

INSTALLATION / OPERATING MANUAL

# FULL HD MEGA-PIXEL RUGGED IR PTZ CAMERA

P/N : 388062510  
PRINTED IN KOREA

*Distributed by*



Before attempting to connect or operate this product,  
please read these instructions carefully and save this manual for future use.

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## 1. INFORMATION FOR USER

### 1.1 WARNING

TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS PRODUCT TO RAIN OR MOISTURE. DO NOT INSERT ANY METALLIC OBJECTS THROUGH THE VENTILATION GRILLS OR OTHER OPENINGS ON THE EQUIPMENT.



**CAUTION**  
RISK OF ELECTRIC SHOCK  
DO NOT OPEN



**CAUTION :** TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK). NO USER SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

### 1.2 EXPLANATION OF GRAPHICAL SYMBOLS



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.

### 1.3 FCC COMPLIANCE STATEMENT

**FCC 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. 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.

### 1.4 CE COMPLIANCE STATEMENT

**WARNING** - This is a CLASS A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

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

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

## 2. PRECAUTIONS

### ■ Do not install the camera in extreme temperature conditions.

Do use the camera under conditions where temperatures are within -20°C to 50°C (in continuous operation). Under high temperatures, ensure proper ventilation.

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

It can cause the image quality to be poor.

### ■ Do not install the camera under unstable lighting conditions.

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

### ■ Never use the camera close to a gas or oil leak.

It can cause malfunctions to occur.

### ■ Do not disassemble the camera.

There are no user-serviceable parts inside it.

### ■ Do not drop the camera or subject them to physical shocks.

It can cause malfunctions to occur.

### ■ Do not allow direct sunlight into the camera.

It can damage CCD.

### ■ Do not expose the camera to rain or spill beverages on it.

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

### ■ To prevent electric shock and risk of fire hazards.

### ■ Do not use power sources other than that specified.

### ■ Note

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

## 3. FEATURES

### **S**pecially useful for Police car and other special application

This stable and reliable design makes ideal for car application such as traffic monitoring, car surveillance.

### **A**uto-focus 20X Optical Zoom

The built-in 20X optical zoom lens with auto-focus is combined with a 12X digital zoom(20x), providing a maximum of 240X zoom.

### **3**60° Endless Pan Rotation (15° to 270° Tilt Angle)

### **W**ide Range Auto functions

**Preset** : Up to 63 programmable Presets.

**Tour** : Up to 8 programmable Tours consisting of presets with individual dwell time.

**Scan** : Repeatedly pan & tilt operating between two positions. (Max.4)

**Pattern** : Up to 2 programmable Patterns memorized the PTZ movement.

**Alarm** : Move the camera to programmed Preset position with Alarm trigger.(Max.2)

**Area** : Up to 4 programmable Areas display set.

### **B**uilt-in Fan & Heater

### **T** rue Day & Night (ICR Filter Change)

The IR cut filter is on when the camera is operating as a color camera for precise color reproduction. With ICR, the filter is removed which allows for much greater light sensitivity in monochrome mode.

### **O**SD (On Screen Display)

The camera IDs, camera preset numbers, preset names, area names and camera operation status are displayed on the monitor, allowing set up of various camera functions through the OSD menu screen.

### **M**echanical Auto Flip

### **W**DR (Wide dynamic range)

The Camera delivers clear, high quality pictures even in backlight, by increasing exposure in dark areas while decreasing it in bright areas a corrected image with clear details results (only 36X Zoom Series).

### **V**ariable speed Pan/Tilt control

In manual mode, sophisticated operating is possible at zoom in state by speed correcting function.

### **L**ight Function

It's builtin 12 Pcs IR LED, So it provides visible distance up to 120m in dark.

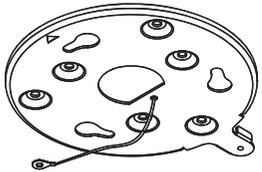
### **C**ompact Size

Even though this camera has built-in 26X/36X optical zoom and LED, it's size is very compact (Refer to the 42~43 pages). So it doesn't spoil beauty of city.

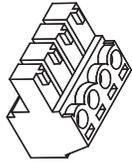
## 4. SETTING & INSTALLATION

### 4.1 Unpacking

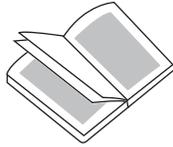
Base plate bracket



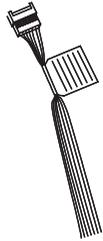
4PIN Plugable Terminal Block



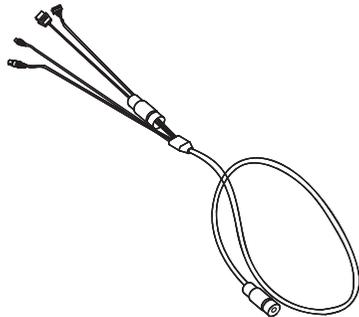
Manual



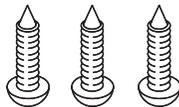
Alarm Cable



Main Cable



Screws

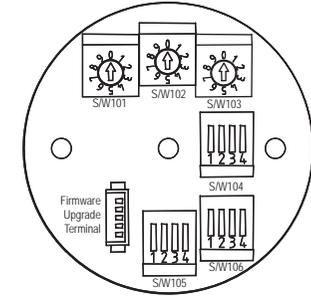
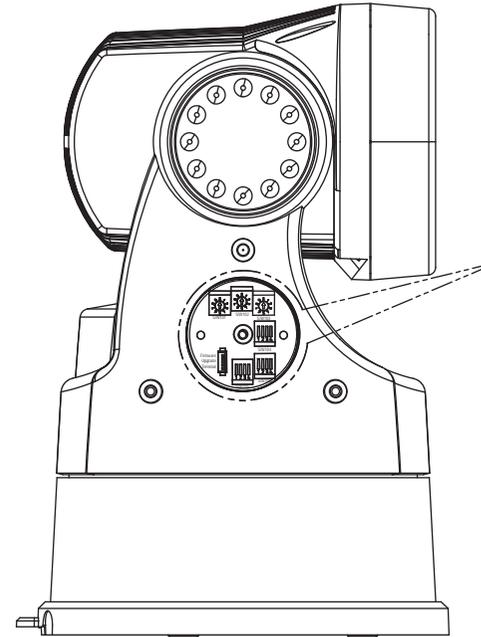


1. BH 3 x 6 (Screw for base plate with camera)
2. TH 3 x 6 (Screw for safety cable)

8 x 38 (Screw to fix the base plate bracket)

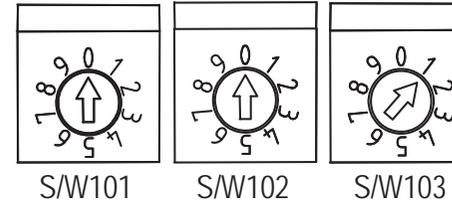
### 4.2 DIP Switch Setting

Before start up the camera, set the protocol, camera address and details with dip-switches referring to the follows.



Open the left side of cover and set the camera

#### Camera ID (ADDRESS)

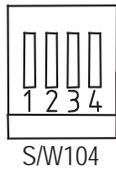
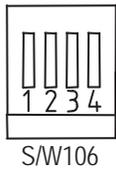
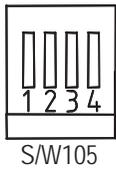


S/W101 : 100 digit of ID  
S/W102 : 10 digit of ID  
S/W103 : 1 digit of ID

**Ex) S/W101=0, S/W102=0, S/W103=1**  
Address=001

Each camera must have a unique address(ID). Identical IDs on the same line may damage the control circuit caused by an electronic short.

### DIP switch



PROTOCOL	S/W105-1	S/W105-2
WTX (WONWOO)	OFF	OFF
PELCO-D	OFF	ON
WPP (PELCO-P)	ON	OFF

VIDEO MODE	S/W106-4
TOP	OFF
BOTTOM	ON

BAUDRATE	S/W105-3	S/W105-4	S/W106-1
2400bps	OFF	OFF	OFF
4800bps	OFF	OFF	ON
9600bps	OFF	ON	OFF
19200bps	OFF	ON	ON
38400bps	ON	OFF	OFF
57600bps	ON	OFF	ON
115200bps	ON	ON	OFF

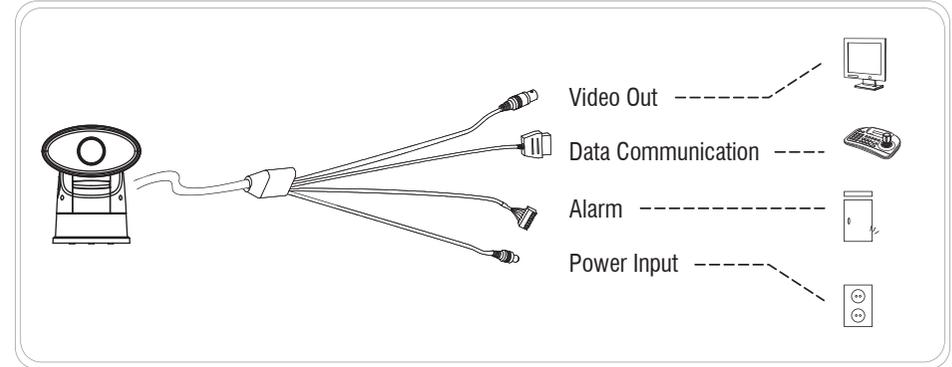
CAM MODE	S/W106-2	S/W106-3
EH	OFF	OFF
MM	OFF	ON
NC	ON	OFF
NC	ON	ON

OUTPUT FORMAT	S/W104-1	S/W104-2	VIDEO MODE	S/W104-3
1920 x 1080 p 30	OFF	OFF	NTSC	OFF
1920 x 1080 i 60	OFF	ON		
1280 x 720 p 60	ON	OFF		
1920 x 1080 i 59	ON	ON	PAL	ON
1920 x 1080 p 25	OFF	OFF		
1920 x 1080 i 50	OFF	ON		
1280 x 720 p 50	ON	OFF		

RS MODE	S/W104-4
RS485	ON
RS422	OFF

## 4.3 Cable Connection

### 4.3.1 Basic Diagram of Cable Connection



### 4.3.2 Video Output Connection

Connect the video out (BNC) connector to the monitor or video input of DVR.

### 4.3.3 RS-485 / RS-422 Communication Connection

Rugged IR PTZ camera can be remotely controlled by an external device or control system, such as a control keyboard or DVR, using RS-485 half-duplex, RS-422 duplex or simplex serial data communication signals. After inserting 4pin pluggable terminal block of accessory package to green port of main cable, then connect marked RX+, RX- to TX+, TX- of the RS-485 control system. If control system is RS-422, connect TX+, TX- of controller to RX+, RX- of the camera. And also connect the TX+, TX- of camera to RX+, RX- of the control device respectively. Total length of the cable for communication should not exceed 1.2Km.

### 4.3.4 Alarm Connection

Rugged IR PTZ camera can operate specific motion receiving external Alarm Device(Sensor)'s signal (Max 2 Alarm.) Connect the alarm cable to external Alarm Device referring to below.

- Brown color line : Ground / Black & Red color lines : Alarm 1 & 2.

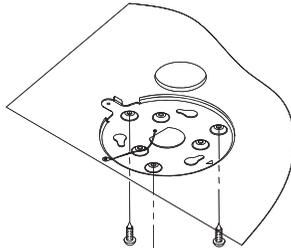
### 4.3.5 Power Connection

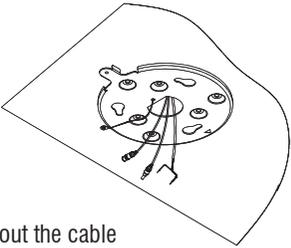
- After connecting above 3 connections(Video/Data Communication/Alarm), connect the power cable finally.
- Connect the power of DC 12V, 1.5A to this camera.
- Use certified Class 2 power supply transformer only.

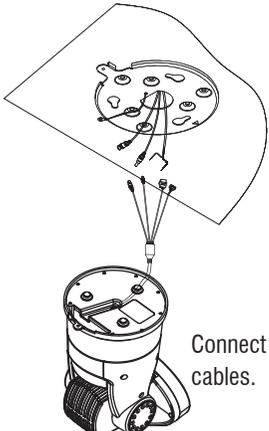
## 4.4 Installation

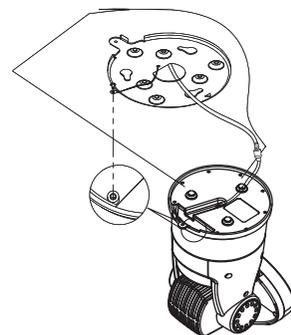
- The following steps of installation and connection work should be done by qualified service personnel or system installers and should confirm to all local codes.
- Be sure to switch the camera off before installation is completed.
- Do not install the camera near the air outlet of an air conditioner.
- Before installation, set camera system with Dip-switches on the 7~8 pages.

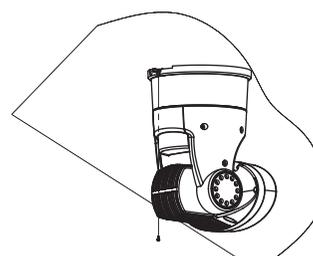
### 4.4.1 Typical Installation

- 

Fix the base plate after make holes on the ceiling.
- 

Pull out the cable where the camera will be installed.
- 

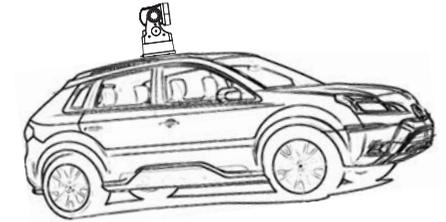
Connect the main cables.
- 

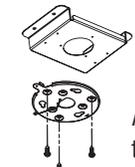
Connect the safety wire to the camera base and base plate using enclosed screws(TH 3x6).
- 

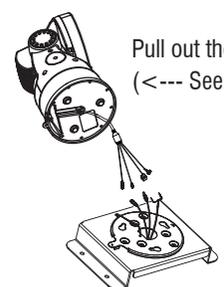
Fix the screw(BH 3x6) after fix the camera on the ceiling.

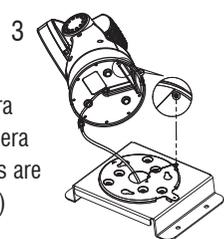
### 4.4.2 Installation for vehicle application

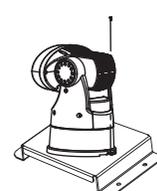
To install Rugged IR PTZ Camera to Vehicle, Bracket must be needed.  
This bracket is provided optionally. (WCA-VB1)

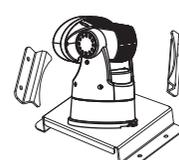


- 

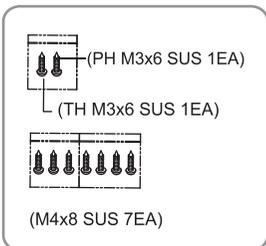
Attached the camera base plate to the bracket base plate by using M4x8 SUS screws.
- 

Pull out the cable from the hole of bracket base plate and connect with camera. (<--- See picture No.2)
- 

Connect the safety wire of camera base plate to the bottom of camera by using TH3x6 screws.(Screws are enclosed in the accessory pack)
- 

Fix the serew(PH3x6) with the camera body and camera base plate. (Screws are enclosed in the accessory pack)
- 

Attach the guide plate to the bracket base by using M4x8 screws.

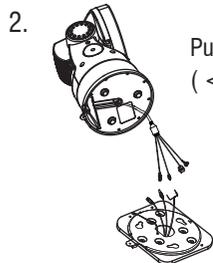
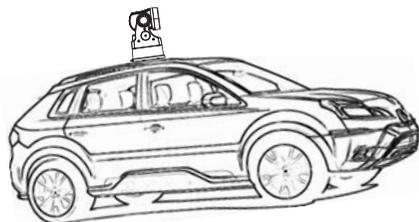


### 4.4.3 Installation for vehicle application

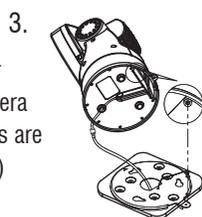
To install Rugged IR PTZ Camera to Vehicle, Bracket must be needed.  
This bracket is provided optionally. (WCA-VB2)



1. Attached the camera base plate to the bracket base plate by using M4x8 SUS screws.



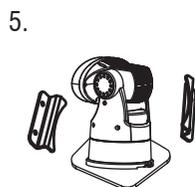
2. Pull out the cable from the hole of bracket base plate and connect with camera. ( <--- See picture no.2)



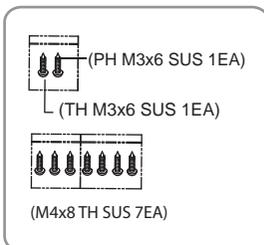
3. Connect the safety wire of camera base plate to the bottom of camera by using TH3X6 screws. (Screws are enclosed in the accessory pack)



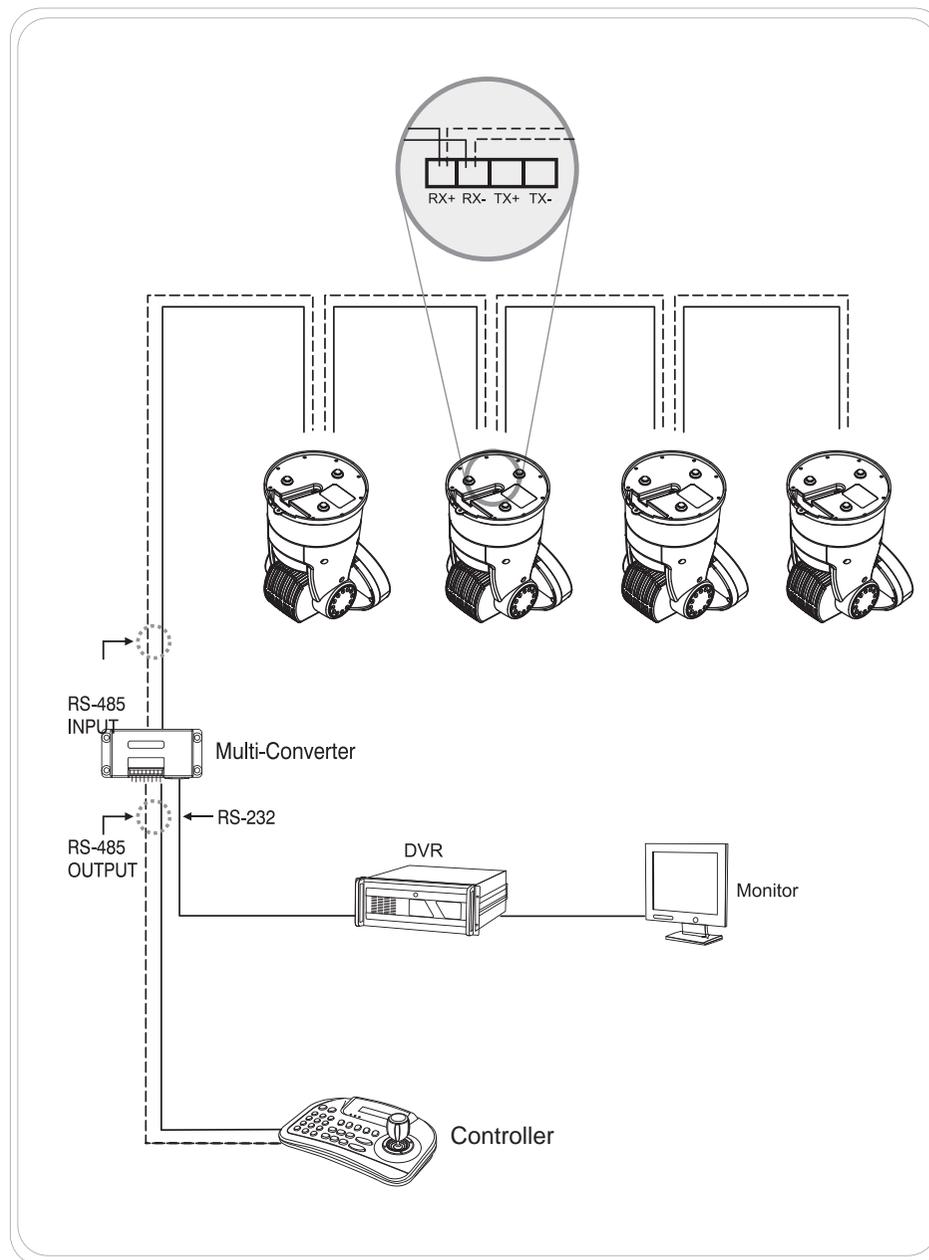
4. Fix the screw (PH 3x6) with the camera body and camera base plate. (Screws are enclosed in the accessory pack)



5. Attach the guide plate to the bracket base by using screws. ( M4x8 TH / M4 SPRING W/S )

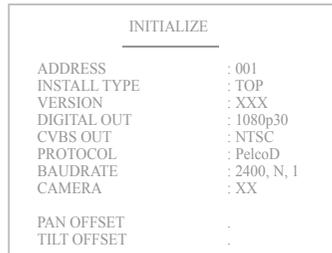


### 4.5 Basic Configuration of the System



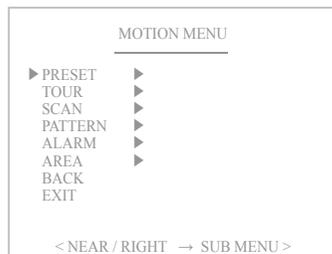
## 5. MAIN SETUP MENU

### 5.1 Initialize



When the device is powered on, you can check the address, version, protocol and video setting values.

### 5.2 Motion Setting



#### MOTION MENU

The preset function is that the camera memorizes positions of the pan/tilt and zoom. This function is a representative function of the speed dome which can find memorized preset positions just by selecting the preset number.

### 5.2.1 PRESET

A Maximum of 63 Preset positions are toured in order.

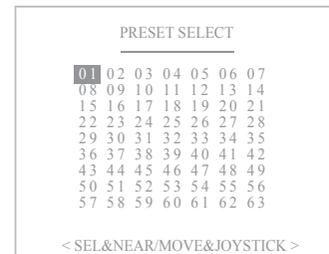


Move : Select : or Delete : or

It's available to set the desired label, displayed on the executing screen of Preset.

After the label is set, push the NEAR button to exit.

#### PRESET NO



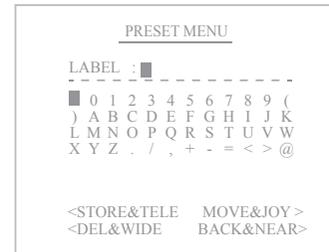
- 1 Select the Position menu
- 2 Move and set the position



- 3 Set & Back



#### LABEL

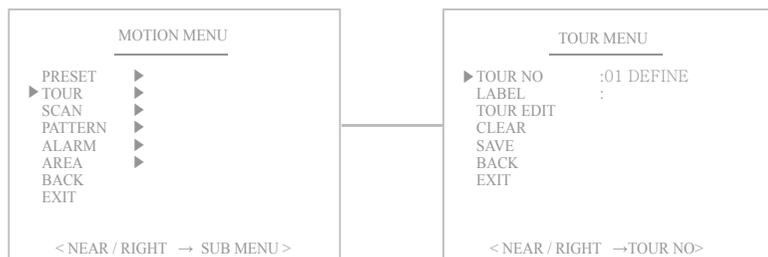


#### Define the Preset position

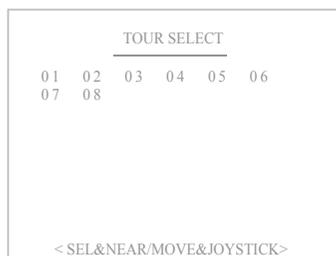


## 5. 2. 2 TOUR

The Tour function consists of several presets run by turn.  
Maximum of 8 Tour functions are toured in order.



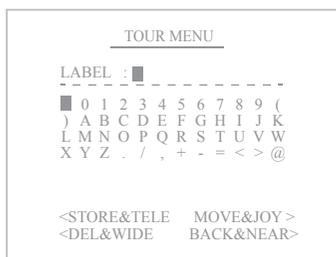
### TOUR NO



Select the Tour number

Move : Select :

### LABEL



Set the Tour Label

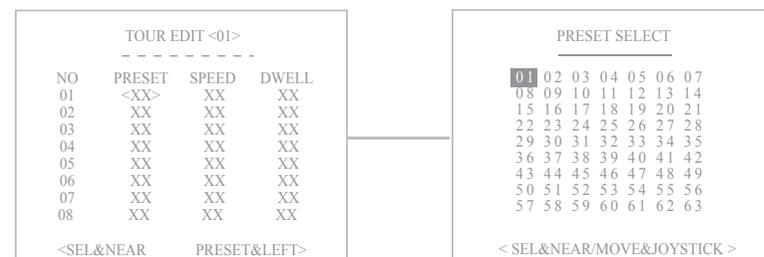
Move : Select : or

Delete : or

It's available to set the desired label, displayed on the executing screen of Tour.

After the label is set, push the NEAR button to exit.

### TOUR EDIT



Define the Preset position

- ① Move to the set-up window
- ② Move and set the position
- ③ Set & Back



## 5. 2. 3 SCAN



The Scan function means that the camera keeps panning between two programmed pan positions. It is also adjusts the moving speed(1~63 step). Maximum 4 Scan functions are toured in order.

## SCAN NO



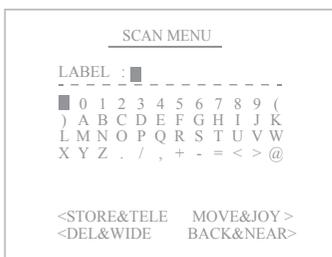
Move :  or  or 

Delete :  or 

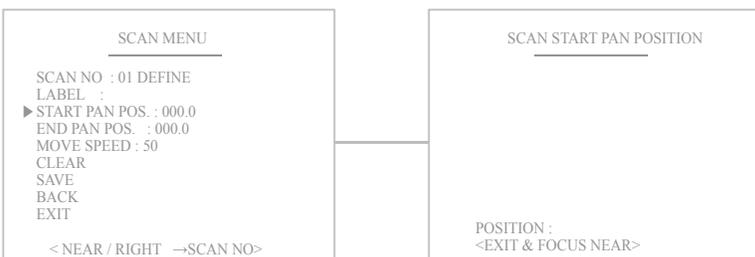
It's available to set the desired label, displayed on the executing screen of Scan.

## LABEL

After the label is set, push NEAR button to go out.

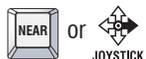


## START POSITION



### Define the Start pan position

① Select Start Pos menu



② Move and set the position



③ Go back



## END POSITION



### Define the End pan position

① Select End Pos menu



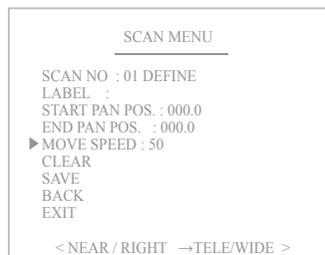
② Move and set the position



③ Go back



## MOVE SPEED



### Set the Scan speed

Increase :  or 

Decrease :  or 

It adjusts the moving speed from 0~63 steps.

※ Select SAVE after scan setting.

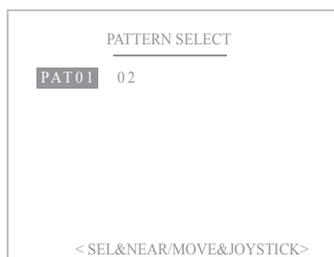
- "Save" above setting data to the memory.
- "CLR" means above setting Pattern data will not be saved and be cleared.
- "BACK" means it goes back to the previous menu.
- "EXIT" means it goes out of the MENU

## 5. 2. 4 PATTERN

The Pattern function memorizes User's random moving path and zoom ratio. Total recording time limit is 90secs and maximum 2 Pattern functions are toured in order.



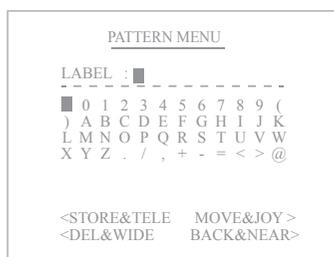
### PATTERN NO



Select the Pattern number

Move : Select :

### LABEL



Set the Pattern Label

Move : Select : or

Delete : or

It's available to set the desired label, displayed on the executing screen of Pattern.

After the label set, push NEAR button to go out.

### RECORD



Record and Save the User's random Pattern data

① Select the "Record" Menu



② Move and record the pattern



③ Set & Back



Play back the recorded Pattern data

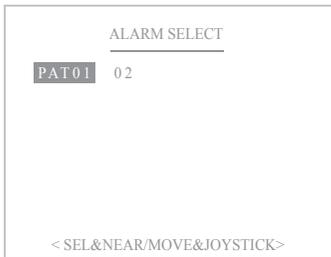
※ PATTERN function is saved automatically.

## 5. 2. 5 ALARM

The Alarm function means that the camera moves to the programmed Preset position by the Alarm trigger. Maximum 2 Alarm functions are toured in order.



## ALARM NO

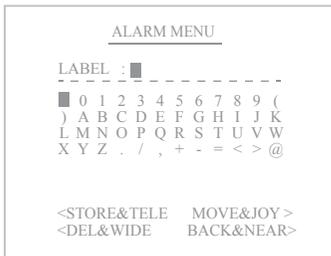


The Alarm function means that the camera moves to the programmed Preset position by the Alarm trigger.

Maximum 2 Alarm functions are toured in order.

Move : Select :

## LABEL



Set the Alarm Label

Move : Select : or

Delete : or

It's available to set the desired label, displayed on the executing screen of Alarm.

After the label is set, push the NEAR button to exit.

## PRESET NO



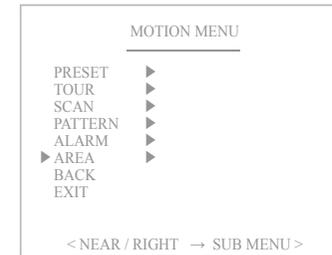
Define the Preset position with Alarm trigger

- 1 Select the "Preset No"
- 2 Move and set the position
- 3 Set & Back

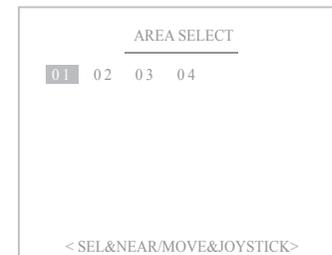


## 5. 2 .6 AREA

The Area function means that it displays the Area name between two programmed pan positions. Maximum 4 Area functions are toured in order.



## AREA NO



Select the Area number

Move : Select :

## AREA



Set the Area Label

Move : Select : or

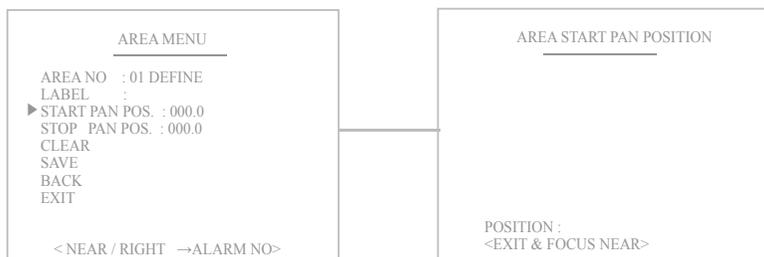
Delete : or

After the label set, push NEAR button to go out.

※ "Save" above setting Alarm data to the memory.

- "Save" above setting data to the memory.
- "CLR" means above setting Pattern data will not be saved and be cleared.
- "BACK" means it goes back to the previous menu.
- "EXIT" means it goes out of the MENU

## START PAN POS



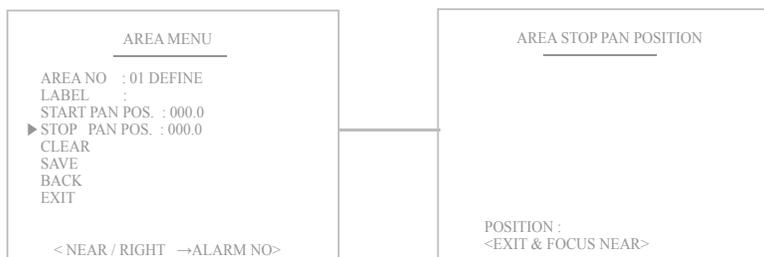
Define the Start pan position

- 1 Select the "Start Pan Pos" menu
- 2 Move and set the position
- 3 Set & Back



※ Camera will move to clockwise direction only when START setting.

## STOP PAN POS



Define the Stop pan position

- 1 Select the "Start Pan Pos" Menu
- 2 Move and set the position
- 3 Set & Back

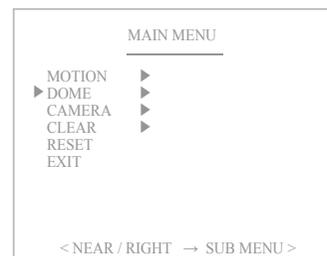


※ "Save" above setting Area data to the memory.

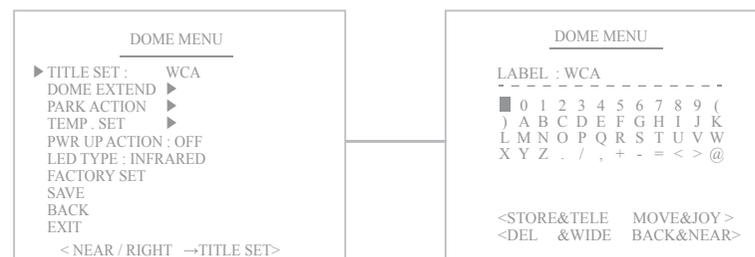
- "Save" above setting data to the memory.
- "CLR" means above setting Pattern data will not be saved and be cleared.
- "BACK" means it goes back to the previous menu.
- "EXIT" means it goes out of the MENU

## 5. 3 DOME Setting

Pan, Tilt, Zoom motion is adjustable in the "Dome Setting" Menu.



### 5. 3. 1 Set the Dome camera title



After the label set, push NEAR button to go out.

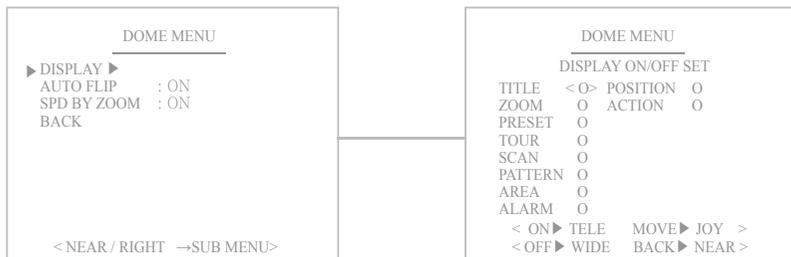
### 5. 3. 2 DOME EXTEND



Additional funtions of DOME MENU.

- DISPLAY
- AUTO FLIP
- SPEED BY ZOOM

## DISPLAY ON/OFF



You can select the OSD ON to shown on the screen or clear by selecting OFF in this function.

OSD ON : OSD OFF : Select :

## AUTO FLIP



You can observe the moving object without reversing of the screen, by using this AUTO FLIP function. ON: If this function is set to ON, camera will be automatically flipped in tilt 90°  
OFF: If this function is set to OFF, tilt movement range is 0~90°

select : or Set ON :

Set OFF :

## SPEED BY ZOOM



When this function is ON, the pan/tilt speed is inversely adjusted to the zoom ratio.

select : or Set ON :

Set OFF :

## 5. 3. 3 PARK ACTION

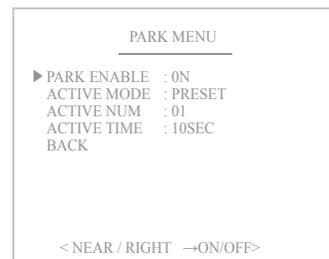


This function enables to locate the camera to specific position automatically if operator doesn't operate the controller for a while.

Move : or Select :

Set :

## PARK ENABLE



Select ON or OFF

Move : or Select :

Set :

## ACTIVE MODE



Select the function which will be back after active time. (PRESET, TOUR)

Move : or Select :

Set :

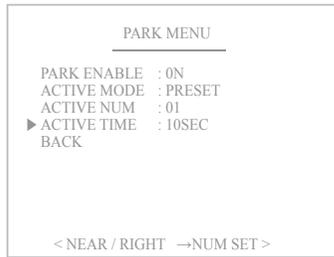
## ACTIVE NUMBER



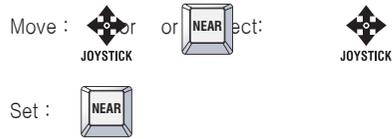
Select the appointed function's Number

- PRESET : 01~63
- TOUR : 01~08

### ACTIVE TIME



Set operating time of PARK ACTION.  
- By 10 sec.(10~60/sec), Max. 2min.



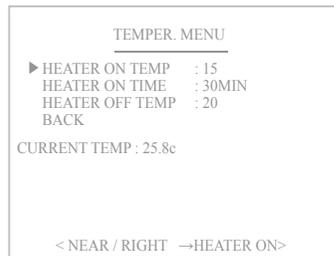
※ This function is not working while Motion function is operating

### 5. 3. 4 TEMP SET

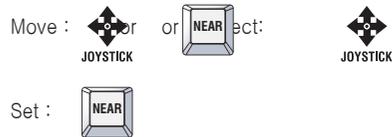


It shows you the current temperature and you can also set the value manually. The compulsory Fan & Heater operation is a useful function to remove humidity.

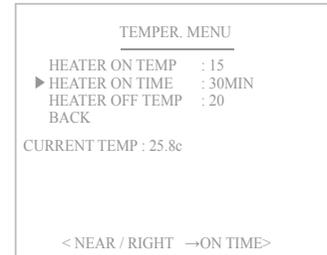
### HEATER ON TEMP



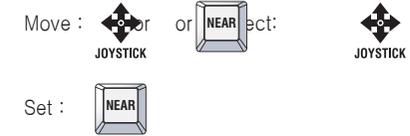
\* Set the operating temperature of the heater.(0~70℃)



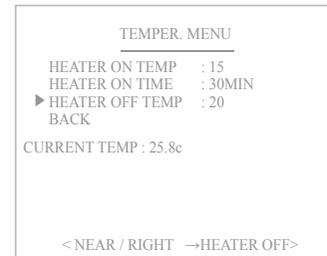
### HEATER ON TIME



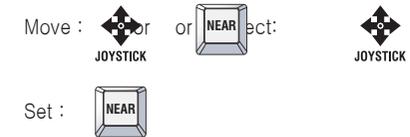
\* Set the operating time of the heater.  
- By 10min. (10~60 min.)



### HEATER OFF TEMP



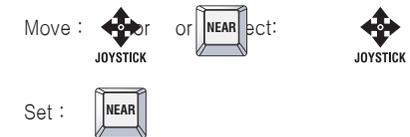
\* Set the temperature of heater OFF. (0~70℃)



### 5. 3. 5 POWER UP ACTION



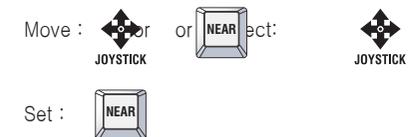
When this function is ON, the camera memorize the latest action and restore it from sudden power failure.



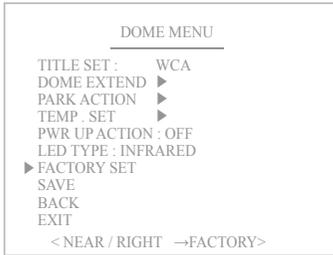
### 5. 3. 6 LED TYPE



Select LED type.  
-> INFRARED(IR), WHITE



### 5. 3. 7 FATORY SET



#### Factory Set

Restore all of setting value to the factory default.



All of existing setting value would be erased.

Move :  or  Select : 

Set : 

※ "Save" above setting data to the memory.

- "Save" above setting data to the memory.

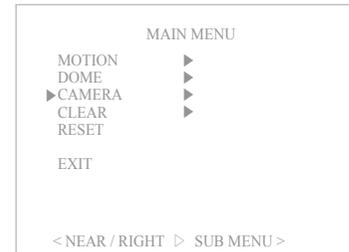
- "CLR" means above setting Pattern data will not be saved and be cleared.

- "BACK" means it goes back to the previous menu.

- "EXIT" means it goes out of the MENU

## 5. 4 Camera Setting

### 5. 4. 1 CAMERA MENU (EH-6300)

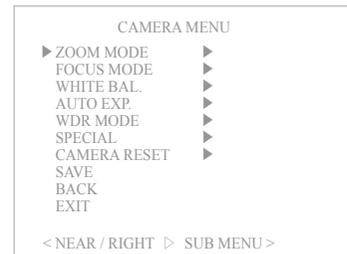


#### CAMERA MENU

- Functions can be set-up using the Camera menu.

In this menu, user can set the zoom, focus, white balance, auto exposure...etc functions.

#### ① ZOOM MODE



Decide using of digital zoom function and select zoom speed.

\* ZOOM SPD : 1 ~ 7steps, USER(standard)

\* D-ZOOM : ON / OFF

#### - ZOOM SPD



ZOOM SPD : Select from 1sept to 7 steps,  
USER (Standard speed)

select :  or  Set ON :  Set OFF : 

#### - D-ZOOM



Decide using of digital zoom function.  
D-ZOOM: ON/ OFF

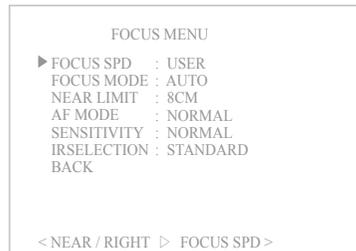
select :  or  Set ON :  Set OFF : 

## ② FOCUS MODE



In Focus menu, you can set up the focus speed, focus mode, near limit, AF mode and sensitivity.

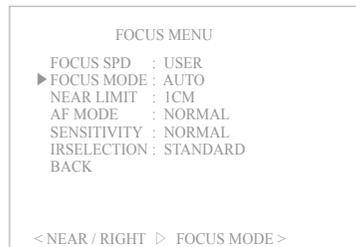
### - FOCUS SPD



Set the speed for camera focusing.



### - FOCUS MODE



**AUTO:** The camera adjusts the focus automatically while monitoring the screen continuously in the auto mode. In the auto focusing mode, zoom key operation is not recognized as the input of the focus key.

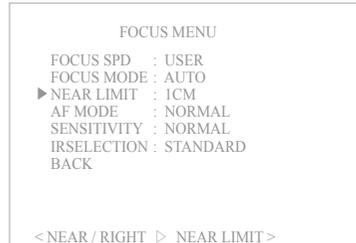
**Manual:** In the manual mode, users can adjust the camera focus manually.

**One Push:** It will be focused in about 5 seconds after zooming, panning, and return to MANUAL mode automatically. This is for focusing accurately after zooming.

**Infinity:** infinity focus is the state where a lens forms an image of an object an infinite distance away. This corresponds to the point of focus for parallel rays.



### - NEAR LIMIT

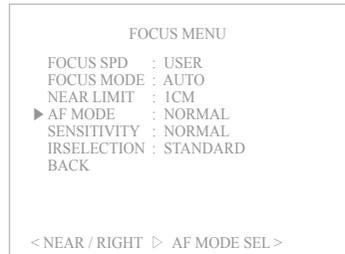


Infinity focus is the state where a lens forms an image of an object an infinite distance away. This corresponds to the point of focus for parallel rays.

( Over Infinity ~ 1.0CM)



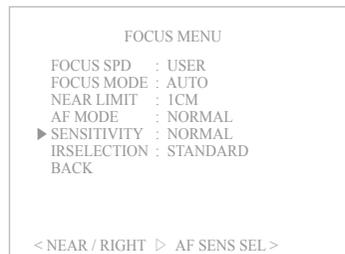
### - AF MODE



Set the AUTO FOCUS MODE position



### - SENSITIVITY



Set the sensitivity of focus.



### - IR SELECTION



Correct the IR conversion data.



③ WHITE BALANCE Set the white balance of camera.



White balance setting is a function revising color temperature to resolve the problem that screen's colors change by the color temperature's difference according to time.  
 RED GAIN: Adjust red color level from 0~255.(standard:208)  
 BLUE GAIN: Adjust blue color level from 0~255.(standard:162)

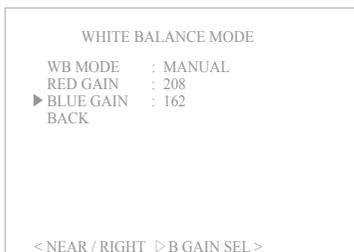
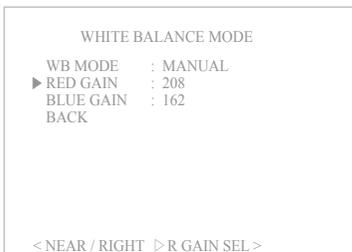
- WB MODE



WB MODE: Set the color depend on white balance.  
 WB MODE : Select AUTO, INDOOR, OUTDOOR ONEPUSH, ATW or MANUAL.

select : or Set ON : Set OFF :

- RED, BLUE MODE



Adjust color level (RED, BLUE : 001~ 255)

select : or Set ON : Set OFF :

④ AUTO EXPO



AE setting is a function adjusting shutter speed according to subject's brightness to get standard amount of exposed light.

AE MODE: Select AUTO, MANUAL, SHUTTER, IRIS or BRIGHT.  
 EXPOSURE : 10.5dB ~ -10.5dB (Standard 0dB)  
 SLOW SHUTTER: Select AUTO, MANUAL  
 SHUTTER: Set the shutter speed.  
 IRIS LEVEL: If you set IRIS in AE mode, you can control the level value (CLOSE ~F1.6)  
 BRIGHT LEVEL: If you set BRIGHT in AE mode, you can control level value (00~31)  
 Gain: Control the brightness (-3dB ~ 28dB)

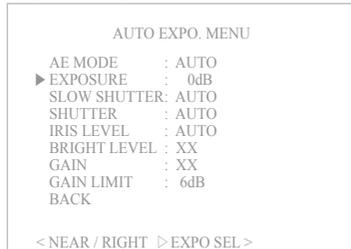
- AE MODE



Select MANUAL, SHUTTER, IRIS or BRIGHT.

select : or Set ON : Set OFF :

- EXPO MODE



-10dB~ + 10dB(0d standard)

select : or Set ON : Set OFF :

- SLOW SHUTTER



Select AUTO or MANUAL .

select : or Set ON : Set OFF :

- SHUTTER



If you set SHUTTER in the AE MODE, you can control shutter speed. (1/1~ 1/1000)

select : or Set ON : Set OFF :

- IRIS LEVEL

AUTO EXPO. MENU	
AE MODE	: IRIS
EXPOSURE	: 0dB
SLOW SHUTTER	: AUTO
SHUTTER	: AUTO
▶ IRIS LEVEL	: F1.6
BRIGHT LEVEL	: XX
GAIN	: XX
GAIN LIMIT	: 6dB
BACK	
< NEAR / RIGHT ▷ AE MODE SEL >	

If you set IRIS in the AE MODE, you can set the IRIS level (CLOSE ~ F 1.6)

select :  or  Set ON :  Set OFF : 

- BRIGHT LEVEL

AUTO EXPO. MENU	
AE MODE	: BRIGHT
EXPOSURE	: 0dB
SLOW SHUTTER	: AUTO
SHUTTER	: AUTO
IRIS LEVEL	: AUTO
▶ BRIGHT LEVEL	: 27
GAIN	: XX
GAIN LIMIT	: 6dB
BACK	
< NEAR / RIGHT ▷ AE MODE SEL >	

If you set BRIGHT in AE mode, you can control level value. (0 ~ 31)

select :  or  Set ON :  Set OFF : 

- GAIN

AUTO EXPO. MENU	
AE MODE	: AUTO
EXPOSURE	: 0dB
SLOW SHUTTER	: AUTO
SHUTTER	: AUTO
IRIS LEVEL	: AUTO
BRIGHT LEVEL	: XX
▶ GAIN	: XX
GAIN LIMIT	: 6dB
BACK	
< NEAR / RIGHT ▷ GAIN SEL >	

If you set MEMUAL in AE mode, you can control Gain. (0 ~ 28dB, -3dB)

select :  or  Set ON :  Set OFF : 

- GAIN LIMIT

AUTO EXPO. MENU	
AE MODE	: AUTO
EXPOSURE	: 0dB
SLOW SHUTTER	: AUTO
SHUTTER	: AUTO
IRIS LEVEL	: AUTO
BRIGHT LEVEL	: XX
GAIN	: XX
▶ GAIN LIMIT	: 6dB
BACK	
< NEAR / RIGHT ▷ GAIN LIMIT >	

Change the GAIN LIMIT. (6~28dB) -changed by 2dB

select :  or  Set ON :  Set OFF : 

⑤ WDR MODE

CAMERA MENU	
ZOOM MODE	▶
FOCUS MODE	▶
WHITE BAL.	▶
AUTO EXP.	▶
▶ WDR MODE	▶
SPECIAL	▶
CAMERA RESET	▶
SAVE	
BACK	
EXIT	
< NEAR / RIGHT ▷ SUB MENU >	

Select WDR(Wide Dynamic Range)

select :  or  Set ON :  Set OFF : 

- WDR MODE

WDR MODE MENU	
▶ WDR MODE	: WDR OFF
SCREED DISP	: LONG
DETECT SEN	: MID
BLOCKED UP LEV	: MID
BLOWN OUT LEV	: MID
EXPOSURE RATIO(%)	: 010
BACK	
< NEAR / RIGHT ▷ WDR MODE >	

Select ON or OFF and set the LEVEL and the LIMIT value.

select :  or  Set ON :  Set OFF : 

- SCREEN DISP

WDR MODE MENU	
WDR MODE	: WDR OFF
▶ SCREED DISP	: LONG
DETECT SEN	: MID
BLOCKED UP LEV	: MID
BLOWN OUT LEV	: MID
EXPOSURE RATIO(%)	: 010
BACK	
< NEAR / RIGHT ▷ SCREEN DIS >	

Select WDR changing time.

select :  or  Set ON :  Set OFF : 

- DETECTION SENSITIVITY

WDR MODE MENU	
WDR MODE	: WDR OFF
SCREED DISP	: LONG
▶ DETECT SEN	: MID
BLOCKED UP LEV	: MID
BLOWN OUT LEV	: MID
EXPOSURE RATIO(%)	: 010
BACK	
< NEAR / RIGHT ▷ DETECT SENS >	

Change the WDR level

select :  or  Set ON :  Set OFF : 

- BLOCKED UP LEVEL



Select blocked up level

select : or Set ON : Set OFF :

- BLOWN-OUT LEVEL



Select blown-out level

select : or Set ON : Set OFF :

- EXPOSURE RATIO



Select exposure ratio

select : or Set ON : Set OFF :

⑥ SPECIAL



In the Special menu, it's available to set special function of the camera

- ENHANCE



Enhance the video color.

select : or Set ON : Set OFF :

- HR MODE



Select HIGH-Resolution

select : or Set ON : Set OFF :

- NR LEVEL



Select NOISE-Reduction level

select : or Set ON : Set OFF :

- GAMMA

SPECIAL MENU	
HR MODE	: ON
NR LEVEL	: 3
▶ GAMMA	: STANDARD
HIGH SENS	: OFF
CHROMA LEV	: OFF
BACK	

< NEAR / RIGHT ▷ GAMMA >

GAMMA : Select light and shade level  
(STANDARD, STRAIGHT, S-CURVE L, S-CURVE M, S-CURVE H)

select :  or  Set ON :  Set OFF : 

- HIGH SENSITIVITY

SPECIAL MENU	
HR MODE	: ON
NR LEVEL	: 3
GAMMA	: STANDARD
▶ HIGH SENS	: OFF
CHROMA LEV	: OFF
BACK	

< NEAR / RIGHT ▷ HIGH SENS >

HIGH SENSITIVITY : Select High sensitivity

select :  or  Set ON :  Set OFF : 

- CHROMA LEVEL

SPECIAL MENU	
HR MODE	: ON
NR LEVEL	: 3
GAMMA	: STANDARD
HIGH SENS	: OFF
▶ CHROMA LEV	: OFF
BACK	

< NEAR / RIGHT ▷ CHROMA LEV >

CHROMA LEVEL : Select chroma level

select :  or  Set ON :  Set OFF : 

- APERTURE GAIN

SPECIAL MENU	
ENHANCE MODE	▶
▶ APERTUREGAIN	: 05
BACK LIGHT	: XX
ICR MODE	: AUTO
DAY ▶ NIGHT LEV	: 2.5LUX
NIGHT ▶ DAY LEV	: 7.0LUX
PRESET FREEZE	: ON
BACK	

< NEAR / RIGHT ▷ APERTURE >

APERTURE GAIN: Select aperture gain

select :  or  Set ON :  Set OFF : 

- BACK LIGHT

SPECIAL MENU	
ENHANCE MODE	▶
APERTUREGAIN	: 05
▶ BACK LIGHT	: ON
ICR MODE	: AUTO
DAY ▶ NIGHT LEV	: 2.5LUX
NIGHT ▶ DAY LEV	: 7.0LUX
PRESET FREEZE	: ON
BACK	

< NEAR / RIGHT ▷ BACK LIGHT >

Select ON/OFF in the BACK LIGHT function.

select :  or  Set ON :  Set OFF : 

- ICR MODE

SPECIAL MENU	
ENHANCE MODE	▶
APERTUREGAIN	: 05
BACK LIGHT	: XX
▶ ICR MODE	: AUTO
DAY ▶ NIGHT LEV	: 2.5LUX
NIGHT ▶ DAY LEV	: 7.0LUX
PRESET FREEZE	: ON
BACK	

< NEAR / RIGHT ▷ ICR MODE >

Select IRC mode.

select :  or  Set ON :  Set OFF : 

- DAY/NIGHT LEVEL

SPECIAL MENU	
ENHANCE MODE	▶
APERTUREGAIN	: 05
BACK LIGHT	: XX
ICR MODE	: AUTO
▶ DAY ▶ NIGHT LEV	: 2.5LUX
NIGHT ▶ DAY LEV	: 7.0LUX
PRESET FREEZE	: ON
BACK	

< NEAR / RIGHT ▷ D/N LEVEL >

Select the darkness level when the DAY mode is changed to NIGHT mode.

select :  or  Set ON :  Set OFF : 

- NIGHT/DAY LEVEL

SPECIAL MENU	
ENHANCE MODE	▶
APERTUREGAIN	: 05
BACK LIGHT	: XX
ICR MODE	: AUTO
DAY ▶ NIGHT LEV	: 2.5LUX
▶ NIGHT ▶ DAY LEV	: 7.0LUX
PRESET FREEZE	: ON
BACK	

< NEAR / RIGHT ▷ N/DLEVEL >

Select the darkness level when the NIGHT mode is changed to DAY mode.

select :  or  Set ON :  Set OFF : 

- PRESET FREEZE



The screen is stopped while the camera is operating preset function.

select : or Set ON : Set OFF :

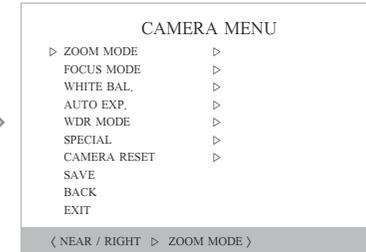
⑦ CAMERA RESET



Make initialize the setting value which is set in CAMERA MENU.

select : or Set ON : Set OFF :

5. 4. 2 CAMERA MENU (MM-202)

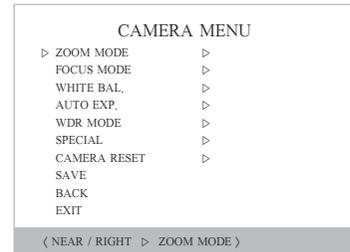


CAMERA MENU

- Functions can be set-up using the Camera menu.

In this menu, user can set the zoom, focus, white balance, auto exposure...etc functions.

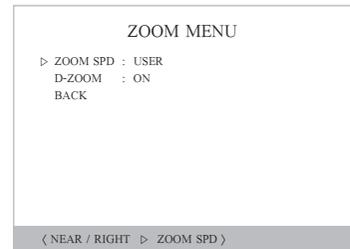
① ZOOM MODE



Decide using of digital zoom function and select zoom speed.

- \* ZOOM SPD : 0 ~ 7steps, USER(standard)
- \* D-ZOOM : ON / OFF

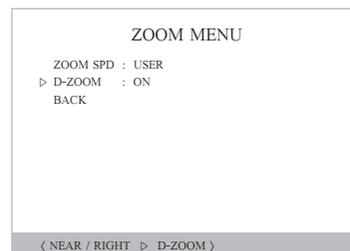
- ZOOM SPD



ZOOM SPD : Select from 1sept to 7 steps, USER (Standard speed)

Select : or Set ON : Set OFF :

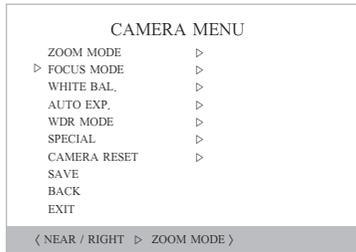
- D-ZOOM



Decide using of digital zoom function.  
D-ZOOM: ON/ OFF

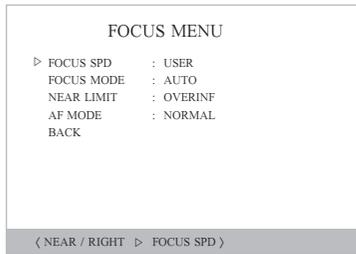
Select : or Set ON : Set OFF :

## ② FOCUS MODE



In Focus menu, you can set up the focus speed, focus mode, near limit, AF mode and sensitivity.

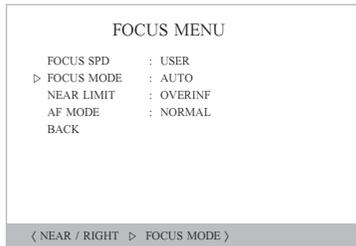
### - FOCUS SPD



Set the speed for camera focusing.  
1 ~ 7steps, USER(standard)

Select : or Set ON : Set OFF :

### - FOCUS MODE



**AUTO:** The camera adjusts the focus automatically while monitoring the screen continuously in the auto mode. In the auto focusing mode, zoom key operation is not recognized as the input of the focus key.

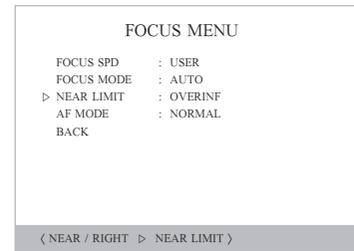
**Manual:** In the manual mode, users can adjust the camera focus manually.

**One Push:** It will be focused in about 5 seconds after zooming, panning, and return to MANUAL mode automatically. This is for focusing accurately after zooming.

**Infinity:** infinity focus is the state where a lens forms an image of an object an infinite distance away. This corresponds to the point of focus for parallel rays.

Select : or Set ON : Set OFF :

### - NEAR LIMIT

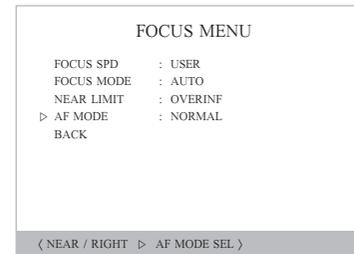


Infinity focus is the state where a lens forms an image of an object an infinite distance away. This corresponds to the point of focus for parallel rays.

( Over Infinity ~ 1.0CM)

Select : or Set ON : Set OFF :

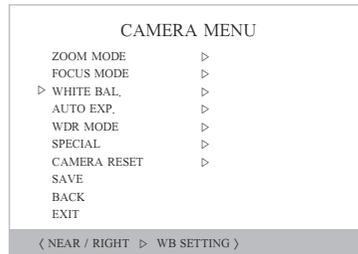
### - AF MODE



Set the AUTO FOCUS MODE position

Select : or Set ON : Set OFF :

### ③ WHITE BALANCE Set the white balance of camera.



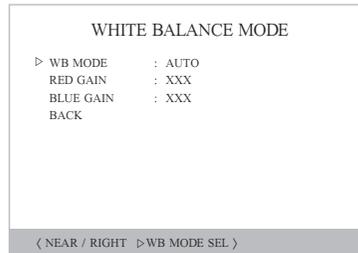
White balance setting is a function revising color temperature to resolve the problem that screen's colors change by the color temperature's difference according to time.

RED GAIN: Adjust red color level from 0~255.

BLUE GAIN: Adjust blue color level from 0~255.

Select : or Set ON : Set OFF :

#### - WB MODE

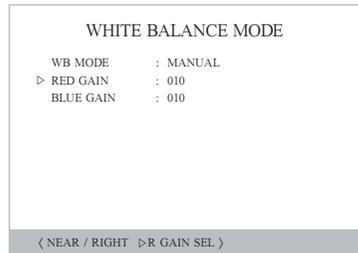


WB MODE: Set the color depend on white balance.

WB MODE : Select AUTO, INDOOR, OUTDOOR, ONEPUSH, ATW, MANUAL or ONEPUSHTRG

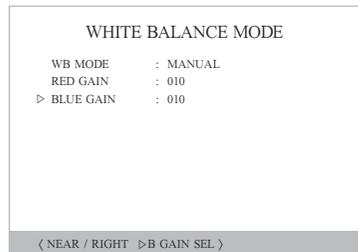
Select : or Set ON : Set OFF :

#### - RED, BLUE MODE

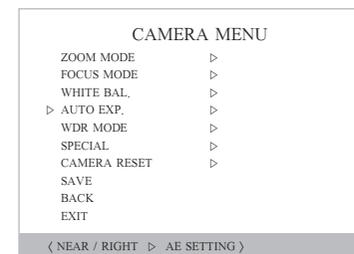


Adjust color level (RED, BLUE : 01~255)

Select : or Set ON : Set OFF :



### ④ AUTO EXPO



AE setting is a function adjusting shutter speed according to subject's brightness to get standard amount of exposed light.

AE MODE: Select AUTO, MANUAL, SHUTTER, IRIS.

DSS LEVEL: Control digital show shutter speed.

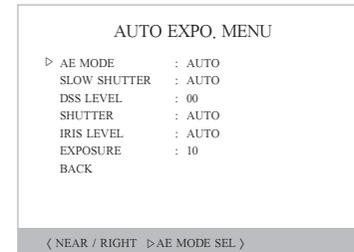
SLOW SHUTTER: Select AUTO, MANUAL

SHUTTER: If you set SHUTTER in AE mode, you can control the level value

IRIS LEVEL: If you set IRIS in AE mode, you can control the level value (1 ~ 19)

EXPOSURE : 0 ~ 19 (Standard 00)

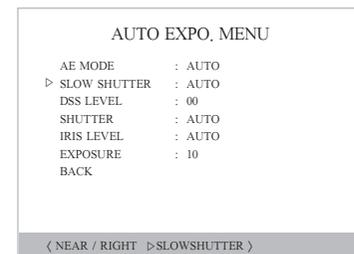
#### - AE MODE



Select AUTO, MANUAL, SHUTTER, IRIS.

Select : or Set ON : Set OFF :

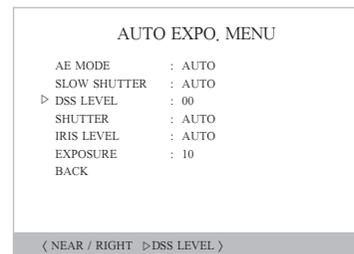
#### - SLOW SHUTTER



Select AUTO or MANUAL .

Select : or Set ON : Set OFF :

#### - DSS LEVEL



Digital Slow Shutter: Control digital show shutter speed.

Select : or Set ON : Set OFF :

### - SHUTTER

AUTO EXPO. MENU	
AE MODE	: SHUTTER
SLOW SHUTTER	: AUTO
DSS LEVEL	: 00
▷ SHUTTER	: 1/20
IRIS LEVEL	: AUTO
EXPOSURE	: 10
BACK	

< NEAR / RIGHT ▷SHUTTER SEL >

If you set SHUTTER in the AE MODE, you can control shutter speed. (1/30 ~ 1/60000)

Select :  or  Set ON :  Set OFF : 

### - IRIS LEVEL

AUTO EXPO. MENU	
AE MODE	: IRIS
SLOW SHUTTER	: AUTO
DSS LEVEL	: 00
SHUTTER	: 1/20
▷ IRIS LEVEL	: 10
EXPOSURE	: 10
BACK	

< NEAR / RIGHT ▷AE MODE SEL >

If you set IRIS in the AE MODE, you can set the IRIS level (1~19)

Select :  or  Set ON :  Set OFF : 

### - EXPO MODE

AUTO EXPO. MENU	
AE MODE	: AUTO
SLOW SHUTTER	: AUTO
DSS LEVEL	: 00
SHUTTER	: AUTO
IRIS LEVEL	: AUTO
▷ EXPOSURE	: 10
BACK	

< NEAR / RIGHT ▷EXPO SEL >

Set the exposure. (0~19, Standard 0)

Select :  or  Set ON :  Set OFF : 

### ⑤ WDR MODE

CAMERA MENU	
ZOOM MODE	▷
FOCUS MODE	▷
WHITE BAL.	▷
AUTO EXP.	▷
▷ WDR MODE	▷
SPECIAL	▷
CAMERA RESET	▷
SAVE	
BACK	
EXIT	

< NEAR / RIGHT ▷ WDR MODE >

Set WDR funtion  
WDR(Wide Dynamic Range)

### - WDR MODE

WDR MODE MENU	
▷ WDR MODE	: OFF
WDR LEVEL	: 02
ATR LEVEL	: 0FF
BACK	

< NEAR / RIGHT ▷WDR MODE >

Select ON or OFF.

Select :  or  Set ON :  Set OFF : 

### - WDR LEVEL

WDR MODE MENU	
WDR MODE	: OFF
▷ WDR LEVEL	: 02
ATR LEVEL	: 0FF
BACK	

< NEAR / RIGHT ▷WDR LEVEL >

Select from 00 to 02.

Select :  or  Set ON :  Set OFF : 

### - ATR LEVEL

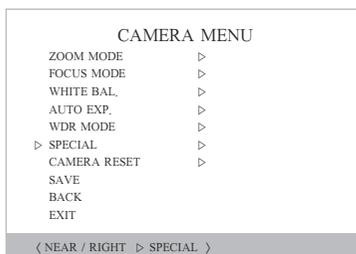
WDR MODE MENU	
WDR MODE	: OFF
WDR LEVEL	: 02
▷ ATR LEVEL	: ON
BACK	

< NEAR / RIGHT ▷ATR LEVEL >

Select ON or OFF

Select :  or  Set ON :  Set OFF : 

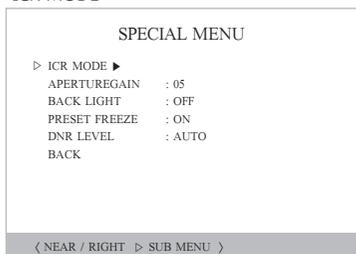
## ⑥ SPECIAL



In the Special menu, it's available to set special function of the camera

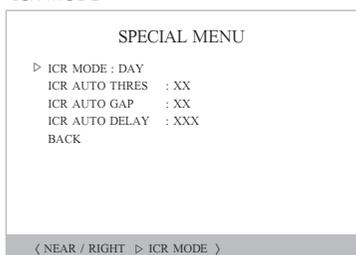
select : or Set ON : Set OFF :

### - ICR MODE



Control DAY & NIGHT funtion.

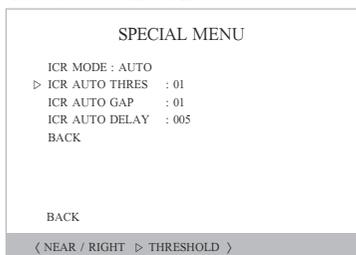
### - ICR MODE



Select AUTO, DAY and NIGHT.

select : or Set ON : Set OFF :

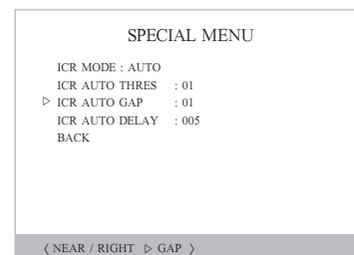
### - ICR AUTO THRESHOLD



Set the ICR THRESHOLD

select : or Set ON : Set OFF :

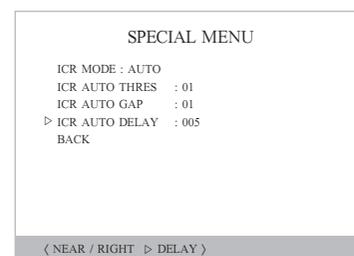
### - ICR AUTO GAP



Select the ICR level.

select : or Set ON : Set OFF :

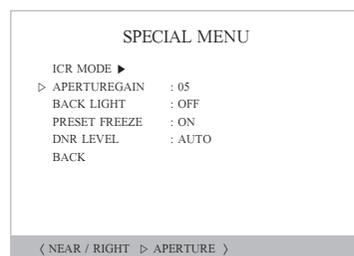
### - ICR AUTO DELAY



Set ICR auto delay.

select : or Set ON : Set OFF :

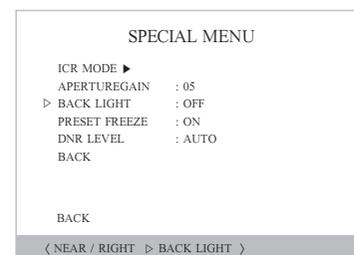
### - APERTURE GAIN



APERTURE GAIN: Select aperture gain

select : or Set ON : Set OFF :

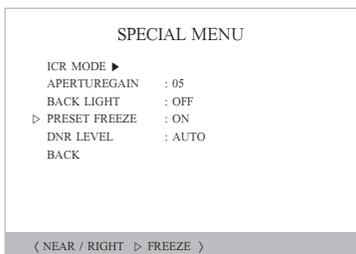
### - BACK LIGHT



Select ON/OFF in the BACK LIGHT function.

select : or Set ON : Set OFF :

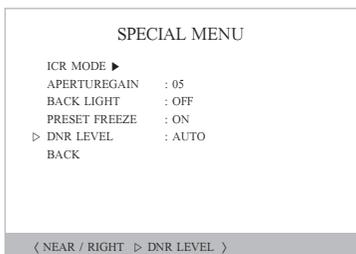
- PRESET FREEZE



The screen is stopped while the camera is operating preset function.

select : or Set ON : Set OFF :

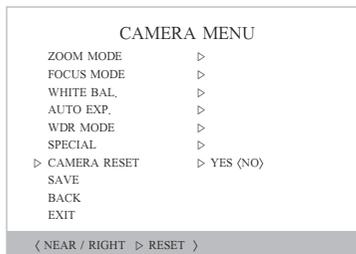
- DNR LEVEL



Select the DNR level from AUTO, LEV1, LEV2, LEV3 and OFF.

select : or Set ON : Set OFF :

⑦ CAMERA RESET

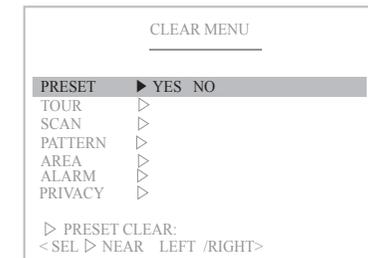


Make initialize the setting value which is set in CAMERA MENU.

select : or Set ON : Set OFF :

5.5 Clear Setting

Clears the PTZ position and function value. With this function the camera keeps the accuracy of the PTZ position value.



select : or Set ON : Set OFF :

5.6 Reset

It is a reset function and is useful when you change the dipswitches for address, protocol and baud rate.



## 6. SPECIFICATIONS

### 6.1 Mechanical Specifications

#### 6.1.1 MECHANICAL

Pan	: 360° Continuous Pan, 0.1° to 100°/sec.
Pan Preset Speed	: 110°/sec, 0.3° Accuracy
Tilt	: TOP 15°~270°, BOTTOM 345°~90° tilt angle, Proportional to zoom
Tilt Preset Speed	: 60°/sec, 0.3° Accuracy
Weight	: Standard Model : Approx. 2.7kg / Packing 3.2kg : Additional LED Model : Approx. 3.5kg / Packing 4kg

#### 6.1.2 ENVIRONMENTAL

Construction	: Die-casing Aluminum : All internal parts are corrosion protected epoxy powder coating
Ingress Protection	: IP66 Outdoor Application
Color	: Ivory and Black
Operating Temp	: -20°C to 50°C (In continuous operation with Fan & Heater)
Storage Temp	: -20°C to 50°C
Humidity	: 0% to 90%

#### 6.1.3 FUNCTIONS

Preset	: 63 points
Tour	: 8 programmable
Pattern	: 2 patterns for Max. 90 second.
Scan	: 4 programmable speed and diagonal scan
Display	: 4 Area Title
Alarm	: 2 alarm
Flip	: Mechanical Auto Flip On/Off (Rotate: TOP 270° BOTTOM 90° at bottom of tilt)
Address	: Up to 255 selectable ID ( setting with Dip-switches)
Data Communication Control	: RS-485/ RS-422
Protocol	: Multiple Protocol (WTX, PELCO-D V1, PELCO-P, PELCO-D V5)
Baud rate	: 2400, 4800, 9600, 19200, 38400, 57600, 115200 bps selectable

#### 6.1.4 ELECTRICAL

Power	: DC12V, 40W, 3.3A / AC24V, 50W, 2.1A Power adaptor not included
Consumption	: DC12V 0.9A(11W) / AC24V 0.6A(15W)
Fan & Heater	: DC12V IR: 1.9A(23W) AC24V IR: 0.9A(22W)

- 12VDC model is designed for vehicle application. Ground for both power and video is just one and therefore the power is not isolated and may damaged by surge input if it is installed in general circumstance not in Vehicle.
- 24VAC is available for CCTV application

### 6.2 Camera Specifications

#### EH-6300

Imager	1/3 Type Exmor CMOS Sensor
Picture elements	2000K pixels
Lens	20× zoom F= 4.7 mm (WIDE) to 94.0 mm(TELE), F1.6 to F3.5
Digital zoom	12× (240× with optical zoom)
Angle of view (H)	Approx. 55.4 degrees (WIDE end), approx. 2.9 degrees (TELE end) (1080i mode) Approx. 37.6 degrees (WIDE end), approx. 2.0 degrees (TELE end) (720p mode)
Min. working distance	10 mm (WIDE end), 1000 mm (TELE end)
Sync system	Internal
Min. illumination (Typical value)	0.5 lx (1/30 sec, 50%, High Sensitivity mode ON) 1.7 lx (1/30 sec, 50%, High Sensitivity mode OFF) ICR-ON Mode 0.095 lx (1/30 sec, 50%, High Sensitivity mode ON) 0.3 lx (1/30 sec, 50%, High Sensitivity mode OFF)
S/N ratio	50 dB (Weight ON)
Wide dynamic range	ON/OFF/AUTO
Noise reduction	ON/OFF (level 5 to 1 / OFF, 6 steps)
Color Enhancement	ON/OFF
Aperture control	16 steps
Preset	6-POSITIONS
Video Output	HD: Analog component (Y/Pb/Pr) Digital (LVDS) Analog SD: VBS

- 12VDC model is designed for vehicle application. Ground for both power and video is just one and therefore the power is not isolated and may damaged by surge input if it is installed in general circumstance not in Vehicle.

## MM-202

Image Sensor	1/3" Panasonic CMOS Sensor
Total Pixels	2,010(H) x 1,108(V), 2.2M Pixels
Active pixels	1,944(H) x 1,092(V), 2.1M Pixels
Scanning system	Progressive Scan
Sync. System	Internal
Resolution	Digital ; 1920x1080p(1080p/30fps) , 1280x720p(720p/60fps) Analog : 700TVL
Min. illumination	Color : 0.5 lux , BW : 0.1lux Color DSS : 0.002 lux , BW DSS : 0.001 lux
Video Output	HD : Digital(LVDS) Analog SD : VBS(without WDR)
S/N Ratio	more than 50dB (AGC off)
Lens type	x20 Day & Night Zoom Lens
Zoom Ratio	Optical x20, Digital x32 Zoom
Focal Length	f = 4.7 mm ~ 94.0 mm
Aperture Ratio	F1.6 (wide) ~ F3.5 (tele)
Focus	Mode / Distance / Lens Refresh / E.Zoom
Mode	Auto / One Push / Manual
Distance	0.1 / 0.5 / 0.8 / 1.0 / 3.0 / 6.0 / 10.0 m
Lens Refresh	Off / 1 ~ 10Day
E.Zoom	Off / MAX x2 ~ x32
Exposure	AUTO / IRIS.P / SHUT.P / MANUAL
Shutter Speed	1/30(25) ~ 1/60,000 sec
Iris	0 ~ 20
Digital Slow Shutter (DSS)	Off / Max x2 ~ x4
WDR/BLC	OFF / WDR / BLC
Day&Night	Auto / Day / Night / Ext
White Balance	AUTO / One Push / Manual / Indoor / Outdoor
DNR	Auto / Off / Low / Middle / High
System	NTSC / PAL
HD Format	1080P / 720P

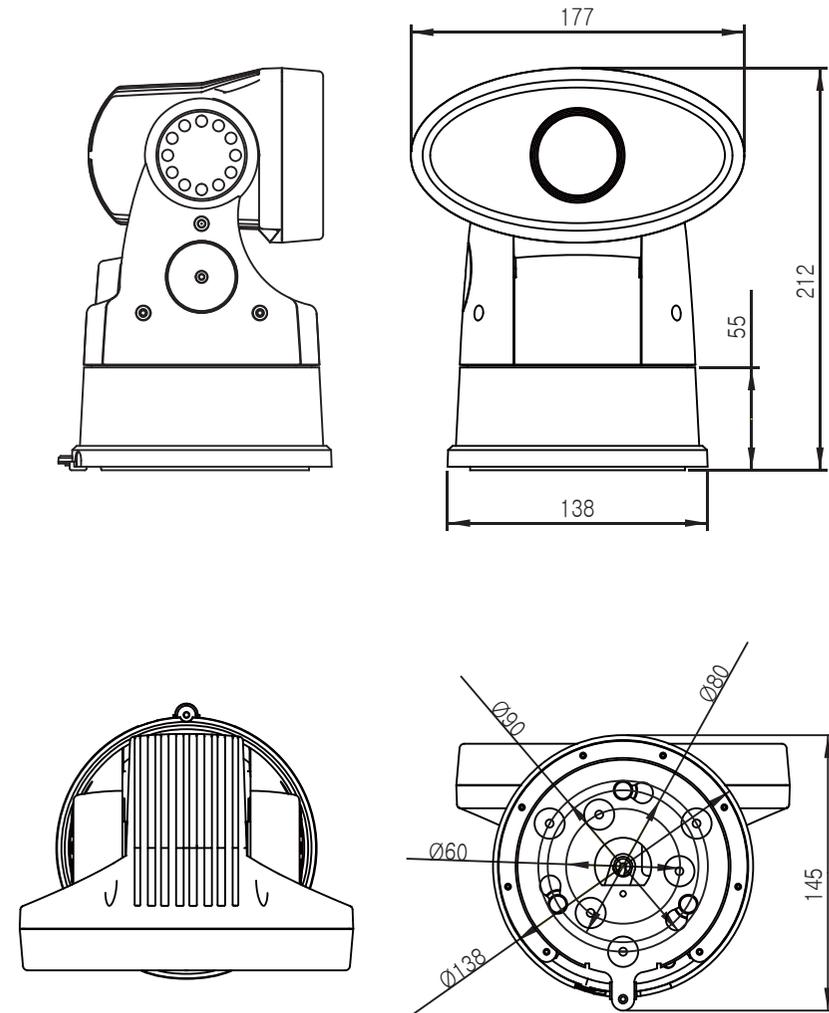
- 12VDC model is designed for vehicle application. Ground for both power and video is just one and therefore the power is not isolated and may be damaged by surge input if it is installed in general circumstances not in a vehicle.
- 24VAC is available for CCTV application

## 6.3 LED Specifications

Infra Red LED	
Light Distance	120m manual focusing
LED	12pcs of 18° IR Lens

## 7. DIMENSIONS(mm)

### 7.1 Standard Model



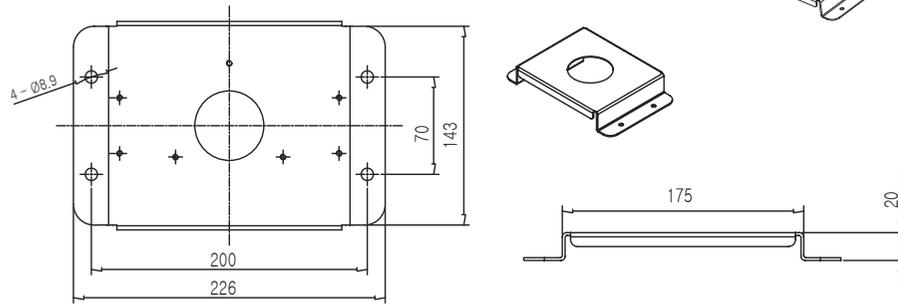
## 8. FROUBLE SHOOTING

If you have trouble with operating camera, refer to the following table.  
If the guidelines do not enable you to solve the problem, contact an authorized technician.

Problem	Solution
No video.	Check that the power is connected to all pieces of equipment in the system. Check that the BNC connectors are inserted properly. Check if the iris of the lens is closed and adjust that. Check the camera's fixed shutter menu and adjust that.
Poor Video Quality.	Check the voltage level of the camera. Check the power supply voltage.
Controller does not work.	Check if the camera and peripheral devices are properly connected. Verify the setups of ID, protocol, and baud rates.
Too dark or bright video.	Check the camera's Brightness Level and adjust that.
Focus out video.	Check the dome cover or camera lens and clean the dirt off. If Auto Focusing is having difficulty focusing on a particular subject, set Focus mode to Manual and adjust the focus by yourself. Reset the camera referring to 38 page.
LED does not work.	Check if light mode is set correctly referring to 37 page. Check the Day & Night mode and converting Lux value referring to 36 page.
Day or night mode does not convert automatically.	Check that Day & Night mode is set to AUTO mode referring to 36 page. Check the converting Lux value and adjust according to surrounding's illumination referring to 36 page. Check if the CDS sensor(there's blue one beside of LED) is covered by something.
Pan, Tilt, Zoom do not work.	Check that the power is connected to all pieces of equipment in the system. Check that the BNC connectors are inserted properly.

## 7.2 Optional Bracket (Vihechle bracket)

WCA-VB1



WCA-VB2

