MSP 214

User Manual

- Manual #: RGB-RD-UM-M214 E001
- Revision: V1.2

MSP 214·User Manual

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

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Company Address

Xiamen 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: Room 602, Building 7, CaiManJie, No.67, Chaoyang Road, Chaoyang District, Beijing, P.R.C

Shanghai office： Building 3, 1358 Nong, Tongpu Road, Shanghai, P.R.C

- **Tel:** +86-592-5771197
- **Fax:** +86-592-5771202
- **Customer Hotline:** 4008-592-315
- **Websites:**
  - ~ http://www.rgblink.com
  - ~ http://www.rgblink.cn
- **E-mail:** sales@rgblink.com

Safe Operation 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 panel will expose dangerous voltages. To avoid personal injury, do not remove the top panel. Do not operate the unit without the panel installed.

Use the Proper Properly

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.

Ground the Product Properly

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 Dangerous Atmospheres

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

Terms and Equipment Mark in This Manual

WARNING

Highlight 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.

Amendment Record

The table below lists the changes to the DVI Extender User Manual.

Format	Time	ECO#	Description	Principal
1.0	2010-11-15	0000	Release	LISA
1.1	2013-08-07	0001	Change the integral style of product and user manual.	Vira
1.2	2014-01-20	0002	1. Update Shenzhen office address. 2. Update the fiber module description.	Vira

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1. Brief Introduction

This chapter is designed to introduce you to the MSP 214 User Manual. It covers:

- Chapter Structure
- Manual Usage
- Terms and Definitions
- System Overview
- Application Questions

Chapter Structure

The following chapters provide instructions for all aspects of MSP 214 operations:

Chapter 1 Brief Introduction

Chapter 2 Hardware Orientation

Chapter 3 Operation Manual

Chapter 4 Common Questions and Solution

Appendix A Specification

Appendix B Contact Information

Manual Usage

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

Navigation

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.

Catalogue 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

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-Concel man. 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 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 sub-carrier 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 chrome 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 includes 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.

- **“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 exist including progressive 1280x720 and interlaced 1920x1080 resolutions. Up to 32 audio signals are carried in the ancillary data.

- **"JPEG" (Joint photographic Expects Group):** Commonly used method of lost 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.

- **"Operator":** Refers to the person who uses the system.

- **"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, 50-filed (25 fps) composite color transmission 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.

1. Brief Introduction

Terms and Definitions

- **“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 feature causes the switcher to wait until the vertical interval to switch. This avoids a glitch (temporary scrambling) which normally is seen when switching between sources.

1. Brief Introduction

Terms and Definitions

- **“SMPTE”:** Society of Motion Picture and Television Engineers. A global organization, based in the United States that sets standards for base band 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 has a pixel by line resolution of 640×480 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

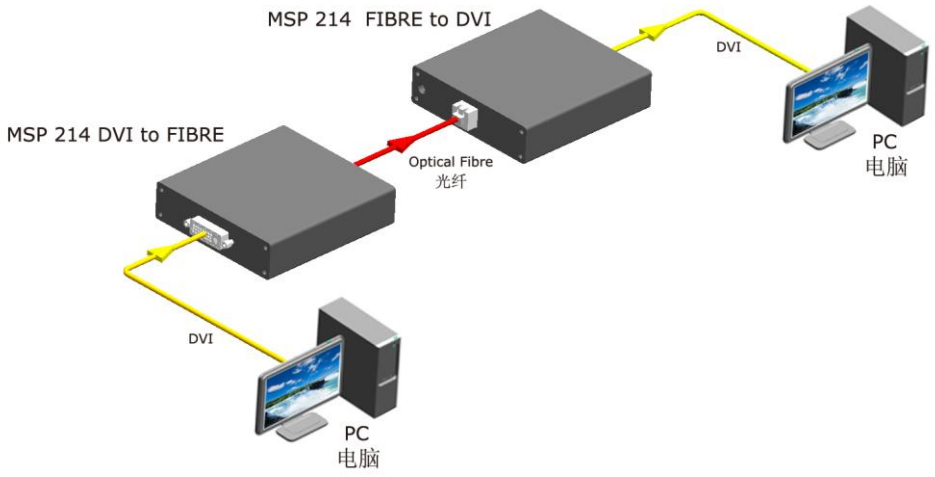
MSP 214 DVI Extender is consisted of DVI transmitter（MSP 214 DVI to Fiber）and DVI receiver （MSP 214 Fiber to DVI）, DVI signal is realized by single mode twin-core fiber or multimode twin-core fiber. And DVI digital video signal has to fulfill the long distance transmission during the multimedia application system.

But when you use an ordinary cable for long distance transmission, it will always show the poor output signal, be easy of the interference, the image displayed appears the phenomenon of the vague, the tailing and color separation etc. At the same time, the distance of transmission is short, it can not meet the requirement of long distance transmission for the multimedia information issuing and so on, using the MSP 214 DVI Extender for transmitting, this kind of problem has been completely solved. The distance of transmission is10km in single mode. In the mean while, the DVI Extender has the outstanding points with a little attenuation, high frequency bandwidth, strong anti-interference, high safety performance, small volume and light in weight etc., therefore, it has incomparable advantages in the respect of the special environment and the long distance transmission. It is used in the multimedia system, which save the construction cost and easy for cable arrangement, and the target of high quality performance is also guaranteed.

MSP 214 DVI to Fiber is the transmitter, and MSP 214 Fiber to DVI is the receiver, the two devices are used together, it can be realized the long distance transmission of DVI signal by MSP 214 DVI to Fiber with fiber optical cable to MSP 214 Fiber to DVI. This is especially suitable for the high definition video signal transmission in the train platform and the military practice.

Application Questions

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



2. Hardware Orientation

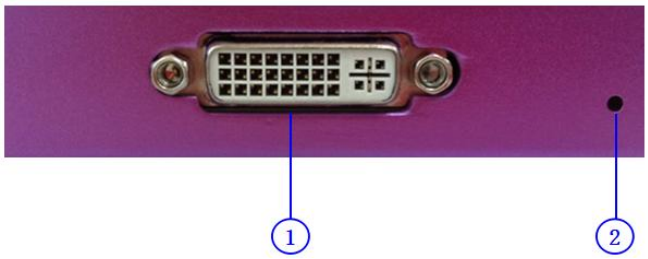
In This Chapter

This chapter provides detailed information about the MSP 214 panel. The following topics are discussed:

- MSP 214 DVI to Fiber Panel
- MSP 214 Fiber to DVI Panel

MSP 214 DVI to Fiber Panel

The figure below illustrates the professional interface and control signals of MSP 214 DVI to Fiber panel:



1: DVI Input

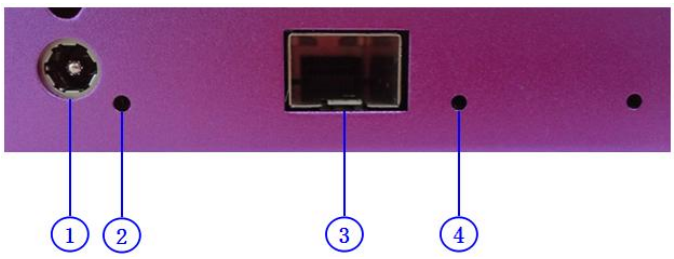
DVI input interface: Input the video signal from computer, DVI signal generator. Connect to the same DVI interface on MSP 214.（This Connection does not support hot-plugging）

Note

DVI is compatible with HDMI.

2: Signal Indicator

When input DVI signal, the signal indicator lights.



1: Power Interface

The device uses the standard 12V/3A power supply.

3: Fiber Output

Used to connect fiber cable, the device uses single mode twin-core fiber or multimode twin-core fiber, LC interface.

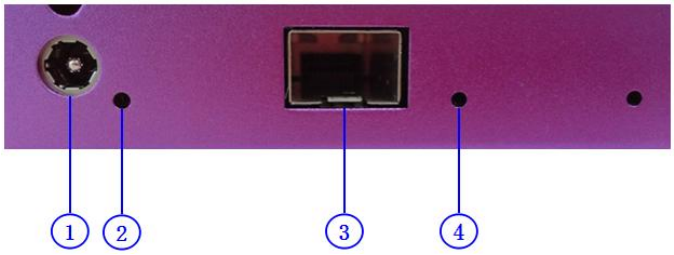
2.4: Indicator

Power indicator 2 lights when device has power supply.

LED indicator 4 is off when connect fiber cable and the device is in normal operation.

MSP 214 Fiber to DVI Panel

The figure below illustrates the professional interface and control signals of MSP 214 Fiber to DVI panel:



1: Power Interface

The device uses the standard 12V/3A power supply.

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Used to connect fiber cable, the device uses single mode twin-core fiber or multimode twin-core fiber, LC interface.

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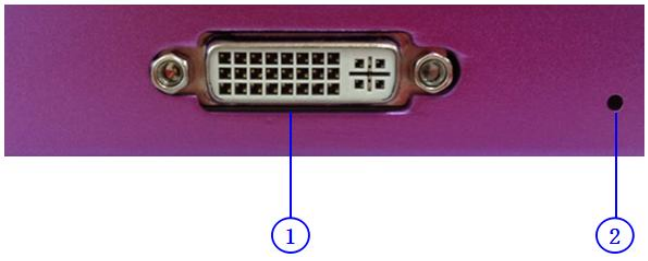
Power indicator 2 lights when device has power supply.

LED indicator 4 is off when connect fiber cable and the device is in normal operation.



1: DVI Output

Connect to the monitor or LED screen which has DVI interface

(This DVI connector does not support hot-plugging).

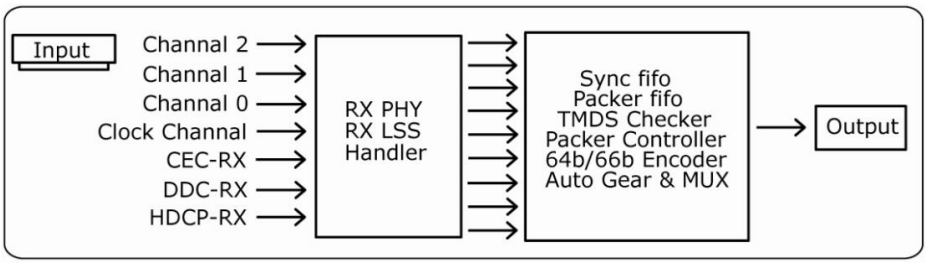
2: Signal Indicator

When output DVI signal, the signal indicator lights.

3. Operation Manual

MSP 214 DVI to Fiber

Function Block Diagram



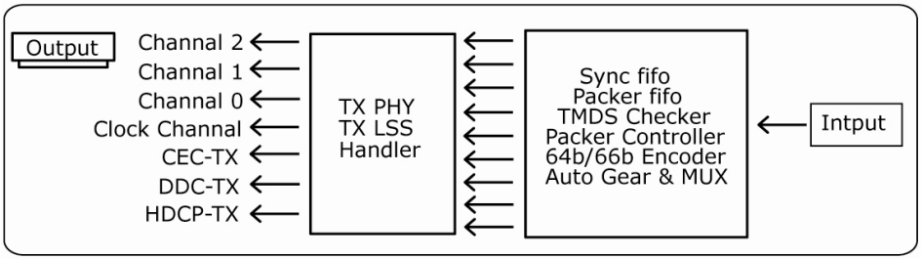
Operating Principle

MSP 214 DVI to Fiber transmitter is connected to computer, media player or HD camera, etc. User can connect the DVI interface on MSP 214 DVI to Fiber panel to PC with DVI cable, then connect the computer or media player, and MSP 214 DVI to Fiber transmitter to power supply. In order to avoid the damage of device, please use the standard power adapter.

Fiber interface is used to connect to MSP 214 Fiber to DVI receiver.

MSP 214 Fiber to DVI

Function Block Diagram



Operating Principle

MSP 214 Fiber to DVI receiver is connected to television (monitor) or LED screen which has DVI interface.

Connect the fiber interface to the other fiber interface on MSP 214 DVI to Fiber transmitter with fiber cable, and then connect the DVI interface on MSP 214 Fiber to DVI panel to display device.

In order to avoid damaging the device, please use the standard power adapter.

4. Common Questions and Solution

In This Chapter

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

- Power indicator light is off or blinks
- Signal indicator light is off or blinks
- 12V power interface poor contact

Power indicator light is off or blinks

1. Check whether plug in the power cord, and has power supply;
2. Check whether the power cable is connected, and in good connection;
3. If above without problem, then the power indicator is damaged.

Signal indicator light is off or blinks

1. Check whether connect the signal;
2. Check whether the input signal, input wire and output wire are normal, the interfaces are in good connection;
3. If above without problem, then the signal indicator is damaged.

Note: The indicator beside fiber interface is off when the device is in normal operation. It will light or blink if the fiber cable is in poor connection.

12V power interface poor contact

1. Check whether the power interface is in good connection, if the interface is not tighten, screw it again.
2. Check whether any problem with adapter head, replace it if there is any problem.
3. Check the power connector is loose, if so, please send to processional personnel for repair.

A. Specification

DVI Input	
Number of Inputs	1
Connector	Standard DVI-I socket
Supported Resolution	VESA: 800*600*60、 1024*768*60、 1280*768*60、 1280*1024*60、 1360*768*60、1366*768*60、 1400*1050*60、 1440*900*60、1600*1200*60、 1680*1050*60、 1920*1080*60、1920*1200*60、 2048*1152*60、 2560*812*60、 2560*816*60 STMPE: 480I60、576I50、720P50/60、1080I50/60、1080P50/60
Signal Level	TMDS pwl, single pixel input,165MHz bandwidth
Format Standard	HDMI 1.3
DVI Output	
Number of Inputs	1
Connector	Standard DVI-I socket
Signal Level	TMDS pw, 165MHz bandwidth
Supported Resolution	VESA: 800*600*60、 1024*768*60、 1280*768*60、 1280*1024*60、 1360*768*60、1366*768*60、 1400*1050*60、 1440*900*60、1600*1200*60、 1680*1050*60、 1920*1080*60、1920*1200*60、 2048*1152*60、 2560*812*60、 2560*816*60 STMPE: 480I60、576I50、720P50/60、1080I50/60、1080P50/60
SFP + Fiber Module	
10 Gigabit single-mode 10 km optical fiber module	
Wavelength of Light Transmission	1310nm
Transmission Rate	10G bps
Transmission Distance	10km
Transmission	Single mode twin-core
Hot Plug	Support
10 Gigabit multimode 300m optical fiber module	
Wavelength of Light Transmission	1270nm

Transmission Rate	10G bps
Transmission Distance	300km
Transmission	Multimode twin-core
Hot Plug	Support
Extras	
Power Supply	12V DC/3A
Working Environment	0℃~70℃
Stored Environment	10%~90%
Dimensions	98mmX92mmX22mm
Product Warranty	3 years parts and labor warranty

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:** +86-592-5771197
- **Fax:** +86-592-5771202
- **Customer Hotline:** 4008-592-315
- **Websites:**
  - ~ http://www.rgblink.com
  - ~ http://www.rgblink.cn
- **E-mail:** support@rgblink.com