MSP 405

HDMI/SDI/Fiber Convertor

User Manual

RGBlink®

Content

Thank you for choosing our product!

This User Manual is designed to show you how to use this convertor 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. 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.

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.
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. To avoid personal injury, do not remove the top cover. Do not operate the unit without the cover installed.

Use the Proper Power Cord

Use only the standard power cord for your product.

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

Unpacking and Inspection

Before opening MSP 405 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 405 should be clean, properly lit, free from static, and have adequate power, ventilation, and space for all components.

Chapter 1 About Your Product

1.1 Product Overview

The MSP 405 is a professional video converter designed for high-demand 4K ultra-high-definition applications. It boasts HDMI, SDI, and fiber optic interfaces, supporting various video signal inputs and outputs. All interfaces support video transmission up to 3840×2160P@60Hz in ultra-high-definition, with backward compatibility for 1920×1080P@60Hz HD resolution and 1280×720P@60Hz SD resolution.

The MSP 405 integrates multiple video conversion functions, which is capable of converting video signals from any one of HDMI, SDI, or fiber optic inputs to any of the other two protocol outputs. It utilizes high-performance FPGA pure hardware algorithms to achieve zero-delay protocol conversion, ensuring real-time and accurate signal transmission.

Additionally, the MSP 405 offers video monitoring, audio playback and embedding, excellent line equalization and driving capability, as well as signal clock recovery and relay function, which is ideal for medium to long-distance applications where video signal transmission delay is critical, such as in large-scale stage and event setups.

With its strong anti-interference, high security, compact size, and lightweight design, the MSP 405 is an ideal choice for converting and transmitting SDI and HDMI video signals.

The key features are as follows:

● Convert SDI signal (HD/3G/6G/12G-SDI) to HDMI 2.0 signal; support auto format adaptation

● Convert SDI signal (HD/3G/6G/12G-SDI) to fiber signal; support signal relay for long-distance transmission

● Convert HDMI 2.0 signal to SDI signal (HD/3G/6G/12G-SDI); support auto format adaptation

● Convert HDMI 2.0 signal to fiber; support medium to long-distance transmission and auto format adaptation

● Convert fiber signal to SDI signal (HD/3G/6G/12G-SDI); support medium to long-distance transmission and auto format

- Convert fiber signal to HDMI 2.0 signal; support medium to long-distance transmission and

auto format adaptation

- Built-in LCD preview monitor

- Standard Test Pattern generator built in for on-site setup

- Audio playback and embedding function

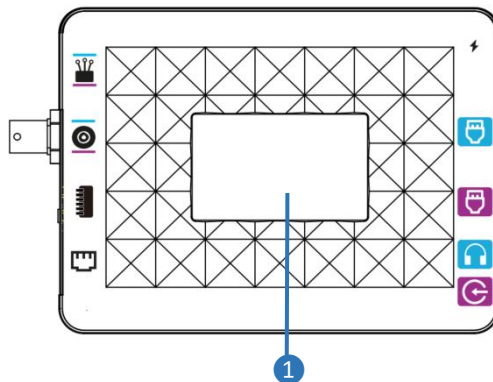- Upgrade and control via Ethernet interface for system integration and custom development
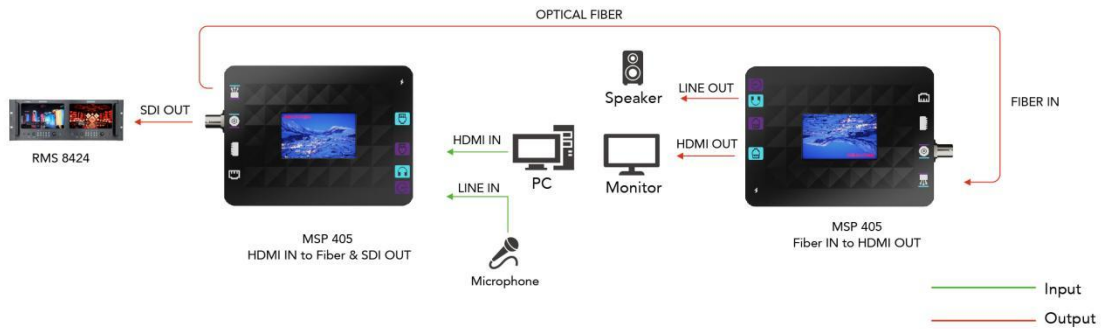
MSP 405 System Connection Diagram Example 1
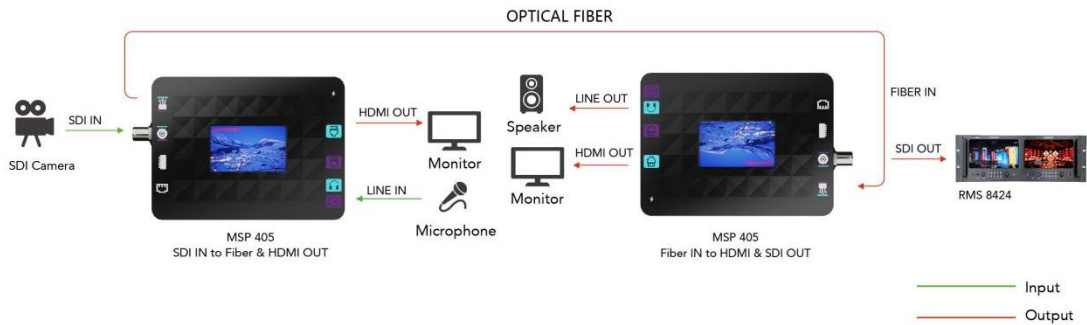
MSP 405 System Connection Diagram Example 2

1.1.1 Front Panel Description

No.	Item	Description
❶	LCD Screen	Built-in preview monitor for signal monitoring.
❷		Fiber input/output port icon.
❸		SDI input/output port icon.
❹		DIP switch icon.
❺		Ethernet port icon.
❻		Power jack icon.
❼		HDMI output port icon.
❽		HDMI input port icon.
❾		Analog audio output icon.
❿		Analog audio input icon.

1.1.2 Interface Panel Description
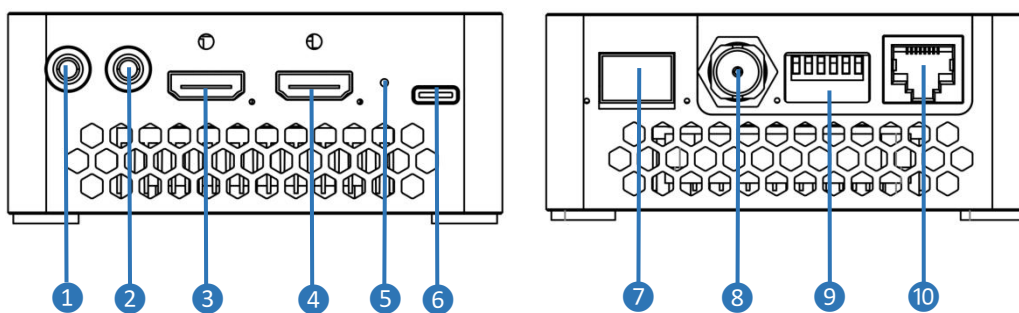
No.	Item	Description
❶	LINE IN	Analog audio input port to input the audio signals. Connect it to audio mixer, CD player, or other such audio equipment.
❷	LINE OUT	Analog audio output port to output the results of audio mixing.

|		Connect it to recorder, amplifier, speaker, or other such equipment.
③	HDMI IN	HDMI input port. Connect it to camera, DVD, PC or other such HDMI signals.
④	HDMI OUT	HDMI output port. Connect it to projector or external display.
⑤	IP Reset Button	To reset the IP address to the default address 192.168.0.199 by inserting a hard probe into the hole to press the internal reset button.
⑥	Power Socket	USB Type-C power socket supports 12V/1.5A power supply.
⑦	Fiber	Fiber input/output port. Connect to the optical fiber module, and transmit signals to another MSP 405 via an optical fiber cable.
⑧	SDI	SDI input/output port. Connect it to SDI sources, such as camera.
⑨	Function DIP Switch	Toggle the DIP switch to different positions to activate various functions or configuration modes. More details please refer to 5.2 DIP Switch Description.
⑩	LAN	Ethernet port for decive upgrade.

1.1.3 Dimension

Following is the dimension of MSP 405 for your reference: 147.9mm × 98.4mm × 41.9mm.
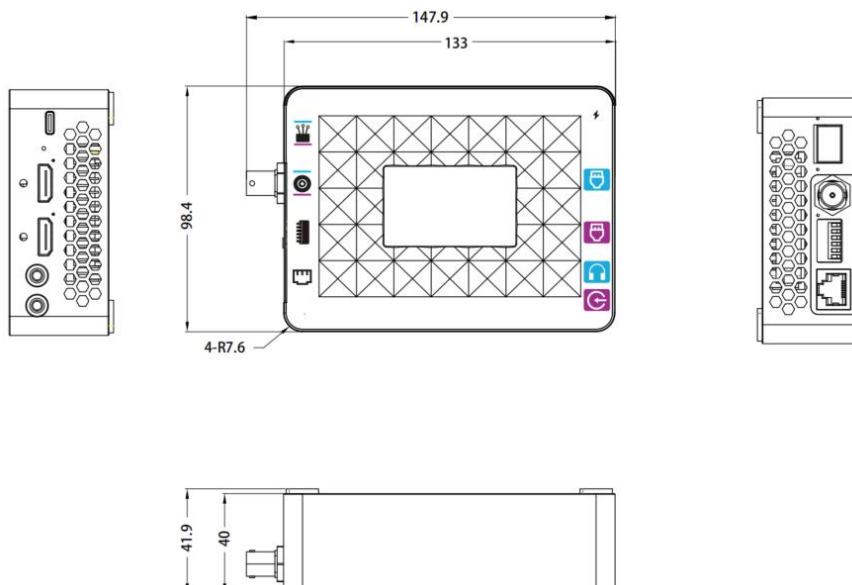
Chapter 2 Use Your Product

MSP 405, a device that functions as both a transmitter and receiver. Designed for flexibility, it supports signal transmission cross various interfaces: SDI to HDMI + optical fiber, HDMI to SDI + optical fiber, and optical fiber to SDI + HDMI when paired with another MSP 405 unit.

2.1 Application Example 1

If you need to convert **SDI Input to HDMI Output** with a resolution of 1920x1080P@60Hz, select Mode 3 on the MSP 405.

Required components are listed as follows:

▬ Power Adapter: Provides power to the device with a voltage of DC 12V and a maximum current of no less than 1.5A.

▬ MSP 405: Device for format conversion between SDI and HDMI signals.

▬ HDMI Monitor: Ensure the HDMI cable and monitor are working properly.

▬ SDI Signal Source: Provides SDI signal.

▬ PC: Used for outputing HDMI signal and configure the resolution.

▬ SDI Monitor: Verify the SDI cable and SDI signal source are working properly.

▬ SDI Cable: Connects the SDI signal source to the MSP 405 and the SDI signal source to the SDI monitor.

▬ HDMI Cable: Connects the PC to the MSP 405 and the PC to the HDMI monitor.

Then follow steps below for connection:

1. **Check the Devices**

Ensure that all devices are in good condition with no damage or abnormalities.

2. Check the Power Adapter

Verify that the power adapter or battery meets the required voltage of 12V and current of no less than 1.5A.

3. Configure HDMI Signal

Set your PC output resolution to 1920x1080P@60Hz. Connect the HDMI output port of PC to the HDMI input port of HDMI monitor using an HDMI cable. Make sure the HDMI signal is displayed correctly on the monitor.

4. Check SDI Signal and Cables

Connect the SDI output port of the SDI signal source (e.g., a camera) to the SDI input port of SDI monitor using an SDI cable. Verify that the SDI signal is displayed on the monitor.

5. Check Grounding and Power Off

Confirm that the signal source and monitor are properly grounded, then disconnect all power cables.

6. Select Mode

Set the MSP 405 to Mode 3 by using the DIP switch.

7. Connect HDMI Cable

Use an HDMI cable to connect the HDMI output port of the MSP 405 to the HDMI input port of the HDMI monitor.

8. Connect SDI Cable

Use an SDI cable to connect the SDI output port of the SDI signal (e.g., a camera) to the SDI input port of the MSP 405.

9. Connect Power

Connect the MSP 405, SDI signal source, and HDMI monitor to power and power them on.

10. Check SDI Input Signal

Check the SDI input signal via the MSP 405's LCD screen. If the signal is not displayed, first check if the MSP 405 is receiving adequate power, then verify the output of the SDI camera, and try using a shorter cable to connect the MSP 405 and SDI camera if necessary.

11. Check HDMI Output Signal

Check the HDMI output signal on the HDMI monitor. Ensure the HDMI display is powered on and set to the correct input. If the signal is not displayed, replace the HDMI cable, reboot the device if needed and switch the mode to Mode 12 for troubleshooting.

2.2 Application Example 2

If you need to convert **HDMI Input to Fiber and SDI Output**, as well as **Fiber Input to HDMI Output**, follow steps blow:
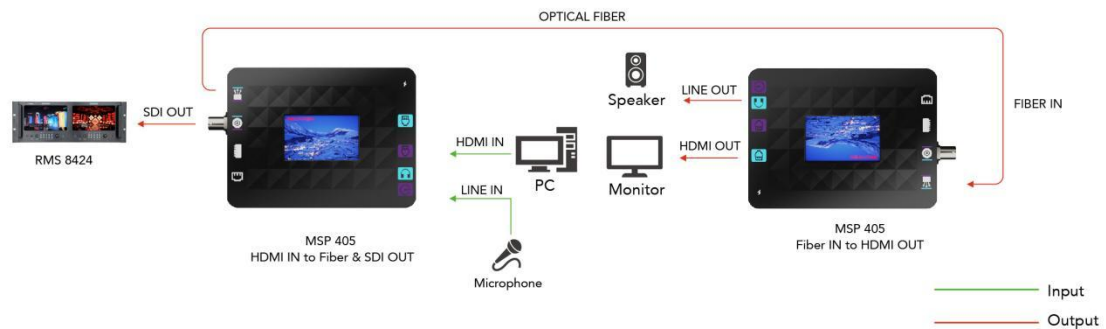
1. Set **MSP 405 Device 1** to **HDMI Input to Fiber and SDI Output** mode.

2. Use an HDMI cable to connect the HDMI output port of a device (e.g., a PC) to the HDMI input port of MSP 405 Device 1.

3. Use an SDI cable to connect the SDI output port (SDI input and SDI output share the same port) of MSP 405 Device 1 to the SDI input port of the SDI monitor.

4. Set **MSP 405 Device 2** to **Fiber Input to HDMI Output** mode.

5. Use a fiber optic cable to connect MSP 405 Device 1 and MSP 405 Device 2.

6. Connect the HDMI output port of the MSP 405 Device 2, which receives fiber signal, to your terminal display so as to enable conversion between fiber and HDMI signals.

2.3 Application Example 3

If you need to convert **SDI Input to Fiber and HDMI Output**, as well as **Fiber Input to HDMI and SDI Output**, follow steps blow:
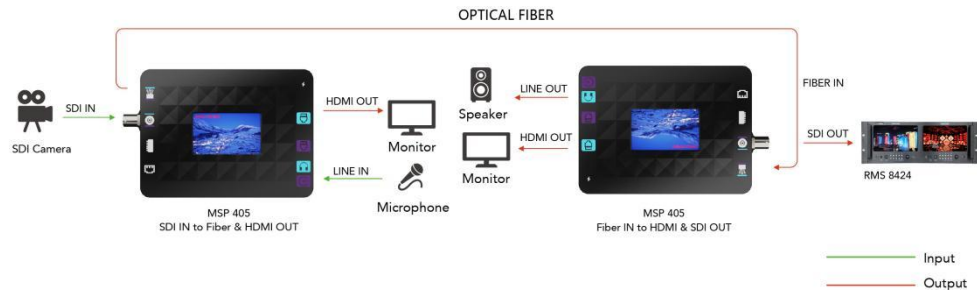
1. Set **MSP 405 Device 1** to **SDI Input to Fiber and HDMI Output** mode.

2. Use an SDI cable to connect the SDI output port of a device (e.g., a camera) to the SDI input port of MSP 405 Device 1.

3. Use an HDMI cable to connect the HDMI output port of MSP 405 Device 1 to the HDMI input port of a display for real-time monitoring of the SDI input from the camera.

4. Set **MSP 405 Device 2** to **Fiber Input to HDMI and SDI Output** mode.

5. Use a fiber optic cable to connect MSP 405 Device 1 and MSP 405 Device 2.

6. Connect MSP 405 Device 2, which receives fiber signal, to your terminal display device so as to achieve signal conversion.

Chapter 3 Order Code

3.1 Product Code

Order Code	Item
601-0405-01-0	MSP 405

Chapter 4 Support

4.1 Contact Us

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Inquiries

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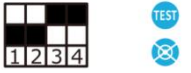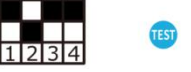
Chapter 5 Appendix

5.1 Specification

Interface	Input	HDMI	1×HDMI-A
		SDI	1×BNC
		Fiber	1×LC
	Output	HDMI	1×HDMI-A
		SDI	1×BNC
		Fiber	1×LC
	Audio	Line In	1×3.5mm Audio Socket
		Line Out	1×3.5mm Audio Socket
	Power	Power	1×USB Type-C Power Jack
	Control	LAN	1×RJ45
		Reset	1×IP Reset Button
		Switch	1×DIP Switch
Performance	Resolution	HDMI/SDI	720p@50/59.94/60
		/Fiber	1080i@50/59.94/60
			1080p@25/29.97/30/50/59.94/60
			2160p@25/29.97/30/50/59.94/60
	Supported	HDMI	2.0b
	Standards	SDI/Fiber	HD/3G/6G/12G-SDI
	Fan	1×built-in fan (speed auto adjusted)	
Power	Input Voltage	USB Type-C 12V/1.5A	
Physical	Net Weight	500g	
	Net Dimension	147.9mm × 98.4mm × 41.9mm	

5.2 DIP Switch Description

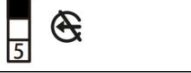| Mode	Position	Function	Description
Mode 0	OFF 1 2 3 4	Power Off	Entire device/system powered off.
Mode 1	1 2 3 4	SDI→HDMI+OPT	1. Converts SDI signal to HDMI output, supports RGB format, no delay.
			2. Converts SDI signal to optical output, with clock recovery, supports loop output, no delay.
Mode 2	1 2 3 4	HDMI→SDI+OPT	1. Converts HDMI signal to SDI output, supports YCbCr 4:2:2 format, no delay.
			2. Synchronizes optical signal with SDI output.
Mode 3	1 2 3 4	SDI→HDMI+OPT	1. Converts SDI signal to HDMI output, with format conversion, output resolution of 1920x1080P@60Hz.
			2. Converts SDI signal to optical output, with clock

			recovery, supports loop output, no delay.
Mode 4		SDI→HDMI+OPT	1. Converts SDI signal to HDMI output, with format conversion, output resolution of 3840x2160P@60Hz.
			2. Converts SDI signal to optical output, with clock recovery, supports loop output, no delay.
Mode 5		HDMI→SDI+OPT	1. Converts HDMI signal to HD-SDI output, with format conversion, output resolution of 1920x1080P@30Hz.
			2. Synchronizes optical signal with SDI output.
Mode 6		HDMI→SDI+OPT	1. Converts HDMI signal to 3G-SDI output, with format conversion, output resolution of 1920x1080P@60Hz.
			2. Synchronizes optical signal with SDI output.
Mode 7		HDMI→SDI+OPT	1. Converts HDMI signal to 6G-SDI output, with format conversion, output resolution of 3840x2160P@30Hz.
			2. Synchronizes optical signal with SDI output.
Mode 8		HDMI→SDI+OPT	1. Converts HDMI signal to 12G-SDI output, with format conversion, output resolution of 3840x2160P@60Hz.
			2. Synchronizes optical signal with SDI output.
Mode 9		OPT→SDI+HDMI +OPT	1. Converts optical signal to SDI output, with clock recovery, supports loop output, no delay.
			2. Synchronizes HDMI output.
			3. Synchronizes optical signal with SDI output.
Mode 10		OPT→SDI+HDMI +OPT	1. Converts optical signal to 3G-SDI output, with format conversion, output resolution of 1920x1080P@60Hz.
			2. Synchronizes HDMI with SDI output.
			3. Synchronizes optical signal with SDI output.
Mode 11		OPT→SDI+HDMI +OPT	1. Converts optical signal to 12G-SDI output, with format conversion, output resolution of 3840x2160P@60Hz.
			2. Synchronizes HDMI with SDI output.
			3. Synchronizes optical signal with SDI output.
Mode 12		Test Pattern_2K	Outputs 2K test pattern, with HDMI output at 1920x1080P@60Hz.
Mode 13		Test Pattern _2K	Outputs 2K test pattern, with HDMI, optical, and SDI outputs all at 1920x1080P@60Hz.
Mode 14		Test Pattern _4K	Outputs 4K test pattern, with HDMI output at 3840x2160P@60Hz.
Mode 15		Test Pattern _4K	Outputs 4K test pattern, with HDMI, optical, and SDI outputs all at 3840x2160P@60Hz.
/		AUDIO	Uses the embedded audio from the video signal for the video output.
/		AUDIO	Uses the audio from the analog audio input port for the video output.

/	TP STILL [6]	Test Pattern	Sets the test pattern to a static state.
/	TP MOVE [6]	Test Pattern	Sets the test pattern to a moving state.

5.3 Interface Performance

Interface	Item	Description	
SDI	Resolution	1280×720p50/59.94/60	
		1920×1080i50/59.94/60	
		1920×1080p25/29.97/30/50/59.94/60	
		3840×2160p25/29.97/30/50/59.94/60	
	Date Rate	Supports HD-SDI, 3G-A-SDI, 3G-B-SDI, 6G-SDI, 12G-SDI, adaptive	
	Standards	SMPTE292M, SMPTE424M, SMPTE2081-1:2015, SMPTE2082-1:2015	
	Color Space	YCbCr 4:2:2	
	Color Depth	10bit	
	Audio	48kHz sample rate, 24-bit, stereo	
	Transmission Distance	HD-SDI	≤200 meters
		3G-SDI	≤150 meters
		6G-SDI	≤100 meters
		12G-SDI	≤70 meters
HDMI	Resolution	1280×720p50/59.94/60	
		1920×1080i50/59.94/60	
		1920×1080p25/29.97/30/50/59.94/60	
		3840×2160p25/29.97/30/50/59.94/60	
	Color Space	RGB, YCbCr 4:4:4, YCbCr 4：2：2, YCbCr 4:2:0	
	Color Depth	8/10/12/16bit	
	Audio	48kHz sample rate, 24-bit, stereo	
Fiber Optic	Resolution	1280×720p50/59.94/60	
		1920×1080i50/59.94/60	
		1920×1080p25/29.97/30/50/59.94/60	
		3840×2160p25/29.97/30/50/59.94/60	
	Data Rate	Supports HD-SDI, 3G-A-SDI, 3G-B-SDI, 6G-SDI, 12G-SDI, adaptive	
	Standards	SMPTE292M, SMPTE424M, SMPTE2081-1:2015, SMPTE2082-1:2015	
	Color Space	YCbCr 4:2:2	
	Color Depth	10bit	
	Audio	48kHz sample rate, 24-bit, stereo	
	Transmission Wavelength	1310±10nm	
	Transmission Power	-3dBm~1dBm	
	Reception	1260nm~1580nm	

	Wavelength		
	Reception Power	-11dBm~1dBm	
	Transmission Distance	Single-mode	≤10000 meters
		Multi-mode	≤200 meters
Analog Audio In	/	Stereo Analog Audio Input	
Analog Audio Out	/	Stereo Analog Audio Output	
LAN	/	100 Mbps Ethernet Port	
Power	/	USB Type-C power input	
		Input: 9-12V Rated Power: ≤10W	
		Supports dual battery power, with approximately 3 hours of single battery life	
		When both USB Type-C and the battery are connected, it automatically switches to USB Type-C power mode	

5.4 Revision History

The table below lists the changes of MSP 405 User Manual.

Format	Time	ECO#	Description	Principal
V1.0	2024-05-15	0000#	First Release	Aster
V1.1	2024-08-22	0001#	1. Add application example 2. Update DIP switch description 3. Add interface performance	Aster

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