



DS-2CE7xH0T-ITxxx Series  
**Turret Cameras**  
User Manual

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Thank you for purchasing our product. If there are any questions or requests, do not hesitate to contact the dealer.

This manual applies to the models below:

Type	Model
Type I Camera	DS-2CE78H0T-IT3F
Type II Camera	DS-2CE76H0T-ITMF

This manual may contain several technical mistakes or printing errors, and the content is subject to change without notice. Updates will be added to the new versions of this manual. We will readily improve or update the products or procedures described in the manual.

## 1 Regulatory Information

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### 1.1 FCC Information

Please take attention that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

**FCC Compliance:** This equipment has been tested and found to comply with the 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 their own expense.

### 1.2 FCC Conditions

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

### 1.3 EU Conformity Statement

**CE** This product and, if applicable, the supplied accessories too are marked with "CE" and comply therefore with the applicable harmonized European standards listed under the Low Voltage Directive 2014/35/EU, the EMC Directive 2014/30/EU.



**2012/19/EU (WEEE Directive):** Products marked with this symbol cannot be disposed of as unsorted municipal waste in the European Union. For proper recycling, return this product to your local supplier upon the purchase of equivalent new equipment, or dispose of it at designated collection points. For more information see: [www.recyclethis.info](http://www.recyclethis.info).



**2006/66/EC (Battery Directive):** This product contains a battery that cannot be disposed of as unsorted municipal waste in the European Union. See the product documentation for specific battery information. The battery is marked with this symbol, which may include lettering to indicate cadmium (Cd), lead (Pb), or mercury (Hg). For proper recycling, return the battery to your supplier or to a designated collection point. For more information, see: [www.recyclethis.info](http://www.recyclethis.info).

## 1.4 Industry Canada ICES-003 Compliance

This device meets the CAN ICES-3 (A)/NMB-3(A) standards requirements.

## 1.5 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.

## 1.6 Safety Instruction

These instructions are intended to ensure that the user can use the product correctly to avoid danger or property loss.

The precaution measure is divided into "Warnings" and "Cautions."

**Warnings:** Serious injury or death may occur if any of the warnings are neglected.

**Cautions:** Injury or equipment damage may occur if any of the cautions are neglected.



**Warnings** Follow these safeguards to prevent serious injury or death.



**Cautions** Follow these precautions to prevent potential injury or material damage.

### 1.6.1 Warnings

In the use of the device, you must be in strict compliance with the electrical safety regulations of the nation and region.

- Input voltage should meet both the SELV (Safety Extra Low Voltage) and the Limited Power Source with 12 VDC according to the IEC60950-1 standard. Refer to technical specifications for detailed information.
- Do not connect multiple devices to one power adapter to avoid overheating or a fire hazard caused by overload.
- Make sure that the plug is firmly connected to the power socket.
- Make sure that the device is firmly fixed if wall mounting or ceiling mounting is used.
- If smoke, odor, or noise rise from the device, turn off the power at once, unplug the power cord, then contact the service center.
- Non-professional personnel should never attempt to disassemble the camera.



### 1.6.2 Cautions

- Do not drop the camera or subject it to physical shock.
- Do not touch sensor modules with fingers.
- Do not place the camera in extremely hot, cold (the operating temperature shall be  $-40^{\circ}$  to  $60^{\circ}$  C), dusty, or damp locations, and do not expose it to high electromagnetic radiation.
- If cleaning is necessary, use a clean cloth with a bit of ethanol, and wipe it gently.
- Do not aim the camera at the sun or extra bright places.
- The sensor may be burned out by a laser beam, so if any laser equipment is in use, make sure that the surface of the sensor will not be exposed to the laser beam.
- To avoid heat accumulation, good ventilation is required for the operating environment.
- Keep the camera away from liquid while in use for non-waterproof device.
- While in delivery, the camera shall be packed in its original packing or packing of the same material.

### 1.6.3 Mark Description

Table 0-1 Mark Description

Mark	Description
---	DC Voltage

## 2 Introduction

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### 2.1 Main Product Features

- High Performance CMOS Sensor
- OSD menu with Configurable Parameters
- Smart IR
- 3-Axis Adjustment

### 2.2 Overview

#### 2.2.1 Overview of Type I Camera

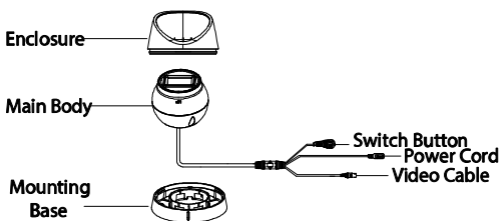


Figure 1, Overview of Type I Camera

**NOTE:** Press and hold the switch button for five seconds to switch the video output. Four kinds of video outputs are available: TVI, AHD, CVI, and CVBS.

#### 2.2.2 Overview of Type II Camera

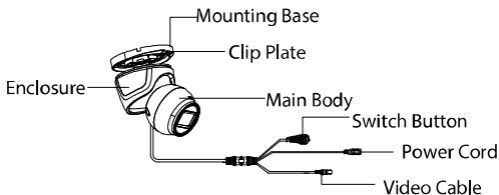


Figure 2, Overview of Type II Camera

**NOTE:** Press and hold the switch button for five seconds to switch the video output. Four kinds of video outputs are available: TVI, AHD, CVI, and CVBS.

## 3 Installation

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### Before You Start

Make sure that the device in the package is in good condition and that all assembly parts are included.

Make sure that all the related equipment is powered off during the installation.

Check the product specification for the installation environment.

Check whether the power supply matches your power output to avoid damage.

Make sure the wall is strong enough to withstand

three times the weight of the camera and the mount.

If the wall is concrete, insert expansion bolts before installing the camera. If the wall is wood, use self-tapping screws to secure the camera.

If the product does not function properly, contact your dealer or the nearest service center. Do NOT disassemble the camera for repair or maintenance yourself.

### 3.1 Type I Camera Installation

#### 3.1.1 Ceiling/Wall Mounting without Junction Box

##### Before You Start

Ceiling mounting and wall mounting are similar. The following takes ceiling mounting as an example.

1. Disassemble the camera by rotating the camera to align the notch with one of the lines, as shown.

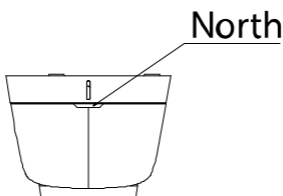


Figure 3, Disassemble the Camera

2. Pry loose the mounting base by using a flat object, for example, a coin.

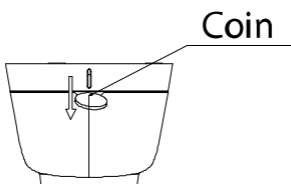


Figure 4, Pry Loose the Mounting Base

3. Paste the drill template (supplied) to where you want to install the camera.
4. Drill the screw holes and the cable hole (optional) on the ceiling according to the drill template.

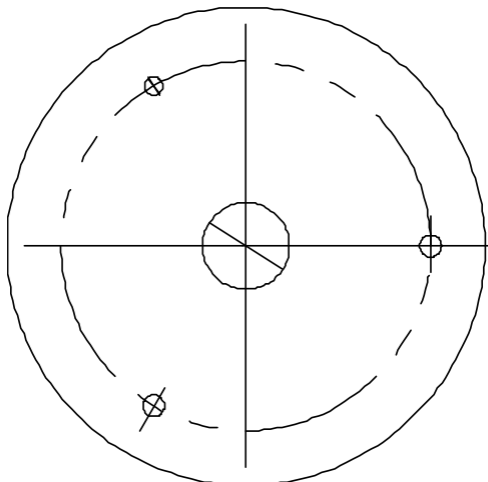


Figure 5, Drill Template

5. Attach the mounting base to the ceiling, and secure it with supplied screws. For a concrete ceiling, first mount the expansion bolts.

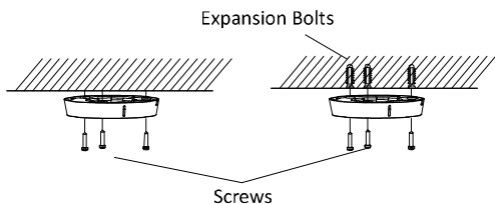


Figure 6, Attach the Mounting Base to the Ceiling

6. Route cables through the cable hole or the side opening.
7. Attach the camera back to the mounting base, and secure it.

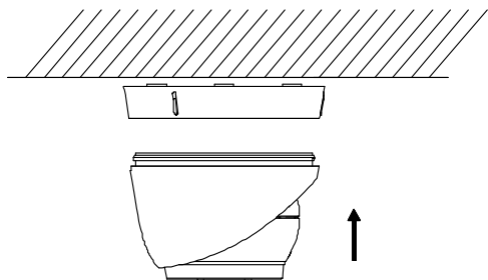


Figure 7, Install the Camera Back

8. Connect the corresponding power cord and video cable.
9. Power on the camera to check if the image on the monitor is at an optimum angle. If not, adjust the



camera according to the figure below.

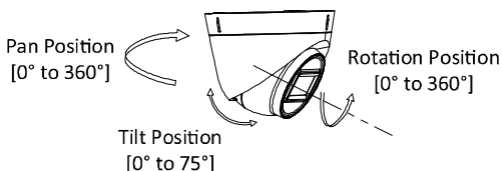


Figure 8, 3-Axis Adjustment

### 3.1.2 Ceiling/Wall Mounting with Junction Box

#### Before You Start

You need to purchase a junction box in advance.

1. Paste the drill template where you want to install the camera.
2. Drill screw holes and the cable hole (optional) according to the drill template.

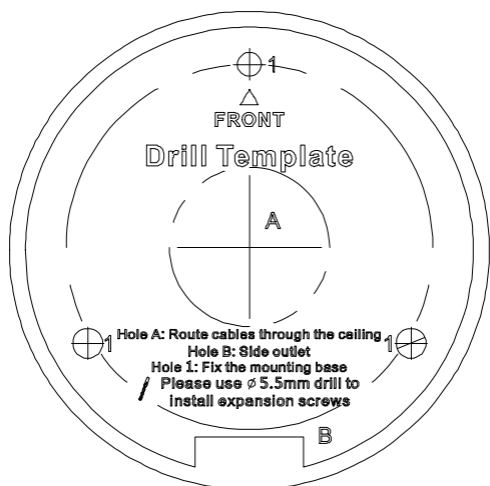


Figure 9, Drill Template

3. Take apart the junction box, and align the screw holes of the mounting base with those on the junction box's cover.
4. Install the mounting base on the junction box's cover with three PM4 screws.
5. Secure the junction box's body on the wall with three PA4 × 25 screws.

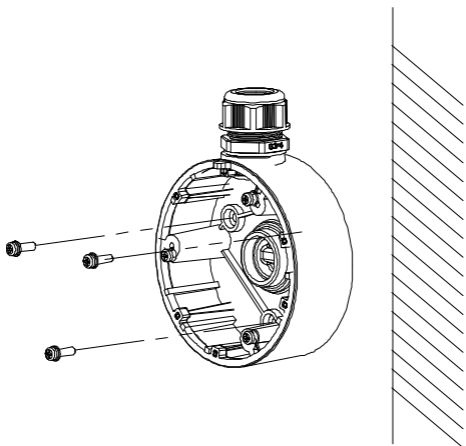


Figure 10, Secure the Junction Box

6. Route the cables through the junction box's bottom cable hole or side cable hole.
7. Attach the junction box cover to its body.
8. Attach the camera back to the mounting base, and secure it.

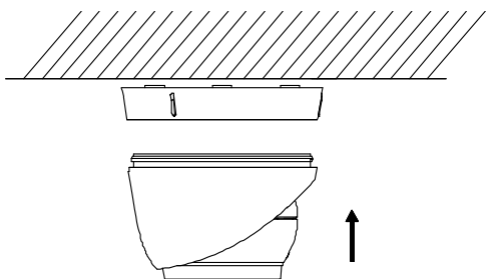


Figure 11, Install the Camera Back

9. Connect the corresponding power cord and video cable.
10. Power on the camera to check if the image on the monitor is at an optimum angle. If not, adjust the camera according to the figure below.

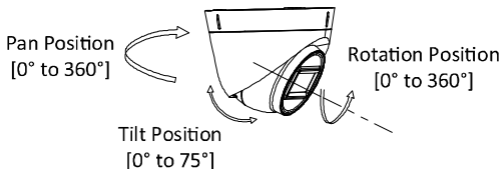


Figure 12, 3-Axis Adjustment

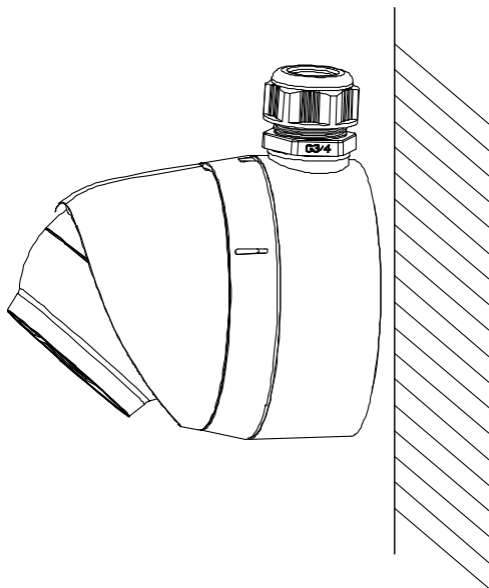


Figure 13, Finish the Installation

## 3.2 Type II Camera Installation

### 3.2.1 Ceiling/Wall Mounting without Junction Box

#### Before You Start

Ceiling mounting and wall mounting are similar. The following takes ceiling mounting as an example.

1. Disassemble the camera by loosening the screw.
2. Remove the mounting base from the main body.

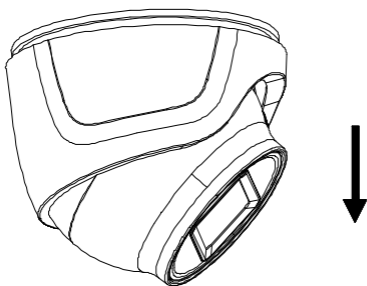
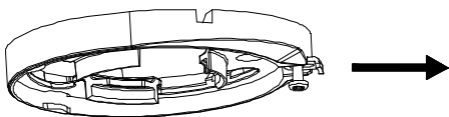


Figure 14, Remove the Mounting Base

3. Drill the screw holes and the cable hole (optional) on the ceiling.

- Secure the mounting base onto the ceiling with supplied screws.

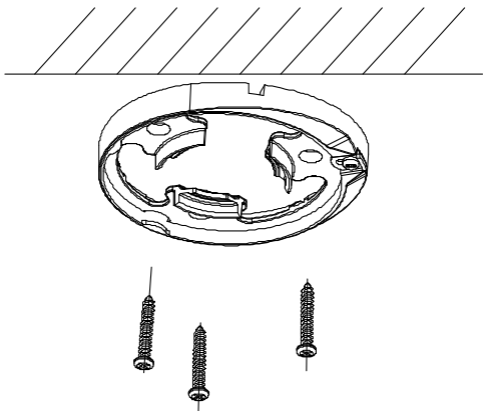


Figure 2-20 Secure the Mounting Base to the Ceiling

- Route the cables through the cable hole or the side opening.
- Secure the camera on the mounting base.
  - Pull out the clip plate, and then combine the camera with the mounting base.
  - Push the clip plate in, and secure the camera by tightening the screw.

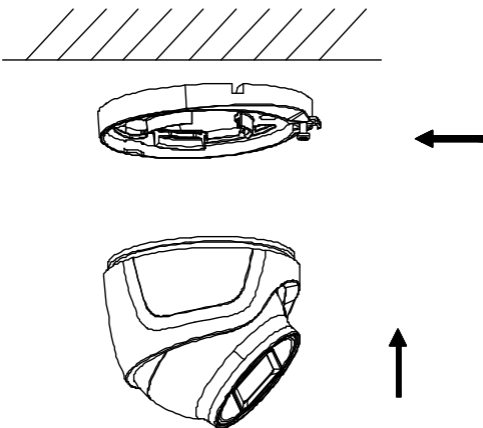


Figure 15, Secure the Camera

- Connect the corresponding cables such as power cord and video cable.
- Power on the camera to check whether the image on the monitor is at an optimum angle. If not, adjust the camera according to the figure below.

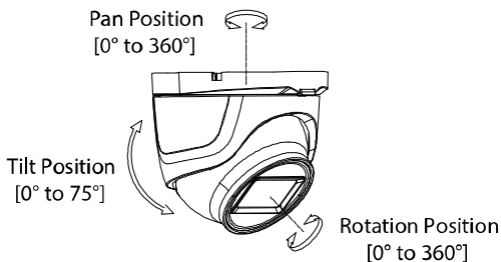



Figure 16, 3-Axis Adjustment

## 4 Menu Description

Please follow the steps below to call the menu.

 **NOTE:** The actual display may vary with your camera model.

1. Connect the camera to the TVI DVR and the monitor, as shown below.

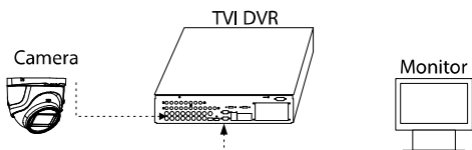



Figure 17, Connection

2. Power on the analog camera, TVI DVR, and monitor to view the image on the monitor.
3. Click **PTZ Control** to enter the PTZ Control interface.
4. Call the camera menu by clicking the  button, or call preset No. 95.

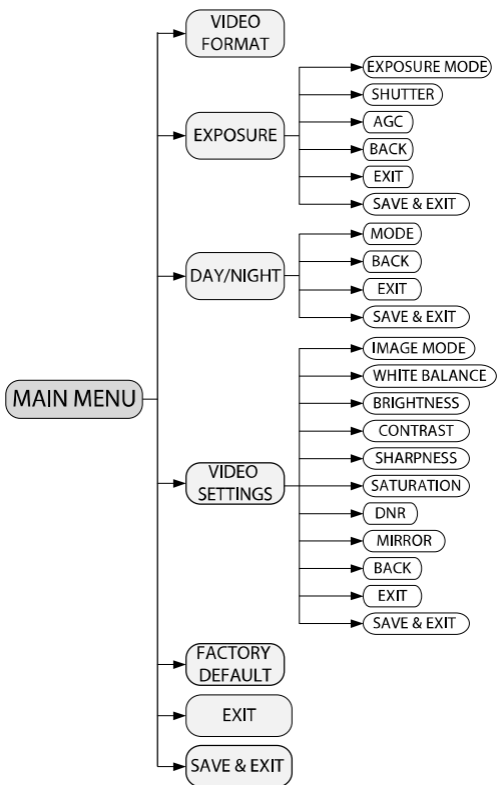


Figure 18, Main Menu Overview

5. Click the direction arrow to control the camera.
  - 1) Click up/down direction button to select the item.
  - 2) Click **Iris+** to confirm the selection.
  - 3) Click left/right direction button to adjust the value of the selected item.

#### 4.1 Video Format

You can set the video format to 5 MP @ 20 fps, 4 MP @ 30 fps, 4 MP @ 25 fps, 2 MP @ 30 fps, or 2 MP @ 25 fps.

#### 4.2 Exposure

Exposure describes the brightness-related parameters, which can be adjusted by **EXPOSURE MODE**, **SHUTTER**, and **AGC**.

EXPOSURE	
EXPOSURE MODE	◀ GLOBAL ▶
SHUTTER	◀ AUTO ▶
AGC	LOW
BACK	←
EXIT	←
SAVE & EXIT	←

Figure 19, Exposure

### 4.2.1 Exposure Mode

You can set the **Exposure Mode** to **Global**, **BLC**, **HLC**, or **DWDR**.


- **Global:** The normal exposure mode, which performs exposure according to the whole image brightness.
- **BLC (Backlight Compensation):** Compensates light for the front object to make it clear, but may cause overexposure of the background, where the light is strong.
- **HLC (Highlight Compensation):** The camera detects strong spots (overexposed portion of image), then reduces the brightness of the strong spots to improve the overall image.
- **DWDR (Digital Wide Dynamic Range):** Helps the camera provide clear images even under backlight circumstances. When both very bright and very dark areas simultaneously exist in the image, DWDR balances the brightness level of the whole image to provide clear images with details.

### 4.2.2 Shutter

A photographic device that administers the exposure by limiting the time over which light is admitted.

### 4.2.3 AGC (Automatic Gain Control)

Optimizes the clarity of the image in poor light conditions. The **AGC** level can be set to **HIGH**, **MEDIUM**, or **LOW**.

 **NOTE:** The noise will be amplified when setting the AGC level.

## 4.3 Day/Night

**Color**, **BW (Black and White)**, and **Auto** are selectable for the **Day/Night** switch.

### 4.3.1 Color

The image is in color in day mode all the time.

### 4.3.2 B&W (Black and White)

The image is black and white all the time, and the **IR Light** will turn on in poor light conditions.

You can turn on/off the **IR Light** and set the **Smart IR** value in this menu.

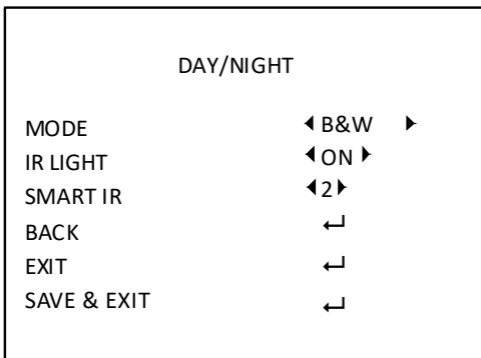


Figure 20, B&W

- **IR Light:** You can turn the IR Light on/off to meet the requirements of different circumstances.
- **Smart IR:** Adjusts the light to its most suitable intensity and prevents the image from overexposure. The Smart IR value can be adjusted from 1 to 3. The higher the value, the more obvious the effect.

### 4.3.3 Auto

Automatically switch to Color or B&W (Black and White) according to the actual scene brightness.

You can turn the **IR Light** on/off and set the **Smart IR** value in this menu.

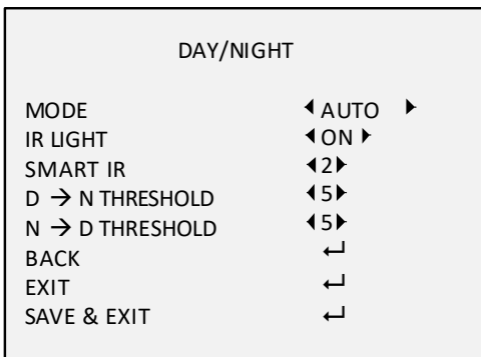


Figure 21, Auto

- **IR Light:** You can turn the IR Light on/off to meet the requirements of different circumstances.



- **Smart IR:** Adjusts the light to its most suitable intensity and prevents the image from overexposure. The Smart IR value can be adjusted from 1 to 3. The higher the value, the more obvious the effect.
- **D/N Threshold (Day to Night Threshold):** Controls the sensitivity of switching the day mode to the night mode. You can set the value from 1 to 9. The larger the value, the more sensitive the camera.
- **N/D Threshold (Night to Day Threshold):** Controls the sensitivity of switching the night mode to the day mode. You can set the value from 1 to 9. The larger the value, the more sensitive the camera.

## 4.4 Video Settings

Move the cursor to **Video Settings** and click **Iris+** to enter the submenu. **Image Mode**, **White Balance**, **Brightness**, **Contrast**, **Sharpness**, **Saturation**, **DNR**, and **Mirror** are adjustable.

VIDEO SETTINGS	
IMAGE MODE	STD
WHITE BALANCE	◀ ←   ▶
BRIGHTNESS	◀ 5 ▶
CONTRAST	◀ 5 ▶
SHARPNESS	◀ 5 ▶
SATURATION	◀ 5 ▶
DNR	◀ 5 ▶
MIRROR	OFF
BACK	←   ↵
EXIT	←   ↵
SAVE & EXIT	←   ↵

Figure 22, Video Settings

### 4.4.1 Image Mode

**Image Mode** is used to adjust the image saturation. You can set it to **STD** (Standard), or **High-Sat** (High Saturation).

### 4.4.2 White Balance

White balance, the white rendition function of the camera, adjusts the color temperature according to the environment. It can remove unrealistic color casts in the image. You can set the mode to **Auto** or **Manual**.

- **Auto:** White balance is adjusted automatically according to the color temperature of the scene illumination.
- **Manual:** You can set the R GAIN/B GAIN value from 1 to 255 to adjust the shades of red/blue color of the image.

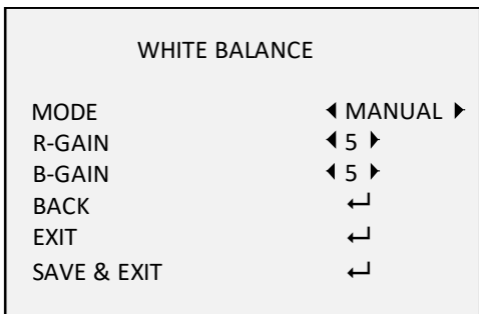


Figure 23, Manual Mode

### 4.4.3 Brightness

Brightness refers to the brightness of the image.

You can set the brightness value to darken or brighten the image. The higher the value, the brighter the image.

### 4.4.4 Contrast

This feature enhances the difference in color and light between parts of an image.

### 4.4.5 Sharpness

Sharpness determines the amount of detail an imaging system can reproduce.

### 4.4.6 Saturation

Saturation is the proportion of pure chromatic color in the total color sensation. The saturation of a color is determined by a combination of light intensity and how much it is distributed across the spectrum of different wavelengths.

### 4.4.7 DNR (Digital Noise Reduction)

The DNR function can decrease the noise effect, especially when capturing moving images in poor light conditions and delivering more accurate and sharper images.

### 4.4.8 Mirror

**OFF**, **H**, **V**, and **HV** are selectable for mirror.

- **OFF**: The mirror function is disabled.
- **H**: The image is flipped 180° horizontally.
- **V**: The image is flipped 180° vertically.
- **HV**: The image is flipped 180° both horizontally and vertically.

## 4.5 Factory Default

Move the cursor to **Factory Default** and click **Iris+** to reset all the settings to the factory defaults.

## 4.6 Exit

Move the cursor to **Exit** and click **Iris+** to exit the menu without saving.

## 4.7 Save & Exit

Move the cursor to **Save & Exit**, and click **Iris+** to save the settings and exit the menu.