A revolutionary MPDP

Infinitely Expandable MPDP

MPDP

ORION PDP CO.,LTD.

www.oriondisplay.net

Address: 257, Gongdan-dong, Gumi-si, Gyeongsangbuk-do, Korea

Tel : +82-2-6678-8533, Fax: +82-2-6678-8599

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MPDP

User's Manual

MIS-4220 / MIS-4220R
MIS-4230 / MIS-4230R

Thank you for purchasing our MPDP.
Please read through this user's manual for safety before installing this product.
This product is manufactured for Multi Plasma display model only.

Features of MPDP

- ▶Enjoy a wide flat screen with high brightness and high quality.
- ▶Easy to install and move due to its thin design
- ▶Enjoy your favorite programs with various split-screen features simultaneously presenting several programs.

Thank you for purchasing our MPDP monitor.

This manual describes how to use the product and notes in use.
Please read the manual carefully before using it.
After reading this manual, please retain for future reference.
If you have any questions or a problem occurs, please contact either the company you purchased this product from or an authorized service center.

※**Displaying static picture for an extended period of time may cause an burn-in effect.**

⚠ **Warning** If you fail to comply with the regulations for safety and proper use, fire or injury may be caused.

Notice to users

Class A digital device

It is a device designed for business purpose with a safety certificate for electromagnetic interference, which user should be mindful of.

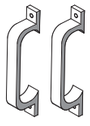
Supplied Accessories

User's Manual

Multi-Screen Control System(MSCS)

Guide Pin(4pcs)

Handle (2 pcs)

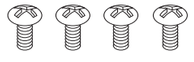


DVI-D Cable

Power Cable

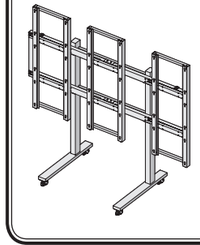
RS232 Cable

Bolt (4 pcs)

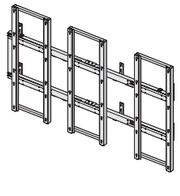


Optional Accessories

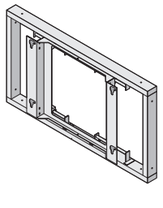
Stand Unit
(refer to page 10)



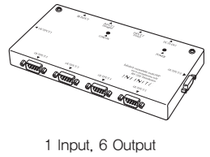
Wall mounting Unit
(refer to page 11)



MAIN FRAME
(refer to page 12~13)



RS-232C Distributor
Necessary for connecting more than 10 units.



1 Input, 6 Output

MF-Controller SET

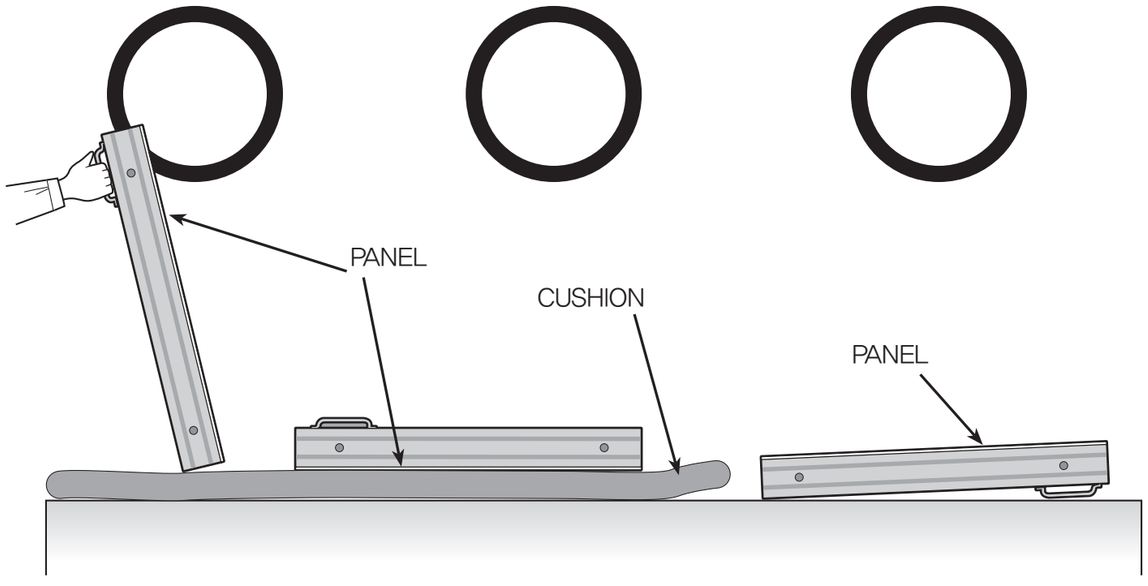
Contents

WARNING

Warning

※Please keep following instruction for panel protection without exception.

**- This product can be damaged even with minor impact for its nature.
Please keep following instruction to carry or store the products.**

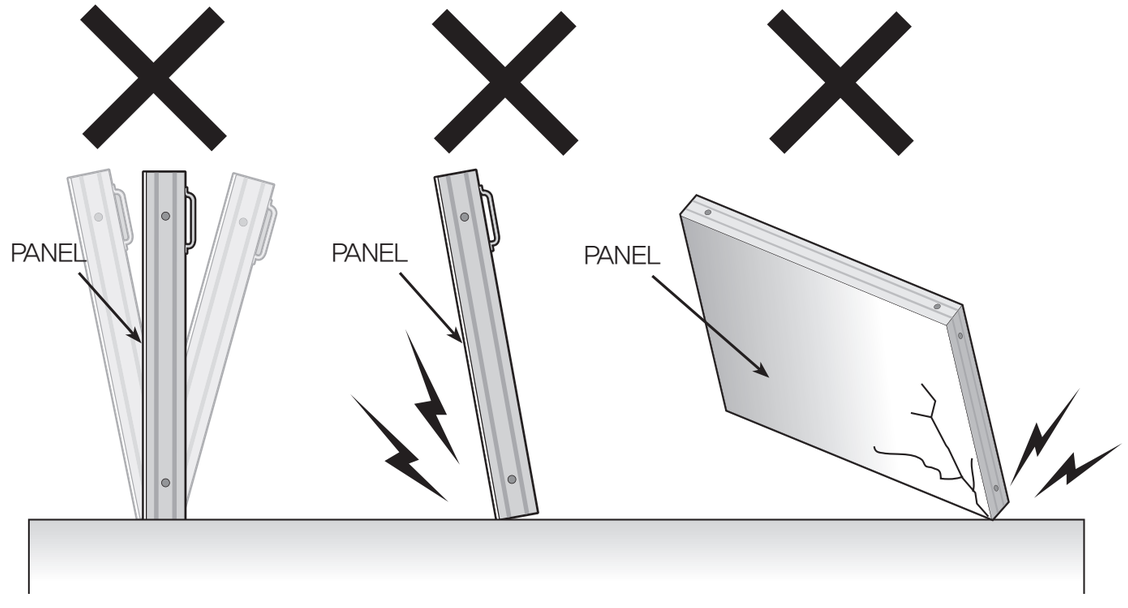


- If you need to stand PDP, you must use handles on the back and lean over the PDP to avoid panel touches ground or floor.
- If you need to lay down PDP as face down position, please use shock-absorbing pads under the PDP.
- If you need to lay down PDP as face up position, please be cautious for falling objects on the surface of the PDP.

Warning

※Handle with Caution.

**-Shock/Impact on the set's sides will result in internal circuit damages.
-The edge/bottom of the panel are fragile.
Use shock-absorbing pads or rugs for laying down the product.**



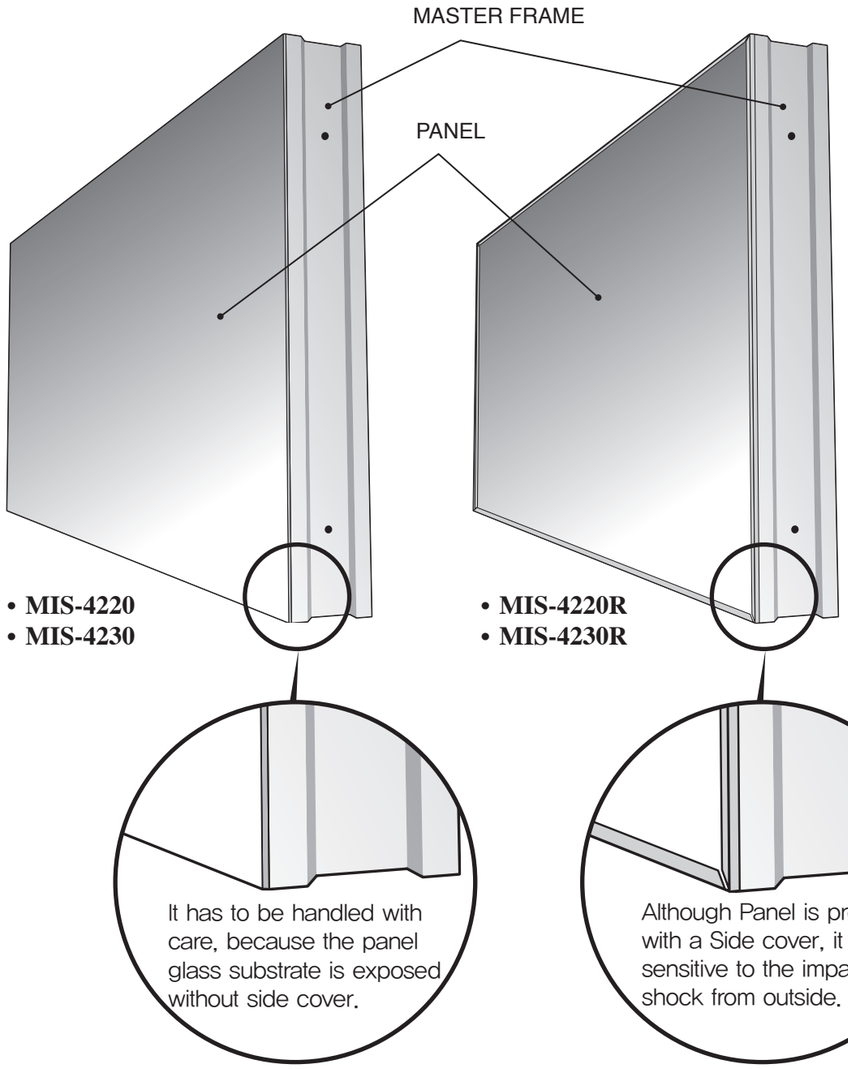
- Please do not stand PDP alone. It may fall or slip off and Panel can be broken or damaged.
- Please do not lean over the PDP. It may damage the bottom part of the PDP.
- Please do not lean over the PDP toward the edge part. It may damage the edge part of the PDP.

WARNING

WARNING

Open Structure

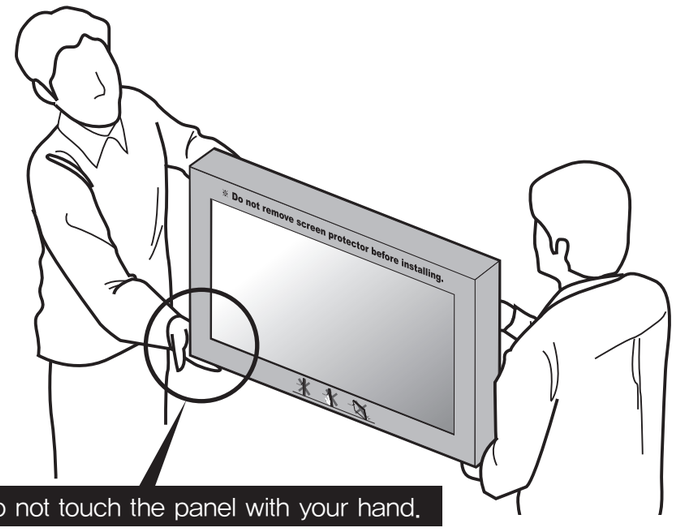
Unlike consumer PDP product, the panel of MPDP is exposed without any protective chassis.
It needs extra caution to carry or install to prevent any impact.



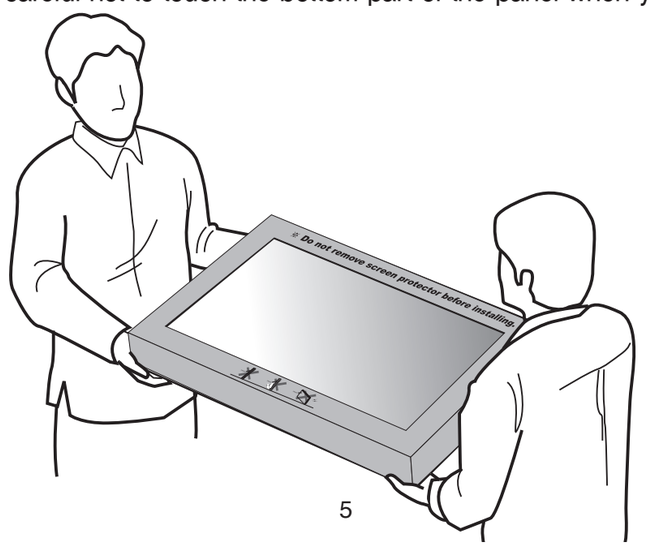
How to carry MPDP

Please see page 8 for unpack and handle assembly.

It always needs two persons to carry or install MPDP.
When you carry MPDP with up straight manner, please hold handles on the back and bottom part of the panel together.
Please be careful not to touch the bottom part of the panel when you put down the panel.



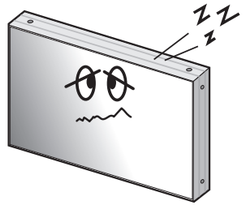
When you carry MPDP with flatbed manner, please hold handles on the back and lower part of the back.
Please be careful not to touch the bottom part of the panel when you put down the panel.



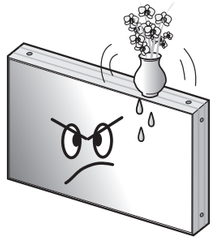
WARNING

1. Safety Precautions

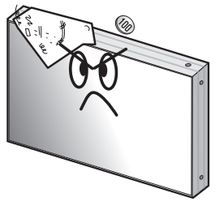
- If it operates abnormally, stop using it immediately.



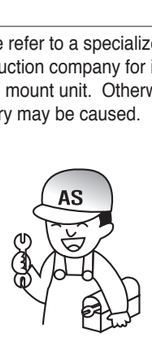
- Do not place any liquid-containing container on it. If the inside is wet, it may cause electric shock or fire.



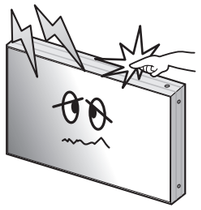
- Do not put any foreign material into the product. It may cause a failure or shorten the life span.



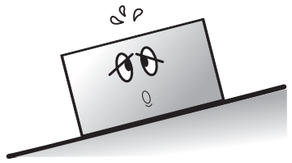
- Please refer to a specialized construction company for installing stand or wall mount unit. Otherwise, damage or injury may be caused.



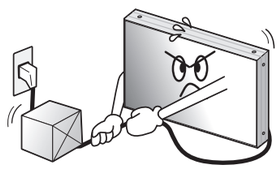
- Do not touch the device when lightning strikes.



- Do not install in an unstable location It may cause injury.

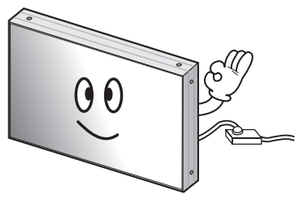


- Avoid any action to damage the power cord or power plug. It may cause fire or electric shock.

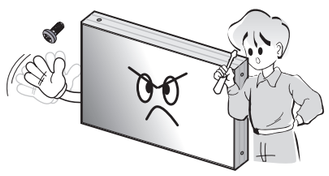


- Do not pull out the power plug with a wet hand. It may cause electric shock.

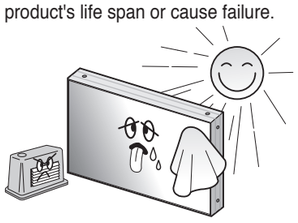
- Do not exceed ratings of AC outlet or extension cords. It may cause failure.



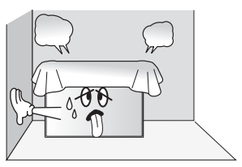
- Do not alter (or disassemble) the product. It may cause electric shock since high voltage is flowing inside.



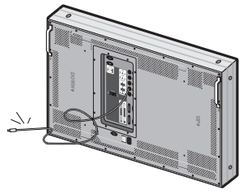
- Do not install the product where it may be exposed to direct sunlight or near any heating device. It may shorten the product's life span or cause failure.



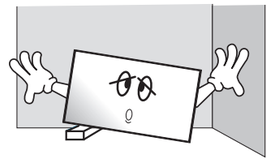
- Make sure the product is not covered with any object. If the ventilation hole is blocked, the inside temperature may rise to cause overheating resulting in fire.



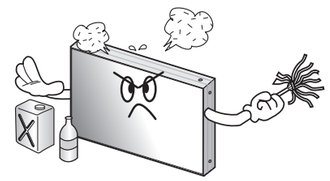
- Do not pull out or hang down the connection cable. It may damage the cord to cause fire or electric shock.



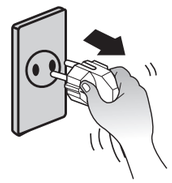
- Do not lean against the product or keep it leaned. It may cause injury or failure.



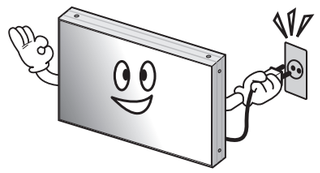
- Do not put it at any place with much humidity, dust, oil, smoke or steam. It may cause failure.



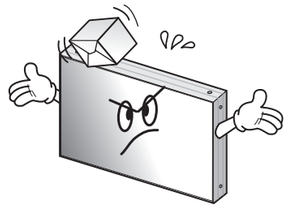
- Pull out the power plug by holding the plug. Otherwise, it may damage the power cord to cause fire or electric shock.



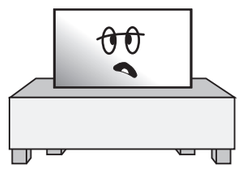
- If you do not want to use the product for a long time, keep the power plug unplugged to save electricity.
- The socket-outlet should be installed near the equipment and be easily accessible.



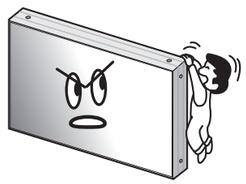
- Do not put any heavy object on it. It may cause failure.



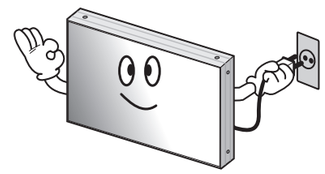
- Install the product on safe and flat surface.



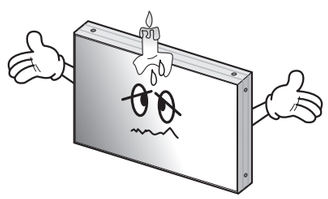
- Do not ride or step on the product It may cause breakage when fallen down.



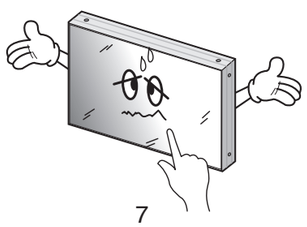
- When moving it, disconnect the connecting cable. Otherwise, it may damage the cable to cause fire or electric shock.



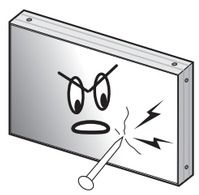
- Do not put candles on the product. If the liquid flows inside the product. It may cause electric shock or fire.



- Do not touch product's front surface with hand. Otherwise, the image quality can be lowered.



- Do not poke the front screen with sharp material. It may damage the screen and may cause malfunction of the product.



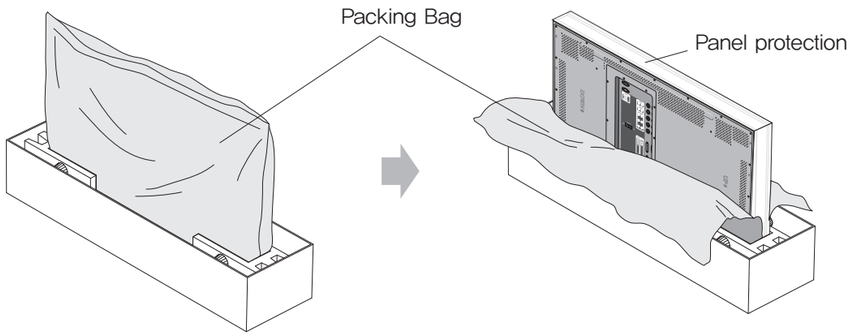
2. How to Install

• Install this set only at a location where adequate ventilation is available.

How to assemble handles

1. Product is packed in a box as shown in Figure 1.

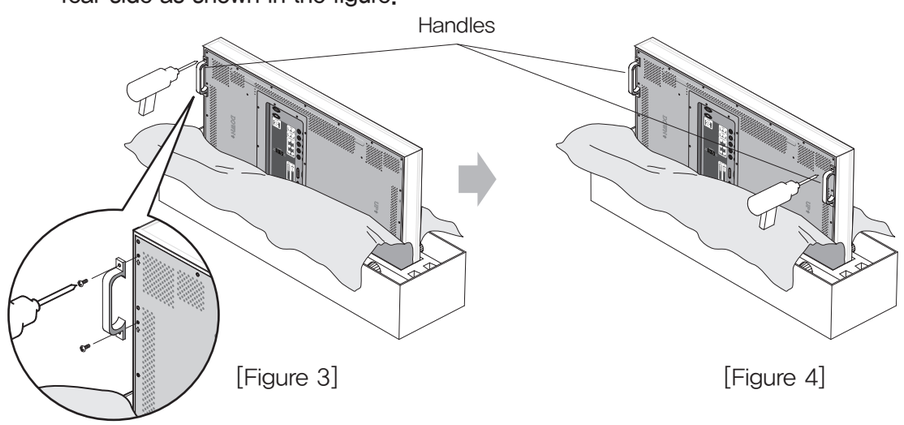
2. Please carefully remove the Packing Bag with a knife or a pair of scissors.
   ※ Please check front and rear side before you cut the bag to prevent any damages on panel or set.



[Figure 1]

[Figure 2]

3. Please assemble handles with the bolts that are in the accessory box to the rear side as shown in the figure.

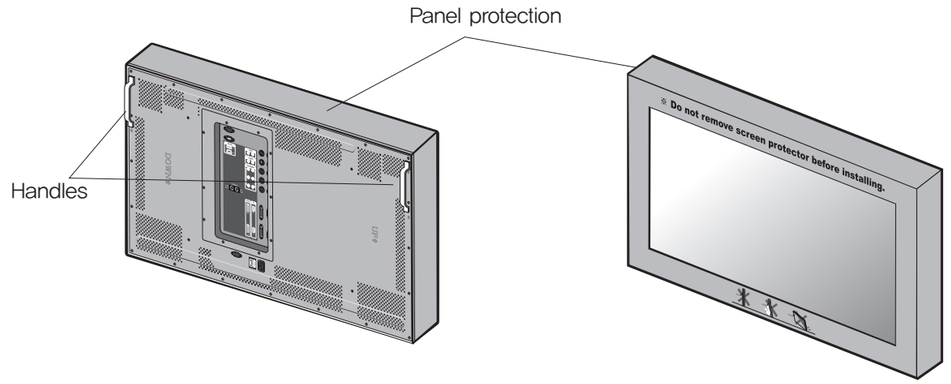


[Figure 3]

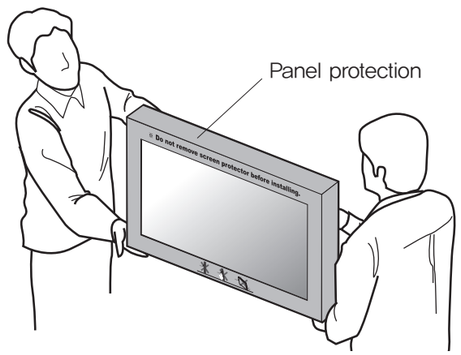
[Figure 4]

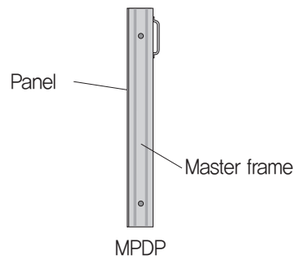
How to move MPDP

1. 2 people hold each handle on product's back side.



2. It needs two people to carry or install this product.
   Please hold the handles in the back and the front bottom part at the same time.
   – Please do not grab the panel, but grab bottom of master frame when you carry or install the products.
   – Please use gloves when you carry or install the products.





※Attention :

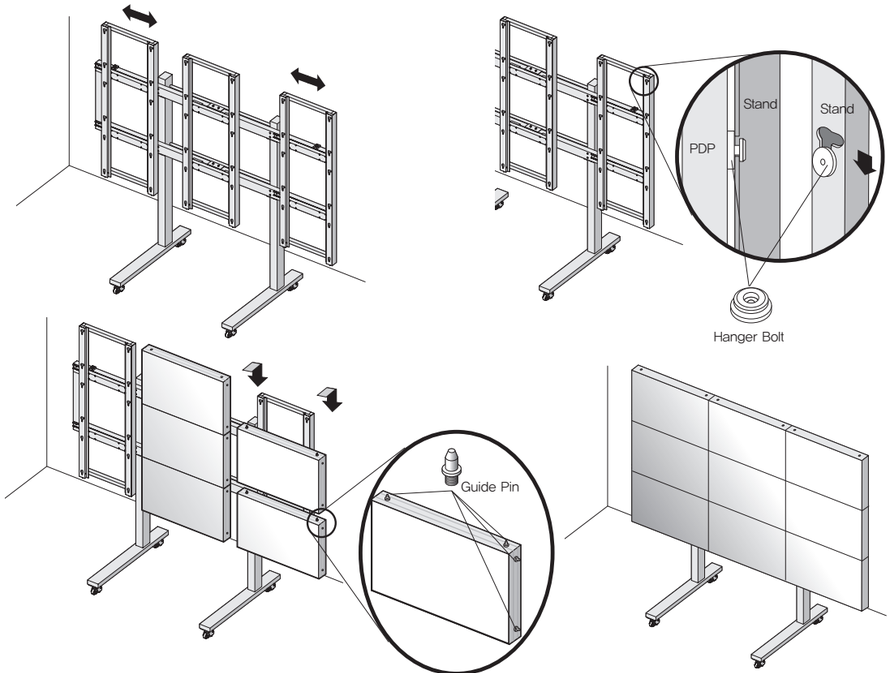
–Do not remove the panel protection pad until a set is completely installed on a stand or a wall hanger.
Please carefully remove Panel protection pad to prevent any damages on the product .

–Please make sure to use panel protection when you move, carry or rent MPDP.

Stand Unit (Option)

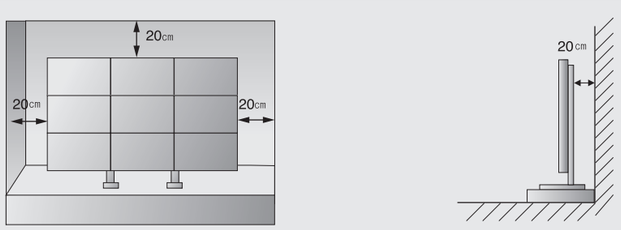
- Please do not install our product at following locations to protect the product and prevent possible malfunction.
  - Places of vibration or shock: PDP set may fall and damaged
  - Next or near to Sprinkler sensors: The sensors may detect heat from a set and sprinkler can be activated.
  - Around high voltage power lines: Noise from the power line may affect screen images
  - Around heating apparatus: PDP set may be overheated and damaged.

- The set can be installed as shown below.
  (For further information, refer to the optional 'Stand Installation and Setup Guide'.)



Install on a Stand

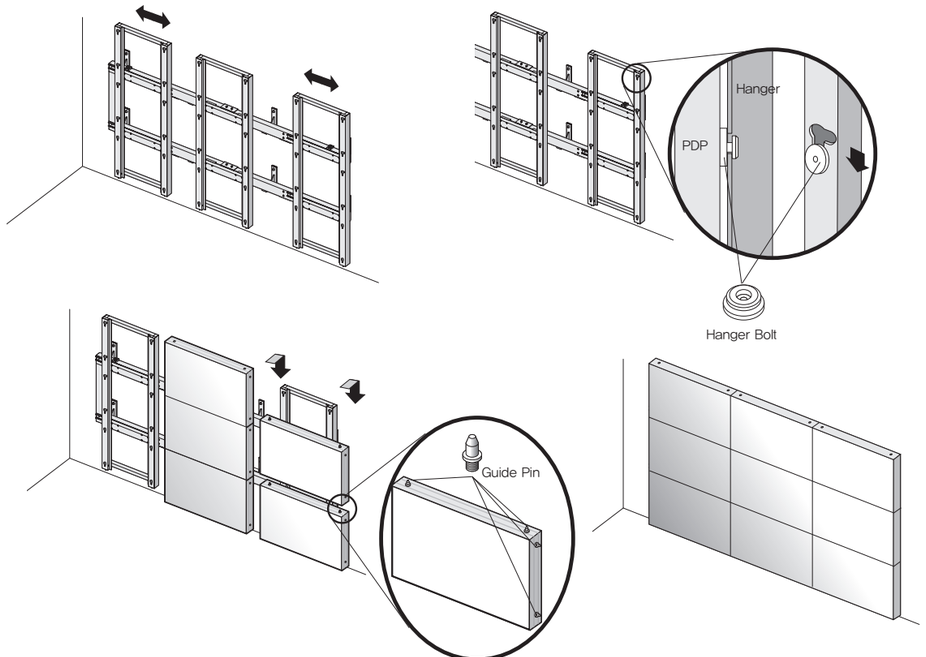
Please secure minimum clearance as shown in the picture for adequate ventilation and technical service.



Wall Mounting Unit (Option)

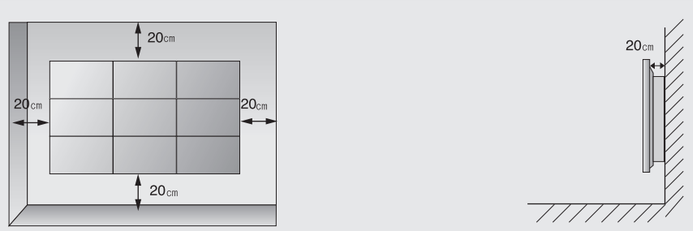
- Please check the stability of wall.
  If the wall is not strong enough, reinforce the wall before installation.
- Please connect all the cables to proper ports in a set before installation.

- The set can be installed on the wall as shown below.
  (For further information, refer to the optional 'Wall Mounting Bracket Installation and Setup Guide'.)



Mount on the wall

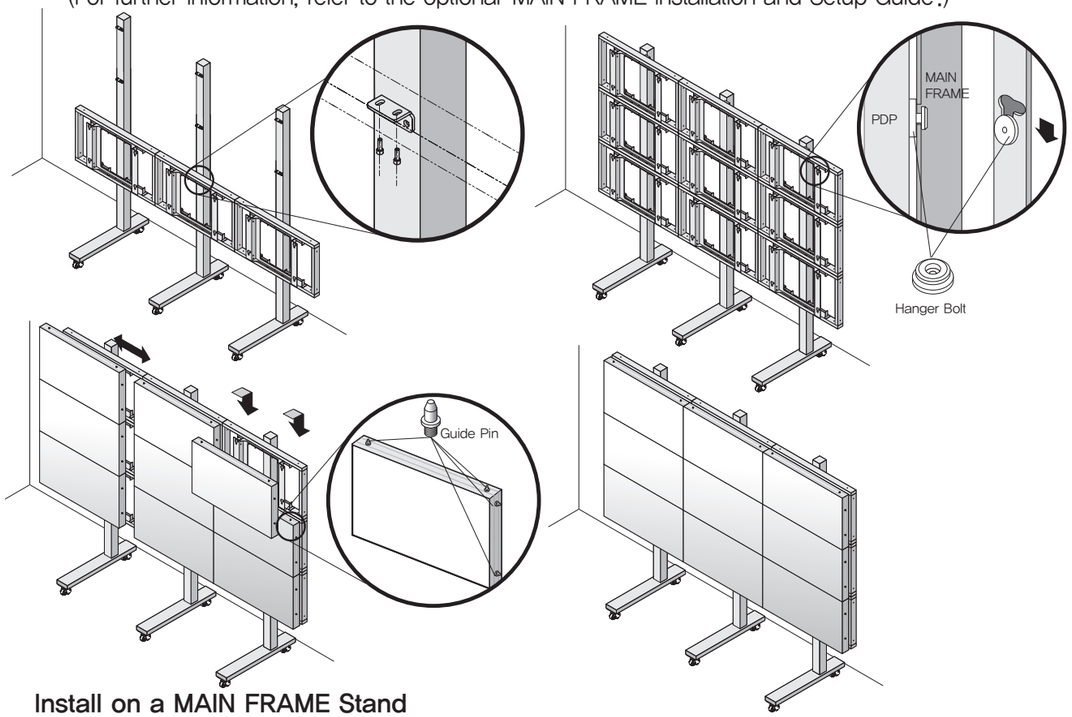
Please secure minimum clearance as shown in the picture for adequate ventilation and technical service.



MAIN FRAME Stand Unit (Option)

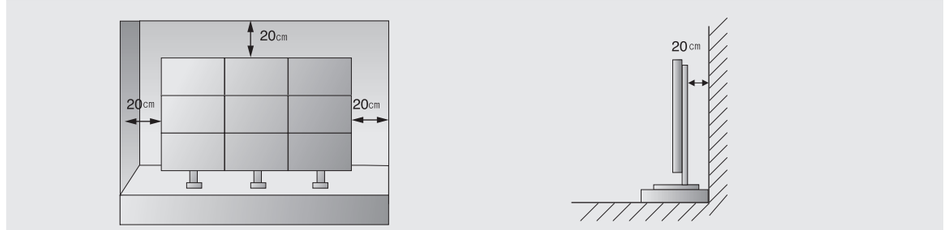
- Please do not install our product at following locations to protect the product and prevent possible malfunction.
  - Places of vibration or shock: PDP set may fall and damaged
  - Next or near to Sprinkler sensors: The sensors may detect heat from a set and sprinkler can be activated.
  - Around high voltage power lines: Noise from the power line may affect screen images
  - Around heating apparatus: PDP set may be overheated and damaged.

- The set can be installed as shown below.
  (For further information, refer to the optional 'MAIN FRAME Installation and Setup Guide'.)



Install on a MAIN FRAME Stand

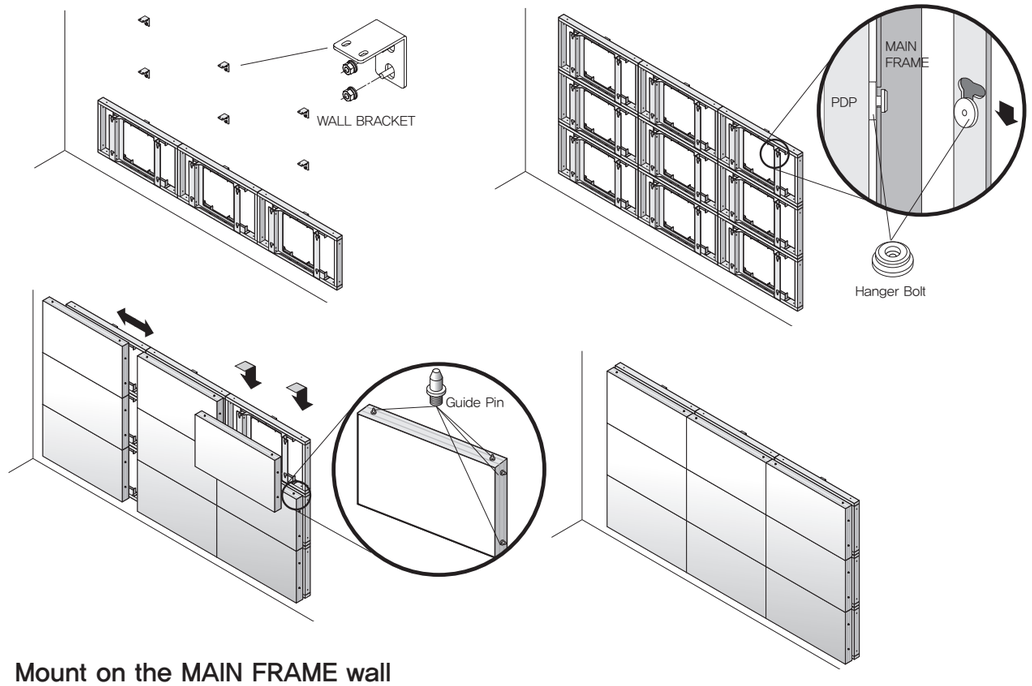
Please secure minimum clearance as shown in the picture for adequate ventilation and technical service.



MAIN FRAME Wall Mounting Unit (Option)

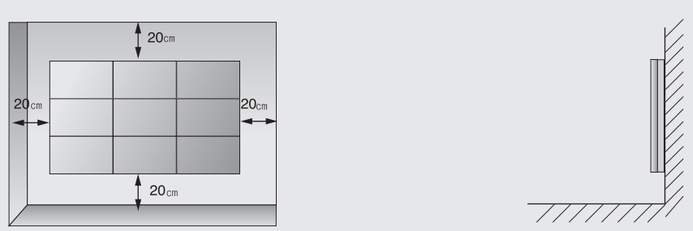
- Please check the stability of wall.
  If the wall is not strong enough, reinforce the wall before installation.
- Please connect all the cables to proper ports in a set before installation.

- The set can be installed on the wall as shown below.
  (For further information, refer to the optional 'MAIN FRAME Installation and Setup Guide'.)



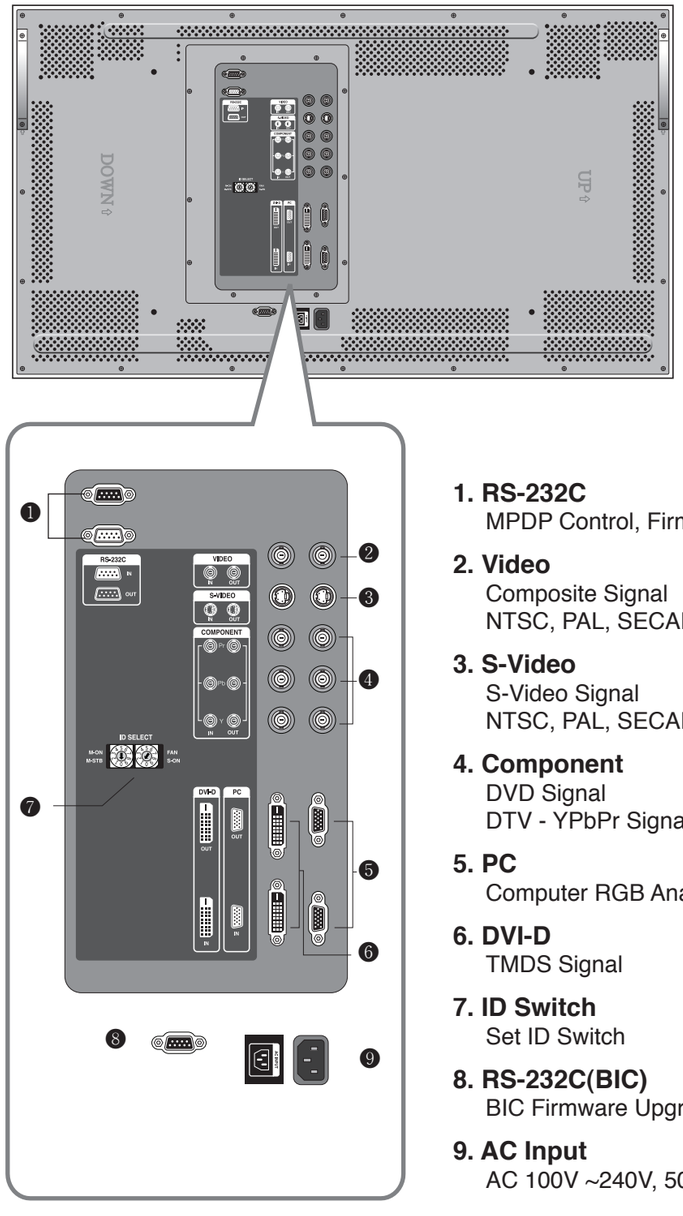
Mount on the MAIN FRAME wall

Please secure minimum clearance as shown in the picture for adequate ventilation and technical service.



3. Guidance for Users

Input/Output Terminals



1. RS-232C
MPDP Control, Firmware Upgrade, 9pin D-sub

2. Video
Composite Signal
NTSC, PAL, SECAM

3. S-Video
S-Video Signal
NTSC, PAL, SECAM, 4pin Mini Din

4. Component
DVD Signal
DTV - YPbPr Signal

5. PC
Computer RGB Analog Signal, D-sub 15pin

6. DVI-D
TMDS Signal

7. ID Switch
Set ID Switch

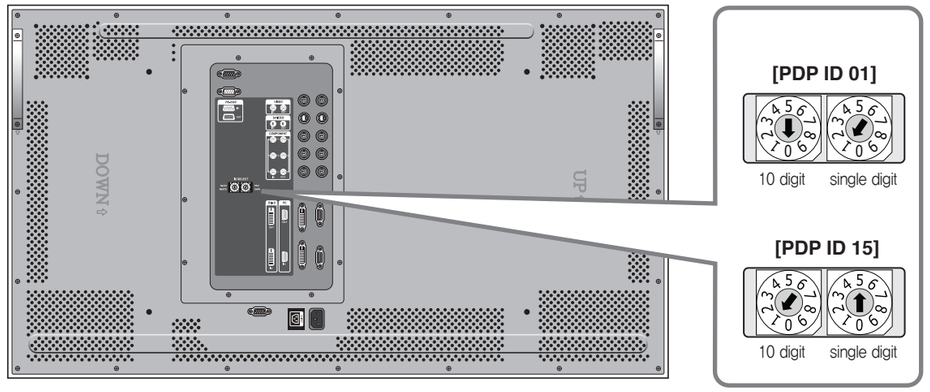
8. RS-232C(BIC)
BIC Firmware Upgrade(MIS-4230R / MIS-4230)

9. AC Input
AC 100V ~240V, 50/60Hz

Set ID Switch Setting

• Example of ID Switch setting

– You can set ID with 2 rotary switches as shown in the following figure.



※When you set or change PDP ID, please disconnect power cord before setting or changing the ID number. If you do not disconnect power cord, the PDPs maintain the previous ID and it may cause malfunction.

• LED Indication

LED ON ○ OFF ●

LED Indication	Description
M-ON ● / M-STB ● — FAN / S-ON	No Power.
M-ON ○ / M-STB ○ — FAN / S-ON	Internal System Check after Power on.
M-ON ● / M-STB ○ — FAN / S-ON	System ready.
M-ON ● / M-STB ○ — FAN / S-ON	Power ON by MSCS Program. (M-ON and S-ON LED will sequentially blink with 1 second interval.)
M-ON ○ / M-STB ● — FAN / S-ON	Power Off by MSCS Program. (System ready).

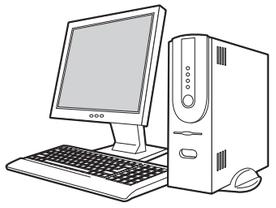
Remark)
M-ON(Master-ON) : IP Board Master Power On.
FAN : FAN POWER ON, IF Red LED on IP board is turned on, please check FANs.
M-STB(Master- Stand By) : IP Board Master Ready
S-ON(Slave-ON) : IP Board Slave Ready

4. How to Connect Cables

4.1. Connection of one set MPDP

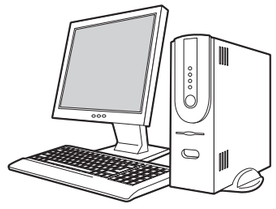
PC & DVI Connection

- MPDP and PC should be connected; a Com Port in a PC and RS-232C IN port in a MPDP is connected with supplied RS-232C cable.
- MPDP On/Off or Screen adjustment can be controlled by MSCS (Multi-Screen Control System).
- ID setting on the backside of MPDP must be identical with the ID setting in MSCS to control MPDP with a PC.
- If you do not have Com Port, you need to use an USB converter for RS-232. Depending on manufacturers or models, converters may cause malfunction.



RS-232C (Maximum 15m)

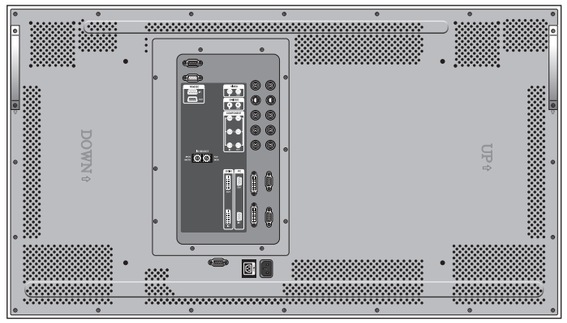
PC (MSCS) to control MPDP

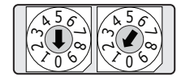


PC- analog connection (Maximum 5m)

DVI connection (Maximum 5m)

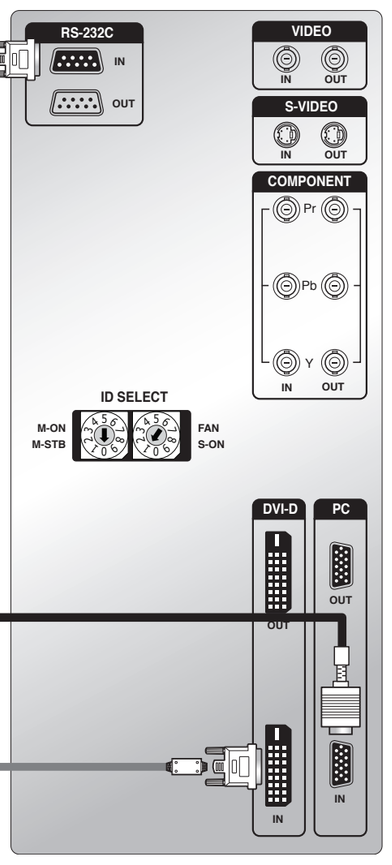
※If you need longer connection, please use DVI boosters or DVI fiber-optic cable.



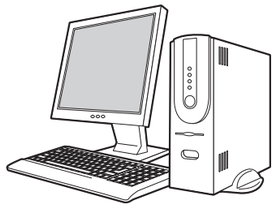


[PDP ID 1]

- ID switch must be set as ID 1 for one set use.



VCR Connection



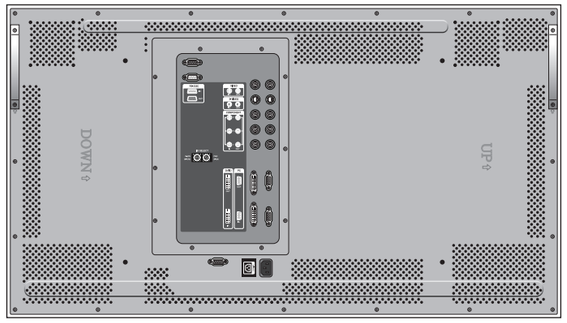
PC(MSCS) to control MPDP

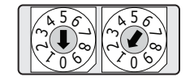
RS-232C (Maximum 15m)

Video connection (Maximum 5m)

S-Video connection (Maximum 5m)

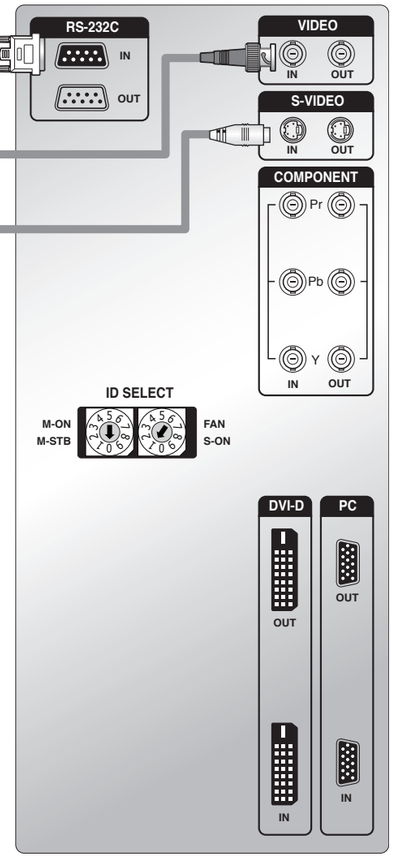
VCR





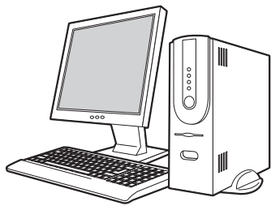
[PDP ID 1]

- ID switch must be set as ID 1 for one set use.



DVD Player & DTV Set top box connection

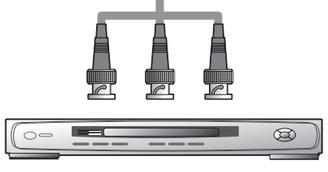
- In case input source is DVD, select DVD/SD in MSCS main screen.
- In case input source is DTV, select HD in MSCS main screen.



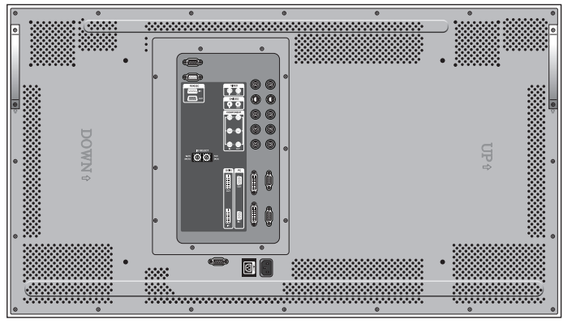
PC(MSCS) to control MPDP

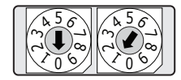
RS-232C (Maximum 15m)

Component connection (Maximum 5m)



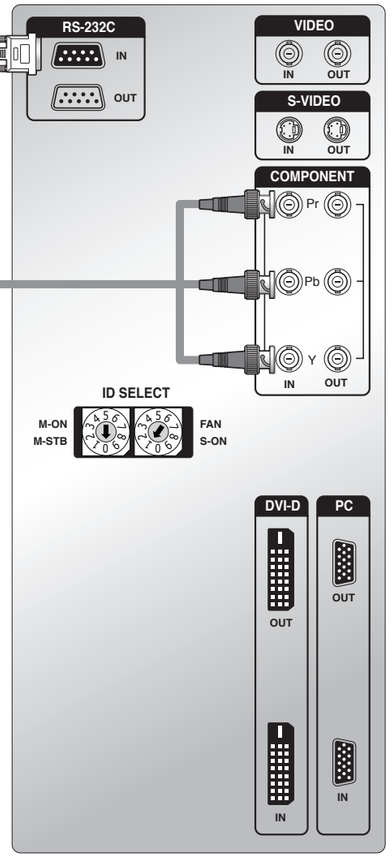
DVD Player & DTV Set top box





[PDP ID 1]

- ID switch must be set as ID 1 for one set use.



Component ports of the set	Y	Pb	Pr
Video output ports of DVD player	Y Y Y	Pb B-Y Cb	Pr R-Y Cr

- According to manufacturers, the indication of DVD Component output port may vary; “Y, PB, PR”, “Y, B-Y, R-Y” or “Y, CB, CR.”

- **Component Input ports**
  You can get better image quality by connecting DVD player to component input ports as below.

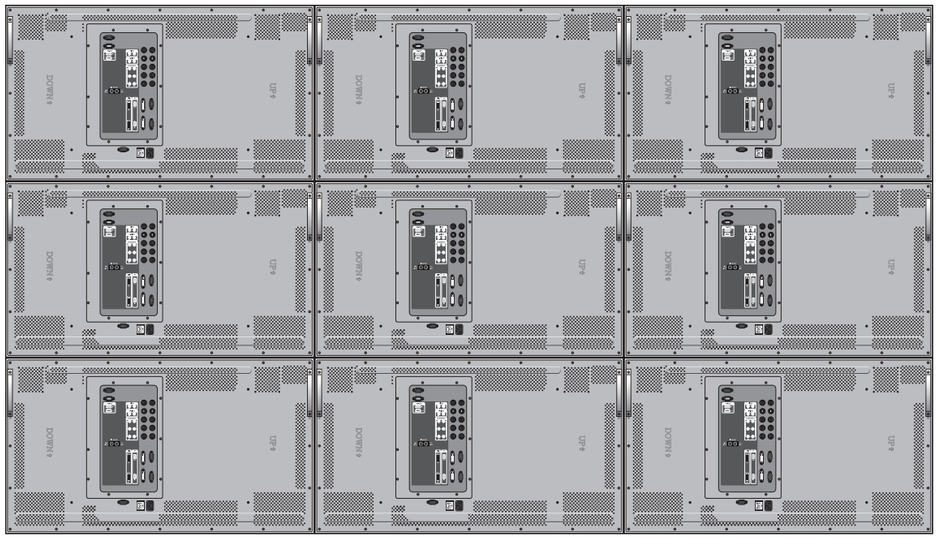
Caution

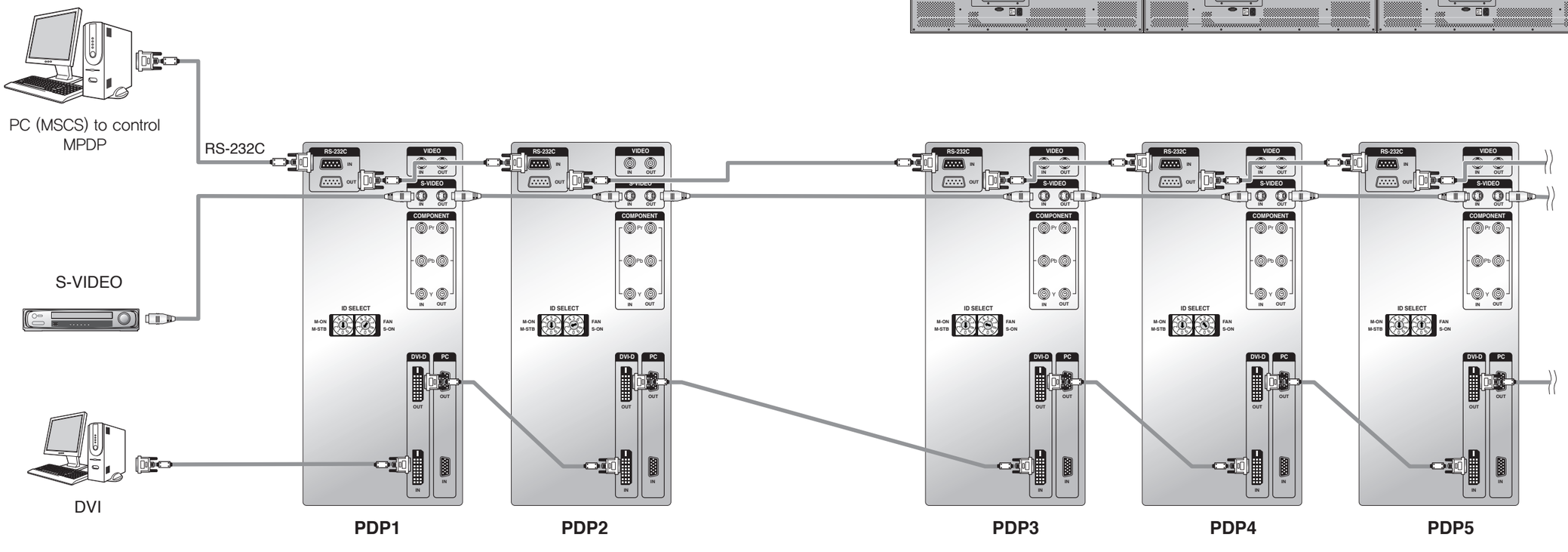
- **Caution for Component connection**
  In case component cables are not properly connected, you may have bluish or redish screen or even no screen images.

4.2. Connection of Multi-screen MPDP

- Recommended maximum set connection for Multi setting is shown in table below.
  If you need to connect more than described in the table, you have to use distributors.
- Image quality can be affected by cable or signal quality.

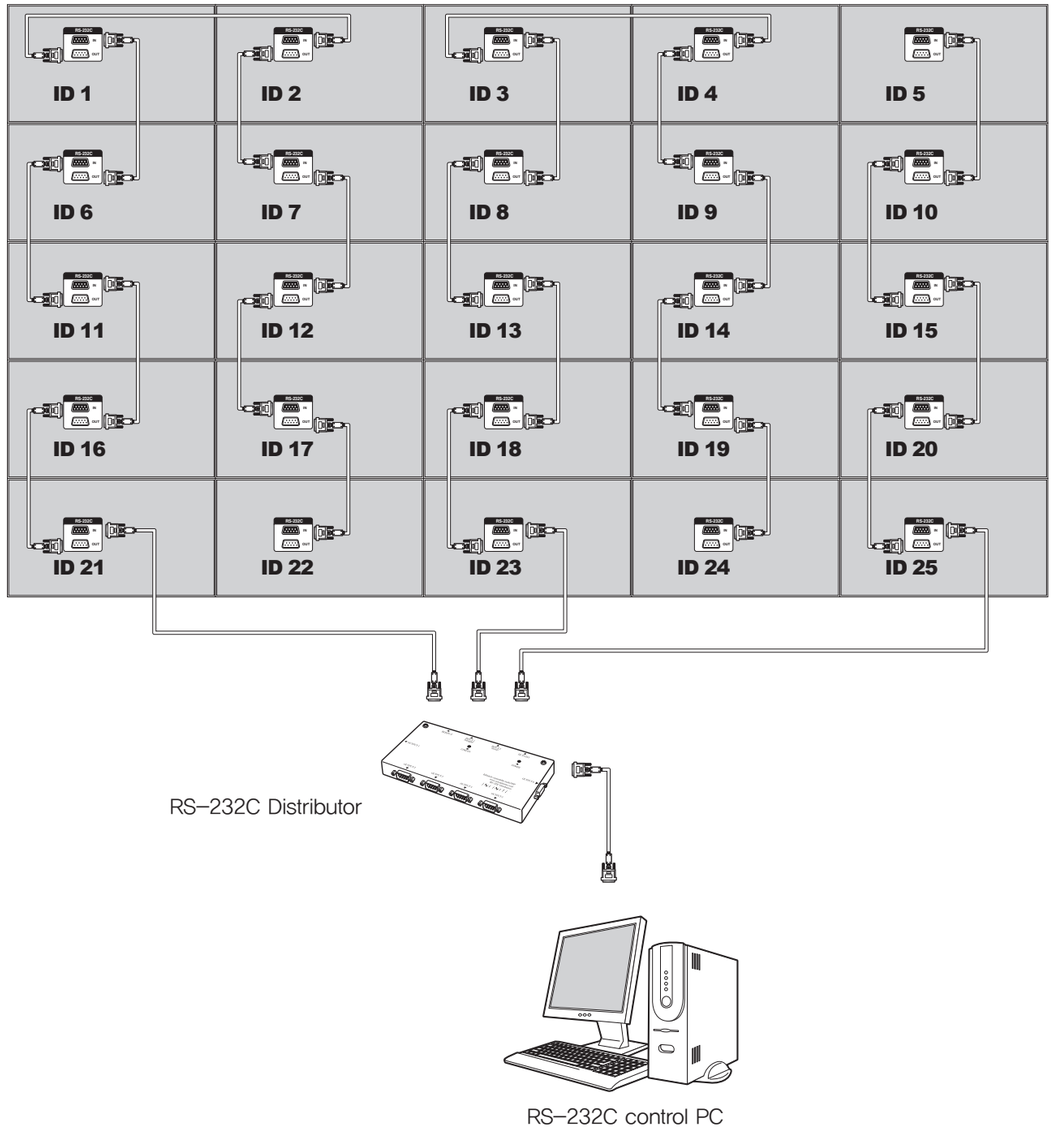
INPUT SOURCE	Resolution	Connection	Remark
DVI	1600 x 1200 x 60HZ	5 sets	
PC	**8.2.** PC & DVI Resolution Reference	1 sets	61 page
DTV	720p, 1080i	4 sets	
DVD	480i, 480p, 576i, 576p	6 sets	
VIDEO/S-VIDEO	NTST, PAL, SECAM	6 sets	



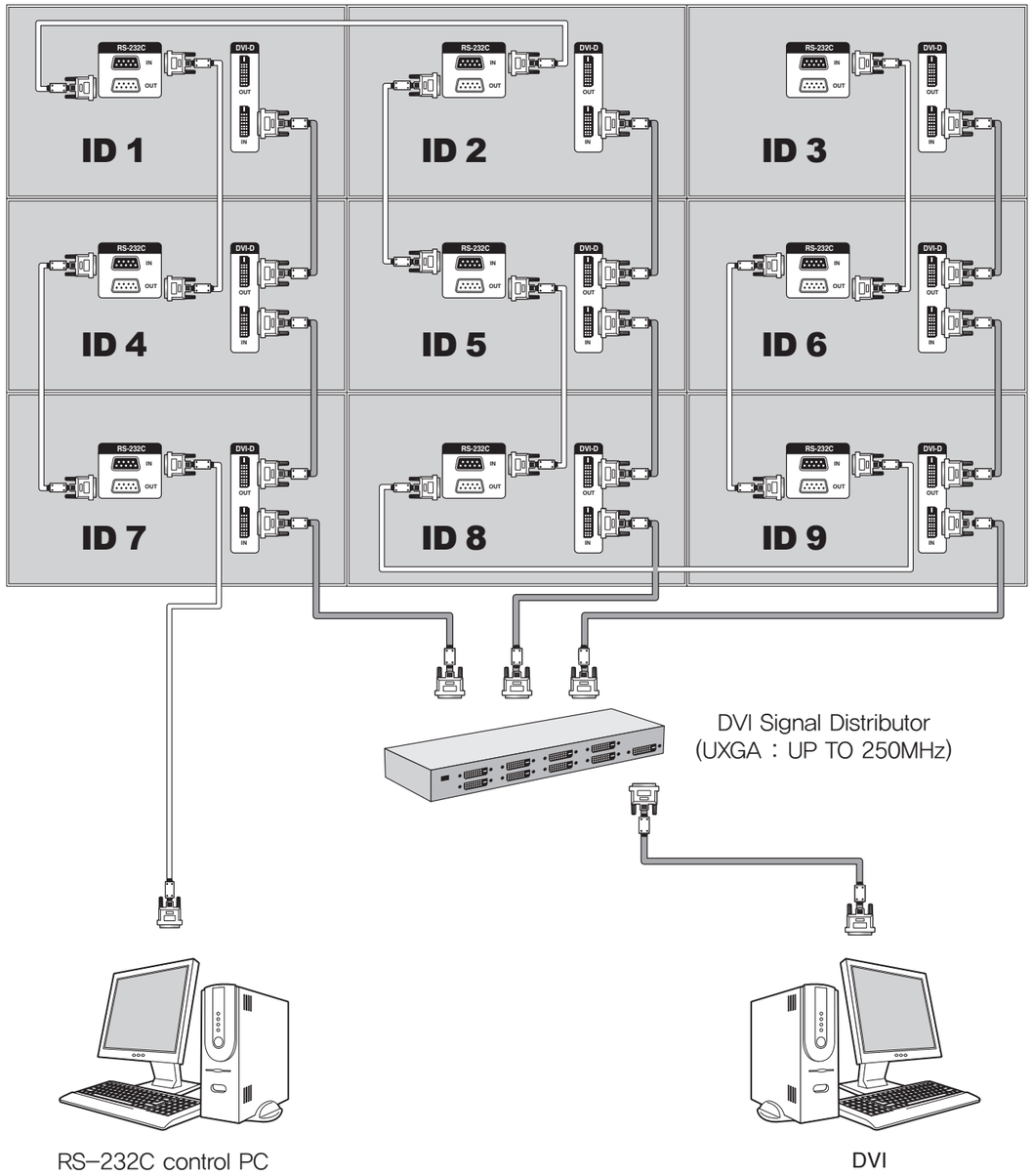


4.3. Connection of RS-232C Cable

• Maximum use of RS-232 with Daisy Chain connection is **10** or less.
If you need additional connection, use RS-232 distributor.



4.4. Connection of 3 x 3 MPDP

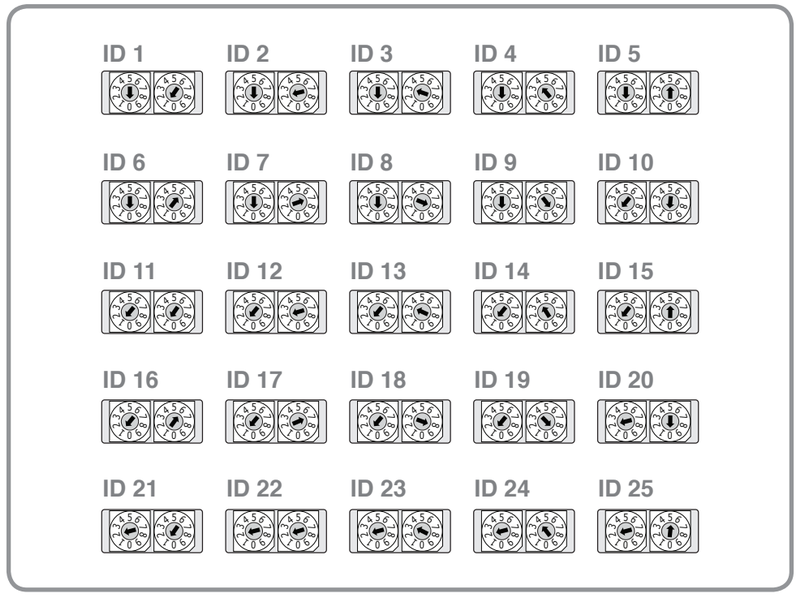


4.5. ID setting of X x Y MPDP

- Identity number (ID) indicates the location of each MPDP.
- When you look at the MPDP screens in front of MPDP.

PDP ID 1	PDP ID 2	PDP ID 3	PDP ID 4	PDP ID 5
PDP ID 6	PDP ID 7	PDP ID 8	PDP ID 9	PDP ID 10
PDP ID 11	PDP ID 12	PDP ID 13	PDP ID 14	PDP ID 15
PDP ID 16	PDP ID 17	PDP ID 18	PDP ID 19	PDP ID 20
PDP ID 21	PDP ID 22	PDP ID 23	PDP ID 24	PDP ID 25

Recommended ID of X x Y screens

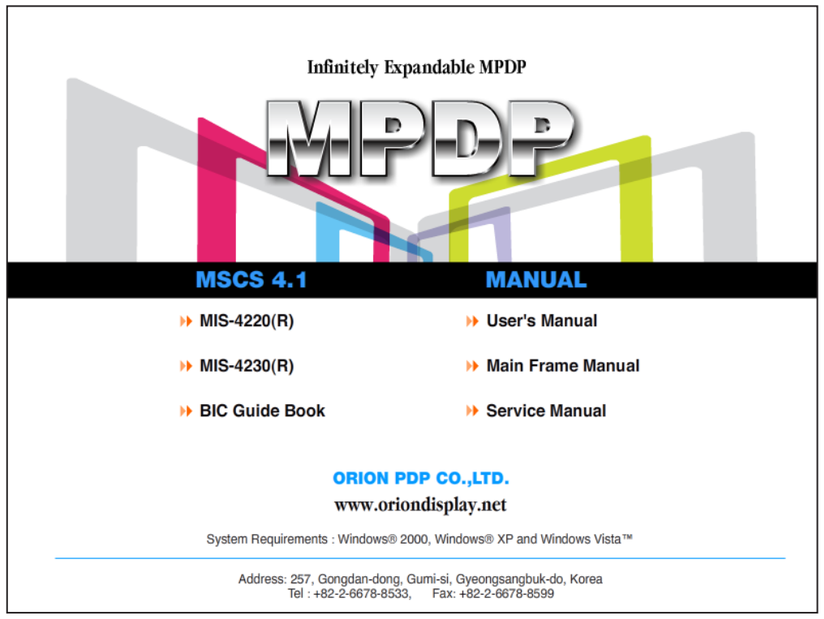


5. Setting and operation of MSCS software

5.1. Installation

- Insert the Installation CD.
- You can see following installation start screen.
- Select proper version for your product and star installation

- MSCS supports Windows® 2000, Windows® XP and Windows Vista™ only



MSCS Installation start screen.

5.2. Start MSCS

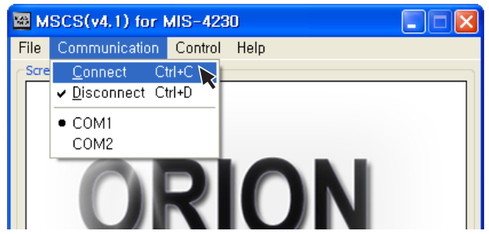
- MSCS is an application program needed to control MPDP.
- When you execute MSCS (v 4.1) for your product at the installation screen, it will create a new folder at *C:₩Program File₩MSCS (v4.1)* and an icon on your computer screen.
- By double clicking the MSCS (v 4.1) icon, the initial screen image of MSCS (v 4.1) will be displayed as shown in the picture.

Main Image of MSCS (Multi Screen Control system)

※Input source is not displayed on the MSCS screen, but it is indicated by colors.
※DVI: Yellow, PC: Green, DTV: Pink, DVD: Purple, S-VIDEO: Brown, VIDEO: Gray

5.3. Setting 'Com Port'

- Com Port connects or disconnects the communication between PC and MPDP.
- Connect MPDP to PC Com Port via RS-232C cable.



Communication Setting

- Go to MSCS Menu → Communication and set Com Port. Click 'Connect' using mouse or press 'Ctrl+C' using keyboard.
- In order to disconnect communication, click 'Disconnect' using mouse or press 'Ctrl+D' using keyboard.
- When you use USB-to-RS232C converters, you need to set Com Port again, because MSCS uses one of Com Port no. 1 to 30.

5.4. "New design/Last design" setting

When Com Port is successfully connected, pop-up window for "New design/Last design" appears.

New/Last Design Set

- Click "Open New Design" to prepare new configuration.
- Click "Open Last Design" to go to last design before closing.

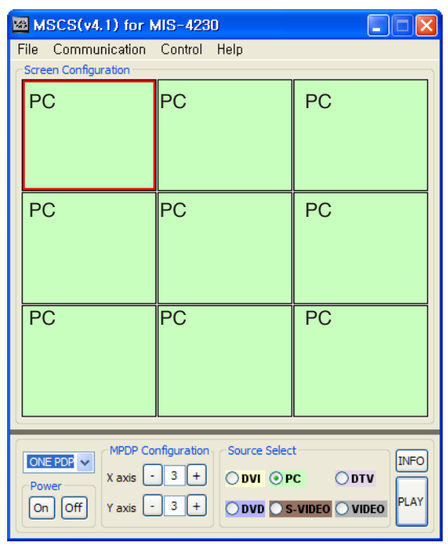
5.5. Multi-screen configuration

Screen Configuration Setting

1 Input the numbers of X and Y
- X is for the number of row and Y is for column.
- The numbers can be selected up to 15.
- MPDP image of selected numbers of X and Y is displayed in the Screen configuration in one second after setting the number.

2 Select one of input sources from DVI, PC, DTV, DVD, S-VIDEO, or VIDEO.

3 Execution of the configuration.
- When you click "PLAY" button after selecting input source from Source select and the numbers of X and Yin MPDP Configuration, the configuration of MPDP is generated as shown in the figure below.



- Info: You can check the resolution of the selected source. This is displayed at the right lower corner of the screen.

5.6. MSCS Instruction

- Check "ALL PDP" to send data to all connected MPDP regardless of ID.

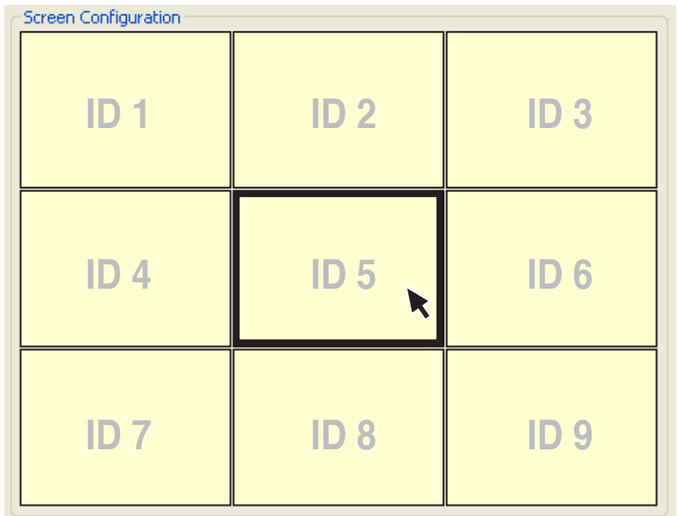
MPDP Control – Power On/Off

- In order to control power of specific MPDP, use "Power On/Off" button after selecting the specific MPDP.

Caution Please wait for about 10 seconds after connecting power plug to MPDP or it may not work properly.
In case MPDP does not work properly, please pull out the power plug and reconnect the plug.

5.7. ID Setting

- ID of MSCS(Multi Screen Control System) is set automatically.



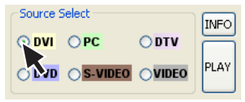
Example of MPDP ID Setting
(Input signal is DVI, Configuration is 3 by 3)

- In order to transmit data to chosen MPDP, ID of Screen Configuration must be selected.
- Select ID using right button of mouse. Selected ID is displayed with red square box.

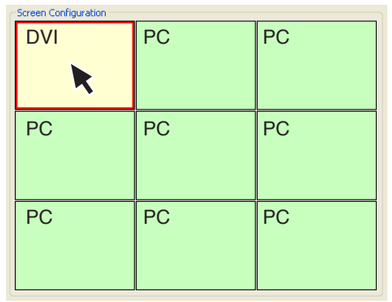
5.8. Configuration of various modes

• You can configure various input sources as you want.

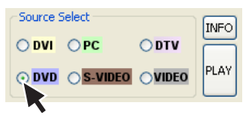
1 Select a desirable input Source in "Source Select"
– Ex) Select "DVI" in "Source Select"

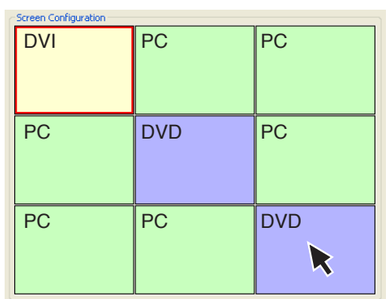


2 Click desirable screen with left button of mouse then the screen would be converted into DVI.
– Click the left mouse button on the screen that you want to change. Screen will be turned into DVI input screen.



3 You can configure other screens in the same way.
– Selected screen would be converted into DVD.

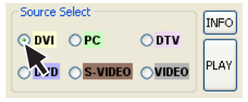




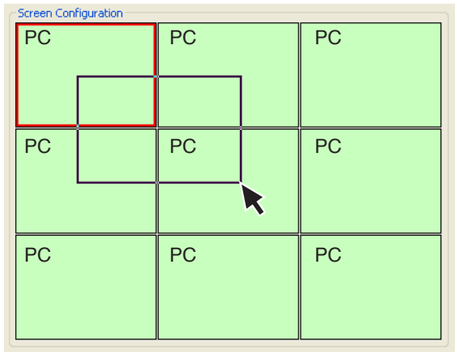
5.9. Setting multi screens at a time

• You can select multi screens at a time as you want.

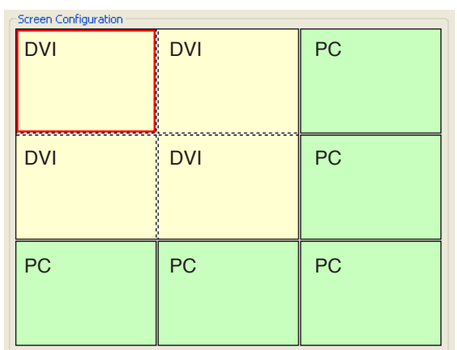
1 Select a desirable input source in "Source Select"
– Select "DVI" in "Source Select".



2 Select screens with left button of mouse and drag from the first screen.



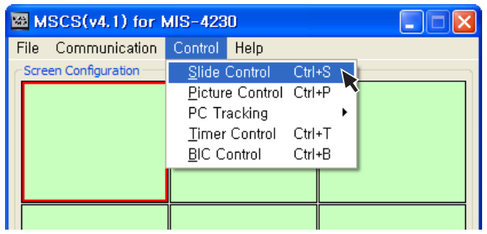
3 Selected screens would be converted into DVI.



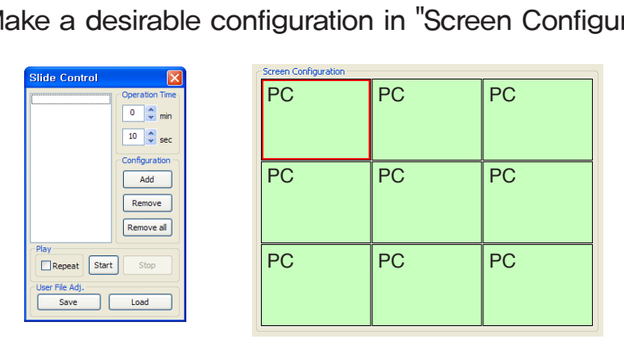
※Click 'Play' button on the main image of MSCS or scroll using mouse to return to initial image.

5.10. Slide Control

- MPDP configuration that users set is displaying repeatedly.
- To use Slide Control, go to MSCS Menu → Control → Slide Control or press "Ctrl+S" using Keyboard.



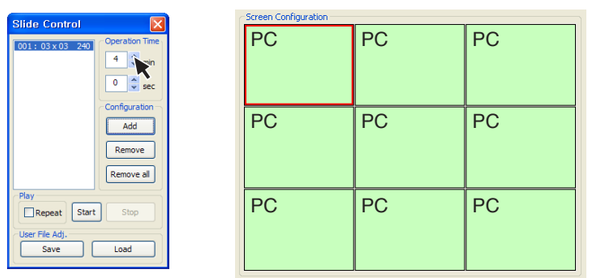
1 Make a desirable configuration in "Screen Configurations"



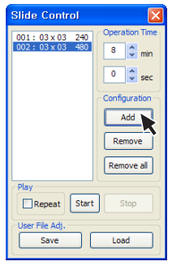
2 Set "Operation Time" in "Slide Control"

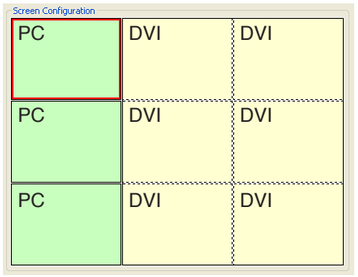
– Click "Add" button to save configuration.

– The range of "Operation Time" is from 10 seconds to 1 hour.



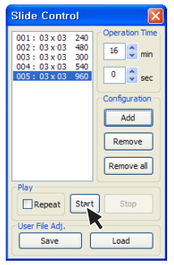
3 Save various screen configurations in the same way.

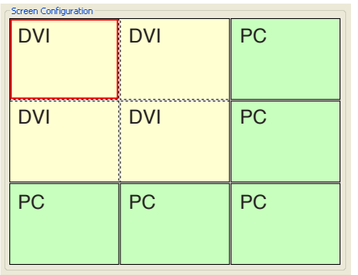




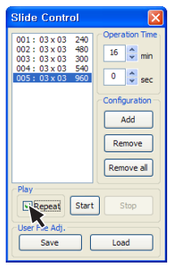
4 Click "Slide Start" to display saved screen configurations.

–Saved screen configurations are displaying for preset time.

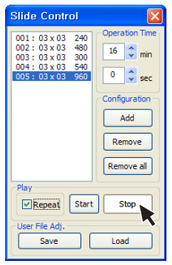




5 Check "Repeat" to display saved configuration repeatedly.

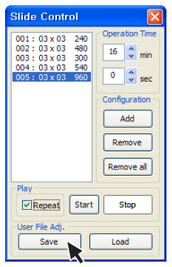


6 Click "Stop" button to end "Slide Control"



7 Save or Load the slide configuration

- Click "SAVE" button to save user added Slide configuration as "*.ssd" file.
- Click "LOAD" button to open saved "*.ssd" file.

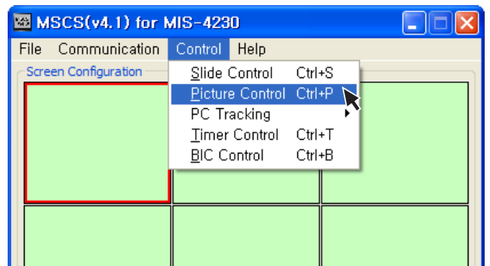


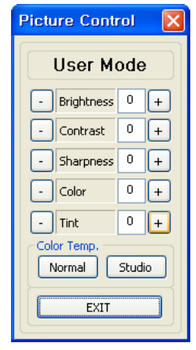
※To view the saved screen configuration, select the list from "List Box."

※Saved screen protocol is transmitted to MPDP by double clicking the list.

5.11. Screen Control

- Register values related to display of MPDP can be changed.
- Click "Picture Control" of "Control" menu bar or enter "Ctrl+P" in order to run "Picture Control" window.



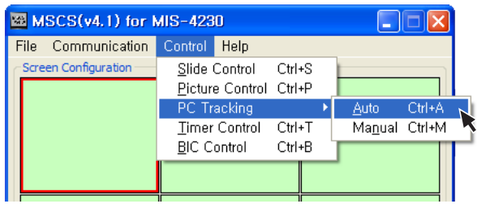


Picture Control

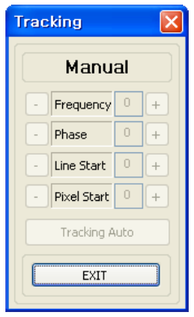
- In order to control display values, input values directly in "Edit Box" and press Enter key. Or click –/+ button using mouse.
- Click "Exit" button or press "Ctrl+X" using keyboard to close "Picture Control" window.
- Color Temp.
  - Normal : Initial setting. Proper for normal video image view.
  - Studio : Low Color temperature. Proper for broadcasting purpose.

5.12. PC Tracking

• Alignment adjustment is available when input source is PC.



• Go to "Control" in menu bar → PC Tracking → Auto in order to run "Tracking Auto" window.



Tracking Manual Window

• In case alignment doesn't work through "Tracking Auto" command, users can tune finely through "Tracking Manual". Go to "Control" of menu bar → PC Tracking → Manual or press "Ctrl+M" using keyboard.

• "Tracking Manual" window enables users to set Frequency, Phase, LineStart and PixelStart.

• When "Tracking Manual" window is on display, users cannot display "Picture Control" window.

• Even when "Tracking Manual" window is on display, selecting 'ID' is available by clicking right button of mouse.
(Refer to "5.5 PDP ID Setting".)

• Detail adjustment steps are as follows.

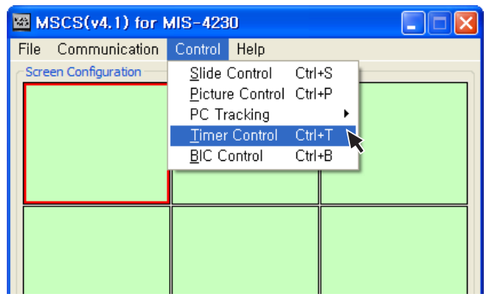
1) Tune "Phase" until the vertical lines are clearly adjusted..
2) Tune "LineStart" to adjust vertical alignment. "PixelStart" for horizontal alignment.
3) Adjust "Frequency" if alignment is still wrong.
If you adjust "Frequency", repeat step 1) and 2) to fit alignment.
Adjustable range is as follows
–The range of "Frequency" you can adjust is –50 to 50
–The range of "Phase" you can adjust is 0 to 31
–The range of "Linestart" you can adjust is –23 to 10
–The range of "Pixelstart" you can adjust is –50 to 40

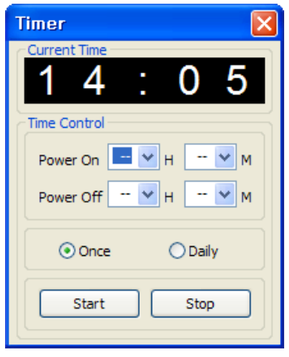
• Click "Exit" button or press "Ctrl+X" using keyboard to close "Tracking Manual" window.

5.13. Timer Control

• Users can decide the time of turning on or off MPDP set by timer control.

• To use this function, click Menu –〉 Control–〉 Timer Control or use 'Ctrl +T' keys from the keyboard.





Timer Control Dialog

• How to set the time of power on or off.

– I. Select Hour and Minutes of turn on or off
– II. Select once for one time use and Daily for daily use, then click 'Start'
– III. Power on or off signal will be transmitted to MPDP at the time of user set.

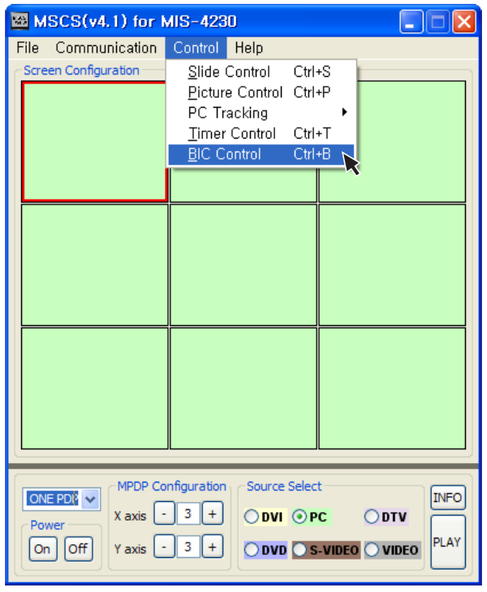
• Time Dialog must be activated to use Timer function

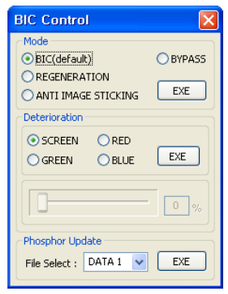
5.14. BIC Control (MIS-4230/MIS-4230R Only)

"BIC Control" function is MIS-4230 & MIS-4230R

This function does not support MIS-4220 & MIS-4220R.

- You can control BIC functions related with burn-in compensation.
- Please select "Menu → Control → BIC Control" or "Ctrl+B" to start BIC control.





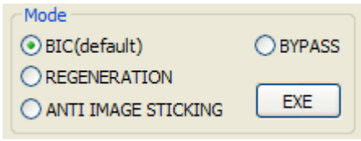
BIC Control

Precaution for MVP device

* MVP devices can be used with APL off mode and it can be selected by MSCS control.
  When APL is turned off, brightness is slightly decreased.
  (Please refer to Service manual for further information.)

MVP (Multi Video Processor) device?
It is a multi channel image processing system using digital signal processing methods. It converts analog composite videos to digital format, save in a memory and process the saved image data without any frame loss and image deterioration to communicate with a computer.

- Select one of BIC mode, BYPASS mode, REGENERAION mode and ANTI IMAGE STICKING mode and click "EXE" to control Burn-in compensation function.



1. BIC On/Off

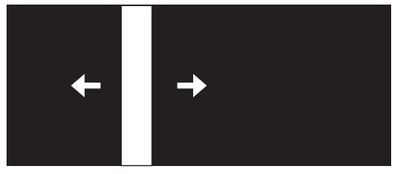
1) BIC Mode:
Activate BIC function to reduce burn-in effect. (BIC function On)

2) BYPASS Mode:
Deactivate BIC function, but BIC board keeps recording burn-in history.(BIC function Off)

2. Additional compensation

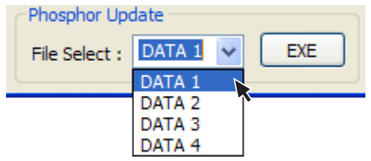
1) REGENERATION Mode:
Compensate burn-in effect by displaying a reversal image of the current burn-in image.

2) ANTI IMAGE STICKING Mode :
In case you find serious Burn-in effect in a certain area, select "Anti Image Sticking Mode," White Stripe pattern scans whole screen to make uniform screen condition to eliminate unequally burned pixels.



White bar pattern in the screen moves horizontally.

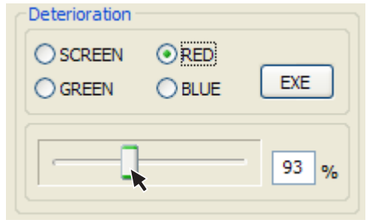
• Phosphor Update function changes phosphor value.
If you cannot have satisfactory compensation result by adjusting Deterioration function, you can change phosphor value.



• Deterioration function adjusts deterioration range for Red, Green and Blue respectively.

1) Set up Test pattern–Red, Green, Blue and "SCREEN" external image source, to control Deterioration.

2) Adjust Deterioration range for Red, Green and Blue respectively.
Adjustable range is 70% to 130% and initial value is 100%.
In case surrounding pixels are brighter than burn–in image, increase the present value and surrounding pixels are darker, decrease the value.



← Lower luminescence. Higher luminescence. →
Activation status between 70% ~ 130%

BIC status Indicator

Red: Malfunction, a small red square continuously blinks at the lower right corner of the screen.

Green: Normal, a small green square blinks several times and disappears at the same position.

Yellow: BIC related events such as Update, a small yellow square continuously blinks at the same position.

※Caution

– Screen may fade in and out when power on. It is a process of BIC initial update.
It is not a malfunction of MPDP.

– Do not use BIC function during moving images. (BYPASS MODE)

– Brightness can be decreased for burn–in compensation.

Burn–In–Compensation Control Method

1. User can select a color (Red, Green or Blue) for compensation from Deterioration Menu in the BIC Control menu.
2. When you find disturbing Burn–in effect on your screen, please select a proper value from Data 1, Data 2, Data 3 and Data 4 in the phosphor change option and execute. (It takes 1 ~2 seconds) Please select Data 1 when Burn–in pattern is brighter than surrounding screen area and select Data 4 for darker Burn–in pattern than surrounding screen area
3. If the selected value does not cause enough compensation result, repeat above process up to 4 times, and select the most satisfactory value and fix the value.
4. If the compensation result is still not good enough, you can fine tune Red, Green and Blue colors one by one in Deterioration Menu
5. Please control Green, Blue and Red sequentially.
Initial value is set as 100% and it can be controlled within the range of 70% ~ 130%.
6. In case of Burn–in pattern is brighter than surrounding area, select lower value (under 100%) and higher value (over 100%) for darker Burn–in pattern.
(Please find optimal value through changing the value by 10 %)
7. Sequentially control Red, Green, and Blue, examine the result with white pattern and repeat the process.
8. If you do not have satisfactory result after repeating above process, please change the value of Green, Red and Blue by 1% until you can find the best result.
9. In case, the compensation result is still unsatisfactory, REGENERATION Mode and ANTI IMAGE STICKING Mode may be applied for better result.
10. Adjusting White Balance after BIC control process may improve compensation result.

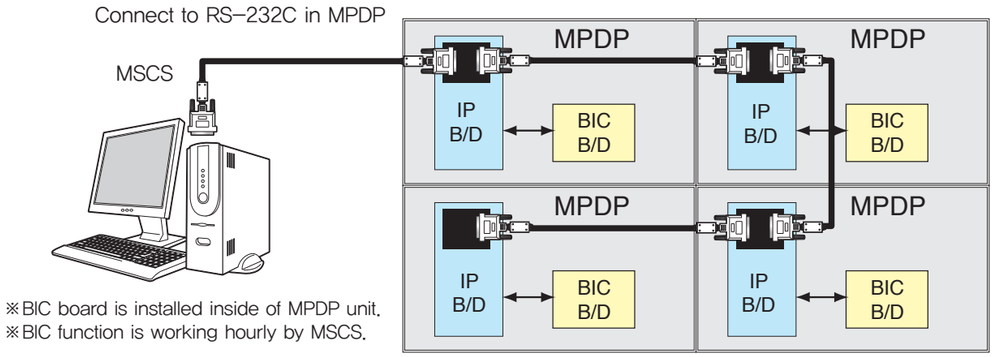
BIC Intervals and effect

Burn–In–Compensation function is executed automatically. However, the level of burn–in effect may vary due to input sources and display period.
In case, you can notice disturbing level of visual burn–in effect, we recommend to execute additional compensation functions.
It is very effective to execute such compensation after 3months of daily 24hour use.
If you do compensation prior to 3 months, the compensation result may be less effective.
If you have any questions or need further information, please contact us or the dealers where you purchased the product.

How to Control BIC

1.MSCS

1) MSCS and MPDP must be always connected.
2) If MSCS command is executed prior to the BIC command, the BIC command will be executed again one hour later.
3) If BIC command is executing, MSCS command does not work.
4) Turn off the energy save mode of the computer.
5) The compensation for undesirable burn-in effect is made automatically when BIC function is executed. If the compensation result is not satisfactory, use additional Burn-in compensation function in MSCS. (Please see page 39 for further information.)



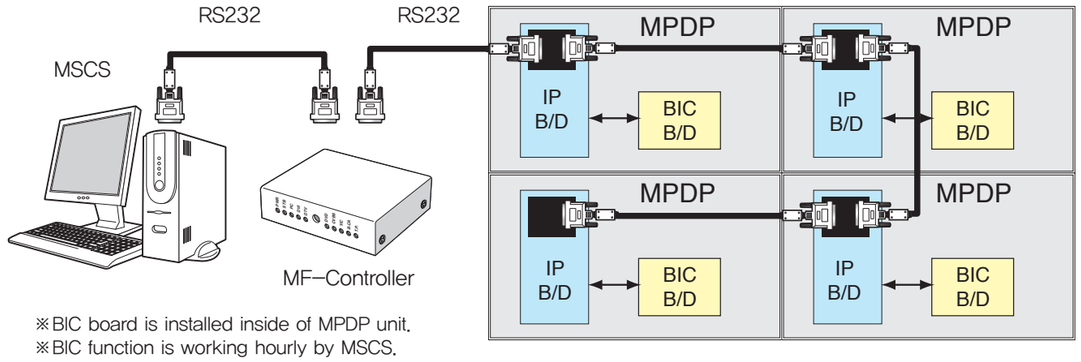
※BIC board is installed inside of MPDP unit.
※BIC function is working hourly by MSCS.

2.The other control program (beside MSCS)

Refer to BIC protocol and program guide to insert BIC control program into the MPDP control program.

3. MF-Controller

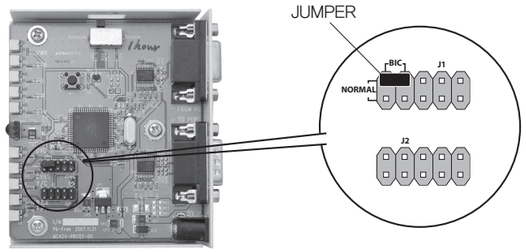
1) If you want to use the other MPDP control program beside MSCS and you cannot integrate BIC control program into the MPDP control program, you can use MF-Controller.
2) The numbers of MPDP units should be set by MF-Controller.
3) The MF-Controller connected to MPDP must be always turned on.
4) During BIC function is being executed, all the commands are ignored. Even the remote controller is not responding. If BIC command is given during the command from MF-Controller is being executed, the BIC command will be executed one hour later.
5) Please refer to the next page for MF Controller configuration.



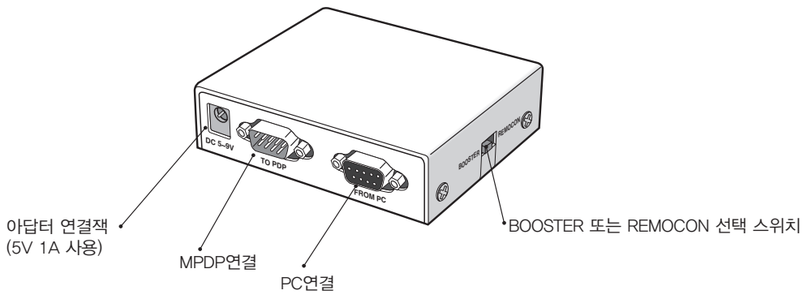
※BIC board is installed inside of MPDP unit.
※BIC function is working hourly by MSCS.

MF-Controller configuration method

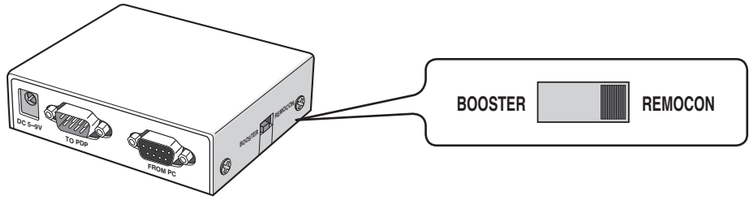
Insert a jumper to BIC part to configure BIC mode of MF Controller.



1. Connect power.
2. Connect female D-sub to the Com port in a computer.
3. Connect male D-sub to the RS-232C port in MPDP.



4. Set the number of the connected MPDP units in advance. The number can be set only by the Remote controller.
5. Set the switch at REMOCON side

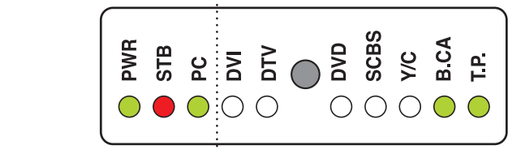


※Note

Select BOOSTER for a booster and BIC functions.

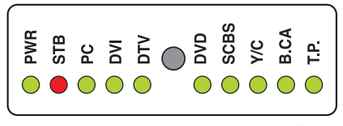
Select REMOCON for a remote controller and BIC functions.

6. Start with press "GO" button.
7. Configure the number of horizontally installed MPDP units at first.
   Press "LEFT" and "RIGHT" buttons to begin horizontal configuration. (◀ ▶)

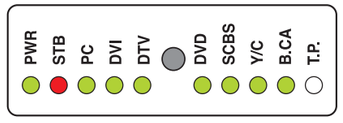


Horizontal & Vertical configuration

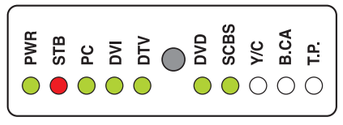
The LEDs are turned on one by one from the rightmost as the number increases from 1 to 7 and turned off from the rightmost for the number 8 or higher.



Horizontal configuration 7sets

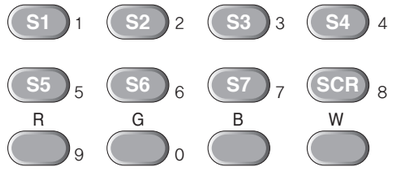


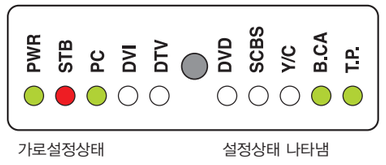
Horizontal configuration 8sets



Horizontal configuration 10sets

Press the button for the number of the MPDP units and the same number of LEDs are turned on from the right side. (In case of 2X2, press S2 button.)

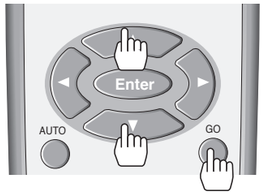


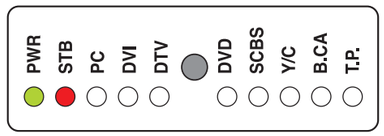


가로설정상태 설정상태 나타냄

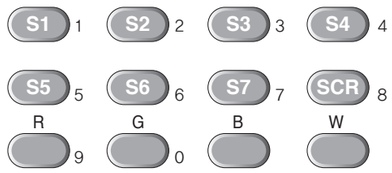
2sets are selected.

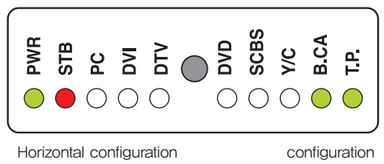
8. Press "UP" and "DOWN" buttons to begin vertical configuration.(▲▼)





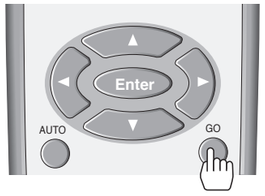
Press the button for the number of the MPDP units and the same number of LEDs are turned on from the right side. (In case of 2X2, press S2 button.)

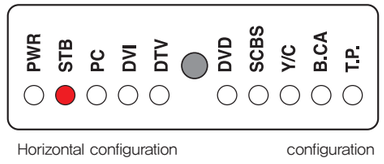




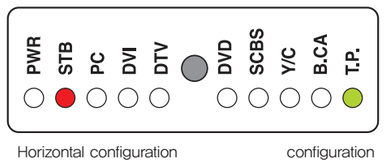
2sets are selected.

9. Press "GO" button to finish configuration mode. (Configuration finish & save)



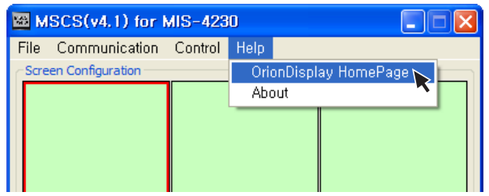


10. The rightmost LED (T.P.) is turned on when MF Controller starts BIC communication. If this LED blinks, there are some communication errors. The LED is turned off after the communication.



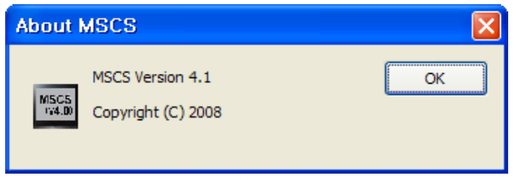
5.15. Orion PDP Home Page logon and Version information

• In order to move to Orion PDP's website, go to "Help" of menu bar → "OrionDisplay HomePage".



Orion PDP Home Page Logon

• Go to "Help" of menu bar → "About" to check MSCS.



Checking MSCS Version

6. MSCS Protocol

*"BIC" function is applicable only to MIS-4230/4230R.

1. Comport Configuration

1.Baudrate : 115200
2.Data Bits : 8
3.Parity : None
4.Stop Bits : 1
5.Flow Control : None

2. Protocol Form

■ Send To PDP

Command	PDP ID	Sub Command	Data	End
4byte	2byte	4byte	Variable	1byte

- Format sent from PC to PDP, only the selected ID("PDP ID") will correspond to the given command.

■ Receive From PDP

Command	PDP ID	Sub Command	Data	End
4byte	2byte	4byte	Variable	1byte

- A respond from PDP to PC, a respond format for certain commands. Not all commands have response.

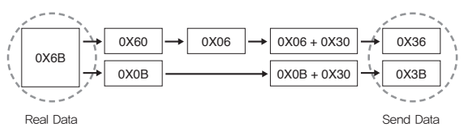
■ Sub Command

- Command code

■ Data fomat

- The format is 2byte dividing the Actual Data(1byte) into two, first 4bits("A") and second 4bits("B"), "B" adds 0x30, "A" shifts 4bit and add 0x30. The Send Data(1byte) becomes 2byte.

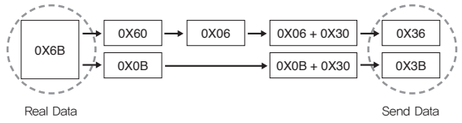
- 1byte



■ Receive From PDP

Receive From PDP	ASCII	k(0x6B)		N(0x4E)	
	HEX	0x36	0x3B	0x34	0x3E

- Starting code for Send Respond from PDP to P, fixed 4byte.
- Refer to the Data format shown in 6.1 Protocol Form.



3. Protocol Value

3.1 Command

■ Send To PDP

Send To PDP	ASCII	k(0x6B)		M(0x4D)	
	HEX	0x36	0x3B	0x34	0x3D

- Starting code for Send Command from PC to PDP, fixed 4byte.
- Refer to the Data format shown in 6.1 Protocol Form.

3.2 PDP ID

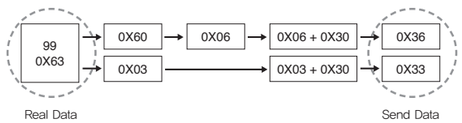
■ Format

- Send Data is 2byte, Refer to the Data format shown in 6.1 Protocol Form.

- Ex)

ID value	Hex value	Send ID value
“1”	0x01	0x30, 0x31
“10”	0x0A	0x30, 0x3A
“20”	0x14	0x31, 0x34
“99”	0x63	0x36, 0x33

- ID ="99" , example



- ID ="99", Coding Example

```
//=========================================
  PDP_ID = 99;                    // PDP_ID: 0x63
  ID[1] = ((PDP_ID)&0xF0)>>4)+0x30;   // ID[1]: 0x36
  ID[0] = (PDP_ID&0x0F)+0x30;         // ID[0]: 0x33
//=========================================
```

3.3 Sub Command

3.3.1 Multi Scale Control

■ Multi Scale Command

Multi Scale	ASCII	M(0x4D)		s(0x73)	
	HEX	0x34	0x3D	0x37	0x33

- MPDP Multi Scale command

3.3.2 PDP Control

■ Power Command

Power On	ASCII	R(0x52)		n(0x6E)	
	HEX	0x35	0x32	0x36	0x3E
Power Off	ASCII	R(0x52)		f(0x66)	
	HEX	0x35	0x32	0x36	0x36

- PDP Power On/Off command

■ Information OSD Command

Information OSD	ASCII	R(0x52)		I(0x49)	
	HEX	0x35	0x32	0x34	0x39

- Command to display current input Mode, Resolution on OSD.

■ Auto Power Command

Auto Power On	ASCII	R(0x52)		M(0x4D)	
	HEX	0x35	0x32	0x34	0x3D
Auto Power Off	ASCII	R(0x52)		m(0x6D)	
	HEX	0x35	0x32	0x36	0x3D

- Auto Power On: Enables Power On by connecting AC Power Supply even without Power On command.
- Auto Power Off: Enables Power On by connecting AC Power Supply and sending Power On command.

■ Input Source Command

Input Source Change DVI	ASCII	R(0x52)		i(0x69)	
	HEX	0x35	0x32	0x36	0x39
Input Source Change PC	ASCII	R(0x52)		p(0x70)	
	HEX	0x35	0x32	0x37	0x30
Input Source Change HD	ASCII	R(0x52)		t(0x74)	
	HEX	0x35	0x32	0x37	0x34
Input Source Change SD/DVD	ASCII	R(0x52)		d(0x64)	
	HEX	0x35	0x32	0x36	0x34
Input Source Change S-VIDEO	ASCII	R(0x52)		s(0x73)	
	HEX	0x35	0x32	0x37	0x33
Input Source Change VIDEO	ASCII	R(0x52)		v(0x76)	
	HEX	0x35	0x32	0x37	0x36

- Command for selecting Input Mode

■ Tracking Command

Auto Tracking	ASCII	R(0x52)		a(0x61)	
	HEX	0x35	0x32	0x36	0x31
Manual Tracking Frequency	ASCII	R(0x52)		F(0x46)	
	HEX	0x35	0x32	0x34	0x36
Manual Tracking Phase	ASCII	R(0x52)		P(0x50)	
	HEX	0x35	0x32	0x35	0x30
Manual Tracking Line Start	ASCII	R(0x52)		L(0x4C)	
	HEX	0x35	0x32	0x34	0x3C
Manual Tracking Pixel Start	ASCII	R(0x52)		X(0x58)	
		0x35	0x32	0x35	0x38

- Auto Tracking: Auto screen positioning command in Input Mode PC
- Manual Tracking: Manual screen positioning command in Inpuit Mode PC

■ Test Pattern Command

Test Pattern Red	ASCII	R(0x52)		5(0x35)	
	HEX	0x35	0x32	0x33	0x35
Test Pattern Green	ASCII	R(0x52)		6(0x36)	
	HEX	0x35	0x32	0x33	0x36
Test Pattern Blue	ASCII	R(0x52)		7(0x37)	
	HEX	0x35	0x32	0x33	0x37
Test Pattern White	ASCII	R(0x52)		8(0x38)	
	HEX	0x35	0x32	0x33	0x38
Return Screen	ASCII	R(0x52)		9(0x39)	
		0x35	0x32	0x33	0x39

- Test Pattern Command

■ APL Command

APL On	ASCII	R(0x52)		x(0x78)	
	HEX	0x35	0x32	0x37	0x38
APL Off	ASCII	R(0x52)		y(0x79)	
		0x35	0x32	0x37	0x39

- APL(Automatic Power Limit) On/Off

■ **PDP Tx Command**

PDP Tx Enable	**ASCII**	R(0x52)		H(0x48)	
	HEX	0x35	0x32	0x34	0x38
PDP Tx Disable	**ASCII**	R(0x52)		S(0x53)	
	HEX	0x35	0x32	0x35	0x33

- Enable: RS232 IC Output(Tx) within PDP
- Disable: RS232 IC Output(Tx) within PDP turns to High Impedance state

Caution

-Do not enable Tx of plural PDP sets at the same time when you control MPDP.
(Make sure only one set is enabled and the other sets are disabled. If plural sets are enabled, it may cause malfunction.)

■ **Software Reset Command**

Software Reset	**ASCII**	R(0x52)		R(0x52)	
	HEX	0x35	0x32	0x35	0x32

- Software Reset

■ **Position Command**

Position Up	**ASCII**	P(0x50)		u(0x75)	
	HEX	0x35	0x30	0x37	0x35
Position Down	**ASCII**	P(0x50)		d(0x64)	
	HEX	0x35	0x30	0x36	0x34
Position Left	**ASCII**	P(0x50)		l(0x6C)	
	HEX	0x35	0x30	0x36	0x3C
Position Right	**ASCII**	P(0x50)		r(0x72)	
	HEX	0x35	0x30	0x37	0x32
Position Reset	**ASCII**	P(0x50)		S(0x53)	
		0x35	0x30	0x35	0x33

- Component, SVIDEO, Composite Video Input screen positioning command

■ **Global Offset Command**

Global Offset On	**ASCII**	P(0x50)		L(0x4C)	
	HEX	0x35	0x30	0x34	0x3C
Global Offset Off	**ASCII**	P(0x50)		R(0x52)	
	HEX	0x35	0x30	0x35	0x32

- Command to enlarge the display considering the seam between two MPDP
- Global Offset On: To enhance the continuity between MPDPs, data for the Seam area is erased.

■ **Video Zoom Control Command**

Video Zoom Control	**ASCII**	P(0x50)		n(0x6E)	
	HEX	0x35	0x30	0x36	0x3E

- -Video Zoom: Default Level is "5", controllable within "1"~"9"

■ **Color Temp Command**

Normal Mode	**ASCII**	G(0x47)		N(0x4E)	
	HEX	0x34	0x37	0x34	0x3E
Studio Mode	**ASCII**	G(0x47)		O(0x4F)	
	HEX	0x34	0x37	0x34	0x3F

- Studio Mode: Sets to Colour Temperature approximately 3200K

■ **Firmware Default Command**

Firmware Default Load	**ASCII**	F(0x46)		1(0x31)	
	HEX	0x34	0x36	0x33	0x31

- Set values to default. Values before factory adjusting.

■ **Factory Data Command**

Factory Data Save	**ASCII**	F(0x46)		2(0x32)	
	HEX	0x34	0x36	0x33	0x32
Factory Data Load	**ASCII**	F(0x46)		3(0x33)	
	HEX	0x34	0x36	0x33	0x33

- Factory Data Save: Data Save after adjusting
- Factory Data Load: Load values of Factory Data

■ **User File Load Command**

User File Load	**ASCII**	F(0x46)		6(0x36)	
	HEX	0x34	0x36	0x33	0x36

- Read and Load Picture Control Data from saved file

- Reference - Application: Saved Picture Control Data is saved as a file as the figure adjusted by the user

* File Format: ***.dat
* Data Structure (31 byte ASCII Code)

User Mode	Brightness, Contrast, Sharpness, Color, Tint
White Balance	Gain R, Gain G, Gain B, Offset R, Offset G, Offset B
Device PC	Gain R, Gain G, Gain B, Offset R, Offset G, Offset B
Device DTV	Gain R, Gain G, Gain B, Offset R, Offset G, Offset B
Device DVD	Brightness, Contrast, Cr, Cb
Device VIDEO	Brightness, Contrast, Color, Tint

- Data save sequence: User Mode ~Device VIDEO

■ **IP Serial Set Command**

IP Serial Set	**ASCII**	F(0x46)		(0x02)	
	HEX	0x34	0x36	0x30	0x32

– Data saving sequence: User Mode ~Device VIDEO

■ **Elapsed Time(=RTC) Reset Command**

Elapsed Timer Reset	**ASCII**	F(0x46)		(0x07)	
	HEX	0x34	0x36	0x30	0x37

- Elapsed time Reset of IP

3.3.3 Get Data Control

■ **Get Data Command**

Get Data Tracking Manual	**ASCII**	R(0x52)		A(0x41)	
	HEX	0x35	0x32	0x34	0x31
Get Data PDP Current Status	**ASCII**	R(0x52)		C(0x43)	
	HEX	0x35	0x32	0x34	0x33
Get Data Total White Balance	**ASCII**	G(0x47)		T(0x54)	
	HEX	0x34	0x37	0x35	0x34
Get Data New Total White Balance	**ASCII**	G(0x47)		P(0x50)	
	HEX	0x34	0x37	0x35	0x30

- Command to read Data saved on EEPROM within the PDP

3.3.4 WhiteBalance Control

■ **Graphic User Mode Command**

Graphic User Mode Brightness	**ASCII**	G(0x47)		a(0x61)	
	HEX	0x34	0x37	0x36	0x31
Graphic User Mode Contrast	**ASCII**	G(0x47)		b(0x62)	
	HEX	0x34	0x37	0x36	0x32
Graphic User Mode Sharpness	**ASCII**	G(0x47)		c(0x63)	
	HEX	0x34	0x37	0x36	0x33
Graphic User Mode Color	**ASCII**	G(0x47)		d(0x64)	
	HEX	0x34	0x37	0x36	0x34
Graphic User Mode Tint	**ASCII**	G(0x47)		e(0x65)	
	HEX	0x34	0x37	0x36	0x35

- Command for controlling Brightness, Contrast, Sharpness, Color, Tint for PC and DTV

■ **Video User Mode Command**

Video User Mode Brightness	**ASCII**	V(0x56)		a(0x61)	
	HEX	0x35	0x36	0x36	0x31
Video User Mode Contrast	**ASCII**	V(0x56)		b(0x62)	
	HEX	0x35	0x36	0x36	0x32
Video User Mode Sharpness	**ASCII**	V(0x56)		c(0x63)	
	HEX	0x35	0x36	0x36	0x33
Video User Mode Color	**ASCII**	V(0x56)		d(0x64)	
	HEX	0x35	0x36	0x36	0x34
Video User Mode Tint	**ASCII**	V(0x56)		e(0x65)	
	HEX	0x35	0x36	0x36	0x35

- Command for controlling Brightness, Contrast, Sharpness, Color, Tint for Video

■ **White Balance Command**

White Balance Gain Red	**ASCII**	G(0x47)		A(0x41)	
	HEX	0x34	0x37	0x34	0x31
White Balance Gain Green	**ASCII**	G(0x47)		B(0x42)	
	HEX	0x34	0x37	0x34	0x32
White Balance Gain Blue	**ASCII**	G(0x47)		C(0x43)	
	HEX	0x34	0x37	0x34	0x33
White Balance Offset Red	**ASCII**	G(0x47)		E(0x45)	
	HEX	0x34	0x37	0x34	0x35
White Balance Offset Green	**ASCII**	G(0x47)		F(0x46)	
	HEX	0x34	0x37	0x34	0x36
White Balance Offset Blue	**ASCII**	G(0x47)		G(0x47)	
	HEX	0x34	0x37	0x34	0x37

- Command for controlling White Balance for DVI

■ **Graphic Data Command**

Graphic Data Gain Red	**ASCII**	G(0x47)		r(0x72)	
	HEX	0x34	0x37	0x37	0x32
Graphic Data Gain Green	**ASCII**	G(0x47)		s(0x73)	
	HEX	0x34	0x37	0x37	0x33
Graphic Data Gain Blue	**ASCII**	G(0x47)		t(0x74)	
	HEX	0x34	0x37	0x37	0x34
Graphic Data Offset Red	**ASCII**	G(0x47)		u(0x75)	
	HEX	0x34	0x37	0x37	0x35
Graphic Data Offset Green	**ASCII**	G(0x47)		v(0x76)	
	HEX	0x34	0x37	0x37	0x36
Graphic Data Offset Blue	**ASCII**	G(0x47)		w(0x77)	
	HEX	0x34	0x37	0x37	0x37

- Command for controlling White Balance for PC and DTV.

■ **Video Data Command**

Video Data Bright-ness	**ASCII**	V(0x56)		r(0x72)	
	HEX	0x35	0x36	0x37	0x32
Video Data Contrast	**ASCII**	V(0x56)		s(0x73)	
	HEX	0x35	0x36	0x37	0x33
Video Data Color	**ASCII**	V(0x56)		t(0x74)	
	HEX	0x35	0x36	0x37	0x34
Video Data Tint	**ASCII**	V(0x56)		u(0x75)	
	HEX	0x35	0x36	0x37	0x35
Video Data Cr	**ASCII**	V(0x56)		v(0x76)	
	HEX	0x35	0x36	0x37	0x36
Video Data Cb	**ASCII**	V(0x56)		w(0x77)	
	HEX	0x35	0x36	0x37	0x37

- Command for controlling White Balance for Video

3.3.5 BIC Control (MIS-4230/MIS-4230R)

■ **BIC Control Command**

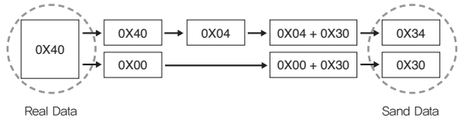
BIC Control	**ASCII**	B(0x42)		₩(0x5C)	
	HEX	0x34	0x32	0x35	0x3C

- BIC(Burn In Compensation) Control Command

3.4 Data

3.4.1 Send Data

※ Refer to the Data format shown in 6.1 Protocol Form.
- Ex) 0x40




```
//=============================================
  Data = 0x40;                          // Data: 0x40
  Data[1] = ((Data)&0xF0)>>4)+0x30;     // Data [1]: 0x34
  Data[0] = (Data &0x0F)+0x30;          // Data [0]: 0x30
//=============================================
```

■ **Multi Scale Data**

Send Multi Scale	**ASCII**	S(Source)		M(Width)		N(Height)		P(Position)	
	HEX	High Value	Low Value	High Value	Low Value	High Value	Low Value	High Value	Low Value

※ Source: Refer to the Input Source Command shown in 6.2 Protocol Value

- M, N, P

- Ex) Selecting 3x3 within MPDP 5x5

ID:1	ID:2	ID:3	ID:4	ID:5
ID:6	ID:7	ID:8	ID:9	ID:10
ID:11	ID:12	ID:13 **N:3, M:3** **P:1**	ID:14 **N:3, M:3** **P:2**	ID:15 **N:3, M:3** **P:3**
ID:16	ID:17	ID:18 **N:3, M:3** **P:4**	ID:19 **N:3, M:3** **P:5**	ID:20 **N:3, M:3** **P:6**
ID:21	ID:22	ID:23 **N:3, M:3** **P:7**	ID:24 **N:3, M:3** **P:8**	ID:25 **N:3, M:3** **P:9**

■ **Tracking Data**

Send Tracking Data	**ASCII**	(Value+127)	
	HEX	High Value	Low Value

■ **Video Zoom Data**

Video Zoom	**ASCII**	Value	
	HEX	High Value	Low Value

- Value(0~9):
0(0x30, 0x30), 1(0x30, 0x31), 2(0x30, 0x32), 3(0x30, 0x33), 4(0x30, 0x34), 5(0x30, 0x35), 6(0x30, 0x36), 7(0x30, 0x37), 8(0x30, 0x38), 9(0x30, 0x39)

■ **Factory Data Save & User File Load**

Send : 62byte Factory Data Save & User File Load	**HEX**	Data[0] ~ Data[9] : User Mode
		Data[10] ~ Data[21] : White Balance
		Data[22] ~ Data[33] : Graphic PC
		Data[34] ~ Data[45] : Graphic DTV
		Data[46] ~ Data[53] : Video DVD
		Data[54] ~ Data[61] : Video VIDEO

User Mode		Brightness, Contrast, Sharpness, Color, Tint
White Balance		Gain R, Gain G, Gain B, Offset R, Offset G, Offset B
Device Data	**Graphic PC**	Gain R, Gain G, Gain B, Offset R, Offset G, Offset B
	Graphic DTV	Gain R, Gain G, Gain B, Offset R, Offset G, Offset B
	DVD	Brightness, Contrast, Cr, Cb
	Video	Brightness, Contrast, Color, Tint,

■ **IP Serial Set Command**

IP Serial Set	**ASCII**	Data 1 ~ Data 8							
	HEX	Data 1	Data 2	Data 3	Data 4	Data 5	Data 6	Data 7	Data 8

– Ex)01234567 = 0x30, 0x31, 0x32, 0x33, 0x34, 0x35, 0x36, 0x37

■ **Graphic&Video Data**

Graphic & Video	**ASCII**	Value	
	HEX	High Value	Low Value

- White Balance value for PC and DTV

■ **BIC Local Data Get (MIS-4230/MIS-4230R)**

Send BIC Local Data	**ASCII**	Data 1		Data 2		Data 3	
	HEX	0x30	0x34	0x30	0x31	0x30	0x34

- Refer to BIC related document.

Data1	Data Size(8Bit, 16bit, 32bit) (Fixed as 32bit)	0x01: 8bit, 0x02: 16bit, 0x04: 32bit
Data2	Read(Get), Write(Set)	0x00: Write(Set), 0x01: Read(Get)
Data3	BIC Internal Address Access (Refer to BIC related documents)	0x04: BIC Local Data Access Address

■ **BIC Global Data Set (MIS-4230/MIS-4230R)**

Send BIC Global Data	**ASCII**	Data1		Data2		Data3		Data4
	HEX	0x30	0x34	0x30	0x30	0x30	0x38	8byte-LocalMax

- Refer to BIC related documents

Data1	Data Size(8Bit, 16bit, 32bit) (Fixed as 32bit)	0x01: 8bit, 0x02: 16bit, 0x04: 32bit
Data2	Read(Get), Write(Set)	0x00: Write(Set), 0x01: Read(Get)
Data3	BIC Internal Address Access (Refer to BIC related documents)	0x08: BIC Global Data Access Address
Data4	Determined by size of Data1. Fixed as 8byte Data.	Collects BIC Local Data and select Max value as BIC Global Data.

3.4.2 Receive Data

■ **Tracking Data**

Receive : 8byte Tracking Data	**HEX**	Data[0] ~ Data[1] : Frequence
		Data[2] ~ Data[3] : Phase
		Data[4] ~ Data[5] : LineStart
		Data[6] ~ Data[7] : PixelStart

- Manual Tracking Data

■ **PDP Current Status Data**

Receive : 38byte PDP Current Status	**HEX**	Data[0] ~ Data[1] : PDP ID
		Data[2] ~ Data[3] : Input Source
		Data[4] ~ Data[5] : Standard Table
		Data[6] ~ Data[7] : System Current Power
		Data[8] ~ Data[9] : BIC Mode
		Data[10] ~ Data[11] : Global Offset
		Data[12] ~ Data[13] : Color Temp
		Data[14] ~ Data[15] : Auto Power
		Data[16] ~ Data[21] : Firmware Version
		Data[22] ~ Data[23] : Video Zoom
		Data[24] ~ Data[31] : IP Serial Number
		Data[32] ~ Data[37] : Elapsed Time

Refer to the Data format shown in 6.1 Protocol Form.

Index	Length	Note		
PDP ID	2byte	"1" : 0x30,0x31, "10" : 0x30,0x3A, "99" : 0x36,0x33		
Input Source	2byte	"14" : DVI "12" : PC	"13" : DTV "7" : DVD	"5" : SVIDEO "2" : VIDEO
Standard Table	2byte	"1" : 640x480x60 "2" : 640x480x85 "3" : 800x600x56 "4" : 800x600x60 "5" : 800x600x75 "6" : 800x600x85 "7" : 853x480x60 "8" : 1024x768x60 "9" : 1024x768x70 "10" :1024x768x75 "11" :1024x768x85 "12" :1280x768x60	"13" :1280x960x60 "14" :1280x1024x60 "15" :1366x768x60 "16" :1600x1200x60 "17" :1400x1050x60 "18" :1706x960x60 "19" : PC_1080ix60 "20" : PC_720Px60 "22" : PC_720Px50 "23" : PC_576Px50 "24" : PC_480Px60	"25" : 1920x1080ix60 "26" : 1920x1080ix50 "27" : 1280x720Px60 "28" : 1280x720Px50 "29" : PAL "30" : SECAM "31" : PALP "32" : NTSC "33" : NTSCP "34" : Artificial "35" : Unknown "36" : NoSignal
System Power	2byte	"0" : Off, "1" : On		
BIC Mode	2byte	"0" : Off, "1" : On		
Global Offset	2byte	"0" : Off, "1" : On		
Color Temp	2byte	"0" : Normal Mode, "1" : Studio Mode		
Auto Power	2byte	"0" : Off, "1" : On		
Firmware Version	6byte	Ex) version: 123456 0x31,0x32,0x33,0x34,0x35,0x36		
Video Zoom	2byte	"0": Off, "1": On		
IP Serial Number	8byte	Ex) version:"12345678" 0x31,0x32,0x33,0x34,0x35,0x36,0x37,0x38		
Elapsed Time	6byte	Ex) version:"123456" 0x31,0x32,0x33,0x34,0x35,0x36		

■ **White Balance Data**

Receive : 34byte White Balance Data	**HEX**	Data[0] ~ Data[9] : User Mode
		Data[10] ~ Data[21] : White Balance
		Data[22] ~ Data[33] : Device Data

User Mode		Brightness, Contrast, Sharpness, Color, Tint
White Balance		Gain R, Gain G, Gain B, Offset R, Offset G, Offset B
Device Data	**Graphic**	Gain R, Gain G, Gain B, Offset R, Offset G, Offset B
	Video	Brightness, Contrast, Color, Tint, Cr, Cb

■ **new White Balance Data**

Receive : 62byte Firmware Version	**HEX**	Data[0] ~ Data[9] : User Mode
		Data[10] ~ Data[21] : White Balance
		Data[22] ~ Data[33] : Device PC
		Data[34] ~ Data[45] : Device DTV
		Data[46] ~ Data[53] : Device DVD
		Data[54] ~ Data[61] : Device S-VIDEO or VIDEO

User Mode		Brightness, Contrast, Sharpness, Color, Tint
White Balance		Gain R, Gain G, Gain B, Offset R, Offset G, Offset B
Device Data	**Graphic PC**	Gain R, Gain G, Gain B, Offset R, Offset G, Offset B
	Graphic DTV	Gain R, Gain G, Gain B, Offset R, Offset G, Offset B
	DVD	Brightness, Contrast, Cr, Cb
	Video	Brightness, Contrast, Color, Tint,

■ **BIC Global Data Set (MIS-4230/MIS-4230R)**

Read BIC Local Data	**ASCII**	Data1		Data2		Data3		Data4
	HEX	0x30	0x34	0x30	0x31	0x30	0x34	8byte-LocalMax

Data1	Data Size(8Bit, 16bit, 32bit) (Fixed as 32bit)	0x01: 8bit, 0x02: 16bit, 0x04: 32bit
Data2	Read(Get), Write(Set)	0x00: Write(Set), 0x01: Read(Get)
Data3	BIC Internal Address Access (Refer to BIC related document)	0x04: BIC Local Data Access Address
Data4	Size determined by Data1Size. Fixed as 8byte Data	

3.5 End

■ **End**

End : 1byte	0x0d

- Shows the end of Protocol

4. Protocol Example

4.1 Send Command

4.1.1 Multi Scale Control

■ **Multi Scale Command**

(PDP ID = 3, Source = PC, Configuration = 2x2)

Multi Scale (19byte)	**Command**		**PDP ID**	**Sub Command**	
	0x36 0x3B 0x34 0x3D		0x30 0x33	0x34 0x3D 0x37 0x33	
	Data				**End**
	Source	**Width**	**Height**	**Position**	
	0x37 0x30	0x30 0x32	0x30 0x32	0x30 0x33	0x0d

Index	Converted Data	Send Data
Command		0x36, 0x3B, 0x34, 0x3D
PDP ID	"3": 0x30, 0x33	0x30, 0x33
Sub Command		0x34, 0x3D, 0x37, 0x33
Source	PC(0x70): 0x37, 0x30	0x37, 0x30
Width	"2": 0x32, 0x32	0x30, 0x32
Height	"2": 0x32, 0x32	0x30, 0x32
Position	ID is "3", so position value "3": 0x30, 0x33	0x30, 0x33

4.1.2 PDP Control

■ **Power On Command (PDP ID = 1)**

Power On (11byte)	**Command**	**PDP ID**	**Sub Command**	**End**
	0x36 0x3B 0x34 0x3D	0x30 0x31	0x35 0x32 0x36 0x3E	0x0d

Index	Converted Data	Send Data
Command		0x36, 0x3B, 0x34, 0x3D
PDP ID	"1": 0x30, 0x31	0x30, 0x31
Sub Command		0x35, 0x32, 0x36, 0x3E

4.1.3 Get Data Control

■ **Get WhiteBalance Version Command(PDP ID = 1)**

Get White Balance (11byte)	**Command**	**PDP ID**	**Sub Command**	**End**
	0x36 0x3B 0x34 0x3D	0x30 0x31	0x34 0x37 0x35 0x34	0x0d

Index	Converted Data	Send Data
Command		0x36, 0x3B, 0x34, 0x3D
PDP ID	"1": 0x30, 0x31	0x30, 0x31
Sub Command		0x34, 0x37, 0x35, 0x34

4.1.4 WhiteBalance Control

■ **Graphic Data Brightness Command (PDP ID = 1, Data = 50)**

Graphic Data Brightness (17byte)	**Command**	**PDP ID**	**Sub Command**	
	0x36 0x3B 0x34 0x3D	0x30 0x31	0x34 0x37 0x35 0x34	
	Data			**End**
	0x33 0x32			0x0d

Index	Converted Data	Send Data
Command		0x36, 0x3B, 0x34, 0x3D
PDP ID	"1": 0x30, 0x31	0x30, 0x31
Sub Command		0x34, 0x37, 0x36, 0x31
Data	"50"(0x32): 0x33, 0x32	0x33, 0x32

4.1.5 BIC Control (MIS-4230/MIS-4230R)

■ **BIC Local Data Send Command (PDP ID = 1)**

BIC Local Data (17byte)	**Command**	**PDP ID**	**Sub Command**	
	0x36 0x3B 0x34 0x3D	0x30 0x31	0x34 0x32 0x35 0x3C	
	Data			**End**
	0x30 0x34 0x30 0x31 0x30 0x34			0x0d

Index	Converted Data	Send Data
Command		0x36, 0x3B, 0x34, 0x3D
PDP ID	"1": 0x30, 0x31	0x30, 0x31
Sub Command		0x34, 0x32, 0x35, 0x3C
Data		0x30, 0x34, 0x30, 0x31, 0x30, 0x34

4.2 Receive Command

4.2.1BIC Control (MIS-4230/MIS-4230R)

■ **BIC Local Data Receive Command (PDP ID = 1)**

BIC Local Data (25byte)	**Command**	**PDP ID**	**Sub Command**	
	0x36 0x3B 0x34 0x3E	0x30 0x31	0x34 0x32 0x35 0x3C	
	Data			**End**
	0x30 0x34 0x30 0x31 0x30 0x34		Receive 8 byte	0x0d

Index	Converted Data	Send Data
Command		0x36, 0x3B, 0x34, 0x3D
PDP ID	"1": 0x30, 0x31	0x30, 0x31
Sub Command		0x34, 0x32, 0x35, 0x3C
Data		0x30, 0x34, 0x30, 0x31, 0x30, 0x34

※Attachment : ASCII to HEX Conversion Table

ASCII	HEX	ASCII	HEX	ASCII	HEX	ASCII	HEX	ASCII	HEX	ASCII	HEX	ASCII	HEX
Esc	1B	,	2C	;	3B	J	4A	Y	59	h	68	w	77
CR	0D	-	2D	<	3C	K	4B	Z	5A	i	69	x	78
LF	0A	.	2E	=	3D	L	4C	[	5B	j	6A	y	79
Space	20	/	2F	>	3E	M	4D	\	5C	k	6B	z	7A
!	21	0	30	?	3F	N	4E	]	5D	l	6C	{	7B
“	22	1	31	@	40	O	4F	^	5E	m	6D	I	7C
#	23	2	32	A	41	P	50	-	5F	n	6E	}	7D
$	24	3	33	B	42	Q	51	`	60	o	6F	~	7E
%	25	4	34	C	43	R	52	a	61	p	70	DEL	7F
&	26	5	35	D	44	S	53	b	62	q	71		
'	27	6	36	E	45	T	54	c	63	r	72		
(	28	7	37	F	46	U	55	d	64	s	73		
)	29	8	38	G	47	V	56	e	65	t	74		
*	2A	9	39	H	48	W	57	f	66	u	75		
+	2B	:	3A	I	49	X	58	g	67	v	76		

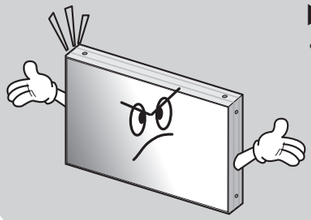
※Hex code value according to Set ID (MPDPD 5X5)

ID 1 id[0] = 0x30 id[1] = 0x31	**ID 2** id[0] = 0x30 id[1] = 0x32	**ID 3** id[0] = 0x30 id[1] = 0x33	**ID 4** id[0] = 0x30 id[1] = 0x34	**ID 5** id[0] = 0x30 id[1] = 0x35
ID 6 id[0] = 0x30 id[1] = 0x36	**ID 7** id[0] = 0x30 id[1] = 0x37	**ID 8** id[0] = 0x30 id[1] = 0x38	**ID 9** id[0] = 0x30 id[1] = 0x39	**ID 10** id[0] = 0x30 id[1] = 0x3A
ID 11 id[0] = 0x30 id[1] = 0x3B	**ID 12** id[0] = 0x30 id[1] = 0x3C	**ID 13** id[0] = 0x30 id[1] = 0x3D	**ID 14** id[0] = 0x30 id[1] = 0x3E	**ID 15** id[0] = 0x30 id[1] = 0x3F
ID 16 id[0] = 0x31 id[1] = 0x30	**ID 17** id[0] = 0x31 id[1] = 0x31	**ID 18** id[0] = 0x31 id[1] = 0x32	**ID 19** id[0] = 0x31 id[1] = 0x33	**ID 20** id[0] = 0x31 id[1] = 0x34
ID 21 id[0] = 0x31 id[1] = 0x35	**ID 22** id[0] = 0x31 id[1] = 0x36	**ID 23** id[0] = 0x31 id[1] = 0x37	**ID 24** id[0] = 0x31 id[1] = 0x38	**ID 25** id[0] = 0x31 id[1] = 0x39

7. Other tips

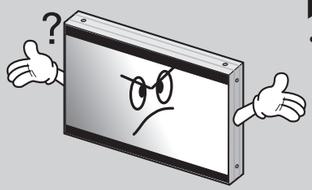
7.1. Before calling for service

Before calling for any repair, check the following and then refer to a near A/S center.



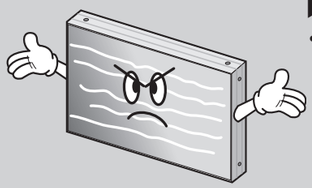
▶"Tick" sound from the main body.

- If there is no problem with the screen or sound, the “tick” sound is likely to result from the cabinet lightly shrinking with the change of room temperature. The sound does not affect product’s performance.



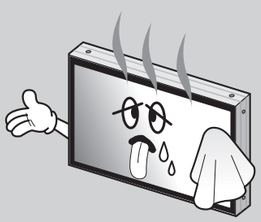
▶No image at upper and lower part of the screen.

- As for a screen which is over 16:9 in width (such as cinema-sized one), no image may be displayed at upper and bottom part of the screen.



▶Speckles or white lines on the screen

- Check whether the problem is caused by vehicle, streetcar, high-voltage cable or neon sign, which emitting interference wave or electromagnetic induction. Avoid any interfering object.

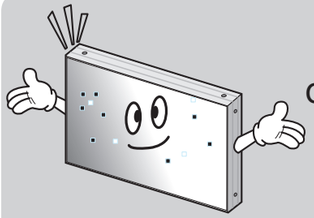


▶Screen or a PDP Set is hot

- PDP sets or screen can be hot, because basic principle of PDP driving is Plasma discharge between electrodes.
- It is not a defect or a malfunction of the product, you may continue to use the product.

7.2. About Plasma display panel

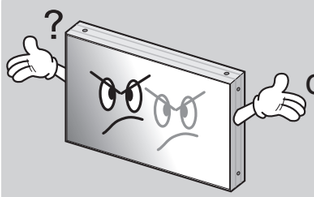
The followings are phenomena caused by characteristics of the plasma display panel.
Since it is not a fault, you may continue to use the product.



Caution

▶Black or twinkling spots on the screen

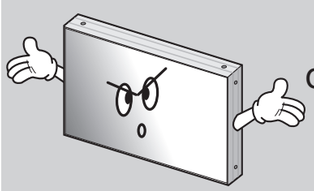
- Although the plasma display panel is manufactured with high-precision technology, there may exist black or twinkling spots on the screen. Since it is not a fault, you may continue to use the product.



Caution

▶Burn-In effect

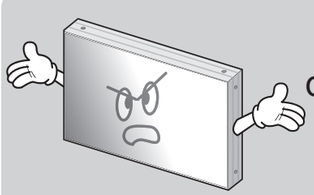
- Displaying static images such as still video frames or computer screen images for an extended period of time may cause burn-in effect. The burn-in effect may be gradually reduced by displaying full white pattern.
- However, please always be careful in using static images on this product, because such burn-in effect may cause permanent damages in some cases.



Caution

▶Noise from the inside

- When you turn on the product slight buzzing sound may be heard from the rear of display panel. Since it is not a fault, you may continue to use the product.



Caution

▶Screen decolorization

- Optical film that is attached on the panel can be slightly decolorized after long time of use. The degree of decolorization may vary depending on display contents and conditions.
  It is due to the characteristics of the film, but it is not a defect.
  (It is caused by chemical characteristics of the film.)

8. Applicable signals

8.1. DVD / DTV

Input Signal		Resolution	Remarks
DVD	480i	720 x 480	
	480p	720 x 480	
	576i	720 x 576	
	576p	720 x 576	
DTV	720p	1280 x 720	
	1080i	1920 x 1080	

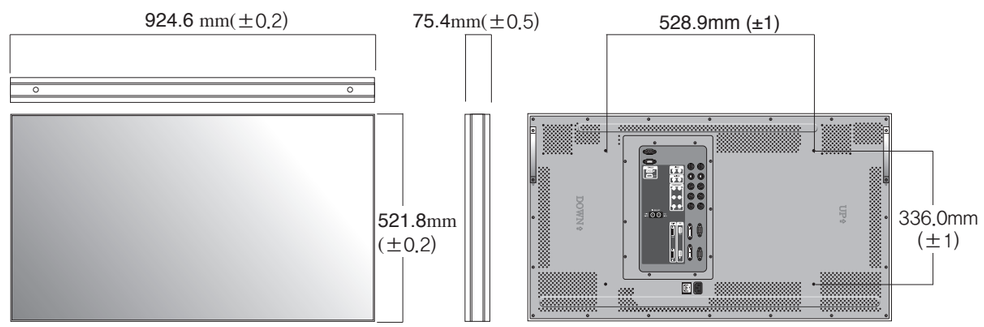
8.2. PC & DVI

- When you select PC for input source, it does not support DTV signal.

Resolution	V-Freq. (Hz)	H-Freq. (KHz)	Remarks
800 x 600	50	30.99	VESA CVT
800 x 600	60	37.88	VESA DMT
853 x 480	50	31.50	ORION
853 x 480	60	31.50	VESA DMT
1024 x 768	60	48.36	
1280 x 768	60	47.69	VESA CVT
1400 x 1050	60	65.317	
1280 x 960	60	60.00	VESA DMT
1280 x 1024	50	52.67	VESA CVT
1280 x 1024	60	63.97	VESA DMT
1360 x 768	50	39.56	VESA CVT
1360 x 768	60	47.71	VESA DMT
1600 x 900	50	46.39	VESA CVT
1600 x 900	60	55.99	VESA CVT
1600 x 1200	50	61.79	VESA CVT
1600 x 1200	60	75.00	VESA DMT
1706 x 960	60	59.57	

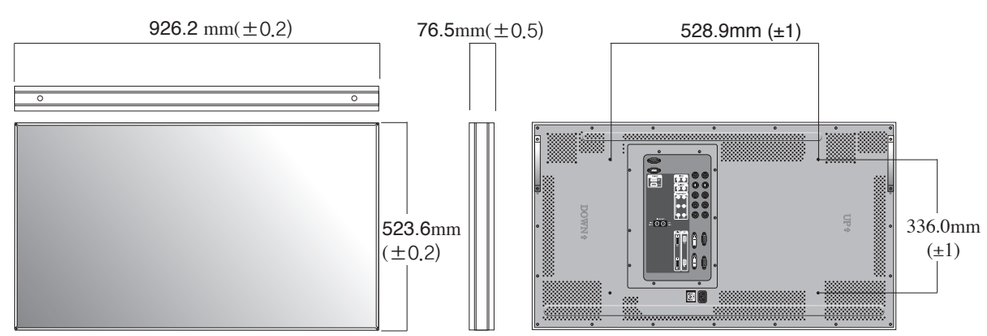
9. Specifications

Model Name		MIS-4220	
Power supply		100 ~ 240V AC. 50/60Hz	
Power consumption			
	Average (Typical)	300W	
	Max	360W	
Plasma display panel		42 inch, 16:9 Aspect Ratio	
	Contrast ratio	10,000 :1 (Dark Room)	
	Brightness	1,000 cd/㎡ (W/O Film)	
Front filter		AGAR (Anti Glare Anti Reflection)	
Number of pixels		853(H) X 480(V)	
Seam gap (In case of multi formation)		4mm	
Environmental condition			
	Temperature	0° C~ 35° C	
	Humidity	20% ~ 70%	
Signal			
	Video signal	NTSC, PAL, SECAM	
	PC signal	SVGA, WVGA, XGA, SXGA, WXGA, UXGA	
	Frequency	Horizontal Frequency 15.5 ~75kHz Vertical Frequency 50/60Hz	
Connectors		Input	Output
	Video	CVBS : BNC 1pin	Same as left side
		S-Video : DIN 4pin	
	Component	Y, Pb, Pr : BNC 3pin	
	PC	PC RGB : D-Sub 15pin	
	DVI	TMDS : DVI-D 24pin	
	Serial	RS-232C D-Sub 9pin(female)	RS-232C D-Sub 9pin (male)
External dimension		924.6mm[W] X 521.8mm[H] X75.4mm[D]	
Weight		25kg (±1kg)	



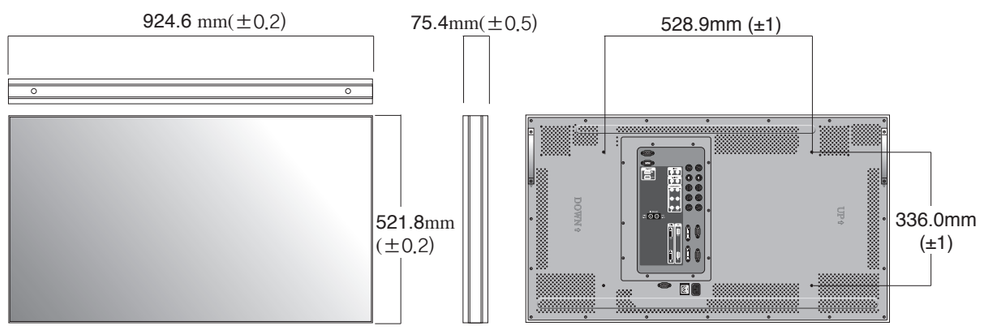
※Product design and specification can be changed for quality improvement without prior notice.

Model Name		MIS-4220R	
Power supply		100 ~ 240V AC. 50/60Hz	
Power consumption			
	Average (Typical)	300W	
	Max	360W	
Plasma display panel		42 inch, 16:9 Aspect Ratio	
	Contrast ratio	10,000 :1 (Dark Room)	
	Brightness	1,000 cd/㎡ (W/O Film)	
Front filter		AGAR (Anti Glare Anti Reflection)	
Number of pixels		853(H) X 480(V)	
Seam gap (In case of multi formation)		5mm	
Environmental condition			
	Temperature	0° C~ 35° C	
	Humidity	20% ~ 70%	
Signal			
	Video signal	NTSC, PAL, SECAM	
	PC signal	SVGA, WVGA, XGA, SXGA, WXGA, UXGA	
	Frequency	Horizontal Frequency 15.5 ~75kHz Vertical Frequency 50/60Hz	
Connectors		Input	Output
	Video	CVBS : BNC 1pin	Same as left side
		S-Video : DIN 4pin	
	Component	Y, Pb, Pr : BNC 3pin	
	PC	PC RGB : D-Sub 15pin	
	DVI	TMDS : DVI-D 24pin	
	Serial	RS-232C D-Sub 9pin(female)	RS-232C D-Sub 9pin (male)
External dimension		926.2mm[W] X 523.6mm[H] X76.5mm[D]	
Weight		25kg (±1kg)	



※Product design and specification can be changed for quality improvement without prior notice.

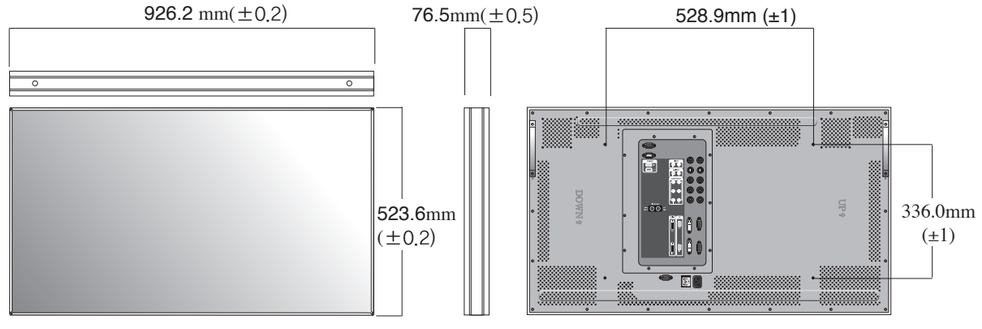
Model Name		MIS-4230	
Power supply		100 ~ 240V AC. 50/60Hz	
Power consumption			
	Average (Typical)	300W	
	Max	360W	
Plasma display panel		42 inch, 16:9 Aspect Ratio	
	Contrast ratio	10,000 :1 (Dark Room)	
	Brightness	1,000 cd/㎡ (Without film & BIC)	
Burn-in effect		Burn-In Compensation (BIC)	
Front filter		AGAR (Anti Glare Anti Reflection)	
Number of pixels		853(H) X 480(V)	
Seam gap (In case of multi formation)		4mm	
Environmental condition			
	Temperature	0° C~ 35° C	
	Humidity	20% ~ 70%	
Signal			
	Video signal	NTSC, PAL, SECAM	
	PC signal	SVGA, WVGA, XGA, SXGA, WXGA, UXGA	
	Frequency	Horizontal Frequency 15.5 ~75kHz Vertical Frequency 50/60Hz	
Connectors		Input	Output
	Video	CVBS : BNC 1pin	Same as left side
		S-Video : DIN 4pin	
	Component	Y, Pb, Pr : BNC 3pin	
	PC	PC RGB : D-Sub 15pin	
	DVI	TMDS : DVI-D 24pin	
	Serial	RS-232C D-Sub 9pin(female)	RS-232C D-Sub 9pin (male)
External dimension		924.6mm[W] X 521.8mm[H] X75.4mm[D]	



Weight	25kg (±1kg)

※Product design and specification can be changed for quality improvement without prior notice.

Model Name		MIS-4230R	
Power supply		100 ~ 240V AC. 50/60Hz	
Power consumption			
	Average (Typical)	300W	
	Max	360W	
Plasma display panel		42 inch, 16:9 Aspect Ratio	
	Contrast ratio	10,000 :1 (Dark Room)	
	Brightness	1,000 cd/㎡ (Without film & BIC)	
Burn-in effect		Burn-In Compensation (BIC)	
Front filter		AGAR (Anti Glare Anti Reflection)	
Number of pixels		853(H) X 480(V)	
Seam gap (In case of multi formation)		5mm	
Environmental condition			
	Temperature	0° C~ 35° C	
	Humidity	20% ~ 70%	
Signal			
	Video signal	NTSC, PAL, SECAM	
	PC signal	SVGA, WVGA, XGA, SXGA, WXGA, UXGA	
	Frequency	Horizontal Frequency 15.5 ~75kHz Vertical Frequency 50/60Hz	
Connectors		Input	Output
	Video	CVBS : BNC 1pin	Same as left side
		S-Video : DIN 4pin	
	Component	Y, Pb, Pr : BNC 3pin	
	PC	PC RGB : D-Sub 15pin	
	DVI	TMDS : DVI-D 24pin	
	Serial	RS-232C D-Sub 9pin(female)	RS-232C D-Sub 9pin (male)
External dimension		926.2mm[W] X 523.6mm[H] X76.5mm[D]	



Weight	25kg (±1kg)

※Product design and specification can be changed for quality improvement without prior notice.