Megapixel HD-SDI
Outdoor Bullet IR Camera

CLEBO-HD AB-2316IR

ABOUT MANUAL
Before installing and using the camera, please read this manual carefully.
Be sure to keep it handy for future reference.

07022012

PRECAUTIONS

- Do not open or modify.
- Do not open the case except during maintenence and installation,
  for it may be dangerous and can cause damages.
- Do not put objects into the unit.
- Keep metal objects and flammable substances from entering the camera.
  It can cause fire, short-circuits, or other damages.
- Be careful when handling the unit.
- To prevent damages, do not drop the camera or subject it to shock or vibration.
- Do not install near electric or magnetic fields.
- Protect from humidity and dust.
- Protect from high temperature.
- Be careful when installing near the ceiling of kitchen or a boiler room,
  as the temperature may rise to high levels.
- Cleaning :
  To remove dirt from the case, moisten a soft cloth with a soft detergent solution and wipe.
- Mounting Surface :
  The material of the mounting surface must be strong enough to support the camera.

FCC COMPLIANCE

This equipment has been tested and found to comply with the limits for a Class B
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 residential environment. This equipment generates, uses, and radiates
radio frequency energy; and if it is not installed and used in accordance with the
instruction manual, it may cause harmful interference to radio communications.

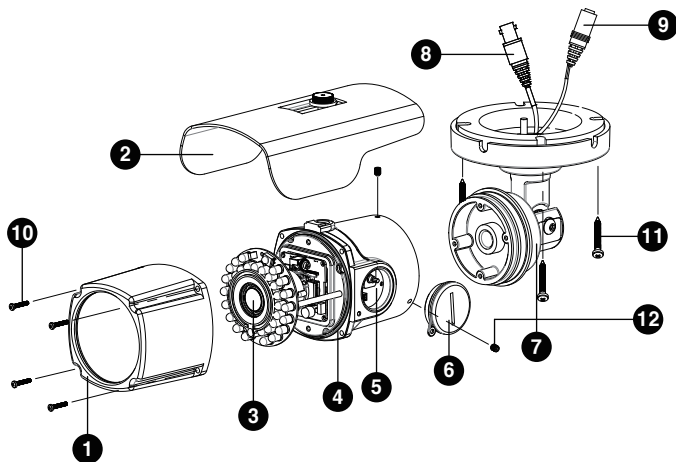**WARNING** : Changes or modifications are not expressly approved by the manufacturer.

Table of Contents

FEATURES*

- Sony 1/2.8" CMOS Sensor
- Highest Resolution 2.1 Megapixels
- 720P / 1080P Mode selectable
- 100ft IR Distance
- Double Shutter WDR (Wide Dynamic Range) at 15fps Settings
- True Day and Night
- AGC / BLC / AWB
- 3D DNR (3D Digital Noise Reduction)
- D-Zoom (1~112 level)
- HL Mask (High Light Masking)
- Mirror Image Control
- Programmable Privacy Zone (24) & Motion Detection
- White defecet cancellation (DEFECT DET)
- 12VDC Support Only
- Secondary Video-BNC Output

PARTS & DESCRIPTIONS*

1 Front Case	**5** Control Board	**9** Power Input Connector DC 12V only
2 Sunshield	**6** Con Cap	**10** Assembly Screw
3 Lens	**7** Double Arm Bracket	**11** Fixing Screw
4 Rear Case	**8** BNC Jack	**12** Set Screw

DIMENSIONS *

230.0

75.5

122.0

96.5

BNC JACK
VIDEO(Yellow)

POWER IN
VCC(Red)

Ø78.0

Ø5.0

68.0

68.0

Ø96.0
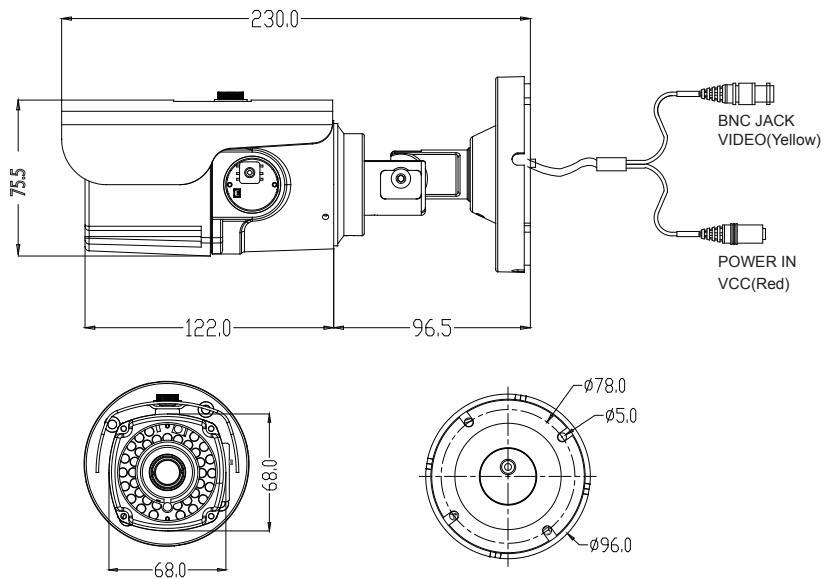
INCLUDED ACCESSORIES *

1. User Manual
2. Mounting Template
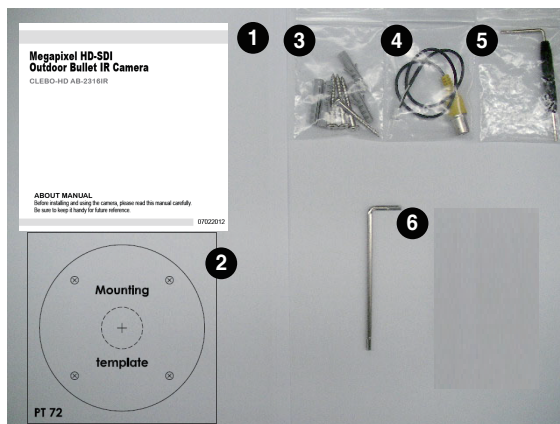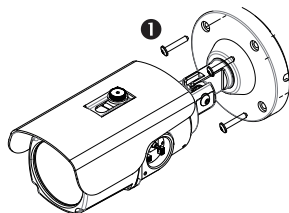3. Four(4) Screw and Four(4) Dry Wall Anchors
4. 2nd Video Jack

5. Tool
6. L-Wrench

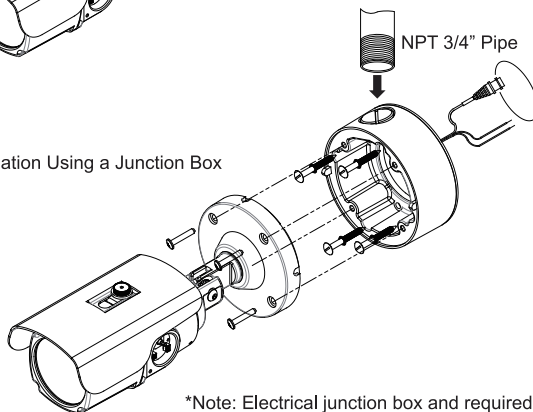# SURFACE MOUNT INSTALLATION *

❶ Use the 4 mounting screws to install the camera on the wall or ceiling.

Then, follow the next step on the pages 9-12.

NPT 3/4" Pipe

*Installation Using a Junction Box

*Note: Electrical junction box and required screws sold separately.

CONNECTING TO MONITOR*

Power DC12V   Video - BNC
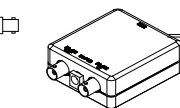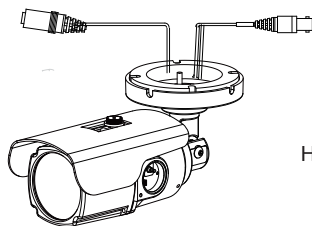
HDMI CONVERTER

HDMI MONITOR
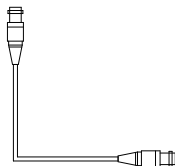
HD-SDI MONITOR
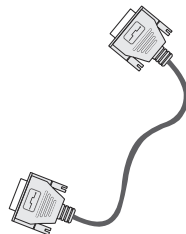
CONTROL BOARD & ADJUSTING LENS*

❶ Remove clear plastic ring from the control cap.
❷ Turn control cap counter-clockwise until cap separates completely from the camera body.

Joystick: Controls the OSD menu.

Secondary Connector:
Tests video output connector.
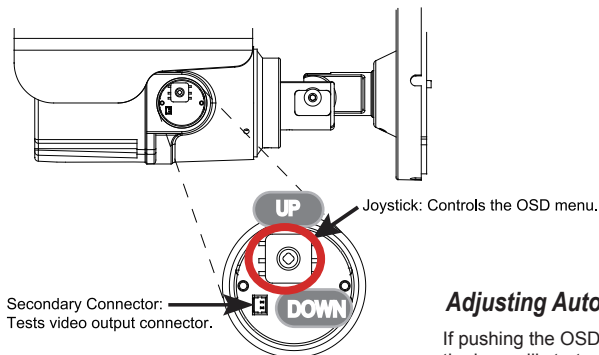
Adjusting Auto Focus Lens

If pushing the OSD joystick to 'UP',
the lens will start zoom-in.
If pushing the OSD joystick to 'DOWN',
the lens will start zoom-out.
If you keep pushing the joystick,
zoom in/out will be continuously operated.
When you find the right angle, take off
your finger from the joystick and wait.
The focus will be automatically adjusted.

CAMERA SETTING ANGLE*

360°

360°

90°
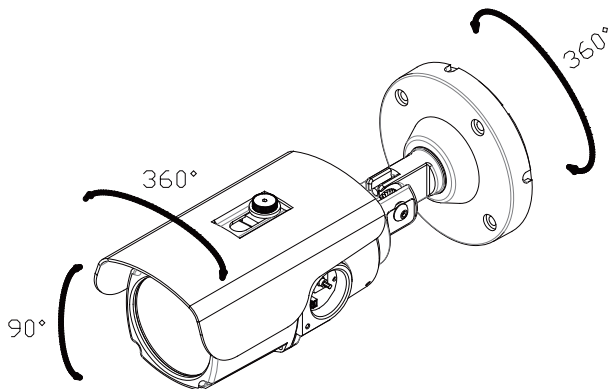
CAUTION :
❶ Do not rotate more than 360º.
❷ Do not unnecessarily twist too many times.

MODULE OSD MAP *

PROPERTY

- CAMERA ID
  0~255
- TITLE
- DISPLAY
  NON, ID,, TITLE
- PROTOCOL
  PELCO-D, NADATEL
- BAUDRATE
  9600, 2400bps
- RETURN

EXPOSURE

- BRIGHTNESS
  0~20
- SHUTTER
  AUTO, MANUAL(Indoor, Deblur120, Deblur240, Outdoor)
- DSS
  OFF, x2, x3, x4
- AGC
  0~20
- RETURN

LENS

- LENS TYPE
  MANUAL, DC, AF
- MODE
  OUTDOOR,INDOOR/FLK,Deblur120,Deblur240
- OPTIC ZOOM TELE, WIDE
- FOCUS MODE MANUAL, AUTO
- FOCUSING FAR, NEAR
- TIMER OFF, 1~10min
- TDN SYNC OFF, ON
- RETURN

FUNCTION

- DZOOM
  0~112
- AWB
  AUTO, AUTO_H, AUTO_L, PRESET, MANUAL, AUTO-ext
- PRIVACY
  ON, OFF
- DNR
  OFF, LOW, MIDDLE, HIGH
- MOTION
  ON, OFF
- RETURN

IMAGE

- CHROMA 0~20
- SHARPNESS 0~10
- MIRROR ON, OFF
- FLIP ON, OFF
- E-Edge ON, OFF
- HLMASK ON, OFF
- CONTRAST LOW, NORMAL, HIGH
- HUE CONTROL R-GAIN, B-GAIN
- RETURN

WDR/BLC

- MAX DR OFF, ON
- MODE OFF, BLC, WDR
- WDR_WGT 0~9
- BLC OSD OFF, ON
- BLC POS-X 0~20
- BLC POS-Y 0~20
- BLC SIZ-X 0~20
- BLC SIZ-Y 0~20
- RETURN

DAYNIGHT

- TDN MODE
  AUTO, COLOR, BW, LED
- BW to C
  0~9
- C to BW
  0~9
- CDS SET
  BW Low, BW High
- RETURN

SET UP

- DETECT DET ON, OFF
- 2.0M MODE 1080P, 720P
- 720P MODE 60/50FPS, 30/25FPS
- LANGUAGE ENG, GER, CHN
- TDN TEST TEST OFF, TEST ON
- FACTORY SET YES, NO
- FREQ 60Hz, 50Hz
  TYPE DOME, BOX, BULLET
  FW_LOCK ON,OFF
- RETURN

EXIT

- EXIT
  No Save, Yes Save
- RETURN

PROPERTY

```
   1  PROPERTY

CAMERA ID      0
TITLE(1-)
DISPLAY        NONE
PROTOCOL       PELCO-D
BAUDRATE       9600 BPS
RETURN
```

CAMERA ID

0~255   You can define the camera ID no. from 0~255

TITLE

(1-)   After setting the camera ID, you also can make the title for each camera ID no. Title is total 8 figures with number and alphabets.
Let me make the title name **HDSDI123.**
TITLE (1-H) H
TITLE (2-D) HD
TITLE (3-S) HDS
TITLE (4-D) HDSD
TITLE (5-I) HDSDI
TITLE (5-1) HDSDI1
TITLE (6-2) HDSDI12

```
   1  PROPEARTY

CAMERA ID      1
TITLE(1-H)     HDSDI123
DISPLAY        NONE
PROTOCOL       PELCO-D
BAUDRATE       9600 BPS
RETURN
```

DISPLAY

NONE, ID, TITLE   You can select whether displaying Camera ID and TITLE or not.

PROTOCOL

PELCO-D, NADATEL   If using Nadatel HD-SDI DVR, select the protocol NADATEL.

BAUDRATE

9600,2400bps   9600 is the default. There are 2 choices - 9600 and 2400bps.

RETURN

EXPOSURE

```
2 EXPOSURE

BRIGHTNESS    IIIIIIIIIIIIII 10
SHUTTER       AUTO
DSS           OFF
AGC           IIIIIIIIIIIIIII 20
RETURN
```

BRIGHTNESS

0~20   You can adjust the brightness.
Higher number means brighter images.
The default is 10.

SHUTTER

AUTO   It's a defualt. Shutter speed is adjusted properly.
MANUAL   Shutter speed is selectable from 1/30 ~ 1/60000 but it's related to the menu LENS-MODE.

```
SHUTTER

LEVEL      1/30
RETURN
```

If LENS MODE is OUTDOOR, shutter speed is adjustable from 1/30~1/60000.
If LENS MODE is INDOOR/FLK, shutter speed is fxied with 1/30.
If LENS MODE is DEBLUR120, shutter speed is adjustable from 1/30~1/120.
If LENS MODE is DEBLUR240, shutter speed is adjustable from 1/30~240.

DSS (Digital Slow Shutter)

OFF, x2, x3, x4   The default is OFF.
If better sensitivity is required, choose x2,3,or 4.

AGC (Auto Gain Control)

0~20   Auto Gain Control automatically adjusts the video gain to enhance picture brightness in low light conditions.The higher number means better sensitivity.
The default is 20.

RETURN

LENS

```
  3 LENS

LENS TYHPE      AF LENS
MODE            DEBLUR120
OPTIC ZOOM      TⅢⅢⅢⅢⅢⅢⅢW
FOCUS MODE      AUTO
TIMER           OFF 00:00
TDN SYNC        OFF
RETURN
```

LENS TYPE

AF LENS
DC LENS
MANUAL

AF mode is supported for Auto Focus Lens.
DC mode is supported for Auto-iris Varifocal lens.
Manual mode is supported for Manual iris or Fixed board lens.

```
  3 LENS

LENS TYHPE      DC LENS
MODE            DEBLUR120
OPTIC ZOOM      _ _ _
FOCUS MODE      _ _ _
TIMER           _ _ _
TDN SYNC        _ _ _
RETURN
```

If DC or Manual mode is selected, some menu can't be controlled - OPTIC ZOOM, FOCUS MODE, TIMER, TDN SYNC.

MODE

OUTDOOR	It offers full range of eletric shutter speed from 1/30~1/60000.
INDOOR/FLK	It fixes shutter speed with 1/30. It can avoid color rolling problem.
DEBLUR120	It offers electric shutter speed from 1/30~1/120.
DEBLUR240	It offers electric shutter speed from 1/30~1/240.

Both DEBLUR120, DEBLUR240 helps to avoid motion blur at still image.

OPTIC ZOOM

Zoom Range is adjustable from Tele to Wide.

LENS

FOCUS MODE

AUTO — When using Auto Focus Lens, Focus can be adjusted automatically.
Also, you can set-up the TIMER to repeat the automatic focusing after finishing the installation. TIMER is OFF and from 1 ~ 10min.

MANUAL — If you want to adjust the focus manually, select MANUAL mode.
In this case, TIMER menu will be changed to FOCUSING and you can adjust the focus Far / Near.

```
   3  LENS


   LENS TYHPE      AF LENS
   MODE            DEBLUR120
   OPTIC ZOOM      T IIIIIIIIIIIIII W
   FOCUS MODE      AUTO
   TIMER           OFF 00:00
   TDN SYNC        OFF
   RETURN
```

```
   3  LENS


   LENS TYHPE      AF LENS
   MODE            DEBLUR120
   OPTIC ZOOM      T IIIIIIIIIIIIII W
   FOCUS MODE      MANUAL
   FOCUSING        N < - > F
   TDN SYNC        OFF
   RETURN
```

TDN SYNC

OFF / ON — OFF is default. If ON is seleced, the camera will adjust the focus when every Day and Night filter change is operated.

RETURN

FUNCTION

```
   4 FUNCTION

DZOOM        0
AWB          AUTO
PRIVACY      OFF
DNR          MIDDLE
MOTION       OFF
RETURN
```

DZOOM

0~112	Digital Zoom function (Level 0~112)

AWB

AUTO	White Balance is automatically adjusted.
AUTO_H	White Balance is automatically adjusted in the condition of Color temperature is high.
AUTO_L	White Balance is automatically adjusted in the condition of Color temperature is low.
PRESET	White Balance is fixed with current setting.
MANUAL	White Balance is manually adjustable.
AUTO-ext	Select AUTO-ext mode when using special lightening like hallogen.

```
   MWB

KELVIN       MIDDLE
R-GAIN       ||||||||||||  10
B-GAIN       ||||||||||||  10
RETURN
```

If MANUAL mode is selected, define the following menu.

KELVIN	Color Temperature level. It has LOW / MIDDLE / HIGH
R-GAIN	It's to adjust the amount of red in the image.
B-GAIN	It's to adjust the amount of blue in the image.

FUNCTION

PRIVACY

OFF / ON

You can hide some parts of the screen for privacy masking. Total 30 different privacy zone maskings are available.

```
     PRIVACY

ZONE NO     0~29
ZONE OP     ON/OFF
X-POS       0~57
Y-POS       0~31
X-SIZ       0~60
Y-SIZ       0~34
COLOR       CYN, GRN, MAG, RED,
            BLU, BLK, WHT, YEL
TRANS       0~4
RETURN
```

ZONE NO	30 different privacy masking zones are available.
ZONE OP	Zone Display. ON/OFF
X-POS	X-Position (0~57)
Y-POS	Y-Position (0~31)
X-SIZ	X-Size (0~60)
Y-SIZ	Y-Size (0~34)
COLOR	Privavy Masking Zone Color - CYN, GRN, MAG, RED, BLU, BLK, WHT, YEL
TRANS	Transparency (0~4) Lower number means more transperant.

DNR

Digital Noise Reduction reduces the noise/distortion on the screen at night, allowing clear images in low light conditions. You can sellect OFF / LOW / MIDDLE / HIGH.

MOTION

OFF/ON

If selecting ON, define the following menu.

```
     MOTION

RESOLUTION   IIIIIIIIIIIIII  5
SENSITIVITY  IIIIIIIIIIIII   5
RETURN
```

*** RESOLUTION
It's what size of motion area must be displayed on the monitor. Higher number means smaller size of marking for motion area.

*** SENSITIVITY
The motion is how sensitively detected. Higher number means less sensitive.

RETURN

IMAGE

```
5 IMAGE

CHROMA          |||||||||||||| 7
SHARPNESS       5
MIRROR          OFF
FLIP            OFF
E-Edge          OFF
HLMASK          OFF
CONTRAST        NORMAL
COLOR SET       COLOR1
HUE CONTROL     ↵
RETURN
```

CHROMA
0~20   It's color chroma level 0~20. The default is 7.

SHARPNESS
0~10   It's to make the image sharper.
              High number means sharper image. The default is 10.

MIRROR
ON/OFF   OFF is the default.

FLIP
ON/OFF   OFF is the default.

E-Edge
ON/OFF   It's a function of edge enhancement.

HLMASK
OFF   It's to mask the high lux areas. OFF is the default.

ON   If ON is selected, you can adjust the masking level
              and color. Level is 0~10. It also has 8 different colors -
              BLK, WHT, YEL, CYN, GRN, MAG, RED, BLU

```
HLMASK

LEVEL       |||||||||||||| 10
COLOR          BLK
RETURN
```

IMAGE

CONTRAST

NORMAL/ HIGH/ HIGHEST   You can adjust the contrast level - Normal, High, and Highest.

COLOR

COLOR 1,2,3   Color 1 is the default. If the color reproduction on the monitor is not satisfied, try other modes - Color 2 or 3.
There are total 3 different color display Color 1,2, and 3.

HUE CONTROL

R-GAIN   You can adjust the amount of Red color. Level is 50~180.
B-GAIN   You can adjust the amount of Blue color. Level is 50~180.

```
        HUE CONTROL

     R-GAIN        80
     B-GAIN        80
     RETURN
```

RETURN

WDR / BLC

```
  6 WDR/BLC

MAX DR        OFF
MODE          OFF
WDR_WGT       5
BLC OSD       OFF
BLC POS-X     5
BLC POS-Y     5
BLC SIZ-X     9
BLC SIZ-Y     9
RETURN
```

MAX-DR
OFF/ ON

MAX Dynamic Range provides clear images even when strong backlighting is present. Select MAX-DR ON or OFF.

MODE
OFF/ BLC/ WDR

OFF
BLC - Back Light Compensation Mode
WDR - Wide Dynamic Range (15fps Only)

WDR_WGT
0~9

It's to set up the dynamic range.
The higher number means wider dynamic range.
The default is 5.

BLC OSD
OFF / ON

Backlight compensation prevents subjects in defined areas of the scene from appearing too dark when backlighting is present.
If ON is selected, BLC Zone size and location is adjustable.

BLC POS-X
0~20

It's to adjust BLC Horizontal Position.

BLC POS-Y
0~20

It's to adjust BLC Vertical Position.

BLC SIZ-X
0~20

It's to adjust BLC Horizontal Size.

BLC SIZ-Y
0~20

It's to adjust BLC Vertical Size.

RETURN

DA & NIGHT

7 DAY&NIGHT

TDN   COLOR
BW to C   IIIIIIIIIIIIIIII 5
C to BW   IIIIIIIIIIIIIIII 5
CDS SET   BW LOW
RETURN

TDN MODE

AUTO	The camera switches between day and night automatically depending on the certain light level.
COLOR	The camera always stays at day mode.
BW	The camera always stays at night mode.
LED	LED mode is supported for using external LED light seperately.

BW to C

0~9   It is to adjust the light level at shich camera switches from night(BW) to day(Color) mode. High number means the higher light level.

C to BW

0~9   It is to adjust the light level at shich camera switches from day(Color) to night(BW) mode. High number means the lower light level.

CDS SET

BW LOW   It is to adjust the filter change signal level when using IR LEDs.
BW HIGH   The default is BW HIGH.

RETURN

SETUP

8 SETUP

DEFECT DET   OFF
2.0M MODE   1080P
720P MODE   60/50FPS
LANGUAGE   ENG
TDN TEST   TEST OFF
FACTORY SET   YES
GREQ   60HZ(NTSC)
TYPE   BOX
F/W LOCK   ON
RETURN

DEFECT DET

OFF / ON   Dead Pixel Cancellation automatically removes defective pixels.

Note : It's not recommand to use from the customer side.

2.0M MODE

1080P / 720P   1080P is the default. If you want to have low resolution image, you can select 720P mode.

720P MODE

60/50FPS   60/50FPS is also supported at 720P mode.
30/25FPS   It's the default.

LANGUAGE

ENG/ GER/ CHN   It provides 3 different language - English, Germany, China.

TDN TEST

TEST OFF/ TEST ON   TDN OFF is the default. It's the TDN filter change continuous test.

Note : It's not recommand to use from the customer side.

FACTORY SET

YES/ NO   NO is the default. If yes is selected, osd menu setting is initiallized.

FREQ

60HZ, 50HZ   It's selectable. 60HZ (NTSC), 50HZ (PAL)

TYPE

DOME, BOX, BULLET   Do not change this menu! It's for factory-use only!

FW_LOCK

OFF / ON   It's the Firmware Lock Function. It's not recommand to select 'ON'.

RETURN

TROUBLESHOOTING

Before sending your camera for repair, check the following or contact one of our technical specialists.

No VIDEO
Check the coaxial cable and make sure it is connected securely.
Check the osd menu setup of the camera.
Check the power supply and make sure the camera has the proper voltage and current.

Out-of Focus VIDEO
Check the clear dome cover and the lens for dirt or fingerprints. Use a soft cloth and gently clean.
Try to operate the autofocus functions on the page 11.

SPECIFICATION *

MODEL	CLEBO-HD AB-2316IR
GENERAL SPEC	
CMOS TYPE	1/2.8" 2.0M Pixels Color
Pixels	2000 (H) x 1241(V)
Resolution	1920x1030 pixels (at COLOR) 30fps
	1920x1030 pixels (at TDN-BW) 30fps
Min illumination	0.1Lux [(F1.6, 30IRE), (at COLOR)]
(F1.6, 30IRE)	0.01Lux [(F1.6, 30IRE), (at TDN(B/W)]
Shutter speed	1/30s ~ 1/25s
S/N ratio	50dB or more (AGC OFF)
Frame Ratio	NTSC (30fps) / PAL (25fps)
Sync System	Internal
Electric Spec	
Voltage range	DC12V only (10V ~ 16V)
Power consumption	LED OFF : 2.0W
	LED ON : 4.0W
Mechanical Spec	
Operatio temp	-10℃ ~ 50℃ (14℉ ~ 122℉)
In storage temp	-20℃ ~ 70℃ (-4℉ ~ 158℉)
Operation humidity	Under 90% (Non-condension)
Video Output Spec	
Main Data Out	HD-SDI
Sub Data Out	CVBS Analog
Main Clock	
Speed	74.25MHz pclk