



**GENERAL LOCK**  
SECURITY PRODUCTS

**CX480-DN Users Manual and Installation Instructions**

**CX480-DN Day/Night Camera**  
**Users Manual and**  
**Installation Instructions**

# Safety Warning

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**1. Do not expose the camera to humidity and dust.**

Moisture can damage the camera and cause the danger of electric shock. If the camera is mounted outdoors, a camera housing is required. Do not install the camera at where there is greasy smoke or steam, where the humidity is too high, or where there is a lot of dust to prevent damages to the camera.

**2. Do not disassemble the camera.**

Do not disassemble the camera body as it is dangerous and may cause the damages to the camera. Refer all servicing to qualified service personnel.

**3. Handle the camera with care.**

Be careful when handling the camera, do not drop it or subject it to strong shock or vibration to prevent any damages to it.

**4. Do not install the camera near electric or magnetic fields.**

Installed the camera away from TV, radio transmitter, magnet, electric motor, transformer, audio speakers because the magnetic fields generate from above devices will distort the video image.

5. **Never face the camera toward the sun.**

Never aim the camera at the sun or other extremely bright objects whether it is in use or not.

6. **Do not install the camera in the high temperature environment.**

Installed the camera away from stoves, or other heat generating devices, or where it could be subject to direct sunlight as the high temperatures could cause deformation, discoloration or other damages of the camera. Install the camera at where the temperature range will stay between 0°C to 50°C(32°F to 122°F).

7. **Cleaning**

Do not touch the surface of CCD sensor by hand directly. Use a soft cloth to remove the dirt from the camera body. Use lens tissue or a cotton tipped applicator and ethanol to clean the CCD sensor and the camera lens. When the camera is not in use, put the cover cap on the lens mount.

# CX480-DN Introduction

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The Day/Night Digital Color Camera introduces a new level of high quality picture. The compact, full performance, general-purpose color DSP Cameras, which use high sensitive 1/3" interline transfer Super HAD CCDs (Charge Coupled Device). It delivers high-resolution superior color images in bright light, and clear sharp monochrome pictures in low light. The evolution 2-in1 intelligent video camera brings your security surveillance system to a new digital era.

## **Main Features**

- 1/3" color CCD pick up device.
- 480 lines of horizontal resolution.
- Signal-to-noise ratio more than 48 dB.
- Minimum illumination of 1.0 lux with F=1.2 lens.
- Programmable camera ID up to 9 characters.
- High resolution color camera in normal light; black and white camera in low light.
- User friendly on-screen set up menu allows ES, AGC, AWB, BLC, and Sync. Phase to be customized program.
- Selectable exposure modes including: ES, Manual Exposure, Flickerless, and Auto IRIS.
- RS232 remote control communication and S-Video output available.

# Specification

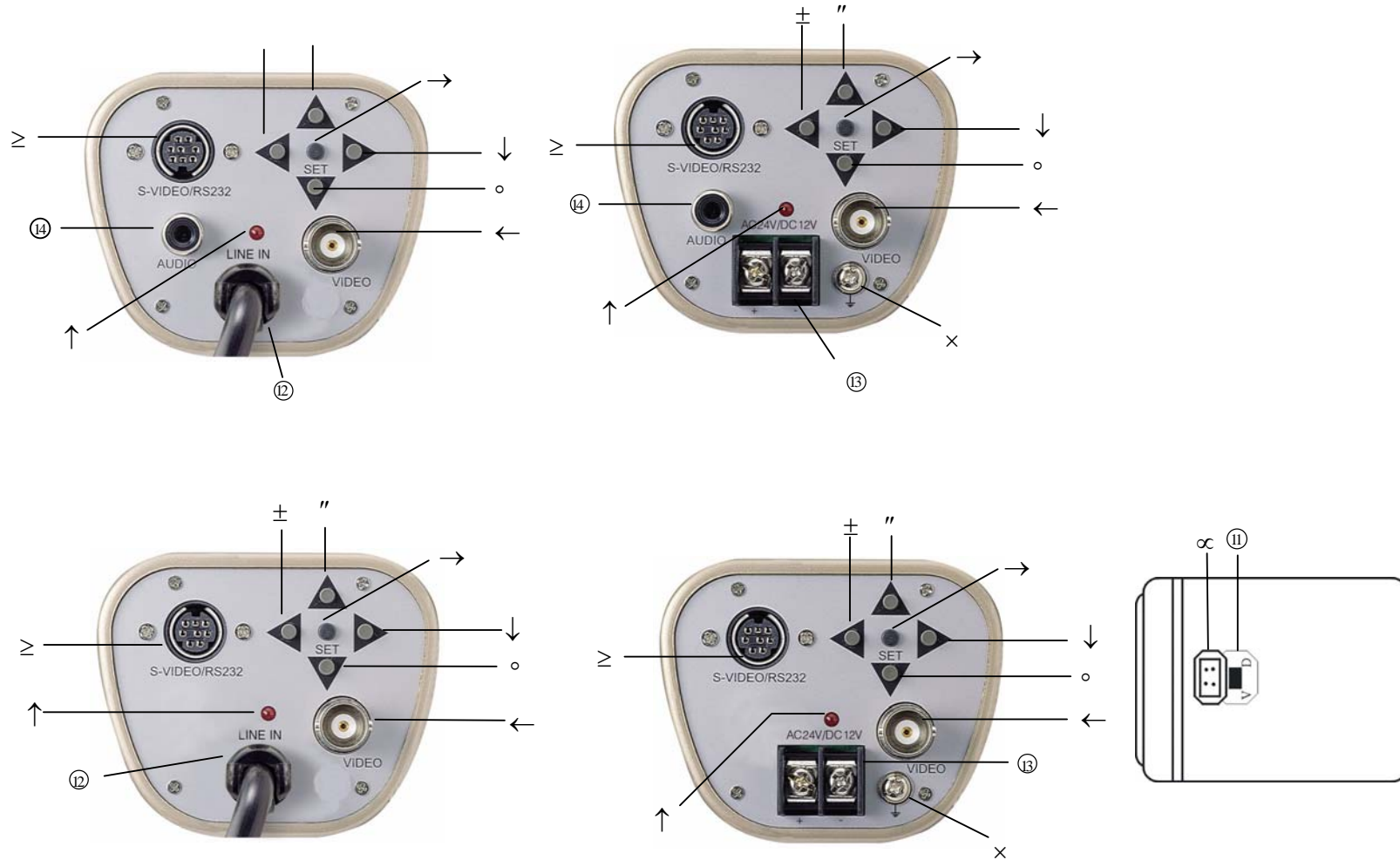
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<b>Pickup device:</b>	1/3" interline transfer color CCD
<b>Video format:</b>	NTSC/PAL
<b>Scanning system:</b>	NTSC:525 lines, PAL:625 lines
<b>Picture elements:</b>	NTSC:768 (H) x 494 (V) ; PAL: 752(H) x 582(V)
<b>Horizontal resolution:</b>	480 TV lines
<b>Sensitivity:</b>	1.0 lux / F=1.2
<b>S/N ratio:</b>	> 48 dB
<b>Camera ID symbol:</b>	9 characters title generator
<b>Back light comp.:</b>	Yes, 255 levels variables on screen
<b>Auto white balance:</b>	3 Modes selectable ①Standard: 2500K~9500K; ②Large Frame: 2400K~11000K; ③Frameless: 2000K~18000K
<b>Auto white balance speed:</b>	15 steps variables on screen
<b>Auto IRIS:</b>	Video Drive or Direct Drive switchable
<b>D/D lens iris level:</b>	Level: 150 steps variables on screen
<b>Exposure:</b>	4 modes selectable on screen ①ES: 1/60(1/50) ~ 1/100000 sec.; AGC Gain: 10~36 dB ②Manual Exposure: 1/60(1/50), 1/100(1/120), 1/250, 1/500, 1/1000, 1/2000, 1/5000, 1/10000 sec.; AGC Gain: 0, 6, 12, 18 dB ③Flickerless: 1/100(NTSC), 1/120(PAL) sec.; AGC Gain: 10~36 dB ④Auto IRIS: 1/60(1/50) sec.; AGC Gain: 10~36 dB

<b>Sync. mode:</b>	Internal sync. / Line lock
<b>V Phase adjustment:</b>	Line Phase: 0~354°, 60 steps var. on screen
<b>Gamma correction:</b>	7 modes selectable on screen
<b>Video output:</b>	BNC VBS, 1.0Vp-p, 75 ohm
<b>S-Video:</b>	Mini Dim S-Video, Y: 1.0Vp-p, 75ohm, C: 286mV, 75ohm(NTSC); 300mV, 75ohm(PAL)
<b>Day/Night:</b>	On / Off
<b>Audio:</b>	Optional
<b>Lens mount:</b>	C/CS mount
<b>Power source:</b>	90~265VAC or AC24V/12VDC
<b>Dimension:</b>	56 x 68 x 101 mm
<b>Operating temperature:</b>	0°C to +50°C
<b>Power consumption:</b>	5W max.

# Major Parts Names and their Functions

## <CX480-DN>



← Video Output Connector

This connector is used to connect with the VIDEO IN connector of the monitor (Video Out: BNC type).

↑ Power LED Indicator

This indicator lights comes on when the power of this camera is on.

→ Tact Switcher for Setting

Press the tact switcher to display the setting menu. It is used to activate an item selected in the SET UP menu.

↓ Tact Switcher for Right Cursor

This tact switcher is used to move the cursor to the right and increase the parameters of the selected item.

◦ Tact Switcher for Down Cursor

This tact switcher is used to move the cursor downward for selecting the items in the screen menu.

± Tact Switcher for Left Cursor

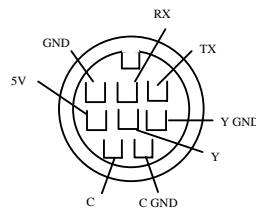
This tact switcher is used to move the cursor to the left and decrease the parameters of the selected item.

" Tact Switcher for Up Cursor

This tact switcher is used to move the cursor upward for selecting the items in the menu.

≥ S-Video / RS-232 port

Connecting Mini Dim Male Connector to S-Video / RS-232 port for better video output quality or communication.



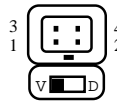
× Ground Connector

Connecting to power system ground.

∞ Auto Iris Lens Connector

This connector is used to connect with the auto iris lens by a 4-pin male connector.

	<u>Pin 1</u>	<u>Pin 2</u>	<u>Pin 3</u>	<u>Pin 4</u>
Video Drive	+12V	GND	VD-IRIS	GND
Direct Drive	Cnt-	Cnt+	Drv+	Drv-



Ⓚ V/D Switch

Switch for Video Drive Auto IRIS lens or Direct Drive Auto IRIS lens.

Ⓚ Line in power cord

This power cord is for 90 ~ 265 VAC power supply.

Ⓚ AC24V/DC12V Compatible Input Terminal

This power terminal is for connecting the 24V AC or 12V DC power supply cord.

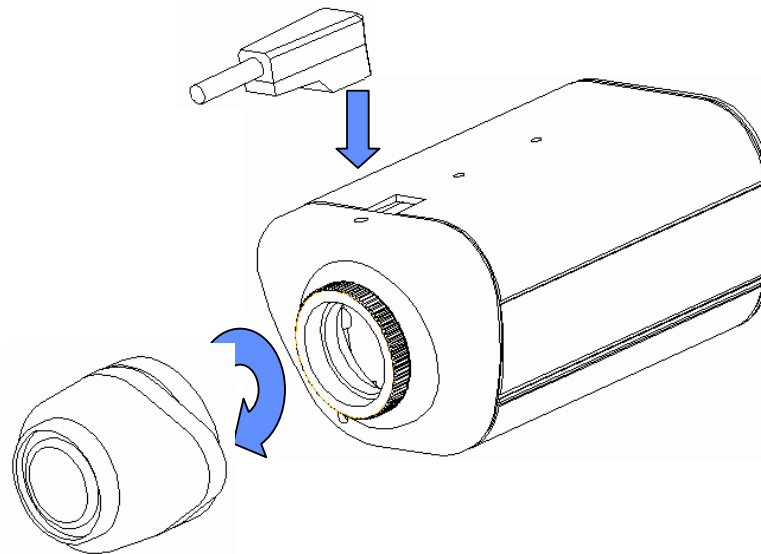
Ⓚ Audio Output Connector

This connector is used to connect with an audio device (Audio Out: RCA connector).

# Mounting The Lens

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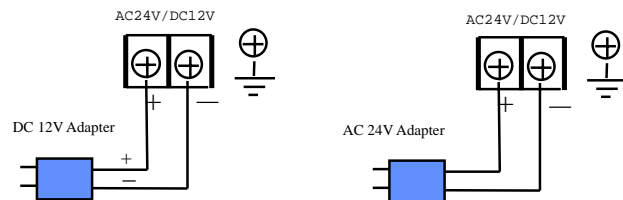
1. Remove the cover cap from the top of the lens mount.
2. If C mount lens is used, please add the C adaptor mount ring (the 5mm thick ring in the accessory pack) on top of the lens mount.
3. Mount the lens by turning it clockwise on the lens mount of the camera.
4. If you use the Auto Iris lens, connecting the lens cable to the auto iris lens connector on the top of the camera.



# Connections

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1. Connect the video output of the camera to a color monitor or other video device through a 75 ohm type coaxial cable with BNC female connector at camera end.
2. Plug the power cord to the electrical outlet 90~265VAC. Power LED indicates red light if the power source is properly connected.
3. Connect the AC 24V or DC 12V power source to the power input terminals. The power supply connection is illustrated below. Please note that the screw marked  $\oplus$  ( GND) should connect to the camera case. Power LED indicates red light if the power source is properly connected.

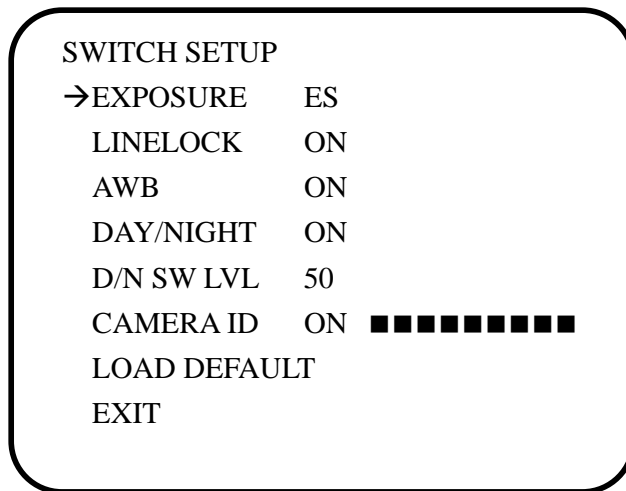


# Settings

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- **Entering the Set Up Menu**



Press the tact switcher  twice to enter main menu shown as below:





This page is just for you to set the main function of the camera. If you would like to do more settings, please go through the following pages.

- **Changing the settings**

Move  and  to select the item you would like to change. To change the settings, use ,  to modify the previous settings.

Check the current settings on the menu appearing on the monitor. If you would not make any changes after checking it, press  to move the cursor to EXIT and press  to exit to the setting menu.

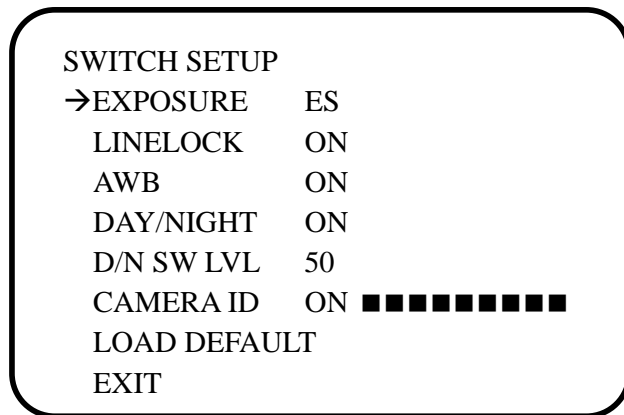
- **EXPOSURE**

1. There are four modes of exposure for you to set on the screen. Use  and  to select the mode. The modes are:  
Electronics Shutter(ES), Manual Exposure(ME), Flickerless(FL), and Auto

Iris(AI).

The default EXPOSURE setting is ES.

2. You can do further setting on the next page after selecting one of the modes.



#### • LINE LOCK

1. This item is used to make the vertical phase of the camera video signal matched to the phase of AC power.
2. Move the cursor to the LINELOCK parameter and press ◀ or ▶ to select **ON** for line lock function or **OFF** for

internal sync.

The default LINELOCK setting is ON.

#### • AWB

1. Normally the AWB (Auto White Balance) is set to ON.
2. Press ◀ or ▶ to change **ON** for automatic white balance or **OFF** to fix current state.

The default AWB setting is On.

#### • DAY/NIGHT

1. The camera is specially designed to have a clear black and white picture under low light environment.
2. The Color and Black/White switching automatically according to the environment, it is a color CCD camera under normal light and Black/White CCD camera under low light.

3. When the setting is off, it is only a color CCD camera.

The default DAY/NIGHT setting is ON.

- **D/N SW LVL**







This parameter, range from 00~99, is to adjust the day/night switch level. When the value is higher, it will be much more easier to switch Color and Black/White automatically, and vice versa.

The default D/N SWLVL setting is 50.

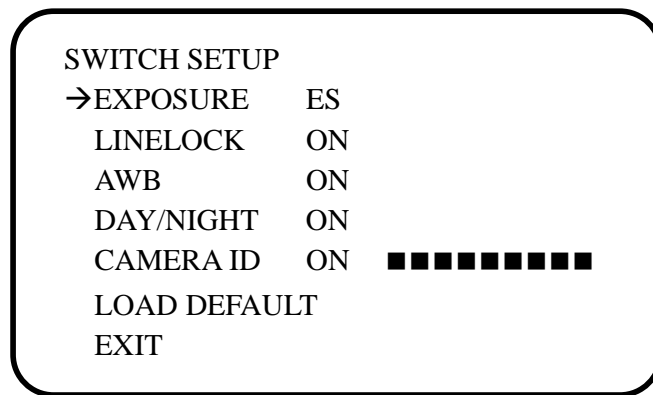
- **CAMERA ID**

1. Press ◀ or ▶ to change the character of CAMERA ID. You can use the camera identification (CAMERA ID) to assign a name to each camera when you set the CAMERA ID ON.


2. The camera ID is up to 9 characters. The characters for setting the ID of the camera

are: “Space”, “0~9”, “A~Z”, “a~z”. Press  to start editing camera ID and then press  or  to select the necessary character then move  or  to change the cursor to another position. After ID setting finished, press  again to return to main menu.

The default CAMERA ID setting is ON.



- **LOAD DEFAULT**






Press  to reset all parameters of the camera to the factory settings.

As soon as the default is loaded, Program VER N.N will be shown on the screen.

**Caution:**



- If the power of the camera is disabled before “PROGRAM VER. N.N” disappeared, please restart the camera and load default again for stable issue.

**Tips:**

- You can also press  ,  ,  ,  ,  together to load default anywhere during the screen display mode off.

**Remark:** “PROGRAM VER N.N” is the current software version of the camera.

- **EXIT**

Press  to exit the setting mode; or press  to go to next setting pages. Once you exit the set up menu, all of the modifications will be saved.

# Engineering Settings

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The second page is for you to do more settings of exposure. The setting function of the second page will be different according to the **EXPOSURE** setting on the previous page. The further setting of each mode is described as below.

## • EXPOSURE ES

EXPOSURE ES	
→LEVEL<IRE>	105 IRE
RESPONSE	14
SHUTTER LIM	1/100,000
BLC	OFF
BLC LEVEL	32
AGC	ON
AGC MAX	187
AGC MIN	01
EXIT	

### 1. LEVEL<IRE>

This parameter, range from 60~120, is to adjust the brightness of exposure levels. When the value is higher, the video image is brighter; when the value is lower, the video image is darker.

The default LEVEL<IRE> setting is 105 IRE.

### 2. RESPONSE

This parameter, range from 1~255, is to adjust the response time of Electronic Shutter according to light changing. The higher value means the response time is longer; the lower value means the response time is shorter.



The default ERSPONES setting is 14.

### 3. SHUTTER LIM

The range of ES is from 1/500 to 1/100,000 seconds. Under ES mode, you can select the electronic shutter speed limit depending on the different light conditions.

The default SHUTTER LIM setting is 1/100,000.

### 4. BLC

Press  or  to set ON or OFF of Back Light Compensation function.

ON: When there is excessive light behind the center object, it is necessary to prevent the center object become too dark. Turn BLC ON, the center object will be brighten in contrast to the edge of the picture where back light would most likely be located.



The default BLC setting is OFF.

### 5. BLC LEVEL

This parameter, range from 0 ~ 255, is to adjust the Back Light Compensation levels. In the back light condition, set BLC ON to obtain the brighter image of viewing object. When the value is higher, the video image is brighter; when the value is lower, the video image is darker.

The default BLC LEVEL setting is 32.

### 6. AGC

Press  or  to set ON or OFF of Auto Gain Control function.

ON: Automatic Gain (brightness level portion of an image) adjustment.

OFF: Fixed Gain level.

The default AGC setting is ON.

### 7. AGC MAX

When AGC is on, you can set the maximum value of AGC from AGC MIN ~ 255.



The default AGC MAX setting is 187.

#### 8. AGC MIN

When AGC is on, you can set the minimum value of AGC from 0 ~ AGC MAX.

The default AGC MIN setting is 01.

#### 9. EXIT



Press  to exit the setting menu or press  to go to next setting pages.

### • EXPOSURE ME

Select ME mode when you wish to fix the shutter speed for the exposure.

EXPOSURE ME	
→SHUTTER SPD	1/50
AGC	ON
AGC	MAX 187
AGC	MIN 01
EXIT	

#### 1. SHUTTER SPD

You can select the manual exposure speed of 1/60(1/50), 1/100(1/120), 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000 by moving  or .

The default SHUTTER SPD setting is 1/60(1/50).

#### 2. AGC MAX

When AGC is on, you can set the maximum value of AGC from AGC MIN ~ 255.

The default AGC MAX setting is 187.

#### 3. AGC MIN

When AGC is on, you can set the minimum value of AGC from 0 ~ AGC MAX.

The default AGC MIN setting is 01.

### • EXPOSURE AI

Select the AI mode when using the Auto IRIS Direct Drive or Video Drive lens.

EXPOSURE AI	
→D/D LEVEL	32
BLC	OFF
BLC LEVEL	32
AGC	ON
AGC MAX	187

### 1. D/D LEVEL

This parameter, range from 01 ~ 150, is to adjust brightness level of the video when using the Direct Drive Auto IRIS lens. When the value is higher, the video image is brighter; when the value is lower, the video image is darker.

**Notice:** D/D level mentioned above is adjusted for Direct Drive lens only. This value is not effective when using Video Drive lens.

The default D/D LEVEL setting is 32.

2. BLC, BLC LEVEL, AGC, AGC MAX, and AGC MIN functions are the same setting procedure as EXPOSURES ES.

### • EXPOSURE FL

Select the Flickerless mode to remove the picture flicker when using a NTSC version camera in 50Hz power source and under fluorescent light; or using PAL version camera in 60Hz power source and under fluorescent light.

EXPOSURE FL	
→AGC	ON
AGC MAX	187
AGC MIN	00
EXIT	

The above parameters are the same setting procedure as EXPOSURE ES. Under the FL mode, the speed of electronic shutter will be stable at 1/100(NTSC) or 1/120(PAL).

• **VIDEO SETUP**

VIDEO SETUP	
→BRIGHT	120
CHROMA	10
HUE	10
SHARPNESS HL	02
SHARPNESS HH	02
SHARPNESS V	10
SHARPNESS G	10
EXIT	

1. **BRIGHT**

This parameter, range from 0-255, is to adjust the brightness of the video. When the value is higher, the video image is brighter; when the value is lower, the video image is darker.

The default BRIGHT setting is 120.

2. **CHROMA**

This parameter, range from 0~20, is to

adjust the chroma of the video.

The default CHROMA setting is 10.

3. **HUE**

This parameter, range from 0~20, is for you to adjust the hue of the video.

The default HUE setting is 10.

4. **SHARPNESS HL**

This parameter, range from 0~3, is for you to adjust the sharpness of low frequency component in horizontal direction.

The default SHARPNESS HL setting is 02.

5. **SHARPNESS HH**

This parameter, range from 0~3, is for you to adjust the sharpness of high frequency component in horizontal direction.

The default SHARPNESS HH setting is 02.

6. **SHARPNESS V**

This parameter, range from 0~15, is for you to adjust sharpness in vertical direction.

The default SHARPNESS V setting is 10.

## 7. SHARPNESS G

This parameter, range from 0~15, is for you to adjust sharpness gain control.

The default SHARPNESS G setting is 10.

Item 4-7 is for you to obtain much sharper pictures.

### • VIDEO SETUP2

#### VIDEO SETUP2

→Y GAMMA	03
Y KNEE	00
C GAMMA	04
C KNEE	07
PATTERN	
EXIT	

## 1. Y GAMMA

This parameter, range from 0~7, is for you to adjust the Y Gamma Correction Curve.

The default Y GAMMA setting is 03.

## 2. Y KNEE

This parameter, range from 0~7, is for you to adjust the Y Gamma Correction Knee.

The default Y KNEE setting is 00

## 3. C GAMMA

This parameter, range from 0~7 is for you to adjust the C Gamma Correction Curve.

The default C GAMMA setting is 04.

## 4. C KNEE

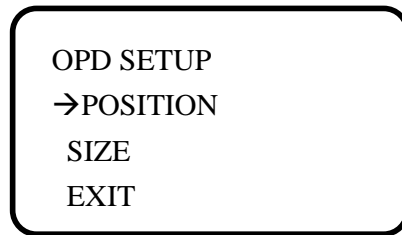
This parameter, range from 0~7 is for you to adjust the C Gamma Correction Knee.

The default C KNEE setting is 07.

## 5. PATTERN

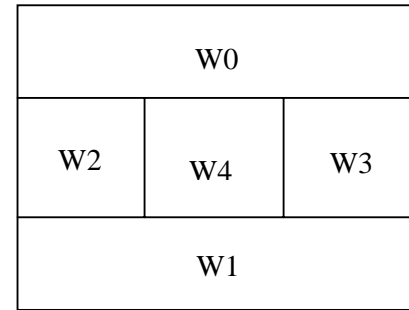
Press ◀ or ▶ to select the patten output from the camera. The list of pattern that can be output by the PG is shown in Table below:

<i>Abbreviation</i>	<i>Pattern</i>
HC	Horizontal color bar
HCVR	Horizontal color bar Vertical ramp
VC	Vertical color bar
VCHR	Vertical color bar Vertical ramp
MR	Monochrome raster
HMR	Horizontal monochrome ramp
VMR	Vertical monochrome ramp
HI	Horizontal impulse
HXI	Horizontal reverse impulse
VI	Vertical impulse
VXI	Vertical reverse impulse
HSR	Horizontal simple ramp









● **OPD SETUP**

In this camera the Optical Detect method is separate 5 windows to detect the luminous for AE, BLC, and AWB algorithm. The OPD window is shown as below:






You can adjust W4 position and size; W0, W1, W2, W3 position and size will change depending on W4's position and size.

1. **POSITION**

Press  to set the position of OPD (Optical Detector) window. You can use , , , and  to move the OPD window. Press  again to stop moving the OPD window.

2. **SIZE**

Press  to activate OPD window, then press  and  to change the width of

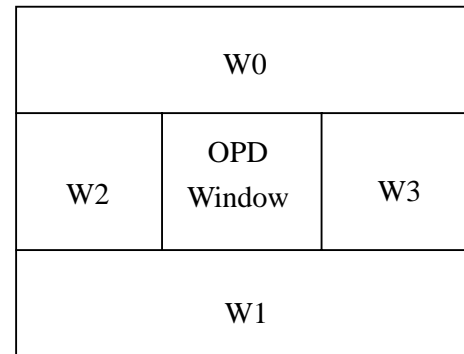
the OPD window; press ▼ and ▲ to change the length of the OPD window.

• **OPD WEIGHT SETUP**

OPD WEIGHT SETUP	
→W0 WEIGHT	01
W1 WEIGHT	01
W2 WEIGHT	03
W3 WEIGHT	03
EXIT	

1. W0 WEIGHT: 0 ~ 15
2. W1 WEIGHT: 0 ~ 15
3. W2 WEIGHT: 0 ~ 15
4. W3 WEIGHT: 0 ~ 15

The above items are for you to set each window's parameters for algorithmic ratio that requested.



• **LINELOCK SETUP**

LINELOCK SETUP	
→VPHASE	00
EXIT	

1. V PHASE  
The V phase, range from 0 ~ 59, is to adjust the line lock delay phase. It have 60 steps to set the phase delay from 0° ~ 354°. Press

◀ or ▶ to match the vertical phase for both video output signals as closely as possible.

The default V PHASE setting is 00.

### • AWB SETUP

AWB SETUP	
→RANGE	STANDARD
SPEED	01
WINDOW SEL	ALL WIND
EXIT	

#### 1. RANGE

Press ◀ or ▶ to select the tracing range of Auto White Balance.

**FRM Less:** Color temperature: 2000°K ~ 18,000°K.

**Standard:** Color temperature: 2,500°K ~ 9,500°K.

**Large FRM:** Color temperature: 2,400°K ~ 11,000°K.

#### 2. SPEED

This parameter, range from 01 ~ 14, is to adjust speed of auto white balance. When the value is larger, the speed is slower.

The default SPEED setting is 01.

#### 3. WINDOW SEL

Press ◀ or ▶ to select Window 0 CUT or ALL Window for AWB algorithm range.