

USER MANUAL

SC121D-TN

PTN Scaler Switcher with Digital Amplifier



Version: SC121D-TN2013V1.2

NOTICE: Please read this user manual carefully before using this product.

This is a manual for scaler switcher SC121D-TN.

This manual is only an instruction for operators, not for any maintenance usage. The functions described in this version are updated till November, 2012. 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 2013-05-27.

Update History

Version	Date	Update Content
1.0	2011.10.05	First version.
1.1	2012.11.23	Add output adjustment function and OSD introduction.
1.2	2013.05.27	Modified the system diagram.

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1. Introduction

1.1. Introduction to SC121D-TN

SC121D-TN is a full HD scaler switcher with 12 video, 6 audio & 2 MIC inputs. It scales & switches any video signal HDMI, VGA, YPbPr, C-Video & S-video to HDBaseT, HDMI & VGA simultaneously, and any audio to 2x20W amplifier. It's controllable via the button, IR, RS232 & TCP/IP.

It's a high performance scaler for education institution, meeting room, conference room, demonstration hall etc.

1.2. Package Contents

- 1 x SC121D-TN
- 1 x TP402R (2 mounting ears & 4 screws)
- 1 x Power Cord
- 1 x Power Adapter (DC 5V)
- 1 x IR remote (Cell battery is not included)
- 4 x Captive screw connectors
- 4 x Plastic cushions
- 1 x RS232 cable
- 1 x User Manual

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

2. Features

- 12 video Inputs: 4 x HDMI, 4 x VGA, 1 x YPbPr, 2 x C-video & 1 x S-video.
- 2 MIC inputs with level control and mixer function.
- Upscale to outputs HDBaseT, HDMI & VGA simultaneously up to 1080P.
- HDBaseT output to be paired with transmitter TPHD402R for 70M transmission.
- Built-in 2x20Watt@4Ω digital amplifier (or 2x10Watt@8Ω).
- Output resolutions selectable to assure preferred output.
- Output display H/V size: adjustable to settle any overscale problem.
- Output display H/V position moveable.
- MIC volume and line volume adjustable.
- Video parameter setting and preset.
- Powerful OSD function with full control.
- Ultra-switching for instaneous display.
- HDMI1.3 and HDCP compliant.
- Firmware updatable via USB.
- Output freeze function.
- Front panel lockout.
- Controllable via transmitter TPHD402R at display end.
- Controllable via button, IR, RS232 & TCP/IP.

3. Specification

Video Input		Video Output	
Input	4 HDMI 4 VGA 1 YPbPr 2 C-Video 1 S-Video	Output	1 HDMI 1 VGA 1 HDMI TP
Input Connector	HDMI female connector VGA(15 pin HD), female connector RCA female connector 4 pin mini DIN connector	Output Connector	HDMI female connector VGA(15 pin HD), female connector RJ-45 connector
Video Signal	HDMI 1.3, RGBHV, RGBs, RGsB, RsBsGs, NTSC 3.58, NTSC 4.42,PAL,SECAM	Video Signal	HDMI 1.3 VGA HDBase-T
Video General			
Resolution Range	1080P,1920*1080 ; HD, 1360*768 720P, 1280*720; WXGA,1280*800 ; XGA, 1024*768.	Bandwidth	HDMI: 4.95Gbps(1.65Gbps per color) C-Video/S-Video: 150MHz YPbPr: 170MHz VGA: 375MHz
Maximum Pixel Clock	145MHz	Video Impedance	75Ω
Gain	0dB	I/O Level	0.5V~2.0Vp-p
HDCP management	Compliant with High-bandwidth Digital Content Protection(HDCP) with DVI & HDMI 1.3 standards		
Audio Input		Audio Output	
Input	6 Stereo Audio for line audio 2 MIC audio	Output	Stereo audio for line audio 2x10W@8Ω/2x20W@4Ω amplifier
Input Connector	4 RCA female connector for YPbPr, C-Video & S-Video audio 4 3.5mm jack for VGA	Output Connector	RCA connector Amplifier connector

	audio HDMI for HDMI embedded audio		
Audio Input Impedance	>10kΩ	Audio Output Impedance	50Ω
Audio General			
CMRR	>90dB @20Hz to 20K Hz	Stereo Channel Separation	>80dB @1KHz
Frequency Response	20Hz~20K Hz		
Control Parts			
Control/Remote	IR remote, Buttons & RS-232, TCP/IP	Pin Configurations	2 = TX, 3 = RX, 5 = GND
General			
Temperature	-20 ~ +70°C	Humidity	10% ~ 90%
Power Supply	100VAC ~ 240VAC, 50/60Hz	Power Consumption	65W
Case Dimension	W483 x H44x D235mm	Product Weight	2.1Kg

4. Operations of the Control Panel and the Remote Controller

4.1. Operations of the Control Panel

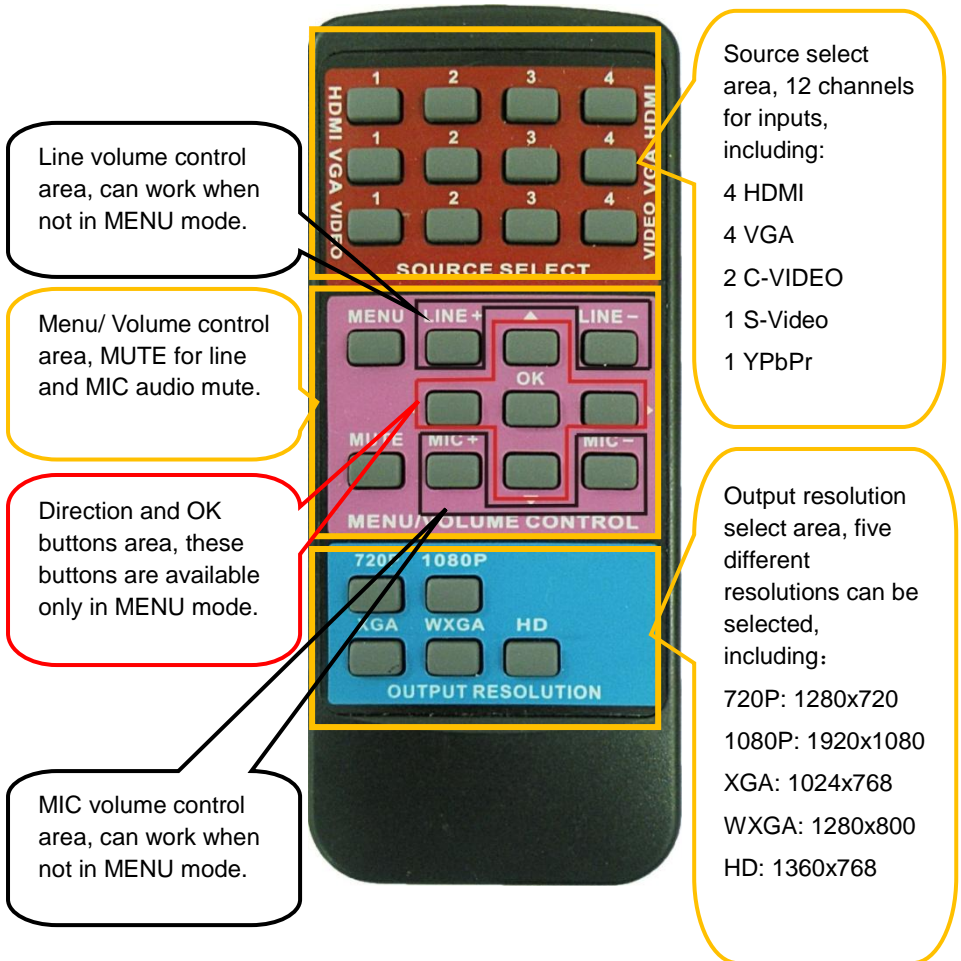


- ① Power indicating LED. It will keep on red when the unit is connected with power.
- ② IR sensor. It is for IR remote controlling, receiving the signal of IR remote.
- ③ Signal indicating LED.
- ④ Video source selection buttons. You can select video/audio sources by these buttons. And VIDEO source including three different signal: YPbPr, C-Video and S-Video.
- ⑤ Signal channel selection buttons.

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- ⑥ Resolution selection buttons. These including 1024x768, 1280x720p, 1280x800, 1360x768, 1920x1080p.
- ⑦ MIC volume control buttons. “MUTE” for mute MIC volume, “△”for MIC volume up, “▽”for MIC volume down, loop controlling.
- ⑧ Line volume control buttons. “MUTE” for mute line volume, “△”for line volume up, “▽”for line volume down, loop controlling.

4.2. Operations of the Remote Controller



5. Interfaces Connection Introduction



- ① Two RCA connectors for stereo audio output, one VGA output, one HDMI output with audio embedded, one TP port for HDMI extending (works with PTN TPHD402R).
- ② Four VGA connectors for VGA inputs.
- ③ Four HDMI connectors for HDMI inputs.
- ④ Four 3.5mm audio connectors for VGA audio inputs.
- ⑤ One Component video input: Y/Pb/Pr, two composite video inputs: C-Video, one Separate video input: S-Video, two pairs L/R for analog audio input.
- ⑥ One RS232 port for series control, one USB port for firmware update.
- ⑦ Two MIC connectors: MIC with pre-amplification, LINE for audio direct input. One TCP/IP port for network controlling.
- ⑧ Amplifier with 2x10W@8Ω output.
- ⑨ Connector for POWER.
- ⑩ Grounding protection.

5.1. Video Input/output

SC121D-TN supports different kinds of video signal, such as C-Video, S-Video, YPbPr, VGA, and HDMI. And all can be scaled to high-resolution HDMI & VGA format and switched out.

5.1.1. C-Video and S-Video input

- Supporting PAL/SECAM/NTSC format
- Changeable aspect ratio. (Full-screen, wide screen, 4:3)
- Color RGB adjustable

5.1.2. YPbPr input

Input Resolution	Display Parameter				
	Frame frequency		Frame frequency		Frame frequency
720x480 I	2:1	525	15.75	60	4:3
720x480 P	1:1	525	31.5	60	4:3
720x576 I	2:1	625	15.625	50	4:3
720x576 P	1:1	625	31.25	50	4:3
1280x720P	1:1	750	45	60	16:9

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1280x720P	1:1	750	37.50	50	16:9
1920x1080 l	2:1	1125	28.125	50	16:9
1920x1080 l	2:1	1125	33.75	60	16:9
1920x1080 l	2:1	1250	31.25	50	16:9
1920x1080 p	1:1	1250	62.5	50	16:9
1920x1080 p	1:1	1250	67.5	60	16:9
The bandwidth is up to 170MHz					

- Changeable aspect ratio. (Full-screen, wide screen, 4:3, auto-adjust)
- Supporting HDTV input

5.1.3. VGA input

The VGA resolution is VESA standard, supporting:

No.	Resolution	No.	Resolution
1	640x480@60 Hz	8	1024x768@70 Hz
2	640x480@72 Hz	9	1024x768@75 Hz
3	720x400@70 Hz	10	1280x1024@75 Hz
4	800x600@60 Hz	11	1280x768
5	800x600@72 Hz	12	1360x768@60 Hz
6	800x600@75 Hz	13	1920x1080
7	1024x768@60 Hz		

- The bandwidth is up to 375MHz.
- The following audio can adjust bass/treble
- Changeable aspect ratio. (Full-screen, 4:3)

5.1.4. HDMI input

HDMI resolution support:

No.	Resolution	No.	Resolution
1	640x480@60Hz	9	1024x768@70 Hz
2	640x480@72Hz	10	1024x768@75 Hz
3	640x480@75Hz	11	1280x1024@75Hz
4	800x600@56Hz	12	1360x768
5	800x600@60 Hz	13	1920x540
6	800x600@72 Hz	14	1920x1080l
7	800x600@75Hz	15	1920x1080P
8	1024x768@60 Hz		

- Digital embedded audio decoding.
- Changeable aspect ratio (Full-screen, wide screen, 4:3, auto-adjust).
- Support HDCP1.3, compatible with DVI signal.

5.2. Audio input/output

- 2 pairs of L/R analog audio input, 4 VGA audio and 2 MIC audio inputs
- 2x10W@8Ω amplifier output. L/R stereo audio output and HDMI embedded audio.
- Volume/Bass/Treble adjustable
- Audio status presets, changeable scene mode (Wall-mounted, Desk)

6. System Diagram

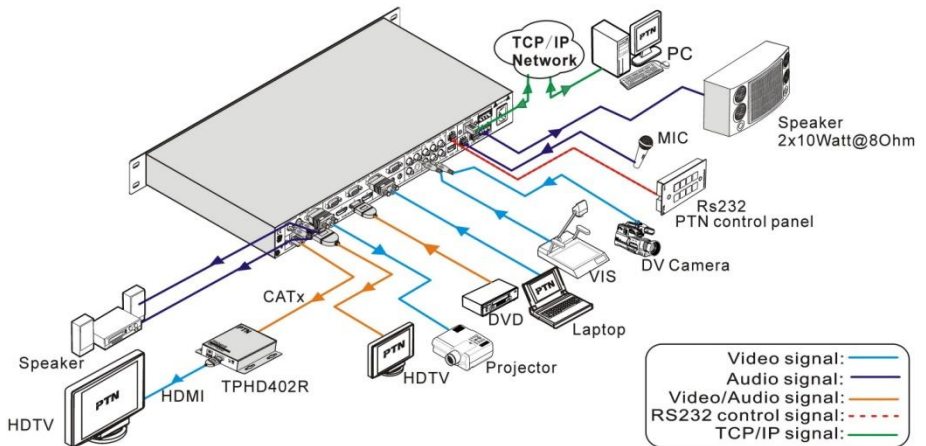


Figure 2 System Diagram

7. OSD Functions Introduction

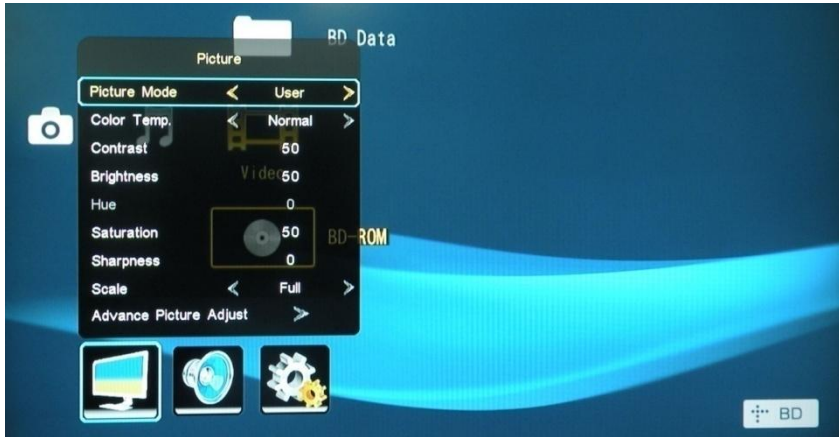
SC121D-TN provides a nice OSD operation menu, with various functions and language. The operation introduction is showed as follows.

7.1. Picture Setting

The first icon from left of OSD menu is to set the picture parameter. It includes the pictures mode preset, color temperature, contrast, brightness, hue, saturation, sharpness, scale, and Advance picture adjust.

Some parameters are available depending on different input. The Advance Picture Adjust can set the Digital Noise Reduction, dynamic color, skin tone and Adaptive Luma adjustment function on or off. And DNR is suggested to be on, this can make the output image clear and smooth.

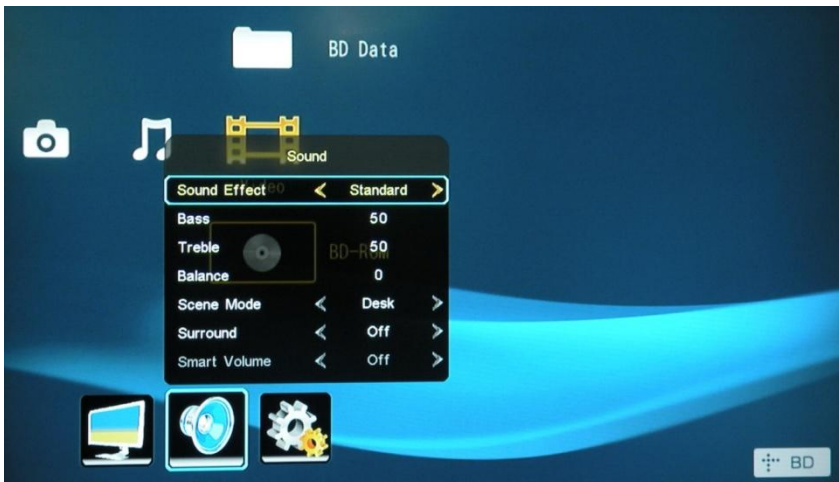
Please check the picture below:



7.2. Audio Setting

The Second icon from left of OSD menu is to set the audio/sound parameter. It includes the sound effect preset, bass, treble, balance, scene mode, surround and smart volume setting. Some parameters are available depending on different input.

Please check the picture below:



7.3. System Setting

The Third icon from left of OSD menu is the system setting, includes the OSD language setting, audio listen only, freeze output image, VGA setting, output adjustment etc.

Listen: Audio output only. To resume video output, please press button “MENU”.

VGA setting: Adjust the H/V signal of VGA input, includes auto adjustment.

Output adjustment: Adjust H/V size and H/V position of the output. This function is available only with HDMI and VGA inputs.



8. Firmware Update

SC121D-TN supports firmware field-updating, by USB flash disk. The Operation is:

- 1) Copy the file “MT23ATV.bin” to a USB flash disk. (The “MT23ATV.bin” file is provided/authorized by PTN engineering department)
- 2) Plug the USB flash disk to the USB port on SC121D-TN.
- 3) Pressing the button “HDMI” on the front panel for 6 seconds or sending RS232 command 0698% for updating, then press the button “OK” on the remote or send RS232 command 0609% to confirm update. SC121D-TN will capture the new firmware from USB flash disk.
- 4) After updating finish, reboot and send the command “0617%” to reset to factory settings.
- 5) After reset, reboot again.

Notice: The name of the update file must be **MT23ATV.bin**.

9. Communication Protocol and Command Codes

9.1. RS232 Controlling

Communication protocol: RS232 Controlling Protocol

Command Type: ASCII

Baud rate: 9600

Data bit: 8

Stop bit: 1

Parity bit: none

Command	Function Description	Feedback Example
0600%	MUTE Line	LINE Mute On
0601%	UnMute Line	LINE Mute Off
0602%	Audio turn up	LINE Volume: XX
0603%	Audio turn down	LINE Volume: XX
0604%	Lock the front panel button	Panel Locked
0605%	Unlock the front panel button	Panel UnLocked
01XX%	Preset the volume. The XX is ranging from 00 to 99	Volume: XX
02XX%	Preset the brightness. The XX is ranging from 00 to 99	Brightness: XX
03XX%	Preset the contrast. The XX is ranging from 00 to 99	Contrast: XX
04XX%	Preset the saturation. The XX is ranging from 00 to 99	Saturation: XX
05XX%	Preset the sharpness. The XX is ranging from 00 to 07	Sharpness: XX
0606%	Auto-adjust the input signal(VGA only)	VGA Adjustment
0607%	Auto-adjust the color temperature	Color Temp: XX
0608%	ZOOM the image, set the aspect ratio	Aspect Ratio: XX
0609%	OK, for OSD selection	OK
0610%	Left of OSD	Left
0611%	Right of OSD	Right
0612%	Up of OSD	Up
0613%	Down of OSD	Down
0614%	Set the picture mode	Picture Mode : XX
0615%	SM Mode	Sound Mode: XX
0616%	MENU of OSD	MENU
0617%	Command to reset to factory defaults	Factory reset
0618%	Change the resolution to 1360X768 HD	Resolution: HD 1360X768
0626%	Change the resolution to 1024X768 XGA	Resolution: XGA 1024X768
0627%	Change the resolution to 1280X720 720P	Resolution: 720P 1280X720
0628%	Change the resolution to 1280X800 WXGA	Resolution: WXGA

		1280X800
0629%	Change the resolution to 1920X1080 1080P	Resolution: 1080P 1920X1080
0630%	Check the volume level	LINE Volume: XX/MIC Volume: XX
0631%	Check the input source	Source: XXXXXX
0632%	Check the output resolution	Resolution: XXXXXXXX
0633%	Check the image mode	Picture Mode : XX
0634%	Check the audio mode	Sound Mode: XX
0635%	Check the image aspec ratio	Aspect Ratio: XX
0636%	Check the brightness	Brightness: XX
0637%	Check the contrast	Contrast: XX
0638%	Check the saturation	Saturation: XX
0639%	Check the sharpness	Sharpness: XX
0640%	Check the color temperature	Color Temp: XX
0644%	OSD CHANNEL display able	OSD Source: Display
0645%	Shield OSD CHANNEL	OSD Channel (Source): No Display
0646%	Volume Bar display able	Volume Bar: Display
0647%	Volume Bar display unable	Volume Bar: No Display
0648%	Digital audio (HDMI and SPDIF) output able	Digital Sound Ouput: Enable
0649%	Shield digital audio (HDMI and SPDIF) output	Digital Sound Ouput: Disable
0650%	Check OSD CHANNEL display status	OSD Source: Display
0651%	Check Volume Bar display status	Volume Bar: Display
0652%	Check Digital audio output status	Digital Sound Ouput: Enable
0655%	Freeze output image	Freeze: Enable
0656%	Cancel the freezing of output image	Freeze: Disable
0698%	Firmware update	
0701%	Switching to HDMI1 input	Source: HDMI 1
0702%	Switching to HDMI2 input	Source: HDMI 2
0703%	Switching to HDMI3 input	Source: HDMI 3
0704%	Switching to HDMI4 input	Source: HDMI 4
0705%	Switching to VGA1 input	Source: VGA1
0706%	Switching to VGA2 input	Source: VGA2
0707%	Switching to VGA3 input	Source: VGA3
0708%	Switching to VGA4 input	Source: VGA4
0709%	Switching to composite video AV1 input	Source: CVIDEO1

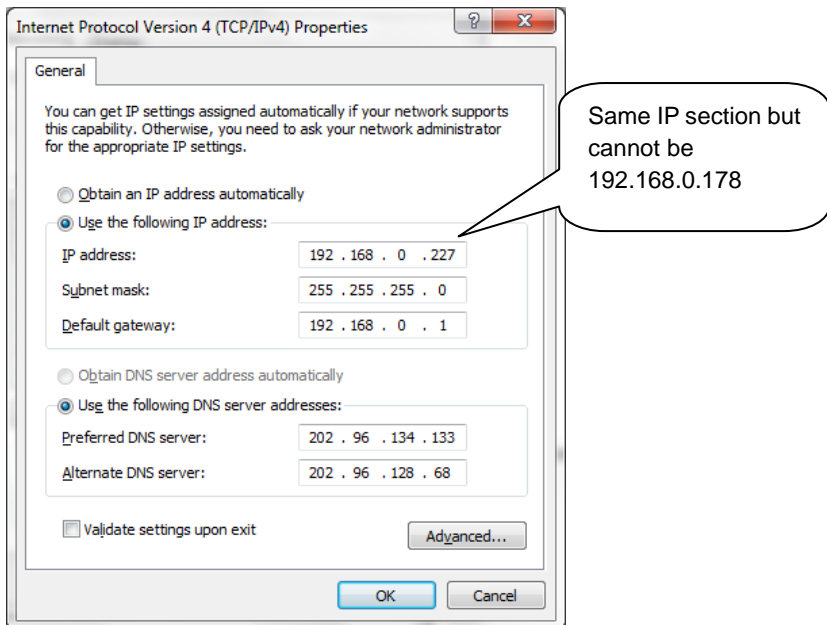
0710%	Switching to YPbPr input	Source: YPbPr
0711%	Switching to S-Video input	Source: SVIDEO
0712%	Switching to composite video AV2 input	Source: CVIDEO2
0720%	Mute Line and MIC	Mute On
0721%	UnMute Line and MIC	Mute Off
0722%	MUTE MIC	MIC Mute On
0723%	UnMute MIC	MIC Mute Off
0724%	MIC volume turn up	MIC Volume: XX
0725%	MIC volume turn down	MIC Volume: XX
08XX%	Preset MIC volume	MIC Volume: XX

9.2. TCP/IP Controlling

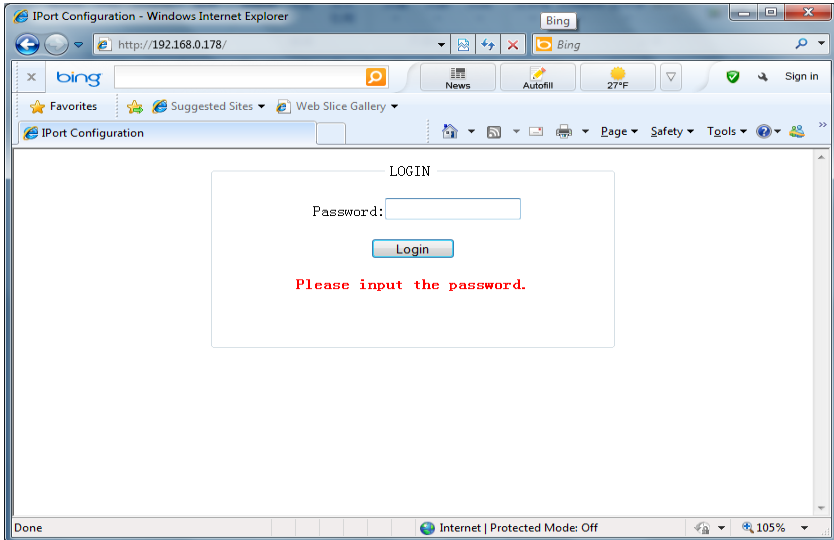
The TP port of SC121D-TN is used for TCP/IP control. And all the control commands are the same as the RS232 command list. Below is the detailed introduction.

9.2.1. IP Configuration

- 1) Connect a computer to the TP port, set its IP to the same IP section as the default IP of SC121D-TN (192.168.0.178). As picture below:

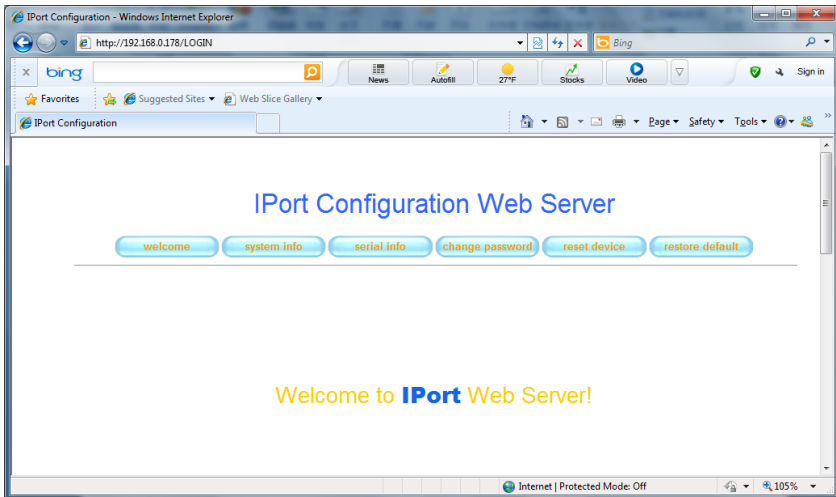


- 2) Enter the 192.168.0.178 to the Internet Explorer, you will see the LOGIN page as below:



- 3) Enter the password “88888”, and then you can enter the configuration page to configure the IP port, including the IP reset, PW reset etc. As picture below:

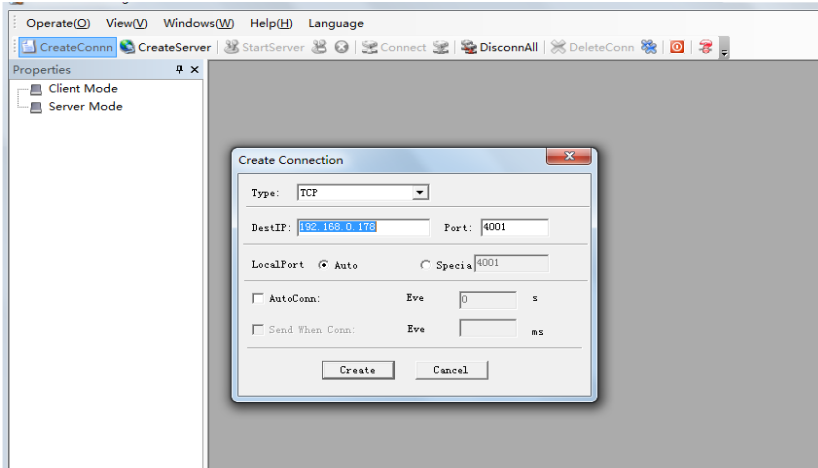
Notice: Serial configuration must be fixed to meet SC121D-TN, so it cannot be changed.



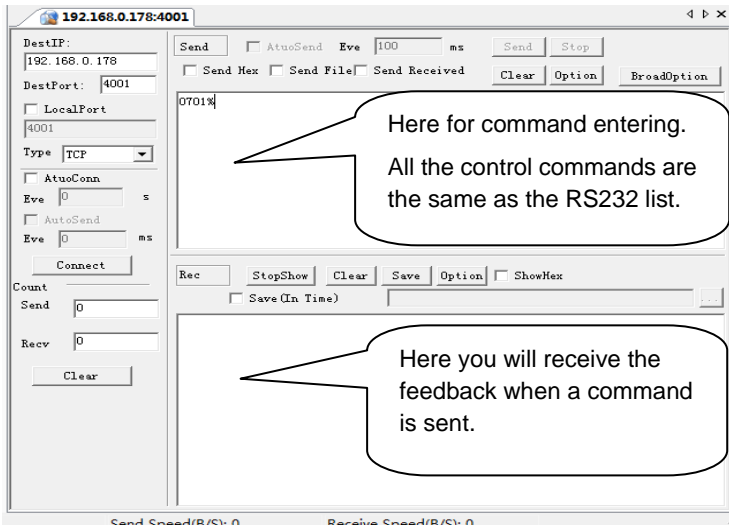
After configuration, reset device, then you can use the new IP address for controlling.

9.2.2. Connection Introduction

- 1) Connect a computer and SC121D-TN to the same network. Open the PTNET software (or any other TCP/IP communication software) and create a connection, enter the IP address and port of SC121D-TN (default IP: 192.168.0.178, port:4001):



- 2) After connect successfully, we can enter commands to control the SC121D-TN, as below:



10. Troubleshooting & Maintenance

- 1) When images of terminal unit output with ghost, such as the projector output with ghost. Please check the projector's setting or try another high quality connection cable.
- 2) When there is a color losing or no video signal output, please check the input and output end connections of the cables.
- 3) When the remote controller doesn't works:
 - The battery has no power, please change a new one.
 - The controller was broken, please repair it.
- 4) 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.
- 5) When there is no output images:
 - Check if there is any signal at the input.
 - Check if there is any signal at the output.

We can check these by using an oscilloscope or a multimeter. If there is no signal input/output, maybe the input/output cables broken or the connectors loosen, please change for another cable.

- If not the problem mentioned above, probably there is something broken inside the unit, please send it to the dealer for repairing.
- 6) If the **POWER** indicator doesn't work or no respond to any operation, please make sure the power cord connection is good.
 - 7) If the output image is interfered, please make sure the system is grounded well.
 - 8) If the static becomes stronger when connecting the BNC connectors, it probably due to the incorrect grounding, please correct it otherwise it would damage the switcher.
 - 9) If the 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.

11. 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 switcher 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.

12. After-sales Service

- 1) If there appear some problems when running SC121D-TN, 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 all three-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.