# TSH4



**User Manual** 

• Manual #: RGB-RD-UM-SD E001

Revision: V1.0



#### TSH4-User Manual

Thank you for choosing our products!

In order to allow you to learn how to use TSH4 quickly, we bring you the detailed user manual. You can read the introduction and directions before using TSH4, please read all the information we provide carefully to use our products correctly.

### Copyright

©2015 All rights reserved by RGBLINK.

This document is done by Xiamen RGBlink Science & Technology Co.,Ltd independently. No part may be copied, reproduced or translated without permission.

#### **Notice**

RGBlink provides this manual "as is" without warranty of any kind, either expressed or implied, including but not limited to the implied warranties or merchantability and fitness for a particular purpose. RGBlink may make improvements and/or changes to the product(s) and/or the program(s) described in this publication at any time without notice.

This publication could contain technical inaccuracies or typographical errors. Changes are periodically made to the information in this publication; these changes are incorporated in new editions of this publication.

# Federal Communications Commission (FCC) Statement

This equipment has been tested and found to comply with the limits for a class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area may cause harmful interference, in which case the user will be responsible for correcting any interference.

#### **Guarantee and Compensation**

RGBlink provides a guarantee relating to perfect manufacturing as part of the legally stipulated terms of guarantee. On receipt, the purchaser must immediately inspect all delivered goods for damage incurred during transport, as well as for material and manufacturing faults. RGBlink must be informed immediately in writing of any complains.

The period of guarantee begins on the date of transfer of risks, in the case of special systems and software on the date of commissioning, at latest 30 days after the transfer of risks. In the event of justified notice of compliant, RGBlink can repair the fault or provide a replacement at its own discretion within an appropriate period. If this measure proves to be impossible or unsuccessful, the purchaser can demand a reduction in the purchase price or cancellation of the contract. All other claims, in particular those relating to compensation for direct or indirect damage, and also damage attributed to the operation of software as well as to other service provided by RGBlink, being a component of the system or independent service, will be deemed invalid provided the damage is not proven to be attributed to the absence of properties guaranteed in writing or due to the intent or gross negligence or part of RGBlink.

If the purchaser or a third party carries out modifications or repairs on goods delivered by RGBlink, or if the goods are handled incorrectly, in particular if the systems are commissioned operated incorrectly or if, after the transfer of risks, the goods are subject to influences not agreed upon in the contract, all guarantee claims of the purchaser will be rendered invalid. Not included in the guarantee coverage are system failures which are attributed to programs or special electronic circuitry provided by the purchaser, e.g. interfaces. Normal wear as well as normal maintenance are not subject to the guarantee provided by RGBlink either.

The environmental conditions as well as the servicing and maintenance regulations specified in this manual must be complied with by the customer.

#### **Trademarks**

Brand and product names mentioned in this manual may be trademarks, registered trademarks or copyrights of their respective holders. All brand and product names mentioned in this manual serve as comments or examples and are not to be understood as advertising for the products or their manufactures.

### Company Address

### RGBlink Science & Technology Co., Ltd.

Headquarter: S603~604 Weiye Building Torch Hi-Tech Industrial

Development Zone Xiamen, Fujian Province, P.R.C

**Shenzhen office:** Floor 11, A1 Building, Baiwang R&D Building, Shahe West Road, Xili Town, Nanshan District, Shenzhen, Guangdong Province, P.R.C

Beijing office: No. 2702, Sino-Light Building Tower B, Wang-Jing East

Road, Chaoyang District, Beijing, P.R.C

Shanghai office: East Building F2, No. 88 Qinjiang Road, Shanghai,

P.R.C

• **Tel**: +86-592-5771197 • **Fax**: +86-592-5771202

• Customer Hotline: 4008-592-315

Websites:

http://www.rgblink.comhttp://www.rgblink.cn

• E-mail: sales@rgblink.com

### **Operators Safety Summary**

The general safety information in this summary is for operating personnel.

#### Do Not Remove Covers or Panels

There are no user-serviceable parts within the unit. Removal of the top cover will expose dangerous voltages. To avoid personal injury, do not remove the top cover. Do not operate the unit without the cover installed.

#### **Power Source**

This product is intended to operate from a power source that will not apply more than 230 volts rms between the supply conductors or between both supply conductor and ground. A protective ground connection by way of grounding conductor in the power cord is essential for safe operation.

#### **Grounding the Product**

This product is grounded through the grounding conductor of the power cord. To avoid electrical shock, plug the power cord into a properly wired receptacle before connecting to the product input or output terminals. A protective-ground connection by way of the grounding conductor in the power cord is essential for safe operation.

#### **Use the Proper Power Cord**

Use only the power cord and connector specified for your product. Use only a power cord that is in good condition. Refer cord and connector changes to qualified service personnel.

#### **Use the Proper Fuse**

To avoid fire hazard, use only the fuse having identical type, voltage rating, and current rating characteristics. Refer fuse replacement to qualified service personnel.

### Do Not Operate in Explosive Atmospheres

To avoid explosion, do not operate this product in an explosive atmosphere.

# Terms In This Manual and Equipment Marking



#### **WARNING**

Highlights an operating procedure, practice, condition, statement, etc, which, if not strictly observed, could result in injury or death of personnel.

Note

Highlights an essential operating procedure, condition or statement.



### **CAUTION**

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

# **Change History**

The table below lists the changes to the TSH4.

Format	Time	ECO#	Description	Principal
1.0	2013-12-14	0000	Release	Vira



# **CONTENT**

CONTENT	8
1. Introduction1	0
Chapter Structure	11
How to Use This Manual	12
Terms and Definitions	13
System Overview	19
2. Hardware Orientation2	1
In This Chapter	21
TSH4 Back Panel	22
1、3: Outputs of Sending Card	22
2、4: DVI Input Port of Sending Card	22
5、6: Power Interface and Switch	22
3. Operation Manual2	3
In This Chapter	23
How to Connect	24
How to Work	25
4. Hardware Installation2	6
In This Chapter	26
Safety Precautions	27

Unpacking and Inspection	27
Site Preparation	27
5. Common Questions and Solution	28
In This Chapter	28
No Output in Large Screen	29
Display shows no bottom half part	29
LED Display Shakes	29
A Specification	30
B Contact Information	31



10

# 1. Introduction

This chapter is designed to introduce you to the TSH4 User Manual. Areas to be covered are:

- Chapter Structure
- How to Use This Manual
- Terms and Definitions
- System Overview
- Application Questions

**Chapter Structure** 

# **Chapter Structure**

The following chapters provide instructions for all aspects of TSH4 operations:

Chapter 1 Introduction

Chapter 2 Hardware Orientation

Chapter 3 Operation Manual

Chapter 4 Hardware Installation

Chapter 5 Common Questions and Solution

Appendix A Specification

Appendix B Contact Information

How to Use This Manual

### How to Use This Manual

Following are important tips for streamlining your use of this User Manual in its electronic "PDF" form.

### **Navigating**

Use Acrobat Reader's "bookmarks" to navigate to the desired location. All chapter files have the same bookmark structure for instant navigation to any section. Please note:



- Extensive hyperlinks are provided within the chapters.
- Use Acrobat's "Go to Previous View" and "Return to next View" buttons to trace your complete navigational path.



- Use the "Previous Page" and "Next Page" buttons to go to the previous or next page within a file.
- Use Acrobat's extensive search capabilities, such as the "Find" tool and "Search Index" tool to perform comprehensive searches as required.

#### **Table of Contents and Index**

Use the Table of Contents bookmarks to navigate a desired topic. Click any item to instantly jump to that section of the guide. You can also use the **Index** to jump to specific topics within a chapter. Each page number in the **Index** is a hyperlink.

#### Terms and Definitions

### **Terms and Definitions**

The following terms and definitions are used throughout this guide.

- "ASCII": American Standard for Information Interchange. The standard code consisting of 7-bit coded characters (8 bits including parity check) used to exchange information between data processing systems, data communication systems, and associated equipment. The ASCII set contains control characters and graphic characters.
- "Aspect ratio": The relationship of the horizontal dimension to the vertical dimension of an image. In viewing screens, standard TV is 4:3, or 1.33:1; HDTV is 16:9, or 1.78:1. Sometimes the ":1" is implicit, making TV = 1.33 and HDTV = 1.78.
- "AV": Audio visual, or audio video.
- A "Background" is an unscaled source, typically originating from a computer. A background source appears at the system's lowest priority

   — visually in back of all other sources.
- "Baudrate": Named of J.M.E. Baudot, the inventor of the Baudot telegraph code. The number of the electrical oscillations per second, called baud rate. Related to, but not the same as, transfer rate in bits per second (bps).
- "Blackburst": The video waveform without the video elements. It
  includes the vertical sync, horizontal sync, and the chroma burst
  information. Blackburst is used to synchronize video equipment to
  align the video output. One signal is normally used to set up an entire
  video system or facility. Sometimes it is called House sync.
- "BNC": Bayonet Neill-Concelman. A cable connector used extensively in television and named for its inventors. A cylindrical bayonet connector that operates with a twist-locking motion. To make the connection, align the two curved grooves in the collar of the male connector with the two projections on the outside of the female collar, push, and twist. This allows the connector to lock into place without tools.
- "Brightness": Usually refers to the amount or intensity of video light produced on a screen without regard to color. Sometimes called "black level.
- "CAT 5": Category 5. Describes the network cabling standard that consists of four unshielded twisted pairs of copper wire terminated by RJ-45 connectors. CAT 5 cabling supports data rates up to 100 Mbps. CAT 5 is based on the EIA/TIA 568 Commercial Building Telecommunications Wiring Standard.
- "Color bars": A standard test pattern of several basic colors (white, yellow, cyan, green, magenta, red, blue, and black) as a reference for system alignment and testing. In NTSC video, the most commonly

13

Terms and Definitions

- used color bars are the SMPTE standard color bars. In PAL video, the most commonly used color bars are eight full field bars. In the computer, the most commonly used color bars are two rows of reversed color bars.
- "Color burst": In color TV systems, a burst of subcarrier frequency located on the back porch of the composite video signal. This serves as a color synchronizing signal to establish a frequency and phase reference for the chroma signal. Color burst is 3.58 MHz for NTSC and 4.43 MHz for PAL.
- "Color temperature": The color quality, expressed in degrees
  Kelvin(K), of a light source. The higher the color temperature, the bluer
  the light. The lower the temperature, the redder the light. Benchmark
  color temperature for the A/V industry include 5000°K, 6500°K, and
  9000°K.
- "Contrast ratio": The radio of the high light output level divided by the low light output level. In theory, the contrast radio of the television system should be at least 100:1, if not 300:1. In reality, there are several limitations. In the CRT, light from adjacent elements contaminate the area of each element. Room ambient light will contaminate the light emitted from the CRT. Well-controlled viewing conditions should yield a practical contrast ratio of 30:1 to 50:1.
- "DVI": Digital Visual Interface. The digital video connectivity standard that was developed by DDWG (Digital Display Work Group). This connection standard offers two different connectors: one with 24 pins that handles digital video signals only, and one with 29 pins that handles both digital and analog video.
- "EDID": Extended Display Identification Data EDID is a data structure used to communicate video display information, including native resolution and vertical interval refresh rate requirements, to a source device. The source device will then output the optimal video format for the display based on the provided EDID data, ensuring proper video image quality. This communication takes place over the DDC Display Data Channel.
- "Ethernet": A Local Area Network (LAN) standard officially known as IEEE 802.3. Ethernet and other LAN technologies are used for interconnecting computers, printers, workstations, terminals, servers, etc. within the same building or campus. Ethernet operates over twisted pair and over coaxial cable at speeds starting at 10Mbps. For LAN interconnectivity, Ethernet is physical link and data link protocol reflecting the two lowest layers of the OSI Reference Model.
- "Frame": In interlaced video, a frame is one complete picture. A video
  frame is made up of two fields, or two sets of interlaced lines. In a film,
  a frame is one still picture of a series that makes up a motion picture.

Terms and Definitions

- "Gamma": The light output of a CRT is not linear with respect to the voltage input. The difference between what you should have and what is actually output is known as gamma.
- "HDMI" High Definition Multimedia Interface: An interface used primarily in consumer electronics for the transmission of uncompressed high definition video, up to 8 channels of audio, and control signals, over a single cable. HDMI is the de facto standard for HDTV displays, Blu-ray Disc players, and other HDTV electronics. Introduced in 2003, the HDMI specification has gone through several revisions.
- "HDSDI": The high-definition version of SDI specified in SMPTE-292M. This signal standard transmits audio and video with 10 bit depth and 4:2:2 color quantization over a single coaxial cable with a data rate of 1.485 Gbit/second. Multiple video resolutions exists including progressive 1280x720 and interlaced 1920x1080 resolution. Up to 32 audio signals are carried in the ancillary data.
- "JPEG" (Joint photographic Expects Group): Commonly used method of lossy compression for photographic images using a discreet cosine transfer function. The degree of compression can be adjusted, allowing a selectable tradeoff between storage size and image quality.
   JPEG typically achieves 10:1 compression with little perceptible loss in image quality. Produces blocking artifacts.
- "MPEG": Motion Picture Expect Group. A standard committee under the auspices of the International Standards Organization working on algorithm standards that allow digital compression, storage and transmission of moving image information such as motion video, CD-quality audio, and control data at CD-ROM bandwidth. The MPEG algorithm provides inter-frame compression of video images and can have an effective compression rate of 100:1 to 200:1.
- "NTSC": The color video standard used in North America and some other parts of the world created by the National Television Standards Committee in the 1950s. A color signal must be compatible with black-and-white TV sets. NTSC utilizes an interlaced video signals, 525 lines of resolution with a refresh rate of 60 fields per second (60 Hz). Each frame is comprised of two fields of 262.5 lines each, running at an effective rate of 30 frames per second.
- "PAL": Phase Alternate Line. A television standard in which the phase of the color carrier is alternated from line to line. It takes four full pictures (8 fields) for the color-to-horizontal phase relationship to return to the reference point. This alternation helps cancel out phase errors. For this reason, the hue control is not needed on a PAL TV set. PAL, in many transmission forms, is widely used in Western Europe, Australia, Africa, the Middle East, and Micronesia. PAL uses 625-line,

15

Terms and Definitions

50-filed (25 fps) composite color transmission system.

- "Operator": Refers to the person who uses the system.
- "PIP": Picture-in-Picture. A small picture within a larger picture created by scaling down one of the images to make it smaller. Each picture requires a separate video source such as a camera, VCR, or computer. Other forms of PIP displays include Picture-by-Picture (PBP) and Picture-with-Picture (PWP), which are commonly used with 16:9 aspect display devices. PBP and PWP image formats require a separate scaler for each video window.
- "Polarity": The positive and negative orientation of a signal. Polarity
  usually refers to the direction or a level with respect to a reference (e.g.
  positive sync polarity means that sync occurs when the signal is going
  in the positive direction).
- "RJ-45": Registered Jack-45. A connector similar to a telephone connector that holds up to eight wires, used for connecting Ethernet devices.
- "RS-232": An Electronic Industries Association (EIA) serial digital interface standard specifying the characteristics of the communication path between two devices using either DB-9 or DB-25 connectors. This standard is used for relatively short-range communication and does not specify balanced control lines. RS-232 is a serial control standard with a set number of conductors, data rate, word length, and type of connector to be used. The standard specifies component connection standards with regard to the computer interface. It is also called RS-232-C, which is the third version of the RS-232 standard, and is functionally identical to the CCITT V.24 standard.
- "Saturation": Chroma, chroma gain. The intensity of the color, or the extent to which a given color in any image is free from white. The less white in a color, the truer the color or the greater its saturation. On a display device, the color control adjusts the saturation. Not to be confused with the brightness, saturation is the amount of pigment in a color, and not the intensity. Low saturation is like adding white to the color. For example, a low-saturated red looks pink.
- "Scaling": A conversion of a video or computer graphic signal from a starting resolution to a new resolution. Scaling from one resolution to another is typically done to optimize the signal for input to an image processor, transmission path or to improve its quality when presented on a particular display.
- "SDI": Serial Digital Interface. The standard based on a 270 Mbps transfer rate. This is a 10-bit, scrambled, polarity independent interface with common scrambling for both component ITU-R 601 and composite digital video and four channels of (embedded) digital audio.
- "Seamless Switching": A feature found on many video switchers. This

Terms and Definitions

- feature causes the switcher to wait until the vertical interval to switch. This avoid a glitch (temporary scrambling) which normally is seen when switching between sources.
- "SMPTE": Society of Motion Picture and Television Engineers. A global organization, based in the United States, that sets standards for baseband visual communications. This includes film as well as video and television standards.
- "S-Video": A composite video signal separated into the luma ("Y" is for luma, or black and white information; brightness) and the chroma ("C" is an abbreviation for chroma, or color information).
- "Sync": Synchronization. In video, sync is a means of controlling the timing of an event with respect to other events. This is accomplished with timing pulses to insure that each step in a process occurs at the correct time. For example, horizontal sync determines exactly when to begin each horizontal scan line. Vertical sync determines when the image is to be refreshed to start a new field or frame. There are many other types of sync in video system.(Also known as "sync signal" or "sync pulse.")
- "TCP/IP": Transmission Control Protocol/Internet Protocol. The
  communication protocol of the Internet. Computers and devices with
  direct access to the Internet are provided with a copy of the TCP/IP
  program to allow them to send and receive information in an
  understandable form.
- "USB": Universal Serial Bus. USB was developed by seven PC and telecom industry leaders (Compaq, DEC, IBM, Intel, Microsoft, NEC, and Northern Telecom). The goal was easy plug-and-play expansion outside the box, requiring no additional circuit cards. Up to 127 external computer devices may be added through a USB hub, which may be conveniently located in a keyboard or monitor. USB devices can be attached or detached without removing computer power. The number of devices being designed for USB continues to grow, from keyboards, mice, and printers to scanners, digital cameras, and ZIP drives.
- "VESA": Video Electronics Standards Association. A nonprofit number organization dedicated to facilitating and promoting personal computer graphics through improved standards for the benefit of the end-user.
   www.vesa.org
- "VGA": Video Graphics Array. Introduced by IBM in 1987, VGA is an analog signal with TTL level separate horizontal and vertical sync. The video outputs to a 15-pin HD connector and has a horizontal scan frequency of 31.5 kHz and vertical frequency of 70 Hz (Mode 1, 2) and 60 Hz (Mode 3). The signal is non-interlaced in modes 1, 2, and 3 and interlaced when using the 8514/A card (35.5 kHz, 86 Hz) in mode 4. It

Terms and Definitions

has a pixel by line resolution of  $640 \times 480$  with a color palette of 16 bits and 256,000 colors.

- "YCrCb": Used to describe the color space for interlaced component video.
- "YPbPr": Used to describe the color space for progressive-scan (non-interlaced) component video.

System Overview

# **System Overview**

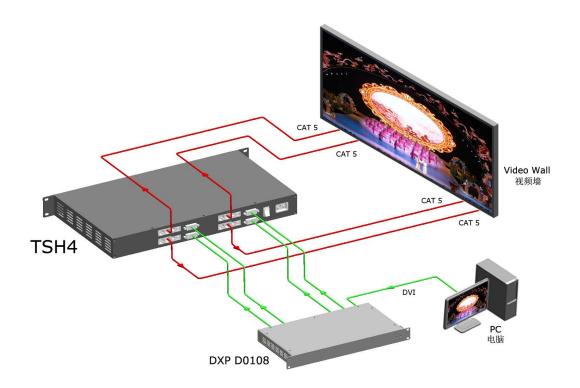
TSH4 can built in 4 sending cards. It supports Linsn 801/802, Nova MSD300, Colorlight Q7 and DBstar Q2011 sending card. Also, it accepts a wide variety of video signals, including computer video, HDTV video. It combines seamless, fade in fade out switching with advanced scaling technologies, which meet the requirements of high quality, high resolution video presentations.

TSH4 can meet the demands of current LED screen control, it can save the area and improve the efficiency, and the installation of power is quite simple if setting the power supply module.

**Application Questions** 

# **Application Questions**

RGBlink offers solutions to demanding technical problems. Any application questions, or required further information, please contact with our customer Support Engineers. Refer to Appendix B for contact details.



20



# 2. Hardware Orientation

# In This Chapter

This chapter provides detailed information about the TSH4 hardware. The following topic is discussed:

TSH4 Back Panel

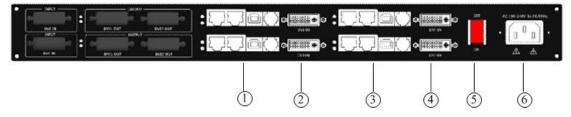
21

#### 2. Hardware Orientation

TSH4 Back Panel

### **TSH4 Back Panel**

The figure below illustrates the professional interface and control signals of TSH4 back panel:



NO	INTERFACE	NO	INTERFACE
1、3	Outputs of Sending Card	5	Switch
2、4	DVI Input Port of Sending Card	6	Power

#### 1、3: Outputs of Sending Card

Connect to LED screen.

#### 2, 4: DVI Input Port of Sending Card

Connect to DVI player or computer with DVI connector.

#### 5. 6: Power Interface and Switch

AC 100-240V 3A 50/60Hz IEC-3 power interface.

Currently, TSH4 is only available for Linsn 801/802, Nova MSD300, Colorlight Q7 and DBstar Q2011 sending card.



23

# 3. Operation Manual

# In This Chapter

This chapter provides detailed operation manual about TSH4. The following topics are discussed:

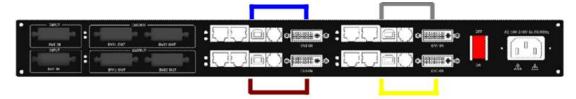
- How to Connect
- How to Work

### **How to Connect**

Operation steps are as follows:

- Connect the device or computer with DVI interface to the DVI input port of sending card in above row of TSH4 with DVI cable.
- Connect outputs of sending card in above row of TSH4 to LED display with cable.
- 3. Plug in power cord with IEC connector.

Same operation with the below row interfaces.



# How to Work

Push power button to ON position, and input DVI signal to DVI inputs of sending card, then outputs of sending card will output the signal to LED display.

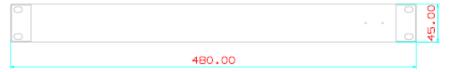


# 4. Hardware Installation

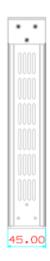
# In This Chapter

This chapter provides comprehensive installation instruction for TSH4 hardware:

Following is the size of TSH4 for your reference:









### Safety Precautions

For all TSH4 installation procedures, please observe the following important safety and handling rules to avoid damage to yourself and the equipment.

- To protect users from electric shock, ensure that the chassis connects to earth via the ground wire provided in the AC power Cord.
- The AC Socket-outlet should be installed near the equipment and be easily accessible.

# **Unpacking and Inspection**

Before opening TSH4 shipping box, inspect it for damage. If you find any damage, notify the shipping carrier immediately for all claims adjustments. As you open the box, compare its contents against the packing slip. If you find any shortages, contact your sales representative.

Once you have removed all the components from their packaging and checked that all the listed components are present, visually inspect the system to ensure there was no damage during shipping. If there is damage, notify the shipping carrier immediately for all claims adjustments.

# Site Preparation

The environment in which you install your TSH4 should be clean, properly lit, free from static, and have adequate power, ventilation, and space for all components.



# 5. Common Questions and Solution

# In This Chapter

This chapter provides the common questions and solution for TSH4. The following topics are provided:

- No Output in Large Screen
- Display shows no bottom half part
- LED Display Shakes

# No Output in Large Screen

- 1. Check whether input the signal.
- 2. Check whether the interfaces are in good connection.
- 3. Check whether the input wire and output wire are normal.

### Display shows no bottom half part

# Sending card does not support the bottom half part

There are limits for different sending cards. As for Linsn TS802, if output resolution is 1920 or higher, while every LAN port can support only 320 height LED screen, more than this value need to add D mouth reticle, more than 640, need to add more sending cards as cascade.

## **LED Display Shakes**

#### Sending card input recognition is not correct

It usually occurs when use sending card improperly or hot plug. It is normal before, but LED display shakes after change the output resolution. Generally, it will normally operate if reboot the device.



# A Specification

DVI Input of Sending Card					
Number of Outputs	4 (Depend on the sending card quantity)				
Connector	Standard DVI-I socket				
Supported Resolution	640 x 480@60Hz ~ 2048 x 1152@60Hz (Depend on the sending				
	card)				
Format Standard	DVI 1.0				
DVI Output of Sending Card					
Number of Outputs	ber of Outputs 8 (Depend on the sending card quantity)				
Connector	Ethernet interface				
Supported Resolution	640 x 480@60Hz ~ 2048 x 1152@60Hz (Depend on the sending				
	card)				
Extras					
Power Supply	AC 100-240V 3A IEC-3				
Working Environment	0℃~+40℃				
Stored Environment	10%~85%				
Size	480mm*268mm*88mm				



### **B** Contact Information

## Warranty:

All video products are designed and tested to the highest quality standard and backed by full 3 years parts and labor warranty. Warranties are effective upon delivery date to customer and are non-transferable. RGBlink warranties are only valid to the original purchase/owner. Warranty related repairs include parts and labor, but do not include faults resulting from user negligence, special modification, lighting strikes, abuse(drop/crush), and/or other unusual damages.

The customer shall pay shipping charges when unit is returned for repair.

**Headquarter:** S603~604 Weiye Building Torch Hi-Tech Industrial Development Zone Xiamen, Fujian Province, P.R.C

Tel: +86-592-5771197Fax: +86-592-5771202

• Customer Hotline: 4008-592-315

Websites:

http://www.rgblink.com

~ http://www.rgblink.cn

• E-mail: support@rgblink.com