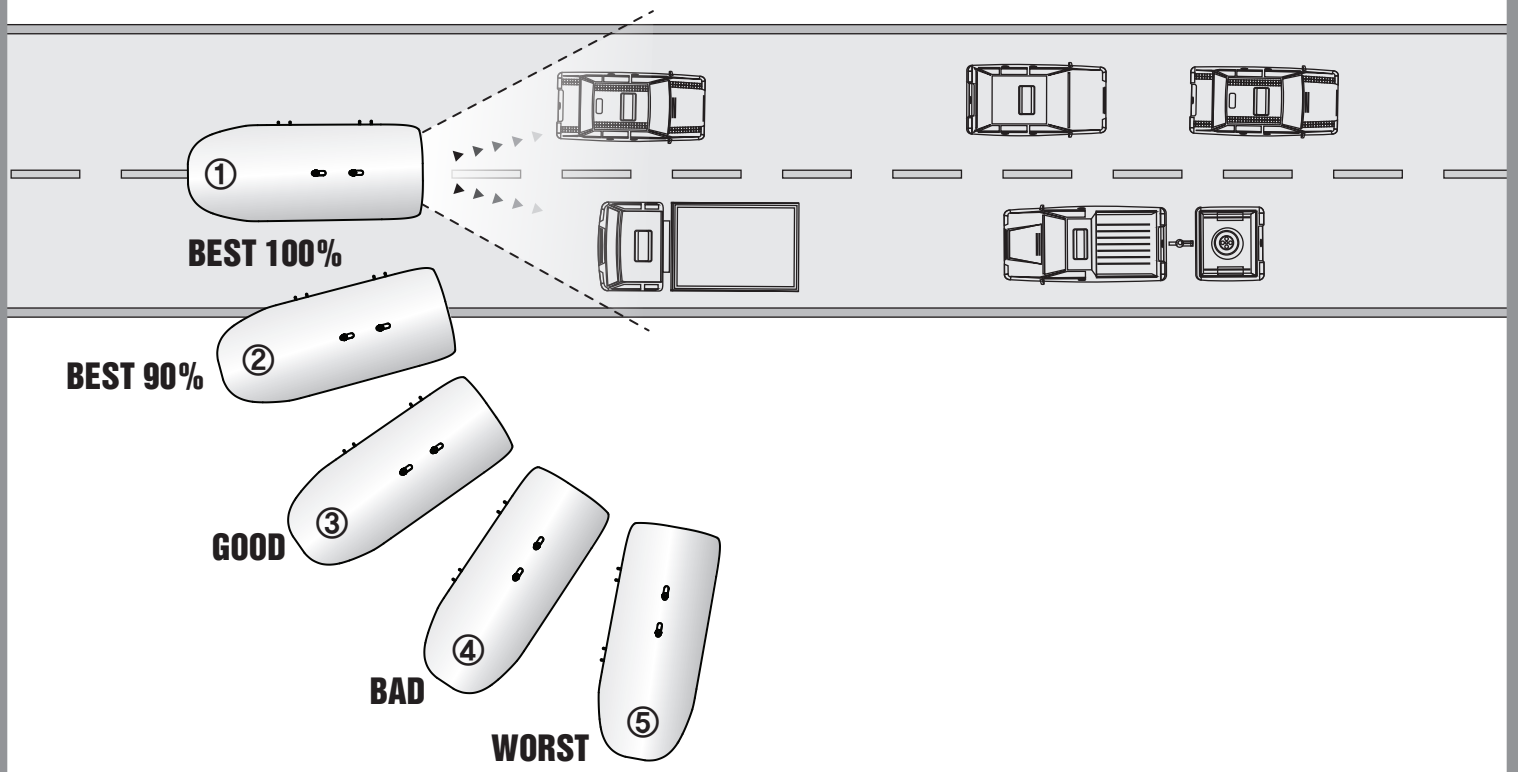
LICENSE PLATE CAMERA

OSD CAOTROL. USER'S GUIDE

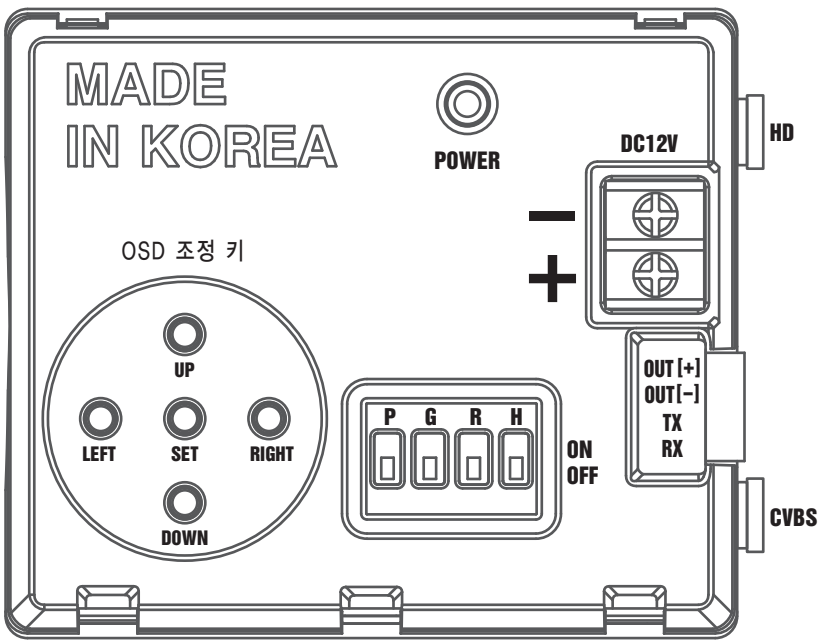


Depending on the installation location, there are advantages of License Plate detection Camera that monitors surroundings and recognizes License Plate of vehicle. No. 1 position is the best location, but if the installation is impossible for the surrounding environment, it will catch good image up to No.3 position. No.4 and No.5 position are used at the places of Parking lot, building entrance, and restricted area to recognize License Plate of slow speed vehicle.

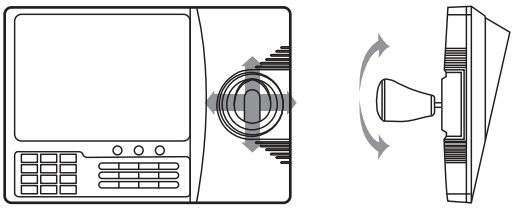
In the No.1 and No.3 position that below 60km speed vehicle passes,
Normal mode is worked when there is no motion.
The license plate detection mode is worked when the motion is detected in the same situation.

SETTINGS

In order to increase the recognition rate,the SETUP setting also is important, more importantly, the installation angle of the camera, height, angle of view, and lighting. In addition, please note that there shouldn't be any reflection under camera because there is CDS Sensor in ther floor of camera .



※ **P** : PARKING , **G** : GATE , **R** : ROAD , **H** : HIGHWAY



- Call OSD MENU : 1. Call #95
  2. Open button
- Zoom in : Tele button or Joystick
- Zoom out : Wide button or Joystick

Installation guide

- Camera installation height
  :3M–8M (If you install camera at less than 3M height, the rate of license plate recognition might be reduced).
- Camera and vehicle distance (recommended distance)
  :16mm (10–20M) / 7–22mm : 15–25M (22mm) / 6–50mm : 20–30M

- As it is the slower speed vehicle , it can detect the longer distant target.
- As it is the brighter envorionment at night, it can detect the longer distant target.
  (illuminator : It makes ambient light bright.)
- Recognition distance according to the installation environment and condtions. + – There is deviation.)

CAMERA OPERATIONS

- Ratio of Vehicle screen aspect
  : The correlation between the camera and the vehicle distance and WIDE-TELE set

Recommended angle

Recommended angle

Recommended angle

As the distance between camera and vehicle is close, it is possible for recognition to be captured in WIDE .

detection is weak
distant distance : (25~30M wide set)

▶▶▶▶▶
after Tele set or
adjusted distance

After more Tele set,
number detection is possible.

detection is weak
close range (15~20M wide set)

▶▶▶▶▶
after Tele set or
adjusted distance

TELE set: BEST image. Close range(15~20M)
two lane road is possible(front angle)

How to adjust DIP SWITCH

TABLE	P	G	R	H
OSD menu is selectable	OFF	OFF	OFF	OFF
P (COUNTRY 1)	ON	OFF	OFF	OFF
G (COUNTRY 2) (Motion)	OFF	ON	OFF	OFF
R (DOWNTOWN1)	OFF	OFF	ON	OFF
H (DOWNTOWN2) (Motion)	OFF	OFF	OFF	ON

(Attention)
If the set value of OSD and DIP SWITCH are different,
it is operated for DIP SWITCH value.

(TVI model: recommended ALL OFF : It is adjustable to UTC (PTZ control)
TVI model : This camera can automatically distinguish whether DVR has UCC function or not when camera is powered on in state of connecting with DVR.
At this time, if connected DVR has UCC function(=PTZ Control), OSD and Dip Switch of Camera doesn't work.

Country MODE & Downtown MODE

- COUNTRY (P.G) : The place where the vechicle speed is slow and where the illuminance is low.
  → Gate. Parking Garage. The road in the residential area.
  1) COUNTRY 1 (P) : Normal road with many vehicles (less than 30~60km speed)
     → always car mode (traffic is large)
  2) COUNTRY 2 (G) : Gate or Parking lot where traffic is low (normal mode (bright condition)
     → Motion dtected (number recognition mode)
     : The most frequently used mode (GATE and Parking lot.)
     The normal road where the traffic is low (below 60km : front angle)
     and (below 30km: diagonal installation)

- DOWNTOWN(R.N) : The place where the vechicle speed is fast and where the illuminance is high.
  1) DOWNTOWN 1 (R) : The bright road where the vehicle speed is above 60km.
     → A road where there is a lot of traffic. Downtown road. Highway.
  2) DOWNTOWN 2 (H) : A bright road where the vehicle speed is below 60km.
     → The road is bright. but not much traffic
     (Normal mode → Motion mode(Number detection mode)
     relatively bright Parking lot and Gate

- Motion mode : Country 2. Downtown 2 : general camera mode (bright condition)
  –〉 The movement of the vehicle (motion mode) (dark) is very efficient
  in the Place where the vehicle speed is slow.

• In the place there is a lot of traffic, this mode is not suitable because the mode is continuously changing.
• As the vehicle speed is too fast, the motion mode is not suitable because the fast vehicle is passed already before the motion is detected.

(EX) COUNTRY 2 (Motion mode)

Normal camera mode
(NO Motion)
: bright condition

Motion mode
(the movement of vehicle is detected)
: dark condition

CAMERA OPERATIONS

- Difference of Country and Downtown :

  • Country Mode : The motion mode isn't relatively dark.
  (The rate of number detection is high in the low lux at night time.)

  • Downtown Mode : This mode is suitable in bright environment because the motion mode makes around relatively dark. (The rate of number detection is high in the high Lux at night time.)

Normal type

Illuminator type

※ The bracket image is a reference.

- illuminator : It makes ambient light bright

  1) The time when illumination is low although Downtown mode has to be set with High-speed vehicle
  2) The time when the target is in distanct distance or it is hard to detect as illunmination is low.
  → when there is no lullminator type : How to reduce distance between camera and vehicle.
  The shorter distance between camera and vehicle, the more IR infuluence is.

Recommended installation site.

- GATE or Parking lot : Country 2 is the most advantageous. (Country 2 is recomended in the general setting.)
  The high traffic place : Country 1
  Very bright Downtown or Parking lot in the big mall : Downtown mode is suitable.

• IR Flasher(0~6) : This function can make IR LED flicker step by step. The smaller value is set, the faster flicker.
It is advantageous to weak power camera because IR can work well with low current.

• Day & Night Lux Setting :

1) D&N LUX :This is lux setting when changing from Day to Night. The smaller lux value is, the darker lux.
If you want to operate IR in darker environment than current, set the smaller value than current setting value.

2) N&D GAP : This is lux setting when changing from NIGHT to DAY.
Plese don't change value as much as possible

• Additional MOTION function

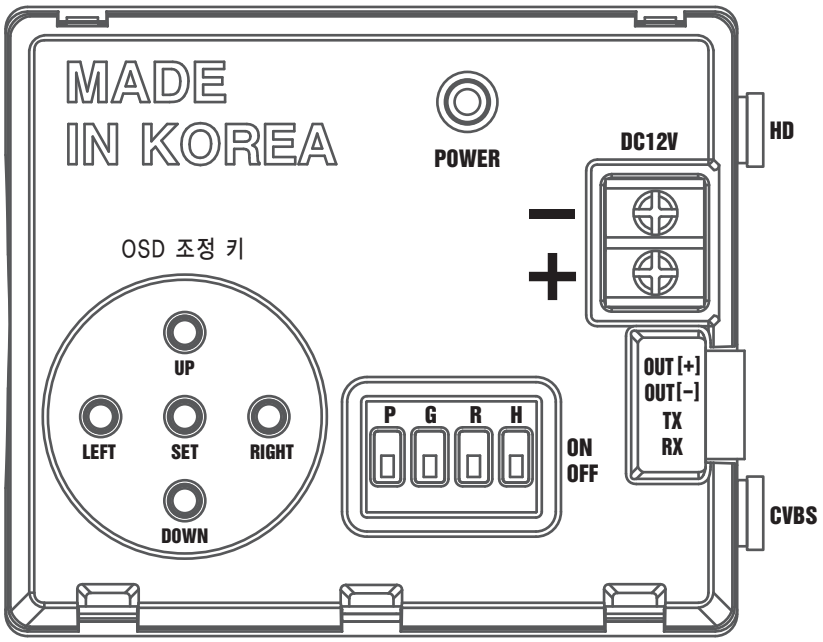
MOTION TIME is set for "MOTION SET → EVEVT → VIEW TIME (8SEC).
If there are continuos motions, it makes the count Zero. Afther making the count zero, it keeps licnese palte detection mode.

Target is set for "MOTION SET → TARGET SIZE(20)".
When the small value is set, it detects even the most minute of movements like snow, rain, and the movement of boughs.
Also, it needs to adjust proper value for reacting to only big targets like vehicle because it might be different set values according to screen SIZE.

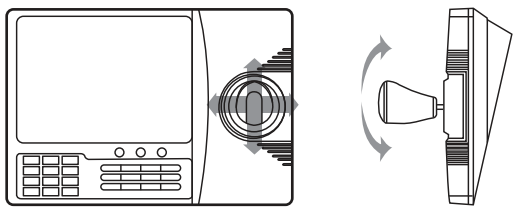
MENU

SETUP MENU	
WHITE BAL	AUTO AUTOext PRESET MANUAL
FUNCTION	SET PLACE IR FLASHER BRIGHTNESS SHARPNESS DEFOG MIRROR FLIP PRIVACY SHADING WDR
BACKLIGHT	OFF HLM BLC
DAY&NIGHT	MODE (EXTERN, AUTO, COLOR, B&W)
MOTION	SET (EVENT, SENSITIVITY, TARGET SIZE, AREA, RETURN)
SPECIAL	Y GAIN Cb GAIN Cr GAIN TRANSFER BURST GAIN
SYSTEM	OUTPUT MODE CVBS DEFECT DET GAMMA CAM ID ID DISPLAY LANGUAGE FACTORY SET
EXIT	

SETTINGS



※ **P** : PARKING , **G** : GATE , **R** : ROAD , **H** : HIGHWAY



• Call OSD MENU : 1. Call #95
2. Open button
• Zoom in : Tele button or Joystick
• Zoom out : Wide button or Joystick

[Installation requirements]

1. Install the camera with in height 5M.
   6~50mm Lens : with in object distance 25M / 12mm Lens : with in object distance 15M / 7~22mm : 10~20M
   by the zoom adjustment of the lens be
2. the width of the captured image should be within 7M by adjusting zoom of lens .
3. Please set FUNCTION menu (SET PLACE and IR FLASHER) and MOTION menu (EVENT) properly to fit the situation

[Installation Characteristics]

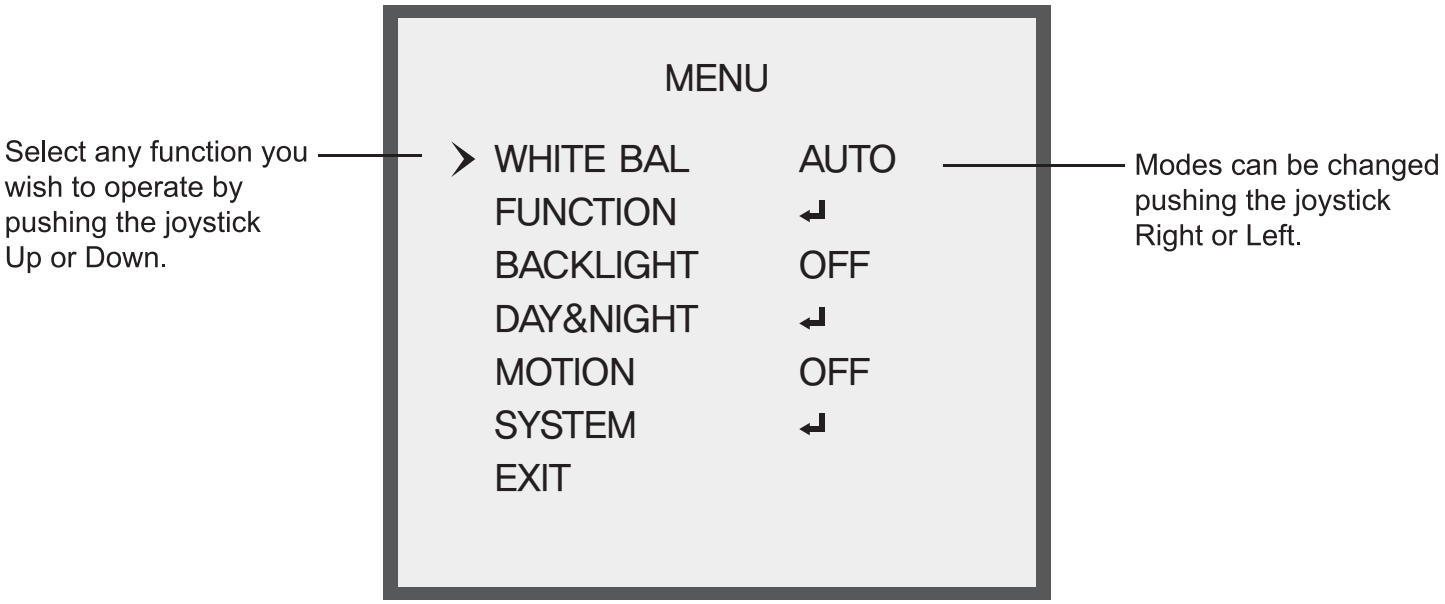
1. You can control the FUNC TION througn OSD KEY directly.
2. You can directly control OSD KEY operation and FUNCTION by using the RS-485 communication.
3. You can capture the best image by setting the speed in DIP SW. (See Table 1)

Terminal	
OUT [+12V]	Alarm signal output
OUT [-GND]	
TX	External device communication PORT
RX	

Table 1	P	G	R	H
OSD MENU SELECT	OFF	OFF	OFF	OFF
COUNTRY 1	ON	OFF	OFF	OFF
COUNTRY 2 (MOTION)	OFF	ON	OFF	OFF
DOWN TOWN 1	OFF	OFF	ON	OFF
DOWN TOWN 2 (MOTION)	OFF	OFF	OFF	ON

Operation with the camera settings : It can be able to communicate camera OSD KEY and RS-485.

MENU



1. Please press the SET button

   - Settings can now be made. The SET menu is displayed on the monitor.
   - To run the OSD menu, please press and hold the SET button for three seconds.

2. Please select any function you wish to activate by pushing the button Up or Down

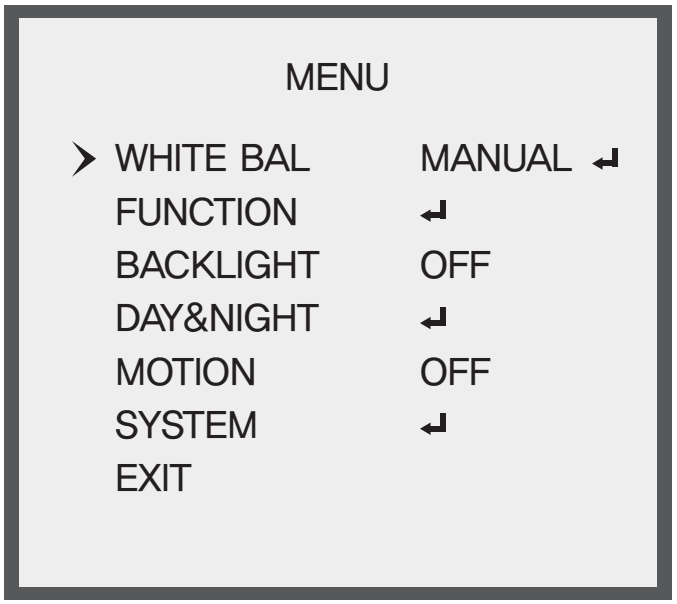
3. Please press the button Right or Left if you wish to change mode.
   - When the button is pressed Right or Left, available values and mode are displayed in order. Please keep press the button until you get the mode you wish.

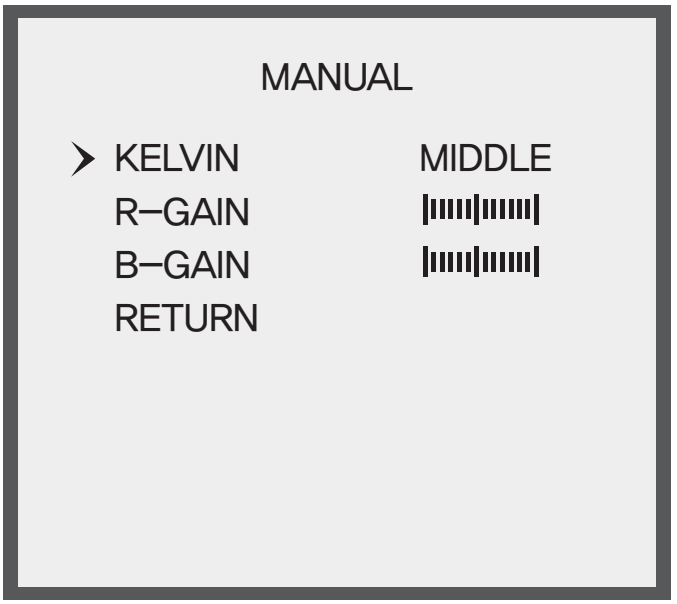
4. Please select "EXIT" and then press the button to finish the setting.

WHITE BAL

- When the MAIN MENU is on the screen, please position the cursor to SETUP by using the button. And then press the button.

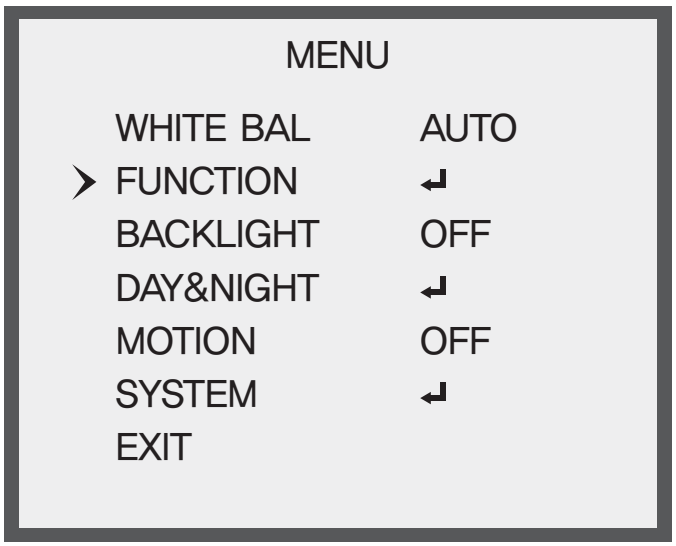
- Use the White Balance function to adjust the screen color.
- When the SETUP menu screen is displayed, select 'White Bal.' by using the Up and Down buttons so that the arrow indicates 'White Bal.' .
- Select a desired mode using the Right and Left buttons.

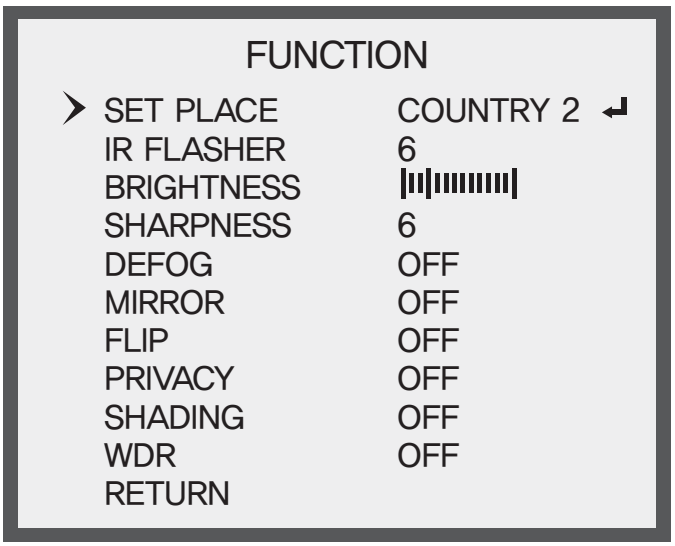




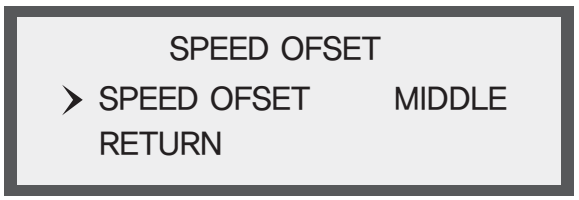
- AUTO : Default - This function continuously adjusts the white balance automatically to adapt to changes in lighting conditions.
- AUTOext : It is a mode to do a halogen and the special lighting to White detection.
- PRESET : This function adjusts the white balance regardless of the subject conditions.
- MANUAL
  - KELVIN : LOW / MIDDLE / HIGH
  - R-GAIN : Left Key (Level DECREMENT), Right Key (Level INCREMENT)
  - B-GAIN : Left Key (Level DECREMENT), Right Key (Level INCREMENT)

FUNCTION





• SET PLACE : It sets the speed of target you want to monitor. When you press the SET KEY, sub-menu will be displayed.
: COUNTRY 1 / COUNTRY 2 / DOWN TOWN 1 / DOWN TOWN 2



• SPEED OFSET (LOW / MIDDLE / HIGH): There are different vehicle speeds for each road. Through SPEED OFSET, plate recognition rate can be improved by changing the setting value when the vehicle speed is different.
(As the SPEED OFSET is set for HIGH, the higher plate recognition rate is, but the darker screen.)

• IR FLASHER : It sets the IR LED blink speed. (It can adjust the blink speed of 0-6 step-by-step) The lower the number, the most rapidly blinks. In six stages, there is no flicker. When the IR LED is set to blink, it is possible to capture more clear image because there is no reflection causing LED.

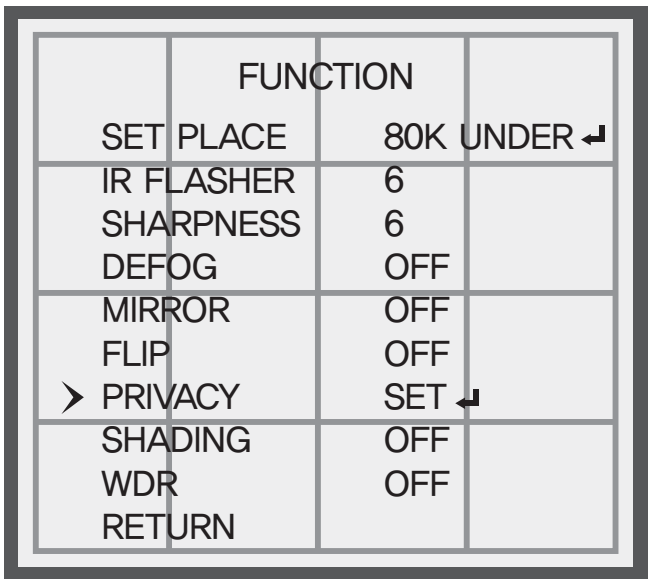
• BRIGHTNESS : User can adjust BRIGHTNESS level.

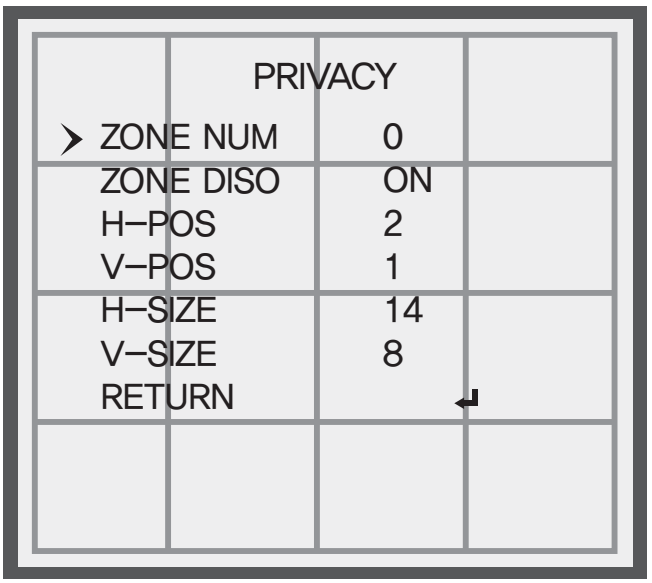
• SHARPNESS : Control 0 to 10 by right and left button.

• DEFOG : MODE (AUTO / MANUAL), LEVEL (LOW / MIDDLE / HIGH)

• MIRROR / FLIP : You can select function by using LEFT or RIGHT button.

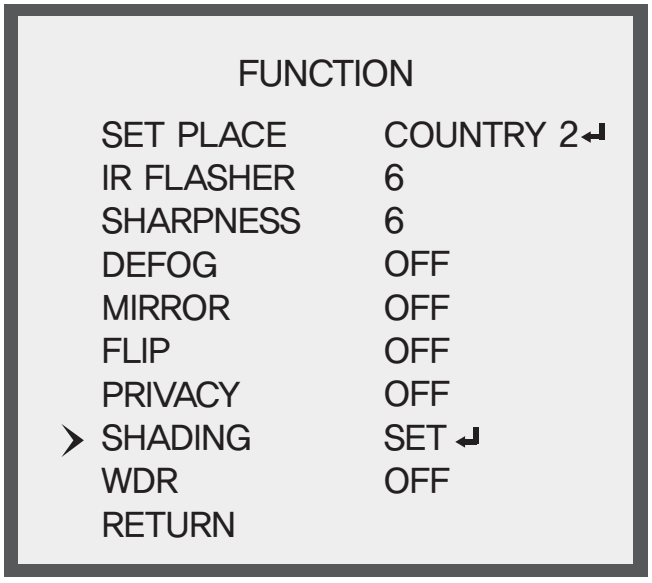
• PRIVACY : This modes conceals the areas you do not wish to appear on the screen.

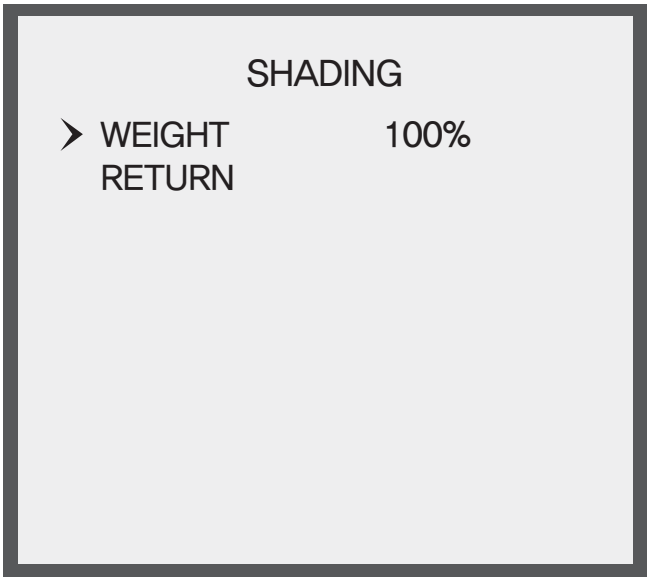




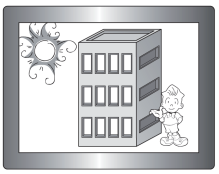
- ZONE NUM : Select the region to apply Privacy (0~15)
- ZONE DISP : you can select (ON/OFF)
- H-POS : You can move the position of the range that you selected in the ZONE NUM to Left and Right.
- V-POS : You can move the position of the range that you selected in the ZONE NUM to Up and Down.
- H-SIZE : You can increase and decrease the size of the range that you selected in the ZONE NUM horizontally.
- V-SIZE : You can increase and decrease the size of the range that you selected in the ZONE NUM vertically.

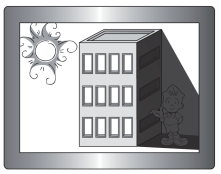
• SHADING : When using wide angle lens, you can compensate darkness of corner on the screen.



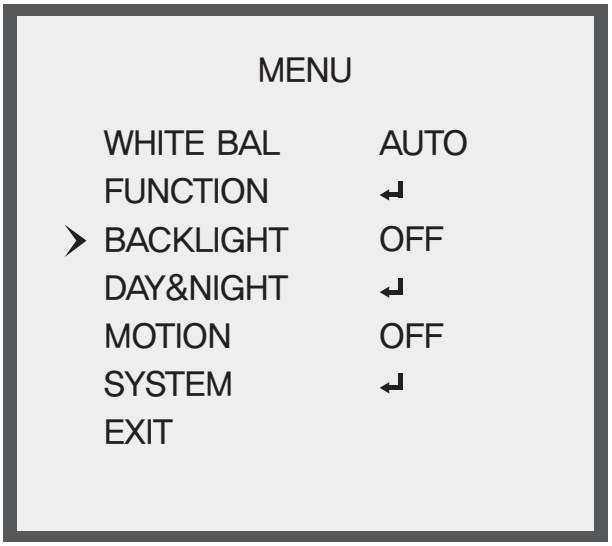


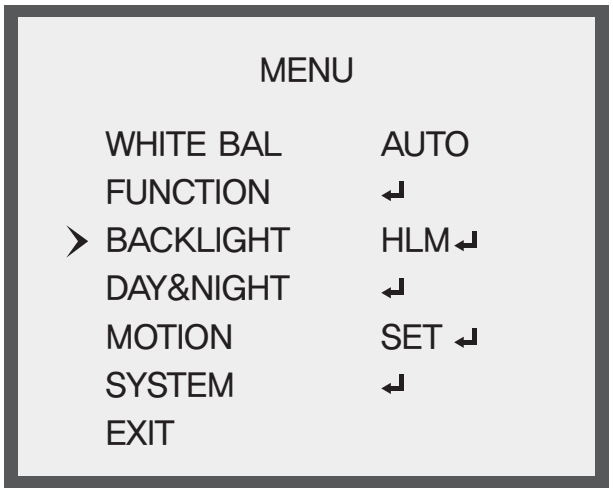
• WDR (Wide Dynamic Range) : OFF / LOW / MIDDLE / HIGH
By using the WDR function, you can distinguish object in the dark.

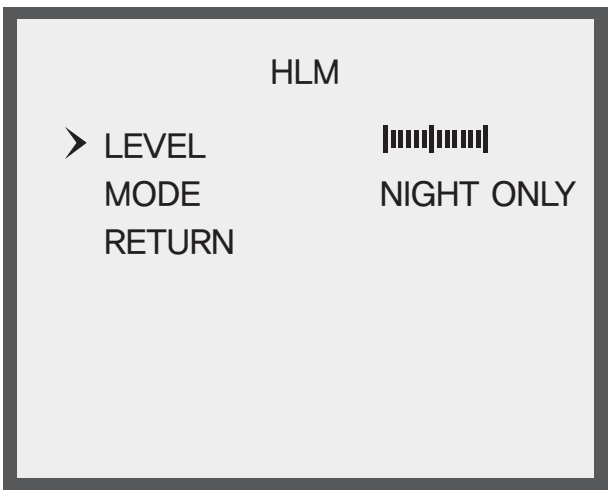

WDR (ON)


WDR (OFF)

BACKLIGHT

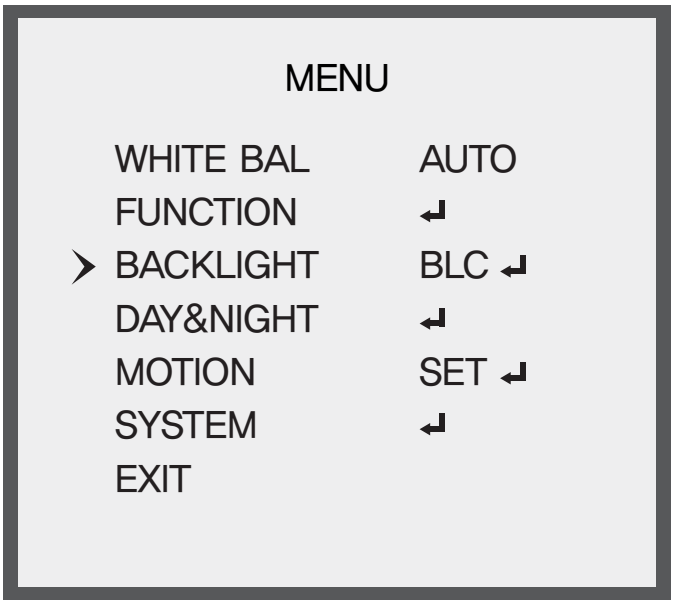


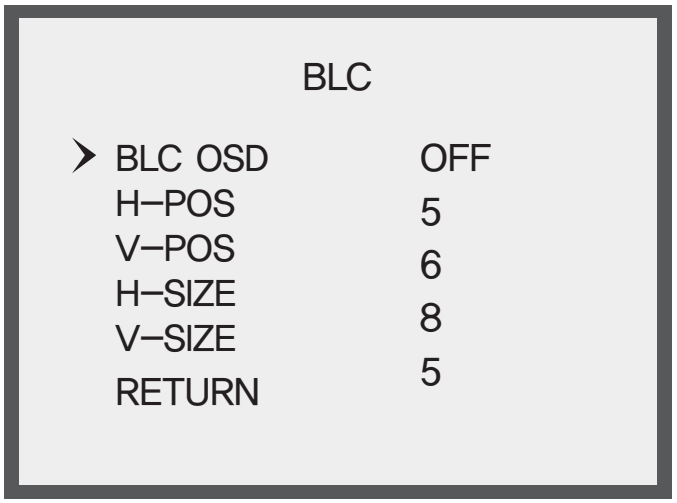


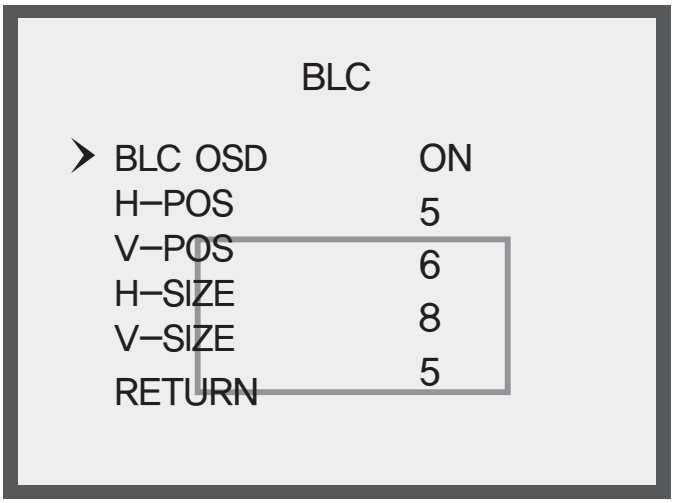


• HLM (High Light Mask)
Function is being prevented against headlights of vehicle effectively. it is the most suitable function to see license plates at night.

- LEVEL: You can set the level point of HLM
- MODE :you can select (NIGHT ONLY / ALL DAY)





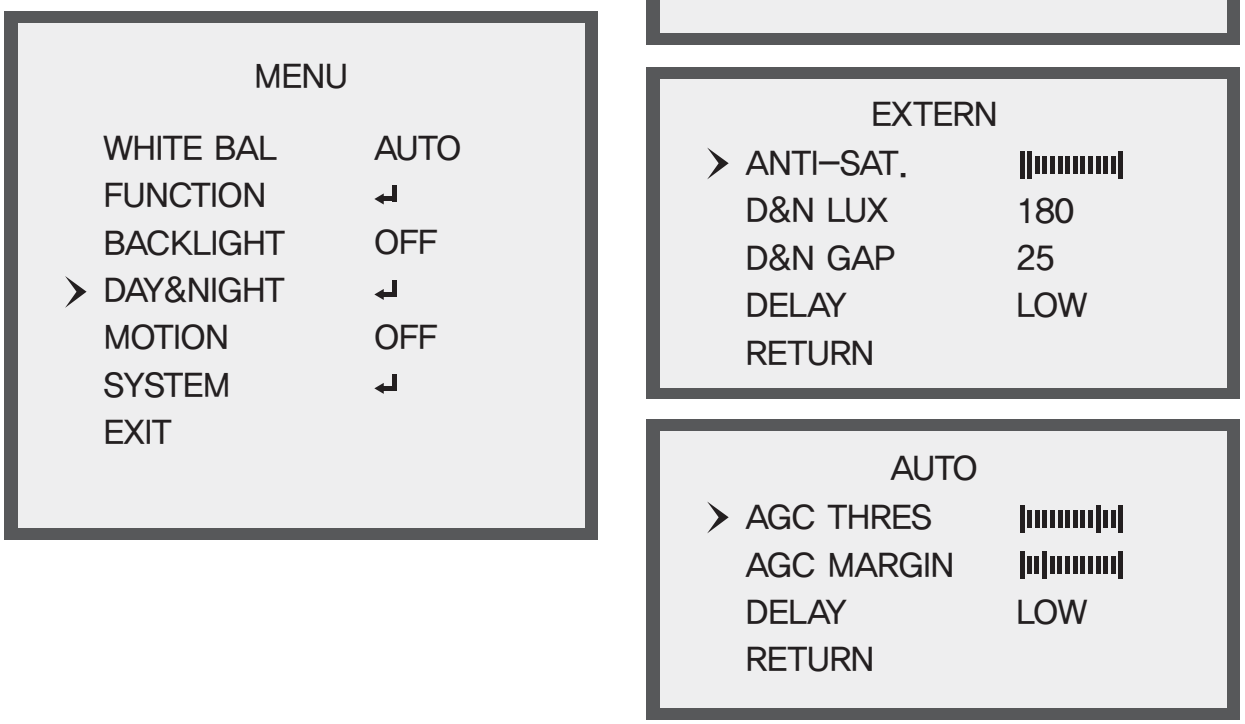


BLC (Backlight Compensation)

When there is a strong backlight behind the object, clear images of the background as well as the object can still be obtained by using BLC function

- BLC OSD : The area to apply the BLC function is shown in BOX shape.
- H-POS : You can move the range to apply BLC to Left and Right
- V-POS : You can move the range to apply BLC to Up and Down
- H-SIZE : You can increase and decrease the size of the range to apply BLC horizontally.
- V-SIZE : You can increase and decrease the size of the range to apply BLC vertically.

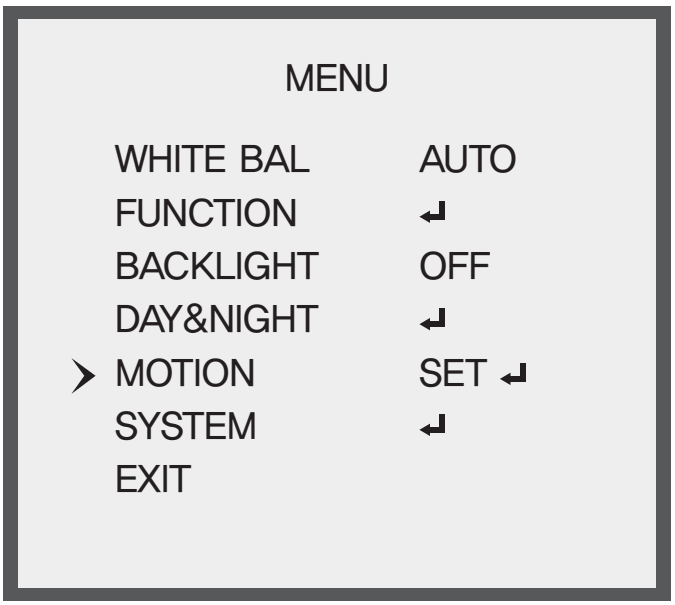
DAY & NIGHT



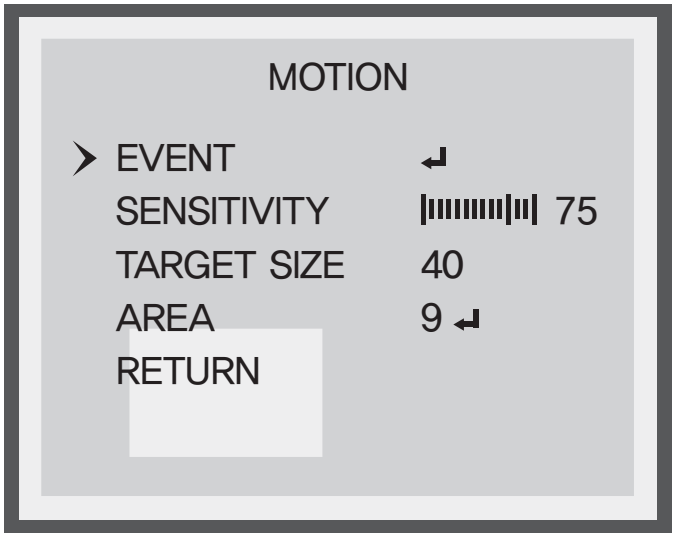
- AUTO : The camera will automatically show color image in high lux and black / white image in low lux.
  - AGC THRES : It controls gain level for changing Day 〉 Night mode.
  - AGC MARGIN : It controls gain level for changing Night 〉 Day mode.
  - DELAY : D&N change on continual time condition set Day 〉 Night or Night 〉 Day. (HIGH, MIDDLE, LOW)
- COLOR : This picture is always displayed in color.
- B&W : The picture is always displayed in black ond white. You can turn on or off the burst signal on B/W mode.
- EXTERN : Select this when the color is controlled by CDS sersor.
  - ANTI-SAT. : As Smart IR function, the smaller ANTI-SAT setting value, the weaker Smart IR function.
    REACT-RATE↵(2~20 (10)) : You can set the SMART IR reaction speed from 2 to 10.
    Higher values makes reaction speed faster.
  - D&N LUX : It controls gain level for changing Day 〉 Night mode. (0~255)
  - D&N GAP : It controls gain level for changing Night 〉 Day mode. (0~255)
  - DELAY : D&N change on continual time condition set Day 〉 Night or Night 〉 Day. (HIGH, MIDDLE, LOW)

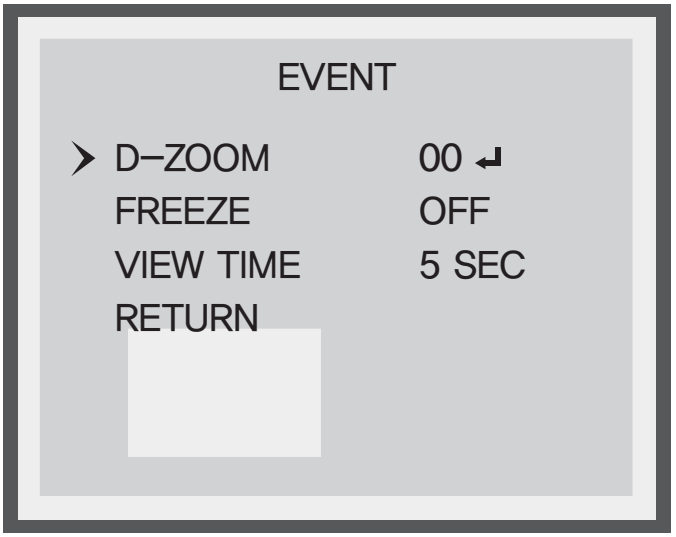
MOTION

Function of MOTION can designate the range of the user to detect the movement on the screen and adjust the size of the area. So, you can monitor the movement of an object on the given region more efficiently



- OFF : MOTION mode is cancelled.
- SET : Any motion in the selected areas is observed. (MOTION ZOOM, SENSITIVITY, TARGET SIZE, AREA)





EVENT

– D–ZOOM : You could set from "0" to "70" and D-Zoom is operated to the setting value when the moving is detected.

– FREEZE : The video can be sropped. (When set this function, zoom function isn't worked.)

– AE FLASHER : You can choose whether to use the multi–shutter. Or to fix the electronic shutter.

– VIEW TIME : D–ZOOM, FREEZE, and AE FLASHER set the amount of time to operate.

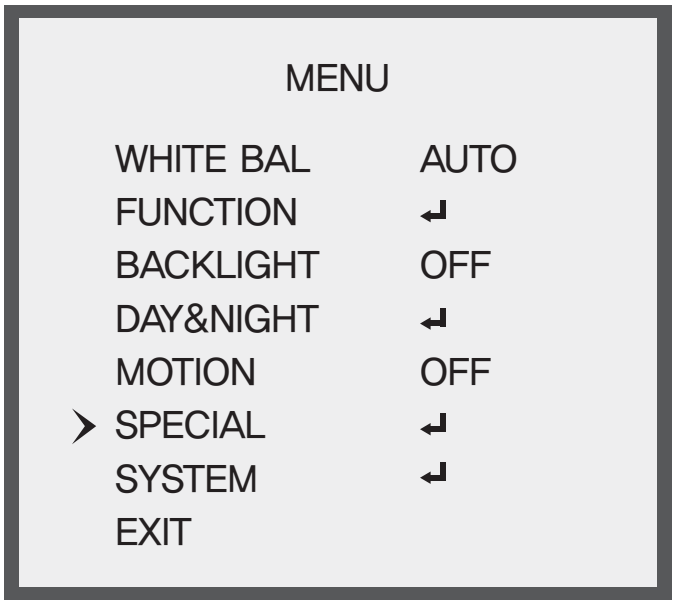
SENSITIVITY : Set the sensitivity of the moving detection.

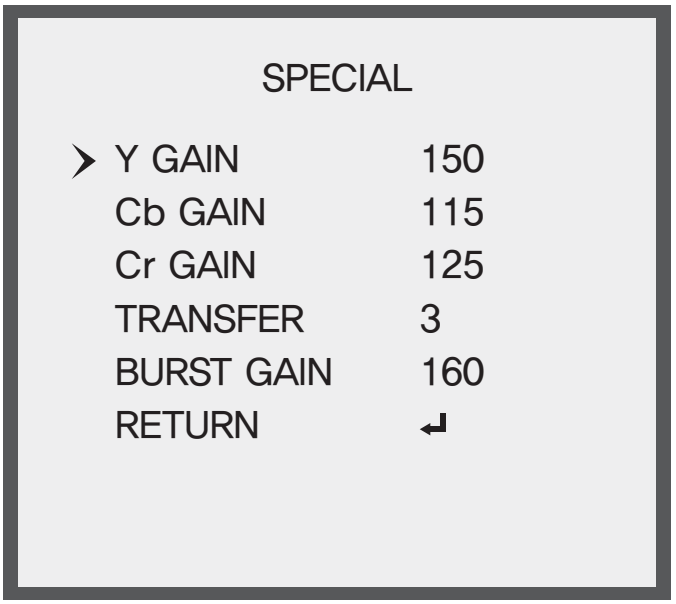
TARGET SIZE : Set the target thing size to detect the moving.
(To prevent malfunction of raindrops, it is necessary to set 40 or more.)

AREA : Select the range to apply motion (16 Zone)
The size and position of the MOTION area are adjusted in control window of H–POS, V–POS, H–SIZE, and V–SIZE.

SPECIAL

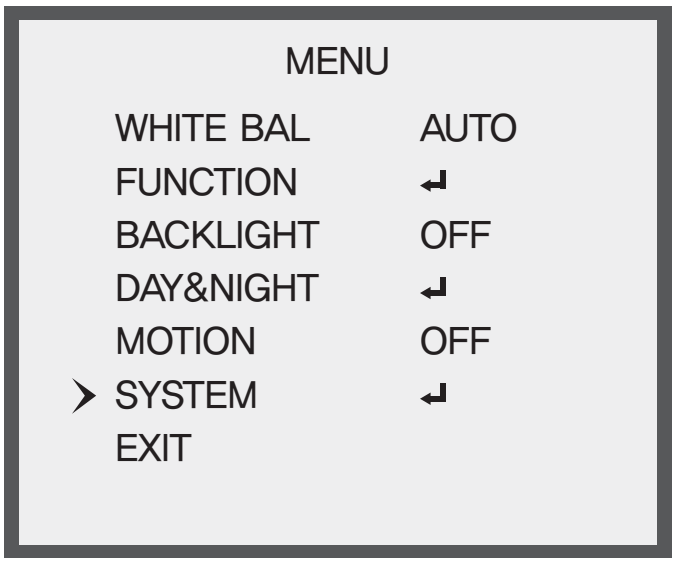
Y GAIN, Cb GAIN, Cr GAIN, TRANSFER, BURST GAIN, RETURN control can be selected.

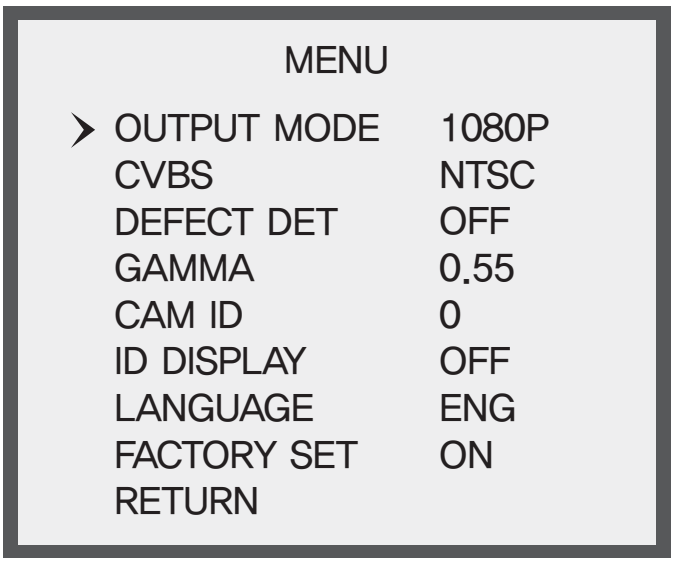




- Y GAIN : You can set the level point of Y GAIN (0~255)
- Cb GAIN : You can set the level point of Cb GAIN (0~255)
- Cr GAIN : You can set the level point of Cr GAIN (0~255)
- TRANSFER : You can set the level point of TRANSFER (0~7)
- BURST GAIN : ou can set the level point of BURST GAIN (0~239)

SYSTEM





OUTPUT MODE : You can select. (1080p / 720p / 720p crop)
CVBS : You can select. (NTSC / PAL)
DEFECT DET
- OFF : DEFECT DET mode is off.
- ON : Close the lens to block the light.
  Adjust left & right buttons and press "SET" button to automatically start the mode.

GAMMA : You can select. (0.45 / 0.50 / 0.55 / 0.60 / 0.65)
CAM ID : You can select camera ID from 0 to 255 when using remote control.
ID DISPLAY : You can select ID ON or OFF.
LANGUAGE : ENG, KOR, CHN, CHN(S), KPN
FACTORY SET : Factory initialize.

EXIT

- Saves all the setting menus and then exits.

PROTOCOL

Communication Protocol

- Format : Async, 1 start bit, 8 bit , none parity, 1 stop bit
- Mode : Full Duplex
- Baudrate : 9600bps
- delay : 100ms

Command Structure

Byte	Name	Description	RETURN
0	STX	Sync byte = 0xa0	STX
1	CMD1	Command byte1	CMD1
2	CMD2	Command byte2, Write(W) = 0x02, Read(R) = 0x01.	CMD2
3	DATA1	0x00	DATA1
4	DATA2	Value	RETURN VALUE
5	CS	Check Sum	UPDATE CS

Checksum Calculation

1. CS = STX + CMD1 + CMD2 + DATA1 + DATA2
2 If calculated value is more than 256, the rest taken the 256 off is CS value.

Command Define

COMMAND	STX	CMD1	CMD2	DATA1	DATA2	CS	NOTE
Color/Bw/Night	0xa0	0x21	W/R	0x00	Value	CS	Day & Night operation mode Setting
	Extern(3),bw(2), color(1),auto(0) , default 3						
Smart IR Level	0xa0	0x22	W/R	0x00	Value	CS	Smart IR setting
	0~20, default 0						
D&N LUX	0xa0	0x23	W/R	0x00	Value	CS	"Illumination Setting switching Day to Night
	0~255, default 180						
D&N GAP	0xa0	0x24	W/R	0x00	Value	CS	Intensity Interval Setting changing Night to Day
	0~255, default 25						
D&N Delay	0xa0	0x25	W/R	0x00	Value	CS	Time Setting changing Day to Time
	0(low), 1(middle), 2(high) default 0						
WDR	0xa0	0x26	W/R	0x00	Value	CS	Backlight Mode Setting
	0(off), 1(Low), 2(Middle), 3(High),default 0						

COMMAND	STX	CMD1	CMD2	DATA1	DATA2	CS	NOTE
BLC/HLC	0xa0	0x27	W/R	0x00	Value	CS	Backlight Mode Setting
	0(off), 1(hlc), 2(blc), default 0						
IR FLASHER	0xa0	0x28	W/R	0x00	Value	CS	IR LED blink rate Setting
	0~5 단계별 깜박임 속도 변경 , 6 : 항상 ON, default 1						
SET PLACE	0xa0	0x2A	W/R	0x00	Value	CS	Monitored objects speed Setting
	2(10K미만), 3(30K미만), 4(60K미만), 5(80K미만),6(80K이상),default 3						
NTSC/PAL	0xa0	0x2B	W/R	0x00	Value	CS	Analog signal Setting
	0(PAL), 1(NTSC)						
IMAGE SCALE	0xa0	0x2C	W/R	0x00	Value	CS	–
	0(FULL), 1(COMP), 2(USER), default 2						
USER SCALE SET	0xa0	0x2D	W/R	0x00	Value	CS	–
	0~20, default 4						
CAM ID	0xa0	0x30	W/R	0x00	Value	CS	Camera ID Setup
	0 ~ 255, default 0						
ID DISPLAY	0xa0	0x31	W/R	0x00	Value	CS	Showing Camera ID
	0(off), 1(on), default 0						
Motion Set	0xa0	0x32	W/R	0x00	Value	CS	Setting the motion mode
	0(on), 1(off), default 0						
Motion Senstive	0xa0	0x33	W/R	0x00	Value	CS	The sensitivity setting of the motion detection
	10 ~ 80, default 40					W	
Motion Target Size	0xa0	0x34	W/R	0x00	Value	CS	Size setting of the motion detection
	0 ~ 255 , default 20					W	
AREA Select	0xa0	0x35	W/R	0x00	Value	CS	Select the motion detection area
	0 ~15, default 9						
AREA X POSITION	0xa0	0x36	W	0x00	Value	CS	Motion-detection area horizontal position
	(0~60)						
AREA Y POSITION	0xa0	0x37	W	0x00	Value	CS	Motion-detection area vertical position
	(0~40)						
AREA X SIZE	0xa0	0x38	W	0x00	Value	CS	Motion detection area horizontal size
	(0~60)						

COMMAND	STX	CMD1	CMD2	DATA1	DATA2	CS	NOTE
AREA Y SIZE	0xa0	0x39	W	0x00	Value	CS	Vertical movement detection zone size
	(0~40)						
Event D-Zoom	0xa0	0x3A	W/R	0x00	Value	CS	EVENT move the zoom setting
	Zoom 설정 (0x00 ~ 0x7F), default 0					W	
Event FREEZE	0xa0	0x3B	W/R	0x00	Value	CS	EVENT movement freeze setting (when the feature set Zooming None)
	0(on), 1(off), default 0					W	
Event View Time	0xa0	0x3D	W/R	0x00	Value	CS	Set EVENT operating time
	Zoom View Time (1 ~ 7SEC), default 5					W	
OSD Key Input	0xa0	0x41	W	0x00	Value	CS	Camera OSD KEY operation
	Enter(0), Up(1), Down(2), Left(3), Right(4)						
DNR	0xa0	0x42	W/R	0x00	Value	CS	-
	0(off), 1(low), 2(middle), 3(high) default 2						
Flip	0xa0	0x43	W/R	0x00	Value	CS	Vertical image inversion
	0(on), 1(off), default 1						
Mirror	0xa0	0x44	W/R	0x00	Value	CS	Horizontal image inversion
	0(off), 1(on), default 0						
Gamma	0xa0	0x45	W/R	0x00	Value	CS	-
	0 ~ 4, default 2						
SENS UP	0xa0	0x46	W/R	0x00	Value	CS	-
	0(off), 1(2x), 2(3x), 3(4x), 4(5x), 5(6x), 6(7x), 7(8x) default 0						
Bright	0xa0	0x47	W/R	0x00	Value	CS	-
	0~20, default 3						
Sharpness	0xa0	0x48	W/R	0x00	Value	CS	-
	0~10, default 6						
Defog	0xa0	0x49	W/R	0x00	Value	CS	Fog compensation setting
	0 (OFF), 1(ON), default 0						
Agc	0xa0	0x4A	W/R	0x00	Value	CS	-
	0~20, default 20						
Output Resolution On 2M Sensor	0xa0	0x50	W/R	0x00	Value	CS	Resolution setting
	0(1080p_30P), 1(720p_60P), 2(720p_30P)						

COMMAND	STX	CMD1	CMD2	DATA1	DATA2	CS	NOTE
Save Configuration	0xa0	0x51	W	0x00	Value	CS	SAVE setting
	EEPROM SAVE 명령						
DayNight Status	0xa0	0x52	R	0x00	Value	CS	Day & Night Status
	0(NIGHT), 1(DAY)						
IR LED Check	0xa0	0x53	W	0x00	Value	CS	OK IR LED operation
	0(off), 1(on), default 0						
F/W Version	0xa0	0x54	R	0x00	Value	CS	Firmware Version check
	Read Only, ex) DL = 0x42(B Version)						
Factory Set	0xa0	0x55	W	0x00	Value	CS	Factory Set
	Write Only						

MEMO