

# **USER'S MANUAL**

## **FULL HD MEGA PIXEL ZOOM CAMERA**

Before installing and using the camera, please read this instructions thoroughly and keep for reference.

# TABLE OF CONTENTS

Precautions -----	3
Features -----	4
Dimensions -----	6
Part Names And Functions -----	7
Connections -----	8
External Device Connections -----	9
Menu Operation -----	10
Main Menu -----	11
Focus -----	12
Exposure -----	13
White Balance -----	16
Image -----	17
Intelligent -----	19
Special Function -----	21
Display -----	23
Specifications -----	24

# PRECAUTIONS

- **Avoid prolonged use in high temperature and high humidity environment**  
Use the product within the operating range specified in the specifications.  
Avoid locations where heat is generated, and Install in a well-ventilated place.
- **Do not install the camera in an unstable place**  
Confirm that the camera is firmly fixed after installation.  
Dropping the product due to poor installation may cause injury.
- **Install the camera away from dusty places**  
This may cause product malfunction, poor image quality, fire or electric shock.
- **Do not install the camera under unstable lighting conditions**  
It is possible to output an inappropriate image due to severe illumination change or lighting flickering.
- **Do not install the camera near gas or oil leaks**  
Use in a place with flammable materials may cause fire.  
Also, keep distance from power line cables or use separate metal piping.
- **Do not disassemble the camera or insert foreign objects**  
There is no warranty liability for products that user disassembled.

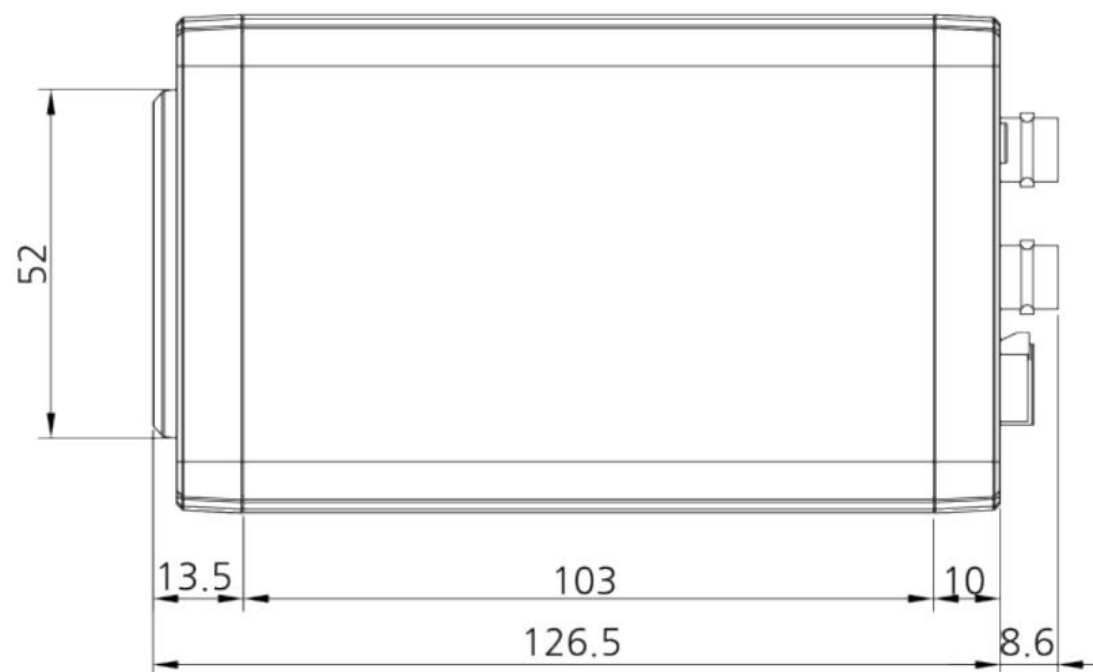
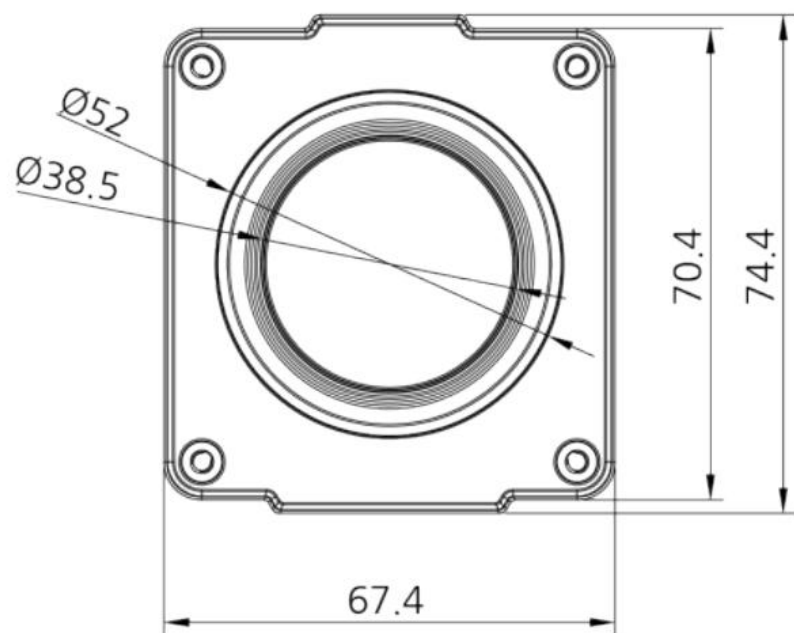
# PRECAUTIONS

- **Do not drop the camera or shock it**  
It may cause malfunction.
- **Never keep the camera directly face to strong light.**  
Exposure to strong light such as sunlight may cause light spreading or light blurring. In addition, direct sunlight can damage the image sensor.
- **Prepare for malfunction due to natural disasters**  
The grounding work or the installation of the surge protector can minimize damage to the product due to lightning, etc.
- **Be sure to check the specifications of the power supply**  
Before connecting the power to the product, make sure that the power supply meets the recommended specifications.

# FEATURES

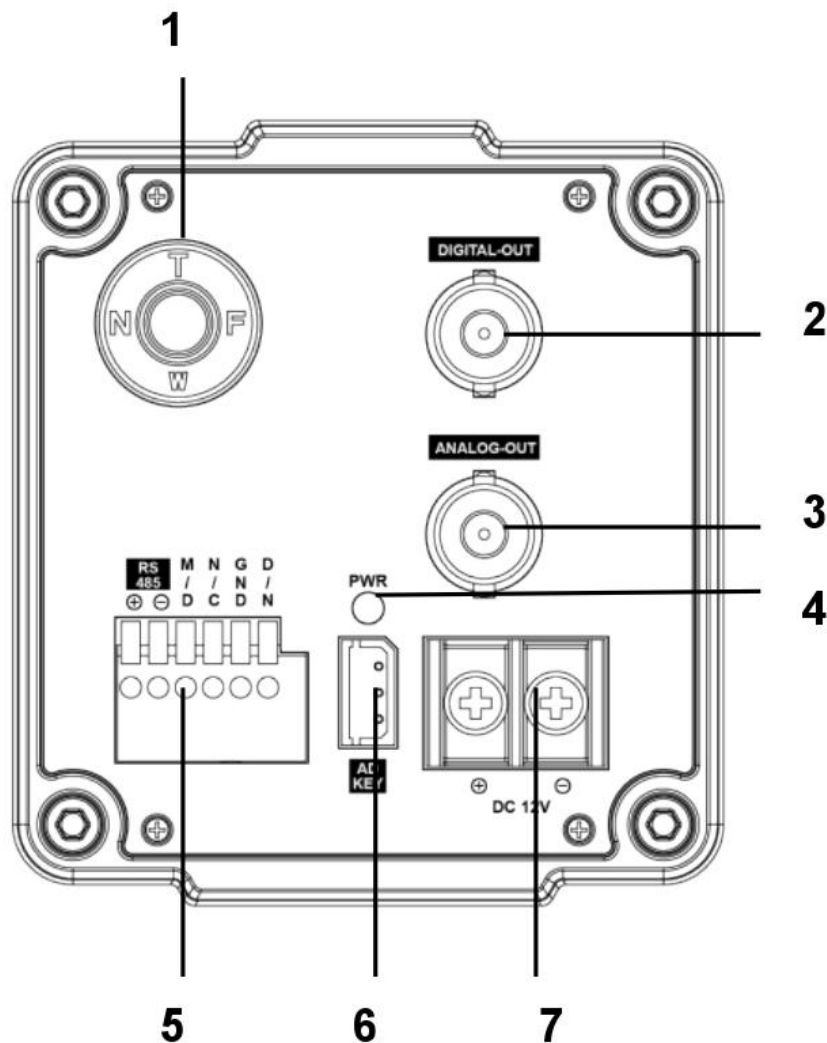
- 1/2.8" 2MP Sony STARVIS CMOS sensor
- EX-SDI, CVBS
- x20 Optical Zoom (5.2~104mm) & x32 Digital Zoom
- Day & Night(ICR)
- Real-Time True WDR(Wide Dynamic Range)
- DNR(Digital Noise Reduction, 2D+3D)
- DSS(Digital Slow Shutter)
- DIS(Digital Image Stabilization)
- Defog
- HLC(High Light Compensation)
- ACE(Digital WDR)
- Privacy Mask Function
- On Screen Display
- Intelligent Motion Detection
- Multi-Protocol(VISCA, Pelco-D, Pelco-P)

# DIMENSIONS



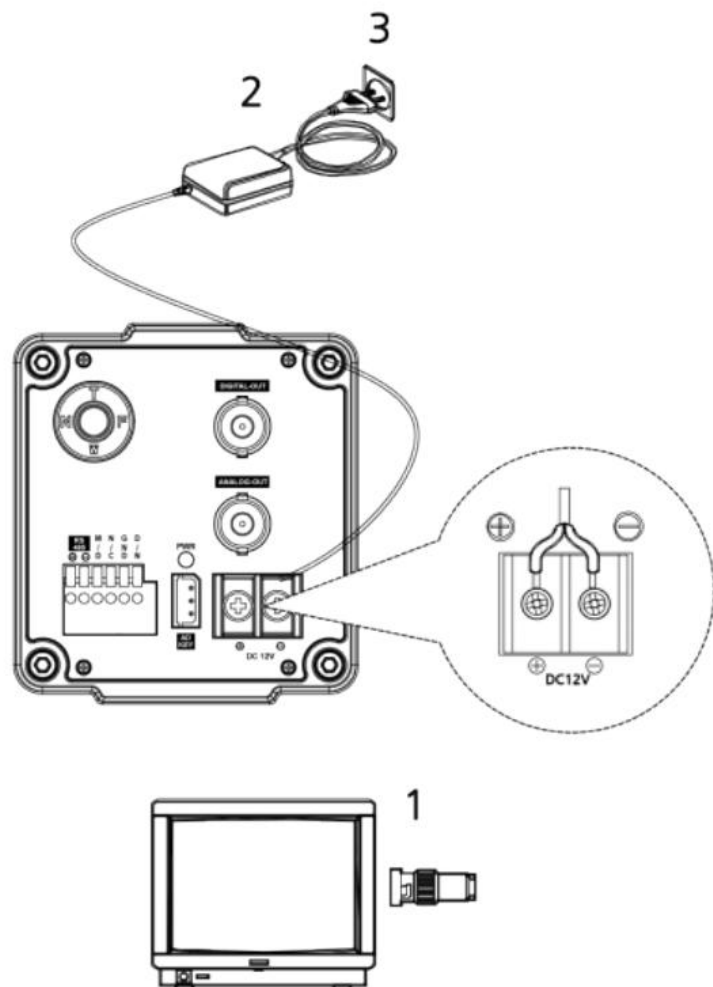
Unit : mm

# PART NAMES AND FUNCTIONS



1. OSD / Zoom / Focus control
2. DIGITAL OUT
3. ANALOG OUT
4. Power LED
5. Control Terminal
  - ① RS-485 (+)
  - ② RS-485 (-)
  - ③ Motion Detection Out
  - ④ No Connection
  - ⑤ Ground
  - ⑥ Day&Night Input (Low : Night, High : Day)
6. AD KEY
  - ① GND
  - ② AD-KEY
  - ③ GND
7. Power : DC12V

# CONNECTIONS



## Basic connection

The peripheral devices (DVR, monitor, lens, etc), DC adaptor and cables are not supplied.

1. Connecting the monitor.

Make the video signal connection between the camera and the monitor or time lapse monitor or DVR.

2. Use a commercially available DC12V adaptor.

Connect an DC 12V power source to the DC 12V input terminal on the back of the camera.

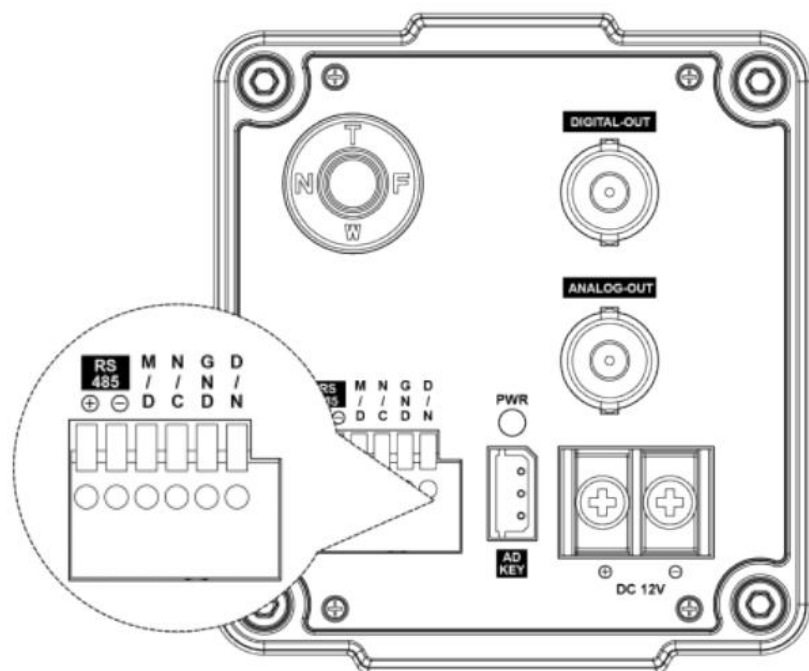
3. Insert the plug of this power cord into a wall outlet.

The POWER indicator will light. Adjust the picture on the monitor using the Brightness and Contrast controls etc.

To monitor's Video Input or Camera Input



# EXTERNAL DEVICE CONNECTIONS



## RS-485 COMMUNICATION

Connect to an external controller of RS-485 format.

## Motion Detection Out

When the motion detection function is working, DC3.3V is outputted to OUT pin and GND pin.

## Day & Night input

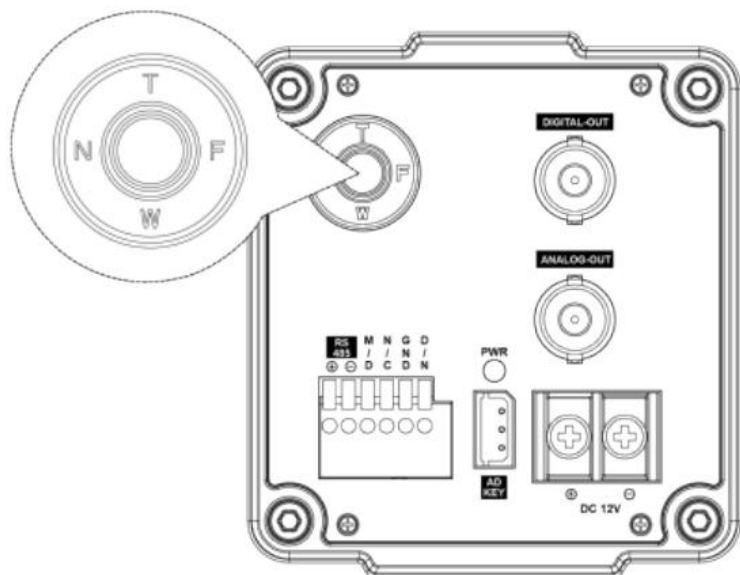
Day/Night mode of the camera can be switched by signal from an external device.

To use this function, <DAY&NIGHT> setting of the camera should be set to the <EXT>.

**Note :** Use a relay unit if the voltage or current of the connected device exceeds the ratings.

# MENU OPERATION

This camera utilizes an on-screen user MENU. To set items on the menu, use the following buttons on the side panel.



Tele(Up) button : Zoom in, Tele (Moves the cursor upwards. Use this button to select an item or adjust the parameters.)

Wide(Down) button : Zoom out, Wide (Moves the cursor downwards. Use this button to select an item or adjust the parameters.)

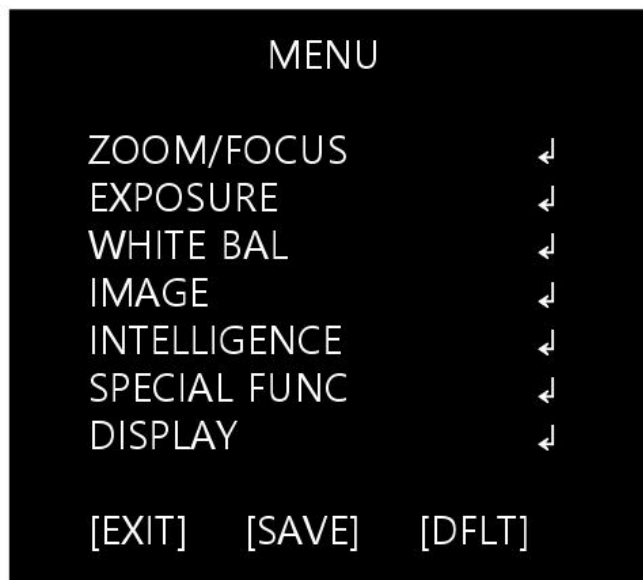
Far(Right) button : Adjust focus in Manual Mode (Moves the cursor to the right. Use this button to select or adjust the parameters of the selected item. The parameter changes each time this button is pressed.)

Near(Left) button : Adjust focus in Manual Mode Moves the cursor to the left. Use this button to select or adjust the parameters of the selected item. The parameter changes each time this button is pressed.)

Set button : Executes selections and displays a submenu for an item with the ← mark.

# MAIN MENU

**Camera menu is subject to change without prior notice to upgrade and quality increase and we may use slip sheet for the change.  
Please check the camera version and the slip sheet if the camera menu and this manual menu is not matched.**



Functions can be setup using “Menu Key Command” of Visca protocol.

The menu consists of the “Main Menu” and “Sub Menu”.

The main menu is displayed where 7 camera functions can be selected.

To the push of each main menu selection, the sub-menu is displayed

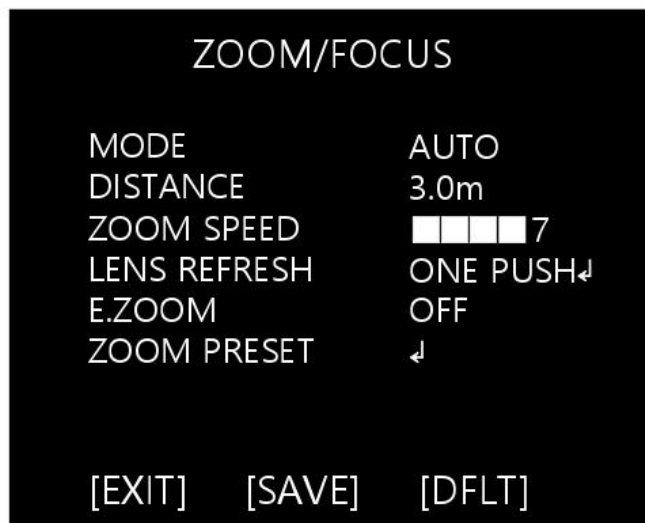
If you want save the menu, select [SAVE].

If you want not save the menu, select [EXIT]

(After select , Power off -> on)

If you want default the menu, select [DFLT]

# FOCUS



- ◆ MODE : Select auto focus mode
  - ▶ AUTO, ONE PUSH, MANUAL
- ◆ DISTANCE : Select minimum distance in focus between camera and object.
  - ▶ 0.5 / 1.5 / 3.0 / 5.0 / 10.0 m
- ◆ ZOOM SPEED : Select Zoom Speed
  - ▶ 0 (Slow) ~ 7 (Fast)
- ◆ LENS REFRESH : Lens origin calibrated automatically.
  - ▶ ONE PUSH← / ON (1 day ~ 10 days)
- ◆ E.ZOOM : Select maximum digital zoom magnification.
  - ▶ OFF / ON (max x2 ~ x19, x21, x23, x25, x28, x32)
- ◆ ZOOM PRESET : Select zoom preset
  - ▶ PRESET # : Select Zoom preset number (1 ~ 5)
  - ▶ MODE : OFF / ON←
    - ▷ ON← : Adjust the Zoom Position

# EXPOSURE

EXPOSURE	
MODE	AUTO
AGC	■■■■■5
SHUT SPEED	---
IRIS	---
DSS	OFF
FLICKERLESS	OFF
BRIGHTNESS	■■■■■10
WDR/BLC	OFF
DAY&NIGHT	AUTO↓
[EXIT]	[SAVE] [DFLT]

- ◆ MODE : Select Exposure Mode
  - ▶ AUTO / IRIS.P / SHUT.P / MANUAL
- ◆ AGC : Select Auto Gain Control
  - ▶ 0 ~ 10
- ◆ SHUT SPEED : Can be set in SHUT.P or MANUAL mode
  - \* 60 / 50 fps mode
    - ▶ x64, x32, x16, x8, x4, x2, 1/60(50), 1/100, 1/120, 1/250, 1/500, 1/700, 1/1000, 1/2000, 1/3000, 1/6000, 1/10000, 1/20000, 1/30000, 1/60000 sec
  - \* 30 / 25 fps mode
    - ▶ x32, x16, x8, x4, x2, 1/30(25), 1/60(50), 1/100, 1/120, 1/250, 1/500, 1/700, 1/1000, 1/2000, 1/3000, 1/6000, 1/10000, 1/20000, 1/30000, 1/60000 sec
- ◆ IRIS : Iris level can be set in IRIS.P or MANUAL mode
  - ▶ 0 ~ 20

# EXPOSURE

- ◆ DSS : Select maximum DSS (Digital Slow Shutter)
  - \* 60 / 50 fps mode
    - ▶ OFF / x2, x4, x8, x16, x32, x64
  - \* 30 / 25 fps mode
    - ▶ OFF / x2, x4, x8, x16, x32
- ◆ FLICKERLESS : Select Flickerless mode
  - ▶ OFF / ON / AUTO (remove screen flicker)
- ◆ BRIGHTNESS : Adjust brightness level
  - ▶ 0(dark) ~ 20(bright) steps
- ◆ WDR/BLC : Select WDR(Wide Dynamic Range) or BLC(Back Light compensation)
  - ▶ WDR↵
    - ▷ MODE : Select WDR mode.
  - ▶ LINE, FRAME
    - ▷ LEVEL : Adjust WDR level.
  - ▶ LOW, MID-LOW, MIDDLE, MID-HIGH, HIGH
- ※ WDR doesn't work in Manual Exposure Mode and Shutter Priority Mode.
  - ▶ BLC↵
    - ▷ POSITION : Adjust the window position
    - ▷ SIZE : Adjust the window size
- ※ Can't use WDR and BLC at the same time.  
(When WDR On, BLC is Off. And when BLC is On, WDR is Off)
- ※ BLC doesn't work in Manual Exposure Mode.

# EXPOSURE

## ◆ DAY&NIGHT : Select Day&Night

- ▶ MODE : AUTO↵ / EXT-IN↵ / DAY / NIGHT↵

- ▷ AUTO

- ▶ DELAY : 0 ~ 255 sec

- ▶ THRS : 0 ~ 28

- Day↔Night switching level in Auto Mode.

- Switching in lower lux with lower threshold level.

- ▶ GAP : LOW, MID-LOW, MIDDLE, MID-HIGH, HIGH

- Margin between Day→Night switching level and Night→Day switching level.

- ▶ IR DETECTION : Setting IR Detection mode. (ON / OFF)

- ▶ IR DET LEVEL : Setting IR Detection level. (LOW, MID-LOW, MIDDLE, MID-HIGH, HIGH)

- ▶ BURST : OFF / ON

- ▷ EXT-IN

- ▶ DELAY : 0 ~ 255 sec

- ▶ BURST : OFF / ON

- ▶ POLARITY : External Input polarity (ACTIVE LOW / ACTIVE HIGH)

- ▷ NIGHT

- ▶ BURST : OFF / ON

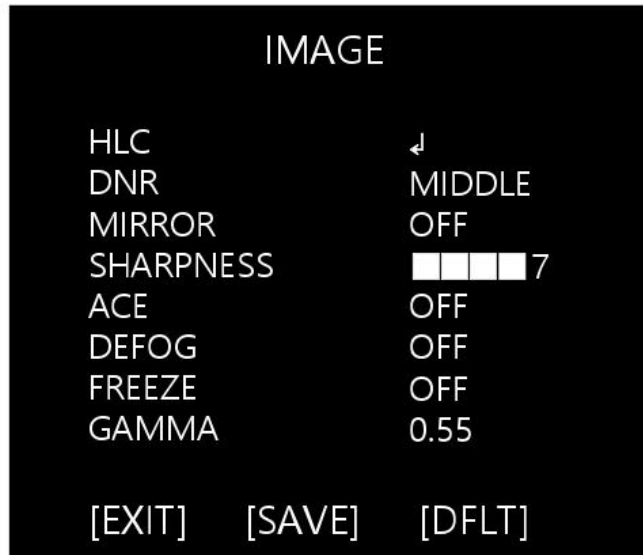
# WHITE BALANCE



- ◆ AWB : Select WHITE BALANCE mode
  - ▶ AUTO / ONE PUSH⇐ / MANUAL / INDOOR / OUTDOOR / AUTO-EXT
  - ▷ AUTO : Automatically adjusts color according to the available lighting.
  - ▷ ONE PUSH : It is a fixed white balance mode that may be automatically readjusted only by pressing ONE PUSH
  - ▷ MANUAL⇐ : Color can be corrected when the user increases or decreases “RED GAIN” or “BLUE GAIN”.
  - ▷ INDOOR : Set color temperature to be Indoor light (3700°K)
  - ▷ OUTDOOR : Set color temperature to be Outdoor light (5100°K)
  - ▷ AUTO-EXT : Auto mode operating on a wider range of color temperatures.
- ◆ RED GAIN : Adjust R gain value ▶ 0 ~ 20 steps
- ◆ BLUE GAIN : Adjust B gain value ▶ 0 ~ 20 steps
- ◆ CHROMA : Adjust CHROMA gain value ▶ 0 ~ 20 steps



# IMAGE

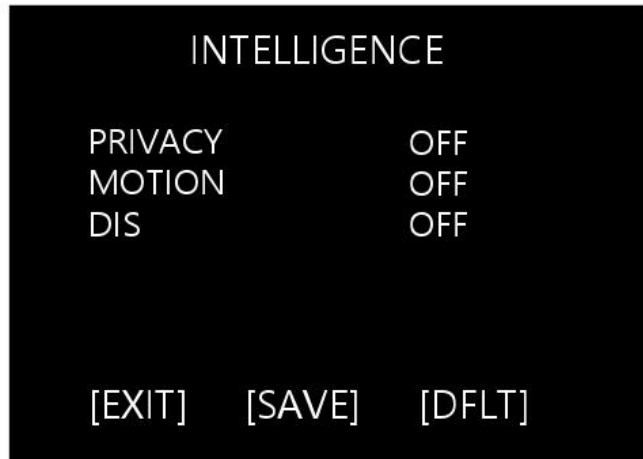


- ◆ HLC : Select High Light Compensation.  
When extremely bright light is projected to the camera masking is used on the portion to prevent partial saturation on the monitor.
  - ▷ MODE : OFF / ON / NIGHT
  - ▷ LEVEL : 0 ~ 20 steps
  - ▷ COLOR : 0 ~ 13 steps
- ◆ DNR : Select Digital Noise Reduction
  - ▶ OFF / LOW / MIDDLE / HIGH / AUTO
- ◆ MIRROR : Select a flip mode
  - ▶ OFF / H / V / H&V
    - ▷ H : You can flip the picture horizontally on the screen
    - ▷ V : You can flip the picture vertically on the screen
    - ▷ H&V : You can flip the picture horizontally & vertically on the screen

# IMAGE

- ◆ SHARPNESS : Adjust sharpness level
  - ▶ 0 ~ 10 steps
- ◆ ACE : Select Digital WDR (Wide Dynamic Range)
  - ▶ OFF / LOW / MIDDLE / HIGH
- ◆ DEFOG : Carry out defog function
  - ▶ OFF / ON↵
    - ▷ MODE : AUTO / MANUAL
    - ▷ LEVEL : LOW / MIDDLE / HIGH
- ※ Can't use DEFOG and ACE at the same time (when DEFOG is On, ACE is Off)
- ◆ FREEZE : Select real or still mode
  - ▶ OFF / ON
- ◆ GAMMA : Select GAMMA
  - ▶ 0.45 / 0.55 / 0.65 / 0.75

# INTELLIGENCE



- ◆ PRIVACY : Hide an area you want to hide on the screen
  - ▶ OFF / ON↵
  - ▷ MASK# : Select mask area number (1 ~ 24)
  - ▷ MODE : Mask enable or disable(OFF / ON)
  - ▷ POSITION : Adjust the mask position
  - ▷ SIZE : Adjust the mask size
  - ▷ COLOR : Select mask color(0 ~ 13)
  - ▷ TRANS : Select mask transparency level(0 ~ 3)
- ◆ MOTION : When there is movement of the subject in the screen, there will be an motion detection
  - ▶ OFF / ON↵
  - ▷ AREA# : Setting 3 areas(1~3) of motion detection
  - ▷ MODE : OFF / ON (Limit and define areas of motion detection)
  - ▷ SENSITIVITY : Adjust sensitivity of MD (0 ~ 20 steps)  
More sensitive to setting to low step with sensitivity
  - ▷ POSITION : Adjust the Area position
  - ▷ SIZE : Adjust the Area size
  - ▷ INTERVAL :Select the alarm interval time (0 ~ 255sec)

# INTELLIGENCE

- ▷ DWELL TIME : Select the duration time about changing MD mode (0 ~ 255sec)
- ▷ ZOOM PRESET : Select Motion Zoom Preset Mode and Position (OFF / ON↵)

## ◆ DIS : Select Digital Image Stabilizer mode

### ▶ OFF / ON↵

- ▷ RANGE : Setting the image compensation range. (10%, 20%, 30%)
- ▷ FILTER : Setting the sensitivity to hold DIS function in worst case.  
(LOW, MIDDLE, HIGH)
- ▷ AUTO C : Setting Auto Centering mode (OFF, HALF, FULL)

# SPECIAL FUNCTION

SPECIAL FUNC	
DEFECT	↓
IMAGE RANGE	FULL
SYSTEM	NTSC
HD FORMAT	1080p/30fps
SDI MODE	EX270M(1.0)
COMM	↓
[EXIT]	[SAVE] [DFLT]

- ◆ DEFECT : Compensates for bad pixels that may occur.  
Occurs when the whole screen is in full black or if there is bad pixelation and it changes the THRS values until the screen is fixed.
- ※ When you use this function, you have to block the lens for blocking lights into the lens.
- ◆ IMAGE RANGE : Select image bit range.  
(Full : 100%, Compressed : 75%)
  - ▶ FULL, COMP, USER↵
  - ▷ LEVEL : Select user mode level (0 ~ 32)
- ◆ SYSTEM : Select NTSC(30/60fps) or PAL(25/50fps).
- ◆ HD FORMAT : Select Digital output  
(▶ 1080i/60(50)fps, 1080p/60(50)fps, 1080p/30(25)fps, 720p/30(25)fps, 720p/60(50)fps)

# SPECIAL FUNCTION

## ◆ SDI MODE : Select SDI mode.

- ▶ OFF / EX-SDI 135M (v2.0) / EX-SDI 135M+ (v2.1) / EX-SDI 270M (v1.0)

### ※ SDI Hot-Key

During OSD is off, if you move the control key as

“Up→Down→Left→Right→Left” in sequence, SDI MODE will be changed.

(EX-SDI→HD-SDI HD-SDI→EX-SDI)

### ※ Analog Hot-Key

During OSD is off, if you move the control key as

“Up→Down→Left→Right→Right” in sequence, HD ANALOG setting will be changed.

(CVBS→HD-T, HD-T→HD-A, HD-A→OFF, OFF→CVBS)

## ◆ 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 / 57600 / 115200bps

### ▷ PROTOCOL : Select operating protocol

- ▶ VISCA / PELCO-D / PELCO-P / UPDATE

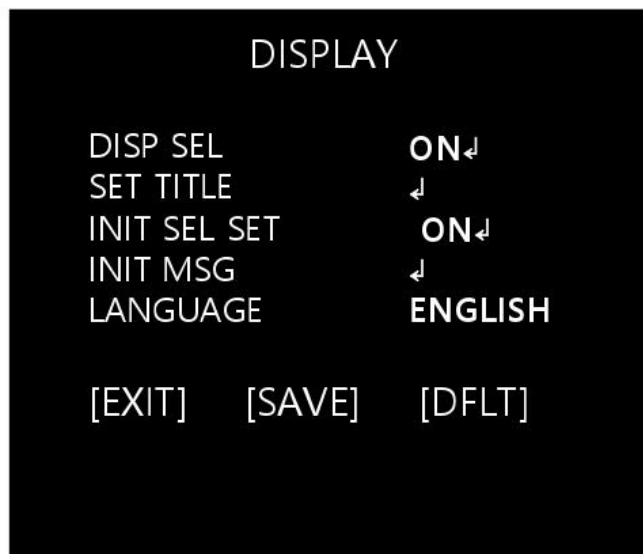
### ▷ UTC : Select HD-T UTC function

- ▶ OFF / ON

### ▷ UTC FORWARD : Sends the UTC command to Controller via UART

- ▶ OFF / ON

# DISPLAY



※ Character Table of Text edit Mode

A B C D E F G H I J K L M N O P Q R S T  
 U V W X Y Z a b c d e f g h i j k l m n  
 o p q r s t u v w x y z , . ( ) { } [ ]  
 0 1 2 3 4 5 6 7 8 9 \* + - / = ~ ! ? " ' `

- ◆ DISP SEL : Select display item.
  - ▶ OFF / ON
    - ▷ ID : OFF / ON
    - ▷ TITLE : OFF / ON
    - ▷ ZOOM RATIO : OFF / ON
    - ▷ SYSTEM MSG : OFF / ON (MD Alarm)
- ◆ SET TITLE : Select camera title menu  
(Text edit— max 40 characters)
- ◆ INIT SEL : Select display initial message.
  - ▶ OFF / ON
    - ▷ ID : OFF / ON
    - ▷ BAUDRATE : OFF / ON
    - ▷ PROTOCOL : OFF / ON
    - ▷ VERSION : OFF / ON
    - ▷ INIT MSG : OFF / ON
- ◆ SET INIT MSG : modify initial message.  
(Text edit – max 40 characters)
- ◆ LANGUAGE : Select language.
  - ▶ English / Simplified Chinese / Traditional Chinese / Japanese

# SPECIFICATION

Image Sensor	1/2.8" Sony Starvis CMOS Sensor
Total Pixels	1945(H) x 1109(V) = 2.16M pixels
Active pixels	1937(H) x 1097(V) = 2.12M pixels
Lens	x20 Day & Night Zoom Lens f = 5.2 mm ~ 104 mm, F1.5 (wide) ~ F3.5 (tele)
FOV	Horizontal : 56.4°~3.1°, Vertical : 33.5°~1.7°
Digital Zoom	2x ~ 32x
Resolution	Digital : 1080p 60(50)/30(25)fps, 1080i 60(50)fps, 720p 60(50)/30(25)fps Analog : CVBS (※ Test Only)
Min. illumination	Color(1/30s, 78dB) : 0.01 lux , BW(1/30s, 78dB) : 0.001lux Color DSS(1/1s, 78dB) : 0.001 lux , BW DSS(1/1s, 78dB) : 0.0001 lux
Video Output	EX-SDI, CVBS(※ Test Only)
S/N Ratio	more than 50dB (AGC off)
Comm. Baudrate	2400 / 4800 / 9600 / 19200 / 38400 / 57600 / 115200



# SPECIFICATION

Focusing Mode	Auto / Manual
Shutter Speed	1/30(25) ~ 1/60,000 sec
WDR/BLC	OFF / WDR / BLC
White Balance	Auto / One Push / Manual / Indoor / Outdoor / Auto-Ext
Power Source	9V to 15V DC
Power Consumption	MAX 500mA
Storage Temperature	-20℃ ~ +60℃ (Humidity : 0%RH ~ 90%RH)
Operating Temperature	-10℃ ~ +50℃ (Humidity : 0%RH ~ 90%RH)
Weight	0.6Kg

※ Design and specifications are subject to change without notice.

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