CV420-18X

4K60/UHD6 18x Zoom Camera

User Manual

Table of Contents

1. General Information

Thank you for your purchase of a Marshall Miniature or Compact Camera.

The Marshall Camera team recommends thoroughly reading this guide for a deep understanding of on-screen-display (OSD) menus, breakout cable operation, settings adjustment explanation, troubleshooting, and other critical information.

Please carefully remove all contents of box, which should include the following components:

CV420-18X includes:

• Camera Breakout Cable (Power/RS485/Audio)

• IR Remote Controller

• 12V Power Supply

The CV420-18X Camera utilizes a built-in 18x optical zoom lens.

Each camera comes set to default at 1920x1080p @ 30fps out of the box; which can be changed in the OSD Menu to a variety of resolutions and framerates.
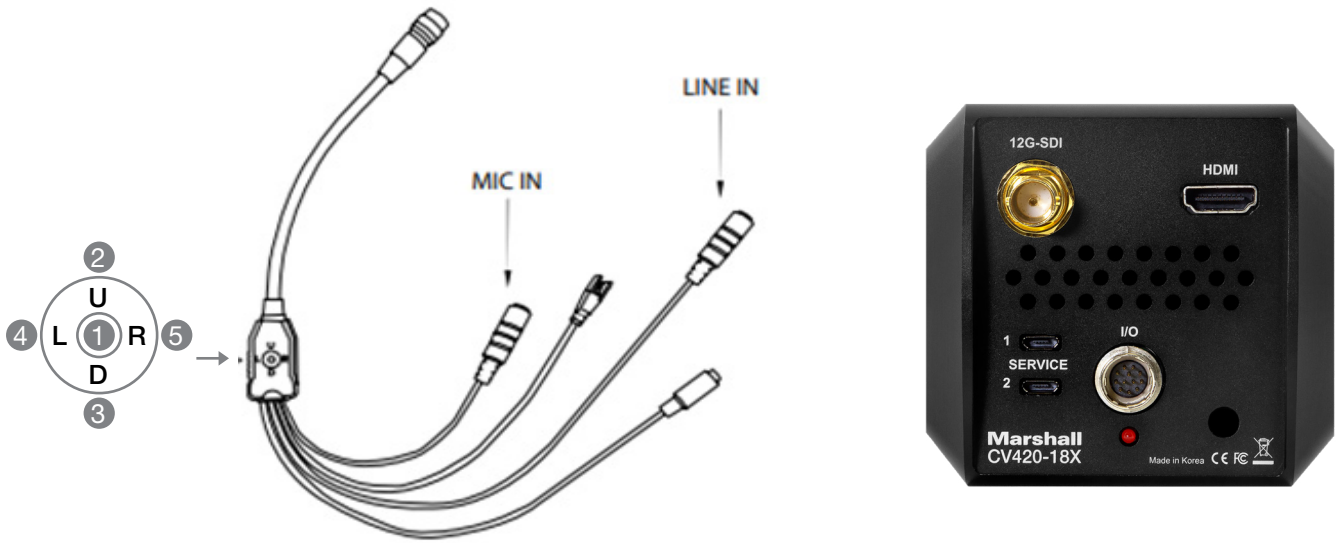
> To RESET Camera to default settings
> (1920x1080p30fps) power-cycle the camera
> then use the following combo on OSD Joystick:
> UP, DOWN, UP, DOWN, then push and HOLD
> joystick in for 5 seconds then release.

2. Menu Structure

Setup	Sub Menu	Sub Menu
WB CONTROL	AWB	
	ATW	
	ONE PUSH	
	INDOOR	
	OUTDOOR	
	MANUAL	BLUE
		RED
AE CONTROL	AUTO	AGC MAX
		SENS UP
		AE BRIGHT
		FLICKERLESS
	SHUT PRI	SHUTTER
		AGC MAX
		SENS UP
		AE BRIGHT
	IRIS PRI	IRIS
		AGC MAX
		SENS UP
		AE BRIGHT
		FLICKERLESS
	AGC PRI	AGC
		SENS UP
		AE BRIGHT
		FLICKERLESS
	MANUAL	SHUTTER
		IRIS
		AGC
		SENS UP
	BRIGHT	BRIGHT LEVEL
FOCUS CONTROL	FOCUS MODE	
	AF MODE	
	DZOOM	
	ZOOM SPEED	
	NEAR LIMIT	
	AF INTERVAL	
	AF AREA / SIZE	
DAY / NIGHT	DAY	
	NIGHT	NIGHT COLOR
	AUTO	

Setup	Sub Menu	Sub Menu
AUDIO	MIC/LINE	AUDIO LEVEL
		MIC ATTENUCATOR
		SAMPLE BITS
IMAGE CONTROL	CONTRAST	
	BRIGHTNESS	
	SATURATION	
	HUE	
	EDGE ENHANCE	
	AUTO SATURATE	
	IMAGE EFFECT	
	IMAGE MIRROR	
	IMAGE FLIP	
	BLACK WHITE LV	BLACK LEVEL
		WHITE LEVEL
	GAMMA CORRECT	
	DNR	DNR MODE
		DNR LEVEL
SPECIAL	ZOOM MAG	
	BINNING	
	DEFECT PIXEL	
	FREEZE	
	HDR	
SETUP	CAM TITLE	
	COMMUNICATION	CAM ID
		ID DISPLAY
		BAUD RATE
	MODEL	
	S/W VER	
	OUTPUT FORMAT	
RESET	USER/FACTORY	
EXIT		

3. OSD Joystick and Button _____

I/O Cable (included in box)

1. SET   Used to access the menu and confrim selection.
2. UP   Used to move the cursor up.
3. DOWN   Used to move the cursor down.
4. LEFT   Used to move the cursor left and change the value
5. RIGHT   Used to move the cursor to the right and change the value.

*Press SET button to access the **Main Menu***

MENU

WB CONTROL	>
AE CONTROL	>
FOCUS CONTROL	>
DAY/NIGHT	>
AUDIO	>
IMAGE CONTROL	>
SPECIAL	>
SETUP	>
RESET	>
EXIT	

Use the UP & DOWN buttons to select the desired item.

Use the LEFT & RIGHT buttons to change the sub-item.

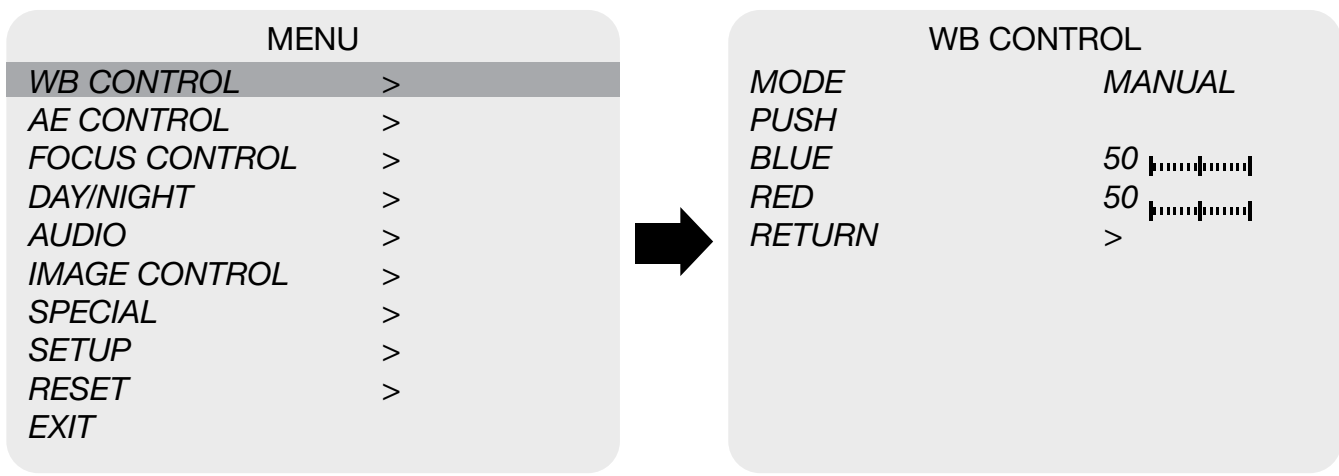*> Icon indicates "Press OSD button" or "Enter Sub Menu"*

4. WB CONTROL _____

Select WB CONTROL using the UP or DOWN button. You can change between AWB, ATW, PUSH, and MANUAL using the LEFT or RIGHT buttons.

- **AWB:** Continuously adjusts camera color balance in accordance with any change in color temperature changes within the range of 3,000°K to 8,000°K.
- **ATW:** Continuously adjusts camera color balance in accordance with any change in color temperature. Compensates for color temperature changes within the range of 1,900°K to 11,000°K.
- **ONE PUSH:** Color temperature will be manually adjusted by pushing the OSD button. Place the white paper in front of the camera when OSD button is pressed to obtain optimum result.
- **MANUAL:** Select this to fine-tune White Balance manually.

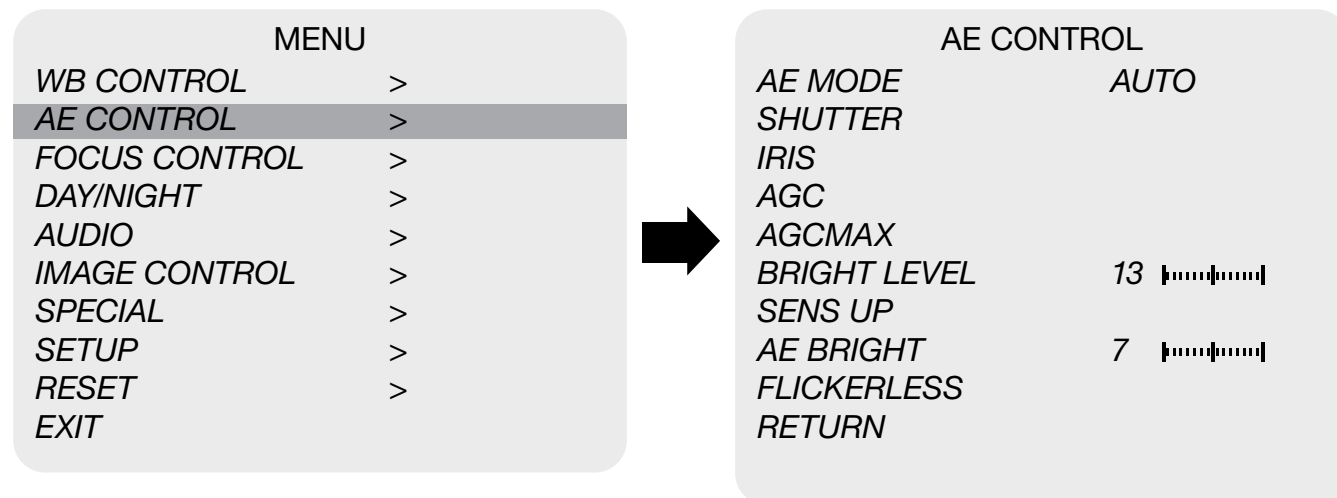 *You can adjust the blue and red tone level manually.*

  1. **BLUE:** Adjust the Blue tone of the image. (0~255)
  2. **RED:** Adjust the Red tone of the image. (0~255)

- **INDOOR:** Select this to adjust white balance to indoor lighting condition.
- **OUTDOOR:** Select this to adjust white balance to outdoor lighting condition.

MENU

WB CONTROL	>
AE CONTROL	>
FOCUS CONTROL	>
DAY/NIGHT	>
AUDIO	>
IMAGE CONTROL	>
SPECIAL	>
SETUP	>
RESET	>
EXIT	

WB CONTROL

MODE	*MANUAL*
PUSH	
BLUE	*50*
RED	*50*
RETURN	>

1. *Adjust White Balance first by using the ATW mode before switching to MANUAL mode.*
2. *White Balance may not work properly under the following conditions. In this case, select the ATW mode.*
- *When the ambient illumination of the subject is dim.*
- *If the camera is directed towards a fluorescent light or is installed in place where illumination changes dramatically, the White Balance operation may become unstable.*
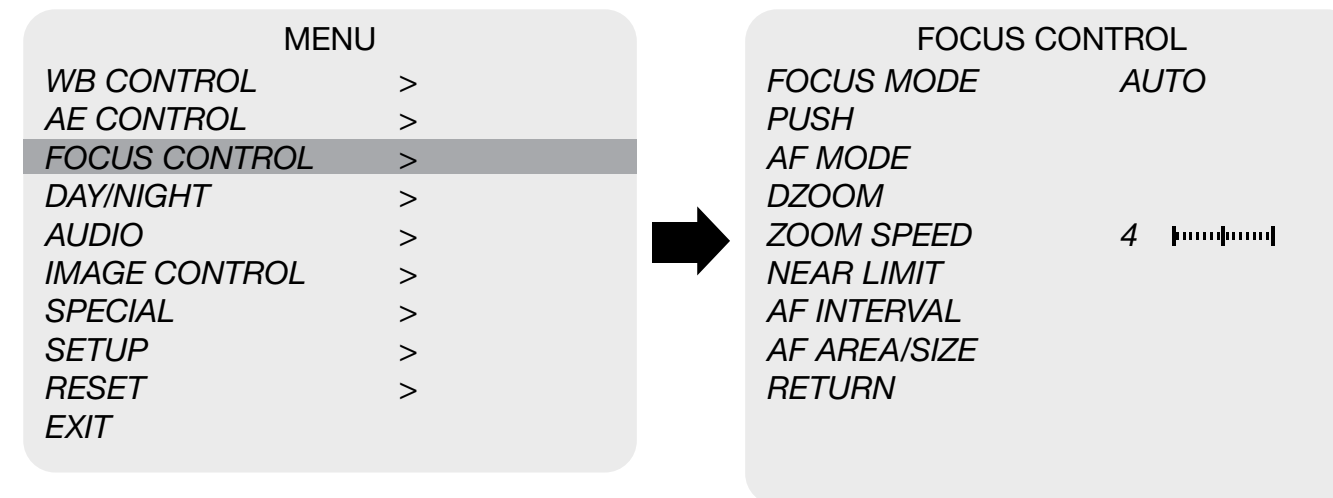
5. AE CONTROL _____

Select AE CONTROL using the UP or DOWN button. You can select one sub-mode using the UP or DOWN buttons.

```
              MENU
WB CONTROL          >
AE CONTROL          >
FOCUS CONTROL       >
DAY/NIGHT           >
AUDIO               >
IMAGE CONTROL       >
SPECIAL             >
SETUP               >
RESET               >
EXIT
```

```
            AE CONTROL
AE MODE              AUTO
SHUTTER
IRIS
AGC
AGCMAX
BRIGHT LEVEL        13  |⊶⊷⊶|
SENS UP
AE BRIGHT            7   |⊶⊷⊶|
FLICKERLESS
RETURN
```

- **AUTO:** Adjusts the exposure level automatically. Detailed fine tuning options are available under this menu.
- **SHUT PRI:** Provides more detailed shutter speed options. All other controls are tuned for the selected shutter speed.
- **IRIS PRI:** Provides more detailed iris control options. All other controls are tuned for the selected iris.
- **AGC PRI:** Provides more detailed gain option. All other controls are tuned for the selected gain.
- **BRIGHT:** Provides bright exposure level control.
- **MANUAL:** Adjusts the exposure level manually
  1. **SHUTTER:** Speed can be set at auto or manual. (NTSC: 1/60~1/10,000, PAL: 1/50~10,000)
  2. **IRIS:** Electronic Iris speed can be controlled. (F1.6~F16)
  3. **AGC:** Electronic gain level can be controlled. (0dB~27dB)
  4. **AGC MAX:** Used to set maximum gain value to control the video noise caused by Auto Gain Control. (0~15)
  5. **SENS UP:** Controls the digital slow shutter to allow extra light into the camera and adjust the picture quality. (off, x2~x15)
  6. **AE BRIGHT:** Select this to adjust auto exposure brightness levels. (0~24)
  7. **FLICKERLESS:** Provides a proper image sensor frequency to match the power frequency in order to minimize video flicker.
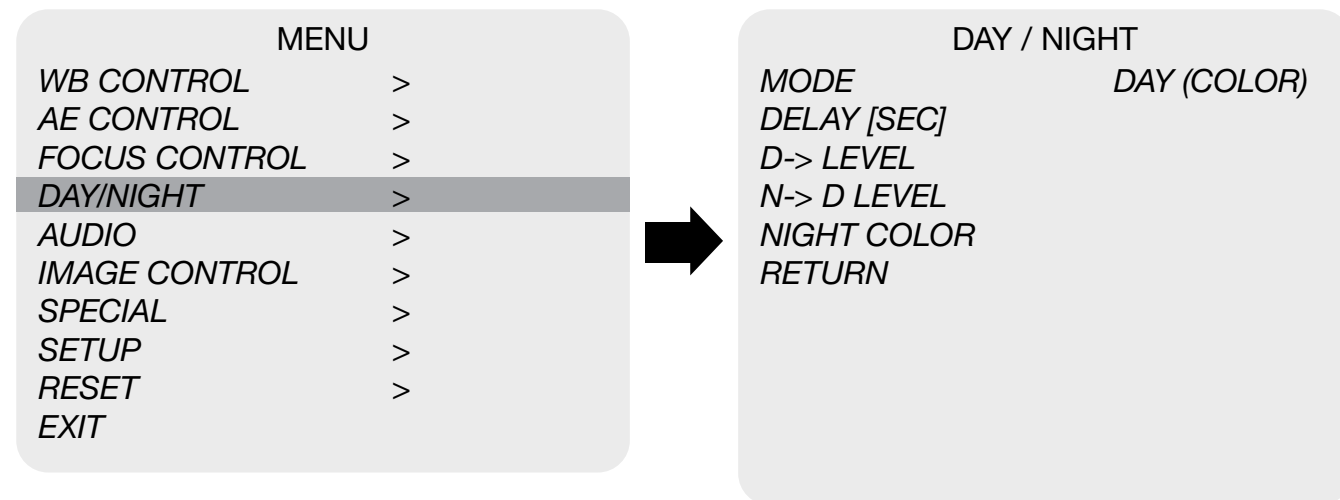
6. FOCUS CONTROL _____

Select FOCUS CONTROLl using the UP or DOWN button. You can change between AUTO and Manual focus modes.

```
              MENU
WB CONTROL          >
AE CONTROL          >
FOCUS CONTROL       >
DAY/NIGHT           >
AUDIO               >
IMAGE CONTROL       >
SPECIAL             >
SETUP               >
RESET               >
EXIT
```

```
           FOCUS CONTROL
FOCUS MODE          AUTO
PUSH
AF MODE
DZOOM
ZOOM SPEED          4  |⊶⊷⊶|
NEAR LIMIT
AF INTERVAL
AF AREA/SIZE
RETURN
```

- **FOCUS MODE:** Adjust camera focus automatically or manually. When MANUAL mode is selected, initial focus position can be automatically adjusted by choosing PUSH menu.
- **AF MODE:** Focusing type can be set under this menu.
  1. **NORMAL:** Normal AF operation.
  2. **INTERVAL:** AF movement is carried out at interval setup from AF INTERVAL menu.
  3. **ZOOM TRIG:** When zoom position is changed, AF will be activated within 5 seconds.
- **DZOOM:** Digital zoom can be enabled. (x1~x3)
- **ZOOM SPEED:** Optical zoom speed can be set. (0~7)
- **NEAR LIMIT:** Set the limit of the tele control. (50cm~30M)
- **AF INTERVAL:** AF Interval time can be set under this menu. Initial setting is 5 seconds and it can be adjusted in 1 second increment.
- **AF AREA/SIZE:** Focus area can be manually adjusted. Camera focus is set to the center of the screen by default.
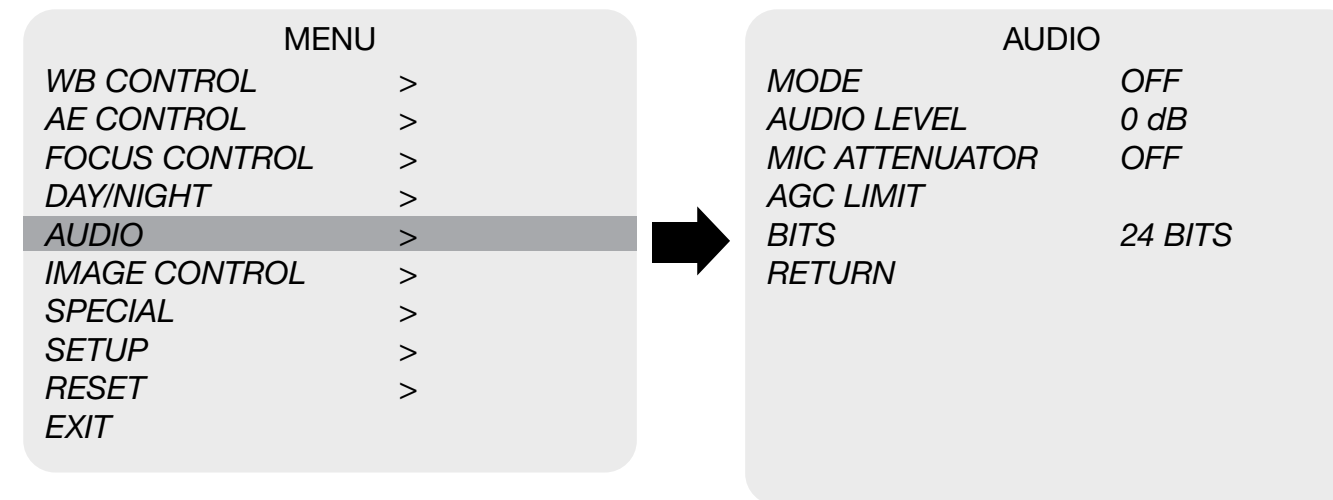
7. DAY / NIGHT

Select DAY / NIGHT using the UP or DOWN button. You can select one sub-mode from AUTO, COLOR, and NIGHT using the UP or DOWN buttons.

```
            MENU                         DAY / NIGHT
WB CONTROL        >           MODE              DAY (COLOR)
AE CONTROL        >           DELAY [SEC]
FOCUS CONTROL     >           D-> LEVEL
DAY/NIGHT         >     ➡     N-> D LEVEL
AUDIO             >           NIGHT COLOR
IMAGE CONTROL     >           RETURN
SPECIAL           >
SETUP             >
RESET             >
EXIT
```

- **MODE:** Set camera to either color mode or B&W mode. (Auto, Day, Night)
- **DAY:** When set to DAY mode, camera stays in color and IR cut filter is engaged.
- **NIGHT:** When set to NIGHT mode, camera stays in B&W and IR cut filter is removed.
  - **NIGHT COLOR:** When on, camera stays on color mode. Night (B&W) can be selected from this mode. (On, Off)
- **AUTO:** When set to AUTO mode, camera changes DAY and NIGHT mode automatically.
  1. **DELAY [SEC]:** Delay time between mode change can be adjusted.
  2. **D-> N LEVEL:** Adjust the level to switch from Day mode to Night mode.
  3. **N-> D LEVEL:** Adjust the level to switch from Night mode to Day mode.

8. AUDIO

Select AUDIO using the UP or DOWN button and enter ON using SEL button. You can select one sub-mode using the UP or DOWN buttons.

```
            MENU                          AUDIO
WB CONTROL        >           MODE              OFF
AE CONTROL        >           AUDIO LEVEL       0 dB
FOCUS CONTROL     >           MIC ATTENUATOR    OFF
DAY/NIGHT         >           AGC LIMIT
AUDIO             >     ➡     BITS              24 BITS
IMAGE CONTROL     >           RETURN
SPECIAL           >
SETUP             >
RESET             >
EXIT
```
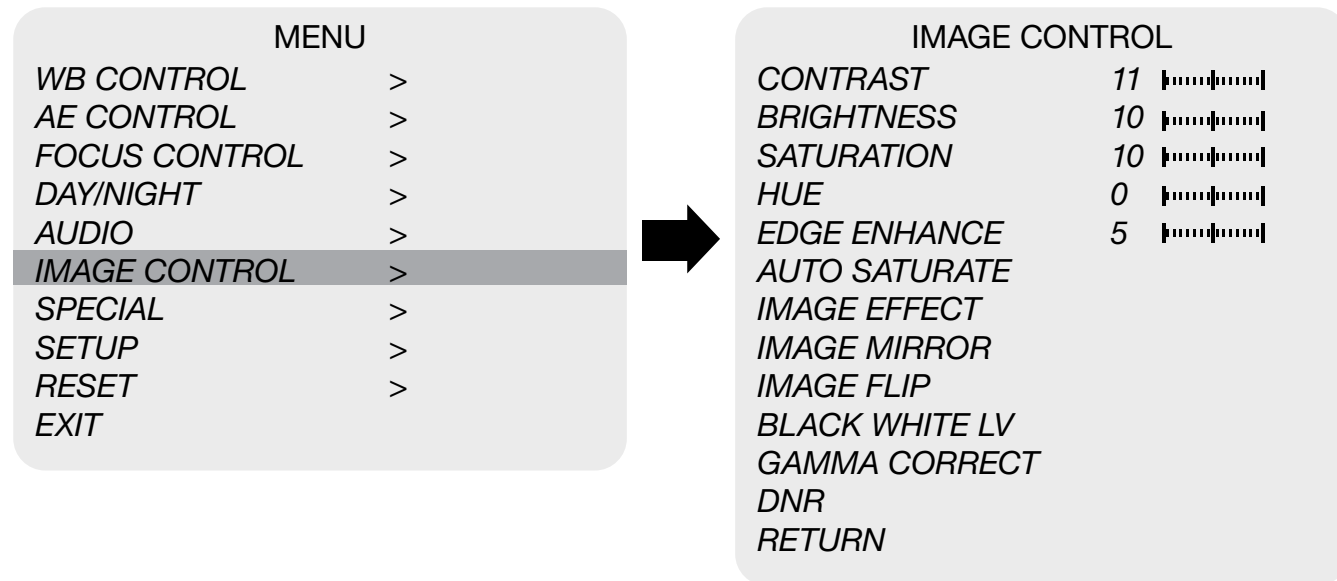
- **MIC / LINE:** Select MIC or LINE for the audio input source.
- **AUDIO LEVEL:** Select this to adjust audio levels manually.
- **MIC ATTENUATOR:** Audio attenuation can be controlled from this menu to minimize the audio noise level
- **AGC LIMIT:** Audio gain limit can be controlled while MIC ATTENUATOR is in used.
  1. **SAMPLE BITS:** Select the bit depth of audio

9. IMAGE CONTROL

Select IMAGE CONTROL using the UP or DOWN button.
You can select CONTRAST, HUE, and image related menu using the UP or DOWN buttons.

```
             MENU
WB CONTROL        >
AE CONTROL        >
FOCUS CONTROL     >
DAY/NIGHT         >
AUDIO             >
IMAGE CONTROL     >
SPECIAL           >
SETUP             >
RESET             >
EXIT
```

```
        IMAGE CONTROL
CONTRAST         11 |‑‑‑‑‑‑|
BRIGHTNESS       10 |‑‑‑‑‑‑|
SATURATION       10 |‑‑‑‑‑‑|
HUE              0  |‑‑‑‑‑‑|
EDGE ENHANCE     5  |‑‑‑‑‑‑|
AUTO SATURATE
IMAGE EFFECT
IMAGE MIRROR
IMAGE FLIP
BLACK WHITE LV
GAMMA CORRECT
DNR
RETURN
```
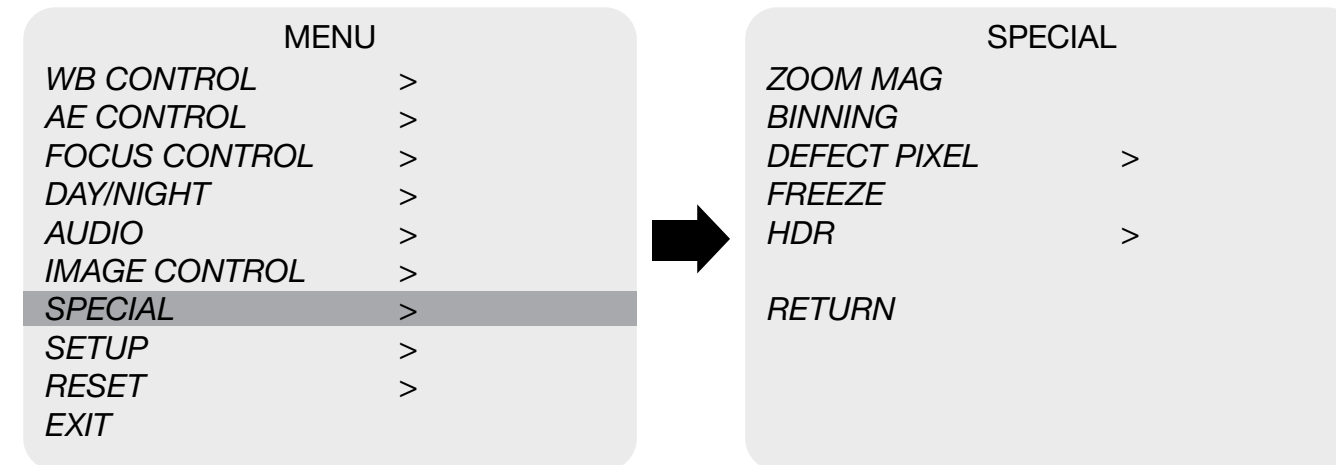
- **CONTRAST:** Adjust the image contrast level.
- **BRIGHTNESS:** Adjust the image brightness level.
- **SATURATION:** Adjust the image saturation level.
- **HUE:** Adjust the image hue level.
- **EDGE ENHANCE:** Adjust the image sharpness level.
- **AUTO SATURATE:** Decrease saturation automatically when noise scene is detected.
- **IMAGE EFFECT:** Adjust different color schemes.
- **IMAGE MIRROR:** Adjust horizontal mirror effect.
- **IMAGE FLIP:** Adjust vertical flip effect.
- **BLACK WHITE LEVEL:** Adjust the image black level and white level value.
- **GAMMA CORRECT:** Adjust the image output gamma level.
- **DNR:** Reduces video noise at low ambient light

    Select the DNR level from Auto, LOW, MIDDLE, and HIGH using the LEFT or RIGHT button.

10. SPECIAL

Select SPECIAL using the UP or DOWN button.
You can select BINNING, FREEZE, and HDR using the UP or DOWN buttons.

```
             MENU
WB CONTROL        >
AE CONTROL        >
FOCUS CONTROL     >
DAY/NIGHT         >
AUDIO             >
IMAGE CONTROL     >
SPECIAL           >
SETUP             >
RESET             >
EXIT
```

```
           SPECIAL
ZOOM MAG
BINNING
DEFECT PIXEL       >
FREEZE
HDR                >

RETURN
```
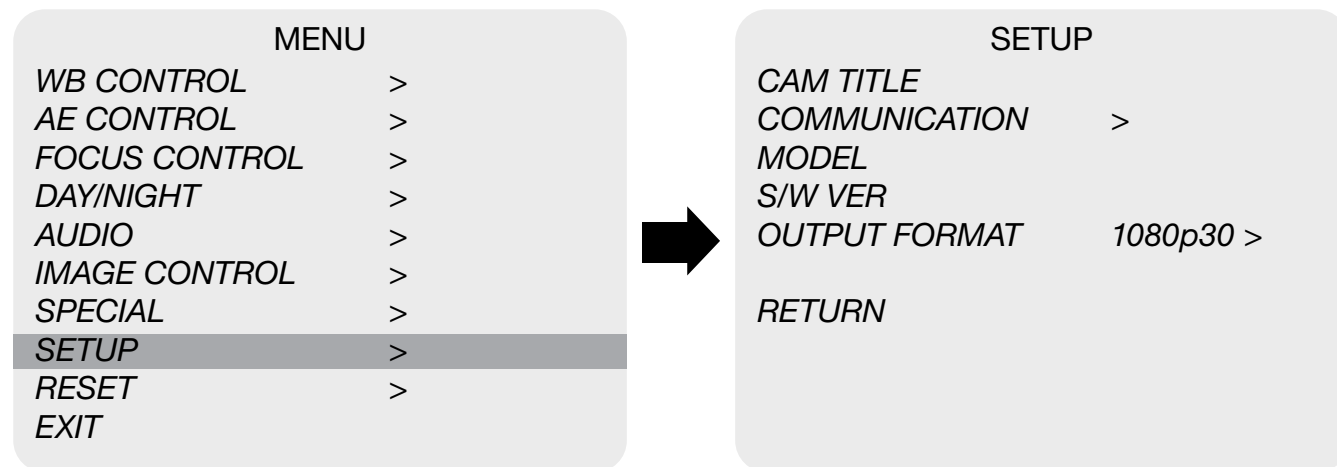
- **ZOOM MAG:** Turn ON or OFF the zoom ratio display on the top left corner of the image.
- **BINNING:** Enable or disable pixel binning.
- **DEFECT PIXEL:** Advanced defective pixel correction menu.
- **FREEZE:** Freeze or defreeze the image output.
- **HDR:** Enables HDR mode
    1. **SDR:** Apply Standard Dynamic Range.
    2. **PQ:** Apply Perceptual Quantizer.
    3. **HLG:** Apply Hybrid Log Gamma.

11. SETUP _____

CAMERA setup can be adjusted from this menu.
You can select CAMERA ID, Communication, System Info, and Output Format using the UP or DOWN buttons.

```
            MENU
WB CONTROL          >
AE CONTROL          >
FOCUS CONTROL       >
DAY/NIGHT           >
AUDIO               >
IMAGE CONTROL       >
SPECIAL             >
SETUP               >
RESET               >
EXIT
```

➤

```
            SETUP
CAM TITLE
COMMUNICATION       >
MODEL
S/W VER
OUTPUT FORMAT       1080p30 >

RETURN
```

- **CAM TITLE:** Camera title can be turned ON or OFF.
- **COMMUNICATION:** VISCA communication can be adjusted.
- **CAM ID:** Camera ID can be setup. (1~254)
- **ID DISPLAY:** Camera ID display can be displayed.
- **BAUDRATE:** Camera baudrate can be set. (2400, 4800, 9600, 19200, 38400, 115200)
- **MODEL:** Displays product module number.
- **S/W VER:** Displays software version number.
- **OUTPUT FORMAT:** Camera resolution and frame rate can be set.

  (1080 by default)
  Select the FRAME RATE using the LEFT or RIGHT buttons.
  Available Frame Rates are:
  4096 x 2160p 60, 59.94, 50, 30, 29.97, 25, 24, 23.98
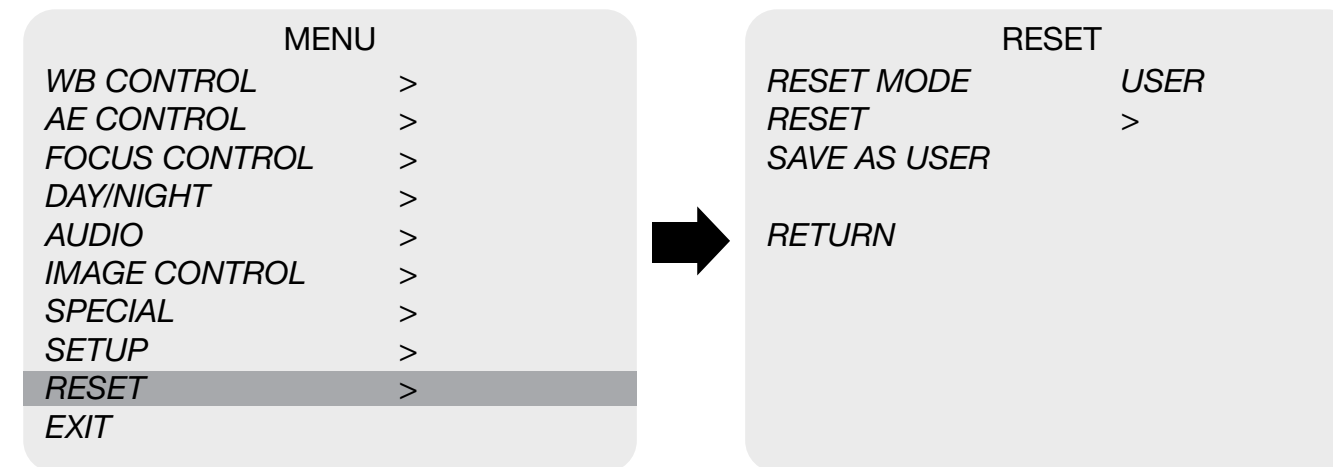 *3804 x 2160p 60, 59.94, 50, 30, 29.97, 25, 24, 23.98*
  1920 x 1080p 60, 59.94, 50, 30. 29.97, 25, 24, 23.98
  1920 x 1080i 60, 59.94, 50
  1280 x 720p 60, 59.94, 50
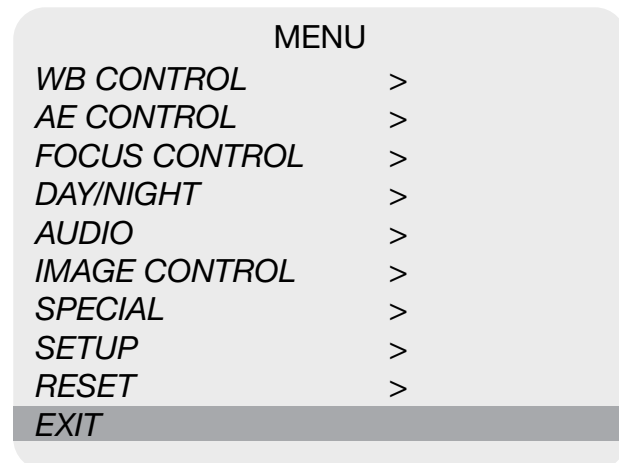
12. RESET _____

Select RESET using the UP or DOWN button.

```
            MENU
WB CONTROL          >
AE CONTROL          >
FOCUS CONTROL       >
DAY/NIGHT           >
AUDIO               >
IMAGE CONTROL       >
SPECIAL             >
SETUP               >
RESET               >
EXIT
```

➤

```
            RESET
RESET MODE          USER
RESET               >
SAVE AS USER

RETURN
```

- **RESET MODE:** Set the camera setting to either "FACTORY" or "USER".
  1. **USER:** Select "USER" if user saved setting value is needed.
  2. **FACTORY:** Select "FACTORY" if factory default setting is needed.
- **RESET:** Reset the camera to the mode set on RESET MODE.
- **SAVE AS USER:** Save the current camera settings as "USER".

13. EXIT

Select EXIT using the UP or DOWN button.

```
                 MENU
WB CONTROL          >
AE CONTROL          >
FOCUS CONTROL       >
DAY/NIGHT           >
AUDIO               >
IMAGE CONTROL       >
SPECIAL             >
SETUP               >
RESET               >
EXIT
```

- **SAVE:** Exit the setup after saving the value changes.

14. TROUBLESHOOTING

Problem	Solutions
Nothing appears on the screen.	a. Check that all connected devices are powered on. b. Confirm that the voltage is correct. c. Confirm that the power supply provides enough current to power the camera. d. Check that all video cables are correctly connected.
The picture is not clear.	a. Check that your monitor is correctly adjusted. b. Confirm that the glass in front of the lens is clean. If there is dust, dirt, or fingerprints on the glass, the image quality will be affected. To clean the glass, use a soft, dry, and non-abrasive cloth or a commercially available lens cleaning set. c. Correctly adjust the focus.
The picture has interference.	a. The camera may be close to a high voltage source, such as a power generator. b. The BNC cable is not terminated properly. c. The video cables are not connected properly.
The picture is flickering continually.	a. Check the termination and set the impedance at 75Ω properly. b. Ensure that the camera is not pointing towards the Sun or any light source. c. Check if there is any intermediate device. d. Check if the distance of the video cable exceeds the maximum transferable limitation.
The camera is not synchronizing with the reference signal.	a. Make sure Tri-Level reference signal is used. b. Locking takes up to 1 minute depending on the signal strength. Make sure the sync LED is solidly lit. c. Check if the cable and connectors used in reference sync are in good condition. d. Make sure the cable length used in reference sync does not exceed 100 ft. e. Make sure OUTPUT EN is on when using the genlock output.

Warranty

Marshall Electronics warranties to the first consumer that this device will, under normal use, be free from defects in workmanship and materials, when received in its original container, for a period of two years from the purchase date. This warranty is extended to the first consumer only, and proof of purchase is necessary to honor the warranty. If there is no proof of purchase provided with a warranty claim, Marshall Electronics reserves the right not to honor the warranty set forth above. Therefore, labor and parts may be charged to the consumer. This warranty does not apply to the product exterior or cosmetics. Misuse, abnormal handling, alterations or modifications in design or construction void this warranty. No sales personnel of the seller or any other person is authorized to make any warranties other than those described above, or to extend the duration of any warranties on behalf of Marshall Electronics, beyond the time period described above.

Due to constant effort to improve products and product features, specifications may change without notice.

Marshall

20608 Madrona Avenue, Torrance, CA 90503
Tel: (800) 800-6608 / (310) 333-0606 • Fax: 310-333-0688

www.marshall-usa.com

support@marshall-usa.com