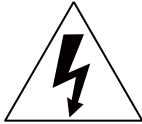
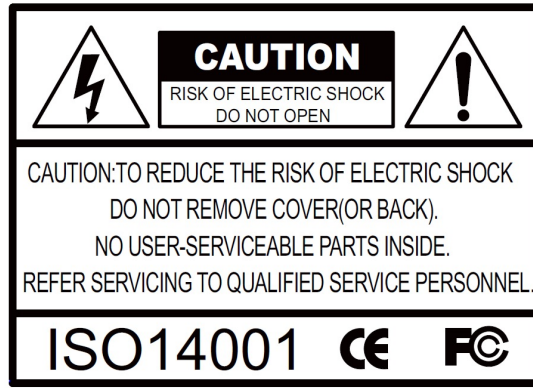


COSTAR
VIDEO SYSTEMS

HD - TVI Camera

Quick Guide



The lightning flash with an arrowhead symbol, within an equilateral triangle is intended to alert the user to the presence of uninsulated dangerous voltage within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

INFORMATION - This equipment has been tested and found to comply with limits for a Class A digital device, pursuant to part 15 of the FCC Rules & CE 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.

WARNING - Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.

CAUTION : To prevent electric shock and risk of fire hazards:

- ◆ Do NOT use power sources other than those specified.
- ◆ Do NOT expose this appliance to rain or moisture.

This installation should be made by a qualified service person and should conform to all local codes.

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General Features

■ Transfer Video Interface

The combination of a 2MP CMOS image sensor and TVI DSP provides an excellent resolution of TVI picture.

■ 3D-DNR

Smart 3DNR prevents the image blurring of moving object and activates only if moving objects are appearing on the scene.

■ Smart-IR

No saturation image, vivid image in darkness! "TVI" camera makes very sharp video image in darkness! This technology eliminates saturation of video image of the closer object in darkness by control of the IR sensitivity. Saturation never happens in our "TVI" cameras, you can enjoy vivid image in any dark condition!

■ Sens-Up

Despite a limited & low light condition, Sens-Up - Max. x32 helps the viewer to get visible and clear images.

■ Defog

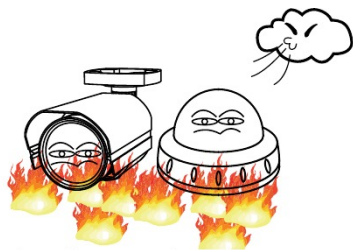
Defog function improve the clarity of images taken in poor conditions such as fog, smoke, rain or snow.

■ WDR

A powerful and advanced technology that captures clean and superior high resolution picture even where images appear dark and strong back light.

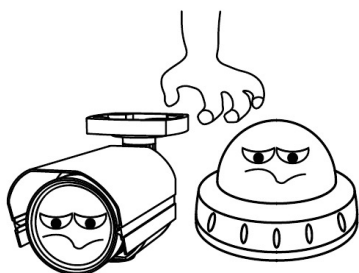
Precautions

Do not install the camera in extreme temperature conditions.



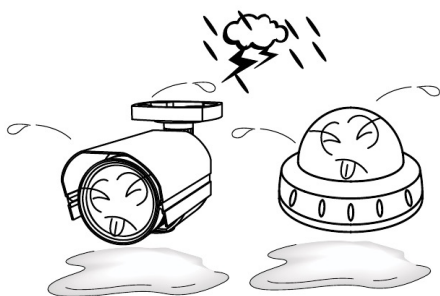
Only use the camera under conditions where temperatures are between -10°C and $+50^{\circ}\text{C}$. Be especially careful to provide ventilation when operating under high temperatures.

Do not touch the front lens of the camera.



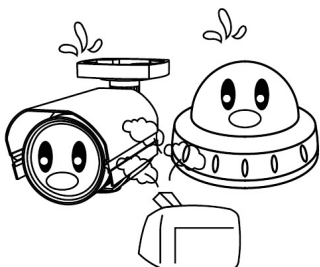
This is one of the most important parts of the camera. Be careful not to leave fingerprints on the lens cover.

Do not expose the camera to rain or spill liquids on it.



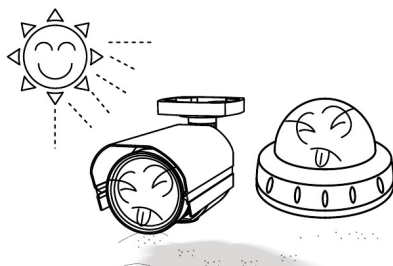
If it gets wet, wipe dry immediately. Liquids can contain minerals that corrode the electronic components.

Do not install or use the camera in an environment where the humidity is high.



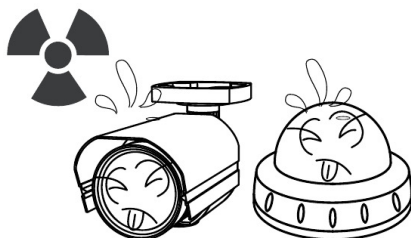
Do not install or use the camera in an environment where the humidity is high.

Never keep the camera pointed directly at strong light.



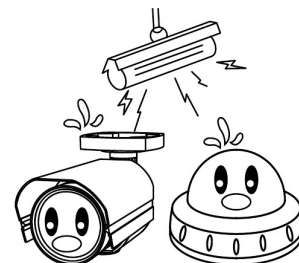
It can cause malfunctions to occur.

Do not expose the camera to radio activity.



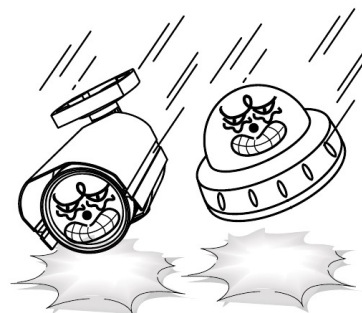
If exposed to radioactivity the CCD will fail.

Do not install the camera under unstable lighting conditions.



Severe lighting change or flicker can cause the camera to work improperly.

Do not drop the camera or subject it to physical shocks.



NOTE

- If the camera is exposed to spotlight or object reflecting strong light, smear or blooming may occur.
- please check that the power satisfies the normal specification before connecting the camera.

Safety Instructions

■ Precaution for use

This camera should be installed by qualified personnel only

There are no user serviceable parts inside

Do not disassemble this camera other than to make initial adjustments

Use appropriate low voltage power cable to prevent fire or electrical shock

Please insure that your installation area can support the weight of the camera

■ Please handle this camera carefully

Do not use a strong or abrasive detergent when cleaning the camera

Do not expose the camera to direct sun

Do not install camera in places where humidity is high

Do not install near cooling or heating device

Do not expose camera to rain or moisture

How to set up the camera menu

■ set up menu

MENU		SUB MENU 1	SUB MENU 2	SUB MENU 3	SUB MENU 4
1.LENS	DC	MODE	INDOOR / OUTDOOR / DEBLUR		
		RETURN (SAVE/CANCEL)			
	MANUAL	MODE	NORMAL / DEBLUR		
		RETURN (SAVE/CANCEL)			
2.EXPOSURE		BRIGHTNESS	0 ~ 20		
		SHUTTER	AUTO		
			MANUAL	SPEED	1/30 ~ 1/30000
			RETURN (SAVE/CANCEL)		
			FLICKER		
			SENS-UP	OFF ~ X32	
		AGC	0 ~ 20		
		RETURN (SAVE/CANCEL)			
3.WHITE BAL	AUTO				
	AWB				
	AWC-SET				
	MANUAL	KELVIN	LOW / MIDDLE / HIGH		
		R-GAIN	0 ~ 20		
B-GAIN		0 ~ 20			
	RETURN (SAVE/CANCEL)				
4.BACKLIGHT	OFF				
	HLC	LEVEL	0 ~ 20		
		MODE	ALL DAY / NIGHT ONLY		
		COLOR	BLK/WHT/YEL/CYN/GRNMAG/RED/BLU		
		RETURN (SAVE/CANCEL)			
	BLC	H-POS	0 ~ 18		
		V-POS	0 ~ 17		
		H-SIZE	0 ~ 18		
		V-SIZE	0 ~ 17		
		RETURN (SAVE/CANCEL)			
WDR	WEIGHT	LOW / MIDDLE / HIGH			
	RETURN (SAVE/CANCEL)				
5.DNR	OFF / LOW / MIDDLE / HIGH				
6.DAY&NIGHT	AUTO	SMART IR	0 ~ 20		
		AGC THRES	0 ~ 20		
		AGC MARGIN	0 ~ 20		
		DELAY	LOW/MIDDLE/HIGH		
		RETURN (SAVE/CANCEL)			
	COLOR				
	B/W	SMART IR	0 ~ 20		
		RETURN (SAVE/CANCEL)			
	EXTERN	SMART IR	0 ~ 20		
		EXTERN S/W	LOW/HIGH		
		DELAY	LOW/MIDDLE/HIGH		
		RETURN (SAVE/CANCEL)			

How to set up the camera menu

■ set up menu

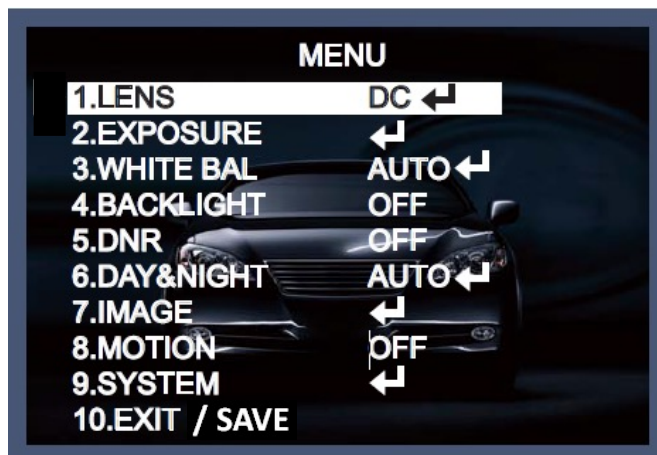
7.IMAGE		SHARPNESS	0 ~ 10			
		GAMMA	0.45 ~ 0.75			
		COLOR GAIN	0 ~ 20			
		MIRROR	ON/OFF			
		FLIP	ON/OFF			
		D-ZOOM	x1.0 ~ x16.0			
		ACE	LOW/MIDDLE/HIGH			
		DEFOG	OFF			
			ON	MODE	AUTO/MANUAL	
				LEVEL	LOW/MIDDLE/HIGH	
				RETURN (SAVE/CANCEL)		
		SHADING	OFF			
			ON	WEIGHT	0% ~ 100%	
				RETURN (SAVE/CANCEL)		
		PRIVACY	ON	OFF		
				ZONE NUM	0~15	
				ZONE DISP	ON/OFF	
				H-POS	0~60	
				V-POS	0~33	
H-SIZE	0~60					
V-SIZE	0~33					
Y LEVEL	0~20					
CB LEVEL	0~20					
CR LEVEL	0~20					
		RETURN (SAVE/CANCEL)				
		RETURN (SAVE/CANCEL)				
8.MOTION	OFF					
	ON	SENSITIVITY	0 ~ 20			
		WINDOW ZONE	0 ~ 3			
		WINDOW USE	OFF/ON			
		DET H-POS	1 ~ 60			
		DET V-POS	1 ~ 34			
		DET H-SIZE	1 ~ 60			
		DET V-SIZE	1 ~ 34			
		ALARM	OFF/ON			
				RETURN (SAVE/CANCEL)		
		RETURN (SAVE/CANCEL)				
9.SYSTEM		COM.	CAM ID	0 ~ 255		
			BAUDRATE	2400 / 4800 / 9600 / 57600 / 115200		
			RETURN (SAVE/CANCEL)			
		IMAGE RANGE	FULL			
			COMP			
			USER	OFFSET	0~30	
				RETURN (SAVE/CANCEL)		
		OUTPUT MODE	720P / 1080P			
		COLOR SPACE	YUV / SD-CBCR / HD-CBCR			
		FRAME RATE	25 FPS (PAL) / 30 FPS (NTSC)			
LANGUAGE	ENG / CHN / CHN(S) / JPN / KOR					
COLOR BAR	OFF/ON					
RESET	ON					
		RETURN (SAVE/CANCEL)				
10.EXIT / SAVE						

Menu set up

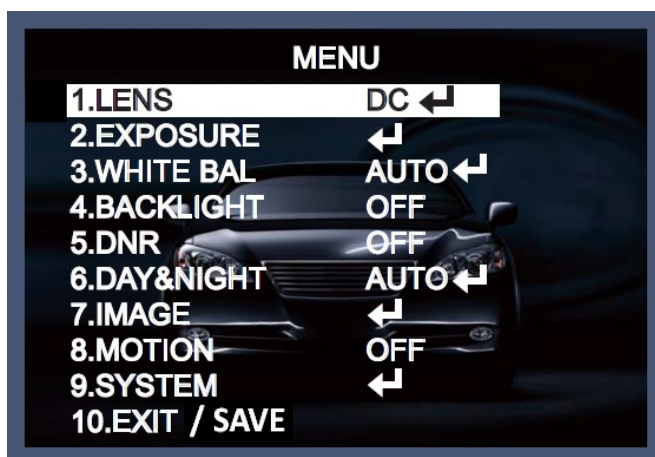
Menu setting can be selected by the button inside the camera.

1. Press the set button.

* The Set Up menu will be displayed on the monitor.



2. Move and select the required function using the Up and Down button.



3. Change menu settings using the Left or Right button.

* Available values or Status are displayed by pressing the Left or Right buttons.

Press the button until desired value / status is displayed.

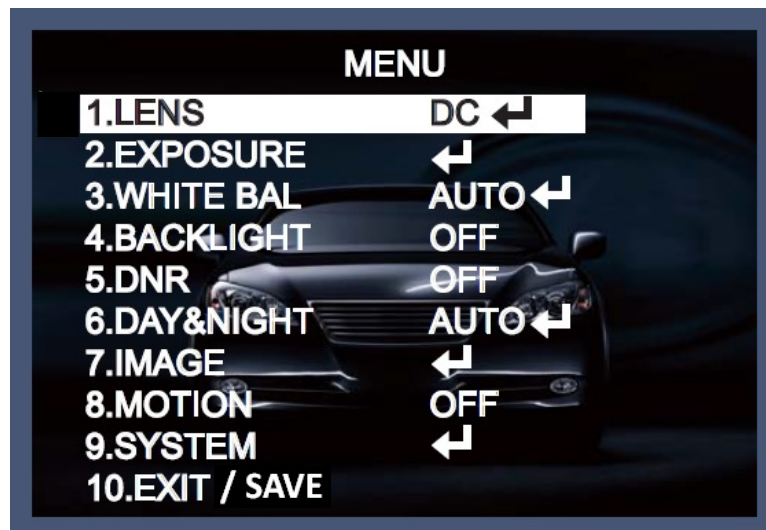
4. After Changing the setting , move to EXIT and press the SET button to EXIT.

NOTE

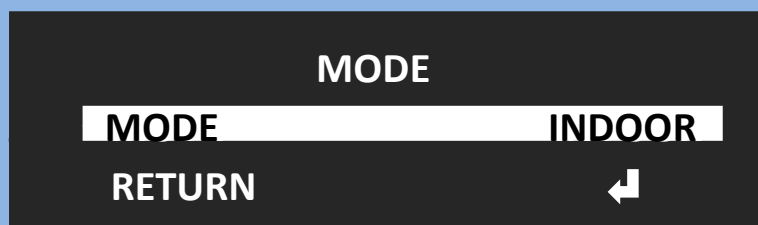
* Move to the available submenu by moving arrow to desired feature.

LENS

1. On the Set Up menu, Select LENS by using the Up or Down button.
2. Select the desired lens type by pressing the ENTER button.



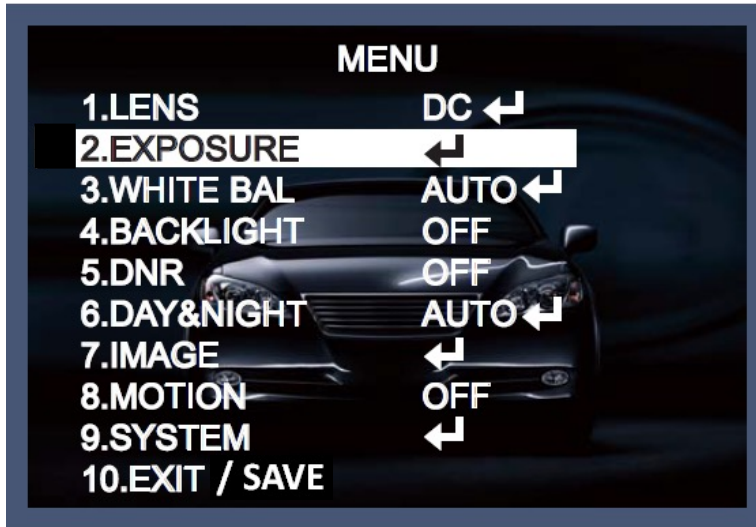
SUB MENU



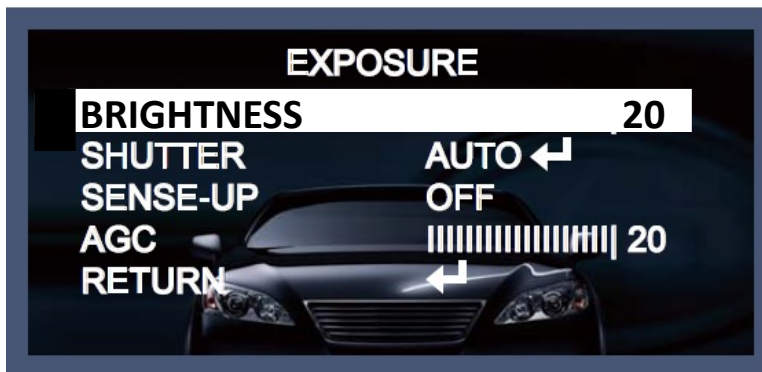
- * When you select the mode setup, you can select INDOOR, OUTDOOR or DEBLUR depending on the installation environment.
- * On manual mode, you can select NORMAL or DEBLUR depending on the installation environment.

EXPOSURE

1. On the Set Up menu, Select EXPOSURE by using the Up or Down button.



2. Press the SET button to access the sub-menu items listed below.



- ◆ BRIGHTNESS : The brightness can be adjusted.
The brightness control range is 1~20.
- ◆ SHUTTER : DC lens is launched with the setting of 1/30 and the manual lens is launched with the setting of Auto shutter, but the shutter speed can be adjusted from 1/30 to 1/30,000.
→ FLK : Select FLK mode if flickering occurs ; caused by the unmatched frequency of electric light.

NOTE

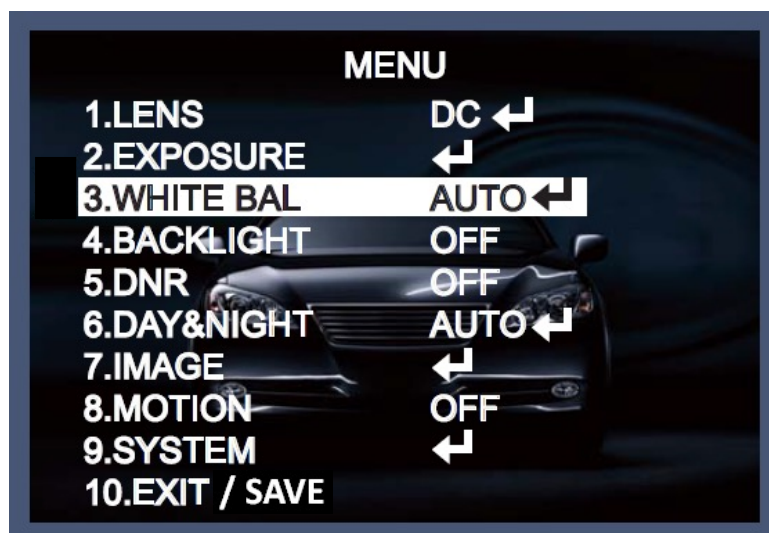
* Sense-Up mode is not worked when Electronic shutter is selected as Manual.

- ◆ SENSE-UP : The bright screen can be displayed by sensing the degree of the darkness automatically under the circumstance of low light condition or at night.
→ Off ~x32 Level Adjustable.
- ◆ AGC (Auto Gain Control) : The higher the AGC level is, the more noises appear.
→ 0~20 Level selectable.

WHITE BALANCE

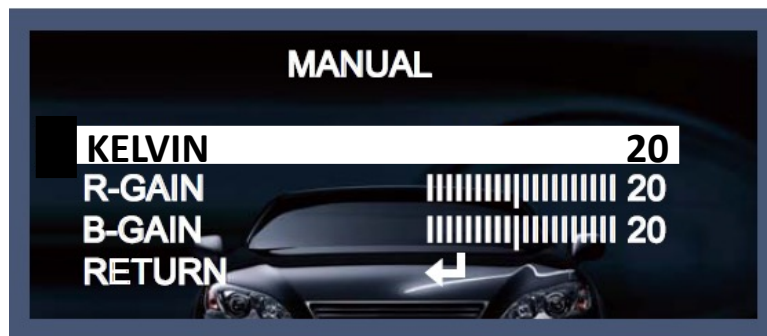
Use this function when the color adjustment of a screen is needed.

1. Move to WHITE BAL on the SETUP menu screen using the Up and Down button.
2. Select the desired mode by using the left or Right button.



- ◆ AUTO : Use this mode when the color temperature is from 2,500k to 9,500k.
- ◆ AWB : The function to search for the color which is matched well with the ambient environment.
- ◆ AWC→SET : After letting camera focus on the blank white paper to the best condition of current lighting environment, press the SET button.
If the lighting condition is changed,
Re-adjustment should be needed.

- ◆ **MANUAL** : Manual compensation make the more detailed control possible.
First, after adjusting the white balance using the ATW or AWB mode, change the mode into the manual compensation mode and then press Set button.
While looking at the color change of the subject seen on the screen after setting up the proper color temperature, increase the each value of the blue and the red.



- KELVIN : LOW/MIDDLE/HIGH level adjustable.
- R-GAIN : 0~20 level adjustable.
- B-GAIN : 0~20 level adjustable.
- Return : Every function is set up at the EXPOSURE menu, and then return the previous menu.

NOTE

The White Balance may not be worked properly in the following conditions.
If this doesn't work, use the AWB mode.

- * When there is a very high color temperature in the circumstances of the subject.
(for example, clear sky, Sunset)
- * It is very dark.
- * If the camera is headed to the fluorescent light directly or if there is a drastic lighting change, The operation of White balance may become unstable.

BACKLIGHT

On this menu, backlight image can be compensated by users selecting one of modes. (HLC, BLC, WDR)

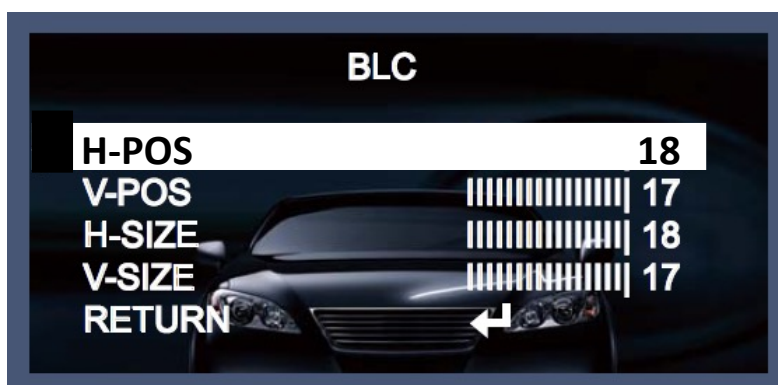
1. Move to BACKLIGHT on the SETUP menu screen using the Up and Down button.
2. Select the desired mode by using the left or Right button.



- ◆ Off : Deactivated status.
- ◆ HLC : This function is used to suppress strong light source (for example, headlights of cars during night time) so that other subjects can be seen in more detail. If you select HLC, a submenu appears where you can make finer adjustments.
 - LEVEL : Adjust the brightness level from which on the light source is to be masked out. 0~20 level adjustable.
 - MODE : All day/night only adjustable.
 - COLOR : Adjust the color from which on the light source is to be masked out.



- ◆ **BLC** : This function is used to counterbalance the screen image by increasing the brightness so that a subject which appears dark due to a strong backlight can be displayed in more detail. If you select BLC, a submenu appears where you can make finer adjustments.
 - H-POS/V-POS/H-SIZE/V-SIZE : Define the position and size of the area of interest by changing the position& size.



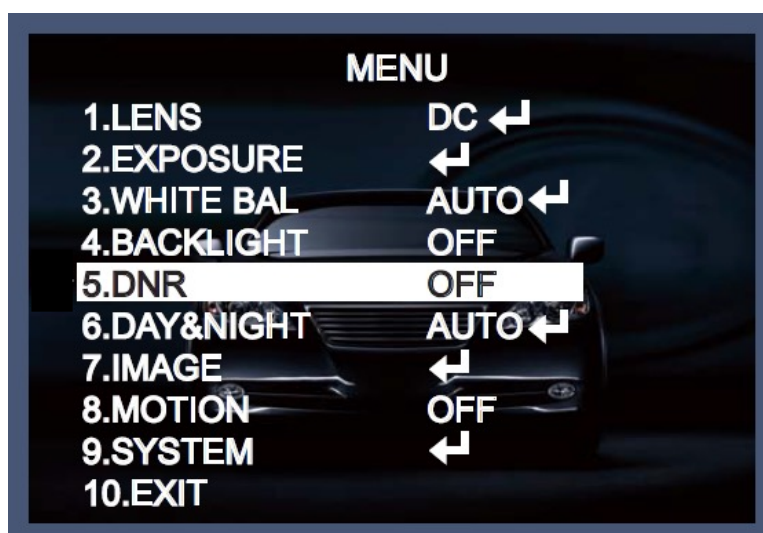
- ◆ **WDR** : The WDR (Wide Dynamic Range) function works to correct excessive light within the frame to produce a usable image. When the image has simultaneous bright and dark areas, it makes both areas distinct. If you select WDR, a submenu appears where you can make finer adjustments.
 - WEIGHT [MIDDLE, HIGH, LOW] : Select the WDR level of the camera.



DNR

This function is used to improve the picture quality by filtering the noise which is generated under low brightness conditions. You can set different levels here.

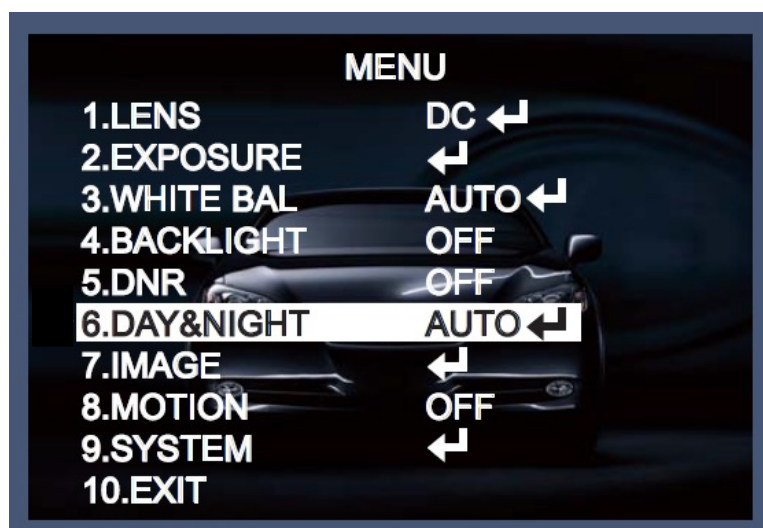
1. Move to DNR by using the Up and Down button.
2. Select the desired mode to use by pressing the left or Right button and LOW/MIDDLE/HIGH level selectable.



DAY&NIGHT

You can change the color mode of color or black / white by setting up the mode.

1. Select Day&Night using the Up or Down button on the Set Up menu screen.
2. Select the desired mode using the Left or Right buttons.



- ◆ **AUTO** : Automatically, It shifts into the color mode in the bright environment and the B/W mode in the low light condition. It can adjust the delay time, starting brightness and end brightness according to the ambient conditions by pressing the Set button.



- SMART IR : 0~20 smart IR level adjustable.
- AGC THRES : 0~20 AGC THRES level adjustable.
- AGC MARGIN : 0~20 AGC MARGIN level adjustable.
- DELAY [LOW/MIDDLE/HIGH] : Set the delay time for switching between COLOR and B/W

- ◆ **COLOR** : Making the video output color always.
- ◆ **B / W** : Making the video output B/W always.



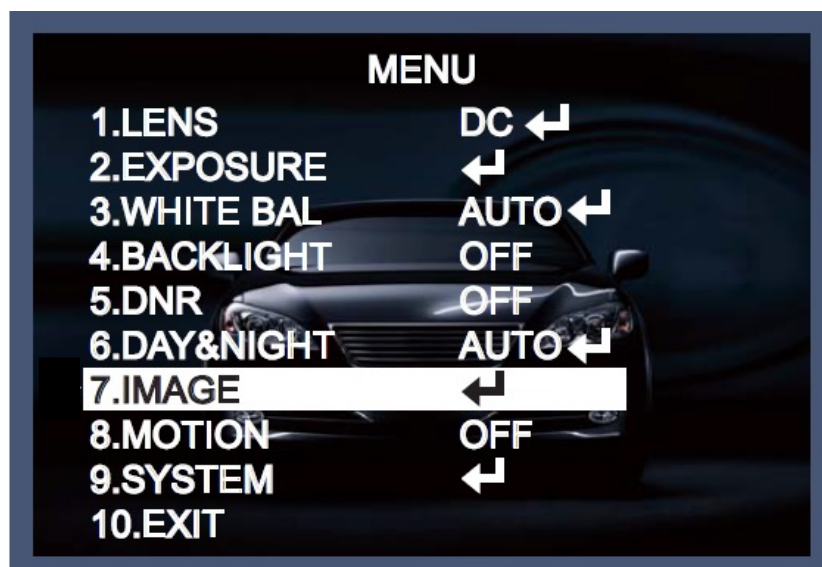
- ◆ **EXTERN** : It can change the color or B/W mode automatically through the connection with the ground terminal. (Option for box camera and IR camera)
- SMART IR : It controls the IR LED (bright portion base), saturation is not expected. 0~20 level adjustable.



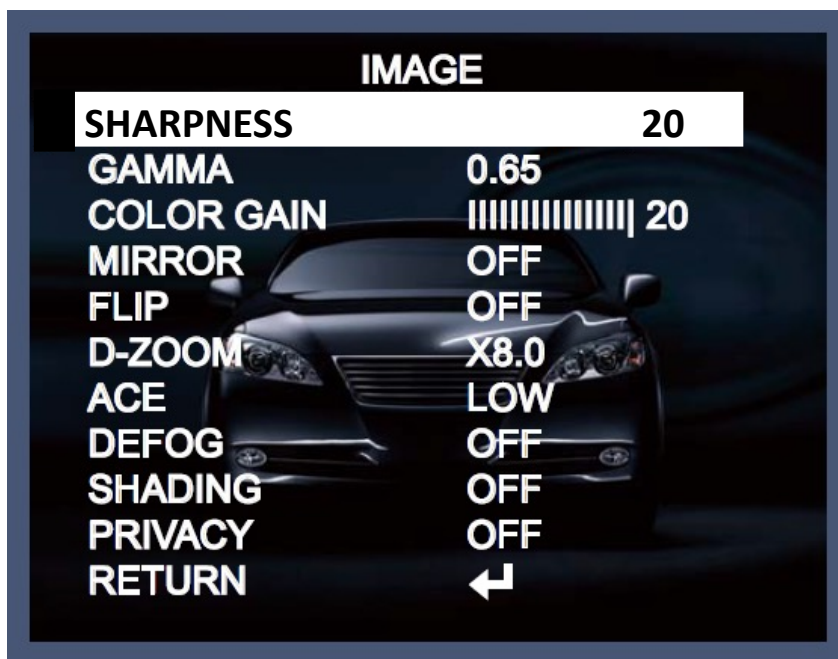
- EXTERN S/W [LOW/HIGH] : Set the external signal for switching between COLOR and B/W.
- DELAY [LOW/MIDDLE/HIGH] : Set the delay time for switching between color and B/W .

IMAGE

When selecting, the following submenu will appear.

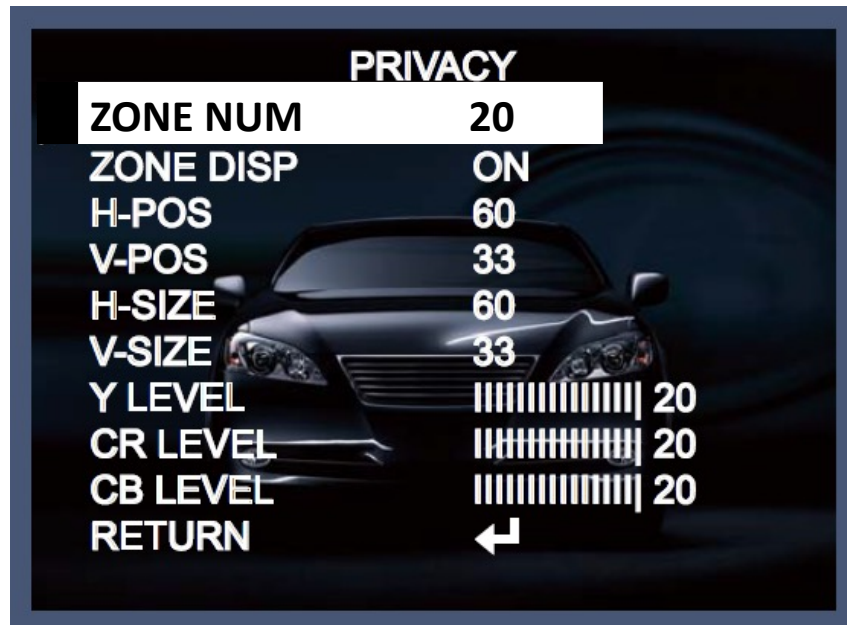


Here you can optimize the image quality by adjusting different options.



- SHARPNESS [1 ~ 20] : Adjusts the image sharpness.
If the level goes up excessively, it may affect the video image and generate a noise.
- GAMMA [0.45 ~ 0.65] : Changes the gamma curve of the camera.
- COLOR GAIN [0 ~ 20] : Changes the color gain of the camera.
- MIRROR [ON, OFF] : Mirrors the image horizontally on the screen.
- FLIP [ON, OFF] : Flips the image vertically on the screen.
- D-ZOOM : You can use the digital zoom with x1~x8 magnification.
The higher the digital zoom magnification is, the lower the resolution is.
- ACE [LOW/MIDDLE/HIGH] : Intelligent lighting level control to overcome even strong backlight conditions.
- DEFOG [ON, OFF] : This function helps to recognize the object in a dusty weather condition.
ON, a submenu appears where you can make finer adjustments.
- SHADING [ON, OFF] : Compensates the shading effects of lenses when the lens is set to a very wide angle.
This function will reduce the brightness difference between the center and the edges. If you select ON, a submenu appears where you can make finer adjustments.

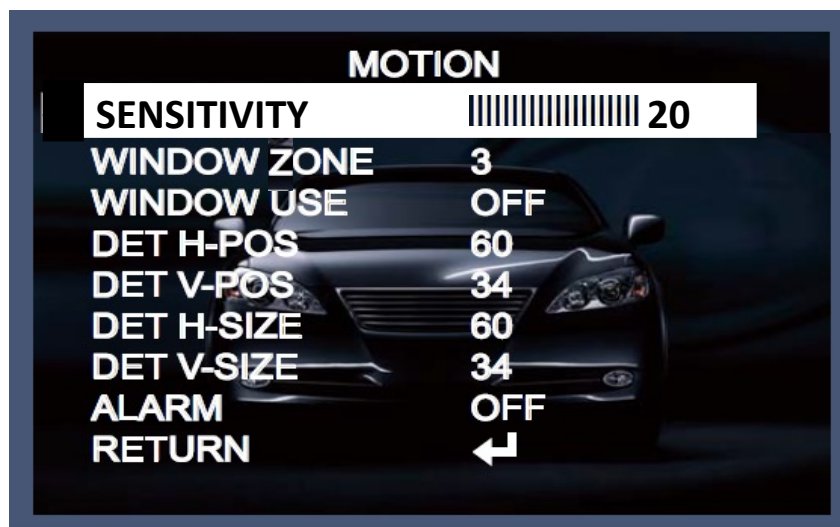
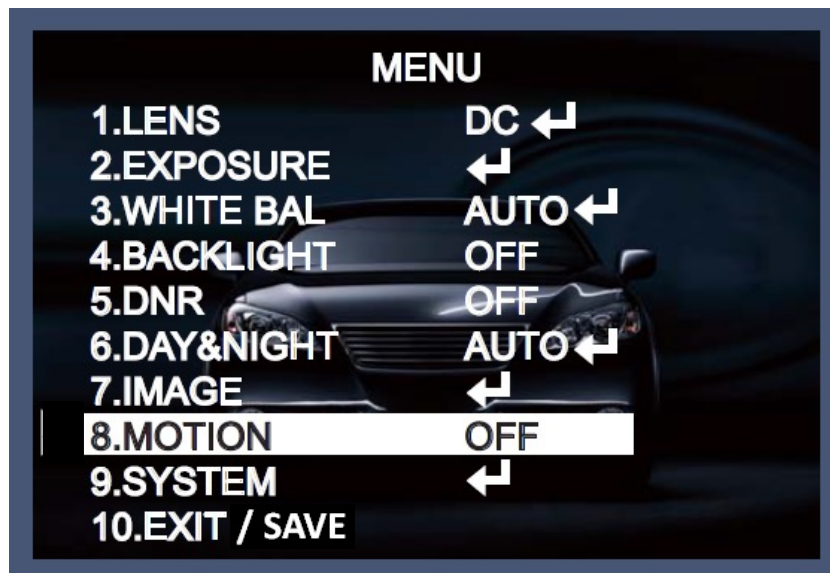
- ◆ **PRIVACY [ON, OFF]** : This is used to hide certain areas on the monitor.
 You can designate each different 16 area.
 The size of a designated area can be adjusted.
 The color of a privacy area can be selected various colors. When you select the return, the setting values in this function menu are saved, then get out of this menu.



- ZONE NUM [0~15] : Select a mask out of the 16 mask areas and set the options below for the selected mask.
- ZONE DISP [ON, OFF] : Choose ON to activate privacy masks and press OFF to deactivate masks.
- H-POS [0~60] : Define the horizontal start position of the privacy mask.
- V-POS [0~33] : Define the vertical start position of the privacy mask.
- H-SIZE [0~60] : Define the horizontal size of the privacy mask.
- V-SIZE [0~33] : Define the vertical size of the privacy mask.
- Y LEVEL [0~20] : Define the brightness of the mask color.
- CR LEVEL [0~20] : Define the red amount of the mask color.
- CB LEVEL [0~20] : Define the blue amount of the mask color.

MOTION

This function is used to detect moving objects in the monitored area. When choosing ON, the following submenu will appear where you can adjust the settings for the MOTION function.



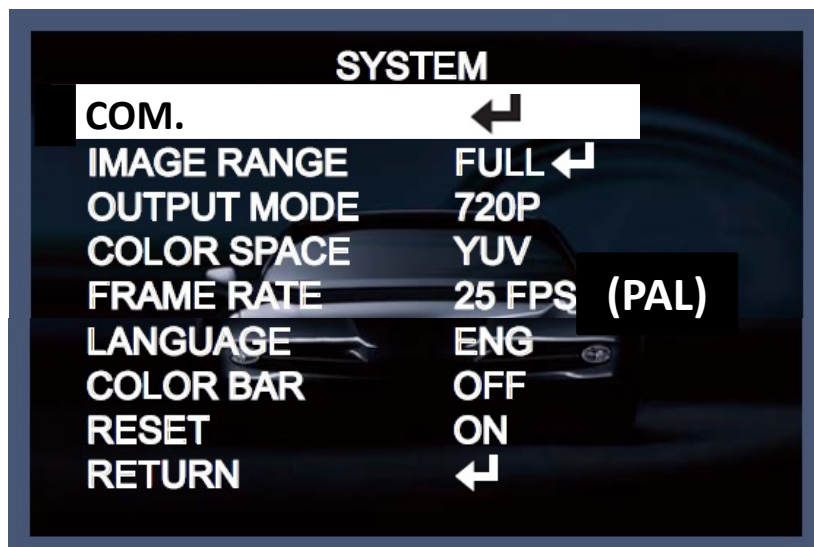
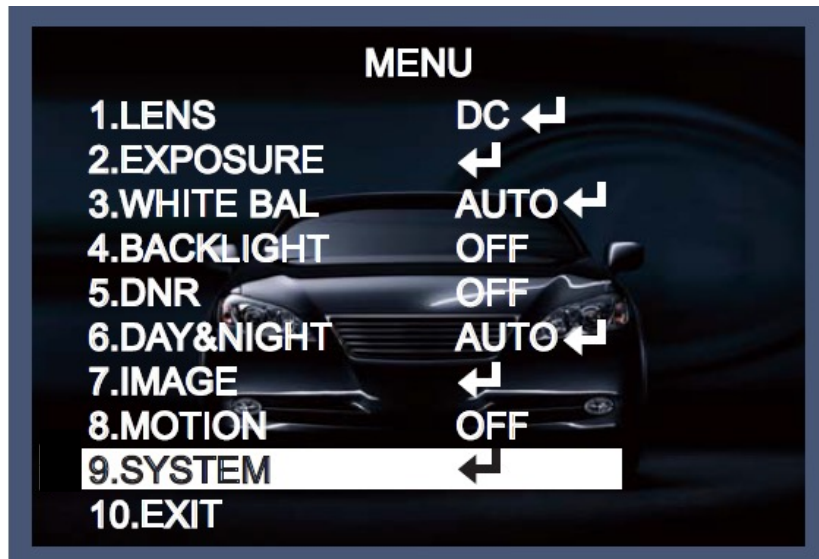
- SENSITIVITY [0~20] : The higher the setting value is, the higher the sensitivity gets, even though the movement of a subject.
- WINDOW ZONE [0~3] : Select the window zone.
 - WINDOW USE [ON, OFF]

- DET H-POS [0~60] : Define the horizontal start position of the monitoring area.
- DET V-POS [0~34] : Define the vertical start position of the monitoring area.
- DET H-SIZE [0~60] : Define the horizontal size of the monitoring area.
- DET V-SIZE [0~34] : Define the vertical size of the monitoring area.
- ALARM [ON, OFF] : In motion situation, you can select the details of option setting.

SYSTEM

This can be used when you want to select the additional function control.

1. When the SETUP menu is displayed, select SYSTEM using the Up and Down button.
2. Select one of the mode using the Up and Down button.



- COM. : This menu id used for RS-485 communication. Users are able to select CAM ID(0~255) and BAUD RATE (2400/4800/9600/57600/115200).
- IMAGE RANGE [FULL/COMP/USER] : Adjust the rate of YC signal to 100%(FULL), 75%(COMP) or 100%~75%(USER).
- OUTPUT MODE [720P/1080P] : Choose output type.
- COLOR SPACE [YUV/SD-CBCR/HD-CBCR] : Select different color settings for a warmer or a colder image.
- FRAME RATE [25 FPS(PAL)/30 FPS(NTSC)] : Choose a frame rate.
- LANGUAGE : ENG, CHN, CHN(S), JPN, KOR
- COLOR BAR [OFF/ON] : Check current condition with color bar.
- RESET [ON] : All settings will be restored to factory default.

EXIT / SAVE

Press the Set button in the exit menu to save the current settings and exit the Set Up menu.

Specifications

TYPE		BOX CAMERA CAMERA
ISP (image signal processor)		EYENIX EN781
Image sensor	Sensor type	1/2.8" 2.13Mega SONY IMX307LQR-C STARVIS CMOS Sensor
	Effective pixels	1945(H) X 1097(V), 2.13M Pixels
	Total pixels	1945(H) X 1109(V), 2.16M Pixels
Resolution		HD-ANALOG (TVI) 1920X1080(1080p@30F/25F) 1280X720(720p@30F/25F) CVBS
Scanning system		Progressive Scan
Min. illumination		DAY : 0.4LUX @ F1.2 (AGC MAX, SENS-UP OFF) NIGHT : 0.01LUX @ F1.2 (AGC MAX, SENS-UP OFF)
Video Out		TVI, CVBS
S/N Ratio		More than 50dB
Lens		C/CS Mount Lens
Function	AGC	0 ~ 10 Level Adjustable
	Shutter Speed	AUTO(NORMAL/DEBLUR) / FLK / MANUAL(1/30Sec ~ 1/30000Sec)
	Brightness	0 ~ 20 Level Adjustable
	Sens-UP	OFF / x2 ~ x32
	WDR (TRUE WDR)	OFF/ON (LOW/MIDDLE/HIGH)
	BLC	OFF / ON
	HLC	OFF / ON
	ACE(D-WDR/ATR-EX)	OFF / ON(LOW/MIDDLE/HIGH)
	Privacy Masking	OFF / ON (BOX : 16 Zone, POLYGON : 8 Zone)
	DEFOG	OFF / ON(AUTO/NORMAL)LOW/MIDDLE/HIGH)
	Day & Night	Auto(AGC) / COLOR / BW / EXTERN(Lux CTL, PWM CTL)
	Smart -IR	0~20 Level Adjustable
	White Balance	ATW / AWB / AWC-SER / MANUAL
	DNR	OFF / LOW / MIDDLE / HIGH (2D+3DNR)
	Mirror	OFF / ON
	FLIP	OFF / ON
	Sharpness	0~10 Level Adjustable
	GAMMA Correction	0.45 ~ 0.75
	D-ZOOM	x1.0 ~ x16.0
	SHADING	OFF / ON (WEIGHT 0% ~ 100%)
Language	ENG / KOR / JPN / CHN / CHN(S)	
Operating temperature		-10°C ~ +50°C(Humidity : 20%RH ~ 80%RH)
Storage temperature		-20°C ~ +60°C(Humidity : 20%RH ~ 95%RH)
Dimension (W x H x D)		50 x 56.8 x 102.5
Weight		240g
Power Source		DC12V / AC24V
Camera Operation (mA)		160mA

Trouble Shooting

PROBLEM	POSSIBLE CAUSE
Nothing appears on the screen.	<ul style="list-style-type: none"> ☞ Check the power cable, power supply output and video connection between the camera and monitor.
The image on the screen is dim.	<ul style="list-style-type: none"> ☞ Are the camera lens or the lens glass dirty? Clean the lens / glass with a soft clean cloth. ☞ Adjust the monitor controls, as required. ☞ If the camera is facing a very strong light, change the camera position. ☞ Adjust the lens focus.
The image on the screen is dark.	<ul style="list-style-type: none"> ☞ Adjust the contrast control of the monitor. ☞ If there is an intermediate device, correctly set the 75Ω/Hz.
The camera is not working properly and the surface of the camera is hot.	<ul style="list-style-type: none"> ☞ Check the camera is correctly connected to an appropriate regulated power source.
Motion Detection is not activated.	<ul style="list-style-type: none"> ☞ Has MOTION DET been set to ON in the menu? ☞ Has MD AREA been properly defined?
The color of the picture is not correct.	<ul style="list-style-type: none"> ☞ Check the settings in WHITE BALANCE menu.
The image on the screen flickers.	<ul style="list-style-type: none"> ☞ Make sure that the camera isn't facing direct sunlight or fluorescent lighting. If necessary, change the camera position.
The SENS-UP does not work.	<ul style="list-style-type: none"> ☞ Check that the AGC setting in the EXPOSURE menu isn't set to OFF.

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