



## User Manual

Scaler Switcher Multiformat Scaling, 4K (60Hz 4:2:0), HDMI Out

Model PT-PSW-41H

Designed in Germany

## Preface

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

This manual is for operation instructions only, not for any maintenance usage.

In the constant effort to improve our product, we reserve the right to make changes in functions or parameters without prior notice or obligation.

## Trademarks

Product model and logo are trademarks. Any other trademarks mentioned in this manual are acknowledged as the properties of the trademark owner. No part of this publication may be copied or reproduced without the prior written consent.

## 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.



**REACH | 1907/2006/EU**

**ROHS | 2011/65/EU**

PureLink hereby declares that this product **PureTools PT-PSW-41H** complies with Directives 1907/2006/EU und 2011/65/EU.

**EMC / LVD (Electro Magnetic Compatibility / Low Voltage Directive)**

PureLink GmbH hereby declares that this product **PureTools PT-PSW-41H** complies with Directives 2014/30/EU and 2014/35/EU. The full text of the EU Declaration of Conformity is available at the following Internet address:

[http://www.purelink.de/ce/4251364706879\\_CE.pdf](http://www.purelink.de/ce/4251364706879_CE.pdf)



## 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 optical 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.
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## 1. Introduction

### 1.1 Introduction to PT-PSW-41H

The PT-PSW-41H is a professional 4K Scaler Switcher scaling HDMI/DP/VGA video signal to an HDMI output by selecting output resolution from 720p to 4K via OSD.

It can work with HDMI, DP, and VGA table grommets to switch source and output black screen for display (table grommets sold separately). CEC and IR learning function is used to control display via front panel buttons. With one built-in IR In, one IR Out and one RS232, the IR and RS232 control signals can be used for display control.

The PT-PSW-41H supports advanced 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 third party control device. Moreover, it features volume buttons to turn up/down the volume level.

### 1.2 Feature

- Features 2 HDMI inputs, 1 DP input and 1 VGA input with auxiliary audio.
- The output resolution can be selected from 720p to 4K x 2K@30Hz 4:4:4 to assure preferred output.
- Supports IR learning to set button function for controlling the connected display.
- Supports volume control via buttons.
- Allows the connected display to be controlled via CEC, IR, RS232 commands or front panel buttons.
- Supports HDMI/VGA/DP table grommets to control source switching and black screen showing.
- Automatically switch based on video sensing.
- Supports RS232 control.
- Supports IR pass through.
- Supports advanced built-in EDID management.

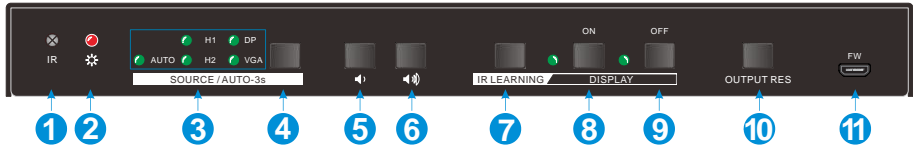
## 1.3 Package List

- 1 x PT-PSW-41H 4x1 4K Scaler Switcher
- 1 x Power Adapter (12VDC, 2A)
- 2 x Mounting Ears with 4 Screws
- 4 x Plastic Cushions
- 6 x 3-pin Phoenix Connectors

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

## 2. Panel Description

### 2.1 Front Panel

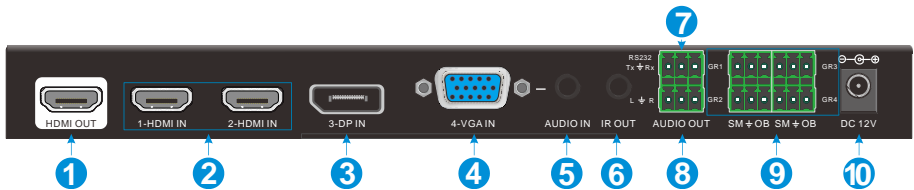


No.	Name	Description
①	Built-in IR Receiver	Receive IR signal from IR remote.
②	Power LED	Red when powered on.
③	Signal LED	<ul style="list-style-type: none"> <li>▪ AUTO: Auto switching activity LED.</li> <li>▪ H1&amp;H2: 1-HDMI/ 2-HDMI input activity LED.</li> <li>▪ DP: DP input activity LED.</li> <li>▪ VGA: VGA input activity LED.</li> </ul>
④	Auto Switching Selector	Press this to enter / exit auto switching mode.
⑤	Volume Down	Press this to decrease the output volume of scaler switcher and display.
⑥	Volume Up	Press this to increase the output volume of scaler switcher and display.
⑦	IR LEARNING	Press this to enter IR learning mode.
⑧	DISPLAY ON & Activity LED	Press this to turn on the display, and it can be customized via IR learning or RS232 commands.



No.	Name	Description
⑨	DISPLAY OFF & Activity LED	Press this to turn off the display, and it can be customized via IR learning or RS232 commands.
⑩	OUTPUT RES	Press this to enter On Screen Display menu (OSD) to select the output resolution.
⑪	FIRMWARE	Micro USB port, used for firmware update.

## 2.2 Rear Panel



No.	Name	Description
①	HDMI OUT	HDMI output port, connect with display.
②	1-HDMI IN & 2-HDMI IN	HDMI input ports, connect with HDMI source.
③	3-DP IN	DP input port, connect with DP source.
④	4-VGA IN	VGA input port, connect with VGA source.
⑤	AUDIO IN	VGA auxiliary audio input.
⑥	IR OUT	Connect with IR emitter to control display via IR.
⑦	RS232	<ul style="list-style-type: none"> <li>Serial port, connect a control device (PC) to control the PT-PSW-41H.</li> <li>Connect the display to control it via front panel buttons.</li> </ul>

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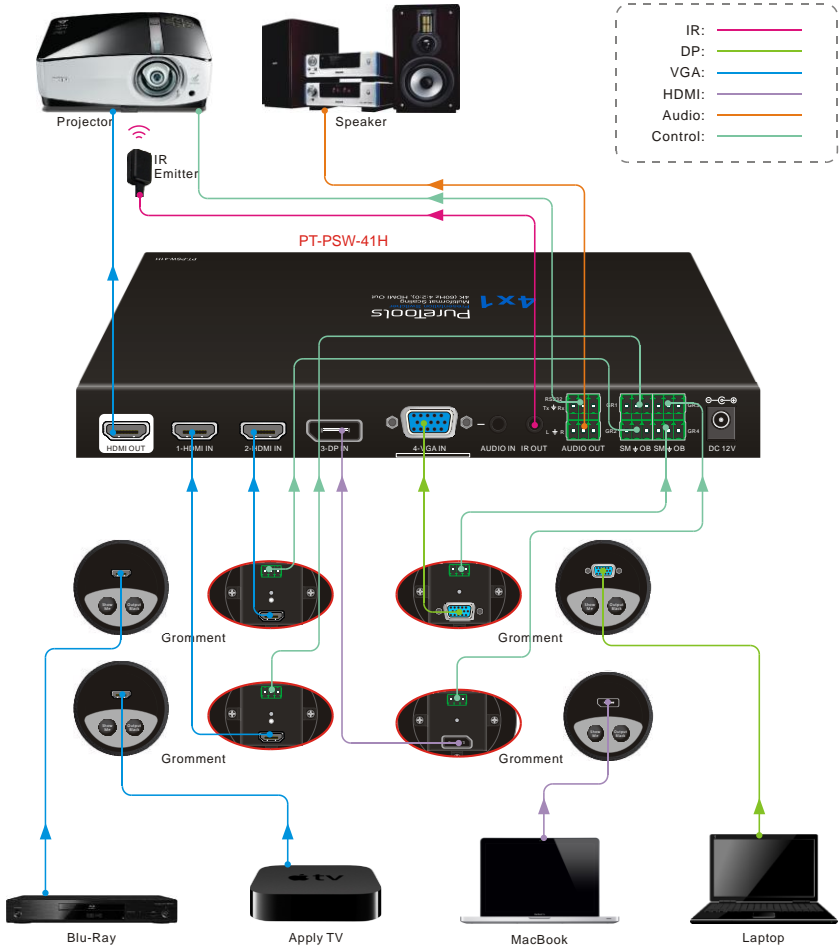
No.	Name	Description
⑧	AUDIO OUT	Audio output port, connect with speaker.
⑨	GR1,GR2, GR3&GR4	Connect with HDMI, DP or VGA table grommet to control source switching and black screen showing.
⑩	DC 12V	Connect the including power adaptor.

## 3. System Connection

### 3.1 Usage Precaution

- Verify that all components and accessories are included prior to installation.
- System should be installed in a clean environment with proper temperature and humidity (see page17 for limits).
- 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 switched live.

## 3.2 System Diagram



## 4. Button Control

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

### 4.1 Signal Switching

#### ① Manual Switching

Press the **SORCE/AUTO-3s** button to select the HDMI, DP or VGA source, the corresponding green activity LED 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**

The PT-PSW-41H has the ability to save the latest configuration before losing power. The switcher automatically enters the mode as latest mode used; moreover, it detects all the inputs and memorizes the connection status for future rebooting use. If the latest 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, PT-PSW-41H will detect all input signals with priority from HDMI to VGA. It will transfer the signal firstly detected to be available to the output device.

## 4.2 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.

## 4.3 Display Control

For compatibility with different displays, two customizable buttons on the front panel can be used to turn on/off the display. These two buttons can be customized by sending RS232 commands or IR learning function.

### 1) By sending RS232 commands

- a) Connect a control PC to the RS232 port.
  - b) Install RS232 control software on the PC, please refer to [6 RS232 control](#) for more details.
  - c) Find the corresponding display control command in the user manual of the display, then configure the **ON** or **OFF** button according to the below command format.
- Configure **ON** button:

Command Format	Description & Example	Feedback
/-ax:XX XX XX XX	"x" represents the baud rate: x=0(2400)/ 1(4800)/ 2(9600)/ 3(19200)/ 4(38400)/ 5(57600)/ 6(115200). "XX XX XX XX " is display control command (HEX, max 48 byte). For example: /-ax:30 31 32 33	XX XX XX XX (30 31 32 33)
/+ax:XXXXXXXX	"x" represents the baud rate: x=0(2400)/ 1(4800)/ 2(9600)/ 3(19200)/ 4(38400)/ 5(57600)/ 6(115200).	XXXXXXXX (0123456)

	<p>"XXXXXXX " is display control command (ASCII, max 48 byte).</p> <p>/+ax:0123456</p>	
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- Configure **OFF** button:

Command Format	Description & Example	Feedback
/-Ax:XX XX XX XX	<p>"x" represents the baud rate: x=0(2400)/ 1(4800)/ 2(9600)/ 3(19200)/ 4(38400)/ 5(57600)/ 6(115200).</p> <p>"XX XX XX XX " is display control command (HEX, max 48 byte).</p> <p>For example: /-ax:30 31 32 33</p>	<p>XX XX XX XX</p> <p>(30 31 32 33)</p>
/-Ax:XXXXXXXX	<p>"x" represents the baud rate: x=0(2400)/ 1(4800)/ 2(9600)/ 3(19200)/ 4(38400)/ 5(57600)/ 6(115200).</p> <p>"XXXXXXXX " is display control command (ASCII, max 48 byte).</p> <p>/+ax:0123456</p>	<p>XXXXXXXX</p> <p>(0123456)</p>

- Disconnect the control PC, then connect the display to the RS232 port.
- Press **ON** or **OFF** button to turn the display on or off.

## 2) IR Learning

- Press the **IR LEARNING** button to enable IR learning mode, the ON and OFF LEDs will light up.
- Press one of the display control buttons, e.g. press **ON** button, and its LED will start to flash.
- Point the display remote at the front panel built-in IR receiver and the press the Power On button on the remote, and the ON LEDs will go dark.
- Repeat the above all three steps to set the **OFF** button function.
- Press **ON** or **OFF** button to turn the display on or off.

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## 4.4 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 in 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.

## 5. RS232 Control

Connect the control device (PC) to the RS232 port of PT-PSW-41H, The PT-PSW-41H can be controlled by sending RS232 commands via RS232 control software installed in the PC.

### 5.1 RS232 Control Software

- **Installation:** Copy the control software file to the computer connected with PT-PSW-41H.
- **Uninstallation:** Delete all the control software files in the corresponding file path.
- **Basic Settings:**

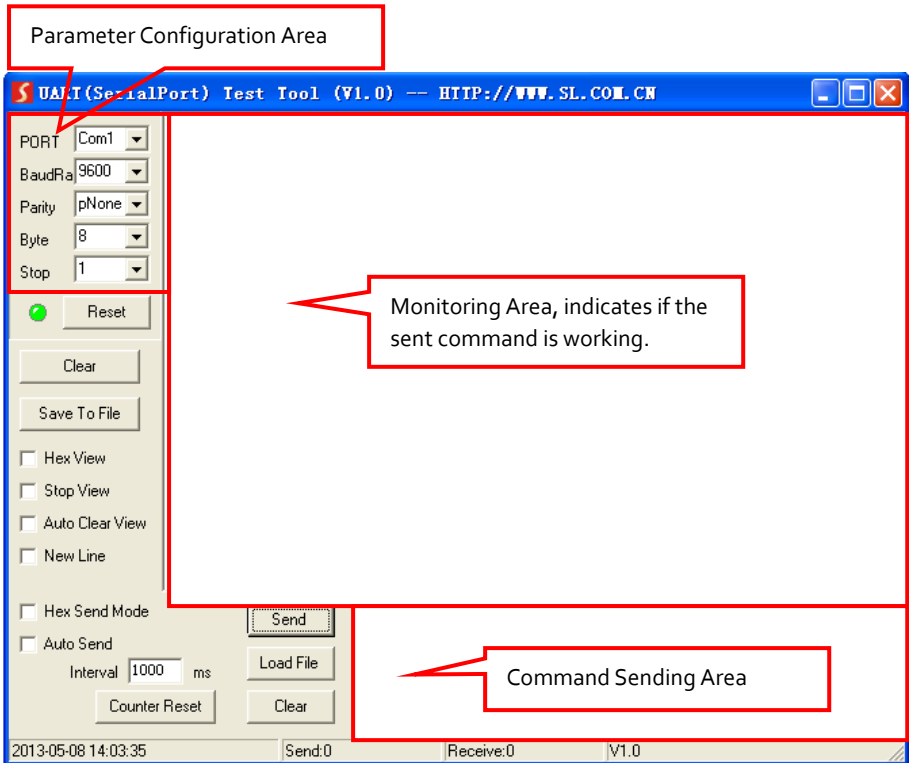
First connect PT-PSW-41H with all needed input and output devices, then connect it with a computer which is installed with RS232 control software. Finally, double-click the software icon to run this software.

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





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, then the command is ready to be sent in the Command Sending Area.

## 5.2 RS232 Command

**Communication protocol:** RS232 Communication Protocol

Baud rate: 9600

Data bit: 8

Stop bit: 1

Parity bit: none

### 5.2.1 System Configuration

Command	Function	Feedback
<b>SFUD</b>	Software upgrading	Software Update
<b>GET VER</b>	Check the software version	Version Vx.x.x
<b>FRST</b>	Restore factory default	Factor Reset
<b>WAKE</b>	Wake up the system	Wake Up
<b>STBY</b>	Turn the system to standby mode	Go To Standby
<b>GET STA</b>	Get the system status	Input:VGA Resolution: 1920x1080 Manual Switching Source Volume: 60 EDID: Initial HDCP: ON

## 5.2.2 Signal Switching

Command	Function	Feedback
<b>SWIN H1</b>	Switch to HDMI input	Switch to hdmi
<b>SWIN H2</b>	Switch to HDMI2	Switch to hdmi2
<b>SWIN DP</b>	Switch to DP	Switch to dp
<b>SWIN VG</b>	Switch to VGA input	Switch to vga
<b>AUTO 01</b>	Enable auto switching	Auto Switching
<b>AUTO 00</b>	Disable auto switching	Manual Switching

## 5.2.3 Audio Setting

Command	Function	Feedback
<b>AUMT S1</b>	Mute source audio	Audio Mute Source: Enable
<b>AUMT S0</b>	Unmute source audio	Audio Mute Source: Disable
<b>VOLS AP</b>	Increase the source volume to xx (xx=0~60)	Source Volume: xx
<b>VOLS AN</b>	Decrease the source volume to xx (xx=0~60)	Source Volume: xx
<b>VOLS xx</b>	Set the source volume to xx (xx=0~60)	Source Volume: xx

## 5.2.4 Output Resolution Selection

Command	Function	Feedback
<b>SRES 01</b>	Change output resolution to 3840x2160	Resolution: 3840x2160
<b>SRES 02</b>	Change output resolution to 1920x1080	Resolution: 1920x1080
<b>SRES 03</b>	Change output resolution to 1280x720	Resolution: 1280x720
<b>VGAA</b>	Automatic image correction for VGA input	VGA Input Auto

## 5.2.5 EDID Management

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

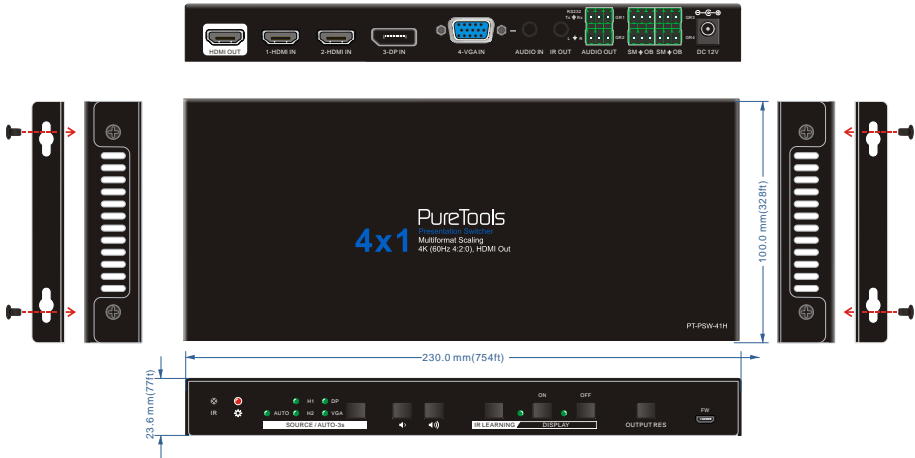
## 5.2.6 Baudrate Setting

Command	Function	Feedback
<b>BAUD 115200</b>	Set RS232 baudrate to 115200	Set Baudrate 115200
<b>BAUD 57600</b>	Set RS232 baudrate to 57600	Set Baudrate 57600
<b>BAUD 38400</b>	Set RS232 baudrate to 38400	Set Baudrate 38400
<b>BAUD 19200</b>	Set RS232 baudrate to 19200	Set Baudrate 19200
<b>BAUD 9600</b>	Set RS232 baudrate to 9600	Set Baudrate 9600
<b>BAUD 2400</b>	Set RS232 baudrate to 2400	Set Baudrate 2400
<b>BAUD 4800</b>	Set RS232 baudrate to 4800	Set Baudrate 4800

## 6. Specification

Input & Output	
Input	(2) HDMI; (1) DP; (1) VGA; (1) AUDIO
Input Connector	(2) Type A Female HDMI; (1) DisplayPort; (1) Female VGA (15-pin); (1) 3.5mm Mini Jack
Output	(1) HDMI; (1) AUDIO
Output Connector	(1) Type A Female HDMI; (1) 3-pin Phoenix Connector
Control	(1) IR OUT; (1) RS232; (1) GR1; (1) GR2; (1) GR3; (1) GR4
Control Connector	(1) 3.5mm Mini Jack; (5) 3-pin Phoenix Connectors
General	
Input Resolution	<ul style="list-style-type: none"> <li>▪ HDMI: Up to 4K@60Hz 4:2:0, Supports HDMI1.4, and HDCP2.2 Compliant.</li> <li>▪ VGA: Up to 1920x1200@60Hz.</li> </ul>
Output Resolution	3840x2160@30Hz, 1920x1080@60Hz, 1080x 720p@60Hz, Supports HDMI1.4, and HDCP1.4 Compliant.
Bandwidth	10.2Gbps
EDID	In-built EDID Management
Power Supply	Input:100V~240V AC; Output:12VDC 2A
Power Consumption	10w (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)	230mm x 23.6mm x 100mm (754ft x 77ft x 328ft)
Net Weight (g)	320g

## 7. Panel Drawing



## 8. Troubleshooting & 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 repair.
<b>POWER</b> indicator doesn't work or no respond to any operation	Fail connection of power cord.	Make sure the power cord connection is good.
Cannot control the device by control device (e.g. a PC) through RS232 port	Wrong RS232 communication parameters	Type in correct RS232 communication parameters.
Output image with white noise.	Broken RS232 port	Send it to authorized dealer for checking.
	Bad quality of the connecting cable	Try another high quality cable.

If your problem persists after following the above troubleshooting steps, seek further help from the authorized dealer or our technical support.



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## 9. After-Sales Service

If problems occur when running the product, please check and deal with the problems referring to this user manual. Any transport costs are borne by the user during the warranty period.

**1) Product Limited Warranty:** The product will be free from defects in materials and workmanship for **two years** (The purchase invoice shall prevail).

Proof of purchase in the form of a bill of sale or receipted invoice which is evidence that the unit is within the Warranty period must be presented to obtain warranty service.

**2) What the warranty does not cover (servicing available for a fee):**

- 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 provided as proof of warranty.
  - The product model shown on the warranty card does not match with the model of the product for repair, or has been altered.
  - Damage caused by force majeure.
  - Servicing not authorized by distributor.
  - Any other cause which does not relate to a product defect.
- Delivery, installation or labor charges for installation or setup of the product.

**3) Technical Support:** For any questions or problems, contact your distributor or reseller and tell them the respective product name and version, the detailed failure situation as well as the formation of the cases.





## Asking for Assistance

**Technical Support:**

Phone: +49 5971 800299 - 0

Fax: +49 5971 800299 - 99

**Technical Support Hours:**

8:30 AM to 5:00 PM Monday thru Thursday

8:30 AM to 4:00 PM Friday

**Write to:**

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D - 48432 Rheine

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