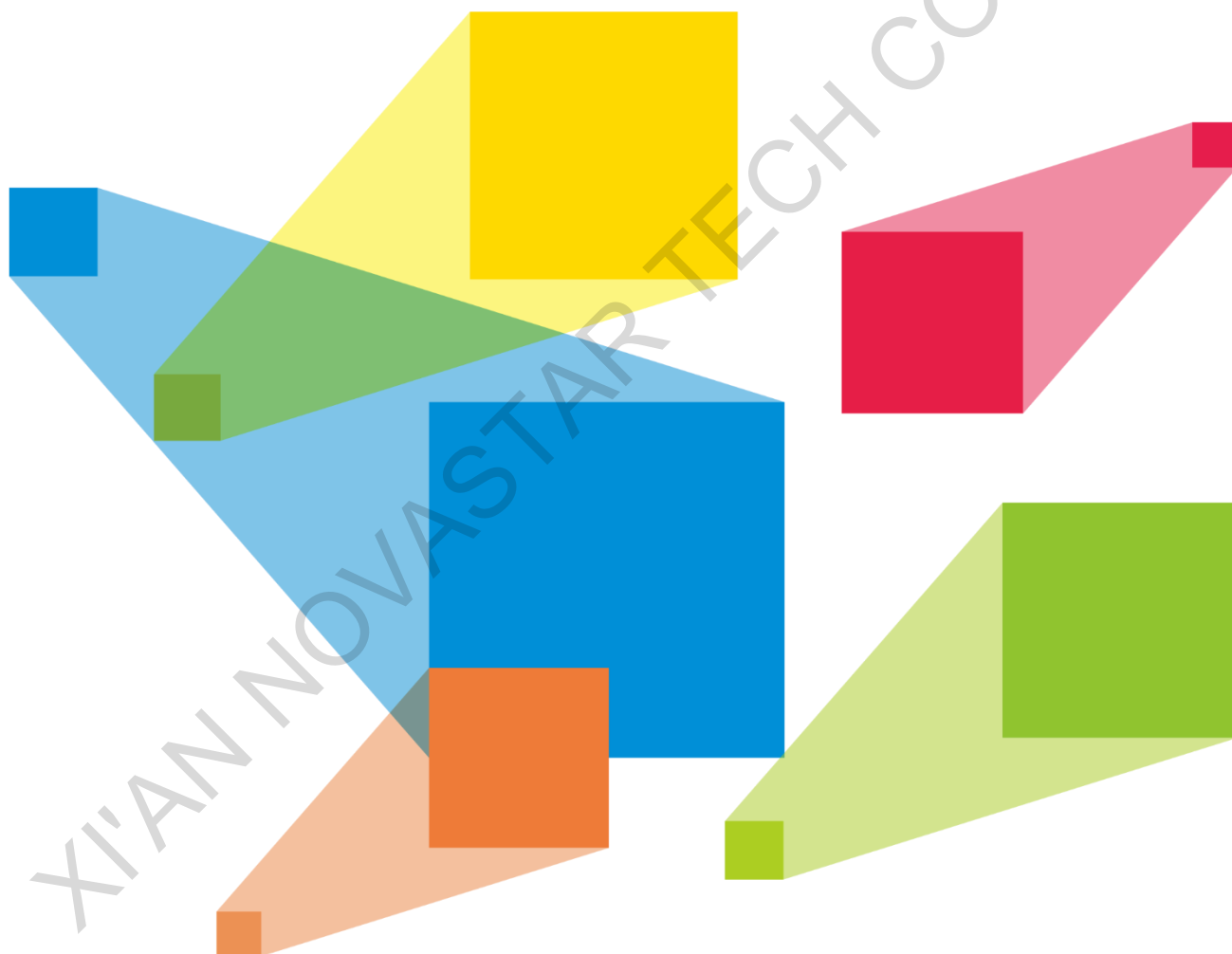# HDR Master 4K

## Video Processor

V2.0.1

Specifications

# Introduction

The HDR Master 4K is a video processor converting SDR content into an HDR format. By analyzing the SDR content and then intelligently filling in the missing information, the HDR Master 4K raises the dynamic range of brightness, color gamut and color depth to HDR standard. With this all-round upgrade, the SDR video source is converted into an HDR10 format which has a wider dynamic range of brightness, more colors and richer bright and dark details.

The HDR Master 4K provides full 4K×2K@60Hz input and output connectors. Based on a pure hardware system architecture, the HDR Master 4K allows for stable and highly-efficient processing capabilities, output connector converting, SDI mosaic as well as long-distance optical fiber transmission.
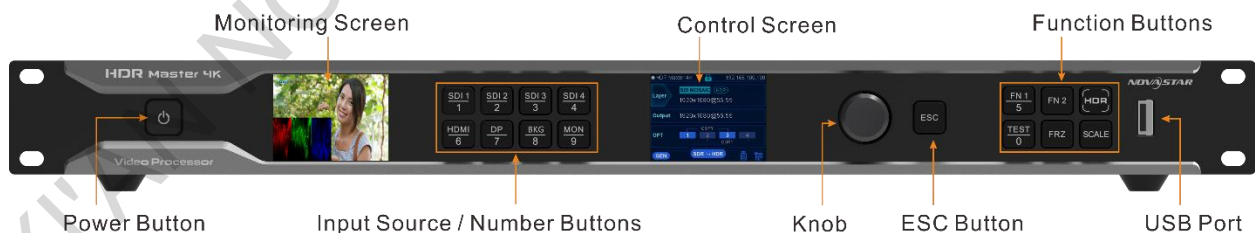
Thanks to the powerful capabilities of receiving a variety of video signals, ultra HD image processing and HDR10 image output, the HDR Master 4K can be widely used in applications such as high-end rental, stage control, fine-pitch LED screens and video source conversion.

# Features

- 1 pluggable input card
  - 1x DP 1.2, 1x HDMI 2.0 and 4x 12G-SDI
  - 3G-SDI mosaic input
  - Up to six 4K×2K@60Hz video inputs simultaneously
- 2 pluggable output cards that output the same content synchronously
  - One with 1x HDMI 2.0 and 4x 10G optical fiber ports
  - The other one with 1x HDMI 2.0 and 4x 12G-SDI output connectors
  - 3G-SDI mosaic output
- Free conversion between SDR and HDR10/HLG
  - Convert SDR content to HDR10/HLG format

- Convert HDR10/HLG content to SDR format
- BKG and LOGO file importing via a USB drive
  - Up to 10 BKG images, each width or height up to 8192 pixels
  - Up to 10 LOGO images, each width or height up to 512 pixels
- An LCD screen dedicated for monitoring
- Self-test and status monitoring
- Input hot backup function
- Output auto scaling to fit screen
- Output color space, sampling rate and bit depth settings
- Layer image flipping, input crop and layer mask

# Appearance

## Front Panel



| Area | Description |
|---|---|
| Power button | Power on or power off the device. |
| Monitoring screen | An LCD screen<br>Displays the monitoring information and input source RGB parade. |
| Input source and number buttons | Press the buttons to switch the layer input source or enter numbers.<br>• Status LEDs for input source buttons:<br>  – On (green): The input source is accessed and used by the layer. |

| Area | Description |
|---|---|
| | – Flashing (red): The input source is not accessed but used by the layer.<br>– On (yellow): The input source is accessed but not used by the layer.<br>– Off: No input source is accessed or the input source is abnormal.<br>• Status LEDs for number buttons:<br>– On (green): The number button is active and can be used to enter a number. |
| Control screen | An LCD screen<br>Displays the device statuses, menus, submenus and messages. |
| Knob | • Rotate the knob to select a menu item or adjust a parameter value.<br>• Press the knob to confirm the selection or enter the submenu screen. |
| ESC button | Exit the current menu or cancel the operation. |
| Function buttons | • FN 1: A reserved button for a custom function, or used as a number button to enter 5<br>• FN 2: A reserved button for a custom function<br>• HDR: Turn on or turn off the SDR to HDR converting function.<br>– On: SDR to HDR converting function turned on<br>– Off: SDR to HDR converting turned off<br>• TEST: Enter the test pattern menu, or used as a number button to enter 5<br>– On: Test pattern opened<br>– Off: Test pattern closed<br>• FRZ: Freeze the output image.<br>– On: Freeze function turned on<br>– Off: Freeze function turned off<br>• SCALE: Make the layer size equal to the output resolution.<br>– On: Scaling function turned on (default)<br>– Off: Scaling function turned off |
| USB port | 1x USB 2.0 (Type-A)<br>• Insert a USB drive to update the device.<br>• Insert a USB drive to import the BKG or LOGO files. |

## Rear Panel



| Input Card |
| --- |
| **R_4x12G SDI+1xHDMI2.0+1xDP1.2 Input Card** |



| Connector | Qty | Standard | Description |
|---|---|---|---|
| HDMI 2.0 | 1 | HDMI 2.0<br>Backwards compatible with HDMI 1.4 and HDMI 1.3 | • Up to 4K×2K@60Hz input resolution<br>• 1080i/576i/480i deinterlacing<br>• HDCP 2.2 and HDCP 1.4 compliant<br>• HDR10 and HLG supported<br>• Max. width: 4092 pixels, max. height: 4095 pixels |

| Connector | Qty | Standard | Description |
|---|---|---|---|
| DP 1.2 | 1 | DP 1.2<br><br>Backwards compatible with DP 1.1 | • Up to 4K×2K@60Hz input resolution<br>• 1080i/576i/480i deinterlacing<br>• HDCP 1.3 compliant<br>• Max. width: 4092 pixels, max. height: 4095 pixels |
| 12G-SDI | 4 | 12G-SDI<br><br>Backwards compatible with 6G-SDI, 3G-SDI, HD-SDI and SD-SDI | • Supports ST-2082-1 (12G), ST-2081-1 (6G), ST-424 (3G), ST-292 (HD) and SMPTE 259 (SD).<br>• Up to 4K×2K@60Hz input resolution<br>• 1080i/576i/480i deinterlacing<br>• For 3G-SDI, HD-SDI or SD-SDI inputs, SDI mosaic input is supported.<br>**Note:**<br>When the input source is a 12G-SDI signal, you must use CANARE / L-4.5CHD+ / UHDTV-SDI SDI cables and the cable length should be less than 50 m. |

## Output Card

### R_1×HDMI2.0+4×Fiber Output Card



| Connector | Qty | Standard | Description |
|---|---|---|---|
| HDMI 2.0 | 1 | HDMI 2.0<br><br>Backwards compatible with HDMI 1.4 and HDMI 1.3 | • SDR, HDR10 and HLG supported<br>• Up to 4K×2K@60Hz or 8K×1K@60Hz output resolution<br>• Max. width: 8192 pixels, max. height: 7680 pixels |
| 10G optical fiber port | 4 | 10G | • OPT 1 and OPT 2 copy the output on HDMI 2.0.<br>• OPT 3 copies the output on OPT 1.<br>• OPT 4 copies the output on OPT 2. |

### R_4×12G SDI+1×HDMI2.0 Process Card



| Connector | Qty | Standard | Description |
|---|---|---|---|
| HDMI 2.0 | 1 | HDMI 2.0<br><br>Backwards compatible with HDMI 1.4 and HDMI 1.3 | • SDR, HDR10 and HLG supported<br>• Up to 4K×2K@60Hz or 8K×1K@60Hz output resolution<br>• Max. width: 8192 pixels, max. height: 7680 pixels |
| 12G-SDI | 4 | 12G-SDI<br><br>Backwards compatible with 6G-SDI, 3G-SDI, HD-SDI and SD-SDI | • Up to 4K×2K@60Hz output resolution on each connector<br>• For 3G-SDI, HD-SDI or SD-SDI outputs, SDI mosaic output is supported. |

### R_Control Card



| | |
|---|---|
| ETHERNET | Gigabit Ethernet port<br><br>Connect to the control PC. |

| USB | 2x USB 2.0 (Type-A)<br>• Insert a USB drive to update the device.<br>• Insert a USB drive to import the BKG or LOGO files. |
|---|---|
| CONTROL UI | A reserved connector |
| GENLOCK | Connect to a synchronization signal.<br>Supports bi-level and tri-level.<br>• IN: Accept the sync signal.<br>• LOOP: Loop the sync signal. |

**Note:**

The R_1xHDMI2.0+4xfiber output card and 4x12G SDI+1xHDMI2.0 process card output the same content.

# Applications

# Dimensions
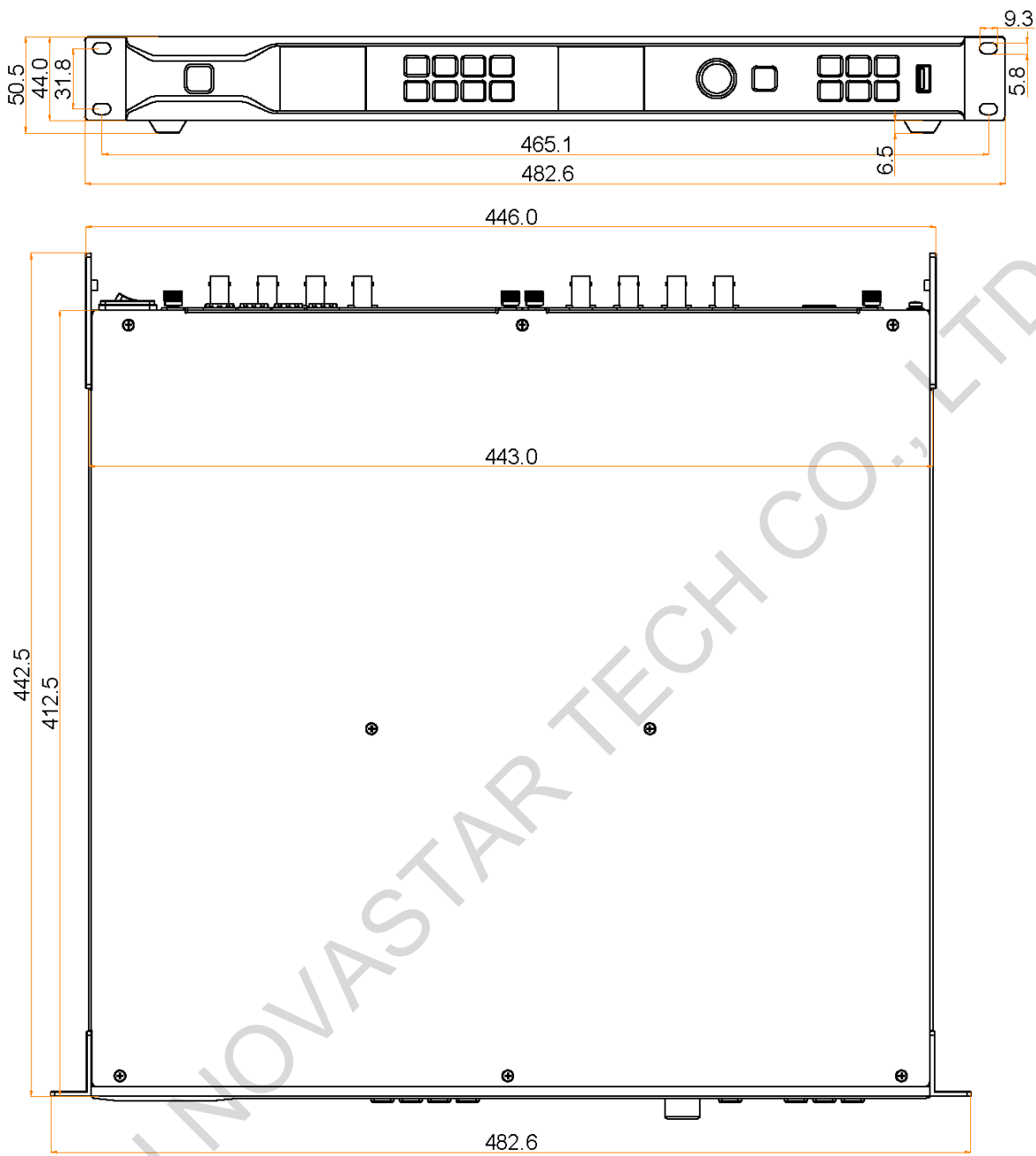


Tolerance: ±0.3      Unit: mm

# Specifications

| Overall Specifications | | |
|---|---|---|
| Operating Environment | Temperature | 0°C to 45°C |
| | Humidity | 10% to 85%, non-condensing |
| Storage Environment | Temperature | –20°C to +60°C |
| | Humidity | 10% to 90%, non-condensing |

| Electrical Parameters | Power supply | 100–240V~, 3A, 50/60Hz |
|---|---|---|
| | Max. power consumption | 120 W |
| Physical Specifications | Dimensions | 482.6 mm × 442.5 mm × 50.5 mm |
| | Net weight | 7.5 kg |
| | Gross weight | 12.1 kg |
| Packing Information | Carrying case | 582 mm × 185 mm × 555 mm |
| | Packing box | 612 mm × 225 mm × 595 mm |
| | Accessory box | 2x HDMI cables<br>1x Mini DP to DP cable<br>1x DP cable<br>1x Ethernet cable<br>1x Power cord (EU)<br>1x Power cord (UK)<br>1x Power cord (US)<br>1x Power cord (CN)<br>1x Cable clip<br>1x Cable tie<br>1x Quick Start Guide<br>1x Safety Manual<br>1x Customer Letter<br>1x Certificate of Approval |
| Certifications | | CE, FCC, IC, RoHS |
| Noise Level (typical at 25°C/77°F) | | 50 dB (A) |

# Input and Output Features

| Connector | Bit Depth | | Max. Input and Output Resolutions |
|---|---|---|---|
| • HDMI 2.0<br>• DP 1.2 | 8-bit | RGB 4:4:4 | 4096×2160@60Hz<br>8192×1080@60Hz |
| | | YCbCr 4:4:4 | |
| | | YCbCr 4:2:2 | |
| | | YCbCr 4:2:0 | Not supported |
| | 10-bit | RGB 4:4:4 | 2560×1600@60Hz |
| | | YCbCr 4:4:4 | |
| | | YCbCr 4:2:2 | 3840×2160@60Hz |
| | | YCbCr 4:2:0 | Not supported |

| Connector | Bit Depth | | Max. Input and Output Resolutions |
|---|---|---|---|
| | 12-bit | RGB 4:4:4 | 2560×1600@60Hz |
| | | YCbCr 4:4:4 | |
| | | YCbCr 4:2:2 | 3840×2160@60Hz |
| | | YCbCr 4:2:0 | Not supported |
| 12G-SDI | • Supports ST-2082-1 (12G), ST-2081-1 (6G), ST-424 (3G), ST-292 (HD) and SMPTE 259 SD.<br>• Up to 4096×2160@60Hz inputs and outputs<br>• The input resolution and bit depth settings are not supported. | | |

# Input and Output Resolutions

| Resolution and Frame Rate | | Input Connector | | Output Connector | |
|---|---|---|---|---|---|
| Standard Resolution | Standard Frame Rate (Hz) | HDMI 2.0 | DP 1.2 | HDMI 2.0/OPT | 12G-SDI |
| 720×480i | 59.94 | × | × | × | √ |
| 720×576i | 50 | × | × | × | √ |
| 1024×768 | 48/50/59.94/60/75/85 | √ | √ | √ | × |
| 1280×720 | 23.98/24/25/29.97/30/50/59.94/60 | √ | √ | √ | √ |
| 1280×720 | 48 | √ | √ | √ | × |
| 1280×1024 | 48/50/59.94/60/75/85 | √ | √ | √ | × |
| 1440×900 | 60/75/85 | √ | √ | √ | × |
| 1600×1200 | 48/50/59.94/60 | √ | √ | √ | × |
| 1680×1050 | 60 | √ | √ | √ | × |
| 1920×1080 | 23.98/24/25/29.97/30/50/59.94/60 | √ | √ | √ | √ |
| 1920×1080 | 48 | √ | √ | √ | × |
| 1920×1080i | 50/59.94/60 | × | × | × | √ |
| 1920×1200 | 50/59.94/60 | √ | √ | √ | × |
| 2048×1080 | 48 | √ | √ | √ | × |
| 2048×1080 | 23.98/24/25/29.97/30/50/59.94/60 | √ | √ | √ | √ |
| 2048×1152 | 30/60 | √ | √ | √ | × |
| 2560×1080 | 50/59.94/60 | √ | √ | √ | × |
| 2560×1600 | 50/59.94/60/120 | √ | √ | √ | × |
| 3840×1080 | 30/50/59.94/60/120 | √ | √ | √ | × |

| Resolution and Frame Rate | | Input Connector | | Output Connector | |
|---|---|---|---|---|---|
| **Standard Resolution** | **Standard Frame Rate (Hz)** | **HDMI 2.0** | **DP 1.2** | **HDMI 2.0/OPT** | **12G-SDI** |
| 3840×2160 | 23.98/24/25/29.97/30/60 | √ | √ | √ | × |
| 3840×2160 | 50/59.94 | × | × | × | √ |
| 4096×2160 | 23.98/24/25/29.97/50/59.94 | × | × | × | √ |
| 4096×2160 | 30/60 | × | × | √ | √ |
| 7680×1080 | 30/60 | × | × | √ | × |
| 8192×1080 | 30/60 | × | × | √ | × |

- √: The connector supports this resolution and frame rate.
- ×: The connector does not support this resolution and frame rate.
- The SDI connectors do not support input resolution settings.

# 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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