

# 12X Smart Zoom Super Night Vision Outdoor Camera

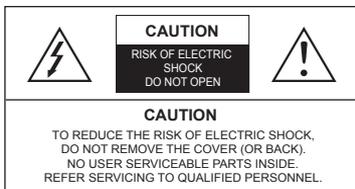
INSTRUCTION MANUAL



· **EL-3000**

## Dear Customers!

By selecting this product, you have decided to use a professional device that guarantees highest quality and reliability. We would like to thank you very much for your confidence and kindly ask you to read the following instructions carefully before installation and operation in order to take full advantage of all quality features regarding this product.



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



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

## INFORMATION

This equipment has been tested and found to comply with limits for a Class A digital device, pursuant to part 15 of the FCC Rules. 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 its own expense.

## WARNING

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

## CAUTION – To prevent electric shock and risk of the fire hazards

- Do NOT use power source other than that specified.
- Do NOT expose this appliance to rain or moisture.

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

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## 1. Precautions

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- Please read the manual carefully before the installation in order to set up the camera correctly and to obtain the best picture quality.
- Please keep the manual in good condition for your future reference and service application.
- Installation and services should be only carried out by an authorized personnel according to local safety regulations.
- If any liquid or solid matter gets into the housing, immediately disconnect the camera from power supply and have it checked by your authorized dealer before reusing.
- Avoid installing the camera at extremely hot or cold places.
- If you are not a certified person, never try to dismantle the camera. To avoid electric shock, never remove the screws or covers. There are no parts inside that need maintenance by the user. All maintenance should be carried out by qualified personnel.
- Avoid installing the camera at a place of high humidity.
- Avoid installing the camera at the place exposed to gas or oil.
- Keep the top glass of the lens always clean in order to obtain the best picture quality all the time. Be careful not to be stained by fingerprint.
- Don't face the camera directly toward sunlight or sunlight reflecting area. CCD may go defective at this condition.
- Please give a special attention to keep the unit from dangerous drop or external shock during the process of transportation or handling.
- Never try to touch the camera in wet hand. It may cause an electric shock.
- Do not expose the camera to radioactivity. It causes a serious damage on the CCD.

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## 2. Limitation of liability

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This publication is provided "AS IS" without warranty of any kind, either express or implied, including but not limited to, the implied warranties of merchantability, fitness for any particular purpose, or non-infringement of the third party's right. This publication could include technical inaccuracies or typographical errors. Changes are added to the information herein, at any time, for the improvements of this publication and/or the corresponding product(s).

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## 3. Disclaimer of warranty

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In no event shall seller be liable to any party or any person, except for replacement or reasonable maintenance of the product, for the cases, including but not limited to below:

- (1) Any damage and loss, including without limitation, direct or indirect, special, consequential or exemplary, arising out of or relating to the product;
- (2) Personal injury or any damage caused by inappropriate use or negligent operation of the user;
- (3) Unauthorized disassemble, repair or modification of the product by the user;
- (4) Inconvenience or any loss arising when images are not displayed, due to any reason or cause including any failure or problem of the product;
- (5) Any problem, consequential inconvenience, or loss or damage, arising out of the system combined by the devices of third party.
- (6) Any claim or action for damages, brought by any person or organization being photogenic subject, due to violation of privacy with the result of that surveillance-camera's picture, including saved data, for some reason, becomes public or is used for the purpose other than surveillance.

## 4. Package



Camera x 1



manual x 1



Extra video output cable  
x 1



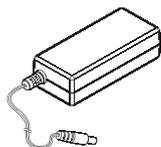
L- Wrench Ø4.0 x 1



Tapping screws x3



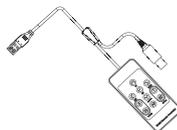
Plastic anchor x3



DC24V/1.9A Adaptor  
x 1



\* Different by Country standard  
Adaptor power plug  
x 1



OSD Menu control key  
1EA

## 5. Special features of the model

### \* Higher resolution of 650TVL(D)/700TVL(N)

The number of 960H CCD image sensor (ensures the amount of information in the input stage) and "Effio" Series superior signal processing technique (high resolution video output) maintains image information to the utmost limits.

- Combination of Effio and new 960H CCD provides clearer picture.
- Higher resolution of 650TV Lines at daytime and 700 Lines at night time.

### \* Intelligent motion detection

You can transmit an alert signal when it detects motion of an object on the screen. This feature is useful when you have to monitor several screens simultaneously.

### \* Intelligent Object detection

You can transmit an alert signal when it detects absent of an object on the screen (or detect appearance of an object on the screen). This feature is useful when you have to monitor several screens simultaneously.

### \* DNR (Digital Noise Reduction)

By using both of 2D DNR (space-based) and 3D DNR(time-based), the amount of low illuminance noise has been significantly reduced and the signal-to-noise ratio(S/N) as well as horizontal resolution has been improved, resulting in a clear and sharp image display even in the dark environment.

### \* HR (High Resolution) Mode

The horizontal resolution of 650TV Lines at Color mode and 700TV Lines at B/W mode can be achieved by using the HR Mode.

### \* X12 Optical Zoom

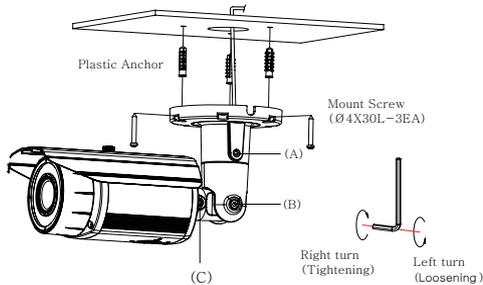
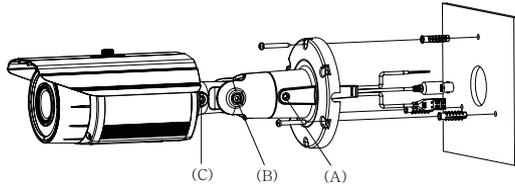
Built-in x12 optical zoom lens is highly reliable.  
It features auto focus, auto D&N, zoom function.

### \* Day & Night (ICR)

The ICR will automatically engage depending on the ambient light, allowing the camera to be effective in day&night environment.

## 6. Installation

### 6-1. Installation overview

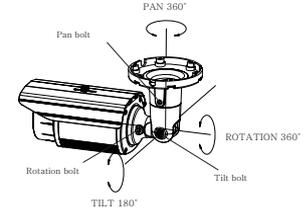


- ① Drill three screw holes on the wall or ceiling plate to fix three anchors (supplied) in the holes.
- ② Fix the plastic anchors in the holes.
- ③ Position the mounting bracket on the screw points.
- ④ Fix the mounting bracket by tightening the screws.
- ⑤ Slightly loosen bolt (A), (B) then adjust TILT (180°) and PAN (360°) of the camera and tighten the bolt firmly.
- ⑥ Slightly loosen bolt (C) then adjust ROTATION (360°) of the camera and tighten the bolt firmly.

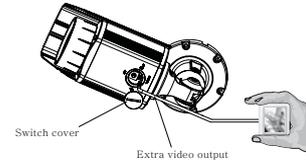
## 6. Installation

### 6-2. 3-Axis Adjustment

1. PAN 360°
2. TILT 180°
3. ROTATION 360°



### 6-3. Ext-Video



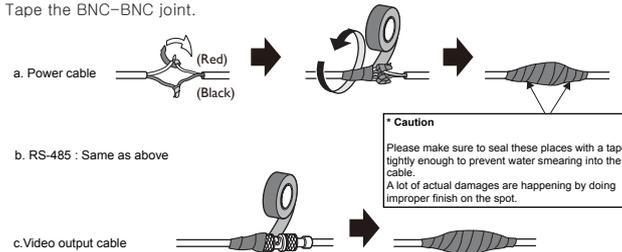
#### - How to use

- ① Take off switch cover located on the bottom of the camera body.
- ② Connect Extra video output to LCD Monitor as in the drawing.

### 6-4. Waterproof processing of cable end connection

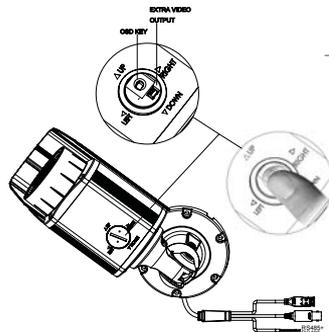
Make sure to use a butyl tape. (Do not use a sealing material on those parts)

- ① It is useful to connect the cable ends from camera to the extension cable for waterproof.
- ② Connect and tape the power cables (Power-Power/Ground-Ground).
- ③ Bind the power cables together with the tape. When DC-Jack is used, tape the DC-DC joint.
- ④ Connect and tape the RS485 cables (RS485+—TRX+ /RS485— —TRX-)
- ⑤ Tape the BNC-BNC joint.



## 7. Tips for quick installation

### 7-1. Quick control to Zoom & Focus



– Push up or down the Tact SW (OSD Key) by finger for a second without pressing the switch.

- Up (▲) – Zoom in
- Down (▼) – Zoom out
- Left / Right (◀, ▶) – Focus in/out

※ When the Tact SW is pressed, the MAIN MENU appears on the screen.

**Note**  
For a RS-485 controller, refer to the page 12 (8-2. Setting up the menu)

### 7-2. RS485 Connection

You can access to the OSD menu via the remote controller or the DVR as in the drawing.



### 7-3. Quick setting of Smart Zoom

You can set the smart-zooming in the intelligence menu by using the motion detection and object detection.

**\*\* Smart Zoom with Motion Detection (MD)**

1. Go into the "INTELLIGENCE" mode and select "MOTION DET" mode.
2. Enable the MODE to "ON" and select "MD area numbers (1 ~ 3)".
3. Activate to "ON" and adjust Sensitivity of MD (1 ~ 20)
4. Select Zoom position to move to "ZOOM PRESET".

**\*\* Smart Zoom with Object Detection (OD)**

1. Go into the "INTELLIGENCE" mode and select "OBJECT DET" mode.
2. Enable the MODE to "ON" and select "OD area numbers (1 ~ 9)".
3. Adjust Sensitivity of OD (1 ~ 5)
4. Select Zoom position to move to "ZOOM PRESET".

**Note**

The camera is fixed and zoom position is center-zoomed.  
For smart zooming, the positions of MD and OD area numbers are recommended to be on the center.  
Refer to the INTELLIGENCE menu for details (PAGE. 16)

## 8. Functions and operation

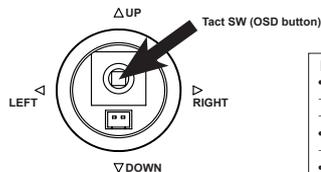
### 8-1. On Screen Menu (OSD) menu.

MAIN MENU									
<b>FOCUS</b>	MODE	DISTANCE	LENS REFRESH	E.ZOOM	HOME POSITION				
<b>EXPOSURE</b>	MODE	AGC	SHUT SPEED	IRIS	DSS	FLICKER LESS	BRIGHTNESS	WDR/ BLC	DAY & NIGHT
<b>WHITE BALANCE</b>	MODE	RED GAIN	BLUE GAIN						
<b>IMAGE</b>	DNR	HR	MIRROR	SHARPNESS	EFFECT	FREEZE			
<b>INTELLIGENCE</b>	PRIVACY	MOTION DET	OBJECT DET						
<b>SPECIAL FUNC</b>	SCENE MODE	COMM							
<b>DISPLAY</b>	DISP SEL	INIT SEL	SET TITLE	SET INIT MSG	LANGUAGE	SETUP STATUS			

### 8-2. Setting up the menu

- Press the Tact SW to enter <MAIN MENU>.
- Move the arrow to a specific menu by pushing the Tact SW up or down.
- Adjust the selected feature by pushing the Tact SW left or right

[MENU]	
FOCUS	▶▶
EXPOSURE	▶▶▶
WHITE BALANCE	▶▶▶▶
IMAGE	▶▶▶▶▶
INTELLIGENCE	▶▶▶▶▶▶
SPECIAL FUNC	▶▶▶▶▶▶▶
DISPLAY	▶▶▶▶▶▶▶▶
[EXIT] [SAVE] [DFLT]	



#### How to use OSD button (Tact SW)

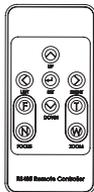
- Press
  - to enter the menu
  - to save settings
- Push up or down
  - to select functions
- Push left or right
  - to adjust a level or mode of sub-menu

- When the adjustment is completed, move the indicator to "SAVE" in the menu and press the button to save your settings.
- And then move the indicator to "EXIT" to exit the menu (or sub-menu) setting.
- If you select "DFLT (default)" in the menu, the settings in the menu will be restored to the factory default.

**Note**

- If '▶▶' indication appears on a selected sub-menu, press the Tact SW to get into a following menu.
- If '...' indication appears on any sub-menu, it means the function with this mark is deactivated.

## 8. Functions and operation

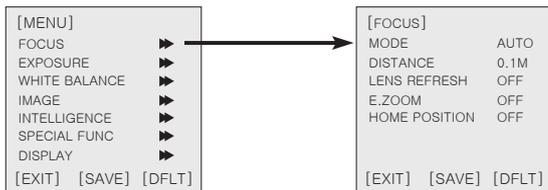


### How to use OSD button (OSD Menu control key)

- SET : to enter the menu, to save settings
- Push up or down : to select functions
- Push left or right : to adjust a level or mode of sub-menu
- Zoom (Tele, Wide) : to Zoom in and out
- Focus (Far, Near) : to Focus in and out

### 8-3. Focus

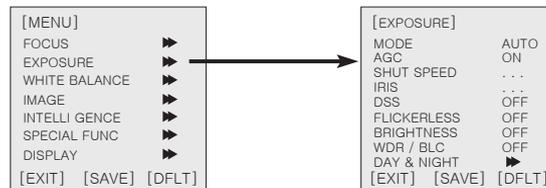
Select the FOCUS and adjust the SETUP suitable to the type of FOCUS



- (1) MODE : Select auto focus mode.  
- AUTO, ONE-PUSH, MANUAL
- (2) DISTANCE : Select minimum distance in focus between camera and object.  
- 0.1/1.0/1.3/2.0/6.0M
- (3) LENS REFRESH : Lens origin calibrated automatically.  
- OFF/ON (1day ~ 10days)
- (4) E.ZOOM : Select maximum digital zoom magnification.  
- OFF/ON (MAX x2 ~ x19, x21, x23, x25, x28, x32)
- (5) HOME POSITION : Select zoom home position function.  
The camera returns to the home position if a certain amount of time elapses without any operation.
  - OFF/ON
  - ZOOM PRESET : Set zoom home position function.
  - DURATION : Select the duration time.  
5/10/15/20/25/30/35/40/45/50/55/60 sec.

## 8. Functions and operation

### 8-4. EXPOSURE



- (1) MODE : Select exposure mode.  
- AUTO/SHUT.P/IRIS.P/MANUAL
- (2) AGC : Select Auto Gain Control.  
- OFF/ON(AUTO,SHUT.P or IRIS.P Mode)  
- 0/2/4/6/8/10/12/14/16/18/20/22/24/26/28/30dB (MANUAL Mode)
- (3) SHUT SPEED : Can be set in SHUT.P or MANUAL mode.  
- NTSC : x512, x128, x64, x32, x16, x8, x4, x2, 1/60, 1/90, 1/100, 1/180, 1/250, 1/500, 1/1000, 1/1500, 1/2000, 1/5000, 1/10000, 1/20000, 1/50000, 1/100000 sec.  
- PAL : x512, x128, x64, x32, x16, x8, x4, x2, 1/50, 1/80, 1/120, 1/150, 1/250, 1/500, 1/1000, 1/1500, 1/2000, 1/5000, 1/10000, 1/20000, 1/50000, 1/100000 sec.
- (4) IRIS : Iris level can be set in IRIS.P mode.  
- 1 ~ 18 steps
- (5) DSS : Select Max DSS (Digital Slow Shutter).  
- OFF/MAX x2, x4, x8, x16, x32, x64, x128, x512
- (6) FLICKERLESS : Select Flickerless mode.  
- OFF/ON (remove screen flicker)
- (7) BRIGHTNESS : Adjust brightness level.  
- 1(dark) ~ 15(bright) steps
- (8) WDR/BLC : Select WDR (Wide Dynamic Range) or BLC (Back Light Compensation).  
- OFF/ WDR/ BLC

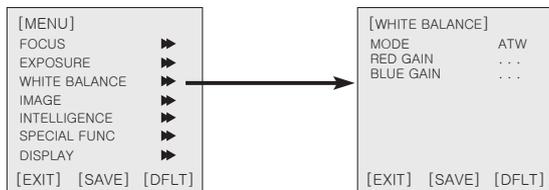
## 8. Functions and operation

- WDR : Select level 1 ~ 7 steps.
- BLC : Select Auto / Manual mode. You can adjust Area(1~9), Level(low/mid/high) in Manual mode.



- (9) DAY&NIGHT : Select Day&Night.
- Mode : Select Day&Night mode among DAY/ NIGHT/ AUTO/ EXT.
  - Delay : Adjust the working time of the filter when Day&Night operated.  
5/ 10/ 15/ 20/ 25/ 30/ 35/ 40/ 45/ 50/ 55/ 60 sec.
  - BURST : When you select BW, you can burst off/on.

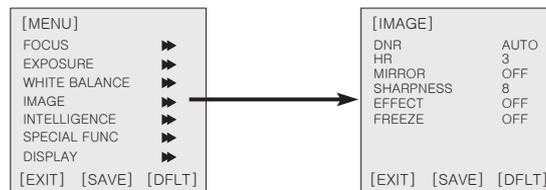
### 8-5. WHITE BALANCE



- MODE : Select white balance mode.  
ATW/ ONE-PUSH/ INDOOR/ OUTDOOR/ MANUAL/ AUTO
  - ATW : Automatically adjust color according to the available lighting.
  - ONE-PUSH : It is a fixed white balance mode that may be automatically readjusted only by pressing SET Button in ONE-PUSH mode.
  - OUTDOOR : Set color temperature to be Outdoor light(5400°K).
  - INDOOR : Set color temperature to be Indoor light(3200°K).
  - MANUAL : Color can be corrected when the user increases or decreases "Red Gain" or "Blue Gain".
  - AUTO : Wide color temperature range(more ATW range).
- RED GAIN / BLUE GAIN : enable to set the current color temperature (0~255) manually.

## 8. Functions and operation

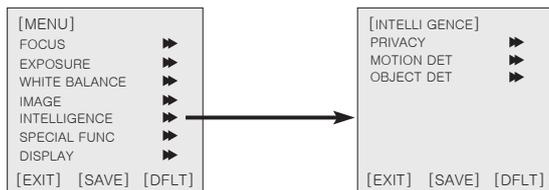
### 8-6. IMAGE



- (1) DNR : On screen digital noise reduction.  
- OFF/ 1 ~ 10/ AUTO
- (2) HR : Select High resolution.  
- OFF/ 1 ~ 7
- (3) MIRROR : Select a flip mode.  
- OFF  
/ V (You can flip the picture vertically on the screen)  
/ H (You can flip the picture horizontally on the screen)  
/ H&V (You can flip the picture horizontally & vertically on the screen)
- (4) SHARPNESS : Adjust sharpness level.  
- 1 ~ 16 steps
- (5) EFFECT : Select the negative or B/W effect.  
- OFF/ NEGATIVE/ BW
- (6) FREEZE : Select real or still mode.  
- OFF/ ON

## 8. Functions and operation

### 8-7. INTELLIGENCE (Smart Zoom)



- (1) PRIVACY : Hide the area you want to hide on the screen.
- MASK : Select mask area number(1~16)
  - MODE : Mask enable or disable(OFF/ON)
  - MOSAIC TYPE : Mosaic roughness setting(1 ~ 8)
  - MOSAIC : Mosaic display(OFF/ON)
  - COLOR : Select mask color(1 ~ 14)
  - TRANSPARENCY : Select mask transparency level(0 ~ 3)
  - POSITION : Adjust the mask position
  - SIZE : Adjust the mask size
- (2) MOTION DET : When there is a movement of the subject in the screen, there will be an motion detection.
- MODE : MD function enable or disable (OFF/ON)
  - AREA : Select MD area number (1 ~ 3)
  - ACTIVATE : Activate or deactivate the each MD area (OFF/ON)
  - SENSITIVITY : Adjust sensitivity of MD (1 ~ 20)
  - INTERVAL TIME : Select the alarm interval time (1 ~ 256 sec.)
  - DEWELL TIME : Select the duration time about changing MD mode (1 ~ 256 sec.)
  - POSITION : Adjust the MD position
  - SIZE : Adjust the MD size
  - ZOOM PRESET : Select zoom position to move when alarm is occurred
- (3) OBJECT DET : Detect object appeared or removed on the screen.
- MODE : Object detection enable or disable OFF/ON
  - AREA : Select OD Area number (1 ~ 9)
  - SENSITIVITY : Adjust sensitivity (1 ~ 5)
  - DEWELL TIME : Select the duration time about changing OD mode (1 ~ 256 sec.)
  - ZOOM PRESET : Select zoom position to move when alarm is occurred

## 8. Functions and operation

### 8-8. SPECIAL FUNCTION



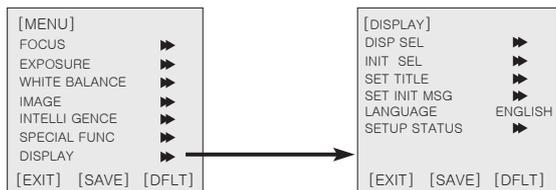
- (1) SCENE MODE : Select scene preset (screen).
- USER, NORMAL, TRAFFIC, BACK LIGHT, DAY/NIGHT, CASINO

Function		Normal	Traffic	Back Light	Day/ Night	Casino
AE	Mode	Auto	Auto	Auto	Auto	Auto
	WDR	OFF	OFF	ON	OFF	OFF
	DSS	Max 4x	Max 2x	Max 4x	Max 4x	Max 4x
D&N	Mode	Auto	Auto	Day	Auto	Day
	Burst	OFF	ON	OFF	OFF	OFF
AWB	Mode (Day)	ATW	Auto	Auto	Auto	Auto
	Mode (Night)	ATW	ATW	Auto	ATW	Auto

- (2) COMM : Set up the camera ID, baud rate, protocol.
- ID : Select the camera ID
    - 1 ~ 255
  - BAUD RATE : Select serial communication speed
    - 2400/ 4800/ 9600/ 19200/ 38400 bps
  - PROTOCOL : Select operating protocol
    - VISCA/ Pelco-D/ Pelco-P

## 8. Functions and operation

### 8-9. DISPLAY



(1) DISP SEL : Select display item.

- ID : OFF/ ON
- TITLE : OFF/ ON
- ZOOM RATIO : OFF/ON

(2) INIT SEL : Select items to display on the screen on initializing time after power-on.

- ID : OFF/ ON
- BAUD RATE : OFF/ ON
- PROTOCOL : OFF/ ON
- VERSION : OFF/ ON

(3) SET TITLE : Select camera title menu (Text edit).

(4) SET INIT MSG : Select camera initial message menu (Text edit).

(5) LANGUAGE : Select language.  
- ENGLISH/ KOREAN

(6) SETUP STATUS : Show the setup status of CURRENT OSD menu and compare the each value with the one of the FACTORY default.

## 9. Troubleshooting

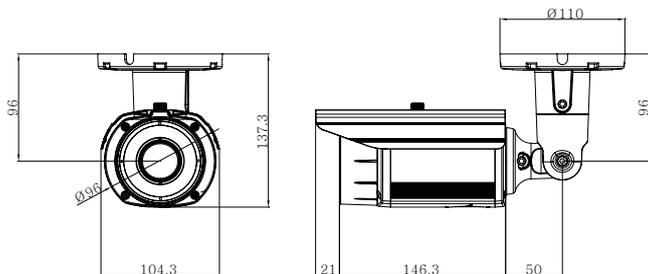
If there are problems in operating, please refer to the checklist below. If the problem persists, please contact the agent where this product is purchased.

Problems	Troubleshooting
Nothing appears on the screen.	<ul style="list-style-type: none"> <li>• Please check that the power cord and line connection between the camera and monitor are fixed properly.</li> <li>• Please check that you have properly connected VIDEO cable to the camera VIDEO output jack.</li> </ul>
The image on the screen is dim.	<ul style="list-style-type: none"> <li>• Is lens stained with dirt? Clean your lens with soft, clean cloth.</li> <li>• Set the monitor to proper condition.</li> <li>• If the camera is exposed to too strong light, change the camera position.</li> </ul>
The image on the screen is dark.	<ul style="list-style-type: none"> <li>• Adjust the contrast feature of the monitor.</li> <li>• If you have an intermediate device, set the 75Ω / Hi-Z properly (Please check the impedance)</li> </ul>
The camera is not working properly, and the surface of the camera is hot.	<ul style="list-style-type: none"> <li>• Please check that you have properly connected the camera to an appropriate power source.</li> </ul>
The DAY/NIGHT menu does not work.	<ul style="list-style-type: none"> <li>• Please check if DAY NIGHT menu is set to 'AUTO'.</li> </ul>
The DSS function does not work.	<ul style="list-style-type: none"> <li>• Please check that the mode of EXPOSURE SETUP menu is set to 'SHUT.P' or 'MANUAL'.</li> </ul>
The MOTION DETECTION function is not working.	<ul style="list-style-type: none"> <li>• Please check if MOTION DETECTION function is turned on.</li> <li>• Please check if MD sensitivity is too low.</li> <li>• Please check the setting of the MD area.</li> </ul>
Color is not correct.	<ul style="list-style-type: none"> <li>• Please check the setting of WHITE BALANCE SETUP menu .</li> </ul>
The screen flickers continually.	<ul style="list-style-type: none"> <li>• Please check that direction of camera turns toward the Sun.</li> </ul>

## 9. Troubleshooting

Problems	Troubleshooting			
RS-485 communication fails.	<ul style="list-style-type: none"> <li>Please check the polarity between RS-485 Control Port and RS-485 cable.</li> </ul>			
	485 Control Board Connection Port		RS-485 Control Port	
	(+)-CONNECTION TERMINAL(TRX+)		485+	
	(-)-CONNECTION TERMINAL(TRX-)		485-	
	<ul style="list-style-type: none"> <li>Please check if the initial value of the RS-485 Communication setup matches between camera and OSD Controller or DVR.</li> <li>* RS-485 Communication establishment initial value</li> </ul>			
	Item	Camera ID	BAUD RATE	UART MODE
Initial value	1	9600	8-NONE-1	ENABLE
<ul style="list-style-type: none"> <li>We recommend that you make ground connection between camera and controller for safe communication control.</li> <li>When RS-485 cable is not properly connected, A warning message 'ERROR RS-485 Connection. Please reconnect and Reboot' is displayed. Then please turn off the power and connect the cable again.</li> </ul>				

## 10. Dimension (mm)



## 11. Specification

MODEL	EL-3000
Image sensor	1/4" SONY Super HAD II Double Scan CCD
Effective pixels	NTSC : 976(H) X 494(V) PAL : 976(H) X 582(V)
H.Resolution	650TV Lines(Day) / 700TV Lines(Night)
Synchronizing system	Internal
Video output	1.0Vp-p Composite 75Ohms
S/N ratio	More than 50dB (AGC OFF)
Min.Illumination	0Lux
Shutter speed	NTSC : 1/60 ~ 100,000 sec. PAL : 1/50 ~ 100,000 sec.
Gamma control	Standard $\gamma=0.45$
White Balance	1,500°K ~ 10,000°K Auto ATW/ONE-PUSH/ Indoor/ Outdoor/ MANUAL/ Auto
Gain control	OFF/ ON (Max 30dB)
Smear effect	0.005%
Power source	24VDC / 24VAC
Operating current	140mA / 24VDC(IR OFF), 510mA/24VDC(IR ON) 130mA / 24VAC(IR OFF), 400mA/24VAC(IR ON)
Zoom Ratio	Optical x12, Digital x32 Zoom
Focal Length	f = 3.8mm ~ 45.6mm
Aperture Ratio	F1.6 ~ F2.7
IR spectrum	850nm
Viewable distance	Up to 70M at moonless night
Iris control	DC IRIS
MTBF of IR	20,000 hours
Operating temp	-10°C ~ 50°C
Humidity	0%RH ~ 90%RH
Measurement(mm)	110(W) x 138(H) x 272(D)
Weight(Approx.g)	2600
<b>Function</b>	
WDR/BLC	OFF/ON(User selectable by OSD)
DNR	OFF/ MANUAL/ AUTO(User selectable by OSD)
DSS	OFF/x2 ~ x512
Motion Detection	OFF/ 3 positions
Object Detection	OFF/ 9 positions
HR	OFF/ 1 ~ 7 steps
Privacy mask	OFF/ 16 positions