MSP 318

HDMI 2.0 KVM Fiber Extender Set

USER MANUAL

RGBlink®

CONTENTS

Thank you for choosing our product!

This User Manual is designed to show you how to use this video processor quickly and make use of all the features. Please read all directions and instructions carefully before using this product.

Declarations

FCC/Warranty

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.

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.

Installation Safety Summary

Safety Precautions

For all MSP 315 processor 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 MSP 315 processor 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 MSP 315 should be clean, properly lit, free from static, and have adequate power, ventilation, and space for all components.

Chapter 1 Your Product

1.1 In the Box

2×Power Adapter

1.2 Product Overview

MSP 318 is an Optical HDMI Extender that overcomes the length restriction of standard HDMI cables by using optical fiber to send high definition audio and video signals over large distances.

It also built in USB for KVM keyboard mouse for HDMI KVM solution.It is also built in RS232/IR selection to extend the IR remote control and transfer RS-232 (up to 115kbps) in both directions, allows you to connect serial devices such as touch screens and barcode scanners.

The key features of MSP 318 are as follows:

● Support 4K@60hz (18Gbps) YUV 4:4:4 8bits, HDR.

● Support HDMI 2.0/HDCP 2.2.

● External SFP+ 10 Giga module for different distance (Order optional)

● IR/RS232/USB function selection.

● Support USB keyboard mouse (KVM)

● Support Bi-directional IR pass through from 20Khz to 60Khz.

● Support Bi-directional RS232.
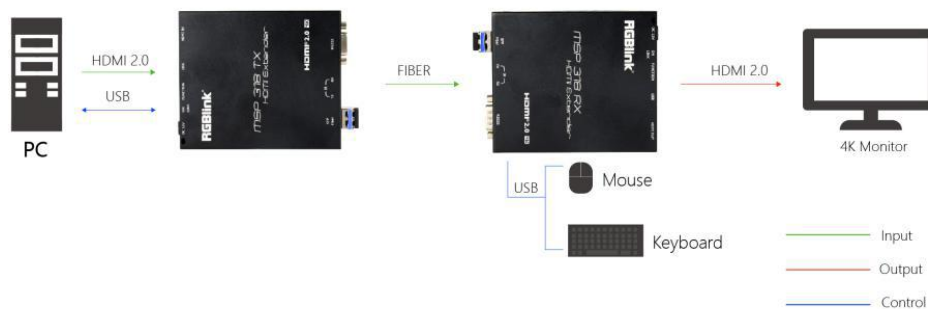
MSP 318 System Connection Diagram

1.2.1 TX
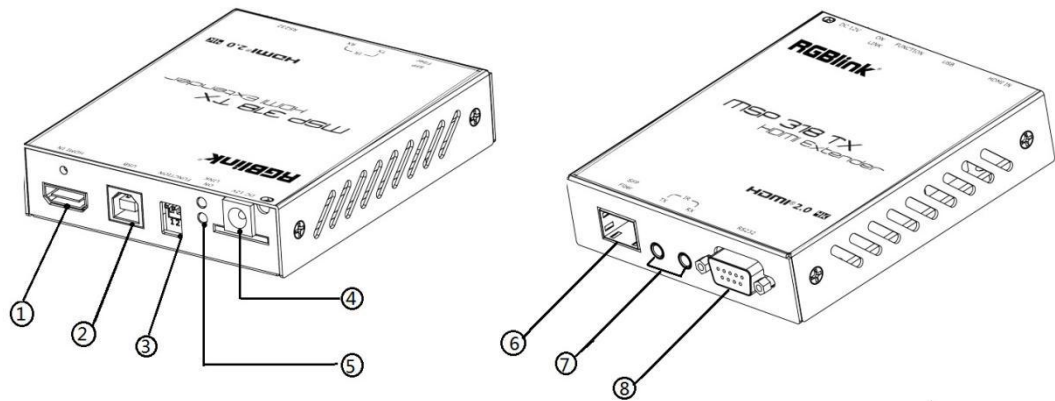
Illumination			
1	HDMI IN （HDMI Type A，HDMI input port to connect to HDMI output of PC or Bluray player)	2	USB, USB type B to connect to USB-A port of PC
3	DIP switch for IR, RS232 and USB function selection	4	LED indicator
5	DC 12V/1.5 A	6	Slot for SPF Fiber module
7	2 3.5mm phone jacks for TX and RX of IR	8	for remote control, connect to PC to transmit serial command

1.2.2 RX
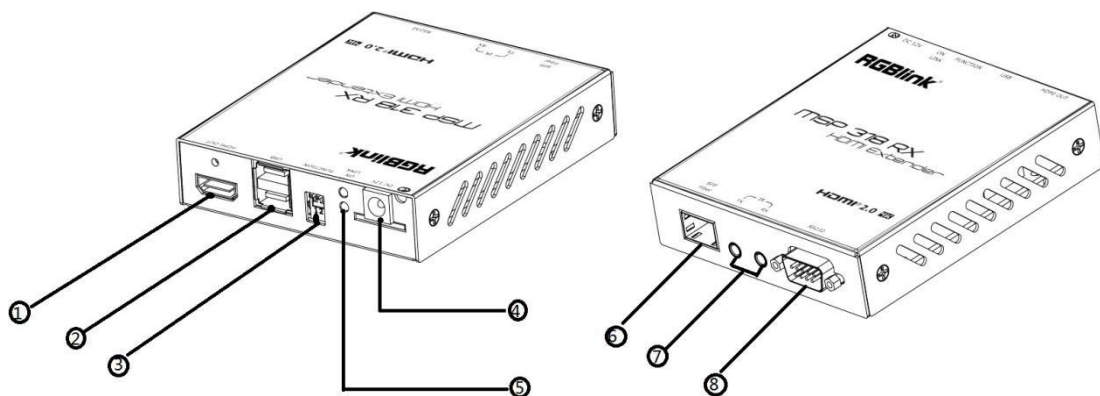
Illumination			
1	HDMI OUT (HDMI Type A， HDMI output port to connect to HDMI port of HD display such as 4K display)	2	USB, 2 USB type A to connect keyboard and mouse
3	DIP switch for IR, RS232 and USB function selection	4	LED indicator
5	DC 12V/1.5A	6	Slot for SPF Fiber module
7	2x3.5mm phone jacks for TX and RX of IR	8	RS232，DB9 male，to receive RS232 serial signal， allows users to use touch screen or barcode scanner.

1.2.3 Dimension

Following is the dimension of MSP 318 TX and RX for your reference:
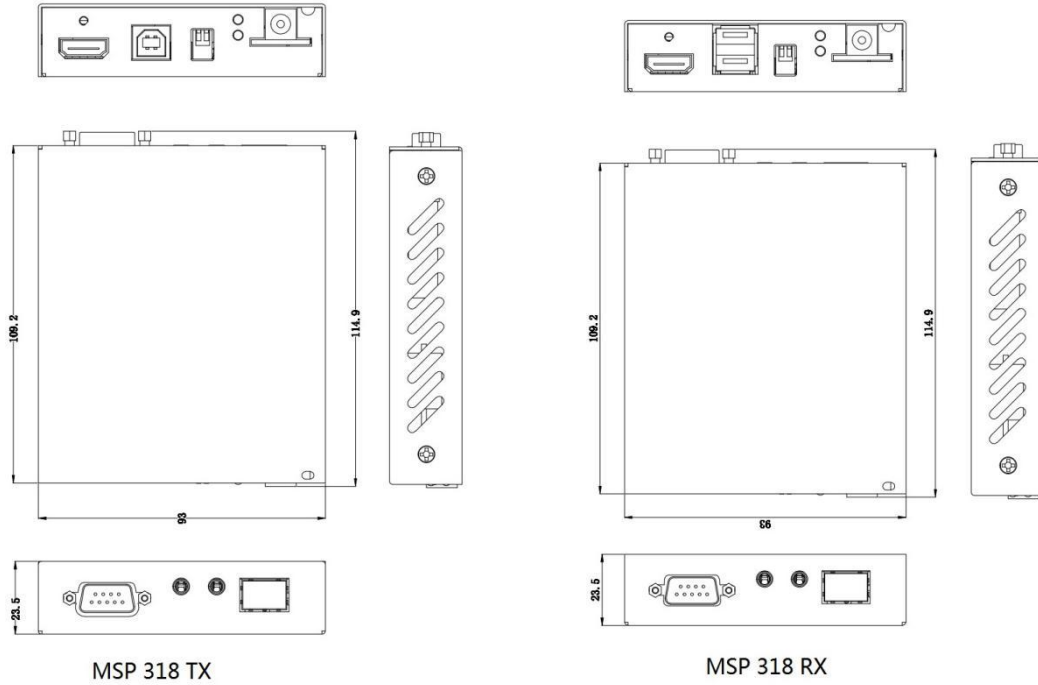
MSP 318 TX

MSP 318 RX

Chapter 2 Use Your Product

2.1 Operation Steps

1. Use HDMI cable to connect HDMI port of bluray player or PC to "HDMI IN" on MSP 318 TX (transmitter) and connect "HDMI Out" on MSP 318 RX (receiver) to HDMI port on HD Display or projector by premium HDMI cable.

2. Use fiber cable to connect SFP on MSP 318 TX and RX.

3. MSP 315 Extender provides bidirectional IR control, connecting as needed: one transmitter connects to the IR receiver, the other transmitter connects to the IR transmitter, or both the IR receiver and the IR transmitter

4. Connect the RS232 control device to the RS232 interface of any transmitter (either transmitter or receiver, the data is bidirectional) and the RS232 interface of the controlled device to the RS232 interface of another transmitter .

5. MSP 318 support for mouse and keyboard through USB (KVM) to remote control computer or media server. Connect USB type B to computer on TX and 2 USB A on RX to keyboard and mouse.

6. Supply power to TX and RX via 12/1.5A adaptor.

2.2 LED Indicator

LED Color	TX	RX
Green	Power On/Off	
Blue	Fiber Link/Unlink	

2.3 Dip Switch Function
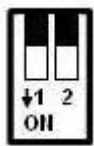
Dip switch is offered for users to select the feature of IR, RS232 and USB (KVM).

Here are the switch position to be set to switch on each feature.

IR: SW1 ON (down position) + SW2 OFF (up position)

RS232: SW1 OFF (up position)+ SW2 ON (down position)

USB: SW1 ON (down position)+ SW2 ON (down position)

Chapter 3 Caution

1. Under HDMI 2.0 mode, recommend to use "PREMIUM certified" HDMI cable.
2. IR Emitter/Receiver cable do not put too close to avoid mutually interference.
3. This Device not support CEC
4. The transmission distance based on 10G Fiber module 300M-60KM.

Chapter 4 Order Codes

4.1 Product

611-0014-00-0　　MSP 318　（TX/RX Set）

4.2 Module

950-0002-00-0　　SFP, Multi Mode, 300m Max

950-0003-00-0　　SFP, Single Mode, 500m Max

950-0007-00-0　　SFP, Single Mode, 2km Max

950-0004-00-0　　SFP, Single Mode, 10km Max

Chapter 5 Support

5.1 Contact Us

Contact Us

Web
www.rgblink.com

Phone
+86-592-577-1197

Email
Sales   sales@rgblink.com
Support   support@rgblink.com

Social Media

@RGBLINK   /rgblink   +rgblink   /rgblink   rgblink   rgblink

Chapter 6 Appendix

6.1 Specification

Connector			
Input	TX	HDMI 2.0	1×HDMI Type A
	RX	SPF Fiber	1×LC
Output	TX	SPF Fiber	1×LC
	RX	HDMI 2.0	1×HDMI Type A
Communication	TX	RS232	1×DB9 （female）
		PIN	Definition
		Pin 2	TX
		Pin 3	RX
		Pin 5	GND
		USB	1×USB Type B
		IR	2×3.5mm Phone Jack
	RX	RS232	1×DB9 （male）
		Pin	Definition
		Pin 2	RX
		Pin 3	TX
		Pin 5	GND
		USB	2×USB Type A
		IR	2× 3.5mm Phone Jack
Performance			
Supported Input Resolutions	SMPTE	720p@23.98/24/25/29.97/30/50/59.94/60 | 1080i@23.98/24/25/29.97/30/50/59.94/60 | 1080p@23.98/24/25/29.97/30/50/59.94/60 | 2160p@24/30/50/60	
	VESA	800x600@60 | 1024x768@60 | 1280x768@60 | 1280x1024@60 |	

|		
		1366x768@60 | 1600x1200@60 | 1920x1080@60 | 2048x1152@60 | 2560x1600@60 | 3840x1080@60 | 3840x2160@24/30/50/60
Supported Output Resolutions	SMPTE	720p@23.98/24/25/29.97/30/50/59.94/60 | 1080i@23.98/24/25/29.97/30/50/59.94/60 | 1080p@23.98/24/25/29.97/30/50/59.94/60 | 2160p@24/30/50/60
	VESA	800x600@60 | 1024x768@60 | 1280x768@60 | 1280x1024@60 | 1366x768@60 | 1600x1200@60 | 1920x1080@60 | 2048x1152@60 | 2560x1600@60 | 3840x1080@60 | 3840x2160@24/30/50/60
General		
Input Voltage	TX	DC 12V/1.5A
	RX	DC 12V/1.5A
Working Temperature	-10 ~45℃	
Storage Temperature	-30~70℃	
Humidity	20 - 95%	
Weight	Nett	0.27 kg（TX）0.27（RX）
	Packaged	0.9kg
Dimensions	Nett	115mm × 93mm × 24mm (TX) 115mm × 93mm × 24mm (RX)
	Packaged	160mm × 120mm×80mm (Set)

6.2   Rack Installation
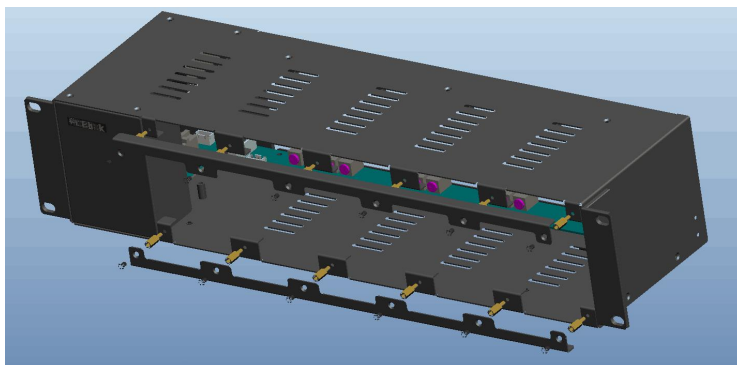
Step 1: Lock M3*10 brass standoffs in the position as the red arrow pointed in the following pic.

锁M3*10铜柱
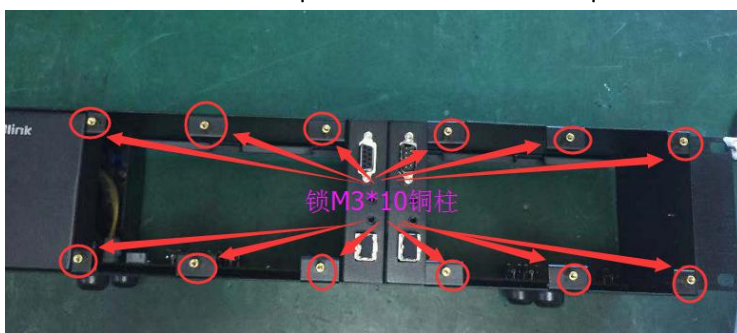
Step 2: Lock M3*5 cross countersunk head screw in the position as the the red arrow pointed in the following pic.

锁M3*5十字沉头螺丝
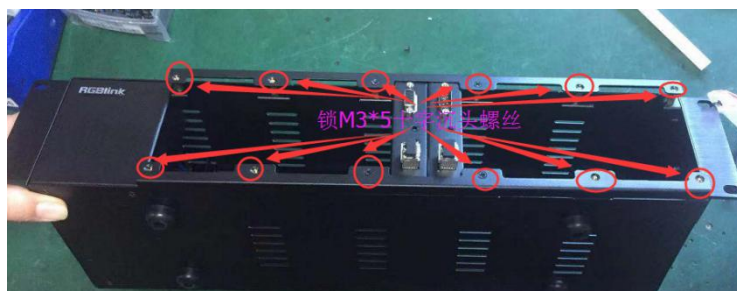
6.3 Terms & Definitions

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 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.
- **"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.

● **"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.

● **"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 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 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.

6.3 Revision History

The table below lists the changes of MSP 315 User Manual.

Format	Time	ECO#	Description	Principal
V1.0	2019-11-12	0000#	Release	Sophie