

User Manual

MP-SC-21

2x1 4K Scaler Switcher



All Rights Reserved

Version: MP-SC-21_2020V1.0

Preface

Read this user manual carefully before using the product. Pictures are shown in this manual for reference only. Different models and specifications are subject to real product.

This manual is only for operation instruction, please contact the local distributor for maintenance assistance. The functions described in this version were updated till March, 2020. In the constant effort to improve the product, we reserve the right to make functions or parameters changes without notice or obligation. Please refer to the dealers for the latest details.

FCC Statement

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. It has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a commercial installation.

Operation of this equipment in a residential area is likely to cause interference, in which case the user at their own expense will be required to take whatever measures may be necessary to correct the interference.

Any changes or modifications not expressly approved by the manufacture would void the user's authority to operate the equipment.



SAFETY PRECAUTIONS

To ensure the best from the product, please read all instructions carefully before using the device. Save this manual for further reference.

- Unpack the equipment carefully and save the original box and packing material for possible future shipment.
- Follow basic safety precautions to reduce the risk of fire, electrical shock and injury to persons.
- Do not dismantle the housing or modify the module. It may result in electrical shock or burn.
- Using supplies or parts not meeting the products' specifications may cause damage, deterioration or malfunction.
- Refer all servicing to qualified service personnel.
- To prevent fire or shock hazard, do not expose the unit to rain, moisture or install this product near water.
- Do not put any heavy items on the extension cable in case of extrusion.
- Do not remove the housing of the device as opening or removing housing may expose you to dangerous voltage or other hazards.
- Install the device in a place with fine ventilation to avoid damage caused by overheat.
- Keep the module away from liquids.
- Spillage into the housing may result in fire, electrical shock, or equipment damage. If an object or liquid falls or spills on to the housing, unplug the module immediately.
- Do not twist or pull by force ends of the cable. It can cause malfunction.
- Do not use liquid or aerosol cleaners to clean this unit. Always unplug the power to the device before cleaning.
- Unplug the power cord when left unused for a long period of time.
- Information on disposal for scrapped devices: do not burn or mix with general household waste, please treat them as normal electrical wastes.

Table of Contents

| | |
|--|----|
| 1. Product Introduction..... | 1 |
| 1.1 Features | 1 |
| 1.2 Packing List | 2 |
| 2. Specification | 3 |
| 3. Panel Description..... | 4 |
| 3.1 Front Panel | 4 |
| 3.2 Rear Panel..... | 5 |
| 4. System Connection..... | 6 |
| 4.1 Usage Precaution | 6 |
| 4.2 System Diagram | 6 |
| 5. Button Control..... | 7 |
| 5.1 Signal Switching | 7 |
| 5.2 Volume Adjustment..... | 7 |
| 5.3 Output Resolution Selection | 8 |
| 6. RS232 Control | 9 |
| 6.1 RS232 Control Software..... | 9 |
| 6.2 RS232 Command | 11 |
| 6.2.1 System Configuration | 11 |
| 6.2.2 Signal Switching | 11 |
| 6.2.3 Audio Setting | 11 |
| 6.2.4 Output Resolution Selection | 12 |
| 6.2.5 EDID Management | 12 |
| 6.2.6 Baudrate Setting..... | 13 |
| 6.2.7 Control Far-end Third Party Device | 13 |
| 7. Troubleshooting and Maintenance | 15 |
| 8. Customer Service | 16 |

1. Product Introduction

The MP-SC-21 is a professional 4K Scaler Switcher that scales HDMI/VGA video signal to an HDBaseT output by selecting output resolution from 720p to 4K via OSD. The HDBaseT output supports bidirectional PoH and can connect to HDBaseT receiver up to a maximum of 70 meters (230 ft) (HDBaseT receiver sold separately).

With 1 IR In and 1 IR Out and 1 RS232, the IR and RS232 control signals can be transmitted bi-directionally between the MP-SC-21 and a compatible HDBaseT receiver. It also works with the HDMI and VGA table grommets to switch source and output black screen for display (table grommets sold separately).

The MP-SC-21 supports advanced built-in EDID management and is HDCP 2.2 compliant. Video and audio sources can be selected via front panel button, table grommets or RS232 commands by 3rd Party control device. Moreover, it features volume buttons to turn up/down the volume level.

1.1 Features

- Features 1 HDMI input and 1 VGA input with auxiliary audio input.
- The output resolution can be selected from 720p to 4k x 2k @30Hz 4:4:4 to assure preferred output.
- Transmits 4Kx2K up to 131ft (40m) or 1080p up to 230ft (70m) via HDBaseT port.
- Supports volume control via buttons.
- Supports HDMI/VGA table grommets to control source switching and black screen showing.
- Automatically switch based on video sensing.
- Supports RS232 pass-through to communicate control signal between the scaler and the connected HDBaseT matrix or receiver.
- Allows the connected source and display to be controlled via bi-directional IR pass-through remotely.
- Supports bidirectional PoH, the HDBaseT receiver can be powered by this scaler switcher, or this scaler switcher can be powered by compatible device via HDBaseT port.
- Supports advanced built-in EDID management.

1.2 Packing List

- 1 x MP-SC-21 2x1 4K Scaler Switcher
- 2 x Mounting Ears with 4 Screws
- 4 x Plastic Cushions
- 1 x Power Adapter (12VDC, 2A)
- 1 x RS232 Cable
- 2 x 3-pin Phoenix Connectors

Note: Please contact your distributor immediately if you found any damage or defect in the components.

2. Specification

| Input & Output | |
|---------------------------|---|
| Input | (1) HDMI; (1) VGA; (1) AUDIO |
| Input Connector | (1) Type A Female HDMI; (1) female VGA (15-pin); (1) 3.5mm mini jack |
| Output | (1) HDBaseT |
| Output Connector | (1) Female RJ45(with LED indicators) |
| Control | (1) IR IN; (1) IR OUT; (1) RS232; (1) GR1; (1) GR2 |
| Control Connector | (2) 3.5mm mini jacks; (3) 3-pin phoenix connectors |
| General | |
| Input Resolution | <ul style="list-style-type: none"> ▪ HDMI: Up to 4K@60Hz 4:2:0, supports HDMI1.4, and HDCP2.2 compliant. ▪ VGA: Up to 1920x1200@60Hz. |
| Output Resolution | 3840x2160@30Hz, 1920x1080@60Hz, 1080x 720p@60hz, supports HDMI1.4, and HDCP1.4 compliant. |
| Transmission Distance | 4K≤40m; 1080p≤70m (High-qualified Cat5e/6/7 cable) |
| Bandwidth | 10.2Gbps |
| EDID | In-built EDID management |
| Power Supply | Input:100V~240V AC; Output:12VDC 2A |
| Power Consumption | 8w (max) |
| Operation Temperature | -10 ~ +40°C (+14°F ~ +104°F) |
| Storage Temperature | -15 ~ +55°C (+5°F ~ +131°F) |
| Relative Humidity | 10% ~ 90% |
| Dimension (W*H*D) | 195mm x 23.6mm x 100mm |
| Net Weight (g) | 303g |

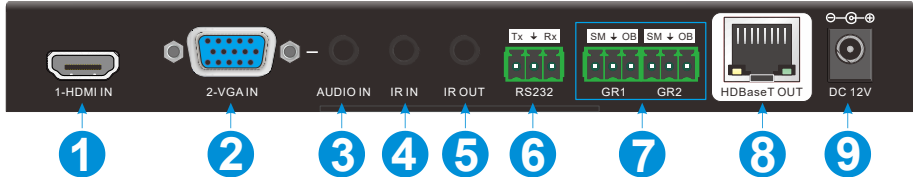
3. Panel Description

3.1 Front Panel



| No. | Name | Description |
|-----|-------------------------|--|
| ① | Power LED | Red when powered on. |
| ② | Signal LED | <ul style="list-style-type: none"> ▪ AUTO: Auto switching activity LED. ▪ HDMI: HDMI input activity LED. ▪ VGA: VGA input activity LED. |
| ③ | Auto Switching Selector | Press this to enter / exit auto switching mode. |
| ④ | Volume Down | Press this to decrease the output volume of scaler switcher and display. |
| ⑤ | Volume Up | Press this to increase the output volume of scaler switcher and display. |
| ⑥ | OUTPUT RES | Press this to enter On Screen Display menu (OSD) to select the output resolution. |
| ⑦ | FIRMWARE | Micro USB port, used for firmware update. |

3.2 Rear Panel



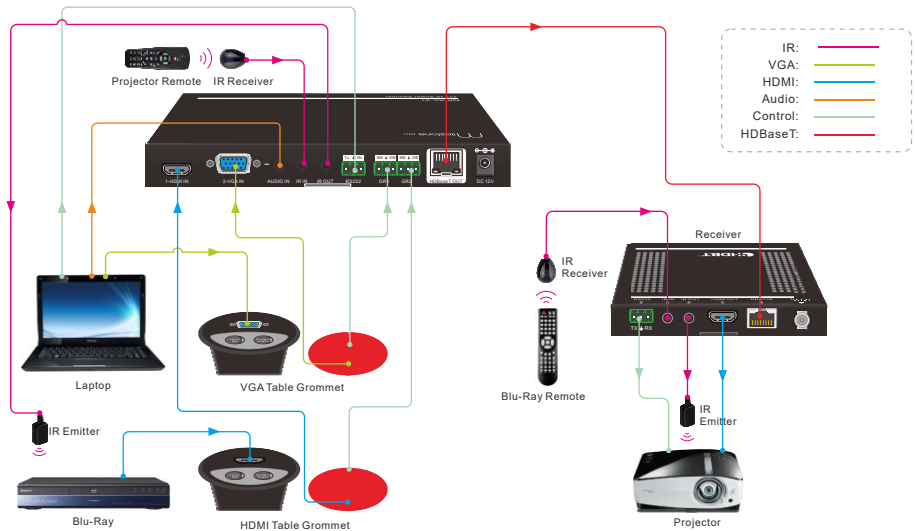
| No. | Name | Description |
|-----|-------------|--|
| ① | 1-HDMI IN | HDMI input port, connect with HDMI source device. |
| ② | 2-VGA IN | VGA input port, connect with VGA source device. |
| ③ | AUDIO IN | VGA auxiliary audio input. |
| ④ | IR IN | Connect with IR receiver to control device via IR. |
| ⑤ | IR OUT | Connect with IR emitter to control source via IR. |
| ⑥ | RS232 | <ul style="list-style-type: none"> ▪ Serial port, connect a control device (PC) to control the MP-SC-21. ▪ Control the third-party device from control device based on RS232 pass-through. |
| ⑦ | GR1& GR2 | Connect with HDMI or VGA table grommet to control source switching and black screen showing. |
| ⑧ | HDBaseT OUT | Connect with HDBaseT matrix or receivers via Cat5e/6/7 cable. |
| ⑨ | DC 12V | Conenct the including power adaptor. |

4. System Connection

4.1 Usage Precaution

- Verify all components and accessories included before installation.
- System should be installed in a clean environment with proper temperature and humidity.
- If the scaler switcher will be permanently mounted to a surface, attach the included mounting ears with the supplied screws.
- If the scaler switcher will be sitting on a shelf, attach the included plastic cushions to the bottom of the unit.
- All of the power switches, plugs, sockets and power cords should be insulated and safe.
- All devices should be connected before power on.

4.2 System Diagram



5. Button Control

Front panel buttons can be used for video switching, volume adjusting and output resolution selection.

5.1 Signal Switching

① Manual Switching

Press the **SORCE/AUTO-3s** button to select the HDMI or VGA source, the corresponding green activity LED (HDMI/VGA) will be lighted up.

② Auto Switching

Long-press the **SORCE/AUTO-3s** button at least 3 seconds to enable auto switching mode, the green activity LED (AUTO) will be lighted up. Press this button again to select next source and exit auto mode.

The auto switching mode abides by the following principles:

- **New Input**

Once new source is connected, the new source will be automatically switched to input signal.

- **Rebooting Device**

MP-SC-21 has the ability to save the last configuration before losing power. The switcher automatically enters the mode as last mode used; moreover, it detects all the inputs and memorizes the connection status for future rebooting using. If the last displayed signal is still available, the unit will output the signal. Otherwise, the unit will detect all the input signals with priority from HDMI to VGA. When the first signal was detected, it will transfer to output.

- **Signal Removing**

Once removing the current display signal, MP-SC-21 will detect all input signals with priority from HDMI to VGA. It will transfer the signal firstly detected to be available to output device.

5.2 Volume Adjustment

① Press the **Volume Up** button to increase the output volume of scaler switcher and display.

② Press the **Volume Down** button to decrease the output volume of scaler switcher and display.

5.3 Output Resolution Selection

① Resolution Selection

Step1: Press the **OUTPUT RES** button to enter the following resolution list shown as below.

| Resolution |
|-------------|
| 3840 × 2160 |
| 1920 × 1080 |
| 1280 × 720 |

Step2: Press this button again to move up and down at the list.

Step3: Long-press this button at least 2 seconds to confirm the selected output resolution.

② Resolution Reset

Long-press the **OUTPUT RES** button at least 5 seconds to reset the output resolution to default 720P.

6. RS232 Control

Connect the control device (PC) to the RS232 port of MP-SC-21, The MP-SC-21 can be controlled by sending RS232 commands via RS232 control software installed in PC.

The RS232 port supports pass-through function, in additional, RS232 commands can be transmitted bi-directionally between MP-SC-21 and HDBaseT receiver, so it is able to control a third party device from local or remote. The baud rate supports 2400, 4800, 9600(default), 19200, 38400, 57600 or 115200.

6.1 RS232 Control Software

- **Installation:** Copy the control software file to the computer connected with MP-SC-21.
- **Uninstallation:** Delete all the control software files in corresponding file path.
- **Basic Settings:**

First to connect MP-SC-21 with all input devices and output devices needed, then to connect it with a computer which is installed with RS232 control software. Finally, double-click the software icon to run this software.

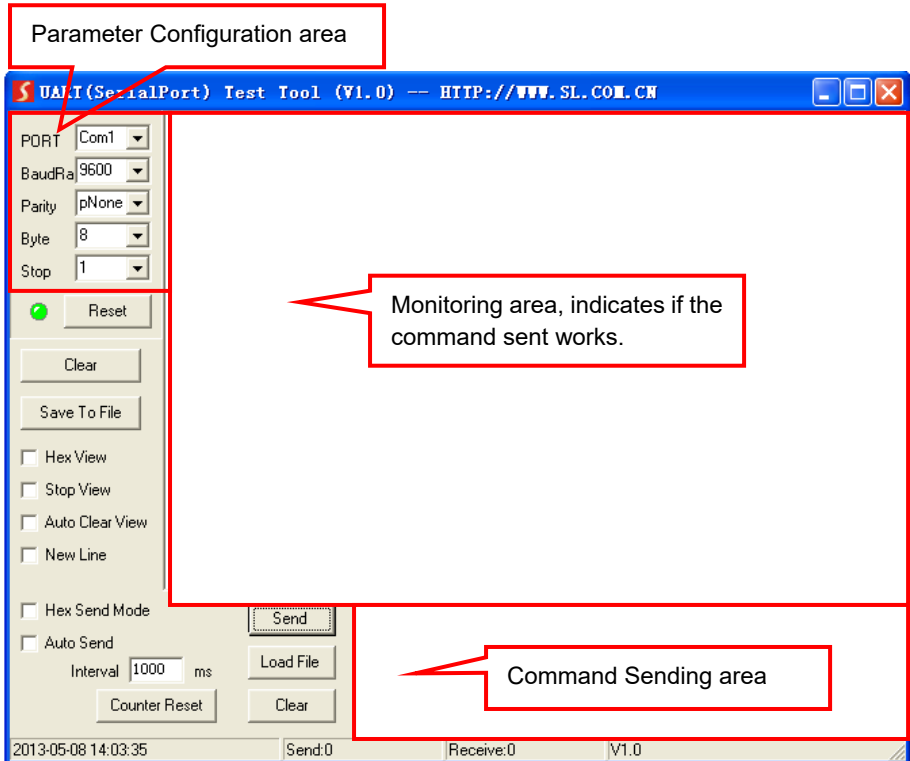
Here we take the software **CommWatch.exe** as example. The icon is showed as below:



CommWatch.exe

2x1 4K Scaler Switcher

The interface of the control software is showed as below:



Please set the parameters of COM number, bound rate, data bit, stop bit and the parity bit correctly, and then the command is ready to be sent in Command Sending Area.

6.2 RS232 Command

Communication protocol: RS232 Communication Protocol

Baud rate: 9600

Data bit: 8

Stop bit: 1

Parity bit: none

6.2.1 System Configuration

| Command | Function | Feedback |
|------------------------------------|---------------------------------|---|
| SFUD<CR><LF> | Software upgrading | Software Update |
| GET VER<CR><LF> | Check the software version | Version Vx.x.x |
| FRST<CR><LF> | Restore factory default | Factor Reset |
| WAKE<CR><LF> | Wake up the system | Wake Up |
| STBY<CR><LF> | Turn the system to standby mode | Go To Standby |
| GET STA<CR><LF> | Get the system status | Input:VGA Resolution: 1024x768 Manual Switching Source Volume: 60 EDID: Initial HDCP: ON |

6.2.2 Signal Switching

| Command | Function | Feedback |
|------------------------------------|-----------------------------|------------------|
| SWIN H1<CR><LF> | Switch to HDMI input | Switch to hdmi |
| SWIN VG<CR><LF> | Switch to VGA input | Switch to vga |
| AUTO 01<CR><LF> | Enable auto switching mode | Auto Switching |
| AUTO 00<CR><LF> | Disable auto switching mode | Manual Switching |

6.2.3 Audio Setting

| Command | Function | Feedback |
|------------------------------------|---------------------|-------------------------------|
| AUMT S1<CR><LF> | Mute source audio | Audio Mute Source: Enable |
| AUMT S0<CR><LF> | Unmute source audio | Audio Mute Source: Disable |

2x1 4K Scaler Switcher

| Command | Function | Feedback |
|------------------------------------|---|-------------------|
| VOLS AP<CR><LF> | Increase the source volume to xx (xx=0~60) | Source Volume: xx |
| VOLS AN<CR><LF> | Decrease the source volume to xx (xx=0~60) | Source Volume: xx |
| VOLS xx<CR><LF> | Set the source volume to xx (xx=0~60) | Source Volume: xx |

6.2.4 Output Resolution Selection

| Command | Function | Feedback |
|------------------------------------|--|--------------------------|
| SRES 01<CR><LF> | Change output resolution to 3840x2160 | Resolution: 3840x2160 |
| SRES 02<CR><LF> | Change output resolution to 1920x1080 | Resolution: 1920x1080 |
| SRES 03<CR><LF> | Change output resolution to 1280x720 | Resolution: 1280x720 |

6.2.5 EDID Management

| Command | Function | Feedback |
|------------------------------------|--|---------------|
| EDID DF<CR><LF> | EDID default | EDID: Initial |
| EDID MN<CR><LF> | Get the EDID data from display | EDID: Manage |
| EDID US<CR><LF> | When the command applied, system prompts to upload the user-defined EDID file (.bin) from U-disk. | EDID: User |

2x1 4K Scaler Switcher

6.2.6 Baudrate Setting

| Command | Function | Feedback |
|--|----------------------------------|---------------------|
| BAUD 115200<CR><LF> | Set the RS232 baudrate to 115200 | Set Baudrate 115200 |
| BAUD 57600<CR><LF> | Set the RS232 baudrate to 57600 | Set Baudrate 57600 |
| BAUD 38400<CR><LF> | Set the RS232 baudrate to 38400 | Set Baudrate 38400 |
| BAUD 19200<CR><LF> | Set the RS232 baudrate to 19200 | Set Baudrate 19200 |
| BAUD 9600<CR><LF> | Set the RS232 baudrate to 9600 | Set Baudrate 9600 |
| BAUD 2400<CR><LF> | Set the RS232 baudrate to 2400 | Set Baudrate 2400 |
| BAUD 4800<CR><LF> | Set the RS232 baudrate to 4800 | Set Baudrate 4800 |

6.2.7 Control Far-end Third Party Device

| Command | Description | Command Example | | | | | | | | | | | | | | | | |
|------------------------|--|-----------------|-----------|---|------|---|------|--|------|---|-------|---|-------|---|-------|---|--------|--|
| /+b:xxxxxxxx | <p>Send ASCII command to control far-end third party device from the scaler switcher to receiver based on RS232 pass-through function.</p> <p>① b = 0~6 is for baud rate.</p> <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>b</th> <th>Baud Rate</th> </tr> </thead> <tbody> <tr><td>0</td><td>2400</td></tr> <tr><td>1</td><td>4800</td></tr> <tr><td>2</td><td>9600</td></tr> <tr><td>3</td><td>19200</td></tr> <tr><td>4</td><td>38400</td></tr> <tr><td>5</td><td>57600</td></tr> <tr><td>6</td><td>115200</td></tr> </tbody> </table> <p>② xxxxxxxx is for ASCII data (max 48 Byte).</p> | b | Baud Rate | 0 | 2400 | 1 | 4800 | 2 | 9600 | 3 | 19200 | 4 | 38400 | 5 | 57600 | 6 | 115200 | <p>/+2:123456789</p> <p>Send the ASCII command "123456789" to control the third party device of which baud rate is 9600.</p> |
| b | Baud Rate | | | | | | | | | | | | | | | | | |
| 0 | 2400 | | | | | | | | | | | | | | | | | |
| 1 | 4800 | | | | | | | | | | | | | | | | | |
| 2 | 9600 | | | | | | | | | | | | | | | | | |
| 3 | 19200 | | | | | | | | | | | | | | | | | |
| 4 | 38400 | | | | | | | | | | | | | | | | | |
| 5 | 57600 | | | | | | | | | | | | | | | | | |
| 6 | 115200 | | | | | | | | | | | | | | | | | |
| /-b:xx xx xx xx | <p>Send HEX command to control far-end third party device from the scaler switcher to receiver based on RS232 pass-through function.</p> <p>① b = 0~6 is for baud rate.</p> <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>b</th> <th>Baud Rate</th> </tr> </thead> <tbody> <tr><td>0</td><td>2400</td></tr> <tr><td>1</td><td>4800</td></tr> </tbody> </table> | b | Baud Rate | 0 | 2400 | 1 | 4800 | <p>/-2:30 31 32 33 34</p> <p>Send the HEX command "30 31 32 33 34" to control the third party device of which baud rate is 9600.</p> | | | | | | | | | | |
| b | Baud Rate | | | | | | | | | | | | | | | | | |
| 0 | 2400 | | | | | | | | | | | | | | | | | |
| 1 | 4800 | | | | | | | | | | | | | | | | | |

2x1 4K Scaler Switcher

| Command | Description | Command Example | | | | | | | | | | |
|---------|---|-----------------|------|---|-------|---|-------|---|-------|---|--------|--|
| | <table border="1" data-bbox="398 181 698 351"><tbody><tr><td data-bbox="398 181 465 213">2</td><td data-bbox="465 181 698 213">9600</td></tr><tr><td data-bbox="398 213 465 245">3</td><td data-bbox="465 213 698 245">19200</td></tr><tr><td data-bbox="398 245 465 277">4</td><td data-bbox="465 245 698 277">38400</td></tr><tr><td data-bbox="398 277 465 309">5</td><td data-bbox="465 277 698 309">57600</td></tr><tr><td data-bbox="398 309 465 351">6</td><td data-bbox="465 309 698 351">115200</td></tr></tbody></table> <p data-bbox="315 357 743 410">② xx xx xx xx is for HEX data (max 48 Byte).</p> | 2 | 9600 | 3 | 19200 | 4 | 38400 | 5 | 57600 | 6 | 115200 | |
| 2 | 9600 | | | | | | | | | | | |
| 3 | 19200 | | | | | | | | | | | |
| 4 | 38400 | | | | | | | | | | | |
| 5 | 57600 | | | | | | | | | | | |
| 6 | 115200 | | | | | | | | | | | |

7. Troubleshooting and Maintenance

| Problems | Potential Causes | Solutions |
|---|---------------------------------------|--|
| Output image with white noise. | Bad quality of the connecting cable. | Try another high quality cable. |
| | Fail or loose connection. | Make sure the connection is good. |
| No output image when switching. | No signal at the input / output end. | Check with oscilloscope or multimeter if there is any signal at the input/ output end. |
| | Fail or loose connection. | Make sure the connection is good. |
| | The switcher is broken. | Send it to authorized dealer for repairing. |
| POWER indicator doesn't work or no respond to any operation. | Fail connection of power cord. | Make sure the power cord connection is good. |
| Static becomes stronger when connecting the video connectors. | Bad grounding. | Check the grounding and make sure it is connected well. |
| Cannot control the device by control device (e.g. a PC) through RS232 port. | Wrong RS232 communication parameters. | Make sure RS232 communication parameters are correct. |
| | Broken RS232 port. | Check with the authorized dealer. |

Note: If your problem still remaining after following the above troubleshooting steps, please contact your local dealer or distributor for further assistance.

8. Customer Service

The return of a product to our Customer Service implies the full agreement of the terms and conditions hereinafter. These terms and conditions may be changed without prior notice.

1) Warranty

The limited warranty period of the product is fixed three years.

2) Scope

These terms and conditions of Customer Service apply to the customer service provided for the products or any other items sold by authorized distributor only.

3) Warranty Exclusions:

- Warranty expiration.
- Factory applied serial number has been altered or removed from the product.
- Damage, deterioration or malfunction caused by:
 - ✓ Normal wear and tear.
 - ✓ Use of supplies or parts not meeting our specifications.
 - ✓ No certificate or invoice as the proof of warranty.
 - ✓ The product model showed on the warranty card does not match with the model of the product for repairing or had been altered.
 - ✓ Damage caused by force majeure.
 - ✓ Servicing not authorized by distributor.
 - ✓ Any other causes which does not relate to a product defect.
- Shipping fees, installation or labor charges for installation or setup of the product.

4) Documentation:

Customer Service will accept defective product(s) in the scope of warranty coverage at the sole condition that the defeat has been clearly defined, and upon reception of the documents or copy of invoice, indicating the date of purchase, the type of product, the serial number, and the name of distributor.

Remarks: For further assistance or solutions, please contact your local distributor.