

INSTRUCTION MANUAL

FULL HD MEGA PIXEL ZOOM CAMERA

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

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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.

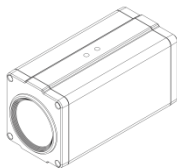
PRECAUTIONS

- **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

- 1/2.3" Sony Global shutter CMOS sensor
- 36x Optical Zoom
- Full HD Resolution
1920x1080p 60/50/30/25fps, 1280x720p 60/50/30/25fps
- Day & Night(ICR)
- DWDR(Digital Wide Dynamic Range)
- DNR(Digital Noise Reduction, 2D+3D)
- DIS(Digital Image Stabilization)
- EX-SDI(Long Reach)
- Privacy Mask Function
- On Screen Display
- Intelligent Motion Detection
- Multi-Protocol(VISCA, Pelco-D, Pelco-P)
- Supports External trigger input and Strobe output

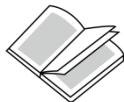
PACKAGE COMPONENTS



CAMERA



CABLE



MANUAL

Optional Remote Controller



Not used

Tele/Up

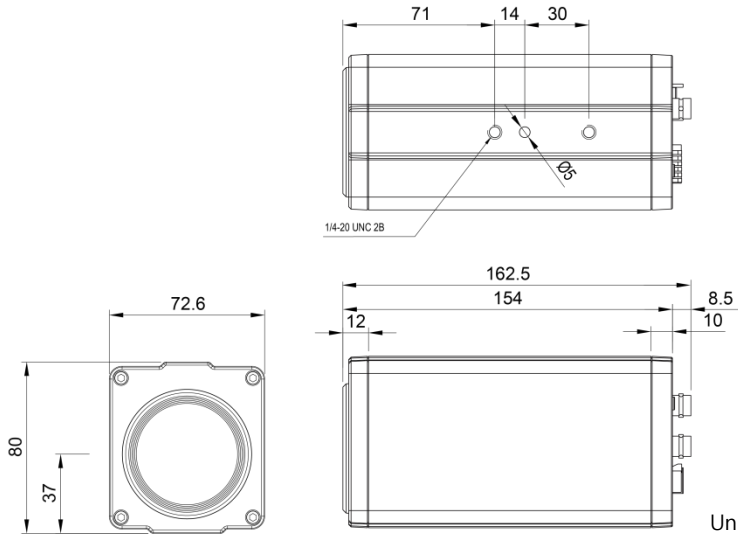
Far/Right

Menu/Set

Wide/Down

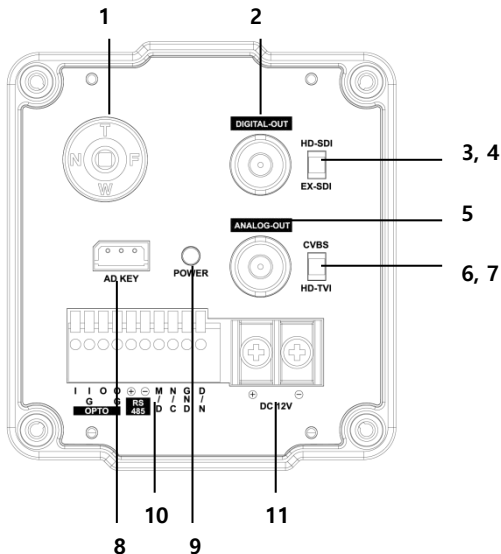
Near/Left

DIMENSIONS



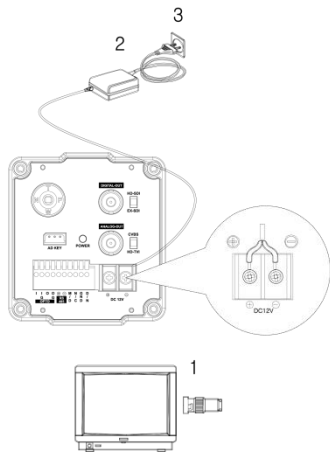
Unit : mm

PART NAMES AND FUNCTIONS



1. OSD / Zoom / Focus control
2. DIGITAL OUT
3. HD-SDI
4. EX-SDI
5. ANALOG OUT
6. CVBS
7. HD-SDI
8. AD KEY
 - 1) GND
 - 2) AD-KEY
 - 3) GND
9. Power LED
10. Control Terminal
 - 1) OPTO – I : Trigger Input
 - 2) OPTO – IG : Isolated Ground(Trigger)
 - 3) OPTO – O : Strobe Output
 - 4) OPTP – OG : Isolated Ground(Strobe)
 - 5) RS-485 (+)
 - 6) RS-485 (-)
 - 7) Motion Detection Out
 - 8) No Connection
 - 9) Ground
 - 10) Day&Night Input (Low : Night, High : Day)
11. 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.

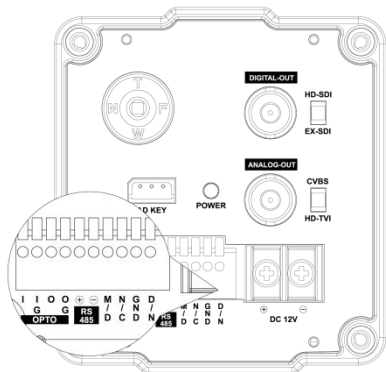
Connect an DC 12V power source to the DC 12V input terminal on the back of the camera.

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.

EXTERNAL DEVICE CONNECTIONS

OPTD : External trigger input and stobe output.

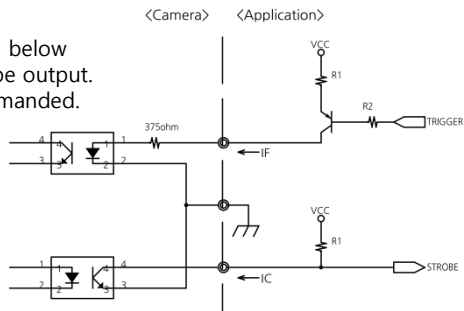
PIN	Signal Name	Description	Remark
I	Trigger Input	Anode of opto coupler(*)	
IG	TriggerReturn	Cathode of opto coupler	Isolated ground
O	Strobe Output	Open Collector of opto coupler	
OG	Strobe Return	Emitter of opto coupler	Isolated ground

(*) Serial resistors 375Ω inside camera

※ The recommended termination circuitry is drawn below

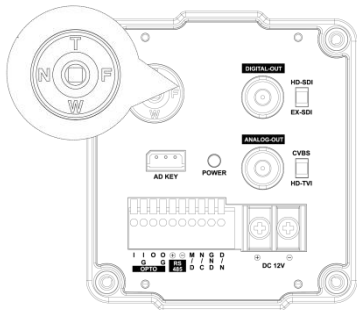
- A current of 2.5mA is recommended for the strobe output.

- For the trigger input a current of 10mA is recommended.



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.)

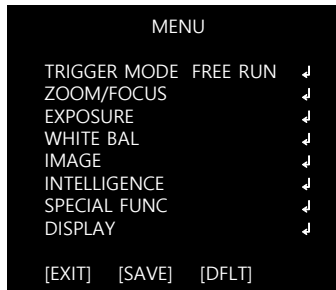
Far(Right) button : Adjust focus in Manual Mode (Moves the cursor to the right. Use this button to select or adjust the parameters of the selected item. The parameter changes each time this button is pressed.)

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 8 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]

TRIGGER MODE

TRIGGER/STROBE

TRIGGER POL	ACTIVE LOW
TRIGGER DELAY	0.0ms
STROBE POL	ACTIVE HIGH
STROBE DELAY	0.0ms
STROBE WIDTH	1.0ms
SHUT SPEED	1/500sec
AGC	■■■ 0
IRIS	F2.8
DAY&NIGHT	NIGHT

[BACK] [SAVE] [DFLT]

- ◆ TRIGGER MODE : Select trigger mode
 - ▷ FREE RUN : Continuous image output mode
 - ▷ EXT-TRIGGER : External trigger synchronous image output mode.
- ※ When Ext-trigger mode is selected, focus mode and exposure mode are forced into manual mode.
- ◆ TRIGGER POL : Select the polarity of the external trigger signal.
 - ▶ ACTIVE LOW / ACTIVE HIGH
- ◆ TRIGGER DELAY
 - : Sets the delay time from the external trigger input to the image capture start.
 - ▶ 0 ~ 255.9ms
- ◆ STROBE POL : Select the polarity of the strobe output signal.
 - ▶ ACTIVE LOW / ACTIVE HIGH

TRIGGER MODE

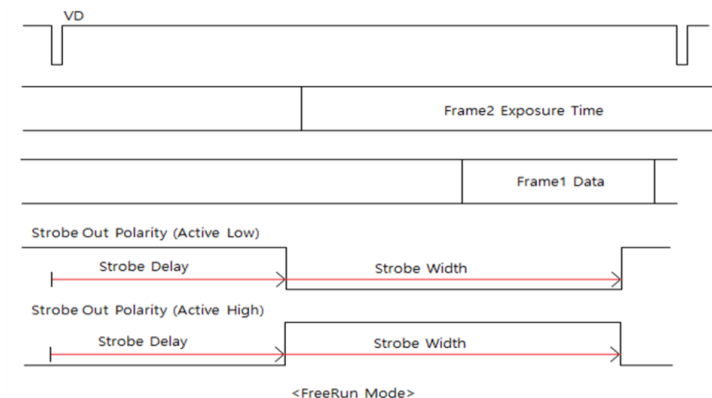
- ◆ STROBE DELAY : Sets the delay time from the trigger signal to the strobe on signal output.
 - ▶ 0 ~ 255.9ms (※ Ext-trigger mode)
 - ▶ 0 ~ (33.3 – width)ms @30fps, 0 ~ (16.6 – width)ms @60fps,
0 ~ (40 – width)ms @25fps, 0 ~ (20 – width)ms @50fps (※ Free run mode)
- ◆ STROBE WIDTH : Sets the length of the strobe on signal.
 - ▶ 1 ~ 255.9ms (※ Ext-trigger mode)
 - ▶ 1 ~ (33.3 – delay)ms @30fps, 1 ~ (16.6 – delay)ms @60fps,
1 ~ (40 – delay)ms @25fps, 1 ~ (20 – delay)ms @50fps (※ Free run mode)
- ◆ SHUT SPEED : Set the shutter speed used only in Ext-Trigger mode.
 - ▶ 1/30(25), 1/60(50), 1/100, 1/120, 1/250, 1/500, 1/1000, 1/2000, 1/5000, 1/10000,
1/20000sec (※ 30 or 25fps mode)
 - ▶ 1/60(50), 1/100, 1/120, 1/250, 1/500, 1/1000, 1/2000, 1/5000, 1/10000, 1/20000sec
(※ 60 or 50fps mode)
- ◆ AGC : Set the Manual Gain used only in Ext-Trigger mode.
 - ▶ 0 ~ 10 steps

TRIGGER MODE

- ◆ IRIS : Set the Manual Iris used only in Ext-Trigger mode.
 - ▶ CLOSE / F1.5 / F1.8 / F2.0 / F2.4 / F2.8 / F3.4 / F4.0 / F4.8 / F5.6 / F6.8 / F8.0 / F9.6 / F11 / F14 / F16
 - ◆ DAY&NIGHT : Select whether to use Day or Night when in Ext-Trigger mode.
 - ▶ DAY / NIGHT
- ※ If you don't change exposure settings in the TRIGGER menu, exposure state is automatically set just before switching to the Ext-trigger mode.

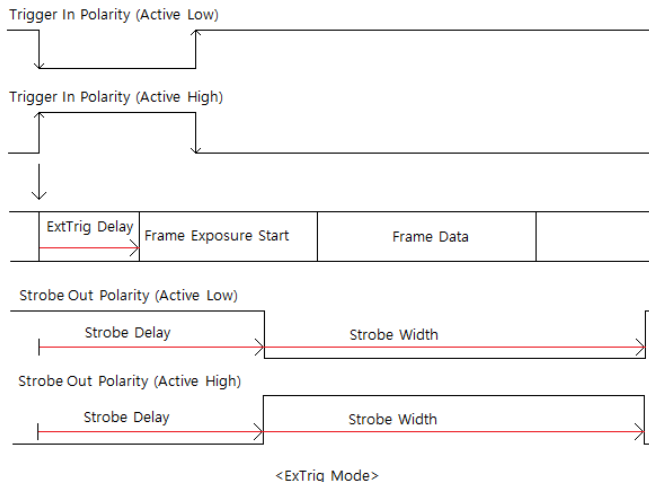
TRIGGER MODE

※ Timing Chart : FREERUN mode

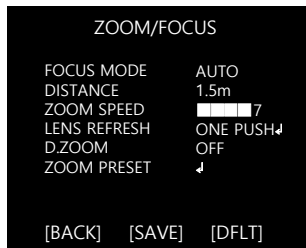


TRIGGER MODE

※ Timing Chart : EXT-TRIGGER mode

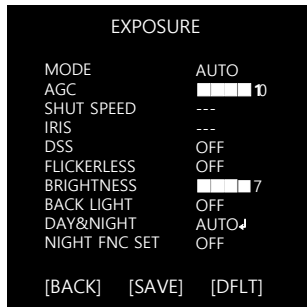


ZOOM/FOCUS



- ◆ FOCUS MODE : Select auto focus mode
 - ▶ AUTO, ONE PUSH, MANUAL
- ※ In Ext-Trigger Mode, it is fixed to Manual mode.
- ◆ DISTANCE : Select minimum distance in focus between camera and object.
 - ▶ 0.1m / 1.5m / 3.0m / 5.0m / 10.0 m
- ◆ ZOOM SPEED : Select Zoom Speed
 - ▶ 0 (Slow) ~ 7 (Fast) steps
- ◆ LENS REFRESH : Lens origin calibrated automatically.
 - ▶ ONE PUSH↵ / ON (1 day ~ 10 days)
- ◆ D.ZOOM : Select maximum digital zoom magnification.
 - ▶ OFF / ON (max x2 ~ x19, x21, x23, x25, x28, x32)
- ※ The Digital Zoom can not be used with the DIS function.
- ◆ ZOOM PRESET : Select zoom preset
 - ▶ PRESET # : Select Zoom preset number (1 ~ 5)
 - ▶ MODE : OFF / ON↵(Adjust the Zoom Position)

EXPOSURE



- ◆ MODE : Select Exposure Mode
 - ▶ AUTO / IRIS.P / SHUT.P / MANUAL
- ※ In Ext-Trigger Mode, it is fixed to Manual mode.
- ◆ AGC : Select Auto Gain Control
 - ▶ 0 ~ 10
- ◆ SHUT SPEED : Can be set in SHUT.P or MANUAL mode
 - ▶ 1/1, 1/2, 1/4(3), 1/8(6), 1/15(12), 1/30(25), 1/60(50), 1/100, 1/120, 1/250, 1/500, 1/1000, 1/2000, 1/5000, 1/10000, 1/20000 sec
- ◆ IRIS : Iris level can be set in IRIS.P or MANUAL mode
 - ▶ CLOSE / F1.5 / F1.8 / F2.0 / F2.4 / F2.8 / F3.4 / F4.0 / F4.8 / F5.6 / F6.8 / F8.0 / F9.6 / F11 / F14 / F16
- ◆ DSS : Select maximum DSS (Digital Slow Shutter)
 - ▶ OFF / 2x / 4x / 8x / 16x / 32x / x64 (※ 60 or 50fps mode)
 - ▶ OFF / 2x / 4x / 8x / 16x / 32x (※ 30 or 25fps mode)
- ◆ FLICKERLESS : Select Flickerless mode
 - ▶ OFF / ON / AUTO (remove screen flicker)
- ◆ BRIGHTNESS : Adjust brightness level
 - ▶ 0(dark) ~ 14(bright) steps

EXPOSURE

- ◆ BACK LIGHT : Select HLC(High Light compensation) or BLC(Back Light compensation).
 - ▶ OFF
 - ▶ BLC
 - ▷ LEVEL : 0 ~ 6 steps
 - ▷ POSITION : Adjust the window position.
 - ▷ SIZE : Adjust the window size.
- ※ BLC doesn't work in Manual Exposure Mode.
 - ▶ HLC : When extremely bright light is projected to the camera masking is used on the portion to prevent partial saturation on the monitor.
 - ▷ MODE : ON / NIGHT
 - ▷ LEVEL : 0 ~ 20 steps
 - ▷ GRAY LEVEL : 0 ~ 10 steps
 - ▷ POSITION : Adjust the window position.
 - ▷ SIZE : Adjust the window size.

EXPOSURE

◆ DAY&NIGHT : Select Day&Night.

▶ AUTO↓

▷ DELAY : 0 ~ 255 sec

▷ THRS : 0 ~ 28 steps

Day→Night switching level in Auto Mode.

Switching in higher lux with higher threshold level.

▷ GAP : LOW / MID-LOW / MIDDLE / MID-HIGH / HIGH

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

▷ BURST : OFF / ON

▶ EXT-IN↓ / DAY / NIGHT↓

▷ DELAY : 0 ~ 255 sec

▷ BURST : OFF / ON

▷ POLARITY : External Input polarity (ACTIVE LOW / ACTIVE HIGH).

▶ DAY

▶ NIGHT↓

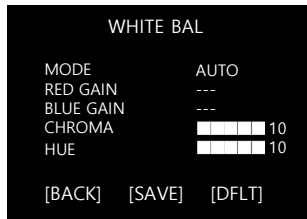
▷ BURST : OFF / ON

EXPOSURE

- ◆ NIGHT FNC SET : Select whether or not to use the Night State-Only setting.
 - ▶ OFF : Use the same settings as the Day status.
 - ▶ ON↓ : Use the Night State-Only setting for the following features.
 - ▷ FOCUS MODE : AUTO / ONE PUSH / MANUAL
 - ▷ EXPOSURE MODE : AUTO / IRIS.P / SHUT.P / MANUAL
 - ▷ AGC : 0 ~ 10
 - ▷ SHUT SPEED : 1/1, 1/2, 1/4(3), 1/8(6), 1/15(12), 1/30(25), 1/60(50), 1/100, 1/120, 1/250, 1/500, 1/1000, 1/2000, 1/5000, 1/10000, 1/20000 sec
 - ▷ IRIS : CLOSE / F1.5 / F1.8 / F2.0 / F2.4 / F2.8 / F3.4 / F4.0 / F4.8 / F5.6 / F6.8 / F8.0 / F9.6 / F11 / F14 / F16
 - ▷ DSS : OFF / 2x / 4x / 8x / 16x / 32x / x64 (※ 60 or 50fps mode)
OFF / 2x / 4x / 8x / 16x / 32x (※ 30 or 25fps mode)
 - ▷ FLICKERLESS : OFF / ON / AUTO
 - ▷ BRIGHTNESS : 0(dark) ~ 14(bright)
 - ▷ BACK LIGHT : OFF / BLC / HLC
 - ▷ SHARPNESS : 0 ~ 10 steps

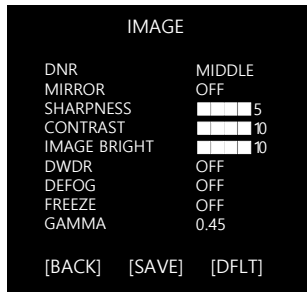
※ If you don't change the setting of NIGHT FNC SET menu, exposure state is automatically set just before switching to the night state.

WHITE BALANCE



- ◆ AWB : Select WHITE BALANCE mode
 - ▶ 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)
- ◆ RED GAIN : Adjust R gain value ▶ 0 ~ 100 steps
- ◆ BLUE GAIN : Adjust B gain value ▶ 0 ~ 100 steps
- ◆ CHROMA : Adjust CHROMA gain value ▶ 0 ~ 20 steps
- ◆ HUE : Adjust Hue value. ▶ 0 ~ 20 steps

IMAGE

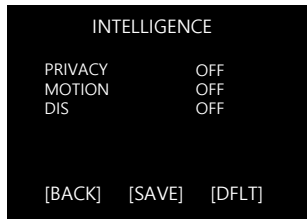


- ◆ DNR : Select Digital Noise Reduction
 - ▶ OFF / LOW / MIDDLE / HIGH / AUTO
- ◆ MIRROR : Select a flip mode
 - ▶ OFF / H / V / H&V
 - ▷ H : You can flip the picture horizontally on the screen
 - ▷ V : You can flip the picture vertically on the screen
 - ▷ H&V : You can flip the picture horizontally & vertically on the screen
- ◆ SHARPNESS : Adjust sharpness level
 - ▶ 0 ~ 10 steps
- ◆ CONTRAST: Adjust contrast level.
 - ▶ 0 ~ 20 steps
- ◆ IMAGE BRIGHT : Adjust image brightness level.
 - ▶ 0 ~ 20 steps

IMAGE

- ◆ DWDR : Select Digital WDR (Wide Dynamic Range)
 - ▶ OFF
 - ▶ AUTO ↓ : Select auto level (HIGH, MIDDLE, LOW)
 - ▶ MANUAL ↓ : Select dark or bright level
 - ▷ DARK LEVEL : 0 ~ 16
 - ▷ BRIGHT LEVEL : 0 ~ 16
- ◆ DEFOG : Carry out defog function
 - ▶ OFF
 - ▶ AUTO↓
 - ▷ AUTO LEVEL : HIGH, MIDDLE, LOW
 - ▶ MANUAL
 - ▷ LEVEL : 0 ~ 8
- ◆ FREEZE : Select real or still mode
 - ▶ OFF / ON
- ◆ GAMMA : Select GAMMA
 - ▶ 0.35 / 0.40 / 0.45 / 0.50 / 0.55 / 0.60 / 0.65 / 0.70

INTELLIGENCE



- ◆ PRIVACY : Hide an area you want to hide on the screen
 - ▶ OFF / ON↵
 - ▷ MASK# : Select mask area number.(1 ~ 8)
 - ※ Only 4 masks are displayed on the CVBS and the SDI output.
 - ▷ MODE : Mask enable or disable(OFF / ON)
 - ▷ POSITION : Adjust the mask position
 - ▷ SIZE : Adjust the mask size
 - ▷ COLOR : Select mask color(0 ~ 13)
- ◆ MOTION : When there is movement of the subject in the screen, there will be an motion detection
 - ▶ OFF / ON↵
 - ▷ AREA# : Setting 4 areas of motion detection.(1~4)
 - ▷ MODE : Limit and define areas of motion detection. (OFF / ON)
 - ▷ 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[↵]

※ When the DIS is turned on, the Digital Zoom is forced turned off.

SPECIAL FUNCTION



- ◆ DEFECT : Select Defected Pixel Compensation mode.
 - ※ Select "OFF↓" and press "Set key" to run bad pixel detection process.
 - ▶ OFF↓ / ON
- ◆ SYSTEM : Select NTSC(30fps) or PAL(25fps).
- ◆ HD FORMAT : Select Digital output
 - ▶ 720p/30(25)fps, 1080p/30(25)fps, 1080p/60(50)fps
- ※ 1080p/60(50) format is available in the TVI switch is off.
- ◆ EX-SDI MODE : Select EX-SDI mode.
 - ▶ EX-SDI 270M (1.0) / EX-SDI 135M (2.0)
- ※ In 1080p/60(50)fps format, it is fixed to EX270M mode.

SPECIAL FUNCTION

- ◆ COMM : Set up the camera ID, baud rate, protocol
 - ▷ ID : Select the camera ID(1 ~ 255)
 - ※ ID is common to UART and RS-485
 - ▷ BAUD RATE : Select baud rate for UART.
 - ▷ PROTOCOL : Select Protocol for UART.(VISCA / PELCO-D / PELCO-P)
 - ▷ 485 BAUDRATE : Select baud rate for RS-485.
(2400 / 4800 / 9600 / 19200 / 38400 / 57600 / 115200bps)
 - ▷ 485 PROTOCOL : Select Protocol for RS-485.(VISCA / PELCO-D / PELCO-P)
 - ▷ UTC : Select whether to enable TVI-UTC communication. (OFF / ON)
 - ▷ UTC PROTOCOL : Select Protocol for TVI-UTC. (PELCO-C / HIKVISION-C)
 - ▷ UTC FORWARD : Select whether to enable the function to forward the UTC command to UART or RS485. (OFF / ON)
 - ▷ UTC FWD PORT : Select the communication port on which to send the UTC command. (UART / RS-485)
 - ※ When the UTC Forward function is turned on, the UTC Command is not handled by the camera, but is only forwarded to the communication port (UART or RS485).

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)

SPECIFICATION

Image Sensor	1/2.3" Sony Global Shutter CMOS Sensor
Total Pixels	1936(H) x 1226(V) = 2.37M pixels
Active pixels	1936(H) x 1216(V) = 2.35M pixels
Lens	36x Day & Night Zoom Lens f = 6.0mm ~ 216.0mm, F1.5 (wide) ~ F4.8 (tele)
FOV	Horizontal : 52.62°~1.95°, Vertical : 31.08°~1.10°
Digital Zoom	2x ~ 32x
Resolution	Digital : 1080p 60/50/30/25fps, 720p 60/50/30/25fps Analog : CVBS
Min. illumination	Color(1/30s, 48dB) : 0.3 lux , BW(1/30s, 48dB) : 0.01 lux Color DSS(1/2s, 48dB) : 0.06 lux , BW DSS(1/2s, 48dB) : 0.002 lux
Video Output	HD-SDI, EX-SDI, TVI, CVBS
S/N Ratio	more than 50dB (AGC off)
Comm. Baudrate	2400 / 4800 / 9600 / 19200 / 38400 / 57600 / 115200

SPECIFICATION

Focusing Mode	Auto / One Push / Manual
Shutter Speed	1/1 ~ 1/20,000 sec
White Balance	Auto / One Push / Manual / Indoor / Outdoor
Power Source	DC12V±10%
Power Consumption	MAX 550mA
Operating Temperature	-10°C ~ +50°C (Humidity : 0%RH ~ 90%RH)
Weight	0.82Kg

※ Design and specifications are subject to change without notice.

P/N :
PRINTED IN KOREA

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