SICP User Manual

[NSV -Series]

Before operating the unit, please read this manual thoroughly, and retain it for future reference

◆ SICP (Serial Interface Communication Protocol)

This document defines all the command and messages exchanged between the Master (a PC or the other controller) and the Slave (the displays).
It also describes the ways to send or read the commands or the messages.

1. Protocol definition

SICP stands for "Serial Interface Communication Protocol".
The protocol is specifically designed to allow data communication in half duplex multi-point environments, but it can also be used for half duplex point-to-point RS-232C communication.

2. Communication characteristics

A half duplex communication is implemented starting from the concept of a master-slave structure, where the display is the slave.
The first action is always taken by the master, which can be either a PC or any controlling device (acting as server) interfaced to the monitor. After sending a command or a request in the appropriate format the master receives from the slave an acknowledgement, which tells the transmitter whether the command is not valid (or not executable, anyway) or it is accepted. In case of a request, the requested information is sent back and it becomes the acknowledgement by itself.

3. How to connect a external equipment

Female Pin number   Male Pin number
2 <---> 2
3 <---> 3
5 <---> 5

4. Hardware Protocol

Baud rate : 9600 bps
Data bits : 8 bit
Parity bits : None
Stop bits : 1 bit
Handshake : None

Introduction

This manual booklet describes how to manage and utilize the product (Video Wall set) through remote control via RS232 protocol. This will introduce SICP V3.01 (Software that enables you to control the Video Wall via serial) and various applications will be possible with this software. As per different way of customizing, the functions and specifications of each product may vary.

Notice: Please extract VBRunTimesR7.zip and install the program on VISTA, WIN7/8/10 before installing SICP.
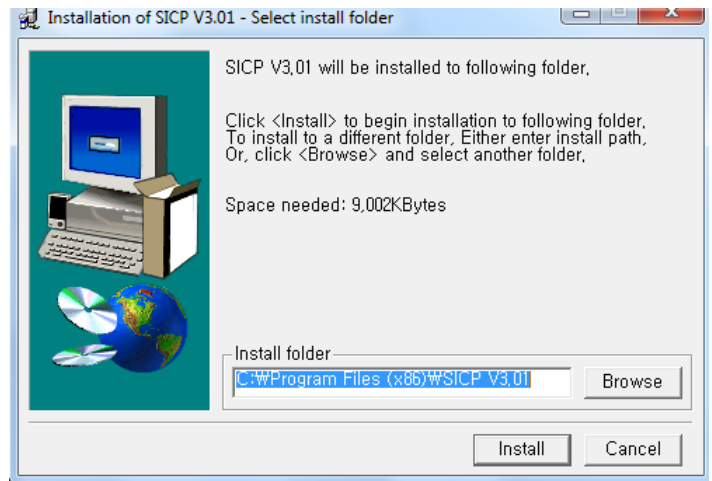
Installing SICP V3.01

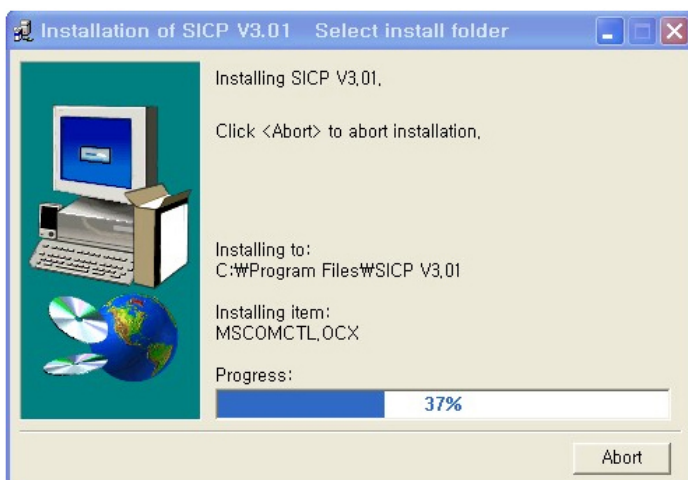Run the file named "**SICP 301GPOSet up.exe"** and follow the instruction below.
If you have SICP program installed previously, delete the previous one and re-install the new one.
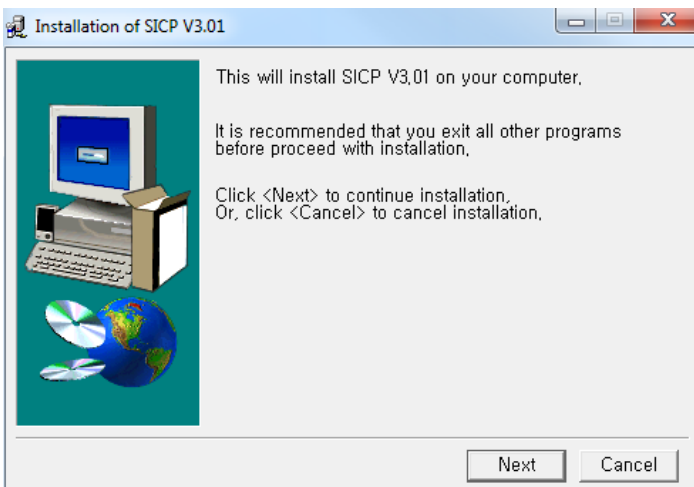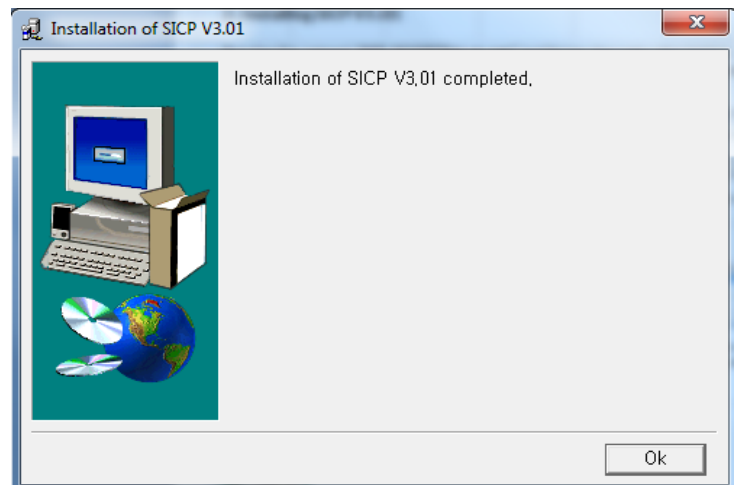
Press "Next"

Select the folder in which you wish to save the file.
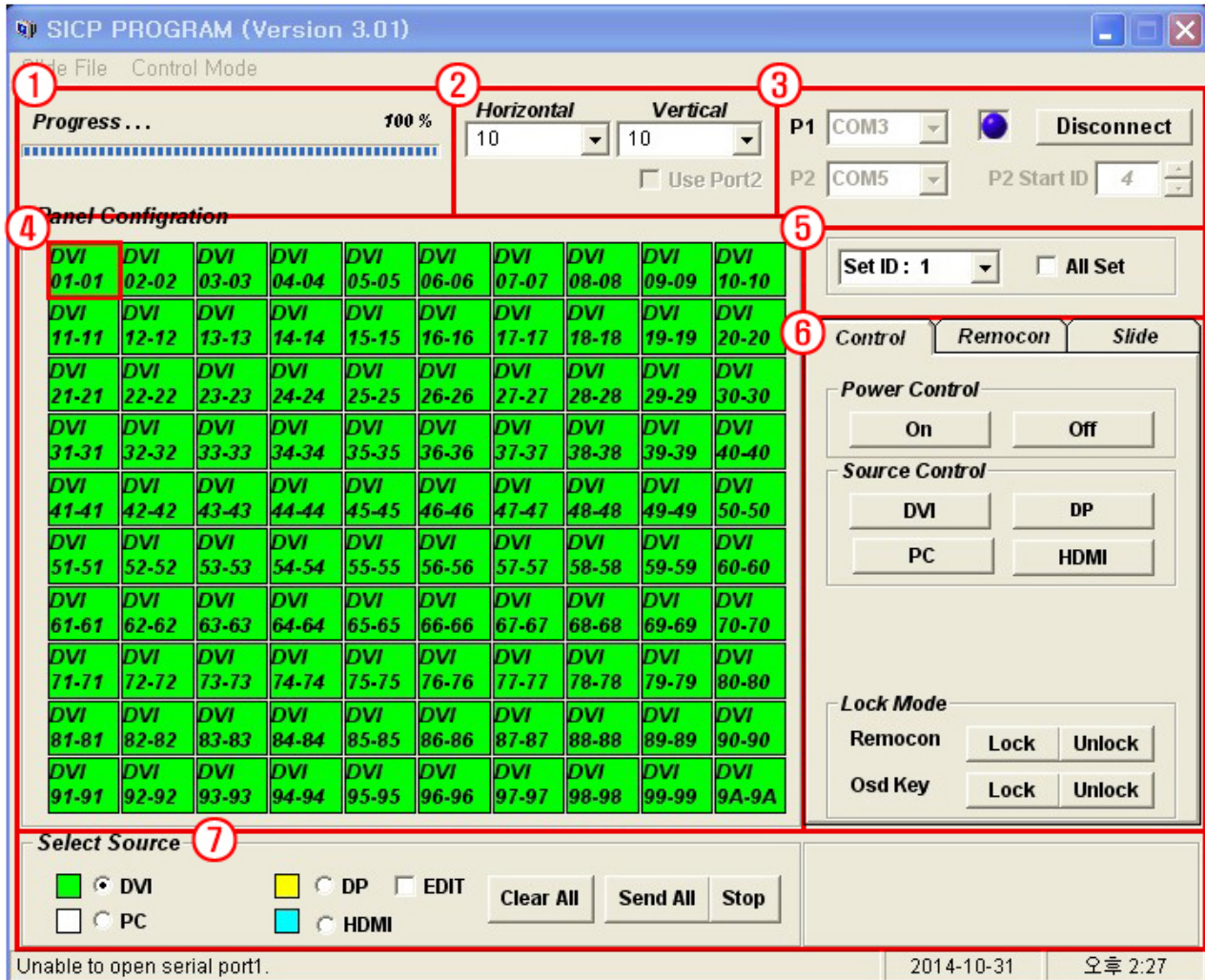Press "Install" after selecting the desired folder.

Wait until the installation is complete.

Once installation is complete, go to "Start" Menu ->
Programs -> SICP V4.01 to run the program

Running SICP V3.01 and Structure

Go to "Start" Menu -> Programs -> SICP V3.01 to run the program.

1. Progress Bar: Shows the status of RS-232 communication
2. Horizontal & Vertical: Select Horizontal & Vertical count of sets in array.
3. Communication: Select the COM Port connected to the PC.
4. Panel Configuration: Indicates information such as display configuration, source, Set ID and display sequence number.
5. Set ID: Shows the Set ID selected for control.
6. Control Button: Set of control buttons/functions.
7. Edit tools: Set of editing tools.

Connect & Disconnect

- Users can connect RS-232 input and control from your PC using an RS232 Cable.
- Select the Port into which PC is connected (refer to ③ in the image on previous page) and click "connect" button.

  If connected properly, the indicator in box ④ will turn BLUE (from RED). If not connected properly, one of the following messages will appear:

  *"Unable to open serial port": The port may not be available on your PC, or another program may be running under this port.

  *"Cannot connect with Easy DID System": RS232 Cable may not be connected properly or Set ID may be incorrect. Re-check on Set ID.

Multi-vision Control

Users can control each display separately. First, select the display you wish to control by selecting Set ID. You may click on it (Refer to box ④ in the image on the previous page) or select it from the drag-down menu (Refer to ⑤ in the image on the previous page). Users may conduct the following functions on the selected set:

1) Basic Control
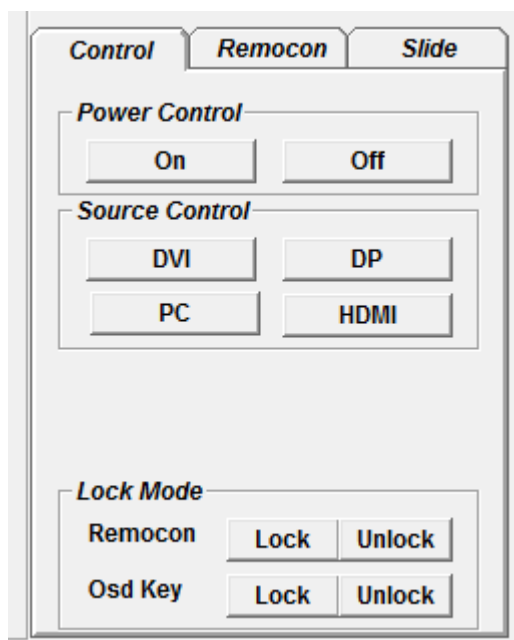
- Select "Control" Tab as shown to the left

Power Control: Powers the Set On/Off
Source Control: Selects Source
Sound Mute: Turns Mute On/Off
Lock Mode: Locks or unlocks the IR/control key.

2) Virtual Remocon (Remote Controller)
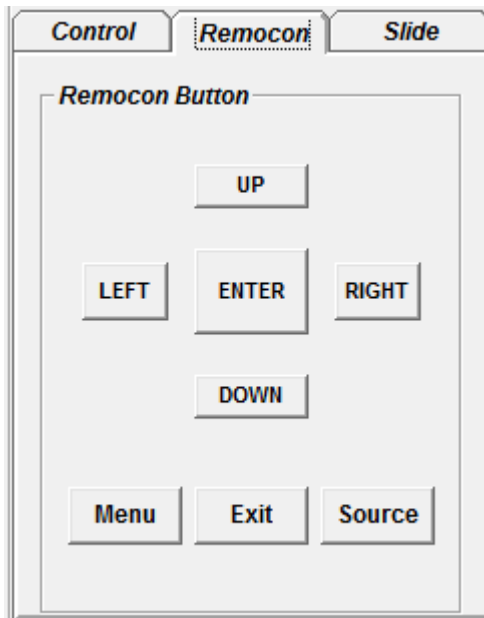
- Select the "Remocon" Tab as shown to the left.

- This virtual remote controller controls sets (displays) via RS-232 in the same manner that a physical remote controller would.

Note: Functions in Slide Tab will be described in "6. Slide Function"

3) Color Setting
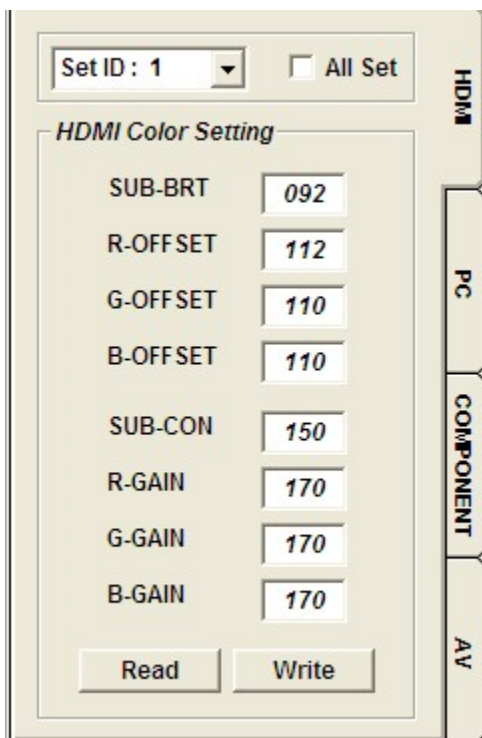
- Users may access the "Color Setting" mode only after entering Supervisor Mode. In order to enter Supervisor mode, go to "Control Mode" in the toolbar (top) and select "Setting Mode"

- Hot key: Ctrl+F2.
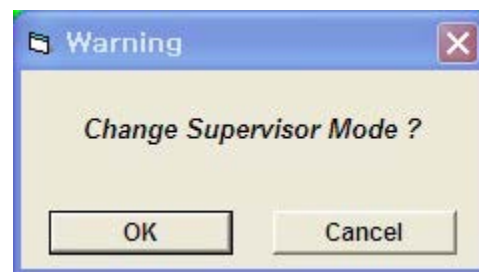
- Click "OK"
- Adjust color values (0~255). The color will be optimized during production & Quality Assurance. Adjusting color values is not recommended without prior consultation with GPO US.

4) Edge Setting
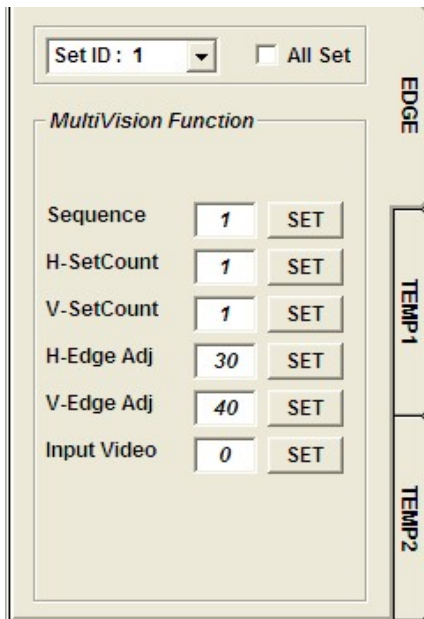
- Users can access "Edge Setting" only if after entering Supervisor Mode. In order to enter Supervisor mode, go to "Control Mode" in the tool bar (top) and select "Setting Mode"

  - Hot key: Ctrl+F3.
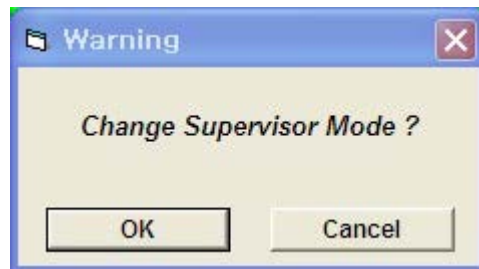
- Click "OK"
- Commands are writable only (not readable).

<OSD Menu>
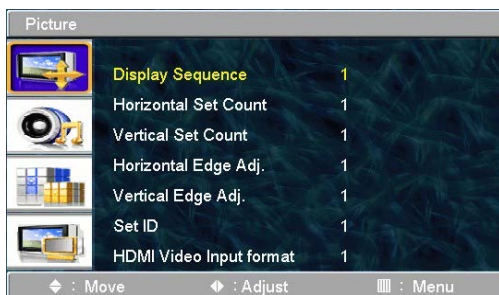
< Others >
- **Display Sequence**: position of display within context of the array (example below)
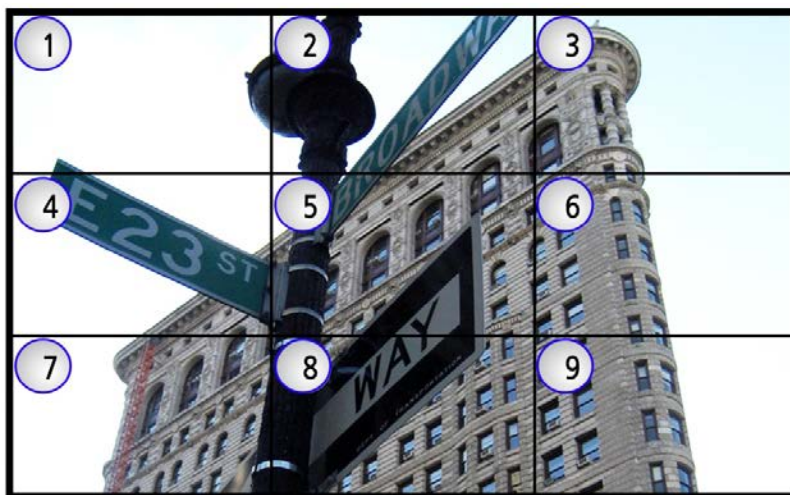
- H-Set Count (Horizontal Set Count): Number of displays in array horizontally (counting left-to-right)
E.g. Diagram of array on previous page shows H-Set Count of "3"

V-Set Count (Vertical Set Count):): Number of displays in array vertically (counting top-to-bottom)
E.g. Diagram of array on previous page shows V-Set Count of "3"

- H-Edge Adj (Horizontal Edge Adjust): Set the horizontal gap between displays in Video Wall (value range: 0~200)

- V-Edge Adj (Vertical Edge Adjust): Set the vertical gap of displays in Video Wall (0~200)
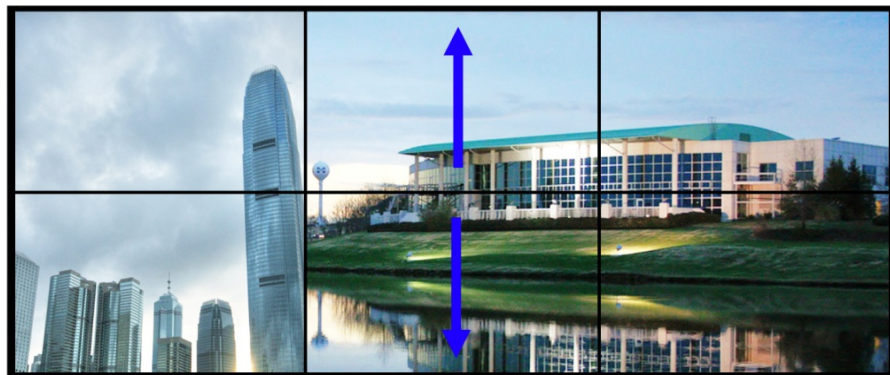
- HDMI Video Input format: Select video format of HDMI input data
0: RGB444
1: YPbPr444
2: YPbPr422

*HDMI Video Input format issues often manifest themselves in the form of a magenta/pink tint on display panels. If this issue arises, check the type of source being used. If, for example, a Blu-Ray player is being used, the HDMI Input Format on the displays must be set to "1" (default value is "0").
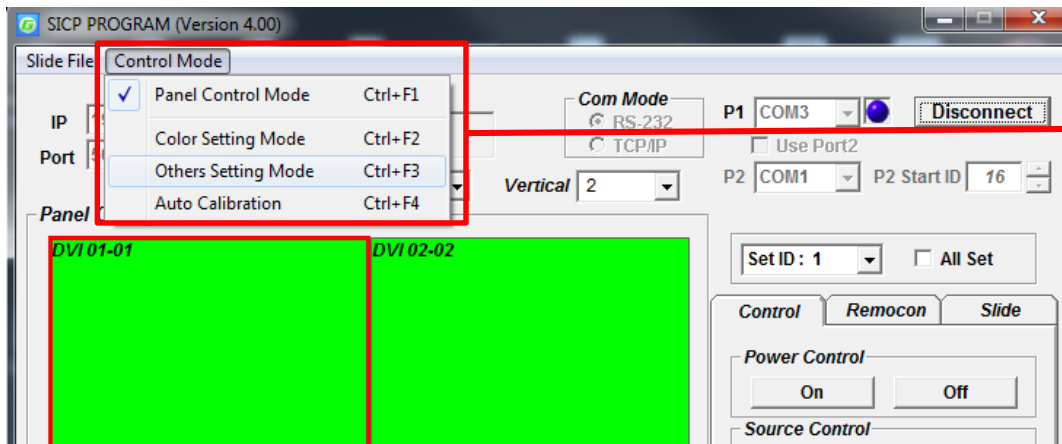
1. Click "Control Mode"
2. Select "Other setting" mode
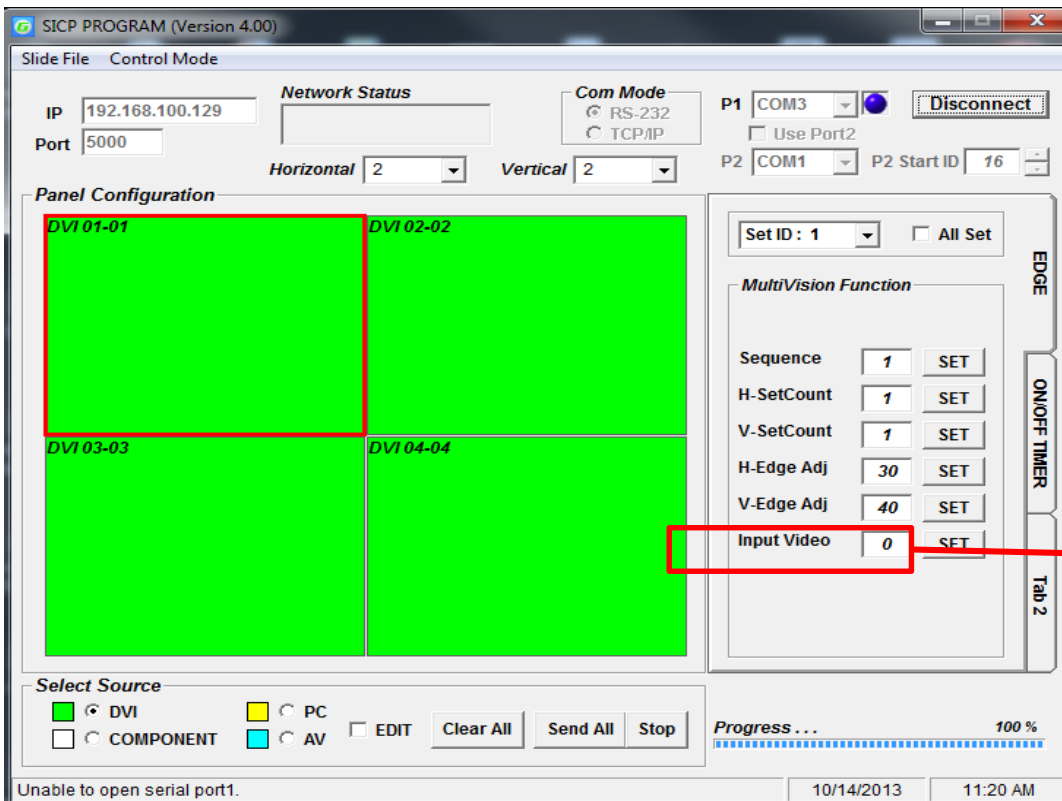
3. Change the input video format. (Ex. PC : 0, Blu-Ray player: 1)

SICP program

Slide Function

1) Edit

Example> When users wish to display a 5X5 background from DVI input and display 3X3 (in the center) from VGA input.

- Click on Edit box as described in ① on the image above.

- Select PC as described in ② on the image above.

- Select the area by clicking and dragging as described in ③ of the image above.

- The complete image will appear as the image on the top/right.

 # **Send**: Press "Send All" in order to test the settings entered in order to decide if the adjustments are satisfactory.

 # **Initialize**: Select the "DVI" bubble in the "Edit" tool and press "Set All" in order to initialize.

 # Add & Delete in Slide Schedule
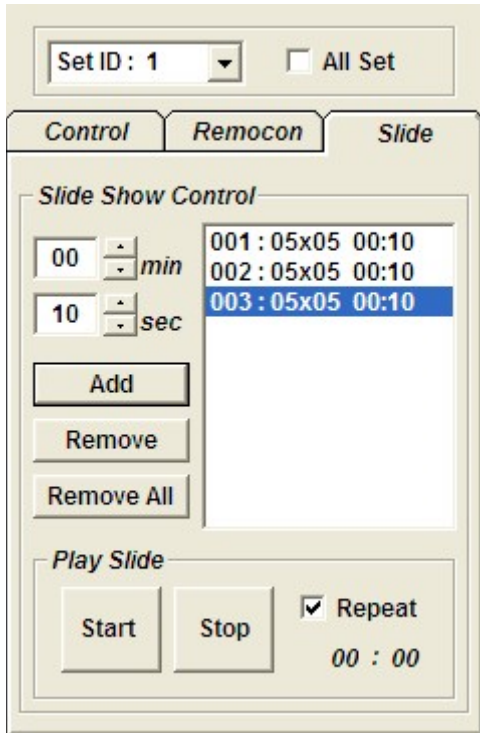
Slide (Layout) scheduling: Users set intervals/schedules for each "slide"/layout separately.

Users cannot change the sequence of play after initial scheduling is activated, so the schedule must be arranged and finalized prior to clicking "Start".

"Add" button: Inserts the edits (slides)
- "Remove" button: Removes highlighted slide
- "Remove All" button: Removes the entire slide schedule

2) Play

 Click the "Start" icon (refer to the image above) to begin schedule and click "Stop" icon if you wish to stop the scheduled cycle of slides/layouts.

- Repeat: Check "Repeat" to loop schedule continuously.

3) File Management

 Users may save layouts and replay the saved schedules. Users must save after completing scheduling.

- Save a file: Go to "Slide File" (top left of SICP program GUI) and press "File Save" in order to save the file in the folder you wish to select. The file format is *.sld.

- Open a file: Go to "Slide File" and press "File Open" in order to open the slide you wish to play back.

Serial Command Protocol

Transmission Formats

This is the format that the computer will send to the display to execute commands.

The format for this command transmission is as follows (total 13 byte):

ex) <STX>001PWRWOFF0<ETX> (Set ID : 1 , Power Off Send)

STX	ID1	ID2	ID3	CM1	CM2	CM3	R/W	DA1	DA2	DA3	IND	ETX
0x0f	0	0	1	P	W	R	W	O	F	F	0	0x0d
Hex	ASCII (capital letter)											Hex

- STX : Start of Text (0x0f)
- ID1 ~ ID3 : Set ID (001~100)
- CM1 ~ CM3 : Command (PWR, MIN, MUT,RML,KPL......)
- R/W : Read/Write Only use "Read"(R) or "Write" (W) as set forth in this document
- DA1 ~ DA3 : Data (Values)
- IND : Index
- ETX : End of Text (0x0d)

OK Acknowledgement

An acknowledgement will be sent by the display to the computer to verify that the command has been successfully received and executed. This format for this acknowledgement is as follows:

ex) <STX>001PWR#OFF#<ETX> (Set ID : 1 , Power Off Acknowledgement)

STX	ID1	ID2	ID3	CM1	CM2	CM3	R/W	DA1	DA2	DA3	IND	ETX
0x0f	0	0	1	P	W	R	#	O	F	F	#	0x0d
Hex	ASCII (capital letter)											Hex

Error Acknowledgement

The Error Values will be sent by the display to the computer to verify that the command has been successfully received and executed.

This format for this Error Values is as follows:

ex) <STX>001PWRERROR<ETX> (Set ID : 1 , Power Off Error)

STX	ID1	ID2	ID3	CM1	CM2	CM3	R/W	DA1	DA2	DA3	IND	ETX
0x0f	0	0	1	P	W	R	E	R	R	O	R	0x0d
Hex	ASCII (capital letter)											Hex

How to choose display ID number

◆ Read Set ID Number

* Attention : "Read Set ID" Function requires serial connection to only one display (1 pc : 1 display)

STX	ID1	ID2	ID3	CM1	CM2	CM3	R/W	DA1	DA2	DA3	IND	ETX
0x0f	F	F	F	**S**	**I**	**D**	R	0	0	0	0	0x0d
Hex	ASCII (capital letter)											Hex

  - ID1 ~ ID3 : "FFF" (Set ID)

  - DA1 ~ DA3 : "000" (Don't care)

  Ex) <STX>FFFSIDR0000<ETX> (Read Set ID)

  Acknowledgement => <STX>001SID#001#<ETX> (Set ID : 1)

◆ Write Set ID Number

* Attention : Write Set ID Function requires serial connection to only one display (1 pc : 1 display)

STX	ID1	ID2	ID3	CM1	CM2	CM3	R/W	DA1	DA2	DA3	IND	ETX
0x0f	F	F	F	**S**	**I**	**D**	W				0	0x0d
Hex	ASCII (capital letter)											Hex

  - ID1 ~ ID3 : "FFF" (Set ID)

  - DA1 ~ DA3 : "001" (Set ID Number)

  Ex) <STX>FFFSIDW0010<ETX> (Write Set ID : 1)

    Acknowledgement => <STX>001SID#001#<ETX>

Command List

◆ Power On/Off (PWR)

STX	ID1	ID2	ID3	CM1	CM2	CM3	R/W	DA1	DA2	DA3	IND	ETX
0x0f				**P**	**W**	**R**	W				0	0x0d
Hex	ASCII (capital letter)											Hex

-ID1 ~ ID3 : Set ID ("001" ~ "100")

-DA1 ~ DA3 : "-ON" : Power On / "OFF" : Power Off

Ex) <STX>001PWRWOFF0<ETX> (Power Off)

    Acknowledgement => <STX>001PWR#OFF#<ETX>

Note: Do not substitute "R" for "W" in the "R/W" column in order to read display power state..

◆ **Remote Control Lock On/Off (RML)**

STX	ID1	ID2	ID3	CM1	CM2	CM3	R/W	DA1	DA2	DA3	IND	ETX
0x0f				**R**	**M**	**L**	W				0	0x0d
Hex						ASCII (capital letter)						Hex

-ID1 ~ ID3 : Set ID ("001" ~ "100")

-DA1 ~ DA3 : "-ON" : Lock On / "OFF" : Lock Off

Ex) <STX>001RMLW-ON0<ETX> (Lock On)

　　Acknowledgement => <STX>001RML#-ON#<ETX>

◆ **Keypad Control Lock On/Off (KPL)**

STX	ID1	ID2	ID3	CM1	CM2	CM3	R/W	DA1	DA2	DA3	IND	ETX
0x0f				**K**	**P**	**L**	W				0	0x0d
Hex						ASCII (capital letter)						Hex

-ID1 ~ ID3 : Set ID ("001" ~ "100")

-DA1 ~ DA3 : "-ON" : Lock On / "OFF" : Lock Off

Ex) <STX>001KPLW-ON0<ETX> (Lock ON)

　　Acknowledgement => <STX>001KPL#-ON#<ETX>

◆ **Source Change (MIN)**

STX	ID1	ID2	ID3	CM1	CM2	CM3	R/W	DA1	DA2	DA3	IND	ETX
0x0f				**M**	**I**	**N**	W				0	0x0d
Hex						ASCII (capital letter)						Hex

-ID1 ~ ID3 : Set ID ("001" ~ "100")

-DA1 ~ DA3 : "DVI" : DVI / "HDM" HDMI / " -PC" : VGA (D-SUB) / "-DP" : DisplayPort

Ex) <STX>001MINWDVI0<ETX> (Source DVI)

　　Acknowledgement => <STX>001MIN#DVI#<ETX>

Serial Command Protocol

◆ **Virtual Remote Control (RMT)**

STX	ID1	ID2	ID3	CM1	CM2	CM3	R/W	DA1	DA2	DA3	IND	ETX
0x0f				**R**	**M**	**T**	W				0	0x0d
Hex					ASCII (capital letter)							Hex

-ID1 ~ ID3 : Set ID ("001" ~ "100")

-DA1 ~ DA3 : "MEN" (Menu)   "SOU" (Source)   "LEF" (Left & Volume-)
　　　　　　　 "RIG" (Right & Volume+)   "ENT" (Enter)
　　　　　　　 "-UP" (Up)   "DOW" (Down)   "EXI" (Exit)

Ex) <STX>001RMTWSOU0<ETX> (Remote Source Button)
　　 Acknowledgement => <STX>001RMT#SOU#<ETX>

◆ **Horizontal Set Count (HSC)**

STX	ID1	ID2	ID3	CM1	CM2	CM3	R/W	DA1	DA2	DA3	IND	ETX
0x0f				**H**	**S**	**C**	W				0	0x0d
Hex					ASCII (capital letter)							Hex

- ID1 ~ ID3 : Set ID ("001" ~ "100")
- DA1 ~ DA3 : "001" ~ "010"

Ex) <STX>001HSCW0100<ETX> (H-Set Count 10)
Acknowledgement => <STX>001HSC#010#<ETX>

◆ **VGA Auto Adjust (AUT)**

STX	ID1	ID2	ID3	CM1	CM2	CM3	R/W	DA1	DA2	DA3	IND	ETX
0x0f				**A**	**U**	**T**	W				0	0x0d
Hex					ASCII (capital letter)							Hex

-ID1 ~ ID3 : Set ID ("001" ~ "100")

-DA1 ~ DA3 : "-PC"

Ex) <STX>001AUTW-PC0<ETX> (VGA Auto)

Acknowledgement => <STX>001AUT#-PC#<ETX>

◆ **Vertical Set Count (VSC)**

STX	ID1	ID2	ID3	CM1	CM2	CM3	R/W	DA1	DA2	DA3	IND	ETX
0x0f				**V**	**S**	**C**	W				0	0x0d
Hex	ASCII (capital letter)											Hex

- ID1 ~ ID3 : Set ID ("001" ~ "100")
- DA1 ~ DA3 : "001" ~ "010"

Ex) <STX>001VSCW0100<ETX> (V-Set Count 10)
Acknowledgement => <STX>001VSC#010#<ETX>

◆ **Display Sequence (SDS)**

STX	ID1	ID2	ID3	CM1	CM2	CM3	R/W	DA1	DA2	DA3	IND	ETX
0x0f				**S**	**D**	**S**	W				0	0x0d
Hex	ASCII (capital letter)											Hex

- ID1 ~ ID3 : Set ID ("001" ~ "100")
- DA1 ~ DA3 : "001" ~ "100"

Ex) <STX>001SDSW0010<ETX> (Display Sequence 1)
Acknowledgement => <STX>001SDS#001#<ETX>

◆ **Horizontal Edge Adjust (HEG)**

STX	ID1	ID2	ID3	CM1	CM2	CM3	R/W	DA1	DA2	DA3	IND	ETX
0x0f				**H**	**E**	**G**	W				0	0x0d
Hex	ASCII (capital letter)											Hex

- ID1 ~ ID3 : Set ID ("001" ~ "100")
- DA1 ~ DA3 : "001" ~ "010"

Ex) <STX>001HEGW0300<ETX> (H-Edge Adjust 30)
Acknowledgement => <STX>001HEG#030#<ETX>

◆ **Vertical Edge Adjust (VEG)**

STX	ID1	ID2	ID3	CM1	CM2	CM3	R/W	DA1	DA2	DA3	IND	ETX
0x0f				**V**	**E**	**G**	W				0	0x0d
Hex	ASCII (capital letter)											Hex

- ID1 ~ ID3 : Set ID ("001" ~ "100")
- DA1 ~ DA3 : "000" ~ "200"
  Ex) <STX>001VEGW0400<ETX> (V-Edge Adjust 40)
  Acknowledgement => <STX>001VEG#040#<ETX>

◆ **HDMI Input format (IVF)**

STX	ID1	ID2	ID3	CM1	CM2	CM3	R/W	DA1	DA2	DA3	IND	ETX
0x0f				**I**	**V**	**F**	W				0	0x0d
Hex	ASCII (capital letter)											Hex

- ID1 ~ ID3 : Set ID ("001" ~ "100")
-DA1 ~ DA3 : "R44"   : RGB444
            "Y44"   : YPbPr444
            "Y22"   : YPbPr422

Ex) <STX>001IVFWR440<ETX> (HDMI Input format RGB444)
Acknowledgement => <STX>001IVF#R44#<ETX>

◆ **Color Adjust DVI (FCD)**

STX	ID1	ID2	ID3	CM1	CM2	CM3	R/W	DA1	DA2	DA3	IND	ETX
0x0f				**F**	**C**	**D**						0x0d
Hex	ASCII (capital letter)											Hex

- ID1 ~ ID3 : Set ID ("001" ~ "100")
- DA1 ~ DA3 : "000" ~ "255" (Color Value)
- R/W : "W" (Write)
        "R" (Read)
-IND : "0" (Sub-Brightness)
       "1" (R-Offset)
       "2" (G-Offset)
       "3" (B-Offset)
       "4" (Sub-Contrast)
       "5" (R-Gain)
       "6" (G-Gain)
       "7" (B-Gain)
Ex) <STX>001FCDW1004<ETX> (Write : DVI Sub-Contrast 100)
Acknowledgement => <STX>001FCD#1004<ETX>
Ex) <STX>001FCDR0002<ETX> (Read : DVI G-Offset)
Acknowledgement => <STX>001FCD#1102<ETX> (G-Offset:110)

◆ **Color Adjust VGA (D-SUB) (FCP)**

STX	ID1	ID2	ID3	CM1	CM2	CM3	R/W	DA1	DA2	DA3	ETX
0x0f				F	C	P					0x0d
Hex	ASCII (capital letter)										Hex

- ID1 ~ ID3 : Set ID ("001" ~ "100")
- DA1 ~ DA3 : "000" ~ "255" (Color Value)
- R/W : "W" (Write)
    "R" (Read)
- IND : "0" (Sub-Brightness)

    "1" (R-Offset)
    "2" (G-Offset)
    "3" (B-Offset)
    "4" (Sub-Contrast)
    "5" (R-Gain)
    "6" (G-Gain)
    "7" (B-Gain)

Ex) <STX>001FCAW1004<ETX> (Write : VGA Sub-Contrast 100)
Acknowledgement => <STX>001FCA#1004<ETX>
Ex) <STX>001FCAR0002<ETX> (Read : VGA G-Offset)
Acknowledgement => <STX>001FCA#1102<ETX> (G-Offset : 110)

◆ **Zoom IN/OUT (ZOM)**

STX	ID1	ID2	ID3	CM1	CM2	CM3	R/W	DA1	DA2	DA3	IND	ETX
0x0f	0	0	0	Z	O	M	W					0x0d
Hex	ASCII (capital letter)											Hex

-ID1 ~ ID3 : Set ID ("000")

-DA1 ~ DA2 : "11" ~ "99" (H- Set Count , V-Set Count)
        Ex) 3x3 Multivision => 33

-DA3 : "I" or "O" ("I" Zoom IN, "O" Zoom OUT)

-R/W : "W" (Write)

-IND : Don't care

Ex) <STX>000ZOMW22I0<ETX> (2x2, Zoom IN, DVI 1)

Ex) <STX>000ZOMW33O1<ETX> (3x3, Zoom OUT, PC)

◆ **Power On/Off Status (PWS)**

STX	ID1	ID2	ID3	CM1	CM2	CM3	R/W	DA1	DA2	DA3	IND	ETX
0x0f				P	W	S	R	0	0	0	0	0x0d
Hex	ASCII (capital letter)											Hex

- ID1 ~ ID3 : Set ID ("001" ~ "100")

- DA1 ~ DA3 : "-ON" : Power On
                  "OFF" : Power Off

Ex) <STX>001PWSR0000<ETX> (Set ID: 1 Read Power Status)
     Acknowledgement => <STX>001PWR#OFF#<ETX>