WARNING
To prevent damage which may result in fire or electric shock hazard, do not expose this appliance to rain or moisture.

1. Be sure to use only the standard adapter that is specified in the specification sheet. Using any other adapter could cause fire, electrical shock, or damage to the product.
2. Incorrectly connecting the power supply or replacing battery may cause explosion, cause excessive heat or fire
3. Securely plug the power cord into the power receptacle. Insecure connection may cause fire.
4. Do not place conductive objects (e.g. screw drivers, coins, metal items, etc.) or containers filled with water on top of the camera. Doing so may cause personal injury due to fire, electric shock, or falling objects.
5. Do not install the unit in humid, dusty, or sooty locations. Doing so may cause fire or electric shock.

6. If any unusual smells or smoke come from the unit, stop using the product. Immediately disconnect the power source and contact the service center. Continued use in such a condition may cause fire or electric shock.

7. If this product fails to operate normally, contact the nearest service center. Never disassemble or modify this product in any way.

8. When cleaning, do not spray water directly onto parts of the product. Doing so may cause fire or electric shock.

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**PRECAUTION**

Please read this Operation Guide before installing and using the camera & retain this copy for your reference.

1. Always follow the instructions in the operations guide when applying power. Fire and equipment damage can occur if power is applied incorrectly. For the correct power supply, refer to the specifications page.

2. Do not use camera if fumes, smoke or a strange odor is emitted from the camera, or if it seems not functional correctly. Disconnect the power source immediately and consult with your supplier.

3. Do not use the camera in extreme environments where high temperatures or high humidity exists. Use the camera under conditions where temperatures are between 32°F ~ 104°F, and humidity is below 90%.

4. If installed close to a TV, radio transmitter, magnet, electric motor transformer or audio speakers the magnetic field generated may interfere with or distort the image.

5. Try to avoid fluorescent light reflections, unstable light conditions, direct pointing toward the sun. Use caution when operating the camera in the vicinity of spotlights or other bright lights and light reflecting objects.

6. To prevent damage, do not drop the camera or subject it to strong shock or vibration.
- **4K UHD 1/2.5 Progressive Scan CMOS sensor** captures sharp and vivid UHD video even under low light conditions.
- **Advanced digital imaging processor** provides vivid and detailed images by utilizing Dynamic Range, Auto White Balance, and Noise Reduction.
- **Superb motion-compensated temporal noise reduction filter** for motion video without blurring.
- **OSD control breakout cable** with power input and RS-485 for remote communication.
- **Flawlessly relays multi-channel embedded audio via SDI output.**
- **Interchangeable lens design** compatible with CS and C mount lenses.
- **Perfectly suited for broadcast, pro audio/video, and security.**
- **Conforming with SMPTE 292M, 424M, and 2081-10.**
- **Versatile, compact, and rugged design.**

**OSD MENU**

1. **Move the Cursor Up/Down to Choose Menu**  
   To move from item to item in the menu, move the joystick to the Up/Down.

2. **Change the Value**  
   To change the value of the selected item, move the joystick to the Left/Right.

3. **Shift to the Sub Menu of the Chosen Menu**  
   To go into sub menu, press SEL key. The menu items with > always have its sub menu.
**EXPOSURE**

### AUTO

Auto mode will adjust the exposure level automatically. Detailed fine tuning options are available under this menu.

- **AGC MAX**: OFF, LOW, MIDDLE, HIGH, DMIN, DMID, DMAX
  - “AGC MAX” sets the maximum gain value to control the video noise caused by Auto Gain Control.
- **SENS UP**: OFF, x2 ~ x10
  - “SENS UP” mode controls the digital slow shutter to allow extra light into the camera and adjust the picture quality.
- **AE BRIGHT**: 0~20
  - Auto Exposure brightness level can be adjusted.

### SHUT FIX

SHUT FIX mode provides more detailed shutter speed option. All other controls are tuned for the selected shutter speed.

- **SHUTTER**: AUTO, 1/30 ~ 1/10,000 (Shutter speed can be set)
- **AGC MAX**: OFF, LOW, MIDDLE, HIGH, DMIN, DMID, DMAX
  - “AGC MAX” sets the maximum gain value to control the video noise caused by Auto Gain Control.
- **SENS UP**: 0~20
  - “SENS UP” mode controls the digital slow shutter to allow extra light into the camera and adjust the picture quality.
- **AE BRIGHT**: 0~10
  - Auto Exposure brightness level can be adjusted.
AGC FIX

AGC FIX mode provides more detailed gain option.
All other controls are tuned for the selected gain value.

- **AGC**: AUTO, 0dB ~ 27dB, d2X ~ d9X
  Gain level can be set.
- **AGC MAX**: OFF, LOW, MIDDLE, HIGH, DMIN, DMID, DMAX
  “AGC MAX” sets the maximum gain value to control the video noise caused by Auto Gain Control.
- **AE BRIGHT**: 0~10
  Auto Exposure brightness level can be adjusted.
- **IRIS SPEED**: 0 ~ 5
  Electronic Iris speed can be controlled. (DC Iris lens only)
- **LENS MODE**: INDOOR, OUTDOOR, MANUAL
  Lens setting will be optimized for the selected environment. (DC Iris lens only)
- **FLK CONTROL**: AUTO, ON, OFF
  “FLK CONTROL” mode provides a proper image sensor frequency to match the power frequency in order to minimize video flicker.
ATW
Auto trace white mode will adjust white balance within 1,900˚K ~ 11,000˚K temperature.
- SPEED : 0 ~ 7
  White balance adjust speed can be adjusted.
- OFFSET-B : 0 ~ 100
  “OFFSET-B” adjusts Blue gain within the range of 0 to 100.
- OFFSET-R : 0 ~ 100
  “OFFSET-R” adjusts Red gain within the range of 0 to 100.

ONE PUSH
One push mode is used if AWB or ATW cannot produce the proper white balance.
Place a white paper in front of the camera when using the one push mode to self-adopt.
- PUSH
  Press Select button to enable “ONE PUSH” white balance adjustment. Place a white paper in front of the camera when using the “ONE PUSH” mode to self-adopt.

* Camera provides a wide range of white balance options.
  Check your color temperature before adjusting this mode.
WHITE BALANCE

*MODE          INDOOR
PUSH
BLUE
RED
SPEED
OFFSET-B  52
OFFSET-R  54
RETURN

*MODE          MANUAL
PUSH
BLUE  50
RED  50
SPEED
OFFSET-B
OFFSET-R
RETURN

INDOOR
“INDOOR” mode will adjust white balance to indoor lighting conditions.

OUTDOOR
“OUTDOOR” mode will adjust white balance to outdoor lighting conditions.

MANUAL
“MANUAL” mode will adjust white balance manually.

- BLUE - 0 ~ 100
  Select blue gain within the range of 0 to 100.
- RED - 0 ~ 100
  Select Red gain within the range of 0 to 100.
**DAY & NIGHT**

Adjust color or B&W setting from this menu.

- **MODE**: DAY(COLOR), NIGHT(B&W)
  
  Set camera to either color mode or B&W mode.

- **NIGHT COLOR**: ON, OFF
  
  When “NIGHT COLOR” is turned ON, camera stays on color mode even “NIGHT(B&W)” is selected from the MODE.

- **COLOR BURST**: ON, OFF
  
  Color burst signal ON or OFF can be set for CVBS signal. (Not applicable)

**NOISE REDUCTION**

Camera noise level can be adjusted from this menu.

- **DNR MODE**: OFF, 2D, 3D, 2D+3D
  
  Digital noise reduction can be applied from this menu.

- **DNR LEVEL**: AUTO, LOW, MIDDLE, HIGH
  
  Noise reduction level can be adjusted from this menu.

- **DNR APERTURE**: 0 ~ 4
  
  Motion artifacts tightness can be adjusted.

  0 = Most ghost artifact 4 = Least ghost artifact
Privacy zone can be setup from this menu.

**MODE** : ON, OFF
Enable “PRIVACY ZONE” ON or OFF.

**TYPE** : SQUARE, POLYGON
Select privacy zone shape.

**MASK NO** : MASK1 ~ MASK8
Select privacy zone mask number.

**DISPLAY** : ON, OFF
Turn ON or OFF the selected privacy mask zone.

**COLOR** : WHITE, GREEN, BLUE, RED, CYAN, MAGENTA, YELLOW, GRAY-1 ~ 6, MOSAIC, BLACK. (Select privacy zone mask color)

**POLY SELECT** : L- TOP, L- BOTTOM, R- TOP, R-BOTTOM
Change the shape of the polygon by selecting the corner of the polygon.

**POSITION-X & POSITION-Y**
Change the size of the selected corner from “POLY SELECT” menu.

**SIZE-X & SIZE-Y**
Change the size of the privacy square.

**DEFAULT**
Set privacy zone to default value.

### PRIVACY MASK

<table>
<thead>
<tr>
<th><em>MODE</em></th>
<th>ON</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TYPE</strong></td>
<td>SQUARE</td>
</tr>
<tr>
<td><strong>MASK NO</strong></td>
<td>MASK 1</td>
</tr>
<tr>
<td><strong>DISPLAY</strong></td>
<td>ON</td>
</tr>
<tr>
<td><strong>COLOR</strong></td>
<td>BLACK</td>
</tr>
<tr>
<td><strong>POLY PIXEL</strong></td>
<td></td>
</tr>
<tr>
<td><strong>POSITION-X</strong></td>
<td>2</td>
</tr>
<tr>
<td><strong>POSITION-Y</strong></td>
<td>5</td>
</tr>
<tr>
<td><strong>SIZE-X</strong></td>
<td>20</td>
</tr>
<tr>
<td><strong>SIZE-Y</strong></td>
<td>11</td>
</tr>
<tr>
<td><strong>DEFAULT</strong></td>
<td></td>
</tr>
<tr>
<td><strong>RETURN</strong></td>
<td></td>
</tr>
</tbody>
</table>
Camera image control can be adjusted from EFFECT menu.

LENS SHADING : ON, OFF

Optical vignetting issue can be corrected from this menu.
GAMMA CORRECT : ON, OFF (1.0)

Gamma level can be adjusted.

- CONTRAST : 0 ~ 20 (Contrast level can be adjusted)
- BRIGHTNESS : 0 ~ 20 (Brightness level can be adjusted)
- SATURATION : 0 ~ 20 (Saturation level can be adjusted)
- HUE : 0 ~ 20 (Hue level can be adjusted)
- EDGE ENHANCE : 0 ~ 20 (Image sharpness level can be adjusted)
- AUTO SATURATE : OFF, LOW, MIDDLE, HIGH
  - Decrease saturation automatically when noisy scene is detected.
- AUTO EDGE : ON, OFF
  - Decrease edge enhancement (sharpness) automatically when noisy scene is detected.
- DEFAULT : See Effects menu to default value.
Camera special functions can be adjusted from SPECIAL menu.
D ZOOM : ON, OFF (Digital Zoom and PIP function can be enabled from this menu)

- **ZOOM CONTROL : RATIO, POSITION, RETURN**
  Adjust the digital zoom ratio and position.
  Use LEFT / RIGHT button to adjust the ratio, then press select.
  USE LEFT / RIGHT/ UP / DOWN button to adjust the image position, then press select.
  Press select to exit.

- **PIP : ON, OFF** (Turn ON or OFF the PIP window)
- **PIP SIZE : 1/16, 1/25** (Change the size of PIP window)
- **PIP POSITION : POSITION, RETURN** (Adjust the PIP window location)
  USE LEFT / RIGHT/ UP / DOWN button to adjust the image position, then press select.
  Press select to exit.
- **DEFAULT : Set privacy zone to default value.**
DEFOG SETUP

*STRENGTH  4  
THRESHOLD
AUTO LEVEL
RETURN

DEFOG : ON, OFF, AUTO
“DEFOG” menu improves foggy image.

- STRENGTH : 0 ~ 16
  Change defog strength.

- THRESHOLD : 0 ~ 3
  Threshold value sets minimum sensitivity value for automatic defog control.
  Higher value makes defog-on control reluctant.

- AUTO LEVEL : LOW, MID, HIGH
  Auto level value sets maximum strength value for automatic defog control.
  Higher value makes defog effect to be stronger.

BACKLIGHT - BLC

*BLC  ON
SIZE/POSITION
DISPLAY  ON
DEFAULT
RETURN

DIS : Digital image stabilization can be turned ON or OFF.
BACK-LIGHT : OFF, BLC, HLM - Camera back-light compensation can be adjusted.

BLC : OFF, ON - BLC enables back light compensation.

- SIZE/POSITION : SIZE, POSITION, RETURN
  Adjust BLC area window size.

- DISPLAY : OFF, ON
  BLC area display can be turned ON or OFF

- DEFAULT : Set BLC menu to default value.
HLM : OFF, ON
HLM can be adjusted.

- AREA DISPLAY : ON, OFF
  HLM AREA DISPLAY can be turned ON or OFF.
- SIZE/POSITION : SIZE, POSITION, RETURN
  Adjust BLC area window size.
- LEVEL : 0 ~ 20
  Amount of masking area can be adjusted.
- BLACK MASK : OFF, ON
  Masking area highlight can be turned ON or OFF.
- DEFAULT : Set HLM menu to default value.

BINNING : OFF, ON
Binning can be turned ON or OFF.
DEFECT PIXEL : OFF, ON (FIXED), STATIC
Defective Pixel Correction feature can be operated. It is turned ON by default and will run both dynamic and static DPC function.
DISPLAY FUNCTION : OFF, ON

Adjust image display features from this menu.

- **FREEZE** : OFF, ON
  Image freeze can be turned ON or OFF.
- **MIRROR** : OFF, MIRROR, V-FLIP, BOTH(H/V)
  Image mirror or flip can be operated.
- **IMAGE EFFECT** : OFF, NEGATIVE, GREY MODE, REDDISH-1 ~ 4, BLUISH-1 ~ 4, GREENISH-1 ~ 4.
  Rotation : OFF, ROT_L 1:1
  Several color effects can be applied.
- **ROTATION** : OFF, ROT_L FULL, ROT_L 1:1, ROT_R Full, ROT_R 1:1
  Image can be rotated either left or right side.
- **PICTURE STYLE** : OFF, STANDARD, VIVID, CLEAR, VIVID CLEAR, NEUTRAL
  Different types of picture style can be applied.

FLICKER DETECT : OFF, ON

“FLICKER DETECT” mode provides a proper image sensor frequency to match the power frequency in order to minimize video flicker.
Camera setup can be adjusted from this menu.

**CAM TITLE**: OFF, ON
Camera title can be turned ON or OFF.

**RS-485**:
VISCA communication control can be adjusted.

- **CAM ID**: 0 ~ 7
  Camera ID can be set.
- **ID DISPLAY**: OFF, ON
  Camera ID can be setup.
- **BAUDRATE**: 2400, 4800, 9600, 19200, 38400
  Camera baudrate can be set.

**SYSTEM INFO**: ON, OFF, AUTO
Camera information can be found under this menu.

**OUTPUT FORMAT**: ON, OFF, AUTO
Camera resolution and frame rate can be set

**MENU COLOR**
OSD menu color can be adjusted.

Supported formats are:
- 4K2160P - 30 / 29.97
- 1080P - 60 / 59.94
- 1080I - 60 / 59.94 / 50
- 720P - 60 / 59.94 / 50

**AUDIO**
Audio input [MIC or LINE] can be selected, and level can be adjusted under this menu.
<table>
<thead>
<tr>
<th>VIDEO</th>
<th>LENS</th>
<th>AUDIO INPUT</th>
<th>STANDARD</th>
<th>PHYSICAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Image Sensor</td>
<td>Lens</td>
<td>Input</td>
<td>SMPTE</td>
<td>Camera Control</td>
</tr>
<tr>
<td>1/1.7” Progressive CMOS</td>
<td>C/CS Mount</td>
<td>3.5mm TRS Stereo</td>
<td>SMPTE 292M, SMPTE 424M</td>
<td>RS-485 VISCA, OSD Button</td>
</tr>
<tr>
<td>Sensor Size</td>
<td></td>
<td>Mic-in &amp; Line in over I/O Cable</td>
<td></td>
<td>Operation Temp</td>
</tr>
<tr>
<td>Diagonal 9.93mm(17:9)</td>
<td></td>
<td>16/24/32 Bits</td>
<td>15° F - 120° F</td>
<td>51mm x 51mm x 102mm</td>
</tr>
<tr>
<td>Effective Pixels</td>
<td>Resolution Rate</td>
<td></td>
<td>2.01” x 2.01” x 4.01”</td>
<td>Weight</td>
</tr>
<tr>
<td>Horizontal: 4096, Vertical: 2160</td>
<td>4K (4096 X 2160)</td>
<td></td>
<td></td>
<td>384g / 0.84lbs</td>
</tr>
<tr>
<td>Pixel Size</td>
<td>3840p 60/59.94/50/30/29.97/25/24</td>
<td></td>
<td></td>
<td>Power</td>
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<tr>
<td>1.85 µm x 1.85 µm</td>
<td>1080p 60/59.94/50/30/29.97/25p/24p</td>
<td></td>
<td></td>
<td>12VDC (+9 - +15VDC)</td>
</tr>
<tr>
<td>Resolution</td>
<td>1080i 60/59.94/50i</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>4096 x 2160, 3840 x 2160,</td>
<td>720 60/59.94/50p</td>
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<tr>
<td>1920 x 1080, 1280 x 720</td>
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<tr>
<td>Resolution Rate</td>
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<td>SMPTE</td>
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<tr>
<td>4K (4096 X 2160)</td>
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<tr>
<td>3840p 60/59.94/50/30/29.97/25p/24p</td>
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<td>SMPTE</td>
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<tr>
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<tr>
<td>720 60/59.94/50p</td>
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<td>SMPTE</td>
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<tr>
<td>Output</td>
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<tr>
<td>HDMI 2.0</td>
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<tr>
<td>Color Space</td>
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<td>SMPTE</td>
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<tr>
<td>4:2:2 (YCbCr) 10bit</td>
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</tr>
</tbody>
</table>

*Specification are subject to change without notice.*
Disposal of Old Appliances

1. When this crossed-out wheel bin symbol is attached to a product it means the product is covered by the European Directive 2002/96/EC.
2. All electrical and electronic products should be disposed of separately from the municipal waste stream in accordance to laws designated by the government or the local authorities.
3. The correct disposal of your old appliance will help prevent potential negative consequences for the environment and human health.
4. For more detailed information about disposal of your old appliance, please contact your city office, waste disposal service or the shop where you purchased the product.

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.