USER'S MANUAL

FULL HD MEGA PIXEL IP ZOOM CAMERA

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

TABLE OF CONTENTS

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.
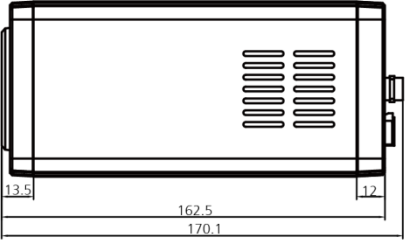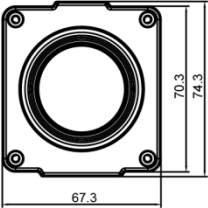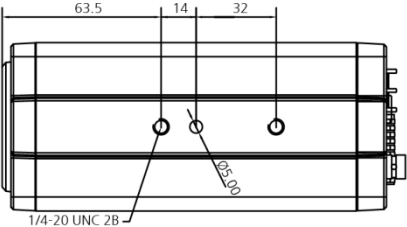
3

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
- Network, EX-SDI, CVBS
- 20x Optical Zoom (5.2~104mm) & 32x 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)
- IPv4, IPv6 support
- H.265, H.264, MJPEG video compression
- Less than 200ms latency with 2MP video streaming
- Edge storage up to 64GB
- Bi-directional audio support

DIMENSIONS

63.5 14 32

Ø5.00

1/4-20 UNC 2B

70.3
74.3

67.3

13.5 162.5 12

170.1

PART NAMES AND FUNCTIONS

1. IEEE802.3af POE / LAN
2. MICRO SDCARD MEMORY
3. SPEAKER OUT
4. MIC IN
5. OSD CONTROL
6. HD-SDI
7. CVBS OUT
8. IP RESET
9. POWER LED
10. I/O Ports
 10-1. RS485 +
 10-2. RS485 -
 10-3. Motion Detection Out
 10-4. GND
 10-5. DAY & NIGHT INPUT
    (LOW : Night, HIGH : Day)
 10-6. GND
 10-7. Alarm IN
 10-8. GND
 10-9. Alarm OUT A
 10-10. Alarm OUT B
11. POWER : DC 12V
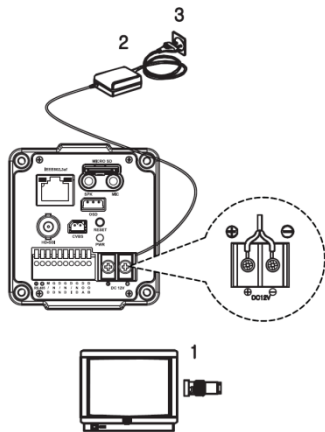
CONNECTIONS

Connect video output(BNC / LAN) to the monitor or PC or NVR.

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.

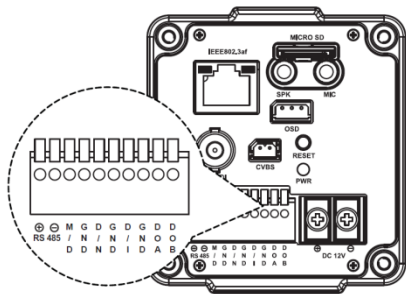2. Use a commercially available DC12V adaptor.

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.

EXTERNAL DEVICE CONNECTIONS

RS-485 COMMUNICATION
Connect to an external controller of RS-485 format.
(Protocol : Pelco-D 2400 supported)

Motion Detection Out
When the motion detection function is working.
DC3.3V is outputed 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>.

Alarm IN
In order to make alarm on the web GUI, short or open
Insert the plug of this power cord into a wall outlet.
between D/I and GND port.
The POWER indicator will light. Adjust the picture on the monitor
(Please refer the IP manual for more information)
using the Brightness and Contrast controls etc.

Alarm OUT
Control the relay On/Off on the web GUI, relay will
short or open between DOA and DOB.
(Please refer the IP manual for more information)
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.

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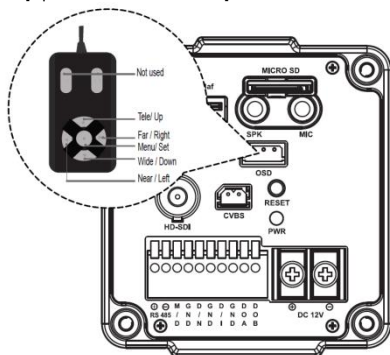
Tele(Up) button : Zoom in, Tele (Moves the cursor upwards. Use this button to select an item or adjust the parameters.)

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.

NETWORK

Setting IP address
Using NVTManagement enables to set network settings.

1. Excute NVTManagement.
. Double click NVTManagement.exe

2. Setting IP address
. Click NVT Scan button to find IP cameras than select the camera.
. Input IP address, net mask, gateway and name server address than click Apply button.
. Default IP and Password is ID:root, PW:pass
. If you have any network information about your network, please ask to your network administrator.

3. Access the camera using web browser.
ID: root
Password: pass

NETWORK

4. Camera setting
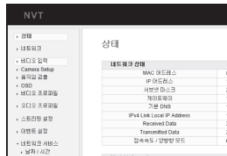
4. 1 Go to setting menu as below.

4. 2 Click Video Source.

4. 3 Go to Camera Control section.
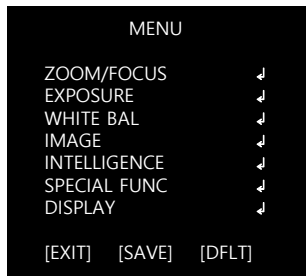

Click Enter button to call OSD menu.
Adjust camera setting using OSD menu.
For more information, please refer the
following OSD setting manual.

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.

```
            MENU

  ZOOM/FOCUS          ↵
  EXPOSURE            ↵
  WHITE BAL           ↵
  IMAGE               ↵
  INTELLIGENCE        ↵
  SPECIAL FUNC        ↵
  DISPLAY             ↵

  [EXIT]   [SAVE]   [DFLT]
```

Functions can be setup using "Menu Key Command" of Visca protocol.
The menu consists of the "Main Menu" and "Sub Menu".
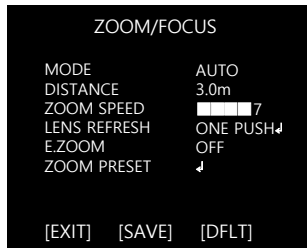The main menu is displayed where 7 camera functions can be selected.
To the push of each main menu selection, the sub-menu is displayed
If you want save the menu, select [SAVE].
If you want not save the menu, select [EXIT]
(After select , Power off -> on)
If you want default the menu, select [DFLT]

FOCUS

```
     ZOOM/FOCUS

MODE            AUTO
DISTANCE        3.0m
ZOOM SPEED      ▮▮▮▮7
LENS REFRESH    ONE PUSH↵
E.ZOOM          OFF
ZOOM PRESET     ↵


[EXIT]   [SAVE]   [DFLT]
```

◈ 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
  ► 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
◈ DSS : Select maximum DSS (Digital Slow Shutter)
  ► 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

EXPOSURE
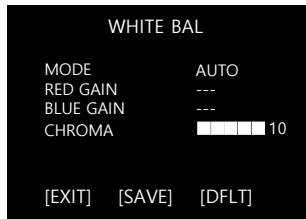
◈ WDR/BLC : Select WDR(Wide Dynamic Range) or BLC(Back Light compensation)
  ► WDR↵
  ▷ MODE : Select WDR mode.
  ► LINE, FRAME
  ▷ LEVEL : Adjust WDR level.
  ► LOW, MID-LOW, MIDDLE, MID-HIGH, HIGH
※ WDR doesn't work in Manual Exposure Mode and Shutter Priority Mode.
  ► BLC↵
  ▷ POSITION : Adjust the 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)
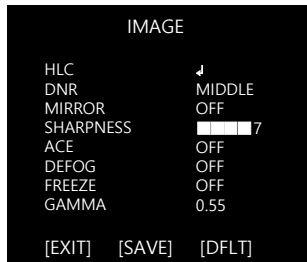※ BLC doesn't work in Manual Exposure Mode.

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

```
       WHITE BAL

MODE            AUTO
RED GAIN        ---
BLUE GAIN       ---
CHROMA          ▮▮▮▮▮ 10


[EXIT]   [SAVE]   [DFLT]
```

◈ 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

```
            IMAGE

   HLC                    ◢
   DNR               MIDDLE
   MIRROR              OFF
   SHARPNESS          ▮▮▮▮ 7
   ACE                 OFF
   DEFOG               OFF
   FREEZE              OFF
   GAMMA              0.55

   [EXIT]   [SAVE]   [DFLT]
```

◈ 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

```
        INTELLIGENCE

PRIVACY         OFF
MOTION          OFF
DIS             OFF


[EXIT]   [SAVE]   [DFLT]
```
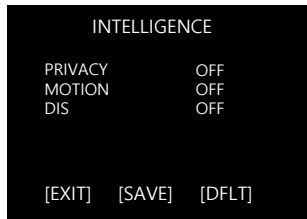
◈ PRIVACY : Hide an area you want to hide on the screen
  ► OFF / ON↵
  ▷ MASK# : Select mask area number (1 ~ 24)
  ▷ MODE : Mask enable or disable(OFF / ON)
  ▷ POSITION : Adjust the mask position
  ▷ SIZE : Adjust the mask size
  ▷ COLOR : Select mask color(0 ~ 13)
  ▷ TRANS : Select mask transparency 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

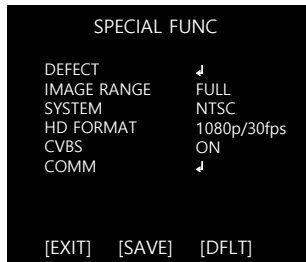 ▷ DWELL TIME : Select the duration time about changing MD mode (0 ~ 255sec)
  ▷ ZOOM PRESET : Select Motion Zoom Preset Mode and Position (OFF / ON↵)

◈ 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
CVBS                ON
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(30fps) or PAL(25fps).
◈ HD FORMAT : Display digital output.
   (► Fixed to 1080p/30(25)fps)
◈ CVBS : Select CVBS output.
   ► OFF / ON

SPECIAL FUNCTION

◈ 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

DISPLAY

```
        DISPLAY

DISP SEL        ON↵
SET TITLE        ↵
INIT SEL SET    ON↵
INIT MSG         ↵
LANGUAGE      ENGLISH

[EXIT]   [SAVE]   [DFLT]
```

※ 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	20x 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 : 1080p30(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

NETWORK

Ethernet	RJ-45 (10/100BASE-T)
Video Compression Format	H.265, H.264, MJPEG
Resolution	1920x1080, 1280x720, 1024x576, 640x360, D1, 4CIF, VGA, CIF, QVGA
bit rate	32Kbps~8Mbps (CBR,/VBR Suppport)
Max. frame rate	30fps@1920x1080
Streaming Capability	Supports up to Triple streams(H.265, H.264, MJPEG)
Audio In / Out	Mic In / Audio Out
Audio Compression	G.711
Audio Communication	Bi-directional audio
Protocol	TCP, UDP, IP, HTTP, DHCP, DNS, ICMP, ARP, IPv4 / IPv6, DDNS, NTP, SNMP, Syslog, UPnP, Bonjure, ZeroConf, RTP/RTSP, Onvif, Genetec Protocol
Storage	SDXC (up to 64GB, MicroSD)
Security	MD5 Password / iptables (firewall) / SSL
Webpage Language	Korean, English
Web Viewer	IE8.0 or above, Microsoft Edge, Firefox, Google Chrome, Apple Safari

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	DC12V±10% / PoE 802.3af
Power Consumption	MAX 500mA
Storage Temperature	-20℃ ~ +60℃ (Humidity : 0%RH ~ 90%RH)
Operating Temperature	-10℃ ~ +50℃ (Humidity : 0%RH ~ 90%RH)
Weight	0.75Kg

※ Design and specifications are subject to change without notice.

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