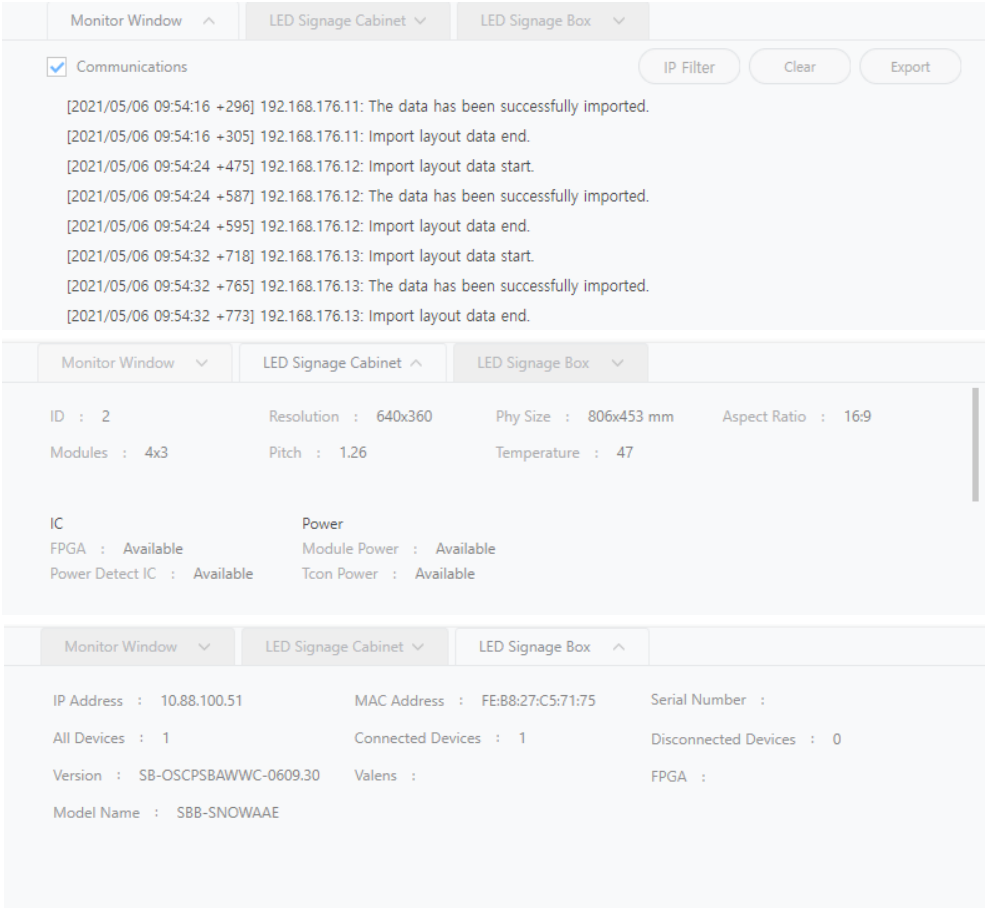


❑ ② Control PC Setting – Sub Information View

1. Monitor Window:
   MDC communication log and connection device information can be checked
   Extractable as a file – Extractable as file

2. LED Signage Cabinet:
   IC information and power information of LED cabinet

3. LED Signage Box:
   IP address, MAC address, ID range of LED cabinet
   Number of LED cabinets (full / connected / unconnected)
   Serial number, version information

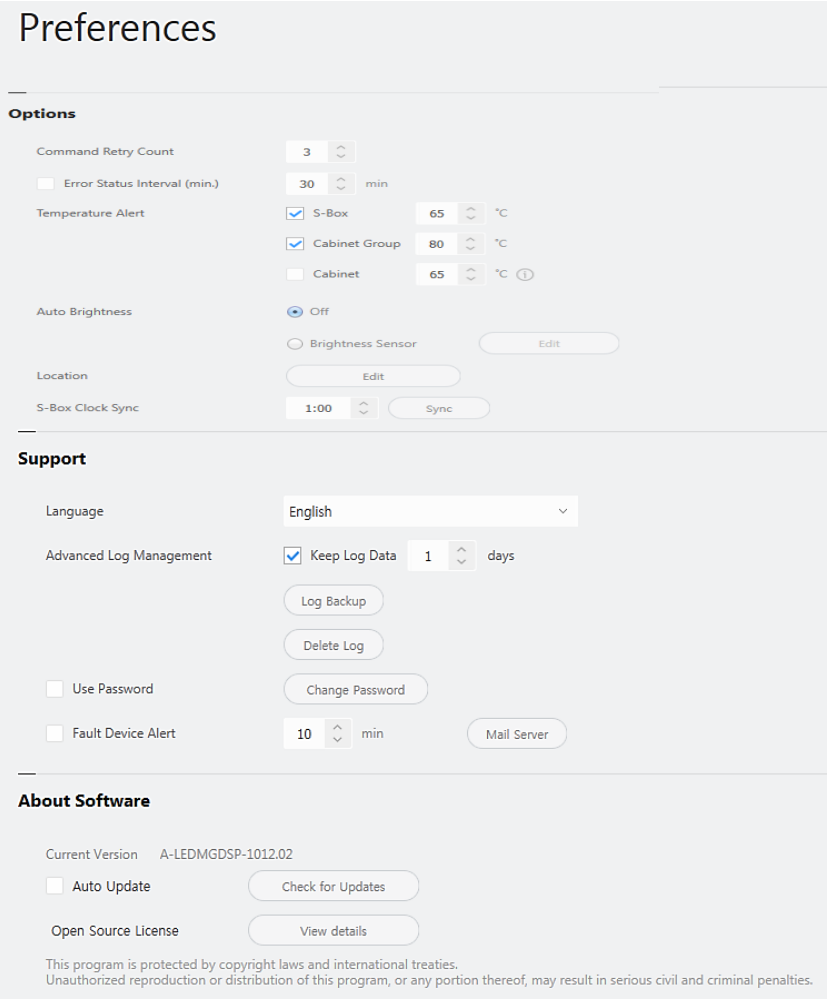


❑ ② Control PC Setting – Preference

1. Options
   - Command retry count
   - Error status check interva
   - Temperature warning
   - S-Box Clock sync

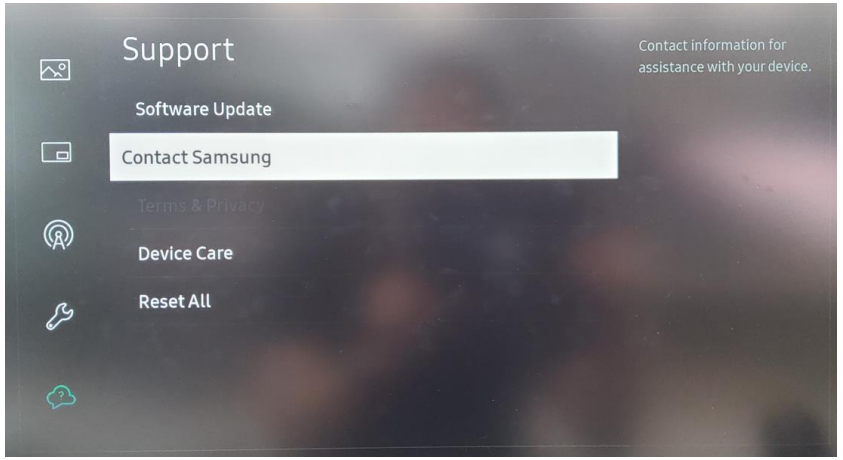
2. Support
   - Program language
   - Log data management
   - Notification of device error through mai
   - Password Configuration Options

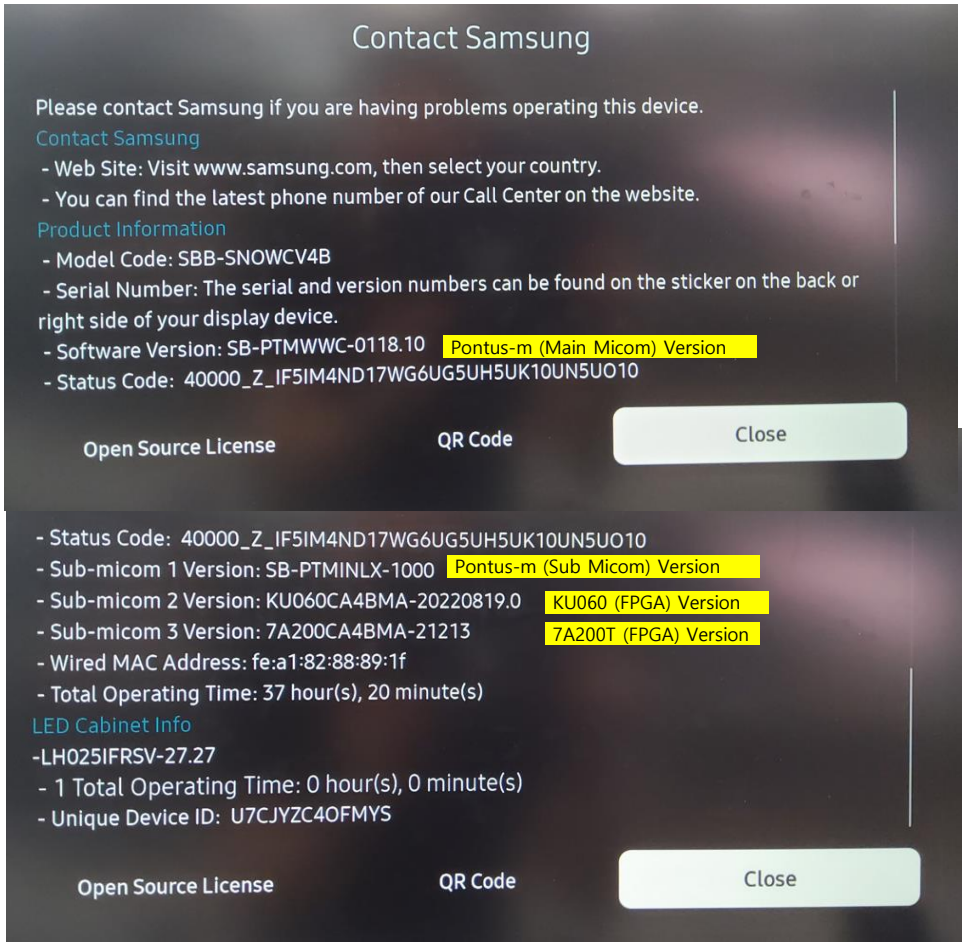
3. About Software
   - Current version and update function of LSM



❑ Software Update - Check software update version

※ Enter Contact Samsung : MENU → Support → Contact Samsung





❑ Software Update – Update using USB

① Pontus-M Main Micom Software upgrade

- **USB Download**

Firmware upgrade downloaded from "www.samsung.com" website

1. Connect the USB drive where the file is stored to the set.

(Please be careful not to disconnect the power or USB drive during upgrade.)

2. When the firmware upgrade is complete, the set is automatically powered off and then turned on aga

3. Please check the firmware version after completing the upgrade.

(The new version has a higher number than the old version.)

※ Note) Since it is recognized as a file name, it is okay to have other model upgrade files together

※ Note) After upgrading the software, the setting value specified by the existing user returns to the default value.

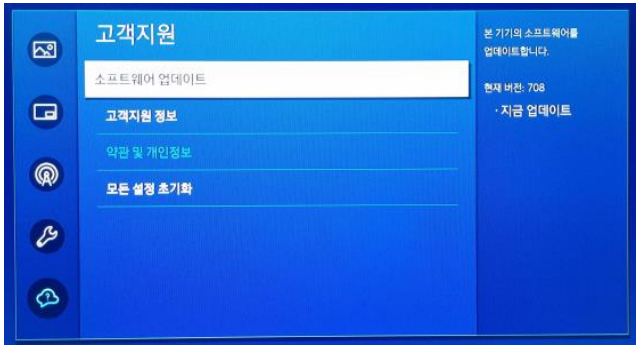
It is recommended to record the current setting value to facilitate reset after upgrade.

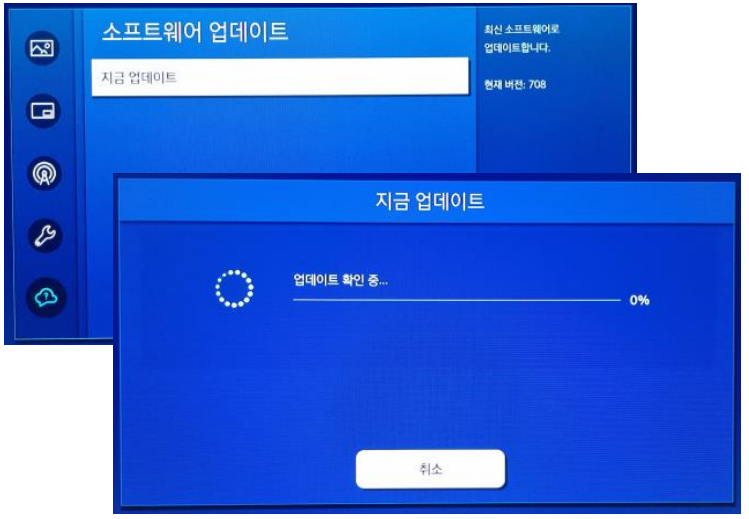
❑ Software Update – Update using USB

① Main SW Upgrade

1. Save the "SB-PTMWWC" folder to the USB root.
2. Connect the USB.
3. Click the "MENU" key on the remote control.
3. Select the "Customer Support" menu.
4. Select the "Update Software" menu.
5. Select the "Update Now" menu to start the upgrade.
6. Wait for the upgrade to complete.
8. Please check SW version.

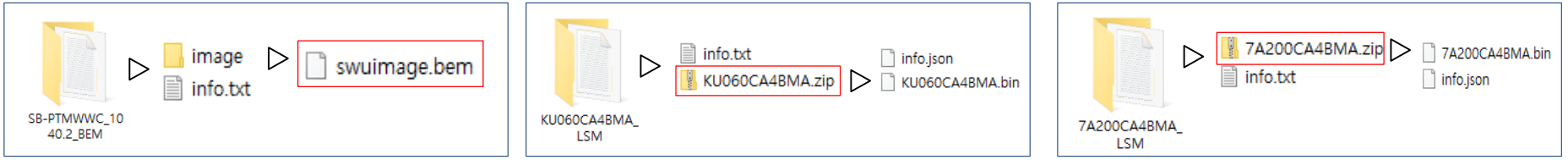






- Software Update – Update using LSM (S-BOX)

1. Please prepare the update SW File. (Files selected when updating files marked in red)



2. After connecting LSM and CV4B, click Software Update button under S-BOX Settings> System menu.

3. Press the Browse button to select the prepared SW file.

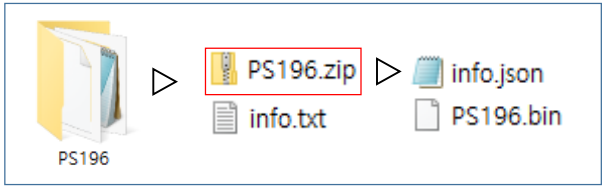
4. After selecting the S-BOX to update, click the Update button to start the update.

❖ If the following occurs after selecting the update file, please check each content and take action.

Update Status	Update Status	Update Status
The software version of the device is later than the software version of the update file. Check the software version of the update file.	The software version names of the device and update file do not match. Check the software version name of the update file.	There is no info.txt file in the designated location. Check the location of the info.txt file.
The version of the selected file is lower or equal to the Software version of the current S-BOX. Please prepare a higher version of the file.	The version name (version TAG) of the selected file does not match the current software version name of S-BOX. Please prepare the correct file.	the info.txt file does not exist. Please check the file.

- Software Update – Update using LSM (S-BOX)

1. Please prepare the update SW File. (Files selected when updating files marked in red)



2. After connecting LSM and CV4BPGS, click [Software Update] button under S-BOX Settings> System menu.

3. Press the [Browse] button to select the prepared SW file.

4. After selecting the S-BOX to update, click the [Update] button to start the update.

❖ If the following occurs after selecting the update file, please check each content and take action.

Update Status

The software version of the device is later than the software version of the update file. Check the software version of the update file.

The version of the selected file is lower or equal to the Software version of the current S-BOX.
Please prepare a higher version of the file.

Update Status

The software version names of the device and update file do not match. Check the software version name of the update file.

The version name (version TAG) of the selected file does not match the current software version name of S-BOX.
Please prepare the correct file.

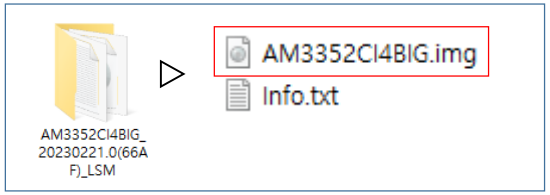
Update Status

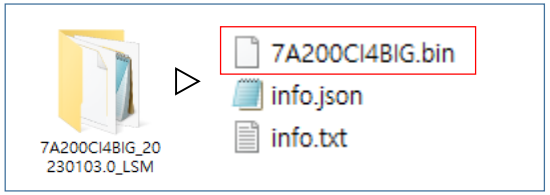
There is no info.txt file in the designated location. Check the location of the info.txt file.

the info.txt file does not exist.
Please check the file.

- Software Update – Update using LSM (IG)

1. Please prepare the update SW File. (Files selected when updating files marked in red)





2. After connecting LSM and CV4BPGS, click Software Update button under Cabinet Settings> System menu.

3. Press the Browse button to select the prepared SW file.

4. After selecting the S-BOX to update, click the Update button to start the update.

❖ If the following occurs after selecting the update file, please check each content and take action.

Update Status

The software version of the device is later than the software version of the update file. Check the software version of the update file.

The version of the selected file is lower or equal to the Software version of the current IG.
Please prepare a higher version of the file.

Update Status

The software version names of the device and update file do not match. Check the software version name of the update file.

The version name (version TAG) of the selected file does not match the current software version name of IG.
Please prepare the correct file.

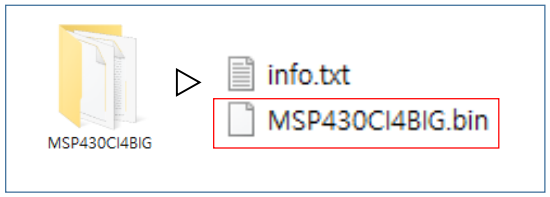
Update Status

There is no info.txt file in the designated location. Check the location of the info.txt file.

the info.txt file does not exist.
Please check the file.

- Software Update – Update using LSM (IG)

1. Please prepare the update SW File. (Files selected when updating files marked in red)



2. After connecting LSM and CV4BPGS, click [Software Update] button under Cabinet Settings> System menu.

3. Press the [Browse] button to select the prepared SW file.

4. After selecting the S-BOX to update, click the [Update] button to start the update.

❖ If the following occurs after selecting the update file, please check each content and take action.

Update Status	Update Status	Update Status
The software version of the device is later than the software version of the update file. Check the software version of the update file.	The software version names of the device and update file do not match. Check the software version name of the update file.	There is no info.txt file in the designated location. Check the location of the info.txt file.
The version of the selected file is lower or equal to the Software version of the current IG. Please prepare a higher version of the file.	The version name (version TAG) of the selected file does not match the current software version name of IG. Please prepare the correct file.	the info.txt file does not exist. Please check the file.

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