

# User Manual

## SC51D

### PTN Compact Scaler Switcher



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Version: SC51D\_2014V1.0

**NOTICE:**

1. Please read this user manual carefully before using this product.
2. Take notice to 4.6 Instructions of VGA Converting Cable when using.

This manual is for operation instruction only, not for any maintenance usage. The functions described in this version are updated till March 2014. Any changes of functions and parameters since then will be informed separately. Please refer to the dealers for the latest details.

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**All product function is valid till 2014-03-18.**

**Update History**

<b>Version</b>	<b>Date</b>	<b>Update Content</b>
1.0	2014.03.18	First version.

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## 1. Introduction

### 1.1 Introduction to SC51D

SC51D is a compact mini scaler switcher with 5 video inputs (3 HDMI, 2 VGA) and 6 audio inputs (3 HDMI audio & 2 VGA audio: switched following the video; 1 MIC audio input). As the VGA input supports VGA, YPbPr and C-video, so the scaler switcher is compliant with multiple video signals.

SC51D scales & switches any video signal to HDMI output. SC51D supports various control methods including front panel control, IR control and RS232 command control.

### 1.2 Features

- Compliant with HDCP.
- Supports CEC, with commands to enable/disable this function.
- Supports video source auto-switching function.
- Output resolutions selectable to assure preferred output, and supports various output resolutions, such as 1920x1200, 1920x1080, 1600x1200, 1360x768, 1280x800, 1280x720, 1024x768.
- VGA video supports C-video, YPbPr and VGA.
- Supports online software upgrading.
- 48V phantom power to support condenser microphone.
- MIC port supports balance/unbalance signal, suppress the external noise effectively.
- 3-level MIC inputs, supports condenser microphone, dynamic microphone and wireless microphone.
- Controllable via button, IR & RS232.
- Powerful OSD operations.

### 1.3 Package Contents

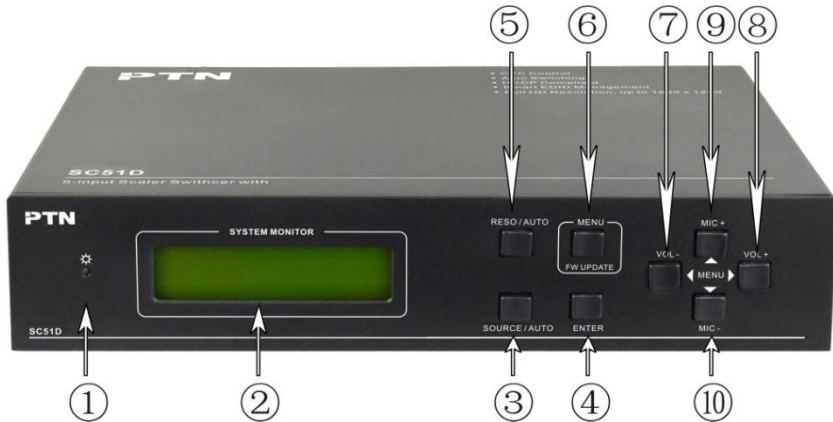
- 1 x SC51D
- 2 x Mounting ears (separate from SC51D)
- 6 x Screws (for mounting ears)
- 4 x Gilding cushions
- 1 x Power Adapter (DC 12V)
- 1 x RS232 cable
- 7 x Captive screw connectors
- 1 x IR remote
- 1 x IR receiver

- 1 x IR emitters
- 6 x Screws (for Gilding cushions)
- 1 x User Manual

**Notes:** Please confirm if the product and the accessories are all included, if not, please contact with the dealers.

## 2. Product Appearance

### 2.1 SC51D Front Panel



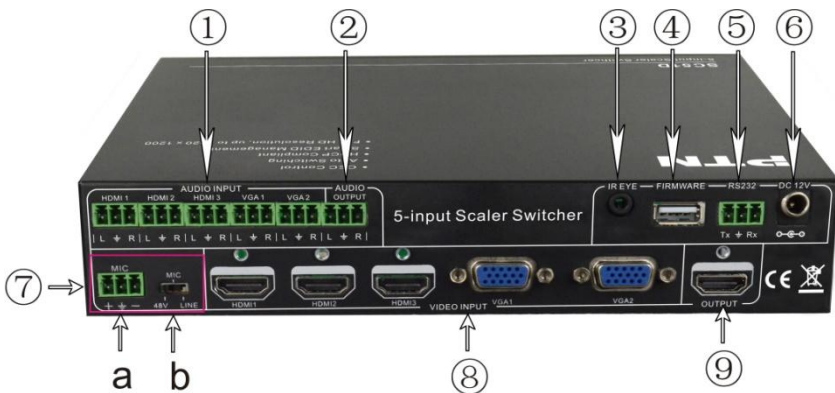
- ① Power indicator  
Turn red when power on, turn green when in standby mode.
- ② LCD screen  
Show the real-time system working status.
- ③ SOURCE/AUTO
  - Use as video source selection button, press to select one source, press again to select next source, switching circularly between HDMI1, HDMI2, HDMI3, VGA1 and VGA2. The LCD screen will show the name of selected source.
  - Use as switching mode selection button, press and hold on for **7 seconds or more** to enter in Auto-switching mode, press and hold on for **7 seconds or more** again to enter in Manual-switching mode.

**Note:** Setting any VGA port to AV or YPbPr in Manual-switching mode, the system will not be able to enter in Auto-switching mode. While in Auto-switching mode, setting any VGA port to AV or YPbPr will force the system to enter in Manual-switching mode with LCD screen and RS232 control software prompting “Not support!”.

- ④ ENTER  
Press to confirm selection in menu.

- ⑤ RESO/AUTO
  - Use as output resolution manual switching button, select between 1360x768, 1280x800, 1280x720, 1024x768, 1920x1200, 1920x1080 and 1600x1200.
  - Use as output resolution switching mode selection button, press and hold on for **7 seconds or more** to enter in Auto-switching mode, press and hold on for **7 seconds or more** again to enter in Manual-switching mode.
- ⑥ MENU/FWUPDATE
  - Use as menu button, press it to enter in OSD menu.
  - Use as software updating button, press and hold on for **7 seconds or more** to enter in software updating procedure.
- ⑦ VOL-
  - Volume down button, press it to turn down the volume
  - Use as direction button NEXT when in menus.
- ⑧ MIC+
  - MIC volume up button, press it to turn up the volume of the microphone
  - Use as direction button MOVE UP when in menus.
- ⑨ VOL+
  - Volume up button, press it to turn up the volume
  - Use as direction button PREVIOUS when in menus.
- ⑩ MIC-
  - MIC volume down button, press it to turn down the volume of the microphone
  - Use as direction button MOVE DOWN when in menus.

## 2.2 SC51D Rear Panel



- ① AUDIO INPUT  
Including 3 HDMI audio & 2 VGA audio inputs corresponding to the 5 video inputs,

users can choose any one audio (embedded HDMI audio or external input audio) for HDMI audio input by sending RS232 commands.

- ② **AUDIO OUTPUT**  
1 Audio output port, connect with an amplifier. The audio comes from the input audio corresponding to the selected video source and mixed with MIC audio.
- ③ **IR EYE**  
Connect with an IR receiver to receive IR signal sent by the IR remote.
- ④ **FIRMWARE**  
USB port, connect with USB flash disk or other storage with update file to update the system firmware.
- ⑤ **RS232**  
Serial control port, 3p captive screw connector, connect with a control device (such as a computer) to control SC51D.
- ⑥ **12V DC**  
Power port, connect with the 12V DC power adapter.
- ⑦ **MIC**
  - a) MIC port, connect with microphone
  - b) MIC Dial switch: 3 levels: 48V phantom power mode (connect with condenser microphone), MIC mode (connect with dynamic microphone) and LINE mode (connect with wireless microphone or line audio).
- ⑧ **VIDEO INPUT**  
Video input ports, includes 3 HDMI inputs & 2 VGA inputs. VGA ports support YPbPr, C-video and VGA format. Factory default is VGA format.
- ⑨ **OUTPUT**  
1 HDMI local output, connect with a HDMI displayer.

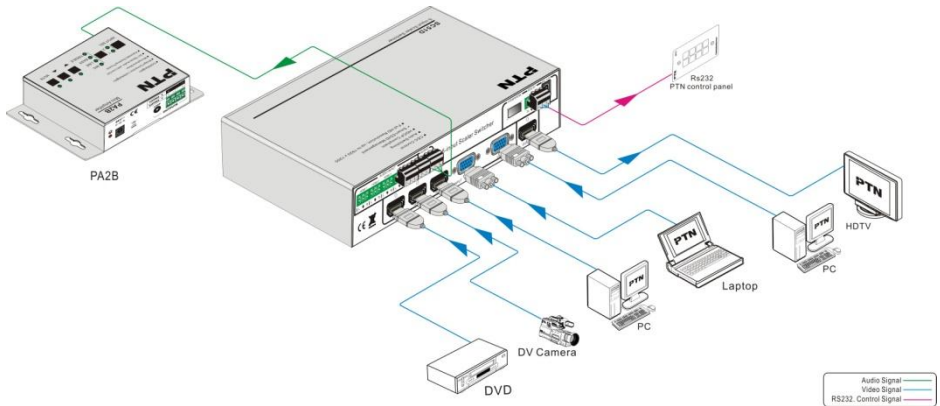
## **3. System Connection**

### **3.1 Usage Precautions**

- 1) System should be installed in a clean environment and has a prop temperature and humidity.
- 2) All of the power switches, plugs, sockets and power cords should be insulated and safe.
- 3) All devices should be connected before power on.

### **3.2 System Diagram**





### 3.3 Connection Procedure

- Step1.** Connect HDMI source devices (e.g. Blue-ray DVD) to HDMI input ports of SC51D with HDMI cable. Connect VGA source devices (e.g. PC) to VGA input ports of SC51D with VGA cable.
- Step2.** Connect the corresponding audio source to the corresponding AUDIO INPUT port of SC51D with audio cable accordingly. The audio of HDMI can be set as embedded or external by sending right commands.
- Step3.** Connect a HDMI display device to HDMI output port of SC51D with HDMI cable.
- Step4.** Connect speakers, headphones or PTN amplifiers to AUDIO OUTPUT port of SC51D.
- Step5.** Connect control device (e.g. PC) to the RS232 port of SC51D.
- Step6.** Select MIC level and connect right microphone to the MIC input port. MIC audio will be transmitted to AUDIO OUTPUT port and mixed with source audio.
- Step7.** Connect DC12V power adaptor to the power port.

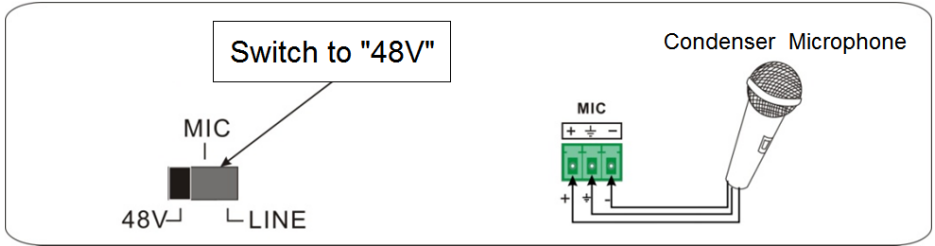
### 3.4 Connection of Microphone

SC51D provides one 3-level microphone input to accommodate different microphone input modes, including 48V phantom power mode, MIC mode & LINE mode.

#### ➤ 48V phantom power input

When switch to “48V” (It has a good frequency characteristic, high input impedance and high sensitivity in this mode), the MIC input will offer a 48V phantom power. This is only used for **condenser microphone**.

Connect the microphone this way: “+” connects to positive, “-” connects to negative and “ $\perp$ ” to ground.



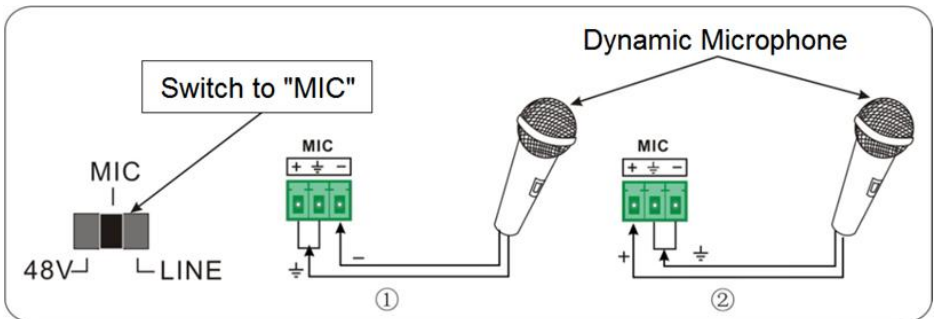
➤ **MIC input**

When switch to "MIC" (It has a low frequency characteristics, and wide frequency response in this mode), the microphone input is used for connecting with **dynamic microphone**. There are two different connections:

1) Unbalanced connection:

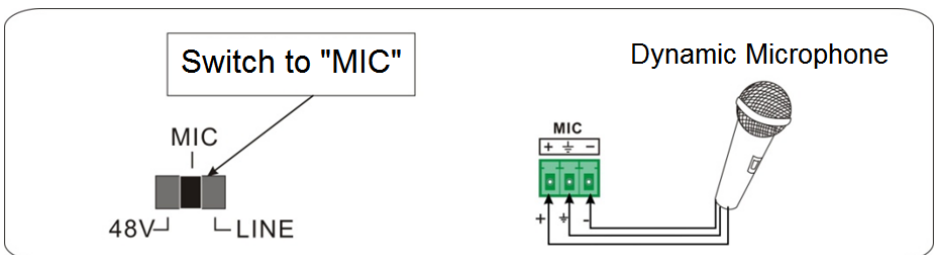
"+" and "⊕" connect to ground, and "-" connects to signal.

"-" and "⊕" connect to ground, and "+" connects to signal.



2) Balanced connection:

"+" connects to positive, "-" connects to negative and "⊕" connects to ground.

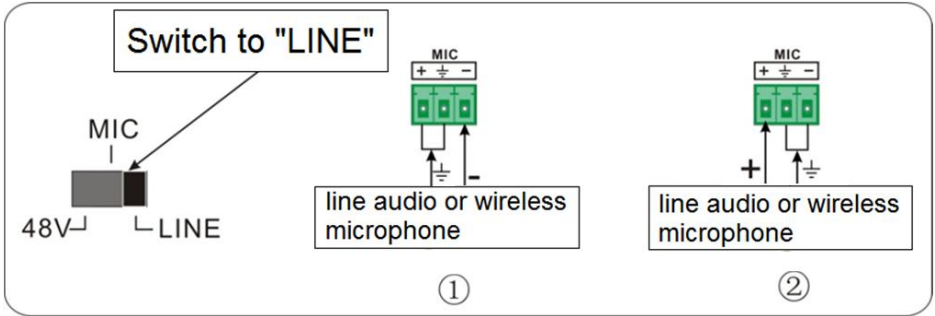


➤ **LINE input**

When switch to "LINE" (It has a low frequency characteristics, and wide frequency response in this mode), the microphone input is used for connecting with line audio or wireless microphone output. There are two different connections:

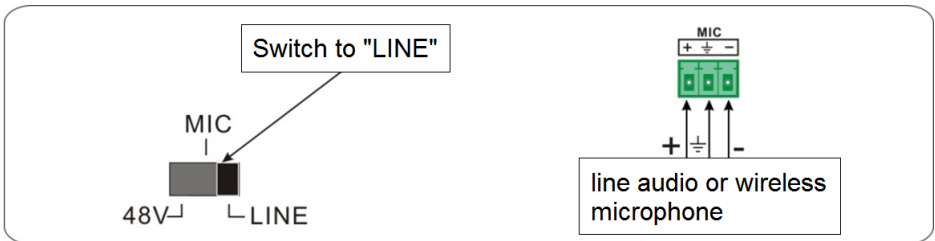
1) Unbalanced connection:

“+” and “ $\perp$ ” connect to ground, and “-” connects to signal.  
 “-” and “ $\perp$ ” connect to ground, and “+” connects to signal.



b) Balanced connection:

“+” connects to positive, “-” connects to negative and “ $\perp$ ” connects to ground.



3.5 Application

SC51D has a good application in various occasions, such as computer realm, monitoring, conference room, big screen displaying, television education, command & control center and smart house etc.

4. System Operations

4.1 Operations of Buttons

The buttons can be used for output resolution adjusting, switching operations, software updating, volume adjusting and operations in menus.

4.1.1 Resolution Adjusting

Support auto-adjusting and manual-adjusting. Press and hold on **RESO/AUTO** button for **7 seconds or more** to enter in auto-adjusting/manual-adjusting mode.

Notice:


1. In auto-adjusting mode, SC51D will choose the resolution of the display device as the preferred resolution.

2. In auto-switching mode, front panel button control is not available, but IR and RS232 control is able to switch modes.

#### 4.1.2 Switching Operations

Support auto-switching and manual-switching. Press and hold on **SOURCE/AUTO** button for **7 seconds or more** to enter in auto-switching/manual-switching mode.

The display result is showed as below:



IN: HDMI1 MANUAL  
1280 X 720



IN: HDMI1 AUTO  
1280 X 720

The display result will be showed for **2 seconds**.

#### Auto-switching function

The auto-switching mode follows the listed principles:

➤ **New input principle**

Once detecting a new input signal, SC51D would switch to this new signal automatically.

➤ **Power rebooting principle**

SC51D offers the function to remember the signal last displayed when rebooting. Once rebooting, SC51D will automatically enter in auto-switching mode, and then detect all inputs and memorize their connection status for future rebooting using.

And if the signal last displayed is still available, then SC51D will output the signal. If not, there will be no signal on outputs.

➤ **Signal removing principle**

Once removing the current display signal, SC51D will detect all input signals with priority (from INPUT 1 to INPUT 5). It will output the signal firstly detected to be available.

**Notice:** Auto-switching function works only when there is new input signal, or when users remove a signal or power rebooting. With any VGA port set to AV or YPbPr, the system will be not able to enter in Auto-switching mode.

#### Operation Examples:

- Connect the INPUT 2, INPUT 4, and INPUT 5 ports to the source devices, select INPUT 4 to outputs.
- Press and hold on the front key **SOURCE/AUTO** for **7 seconds or more** to enter in auto-switching mode.
- With no signal removing or new input, SC51D just works in auto-switching mode, and take no action (Output from INPUT 4)

- Connect INPUT 3 with a source device, and then it will choose INPUT 3 to output.
- Remove the signal of INPUT 3, SC51D will detect from INPUT 1 to INPUT 5. And when it detects that input 2 is available, it will choose INPUT 2 to output.
- Cut off the power of SC51D, then reboot. As SC51D is in auto-switching mode, then it will choose INPUT 2 to output.

#### **4.1.3 Software Updating**

Software updating means to update the inside program of this scaler switcher.

SC51D supports software updating via USB flash disk. The Operation is:

- 1) Copy the file "**MERGE\_51D.bin**" to the root directory of a USB flash disk. (Make sure the file is copied to the root directory for normal use. The "**MERGE\_51D.bin**" file is provided/authorized by PTN engineering department or from our website: <http://www.putron.com>)
- 2) Plug the USB flash disk to the SC51D USB port on its front panel.
- 3) Press the button "MENU" for **7 seconds or more** to update the software automatically.

Or press this MENU button for **6 seconds** until it pops up an update OSD and then select "Option" → "Software Update" to enter in update procedure.

Or send command **50689%** to update software.

#### **4.1.4 Volume Adjusting**

Not in OSD menu, press VOL -- to decrease line volume, VOL + to increase.

Not in OSD menu, press MIC – to decrease MIC volume, MIC + to increase.

#### **4.1.5 Operations in OSD Menus**

Press **MENU** button to enter in the OSD menu, and use **UP, DWON, LEFT, RIGHT** button to select, press **ENTER** button to confirm selection. **MENU** button also can be used to exit present menu level by level until exiting the OSD menu.

## 4.2 Operations of IR

### 4.2.1 IR Remote

With its CEC function, users are able to control the SC51D and source devices synchronously via one IR remote.

The diagram shows a black IR remote control with various buttons grouped into six numbered sections:

- 1 Standby button**  
To enter in/ exit standby mode.
- 2 Input channel selection buttons**  
INPUT 1 is for HDMI1, INPUT 2 for HDMI2...INPUT 5 for VGA2. **AUTO** button: Enable/disable auto-switching mode.
- 3 Volume adjusting buttons**  
MIC-/+: decrease/increase MIC volume  
LINE-/+: decrease/increase line volume  
MIC MUTE: mute/unmute MIC audio  
LINE MUTE: mute/unmute line audio
- 4 Menu operation buttons**  
**MENU**: press to enter in OSD menu or used to return to previous menu. **EXIT**: exit OSD menu.  
**OK**: confirm button.  $\pi, \theta, \tau, \upsilon$ : UP/DWON/LEFT/RIGHT button, for value setting or page-turn, Buttons in area **a** are also able to work in CEC mode to enter the menu of HDMI source device.  
**P.P, ZOOM, S.M**: shortcut button, to select display mode.
- 5 Resolution selection buttons**  
Select the resolution by pressing corresponding button. **AUTO** is for auto-selecting the best resolution.
- 6 CEC function buttons**  
These are for HDMI input signal which supports CEC. Include PLAY, PAUSE, STOP, MENU, REV (reverse) and FWD (forward).

### 4.3 Operations of CEC Function

SC51D supports CEC and CEC standby functions, and can be enabled/ disabled through RS232 commands or OSD menu. If the HDMI source device supports CEC and its CEC is on, and when SC51D enter in standby/startup mode, then source device will automatically enter in standby/startup mode.

And due to CEC function, user can control HDMI source device with basic operations (play, pause, fast forward, fast reverse, menu etc). So user is able to control SC51D and HDMI source device via the IR remote of SC51D.

Commands for CEC function: “50686%” (enable CEC) and “50687%” (disable CEC).

The working status related to CEC and STANDBY is showed as below:

Situation	Working Status
CEC: on, Standby: on	Press STANDBY button on IR remote, SC51D enters in standby mode, so do all HDMI source devices. Press STANDBY button again on IR remote, SC51D exits standby mode, only the HDMI source device switched to starts working.
CEC: on, Standby: off	Press STANDBY button on IR remote, SC51D enters in standby mode, HDMI 1~3 source devices keep on.
CEC: on	Use CEC function buttons, ▲, ▼, ◀, ▶ and OK buttons on IR remote to control HDMI source devices, include play, pause, fast forward, fast reverse and operations in menu.
CEC: off	Unable to control HDMI source devices through IR remote



### CEC: Control HDMI source devices by IR remote of SC51D

### 4.4 Operations of RS232 Control

SC51D can be controlled by sending RS232 commands. Connect the RS232 port of

SC51D and the RS232 port of control device (e.g. a PC). Install the RS232 control software to the control device, then users are able to control the SC51D by sending RS232 commands. Here is a operation guidance for RS232 control.

### 4.4.1 Installation/ uninstallation of RS232 Control Software

- **Installation** Copy the control software file to the computer connected with SC51D.
- **Uninstallation** Delete all the control software files in corresponding file path.

### 4.4.2 Basic Settings

First to connect SC51D with all input devices and output devices needed, then to connect it with a computer which is installed with RS232 control software. Double-click the software icon to run this software.

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



The interface of the control software is showed as below:



The screenshot shows the 'UART (SerialPort) Test Tool (V1.0)' interface. A red box at the top left is labeled 'Parameter Configuration area' and encompasses the settings for PORT (Com1), BaudRate (9600), Parity (pNone), Byte (8), and Stop (1). A large red box in the center is labeled 'Monitoring area, indicates whether the command sent'. A red box at the bottom right is labeled 'Command Sending area' and encompasses the 'Send' button and the 'Interval' field (set to 1000 ms). The interface also includes a 'Reset' button with a green indicator, 'Clear', 'Save To File', and several checkboxes for 'Hex View', 'Stop View', 'Auto Clear View', 'New Line', 'Hex Send Mode', and 'Auto Send'. At the bottom, there are status indicators for '2013-05-08 14:03:35', 'Send:0', 'Receive:0', and 'V1.0'.

Please set the parameters of COM number, bound rate, data bit, stop bit and the parity bit correctly, and then you are able to send commands in Command Sending Area.

### 4.4.3 RS232 Communication Commands

**Communication protocol:** RS232 Communication Protocol

Baud rate: 9600

Data bit: 8

Stop bit: 1

Parity bit: none

Command	Function	Feedback Example
<b>Switch Commands</b>		
<b>50701%</b>	Switch to HDMI 1 input	Switch to HDMI 1
<b>50702%</b>	Switch to HDMI 2 input	Switch to HDMI 2
<b>50703%</b>	Switch to HDMI 3 input	Switch to HDMI 3
<b>50704%</b>	Switch to VGA 1/YPbPr 1/AV 1 input	Switch to VGA 1/YPbPr 1/AV 1
<b>50705%</b>	Switch to VGA 2/YPbPr 2/AV 2 input	Switch to VGA 2/YPbPr 2/AV 2
<b>50680%</b>	Select VGA 1 for INPUT 4	Input 4 Set & Switch to VGA 1
<b>50681%</b>	Select YPbPr 1 for INPUT 4	Input 4 Set & Switch to AV 1
<b>50682%</b>	Select AV 1 for INPUT 4	Input 4 Set & Switch to AV 1
<b>50683%</b>	Select VGA 2 for INPUT 5	Input 5 Set & Switch to VGA 2
<b>50684%</b>	Select YPbPr 2 for INPUT 5	Input 5 Set & Switch to YPbPr 2
<b>50685%</b>	Select AV 2 for INPUT 5	Input 5 Set & Switch to AV 2
<b>50785%</b>	Enable auto-switching	Auto Switching
<b>50786%</b>	Disable auto-switching	Manual Switching
<b>Audio Commands</b>		
<b>50600%</b>	MUTE line audio	LINE Mute
<b>50601%</b>	UnMute line audio	LINE Unmute
<b>50602%</b>	Line audio volume up	LINE Volume: xx
<b>50603%</b>	Line audio volume down	LINE Volume: xx
<b>50720%</b>	Mute LINE audio & MIC audio	LINE Mute
		MIC Mute
<b>50721%</b>	Unmute LINE audio & MIC audio	LINE Unmute
		MIC Unmute
<b>50722%</b>	Mute MIC audio	MIC Mute
<b>50723%</b>	Unmute MIC audio	MIC Unmute
<b>50694%</b>	Enable Mic precedence	Mic precedence: enable
<b>50695%</b>	Disable Mic precedence	Mic precedence: disable
<b>50696%</b>	Check Mic precedence status	Mic precedence: XXXX

Command	Function	Feedback Example
50724%	MIC volume up	MIC Volume: xx
50725%	MIC volume down	MIC Volume: xx
508xx%	Set MIC volume	MIC Volume: xx
50706%	Choose embedded audio as HDMI 1 audio input	HDMI 1 Audio from Embedded
50707%	Choose external audio as HDMI 1 audio input	HDMI 1 Audio from LINE
50708%	Choose embedded audio as HDMI 2 audio input	HDMI 2 Audio from Embedded
50709%	Choose external audio as HDMI 2 audio input	HDMI 2 Audio from LINE
50710%	Choose embedded audio as HDMI 3 audio input	HDMI 3 Audio from Embedded
50711%	Choose external audio as HDMI 3 audio input	HDMI 3 Audio from LINE
<b>Resolution Commands</b>		
50619%	Change the resolution to 1360X768 HD	Resolution: 1360x768
50626%	Change the resolution to 1024X768 XGA	Resolution: 1024x768
50627%	Change the resolution to 1280X720 720P	Resolution: 1280x720
50628%	Change the resolution to 1280X800 WXGA	Resolution: 1280x800
50629%	Change the resolution to 1920X1080 1080P	Resolution: 1920x1080
50620%	Change the resolution to 1920X1200 WUXGA	Resolution: 1920x1200
50621%	Change the resolution to 1600X1200 UXGA	Resolution: 1600x1200
<b>Setup Commands</b>		

Command	Function	Feedback Example
50604%	Lock the front panel buttons	Front Panel lock
50605%	Unlock the front panel buttons	Front Panel Unlock
501xx%	Set the volume to xx. XX ranges from 0 to 60	LINE Volume: xx
502xx%	Set the brightness to xx. XX ranges from 0 to 100	Brightness: xx
503xx%	Set the contrast to xx. XX ranges from 0 to 100	Contrast: xx
504xx%	Set the saturation to xx. XX ranges from 0 to 100	Saturation: xx
505xx%	Set the sharpness to xx. XX ranges from 0 to 100	Sharpness: xx
50607%	Auto-adjust the color temperature	Color Temperature: xx
50608%	Set the aspect ratio	Aspect Ratio: xx
50614%	Set the picture mode	Picture Mode: xx
50615%	Set SM audio mode	Sound Mode: xx
50655%	Freeze output image	Freeze: enable
50656%	Cancel the freezing of output image	Freeze: disable
50646%	Enable MIC Volume Icon display	Volume Icon: enable
50647%	Disable MIC Volume Icon display	Volume Icon: disable
50648%	Enable HDMI embedded audio output	Embedded Audio Output: enable
50649%	Disable HDMI embedded audio output	Embedded Audio Output: disable
50761%	Not display mute icon of LINE audio	LINE Mute Icon: disable
50762%	Display mute icon of LINE audio	LINE Mute Icon: enable
50763%	Not display mute icon of MIC audio	MIC Mute Icon: disable
50764%	Display mute icon of MIC audio	MIC Mute Icon: enable
50765%	Display freeze icon	Freeze Icon: enable
50766%	Not display freeze icon	Freeze Icon: disable
50644%	Display channel status	Input Icon: enable
50645%	Not display channel status	Input Icon: disable

Command	Function	Feedback Example
50650%	Check the channel status	Input Icon: xx
50606%	Auto-adjust the input parameter(VGA only)	VGA Input Auto
50699%	Check the system version	Version Vx.x.x
50688%	Enable MIC noise detecting	MIC detect: enable
50689%	Disable MIC noise detecting	MIC detect: disable
50690%	Check MIC noise detecting statue	MIC detect: XXXX
50791%	HDCP Active	HDCP Active
50792%	HDCP Manual	HDCP Manual
50793%	Enable HDCP output	HDCP ON
50794%	Disable HDCP output	HDCP OFF
50795%	Inquire HDCP/ Active HDCP	HDCP Active
	Inquire HDCP/ Manual HDCP	HDCP Manual
		HDCP OFF/ON
50782%	EDID management, copy the best resolution data of one output to HDMI input	Manage HDMI input with preferred timing
		timing table=[1]
		Resolution:1920x1080
50698%	Software update	
50617%	Reset to factory defaults	Factory Reset
<b>Menu Commands</b>		
50609%	OK for OSD selection	Key: ok
50610%	LEFT button	Key: left
50611%	RIGHT button	Key: right
50612%	UP button	Key: up
50613%	DOWN button	Key: down
50616%	MENU button (enter OSD)	OSD: Enter
50618%	EXIT button (exit OSD)	OSD: Exit
<b>Inquire Commands</b>		

Command	Function	Feedback Example
50630%	Check the volume level	LINE Volume: xx
		MIC Volume: xx
50631%	Check the input source	Input: xx
50632%	Check the output resolution	Resolution: xx
50633%	Check the image mode	Picture Mode: xx
50634%	Check the audio mode	Sound Mode: xx
50635%	Check the image aspect ratio	Aspect Ratio: xx
50636%	Check the brightness	Brightness: xx
50637%	Check the contrast	Contrast: xx
50638%	Check the saturation	Saturation: xx
50639%	Check sharpness	Sharpness: xx
50640%	Check the color temperature	Color Temperature: xx
50651%	Check Volume Icon display status	Volume Icon: xxxx
50652%	Check Digital audio output status	Embedded Audio Output: enable/disable
50712%	Check the audio input sources for HDMI 1, 2, 3	HDMI1 Audio from XXXX port
		HDMI2 Audio from XXXX port
		HDMI3 Audio from XXXX port
50751%	Check whether the LINE audio is mute or not	LINE Mute/Unmute
50752%	Check whether the MIC audio is mute or not	MIC Mute/Unmute
50753%	Check the freeze status	Freeze: enable/disable
50754%	Check the panel locked status	Front Panel Lock/UnLock
50783%	Display statuses including MIC, LINE audio, Resolution, Output Audio on/off, Manual/ Auto-switching modes	Line Volume:XX
		Mic Volume:XX
		Source:XXXX
		Resolution:XXXX
		Digital Sound Output: XXXX
Switch status: XXXX		

Command	Function	Feedback Example
<b>Adjustment Commands</b>		
<b>50678%</b>	Enable screen output adjusting	Enter Output Position Adjust
<b>50679%</b>	Disable screen output adjusting	Exit Output Position Adjust
<b>50670%</b>	Move the image to right	Output Position Adjust X xx
<b>50671%</b>	Move the image to left	Output Position Adjust X xx
<b>50672%</b>	Move the image up	Output Position Adjust Y XX
<b>50673%</b>	Move the image down	Output Position Adjust Y xx
<b>50674%</b>	Stretch left from left side (increase image width)	Output Width Adjust xx
<b>50675%</b>	Pull right from left side (decrease image width)	Output Width Adjust xx
<b>50676%</b>	Stretch upwards from top side (increase image height)	Output Height Adjust xx
<b>CEC Commands</b>		
<b>50687%</b>	Disable CEC	HDMI CEC OFF
<b>50686%</b>	Enable CEC	HDMI CEC ON
<b>50901%</b>	Play&pause	CEC cmd: play&pause
<b>50902%</b>	Stop	CEC cmd: stop
<b>50903%</b>	Menu	CEC cmd: menu
<b>50904%</b>	Retreat	CEC cmd: rev
<b>50905%</b>	Forward	CEC cmd: fwd
<b>50906%</b>	Up	CEC cmd: up
<b>50907%</b>	Down	CEC cmd: down
<b>50908%</b>	Left	CEC cmd: left
<b>50909%</b>	Right	CEC cmd: right
<b>50910%</b>	Conform command	CEC cmd: select
<b>50911%</b>	Exit command	CEC cmd: exit

**Note:**

1. Turn on/ off HDCP auto-management by sending serial commands.
  - a) When HDCP is set to active, whether output source is with HDCP depends on input source. If the input source is with HDCP, so is the output and vice versa.
  - b) When HDCP is set to Manual, whether the output is with HDCP depends on the statue of HDCP. Turn off HDCP, then the output is without HDCP and vice versa.
2. Screen output adjusting avails only when the screen output adjusting is on. Send command 50678% to turn on.
3. CEC commands with grey background avails only when CEC is on.
4. MIC precedence: In Mute mode, if the MIC noise detecting is on, the device will unmute MIC automatically given the outer noise exceeds the limit of noise detecting. Send 50696% to enable MIC precedence, then the device will not be able to change the mute mode no matter how loud the noise is.



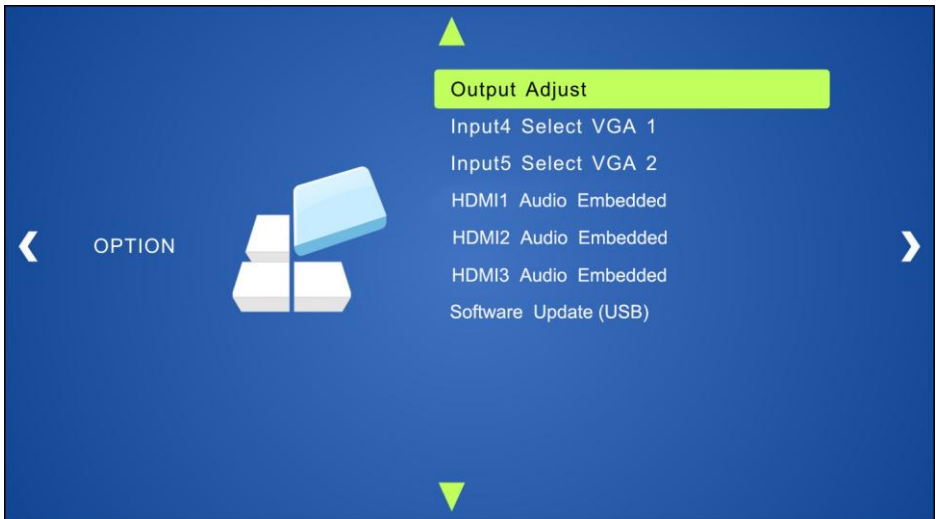
## 4.5 Operations in OSD Menu

SC51D provides a powerful OSD operation menu, contains 4 parts: optional settings, image settings, audio settings and system setting etc.

Press MENU button on front panel (or MENU button on IR remote/send command **50616%**) to enter in OSD menu, so it is able to do some settings through the OSD menu.

### 4.5.1 Option

Includes Output Adjust, Input4/5 Select, HDMI1/2/3 Audio select, and Software Update (USB)



**Output Adjust:** Adjust output image position (X: horizontal direction and Y: vertical direction) and ratio aspect (width and height).

**Input4 Select:** Select video source format for VGA input, includes AV 1 (C-video signal), VGA 1 (VGA signal) and YPbPr 1 (Component video signal). Use ENTER button to select the desired source format.

**Input5 Select:** Select video source for VGA input, includes AV 2 (C-video signal), VGA 2 (VGA signal) and YPbPr 2 (Component video signal). Use ENTER button to select the desired source format.

For INPUT4 & INPUT5, when change for new format signal:

1. Firstly, please select a format through this menu (the signal format changed while

the video source is still the same).

2. Secondly, switch off the present signal channel (e.g. switch to another channel).
3. Thirdly, switch to channel INPUT4/INPUT5 again.

**HDMI1 Audio Select:** switch between Embedded and Line to choose the desired audio output port for HDMI1.

**HDMI2 Audio Select:** switch between Embedded and Line to choose the desired audio output port for HDMI2.

**HDMI3 Audio Select:** switch between Embedded and Line to choose the desired audio output port for HDMI3.

**Software Update (USB):** Insert the USB flash disk with updating file to USB port of SC51D, to update the software through this menu.

### 4.5.2 Picture

Including Picture Mode, Color Temperature, Aspect Ratio, Noise Reduction, Screen and Color Range.

Please check the picture below:



**Picture mode:** Includes Dynamic, Standard, Mild, and User. And only in User mode, it is able to set the image contrast and brightness.

**Color Temperature:** Includes Cool, Medium, Warm and User. And only in User mode, it is able to set values for Red, Green and Blue (RGB).

**Aspect Ratio:** Includes Native, 4:3, 16:9, Zoom1, Zoom2, Just Scan, Panorama, and Point To Point. VGA format only supports 4:3, 16:9 and Point to Point.

**Noise Reduction** (not for VGA format): Includes Off, Low, Middle, High and Default.

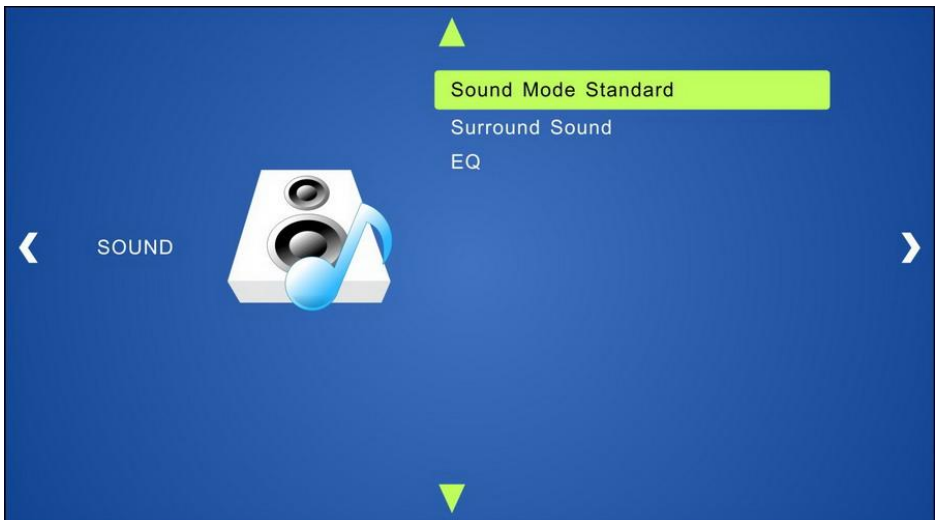
**Screen:** (not for HDMI source): Includes Auto Adjust, Horizontal, Vertical, Size, and Phase.

**Color Range** (not for VGA format): Includes 0~255 and 16~235, use ENTER button to select the color range.

#### 4.5.3 Sound

Including Sound Mode, Surround Sound and EQ

Please check the picture below:



**Sound mode:** Includes Standard, Music, Movie, Sports and User. Only User mode supports to set treble and bass.

**Surround Sound:** Includes Off, Surround and SRS Trusurround XT.

**EQ:** To adjust the sound balance.

#### 4.5.4 Setup

Including OSD Language, Blending, HDMI CEC and OSD Duration



**OSD Language:** Supports 14 languages, including English (default), Chinese etc.

**Blending:** Includes Low, Middle, High and Off. Use ENTER button to select.

**HDMI CEC:** Enable/disable CEC and auto-standby function. Default: CEC on, STANDBY on.

**OSD Duration:** Includes 5 s, 10 s, 15 s and Off. “s” is for Second.

#### 4.6 Instructions of VGA Converting Cable

As VGA source supports YPbPr and C-video source, SC51D provides with 2 VGA converting cables to compliant with these signals.

When need to select these signals as input source, please switch to channel INPUT 4 (or INPUT 5), and then set the signal type in OSD. And then switch to other input channel and connect INPUT 4 (or INPUT 5) with corresponding source device. At last, please switch to INPUT4 (or INPUT 5) again.

#### ● Connect with Component Video (YPbPr) Source

A. Operation Examples:

1. Via front panel buttons & OSD

Press **MENU** button on front panel to enter in OSD, and then enter in **OPTION** setting menu: set “INPUT 4 Select” to **YPbPr1**, and “INPUT 5 Select” to **YPbPr2**. After setting, press **SOURCE/AUTO** button on front panel to switch to YPbPr1 or YPbPr2 source.

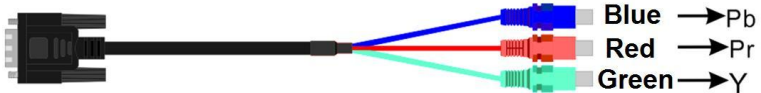
2. Via RS232 commands

Send command **50681%** (or **50684%**) to switch to YPbPr1 (or YPbPr2) source.

3. Via IR remote & OSD

Press **MENU** button on IR remote to enter in OSD, and then enter in **OPTION** setting menu: set "INPUT 4 Select" to **YPbPr1**, and "INPUT 5 Select" to **YPbPr2**. After setting, press **INPUT 4** (or **INPUT 5**) button to switch to YPbPr1 (or YPbPr2) source.

B. Connecting the VGA converting cable like this:



● **Connect with Composite Video (C-VIDEO) Source**

A. Operation Examples:

1. Via front panel buttons & OSD

Press **MENU** button on front panel to enter in OSD, and then enter in **OPTION** setting menu: set "INPUT 4 Select" to **AV1**, and "INPUT 5 Select" to **AV2**. After setting, press **SOURCE/AUTO** button on front panel to switch to AV1 or AV2 source.

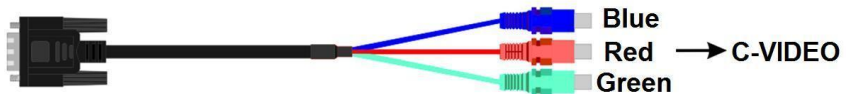
2. Via RS232 commands

Send command **50682%** (or **50685%**) to switch to YPbPr1 (or YPbPr2) source.

3. Via IR remote & OSD

Press **MENU** button on IR remote to enter in OSD, and then enter in **OPTION** setting menu: set "INPUT 4 Select" to **AV1**, and "INPUT 5 Select" to **AV2**. After setting, press **INPUT 4** (or **INPUT 5**) button to switch to AV1 (or AV2) source.

B. Connecting the VGA converting cable like this:



## 5. Specification

Video Input		Video Output	
Input	3 HDMI 2 VGA	Output	1 HDMI 1 HDBaseT

## Compact Scaler Switcher

Input Connector	3 female HDMI 2 female VGA (15 pin)	Output Connector	1 female HDMI 1 RJ45
Video Signal	HDMI, YPbPr, C-video, VGA	Video Signal	1 HDMI 1 HDBaseT
<b>IR Input</b>		<b>IR Output</b>	
Input	1 IR IN	Output	5 IR OUT
Input Connector	3.5mm mini jack	Output Connector	3.5mm mini jack
<b>Video General</b>			
Resolution Range	1024x768, 1280x720, 1280x800, 1920x1080, 1600x1200, 1920x1200	Bandwidth	HDMI:4.95Gbps(1.65Gb ps per color) C-Video:150MHz YPbPr: 170MHz VGA: 375MHz
Maximum Pixel Clock	165MHz	Video Impedance	75Ω
Gain	0dB	Input / Output Level	0.5V~2.0Vp-p
HDCP	Compliant with DVI & HDMI 1.3 standards		
<b>Audio Input</b>		<b>Audio output</b>	
Input	3 Dual-mono stereo audio for HDMI 2 Dual-mono stereo audio for VGA (Support C-VIDEO, YPbPr, VGA)	Output	1 stereo
Input Connector	3P captive (3.81mm)	Output Connector	3P captive (3.81mm)
Input Impedance	>10kΩ	Output Impedance	50KΩ
<b>Audio General</b>			
Frequency Response	20Hz~20K Hz	Stereo Channel Separation	>80dB @1KHz
CMRR	>90dB @20Hz to 20K Hz		
<b>Control Parts</b>			
Control/ Remote	IR remote, Buttons & RS232	Pin Configuration	2 = TX, 3 = RX, 5 = GND
<b>General</b>			
Temperature	-20 ~ +70°C	Humidity	10% ~ 90%

Power Supply	DC12V ± 0.5V	Power Consumption	<b>8W</b> , supply power to SC51D and TPHD402PR separately <b>16W</b> , SC51D supplies power to TPHD402PR
Case Dimension	W220x H44x D148mm	Product Weight	0.67Kg

## 6. Panel Drawing



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## 7. Troubleshooting & Maintenance

- 1) When output image is with snowflake, such as the projector output with snowflake. Generally this is not a unit faulty,
  - Caused by a bad quality of cable. Please try another high quality cable.
  - The video cables are loose, please connect again.
- 2) When it is not able to manage EDID, maybe the HDMI cable is broken or loose.
- 3) When user cannot control the switcher by computer through its COM port, please check the COM port number in the software and make sure the COM port is in good condition.
- 4) If the **POWER** indicator doesn't work or no respond to any operation, please make sure the power cord connection is good.
- 5) When switching , there is no output image:
  - Check with oscilloscope or multimeter if there is any signal at the input/output end. If there is no signal input/output, it may be the input/output connection cord broken or the connectors loosen. Please change for another cable or connect again.
  - If it is still the same after the above checking, maybe there is something wrong in the switcher. Please send it to the dealer for fixing.
- 6) If the static becomes stronger when connecting the video/audio connectors, it probably due to the incorrect grounding, please correct it otherwise it would damage the switcher.
- 7) If it is not able to control the scaler switcher from front panel buttons, but able through RS232 commands, maybe the front panel buttons are locked. Please send command **50605%** to unlock.
- 8) If the scaler switcher cannot be controlled by the buttons on the front panel, RS232 port or IR remote, the switcher may have broken. Please send it to the dealer for repairing.



## 8. Safety Operation Guide

In order to guarantee the reliable operation of the equipments and safety of the staff, please abide by the following proceeding in installation, using and maintenance:

- 1) The system must be earthed properly. Please do not use two blades plugs and ensure the alternating power supply ranged from 100v to 240v and from 50Hz to 60Hz.
- 2) Do not put the device in a place of too hot or too cold.
- 3) As the power generating heat when running, the working environment should be maintained fine ventilation, in case of damage caused by overheat.
- 4) Cut off the general power switch in humid weather or left unused for long time.
- 5) Before following operation, ensure that the alternating current wire is pull out of the power supply:
  - Take off or reship any components of the equipment.
  - Take off or rejoin any pin or other link of the equipment.
- 6) As to non-professional or without permission, please DO NOT try to open the casing of the equipment, DO NOT repair it on your own, in case of accident or increasing the damage of the equipment.
- 7) DO NOT splash any chemistry substance or liquid in the equipment or around.

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## 9. After-sales Service

- 1) If there appear some problems when running SC51D, please check and deal with the problems reference to this user manual. Any transport costs are borne by the users during the warranty.
- 2) You can email to our after-sales department or make a call, please tell us the following information about your cases.
  - Product version and name.
  - Detailed failure situations.
  - The formation of the cases.
- 3) We offer products for **five-year warranty**, which starts from the first day you buy this product (The purchase invoice shall prevail).
- 4) Any problem is same with one of the following cases listed, we will not offer warranty service but offer for charge.
  - Beyond the warranty.
  - Damage due to incorrectly usage, keeping or repairing.
  - Damage due to device assembly operations by the maintenance company non-assigned.
  - 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.

**Remarks:** For any questions or problems, please try to get help from your local distributor, or email PTN at: [support@PTN-Electronics.com](mailto:support@PTN-Electronics.com).



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