

PIPE VIDEO INSPECTION SYSTEMS USER MANUAL

For
3388E SERIES

ASSEMBLING AND OPERATING INSTRUCTIONS



Read instructions carefully before operating this system

WARNING

1. Never use this device in an environment with explosive materials such as GAS, OIL, ETC.
2. Avoid using the device in extremely cold, hot or humid environment; otherwise it may damage the device. Do not drop or press hard on the device.
3. Avoid using the parts / components from other manufacturers to this system, which may damage the equipment due to the un-compatibility.
4. Warranty invalidation if the device is disassembled by users or if there are any physical damages.
5. Always back up your data before connecting your USB stick / Micro SD Card to this system. The manufacturer is not responsible for any data damage or loss on your USB stick / Micro SD Card for any reason.
6. The USB drive file type supported by the device is FAT or FAT32. If the USB drive file type is NTFS or exFAT, please convert them to FAT or FAT32 by formatting the USB and setting the file type as FAT or FAT32; otherwise, the USB drive cannot be recognized by the device.
7. Do not disconnect the unit while recording or playing. It may damage the unit and/or the USB stick / Micro SD Card.
8. The system's PUSH CABLE made of fiberglass is very rigid and not flexible. It CAN NOT be bent sharply or pushed too hard; otherwise, it will be broken.
9. You must put the parts/components properly in the case, otherwise, LCD monitor may be broken.
10. Please forgive that if any change of products will not make additional specify in advance.

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Assembly Drawing and Parts List

Part No.	Description
1	Multi-function Case
2	□10 INCH MONITOR
3	□60M(200FT) □90M(300FT) □120M(400FT) CABLE CFIBERGLASS CABLE
4	POWER ADAPTER&BATTERY CHARGER
5	1.5M or 3M VIDEO CABLE
6	C28 CAMERA HEAD SKIDS(OPTIONAL)
7	C40 CAMERA HEAD SKIDS
8	C360 PAN & TILE CAMERA HEAD (OPTIONAL)
9	REMOTE CONTROL
10	C28MM PAN&TILT CAMERA HEAD
11	T-A SPRING CONNECTOR (OPTIONAL ITEM)
12	SPRING CONNECTOR
13	SPRING CONNECTOR (OPTIONAL ITEM)
14	C40 PAN&TILT CAMERA HEAD
15	C360B PAN&TILT CAMERA HEAD (OPTIONAL)



Note: Not all the parts/components shown above come with the model you buy. Different model comes with different parts / components.

Specifications

Item	Description
Power adapter	110VAC~240VAC 13.5VDC 1700mA
Battery (In the case)	LI-ION battery, DC 12V, 6600mAh
Length of Cable	□60M(200FT) □90M(300FT) □120M(400 FT)
Camera Light Source	Built-in White LED lights (9PCS)
Camera Image	Effective Pixel Array: 976 (H) x 504(V)
Monitor Screen Size	10" TFT LCD Color Monitor
Monitor Picture Resolution	800*600 pixel (for 10" LCD)
System Operating Temperature	-20°C to 55°C

User Manual

Application

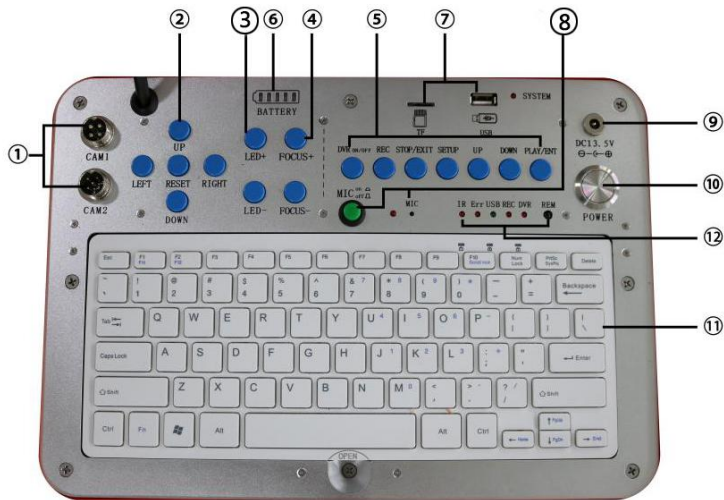
1. WATER SUPPLY SYSTEM
2. WASTEWATER SYSTEM
3. ELECTRICAL AIR CONDITIONER SYSTEM
4. CABLE DUCTING
5. DUCTED VACCUM SYSTEMS
6. PLUMBING
7. BUILDINGS

WARNING:

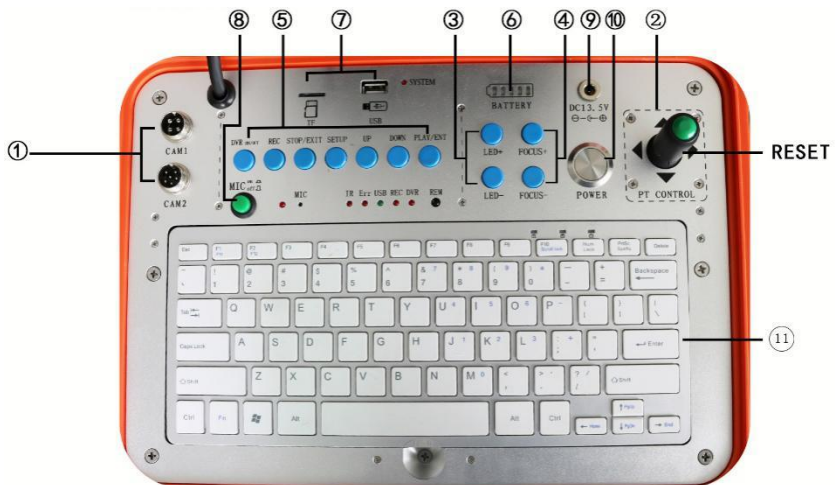
NEVER USE THIS DEVICE IN AN ENVIRONMENT WITH EXPLOSIVE MATERIALS SUCH AS GAS, OIL, ETC.

Know Your Device Control Panel

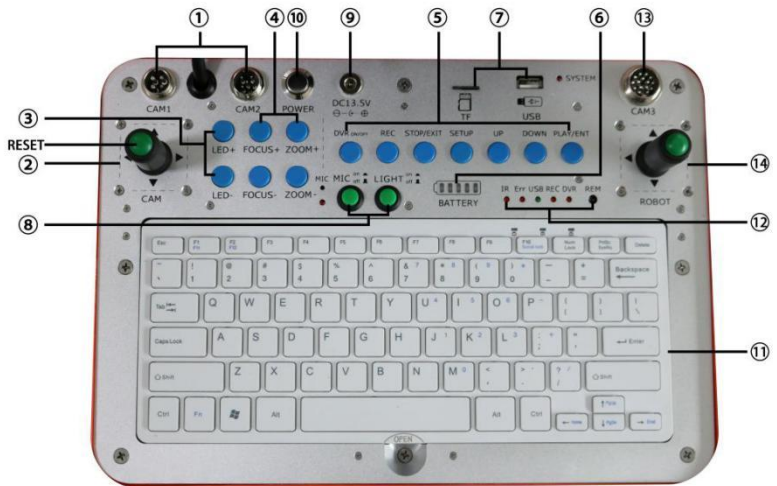
- 3688C Regular Control Station



- 3688C Single-Joystick Control Station



- **3688D Double-Joystick Control Station (used also for Crawler Robot control)**



①、Camera Input

CAM1: Regular camera (four pins jack) .

CAM2: 360° Pan & Tile camera Head (five pins jack) .

②、360° Pan & Tile camera Head Control Buttons/Joystick

LEFT: Turn camera head to left.

RIGHT: Turn camera head to right.

UP: Turn camera head to upward (or Zoom+ CF50 camera head)

DOWN: Turn camera head to downward (or Zoom- CF50 camera)

RESET: Reset camera head's position

③、LED+: Increase the brightness of the camera head LED lights.

LED-: Decrease the brightness of the camera head LED lights.

④、FOCUS+: Adjust the lens focal length+.

FOCUS-: Adjust the lens focal length -.

ZOOM+: Zoom in.

ZOOM-: Zoom out.

⑤、DVR Operation Buttons

REC: Record video button.

STOP/EXIT: Exit from DVR video playing or return to the higher level of submenu.

SETUP: DVR system setup.

UP: DVR user menu up" operation button.

DOWN: DVR user menu down" operation button.

PLAY/ENT: DVR's "play" or "select" button.

⑥、BATTERY: Battery Power Indicator.

Discharge indication status: As the battery continues to discharge, the green indicator lights will go out one by one. When the green indicator turns to a flashing red indicator, it means that the battery is low. Please charge the battery.

Charging indicator status: as the battery charge increases, the green light will light up one by one; when all the green indicator lights turn bright green, it means that the battery is fully charged.

⑦、USB & TF : USB Port and TF Card Slot

⑧、MIC on/off: Microphone switch. When you need to add sound when recording a video, please press the switch, the indicator will light up, and work in the MIC recording state. After the video recording is over, you must press the switch again, otherwise, there will be no audio signal output.

LIGHT on/off: Crawl robot auxiliary lighting witch.

⑨、The power adapter input. Can be used as the machine power supply or charging the battery.

⑩、POWER: Power button.

⑪、Keyboard

You can use the keyboard to input characters (English letters, numbers, and symbols). These characters will be displayed on the screen and can be photographed or superimposed on the video recorded.

⑫、LED Indicators

IR : The remote-control indicator

ERR : Error Indicator of system or USB device

USB : When a new USB stick or a TF card plugged in , the indicator shining.

REC : Video recording indicator.

DVR : DVR Indicator

REM : Remote control signal receiving window.

⑬、Crawl Robot Camera Interface

CAM3: Pan & Tile camera and crawl robot 15 pins Jack.

⑭、Control Joystick of Crawl Robot

LEFT : Left turn

RIGHT: Right turn

UP : Go forward

DOWN:Go backward



LCD Display

- | | |
|-----------|--------------|
| ①、VIDEO | ②、MENU |
| ③、DOWN | ④、UP |
| ⑤、SEL | ⑥、LED ON/OFF |
| ⑦、REM | ⑧、POWER |
| ⑨、10" LCD | |

Remark:

1) After pressing MENU button, the following information will show on the screen:

"ENGLISH,DEUTSCH,FRANC,ESPAKOL,PORTUG,ITALI
ANO,ENGLES, PNCKK

BRIGHT-----50

CONTRAST-----50

COLOR-----50

SHARP-----50
LED BRIGHT-----80
HUE-----50
ENGLISH “

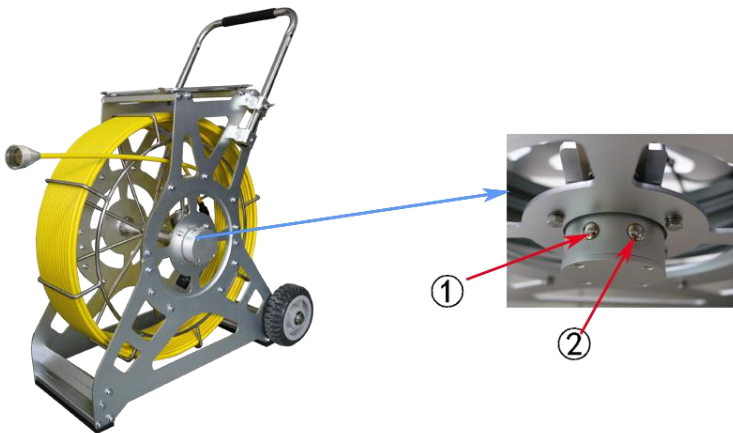
Use Set/Up/Down buttons to choose the language and to adjust the picture and Led light.

Press MANU again, system exits.

- 2) DOWN: Press DOWN key, the image changes mirror up/down.
- 3) UP: Press UP key, the image changes mirror lift/right.
- 4) SEL key: Press SEL key to switch the image between 16:9 and 4:3 (except 10 inch monitor)

Remark: To get a regular image, the cursor on the screen should be at the bottom left. If not, you can press the UP or DWON button to move the cursor to the bottom left to get a regular image.

Meter / Footage Counter On the Cable Reel:



Cable with meter counter

1. Metric & Imperial conversion
2. Reset

C40 Series Camera Head



I. Working environment:

1. Temperature: $-20^{\circ}\text{C} \sim +55^{\circ}\text{C}$
2. Humidity: 90%RH (non-condensation)

II. Technic Specs:

1. Power input: DC 9~13.5V,8W (maximum)

2. Camera module:

- 1) Image sensor: 1/3 Inch CMOS PC1099
- 2) Effective Pixel Array: 976 (H) x 496(V)
- 3) Horizontal resolution: 900 TVL
- 4) Minimum illumination: 0.01LUX/F1.2
- 5) SNR: >45dB
- 6) Video Output: 1 Vp-p / 75 Ohms
- 7) Input voltage: DC 9-13.5V
- 8) Current consumption: 630mA Max
- 9) Video formats: NTSC/PAL
- 10) Frame rate: PAL: 50fields/sec NTSC: 60fields/sec

3. Dynamic balance:

- 1) Mechanical dynamic balance

4. Lighting source:

- 1) LED quantity: 9pcs
- 2) Luminous flux: 200 lm (500 mA)
- 3) Working Current: 0~500 Ma

C360 Series Camera Head



I. Working environment:

1. Temperature: $-20^{\circ}\text{C} \sim +55^{\circ}\text{C}$
2. Humidity: 90%RH (non-condensation)

II. Technic Specs:

1. Power input: DC 9~15V,8W (maximum)

2. Camera module:

- 1). Image sensor: 1/3 Inch CMOS PC1099
- 2). Effective Pixel Array: 976 (H) x 496 (V)
- 3). Horizontal resolution: 900 TVL
- 4). Minimum illumination: 12900 LUX
- 5). SNR: >45dB
- 6). Video Output: 1 Vp-p / 75 Ohms
- 7). Input voltage: DC 9-15V
- 8). Current consumption: 60mA-200mA

3. Swing motor:

- 1) Camera swing angle: 180°

4. Rotating motor:

- 1) Camera rotating angle: 360°

5. Focus motor:

- 1) Can adjust 20 steps.

6. Lighting source:

- 4) LED quantity: 18pcs
- 5) Luminous flux: 107~114 lm (180 mA)

6) Working Current: 0~200 mA

7) Light Cup Angle: 45°

7. Camera Inclination Detection:

1) Measuring range: -90°~ +90°

2) Resolution: 1°

8. 485 communication:

1) Baud rate: 9600 Bit/S, 8 data bits, 1 stop bit, no parity

1) Isolation voltage: 560V

2) ESD protection: ±15KV

3) Transient simulation capabilities: 25KV/us

4) Improve protection: Fault (open circuit, short circuit) protection, thermal shutdown protection

C360B Series Camera Head



I. Working environment:

1. Temperature: -20℃~+55℃

2. Humidity: 90%RH (non-condensation)

II. Technical Specs:

1. Power input: DC 9~15V, 8W (maximum)

2.Camera module:

1).Image sensor:1/3 Inch CMOS PC1099

2).Effective Pixel Array: 976 (H) x 496(V)

3).Horizontal resolution: 900 TVL

4). Minimum illumination: 12900LUX

5).SNR: >45dB

6). Video Output: 1 Vp-p / 75 Ohms

7). Input voltage: DC 9-15V

8). Current consumption: 60mA-200mA

3.Swing motor:

1) Camera swing angle: 180°

4. Rotating motor:

1) Camera rotating angle: 360°

5. Focus motor:

2) Can adjust 20 steps.

6. Lighting source:

1). LED quantity: 4pcs

2).Luminous flux: 107~114 lm (180 mA)

3).Working Current: 0~200 mA

4).Light Cup Angle: 45°

7. Camera Inclination Detection:

1).Measuring range: -90°~ +90°

2). Resolution: 1°

8. 485 communication:

1) Baud rate: 9600 Bit/S,8 data bits,1 stop bit, no parity

2) Isolation voltage: 560V

3) ESD protection: ±15KV

4) Transient simulation capabilities: 25KV/us

5) Improve protection: Fault (open circuit, short circuit) protection, thermal shutdown protection

C28 Series Camera Head



I. Working environment:

1. Temperature: -20℃~+55℃

2. Humidity: 90%RH (non-condensation)

II. Technic Specs:

1. Power input: DC 9~15V,8W (maximum)

2.Camera module:

- 1).Image sensor:1/3 Inch CMOS
- 2).Effective Pixel Array: 4Billion
- 3).Horizontal resolution: 800 TVL
- 4). Minimum illumination: 12900LUX
- 5).SNR: >45dB
- 6). Video Output: 1 Vp-p / 75 Ohms
- 7). Input voltage: DC3.5V
- 8).Current consumption: 60mA-200mA

3.Swing motor:

- 1).Camera swing angle: 180°

4. Rotating motor:

- 1).Camera rotating angle: 360°

5. Focus motor:

- 1).Can adjust 20 steps.

6. Lighting source:

- 1). LED quantity: 2pcs
- 2). Luminous flux: 107~114 lm (180 mA)
- 3). Working Current: 0~200 mA
- 4).Light Cup Angle: 45°

7. Camera Inclination Detection:

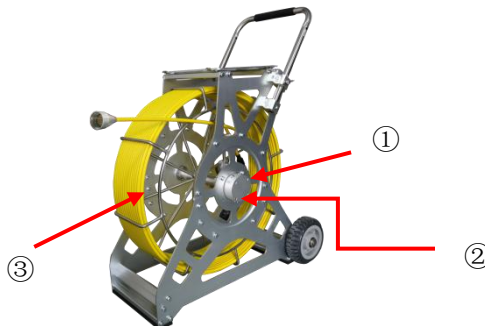
- 1).Measuring range: -90°~ +90°
- 2).Resolution: 1°

8. 485 communication:

- 1) Baud rate: 9600 Bit/S,8 data bits,1 stop bit, no parity
- 2). Isolation voltage: 560V

- 3). ESD protection: $\pm 15\text{KV}$
- 4). Transient simulation capabilities: 25KV/us
- 5). Improve protection: Fault (open circuit, short circuit) protection, thermal shutdown protection

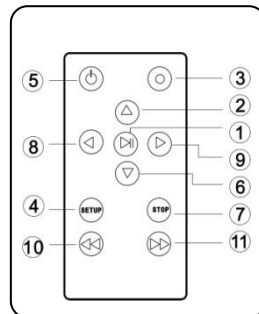
Cable reel



1. Meter/Footage Counter
2. Male Plug
3. Cable Wheel

Remote Control (For Operating DVR and SD Card Recording)

- 1) Enter: Enter to view and play video
- 2) Up: Go to up/previous item
- 3) REC: Start recording/ Snap Shooting (only available for new version)
- 4) SETUP: System setup and recording features
- 5) POWER: Remote-Control on
- 6) Down: Select down/next item
- 7) STOP: Stop or escape from current menu
- 8) Left: Select Left item
- 9) Right: Select Right item
- 10) Rewind: Review video
- 11) Forward: forward video



System Set-Up

IMPORTANT : When you connect the Camera to the Monitor, the power must be turned off; otherwise both units may be damaged.

1. Connect the reel cable to the Monitor.
2. Plug the Power Adapter cord into the wall AC socket and the other end into the "DC 13.5V" jack.
3. Press the POWER button on the front of the Monitor.
4. Gently put the Camera into a pipe/duct, etc., and pull out the Cable until the camera head reach the desired position.
5. Record the pictures if you need (see DVR Operating).
6. Video Out: By using a video cable you can view the picture to on other external Screen.
7. When you finish the job, carefully take out the Camera from the pipe/duct, clean it with a soft and dry cloth, and then put it back to its original position.

System Menu Setting

Clock setting: set date and time	
*Time Format	Select: 24Hour - 12Hour
Year	Set year
Month	Set month
Day	Set day
Hour	Set hour
Minute	Set minutes
Second	Set seconds
Language Setting	Select: English - Chinese
System: showing software version, product version, free space and used space (when USB/ Micro SD Card is connected)	
Record setup: Storage Device Selection ---USB Device or Micro SD card	
Play Mode: No circle, One circle, List circle	
Master reset: press OK again to perform a master reset	
Firmware update: locate the directory where new firmware is stored	
Browse File: Showing all files on the current USB/ Micro SD Card medium.	
Remove USB/Micro SD Card device (only when USB/Micro SD Card device is disconnected) Always use this option to remove safely the USB /Micro SD Card device from the USB/Micro SD Card port.	

Remark: When you plug in an USB key/Micro SD card, the system may not find the USB stick/Micro SD card. In this case, please remove it and try again.

DVR RECORDING OPERATION WITH REMOTE-CONTROL

(Recording via MICRO SD Card is only available for the new versions)

1.If your system coming with 2 video channels, press VIDEO to choose the channel Video 2.

2.To use operate the system with remote-control, please take off the isolation sheet of the battery on the Remote-Control.

3.Press Button 5  POWER on the remote-control to power on the remote control and enter into the Recording system. You can see DVR system Recorder **PLAY VIDEO** manual on the screen.

4.Insert your USB stick/ removable hard disc etc. into the **USB** Port, or Micro SD Card into Micro SD Card Slot, you can see **USB stick/ Micro SD Card Connected** on the screen and the LED light indicator on.

5.Press Button 3  on the remote control to start the recording, and the RECORDING LED light is on while recording. In recording, if you press the RECORDING button again, the DVR will take a photo, which can automatically be saved in the USB stick or Micro SD card (only available for new versions).

6.Press Remote-Control's Button 7 to stop recording.

7.Press Remote-Control's Button  to review recording.

8.If you need to manage your recorded pictures, press Remote-Control's Button 4  . You can also manage the files by selecting the **SETTING** on **PLAY VIDEO** manual on the screen.

NOTE:

-- You can also to record a video with DVR Operation buttons ⑤ on the operation panel.

-- DVR system may sometimes need 10 - 20 seconds for a self-check before it can work properly, please let it run about 20 seconds each time when you try to record.

--The biggest capacity of USB drive/ Micro SD card the system support is 32G bits.

Recording time limit

This unit is featured with a recording time limit. The default time limit is 60

minutes. The system will record with a new file every 60 minutes.

Schedule recording

You can schedule a recording in advance. Simply enable the schedule recording feature under SETUP menu and then the unit will ask user to setup timing. Recording schedule can only set one at a time, you have to reset the schedule for next recording.

Recording via USB Stick / Micro SD Card

The unit can be used to record video and voice via USB devices / Micro SD Card. The recorded video will be stored in the USB devices / Micro SD Card and played back on the TV screen.

Video recording format

The default video recording resolution is 640*480. A One-hour recording will take the storage of 500MB. Users may select 320*240 to save storage space.

Voice recording

A microphone button located on the front panel allows the user to press the button on to record a voice while the video is recording (This function is only available for new versions).

Video Playing

You can use the on-screen menu to enter “play video” mode. The unit will display the recorded video and other compatible videos stored in a USB stick / Micro SD Card. It will not list the non-compatible videos.

Select the Video File.

When you enter “play video” mode, the set will display all of the available video files on the screen. You can use the [▲] or [▼] button to select desired video and press the [►/ENT] button to play. Press and hold the [▲] or [▼] button to go to the previous or next video.

Use the [►/ENT] button to start or pause the playing. Use the [■/exit] button to stop or go back to the previous menu.

The screen will display “loading, please wait ...” for a few seconds before playing the video.

Fast Forwarding and Rewinding

You can use the [►] or [◀] button on the remote control to fast-forwarding or

rewind (1x, 2x, 4x, or 8x, speed). Always press the [▶/ENT] button to go back to normal playing.

Compatible video format:

Divx3.11/Divx4/Divx5/MPEG1/MPEG2/MPEG4 (MPEG4 video file format: .avi, .m4v, .MPG, MPEG, .VOB)

Note: The video player of the device may not support some downloaded videos.

How to use the text writer?

With the signal overlay technology, the text writer is a device that can display the input characters from the keyboard (only supporting English input). The Keyboard input function is the same as the computer keyboard operation.



I. Keyboard Functions

1. It supports the display of 3 pages.
2. The keyboard has a 0-9 number input with symbol switching through the Shift + “key”
3. 26 English letters input and case switching with Caps Lock.
4. F5 is the character display/hide switch key. When you press F5, all the characters are hidden. Press F5 again, all characters are displayed.
5. Move the cursor through the four arrow keys of the keyboard to enter the character at the position where you want.
6. Keys:
 - 1) See Appendix 1 for other punctuations, Appendix 2 for function keys.
 - 2) Keys without functions: Esc、F2、F3、F4、F6、F7、F8、F9、F10、Num Lock、Prtscsysrq、Tab、Ctrl、Fn、Alt

II. How to Operate

1. To start the device, press the VIDEO button below the monitor to enter the

VIDEO2 channel

2. After DVR is empowered, press the DVR ON/OFF button to turn off the DVR and then the screen will enter the preview state. At this time, there is the flashing cursor "I" on the screen.

3. After the normal display of the cursor, press the DVR ON/ OFF button on the control panel to turn on the DVR. You can now record videos, take snapshot, or input the text on the screen.

Appendix 1: Punctuations

,	°	(	)	?
:	;	*	/	@
-	<	>		
-	<	>		

Appendix 2: Function Keys

F1	Clear all characters
F5	Display/hide character switch
Caps lock	Case Switching
Four arrow keys	Up, Down, Left and Right Movement
Backspace、 Delete	To delete
Enter	Enter Key
Shift+ Key	Input the symbol on the corresponding key
space key	Space bar

Video Player Software Installation

Generally, the recorded videos can be played on the computer purchased after the year 2006. If you can not open the recorded document on a computer, there are two options:

Option 1: Go to the website “<http://www.kmplayer.com>” and download the KMPlayer software for free.

Option 2: Install the Media Player Software with the Disc

- Steps:
1. Create a new folder on the computer
 2. Put the disc in the computer drive, open the files in the disc and copy all the files to the above new folder on the computer.
 3. Click fullplay.exe in the new folder

csfcodec	2018/5/9 14:45
hotkey	2018/5/9 14:45
lang	2018/5/9 14:45
UPD	2018/4/16 14:38
binkw32.dll	2014/8/13 11:02
CSMX.dll	2014/8/13 11:02
dh264.ax	2014/8/13 11:02
Es.dll	2014/8/13 11:02
fullplayer.exe	2014/8/13 11:02
haalis.ax	2014/8/13 11:02
install.exe	2014/8/13 11:02
ir41_32.ax	2014/8/13 11:02
ir50_32.dll	2014/8/13 11:02
ivm.dll	2014/8/13 11:02
IVMSource.ax	2014/8/13 11:02
mc.dll	2014/8/13 11:02
media.db	2014/8/13 11:02
Microsoft.VC90.CRT.manifest	2014/8/13 11:02
mkunicode.dll	2014/8/13 11:02
mkzlib.dll	2014/8/13 11:02
mmamrmdmx.ax	2014/8/13 11:02
mp4.dll	2014/8/13 11:02
msvcr90.dll	2014/8/13 11:02

Open the media player



Click the icon “Open File” and choose the videos in AVI format to open.

Recharging the Battery

- 1) Plug the charger into the AC socket on the wall and insert the other end into the DC jack (See Figure2- A).
- 2) The battery can be charged while the device is being used. However, once the power in the battery runs completely out, it can only be charged when the device is turned off.



Figure 2

IMPORTANT MESSAGE: Do not overcharge the battery! Overcharging can result in acid leaking from or damage to the battery.

Battery specifications:

1. TOTAL POWER $\leq 15W$
2. LI-ION BATTERY 12VDC MAX. $\leq 79Wh$
3. CHARGER 13.5V 1700mA
4. CHARGE TIME 6 HOURS
5. WORKING TIME ≥ 200 MINUTES
6. PROTECTIVE VOLTAGE 8.1V
7. THE VOLTAGE BEFOR DISCHARGING 12.6V
8. LOAD CURRENT 1200mA(INPUT 12.2V)

TROUBLE SHOOTING

Trouble	Reason / Solution
Black screen	1. Change the fuse
	2. Recharge the battery
	3. Check power cable and connect it again.
No signal	1. Read the manual again and reconnect it.
	2. Check the camera head and screw down
	3. Clean the camera pins
	4. Check the pins, make sure they are not stuck by dirt.
The camera head lights too weak or no lighted on	Press the "MENU" button, locate the LED brightness setting and then adjust the brightness.
DVR cannot record	1. For the system with 2 Channels, press the "Video" button and change to Video 2
	2. Press POWER button and the monitor indicator light is green.
	3. Use another USB stick / micro SD card and try again
DVR Recording abnormality	Turn off the unit and restart it again in correct steps
Pictures Flashing	1. Check the battery power
	2. Please recharge the battery with the right cable
Battery cannot be recharged	Make sure a right battery recharger cable is used.