



TS5U VIDEO WALL SPLICER

SPECIFICATIONS

Preliminary Version Only

CHANGE HISTORY

Document Version	Release Day	Description
V1.3.1	2021-01-08	Added one HDMI cable to the product accessories.
V1.3.0	2021-11-30	<ul style="list-style-type: none">• Added the description for H_STD I/O card.• Added the maximum layer quantity in the specification table.• Changed the maximum widths and heights supported by the dual-link DVI and HDMI input and output connectors.
V1.2.0	2020-09-04	Added the descriptions for the following cards: <ul style="list-style-type: none">• H_2xDP1.1 input card• H_20xRJ45 sending card
V1.1.1	2020-08-20	Updated the maximum height supported by the H_16x-RJ45+2xfiber sending card to 10240 pixels.
V1.3.0	2020-07-31	Added the descriptions for the following new functions: <ul style="list-style-type: none">• Eye saver mode on Web page• 3D function• Input source grouping• App control on the pad device Added the descriptions for the following input cards: <ul style="list-style-type: none">• H_4x3G SDI input card• H_2xCVBS+2xVGA input card• H_4xVGA input card
V1.0.1	2020-06-02	Updated the descriptions of the H_2xRJ45 IP input card
V1.0.0	2020-05-15	Frist Release

INTRODUCTION

The TS5U is TWT's newest generation of video wall splicer, featuring excellent image quality and designed especially for fine-pitch LED screens. The TS5U can work as splicing processors that integrate both video processing and video control capabilities, or work as pure splicing processors. The whole unit adopts a modular and plug-in design, and allows for flexible configuration and hot swapping of input and output cards. Thanks to excellent features and stable performance, the TS5U can be widely used in a variety of applications, such as energy and power, judicial departments and prisons, military command, water conservancy and hydrology, meteorologic earthquake prediction, enterprise management, metallurgy of steel, banking and finance, national defense, public security traffic management, exhibitions and presentations, production scheduling, radio and television, educational and scientific research, as well as stage rental applications.

Based on the powerful hardware FPGA system architecture, with a modular and plug-in design, the TS5U features a stable and highly efficient pure hardware architecture, and provides a variety of connector modules for flexible and personalized configuration, allowing for easy maintenance and low failure rate. The TS5U provides the industry-standard input connectors, including HDMI, DVI, DP, VGA, CVBS, SDI and IP, and supports 10-bit video source input and processing, as well as 4K high-definition inputs and outputs. The TS5U also provides two kinds of LED 4K sending cards, allowing for the backup between the OPT ports and Ethernet ports as well as ultra-long distance transmission. Moreover, the TS5U supports multi-screen and multi-layer management, input and output EDID management and monitoring, input source renaming, BKG and OSD settings and more, bringing you a rich image construction experience.

“ FEATURES

Modular and plug-in design, for flexible configuration

- Two kinds of LED 4K sending cards
 - H_20xRJ45 sending card loads up to 13,000,000 pixels.
 - H_16xRJ45+2xfiber sending card loads up to 10,400,000 pixels and provides two OPT ports that copy the outputs on Ethernet ports.
- Multi-capacity configuration on a single card slot
 - 4x 2K×1K@60Hz
 - 2x 4K×1K@60Hz
 - 1x 4K×2K@60Hz
- Simple screen configuration using a single card and connector
- Online status monitoring of all input and output cards
- Hot-swappable input and output cards
- H_2xRJ45 IP input card supports up to 100 IP camera inputs and input mosaic.
- Auto decryption of HDCP-encrypted sources

Multi-screen management, for centralized control

- Each screen can have its own output resolution.
 - Output mosaic
- Adopts the frame synchronization technology, which ensures all the output connectors output the image synchronously, and the image is complete and played smoothly, without any stuck, frame loss, tearing or piecing.
- Irregular screen configuration

Supports irregular rectangle mosaic without any limitations.

- Input source grouping management
- Eye saver mode

Display the image in a warmer but less bright way to relieve eye strain.

- LCD bezel compensation

Multi-screen management, for centralized control

- Multi-layer display
- A single card supports 16x 2K layers, 8x DL layers or 4x 4K layers.
- All layers support cross-connector output and the layer quantity is not reduced for crossconnector output.
- High-definition scrolling text
- Customize the scrolling text content, such as slogans or notification messages, and set the text style, scrolling direction and speed. Up to 2,000 presets
- Fade effect and seamless switching supported, less than 60ms preset switching duration
- Scheduled playback of preset playlist
- Set whether to add the presets to playlist, which is ideal for monitoring, exhibitions, presentations, and other applications.
- OSD settings on a single screen and adjustable OSD transparency
 - BKG settings

BKG images do not occupy the layer resources.

The max. width and height of a BKG image is up to 15K and 8K respectively.

- Channel logo management

Set a text or image logo for identifying the input source.

- Input source cropping and renaming after cropping

Crop any input source image and form a new input source after cropping.

- HDR and 10-bit video processing, allowing for a more exquisite and clear image
- Color adjustment

Input, output and layer color adjustable, including the brightness, contrast, saturation, hue and Gamma

- 3D function

Work with TWT 3D emitter – EMT200 to enjoy the 3D visual effect.

Multi-screen management, for centralized control

- Web control
- Real-time response and 1000M/100M self-adaptive network control, allowing for multi-user collaboration

- Monitoring of inputs and outputs on Web page

- Firmware update on Web page

- Ark Visualized Management and Control Platform App control on pad device

Multi-screen management, for centralized control

- Self-test for fault detection
 - Auto monitoring and alarms
- Supports hardware monitoring, such as fan rotation speed, module temperature and voltage,

running status, and sends fault alarms if necessary.

- Supports an optional power supply for higher system reliability.

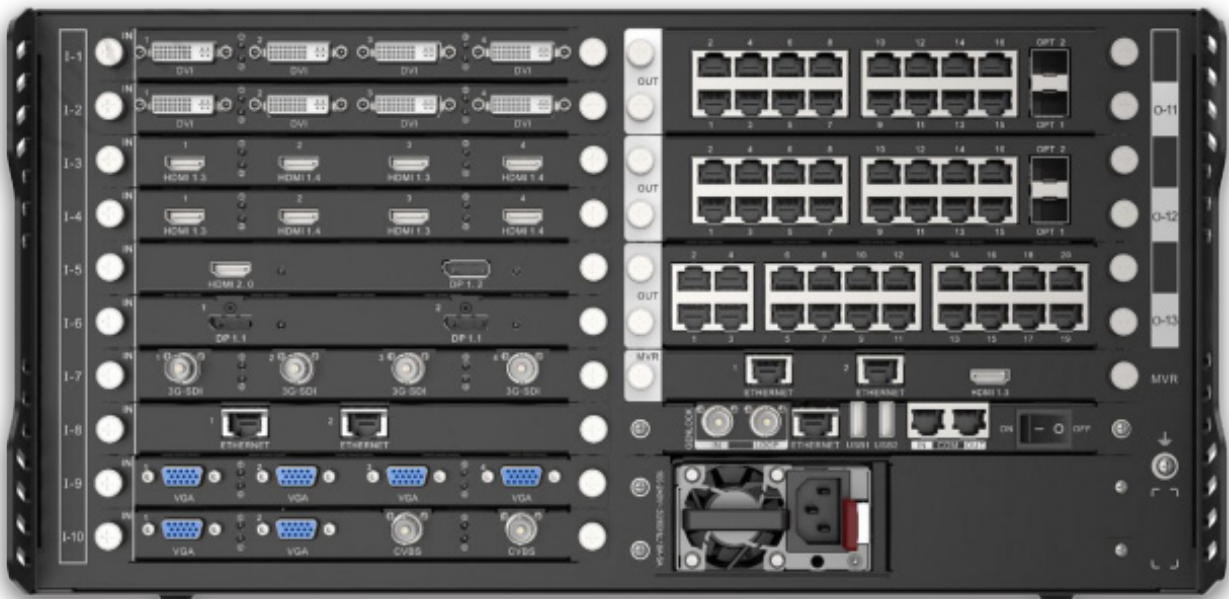
Front Panel



*The picture shown is for illustration purpose only. Actual product may vary due to product enhancement.

NAME	DESCRIPTION
LCD screen	Touchscreen displays the menus, submenus and messages, as well as device status and monitoring information, and allows you to perform all the operations at your fingertips.

Rear Panel



*The picture shown is for illustration purpose only. Actual product may vary due to product enhancement.

NOTES :

- The silkscreen marking “I-x” indicates the slot is dedicated for the input card. “I” stands for input and “x” stands for the slot number. For example, “I-1” indicates this slot is the 1st input slot and for installing an input card only.
 - The silkscreen marking “O-x” indicates the slot is dedicated for the output card. “O” stands for output and “x” stands for the slot number. For example, “O-10” indicates this slot is the 10th output slot and for installing an output card only.
 - The silkscreen marking “MVR” indicates the slot is dedicated for the preview card only.
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INPUT CARD

H_4xDVI input card



Support for single link and dual link input modes, and 10-bit input source HDCP 1.4 compliant

Does not support interlaced signal input.

- Single link mode:

- Four DVI connectors are all used for input.

- Each connector supports the maximum resolution of 2048×1152@60Hz and the minimum resolution of 800×600@60Hz.

- Custom resolutions:

- Max. width: 2560 pixels (2560×972@60Hz)

- Max. height: 2560 pixels (884×2560@60Hz)

- Dual link mode:

- Connectors 2 and 4 are used for input, and connectors 1 and 3 are unavailable.

- Each connector supports the maximum resolution of

- 3840×1080@60Hz and the minimum resolution of 800×600@60Hz.

- Custom resolutions:

- Max. width: 4096 pixels (4096×1124@60Hz)

- Max. height: 4095 pixels (1014×4095@60Hz)

- Status LEDs:

- On: The input source is accessed normally.

- Off: No input source is accessed or the input source is abnormal.

H_4xHDMI input card



Support for 10-bit input source

Does not support interlaced signal input.

- * Single link mode:

- 2x HDMI 1.3

- Each connector supports the maximum resolution of 2048×1152@60Hz, and the minimum resolution of 800×600@60Hz.

- Custom resolutions:

- Max. width: 2560 pixels (2560×972@60Hz)

- Max. height: 2560 pixels (884×2560@60Hz)

- HDCP 1.4 compliant

- 2x HDMI 1.4a

- Each connector supports the maximum resolution of 2048×1152@60Hz, and the minimum resolution of 800×600@60Hz.

- Custom resolutions:

- Max. width: 2560 pixels (2560×972@60Hz)

- Max. height: 2560 pixels (884×2560@60Hz)

- HDCP 1.4 compliant

- * Dual link mode:
 - Two HDMI 1.4a connectors are used for input, and two HDMI 1.3 connectors are unavailable.
 - Each connector supports the maximum resolution of 3840×1080@60Hz.
 - Custom resolutions:
- Max. width: 4096 pixels (4096×1124@60Hz)
Max. height: 4095 pixels (1014×4095@60Hz)
- HDCP 1.4 compliant
- * Status LEDs:
 - On: The input source is accessed normally.
 - Off: No input source is accessed or the input source is abnormal.

H_1xHDMI2.0+1xDP1.2
input card



Only one connector can be used each time.

The default option is HDMI 2.0 connector.

Does not support interlaced signal input.

- 1x HDMI 2.0
- Backward compatible with HDMI 1.4a and HDMI 1.3
- Supports the maximum resolution of 4096×2160@60Hz or 8192×1080@60Hz (forced).
- HDCP 2.2 compliant
- Custom resolutions:

Max. width: 4092 pixels (4092 2261@60Hz)

Max. height: 4095 pixels (2188 4095@60Hz)

- 1x DP 1.2
- Backward compatible with DP 1.1
- Supports the maximum resolution of 4096×2160@60Hz or 8192×1080@60Hz.
- HDCP 2.2 compliant
- Custom resolutions:

Max. width: 8192 pixels (8192×1146@60Hz)

Max. height: 4095 pixels (2188 4095@60Hz)

- Status LEDs:
- On: The input source is accessed normally.
- Off: No input source is accessed or the input source is abnormal.

H_2xRJ45 IP input card



2x RJ45 Gigabit Ethernet ports

Support for interlaced signal input

- Supported protocols: RTSP, GB28181 and ONVIF
- Supported coding formats: H.264 and H.265
- Single card decoding capability:
- 4x 3840×2160@30fps
- 16x 1920×1080@30fps
- DHCP compliant

H_4x3G SDI input card



- 4x 3G-SDI

Backward compatible with HD-SDI and SD-SDI

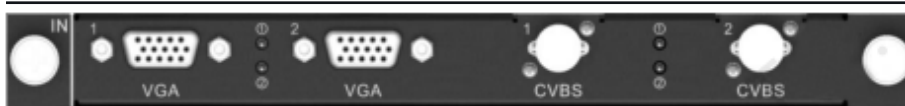
Supports ST-424 (3G), ST-292 (HD) and SMPTE 259 SD.

Each connector supports the maximum resolution of 1920×1080@60Hz.

Supports 1080i/576i/480i de-interlacing processing.

- Status LEDs:
- On: The input source is accessed normally.
- Off: No input source is accessed or the input source is abnormal.

H_2xCVBS+2xVGA
input card



- 2x VGA

Each connector supports the maximum resolution of 1920×1080@60Hz.

- 2x CVBS

Supports PAL and NTSC.

- Status LEDs:

On: The input source is accessed normally.

Off: No input source is accessed or the input source is abnormal.

H_4xVGA input card



- 4x VGA

Each connector supports the maximum resolution of 1920×1080@60Hz.

- Status LEDs:

On: The input source is accessed normally.

Off: No input source is accessed or the input source is abnormal.

H_2xDPI.1 input card



- 2x DPI.1

Each connector supports the maximum resolution of 3840×1080@60Hz or 3840×2160@30Hz.

Custom resolutions:

- Max. width: 4096 pixels (4096×1124@60Hz)

- Max. height: 4095 pixels (1014×4095@60Hz)

Supports 8-bit and 10-bit inputs.

Does not support interlaced signal input.

HDCP 1.3 compliant

- Status LEDs:

On: The input source is accessed normally.

Off: No input source is accessed or the input source is abnormal.

H_STD I/O card



- 2x COM

Programmable RS422/RS485/RS232 ports that are used to control the devices that adopt RS422/RS485/RS232 protocol

- 1x ETHERNET

- Control the device that is connected to this card.

- 10/100Mbps self-adaptive

- TCP/IP protocol and UDP/IP protocol supported

- 3x I/O

- Trigger the execution of the function requirements via programming.

- Input and output modes supported

- 3x RELAY OUT

- Connect to the relay to control the power on and off the connected device.

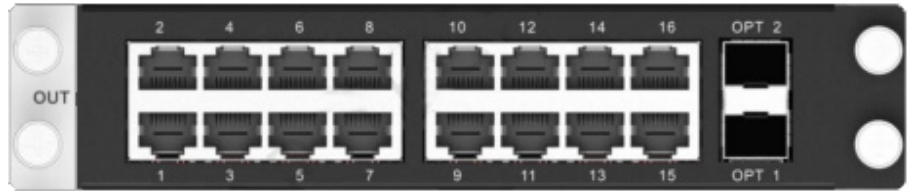
- Voltage: 30 VDC, current: 3A at maximum

- 3x IR OUT

Programmable infrared control supported

OUTPUT CARD

H_16xRJ45+2xfiber sending card



LED 4K sending card can load up to 10,400,000 pixels (max. width: 10,240 pixels, max. height: 10,240 pixels).

This card occupies two slots.

- 6x RJ45 Gigabit Ethernet outputs
- Bit depth: 8-bit

A single Ethernet port loads up to 650,000 pixels.

- Bit depth: 10-bit

A single Ethernet port loads up to 320,000 pixels.

- Backup between Ethernet ports

- 2x OPT outputs

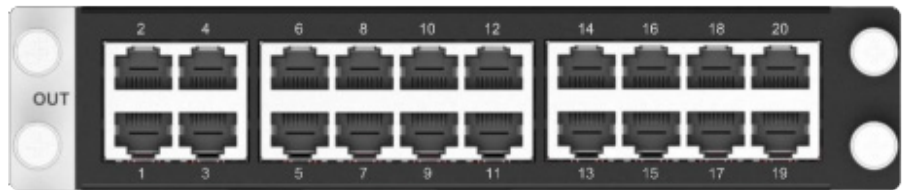
- Support both SMF and MMF transmission. In SMF mode, the maximum

transmission distance reaches up to 10 km.

- OPT 1 copies and outputs the data on Ethernet ports 1–8.

- OPT 2 copies and outputs the data on Ethernet ports 9–16

H_20xRJ45 sending card



LED 4K sending card can load up to 13,000,000 pixels (max. width: 10,752 pixels, max. height: 10,752 pixels).

This card occupies two slots.

- 20x RJ45 Gigabit Ethernet outputs
- Bit depth: 8-bit

A single Ethernet port loads up to 650,000 pixels.

- Bit depth: 10-bit

A single Ethernet port loads up to 320,000 pixels.

- Backup between Ethernet ports

H_2xRJ45+1xHDMI1.3 preview card



- 2x RJ45 Gigabit Ethernet outputs

Connect to the network for monitoring the inputs and outputs.

- 1x HDMI 1.3

Connect to a monitor for displaying the monitoring information.

H_CONTROL CARD

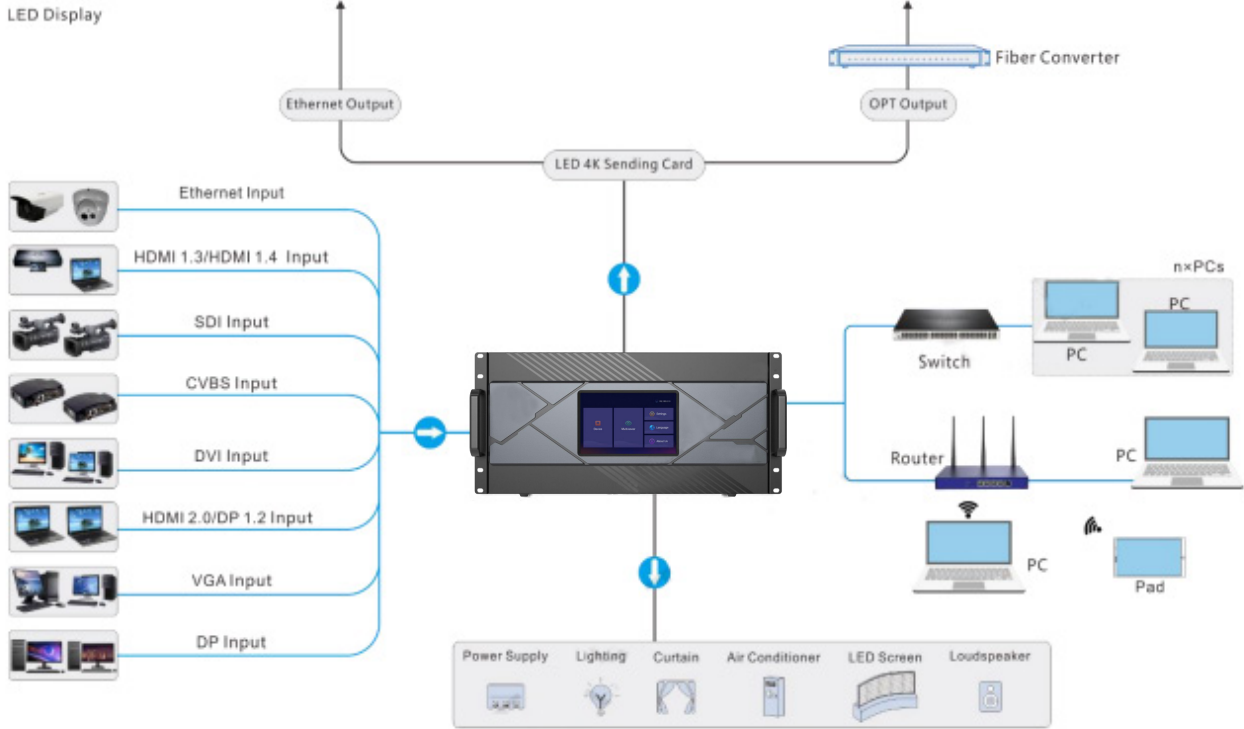


GENLOCK	Supports bi-level and tri-level. <ul style="list-style-type: none">• IN: Accept the Genlock signal• LOOP: Loop the Genlock signal
GENLOCK	A Gigabit Ethernet port <ul style="list-style-type: none">• Connect to the control PC for communication.• Connect to the router, switch or PC.• For Web control and TWT screen configuration
USB1 & USB2	2x USB 2.0 <ul style="list-style-type: none">• Update the device program.• Import or export the device configuration parameters.
USB1 & USB2	A serial port that adopts RS232 serial protocol Support for central control system <ul style="list-style-type: none">• IN: Accept the signal from the central control system.• OUT: Loop the signal.
POWER SWITCH	<ul style="list-style-type: none">• - / ON: Power on the device.• O / OFF: Power off the device.

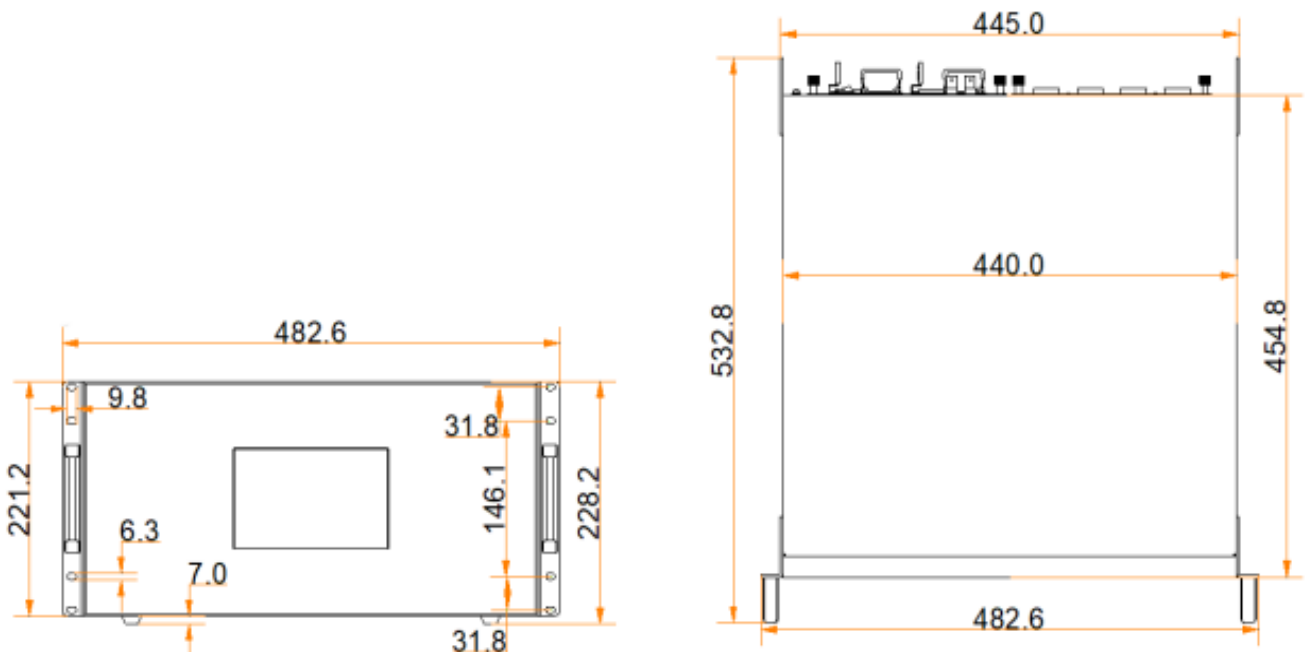
APPLICATIONS



LED Display



DIMENSIONS



Tolerance: ± 0.5 Unit: mm

SPECIFICATIONS

MODEL		TS5U
RACK UNIT		5U
MAX. INPUT CARDS		10
MAX. INPUT CHANNELS		40
MAX. OUTPUT CARDS		3
MAX. LOADING CAPACITY (LED 4K SEDING CARD)		39,000,000 pixels
MAX. LAYERS		48
ELECTRICAL SPECIFICATIONS	POWER CONNECTOR	100–240V~, 50/60Hz, 10A–5A Note: The TS5U comes with a single power supply. A redundant power supply is optional
	POWER CONSUMPTION	400 W
OPERATING ENVIRONMENT	TEMPERATURE	0°C to 45°C
	HUMIDITY	0% to 80%, non-condensing
STORAGE ENVIRONMENT	TEMPERATURE	-10°C to +60°
	HUMIDITY	0% to 95%, non-condensing
PHYSICAL SPECIFICATIONS	DIMENSIONS	482.6 mm × 532.8 mm × 228.2 mm
	NET WEIGHT	25 kg
	GROSS WEIGHT	28 kg
PACKING INFORMATION	PACKING BOX	780 mm × 615 mm × 345 mm
	ACCESSORIES	1x Power cord 1x RJ45 Ethernet cable 1x Grounding cable 1x HDMI cable 1x Quick Start Guide 1x Certificate of Approval 1x Safety Manual 1x Custom Letter
CERTIFICATIONS		CE, FCC, IC, RoHS, EAC

VIDEO SOURCE FEATURES

INPUT CONNECTOR		COLOR DEPTH	MAX. INPUT RESOLUTION
HDMI 2.0	8-bit	RGB 4:4:4	4096×2160@60Hz
		YCbCr 4:4:4	8192×1080@60Hz
		YCbCr 4:2:2	
		YCbCr 4:2:0	4096×2160@60Hz
	10-bit	RGB 4:4:4	4096×2160@30Hz
		YCbCr 4:4:4	4096×1080@60Hz
		YCbCr 4:2:2	4096×2160@60Hz
		YCbCr 4:2:0	
	12-bit	RGB 4:4:4	4096×2160@30Hz
		YCbCr 4:4:4	4096×1080@60Hz
		YCbCr 4:2:2	4096×2160@60Hz
		YCbCr 4:2:0	
DP 1.2	8-bit	RGB 4:4:4	4096×2160@60Hz
		YCbCr 4:4:4	8192×1080@60Hz
		YCbCr 4:2:2	
		YCbCr 4:2:0	Not supported
	10-bit	RGB 4:4:4	4096×2160@30Hz
		YCbCr 4:4:4	4096×1080@60Hz
		YCbCr 4:2:2	4096×2160@60Hz
		YCbCr 4:2:0	Not supported
	12-bit	RGB 4:4:4	4096×2160@30Hz
		YCbCr 4:4:4	4096×1080@60Hz
		YCbCr 4:2:2	4096×2160@60Hz
		YCbCr 4:2:0	Not supported
HDMI 1.4a DP 1.1	8-bit	RGB 4:4:4	4096×1080@60Hz
		YCbCr 4:4:4	
		YCbCr 4:2:2	
		YCbCr 4:2:0	Not supported
	10-bit	RGB 4:4:4	2048×1152@60Hz

INPUT CONNECTOR		COLOR DEPTH	MAX. INPUT RESOLUTION
HDMI 1.3	12-bit	YCbCr 4:4:4	
		YCbCr 4:2:2	4096×1080@60Hz
		YCbCr 4:2:0	Not supported
	12-bit	RGB 4:4:4	2048×1152@60Hz
		YCbCr 4:4:4	
		YCbCr 4:2:2	4096×1180@60Hz
		YCbCr 4:2:0	Not supported
	8-bit	RGB 4:4:4	2048×1152@60Hz
		YCbCr 4:4:4	
		YCbCr 4:2:2	
		YCbCr 4:2:0	Not supported
	10-bit	RGB 4:4:4	2048×1152@60Hz
YCbCr 4:4:4			
YCbCr 4:2:2			
YCbCr 4:2:0		Not supported	
12-bit	RGB 4:4:4	2048×1152@60Hz	
	YCbCr 4:4:4		
	YCbCr 4:2:2		
	YCbCr 4:2:0	Not supported	
SL-DVO	8-bit	RGB 4:4:4	2048×1152@60Hz
DL-DVI	8-bit	RGB 4:4:4	3840×1080@60Hz
VGA CVBS	-	RGB 4:4:4	1920×1080@60Hz
3G-SDI	<ul style="list-style-type: none"> • Supports up to 1920×1080@60Hz video inputs. • Input resolution and bit depth settings are not allowed. • Supports ST-424 (3G) and ST-292 (HD). 		

FCC CAUTION

- Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.
- This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.
- Note: 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 is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.



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TWT reserves the right to make product, dimensions and specifications alternations.

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