

INTELLIGENT NIGHT VISION DOME CAMERA



User Manual



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Safety Precaution

1. Please read this manual carefully before installing and using this camera.
2. In order to avoid damaging this product, please choose the power correctly.
3. The inner elements of the Dome Camera are precise optic, electronic and mechanical parts, so wrong operations, such as heavy load and strong vibration should be avoided during transportation and installation. Otherwise, the product could be damaged.
4. The Camera should not be put on unsteady desks and brackets.
5. Avoid liquid or other things penetrating into the camera, or the camera could be damaged.
6. To avoid affecting the usage of the Dome Camera, please do not dismount its inner elements. There are no user serviceable parts inside.
7. Do abide by electrical safety standards, and use self-contained specialized power sources. Its RS-485 and Video Signal adopt TVS-level anti-thunder, so it can effectively avoid the damage caused by various pulse signals, such as instantaneous thunder below 1500w, surge, etc. RS-485 and Video Signal should be kept away from high voltage equipment or cable during transmission. Please take actions to prevent lightning strike and surge when necessary.
8. No matter the camera is in use or not, it should never be exposed to the sun or other bright objects. Otherwise, it may cause permanent damage to Camera CCD.
9. When the machine has broken down, please do not make any repairing operations unless you refer to instructions to detect faults first. If no reasons can be found, please ask professionals to conduct the maintenance work. And the professional maintenance persons should be authorized by our company.
10. Do not disassemble, or modify the system.

1. Product Overview

Intelligent Dome Camera is a high-tech surveillance product integrating high-performance and high-speed zoom camera, universal shift cloud terrace,

multi-function decoder, omnipotence character generator, CPU processor as well as memory chip. By doing so, this kind of camera not only has the functions of rapid location and continuous follow-up scanning in a row, but also achieves the real all-round and no blind spot monitoring. Besides, it can automatically adapt to the environment and the objectives that are changing in terms of distance. This camera adopts full digital control system, and its design is quite exquisite and simple, minimizing the connections between system components to improve the reliability of the system to the greatest extent, and it is very convenient for installation and maintenance. Moreover, it uses precision stepping motor to drive, achieving the effects of stable operation, rapid response and accurate positioning, and the accuracy of positioning can reach $\pm 0.1^\circ$. In addition, it has the intelligent functions of around scanning, pattern scanning, privacy dodging, and motion detection, alarm uploading images to the appointed mailbox or FTP server. This camera is applied to large area, and moving objects monitoring in every walk of life, such as intelligent mansion, banks, urban streets, electricity departments, airports, stations and so on.

2. Technical Specifications

2.1 7" Intelligent Dome Camera Technique Specifications:

Model	RL-CS-6420F	
Power Supply	AC24V \pm 5%/ 2A	
Operation Temperature	-20 $^\circ$ C ~ +60 $^\circ$ C	
Humidity	\leq 95% no dew	
Power Consumption	>20W	
Communication Mode	RS485	
Baud Rate	2400/4800/9600/19200 bps	
Horizontal Rotate Speed	5 $^\circ$ ~100 $^\circ$ /s (1~64shift)	1~180 $^\circ$ /s (1~64shift)

Horizontal Rotate Range	360°rotation
Pitching Range	90°
Auto Flip Function	Auto Flip 180°when Vertical 90°
Auto Control Focus Speed	Auto adjustment according to focus change
Two Spots Scanning	At random
Two Spots Scan Speed	1~8 optional
Two Spots Scan Dwelling Time	1~60sec.optional
Preset Position Number	128
Speed to Patrol Point	1-100° s/ 1-180° s
Every Preset Position Dwelling Time	1~60secs optional
Scouting Group	6
Scouting Spots in every Group	16

2.2 7"Intelligent Dome Camera Lens' Technique Specifications: (Built-in 22X/

35X D/N Speed Focusing Camera)

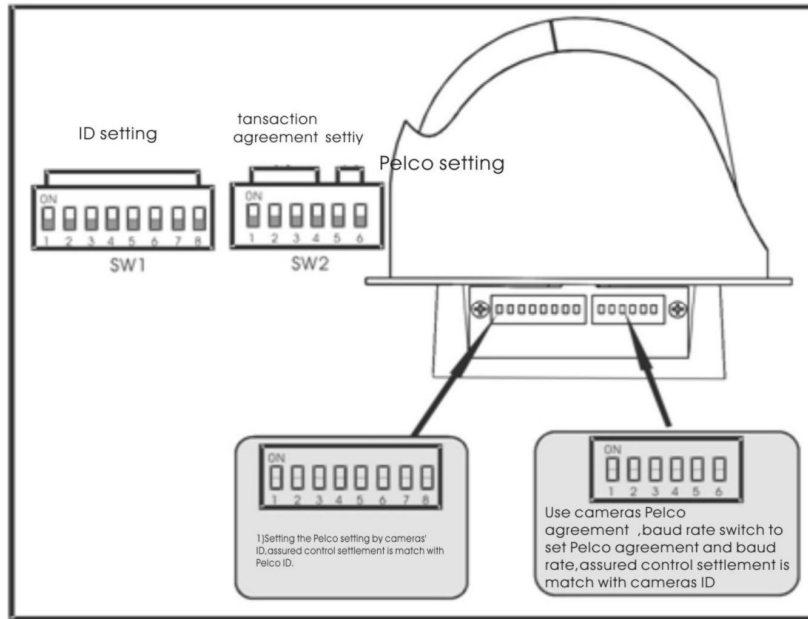
Image Sensor	1/4"SONY SUPER HAD CCD
Signal System	NTSC/PAL
Synchronizing System	Internal/External
Scanning Mode	2:1 interlacing scan
Horizontal Resolution	420 TVL
Min. Illumination	1.0Lux(color)/0.05Lux(BW)
Iris	Auto/Manual

Focus Mode	Auto/Interval/Trigger/Manual
Focus Sensitivity	High/Medium/Low
Focus Rate	22X
Focus	3.9~85.8mm
Image Angel	Wide-angle 65°/ Narrow-angle2.7°(22X)、Wide-angle 75°/ Narrow-angle2°(35X)
BLC	Area detection BLC
AWB	Auto-speedy/manual/indoor/fluorescence light/outdoor
AGC	Auto
S/N Ratio	>52dB
Video Signal Output	1.0±0.2Vpp

3. Settings, Installation and Connection

3.1 Settings of 7" Dome Camera ID, Transfer Rate and Communication Protocol

Before installing the Dome Camera, please confirm the communication protocol, baud rate and local address code of the control host, and then the DIP-switch should be set to be in complete accordance with that in control system. Its corresponding DIP-switch settings and connecting line can be seen in picture 1:



Picture 1

3.2 Settings of Dome Camera ID

Before the Intelligent Dome Camera is used, its address code should be firstly set by (SW1) 8 bit code switch on PCB board with binary system 8421 code. The largest encode address is 255, and the number 1 indicates “on”, while the number “0” means “off”. (As it shown in picture 2): Set each Dome Camera ID code and the keyboard input of corresponding ID on LCD:

VAD Switch	Binary system	Cameras ID	Keyboard showing
	00000001	1	Curent CamID:001
	00000010	2	Curent CamID:002
	00000011	3	Curent CamID:003
	00000100	4	Curent CamID:004

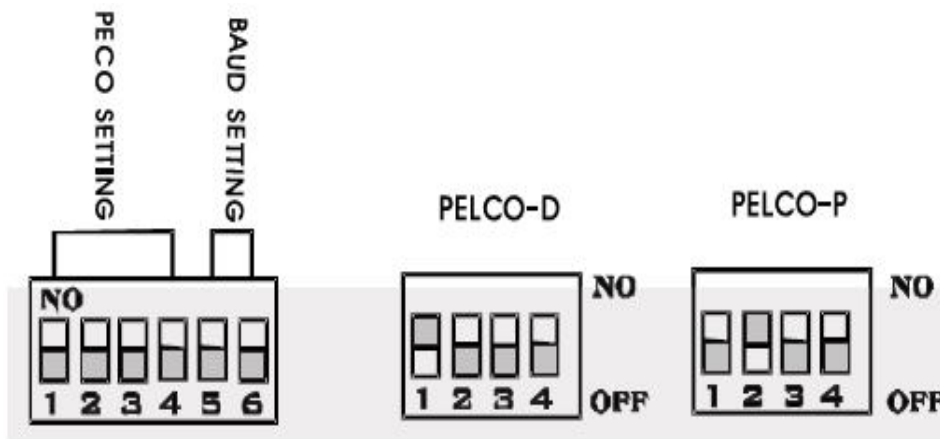
(Picture 2)

As shown in the picture above: The first switch is in the “ON” status, while the rest VAD switches are “OFF”, the Camera ID is 1. Click the “CAM” button on the control keyboard, and then input number “1”. Then click “Enter” again, which indicates that the ID is set as NO.1 control ID. The Dome Camera ID can be set as 001. Other addresses could be set in the same manner.

◆ The new settings will not be effective until the Dome Camera reboots.

3.3 Settings of Dome Camera Communication Protocol

No.1、 2、 3、 4 on PCB board SW2 is the communication protocol settings. As it is shown in picture 3:

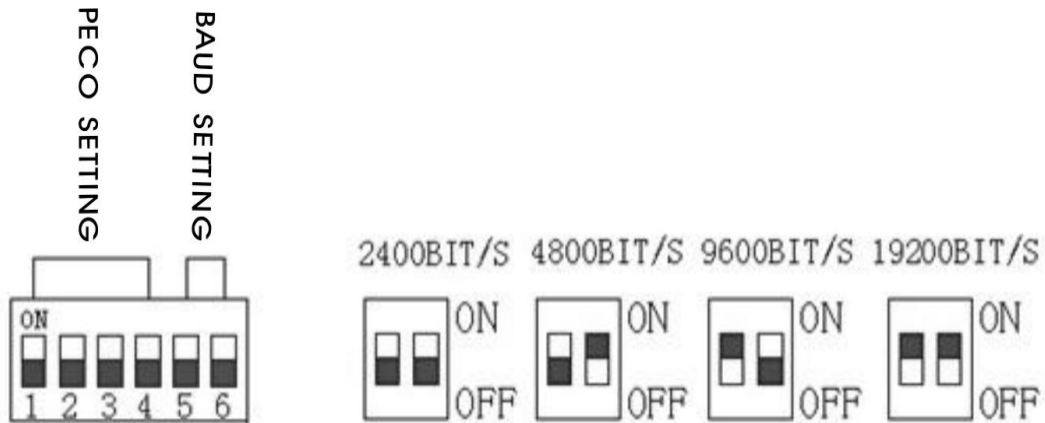


(Picture 3)

◆ The settings of speed dome camera communication protocol do not work until computer reboots.

3.4 Settings of Dome Camera Transfer Rate

No.4、 5 on PCB board SW2 is the communication baud rate settings. The default value is 2400BIT/S. The Baud rate is 2400BIT/S, 4800BIT/S, 9600BIT/S, 19200BIT/S optional, as it is shown in picture 4.



(Picture 4)

3.5 Installation and Connection

1. The installation and connection of the IP Intelligent Dome Camera should be implemented under local provisions by people who own the technical qualifications of CCTV system installation.
2. Please refer to the silk print on PCB and the installation manual for the detailed information of the connection of each line.
3. Avoid direct touch to the lower cover of the dome to prevent scratches and the loss of image quality, for the cover is a high-level optical instrument.
4. To ensure the image quality, the lower cover of the dome camera should be cleaned periodically. When cleaning, take the lower cover down by holding the outer ring carefully, avoiding direct touch; the acidic sweat on one's finger might corrode the coating of the cover. And the scratches made by hard objects might also result in a blurry image. Please use a tender dry cloth or other substitutes to clean both the inner and outer side of the cover. If the dirt is hard to clean, a neutral detergent could be used; any cleanser which is for luxury furniture can be used for the lower cover.

Installation Preparation

3.6 Installation Requirements

- ◆ Installation must be carried out by professionals and the regulations should be abided by to avoid any function failure.
- ◆ Check the accessories, and make sure that the location and the installation method meet all the requirements.

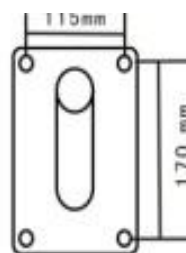
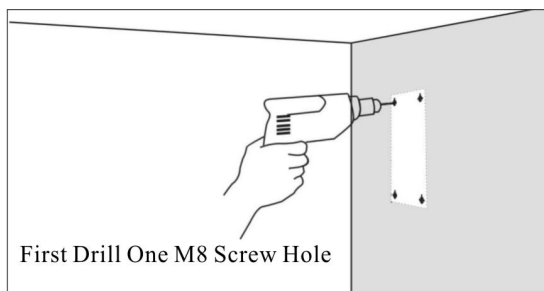
3.7 7" Dome Camera Wall-mounted Bracket Installation

Wall-mounted Bracket Installation

Note: The wall which to be installed on should be solid and with no delaminating. The bearing capacity of the installation location should be able to afford at least five times of the total weight of the Dome, frame and pedestal, in order to avoid image jitter caused by unstable installation.



- When installing on the wall, put up a positioning on it first.
- Use percussion drill to drill holes according to the marks; install four expansion bolts (M8).
- Put the cable, communication line and video wire through the frame holes, and set aside enough cable for connection.
- Fasten the frame to the wall by using four M8 nuts and four spacers, and then install the dome.

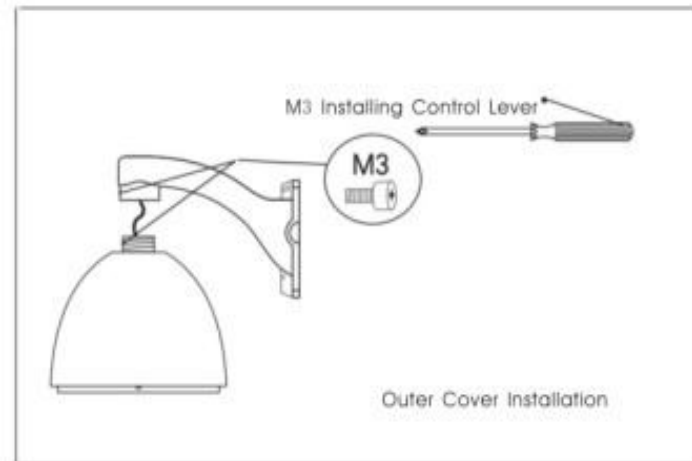


Picture 7

Picture 8

Frame Installation

Take the frame from the bag, and then plug the cable into bracket from the top of the bracket. Next, install the G1 1/2 screw on the top of the outer cover into the screw holes of wall-mounted bracket, and fasten it with 2 bolts (M8).



Outer Wire Connection

Connect the BNC video interface of Dome Camera to the arranged video cable; connect the power cord to the arranged power cord (AC12V/ AC24V). RS485 control wire is connected to RS485 control wire layer out.

◆ **Ensure that the positive and negative polarity of RS485 is properly connected. “A” represents positive pole, while “B” negative pole.**

If RS485 is wrongly connected, it could not control the Dome Camera.

a. Check the polarity of the plug and socket, and the connection of cable, then power on.

b. When the self-checking starts, the Dome will turn 360° horizontally and then 90° vertically for the testing of the camera and the electrical and mechanical structure of the Dome, and turn back to the initial position by the resetting program, then vertically turn to 45°. When the Dome totally stops, the self-checking finishes and it is ready to be under control.

◆ Confirm that bearing capacity of the upright tube、 wall and frame should be able to afford at least five times of the total weight of the Dome, frame.

3.8 7" Dome Camera Ceiling-mounted Bracket Installation

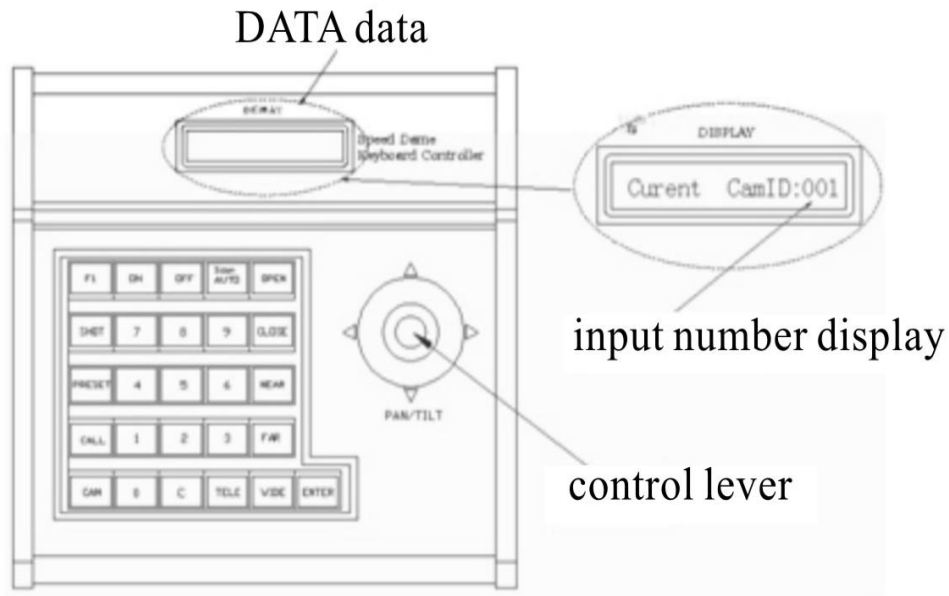
Ceiling-mounted Bracket Installation

Note: The ceiling which to be installed on should be solid and with no delaminating. The bearing capacity of the installation location should be able to afford at least five times of the total weight of the Dome, frame and pedestal, in order to avoid image jitter caused by unstable installation.

4. Dome Camera is controlled by keyboard

Intelligent control and all functions can be achieved by controlling the Dome Camera with keyboard. Meanwhile, there are different operating methods for different control system platforms. Generally speaking, operating methods should be based on the manual offered by system manufacturer. Sometimes there may be some special requirements and operation methods. In this case, please feel free to contact distributors to get the useful information. (We advise you to control the Dome Camera with original keyboard to achieve optimal performance.)

Take the original keyboard of the Dome Camera manufacturer as an example. The agreement for Keyboard control is (PELCO-D、 PELCO-P) .



4.0 Select the Dome Camera ID to be controlled

【CAM】 + 【N】 + 【Enter】 (N: Camera Number, range 0~255)

First click the “CAM”, then input the number N (address) of the Dome Camera to be controlled, and then click “Enter”. When the number N is consistent with the Camera’s address, the Dome Camera is ready to be controlled.

For example: Control No.2 Dome Camera

- a. Click “CAM”. (The screen shows as picture 13)
- b. Input “2”
- c. Click “Enter”. (The screen shows as picture 14)



Picture 13



Picture 14

4.1 Set and Call Preset Position

Preset function is that the position parameters of horizontal angle, vertical angle, and lens focus are stored into Dome Camera with the number (1-128). When needed, these parameters can be transferred to adjust the Dome Camera to a fixed position. Users can conveniently store and call the preset positions by controlling keyboard. This kind of camera support 128 preset positions.

4.1.1 Set Preset Position: [PRESET] + [N] + [Enter] (N: Preset Number, range1~128)

After the Dome Camera is adjusted to the best position through keyboard (including the selection of location, Camera zoom, focus, and Iris), click the “PRESET”, and then type the number N of representing this preset position. Finally click “Enter”.

For example: Set No.2 preset position

- a. Adjust camera to a required position by moving lever, and adjust the lens’s zoom
- b. Click “PRESET” (Picture 15)
- c. Input 2 (Picture 16)
- d. Click “Enter”



Picture 15



Picture 16

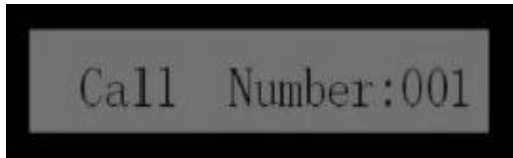
◆ When set preset positions for distant objects, you can focus the image manually. That is to say, when adjust lens at a distance, you can adjust and store the best images by controlling “FAR” / “NEAR” buttons on the keyboard. By doing so, image blurring could be avoided.

4.1.2 Call Preset Position: [CALL] + [N] +ENTER] (N: the number of preset position)

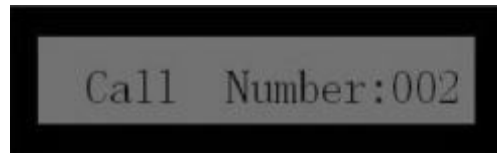
The function of calling preset positions is adjusting camera to the previous position. Click “CALL” firstly, and then input the preset position number to be called. Lastly, click “ENTER”. At this time, the camera is back to the preset position.

For example: Call No.2 preset position

- a. Click “CALL” button. (Refer to the picture 17)
- b. Input No. 2 (Refer to the picture 18)
- c. Click “ENTER” button.



Picture 17



Picture18

4.1.3 Clear Preset Position: [PRESET] + [N] + [OFF] (N: the number of preset position)

Clearing preset position is to delete the stored preset location in the Dome Camera.

For example: Clear No.2 preset position.

- a. Click “PRESET” button. (Refer to the picture 19)
- b. Input No.2. (Refer to the picture 20)
- c. Click “OFF” button.



Picture19



Picture20

4.2 Dome Camera Cruising Function

Auto cruising is an important feature for Dome Camera. This function can arrange preset positions to the cruising queue in a required order. Under an external command, the Dome Camera can automatically visit back and forth at a specified interval time in sequence. Altogether 6 cruise tracks can be set, and each track involves 16 preset positions.

4.2.1 Set Cruising Track: Enter and edit cruise tracks.

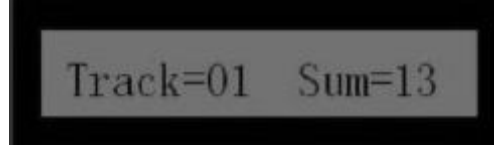
Set the cruise tracks of Dome Camera with keyboard. Click “SHOT” button firstly, then input the number of cruise track. Next, click “ON” button to enter a cruising tracks setting state. After that, click “TELE” button enter the next step, and if you click the “WIDE” button, you can go back to the last step. Each track involving 16 preset positions, and the running speed and dwelling time upon each point can be edited by controlling “TELE/WIDE “buttons.

For example: The first preset position in the first cruise track is set as the No.1 preset position. Its running speed is Level 5 and dwelling time is 3 seconds.

- a. Click “SHOT” button.(Refer to the picture 21)
- b. Press 1 on the number pad to set cruise track.
- c. Click “ON” button is set to enter the track. (Refer to the picture 22)

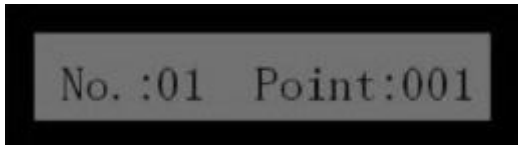


Picture 21



Picture 22

- d. Click “TELE” button.
- e. Press 1 on the number pad to set preset position 1. (Refer to the picture 23)
- f. Click “TELE” button.
- g. Press 5 on the number pad to set running speed. (Refer to the picture 24)



Picture 23

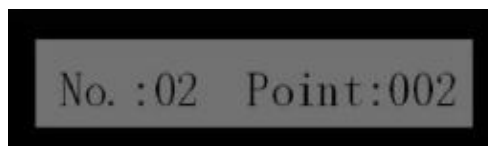


Picture24

- h. Click “TELE” button.
- i. Press 3 on the number pad to set dwelling time. (Picture 25)
- j. Click “TELE” button to set the second preset position. (Picture 26)



Picture25



Picture26

NOTE: Click “OFF” button to save settings and back to last step after the preset positions settings are finished. If you rotate the level or press other buttons, the settings could not be saved.

- Altogether 6 cruise tracks can be set. Each track involving 16 preset locations.(Preset position at random is 1-128).
- 1~60 secs dwelling time for each preset location can be set, and level 1~8 preset location speed to each point can be set as well.

4.2.2 Run Cruising Track: [SHOT] + [N] + [Enter] (N: the number of cruise

track, 1~6)

For example: running the first cruise track.

- a. Click “SHOT” button.
- b. Press 1 on the number pad to activate the first cruise track..
- c. Click “Enter” button.

4.2.3 Stop Cruising Track: [SHOT] + [OFF]/ Use level

4.3 Auto scanning (2-spot scanning, 360° scanning)

The Auto Scanning function enables that the Dome Camera can scan randomly between 2 selected locations, or can do 360° scanning. While scanning, it will automatically run with matched speed according to the lens’ focal length.

4.3.1 Scanning between Two Spots

- a. Move to the starting point (point A) by using level. Then click “PRESET” button, and input 101 on the number pad. Finally click “ENTER” button.
- b. Move to the ending point (point B) by using level. Then click “CALL” button. After that, input 101 on the number pad. At last, click “ENTER” button.
- c. Click “CALL” button. Then input 103 on the number pad. At last, click “ENTER” button.
- d. If you want to stop scanning, please use the level.

4.3.2 360° Scanning: [CALL] + [106] + [Enter]

- a. Click “CALL” button.
- b. Input 106
- c. Click “ENTER” button.
- d. If you want to stop scanning, please use the level.

4.4 Home Place

The Home Place function is that the Dome Camera will return to No.1 preset location automatically when no operation is done in a period of time. The Home Place function of Dome Camera can be activated through keyboard.

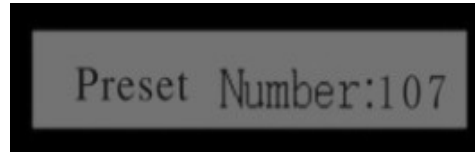
4.4.1 Start Home Place Function: [PRESET] + [107] + [ENTER]

- a. Click “CALL” button (The screen shows as picture 27)

- b. Input 107 on the number pad to activate the mode. (Picture 28)
- c. Click “ENTER” button.



Picture 27



Picture28

4.4.2 Stop Home Place Function: [CALL] + [107] + [ENTER]

- a. Click “CALL” button (Picture 29)
- b. Input 107 on the number pad to activate the mode. (Picture 30)
- c. Click “ENTER” button



Picture29



Picture 30

5. Other Functions

5.1 Object Tracking

Users can use the control lever on the control keyboard to move the Dome camera up and down, or left and right to track the moving object or change the field of vision, and change the visual angle or the image of the object by adjusting the focal length. On the preset condition of auto-focusing and auto-aperture, the camera can adjust itself quickly to get a clear view of the object according to the environment during its moving around.

*** Focal Length/Rotating Speed Auto-matching Technology**

When manual adjusting the Dome camera with a long focal distance, the high rotating speed of camera may cause image loss even touch the control lever slightly. Considering the humanization, this ball camera is designed to auto-adjust both the horizontal and vertical rotating speed according to the focal length which makes the manual operation of tracking easier.

*** Auto-overturn**

When the operator turns the scene to the bottom (vertically) and continues pressing the control stick, the camera will turn 180° horizontally and then upturn 90° to get a back view, which provides a 180° whole-course continuous monitor.

5.2 Camera Control

5.2.1 Zoom Control

Users can zoom in or out by using the [WIDE] and [TELE] key on the control keyboard to get an overall perspective or a close shot.

5.2.2 Focusing Control

Auto-focusing is the default setup. When zooming, the camera will auto-focus on the center of the view to get a clear picture. In particular situation, users can manually focus by using the [NEAR] and [FAR] key to get an expectant view.

◆ Camera cannot auto-focus on following conditions:

- a. The object is not in the center of the picture;
- b. The objects from both far and near spots cannot be visually clear simultaneously;
- c. The object emits strong light, such as neon light and spotlight;
- d. The object is behind a glass with water dew or dust on it;
- e. The object moves very fast;
- f. The object is large and monotonous, like a wall;
- g. The object is too dark or blurry itself.

5.2.3 Aperture Control

● Auto-iris is the default setup. This function can auto-detect the light condition of the environment and adjust accordingly to ensure the brightness of the output picture stable.

● Users can manually adjust the aperture to get a needed brightness by using the control keyboard.

● Users can restore the auto-iris function by using the control keyboard (**Note: auto-iris is suggested**).

Note: When switching the aperture control to manual function, the current control position will be locked, and it will not restore to auto-aperture function automatically, even the scene changes. To restore the auto function, users need to

operate the control lever or give a control order.

5.2.4 Auto BLC

The camera will divide the scene into six areas to realize the auto back light compensation. In a bright environment, it will auto-compensate the dark object and adjust the lighting for the bright background, in order to avoid obtaining an over-bright picture without visualizing the dark object instead of a clear image.

5.2.5 Auto WEB

Automatically adjust according to the lighting of the surroundings to recover the true colors.

6. Camera 【OSD】 Setup

6.1 Operating instructions

“▲” means the current operation of the menu. And select the current operation by controlling “UP”、 “DOWN”、 “LEFT”、 “ RIGHT” button.

When the symbol “▲” is on the left of the screen, select the items by controlling the “UP” “DOWN” buttons, and press the “RIGHT” button to enter the menu setup, or carry out specific functions.

When the symbol “▲” is on the right of the screen, select the items by controlling the “UP” “DOWN” buttons, and press the “LEFT” button to quit from the menu setup, while press the “RIGHT” button to save the settings, or to carry out specific functions.

6.1. 1 Enter Camera 【OSD】

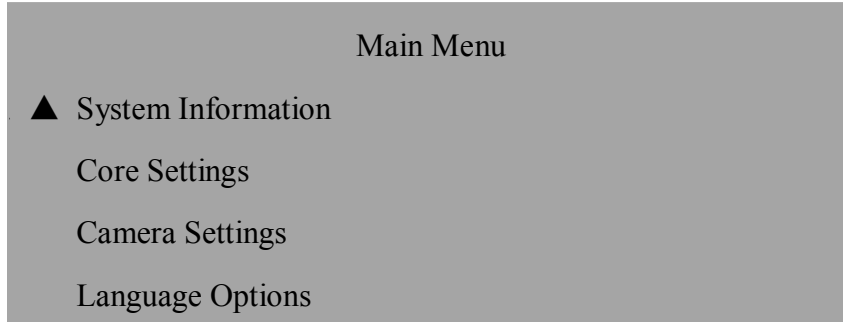
- a. Click “PRESET” button
- b. Input 112
- c. Click “Enter” button to the [OSD]

6.1. 2 Exit Camera 【OSD】

- a. Click “CALL” button
- b. Input 112
- c. Click “Enter” button, and then exit.

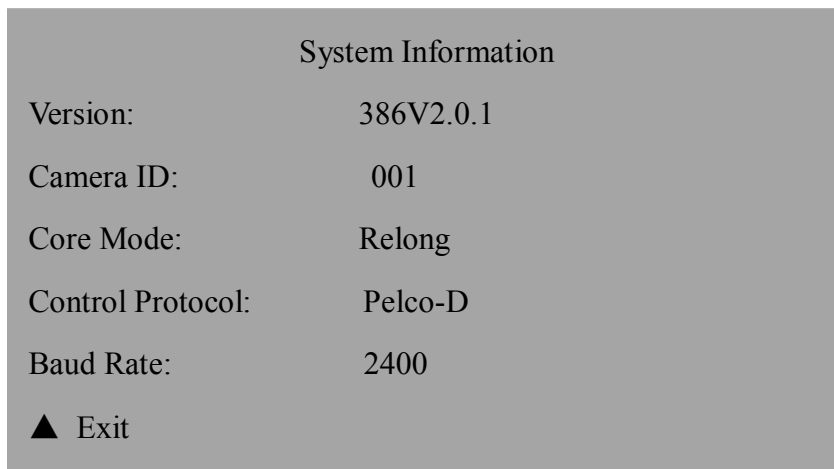
6.2 Enter the main menu

- a. Click “PRESET” button
- b. Input 112
- c. Click “Enter”, then access to the main menu.



6.3 Show System Information

- a. Choose “System Information”;
- b. Click “RIGHT” button to show system information:



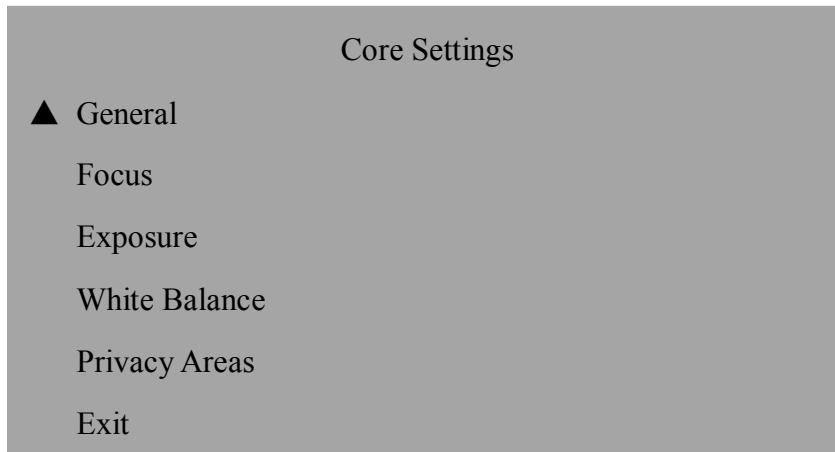
- c. Click “RIGHT” to return to the main menu.

6.3.1 Select Voice

- a. Select the “Language Options”;
- b. Click “RIGHT” button, then the auditory menu can do free shift between Chinese and English.;

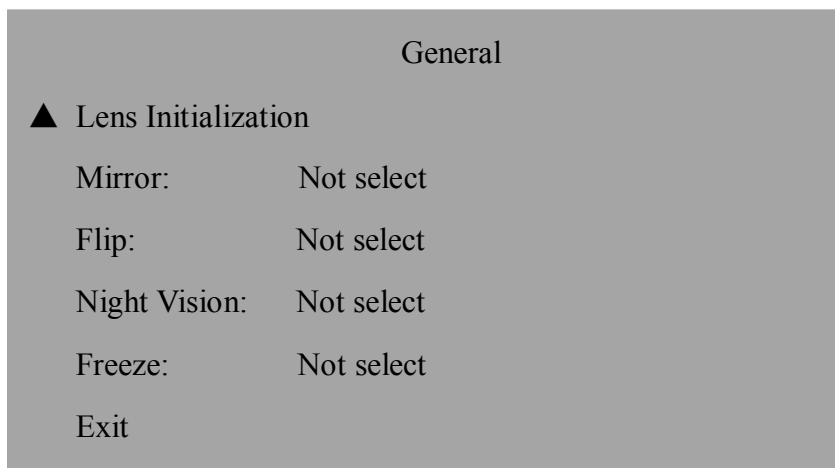
6.4 Enter Core Setup

- a. Choose “Core Setup” in current operation;
- b. Click “RIGHT” button to enter core setup.



6.5 General Settings:

- Choose “General Settings” item in current operation;
- Click the right button, and then enter the “General Settings”:



6.5.1 Lens Initialization:

- Select “Lens Initialization”;
- Click the right button, and carry out the lens initialization. Then the note “Processing Information, please wait...” will be shown on the menu.
- Return to the common settings after finishing the lens initialization.

6.5.2 Mirror

- Select the “Mirror” option;
- Click the “RIGHT” button, and then enter the mirror settings;
- Click “UP”/ “DOWN” button, and choose the mirror settings options “select”/ “not select”;

- d. Click the “RIGHT” button to save the settings.
- e. Click the “LEFT” button to quit from the mirror settings;

6.5.3 Flip

- a. Choose the “Flip” option;
- b. Click the “RIGHT” button, and then enter the flipping settings;
- c. Click the “UP”/ “DOWN” buttons to choose the flipping settings options “select”/ “not select”;
- e. Click the “LEFT” button the quit from the flipping settings.

6.5.4 Night Vision

- a. Select the “Night Vision” item in the current operation;
- b. Click the “RIGHT” button to enter the night vision settings;
- c. Click the “UP”/ “DOWN” buttons to choose the night vision settings options “not select”/ “auto”/ “select”;
- “Not select”: Forbid the night vision function;
- “Auto”: Enter or quit the night vision status according to the light intensity;
- “Select”: Always in the night vision status.
- d. Click the “RIGHT” button to save the settings;
- e. Click the “LEFT” button to quit the settings page.

6.5.5 Freeze

- a. Choose the “Freeze” item.
- b. Click the “RIGHT” button to enter the freezing settings page.
- c. Click the “UP”/ “DOWN” buttons to choose the freezing settings options “select”/ “not select”;
- d. Click the “RIGHT” button to save the settings.
- e. Click the “LEFT” button to quit the freezing page.

6.6 Focusing Settings

- a. Select the “focusing settings”, and then enter a settings page.
- b. Click the “RIGHT” button to enter the focusing settings page.

Focus

- ▲ Auto Focusing Mode
 - Auto Focusing Sensibility
 - Close Range Limited
 - Exit

6.6.1 Auto Focusing Mode Settings:

- a. Select the “auto focusing mode settings”;
- b. Click the “RIGHT” button, and then enter the auto focusing mode settings page;
- c. Click “UP”/ “DOWN” button, and select the following the auto focusing mode:
 - Stay focusing: Focusing is formed once the environment changes.
 - Zoom trigger focus: Focus is triggered when the lens zoom.
 - Interval focus: Focus once every 5 secs.
- d. Click the “RIGHT” button to save the settings.
- e. Click the “LEFT” button to quit the settings page.

6.6.2 Auto Focusing Sensibility Settings:

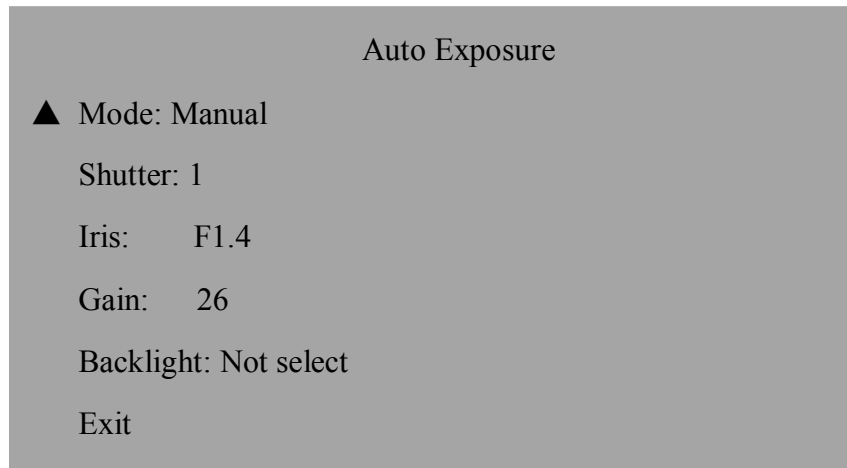
- a. Choose the “Auto Focusing Sensibility Settings” item;
- b. Click the “RIGHT” button, and then enter the setting page.
- c. Click “UP”/ “DOWN” button to select the level of auto focusing sensibility settings “Standard” /”Low”;
- d. Click the “RIGHT” button to save the settings;
- e. Click the “LEFT” button to quit the settings page.

6.6.3 Close Range Limited Settings:

- a. Choose the “Close range limited” item.
- b. Click the “RIGHT” button, and then enter the “Close range limited” page.
- c. Click “UP”/ “DOWN” button to select the specifications: “infinity / 29 CM/ 80CM/ 1M/ 1.4M/ 2M/ 3.5M/ 8M.
- d. Click the “RIGHT” button to save the settings.
- e. Click the “LEFT” button to quit the settings page.

6.7 Exposure Settings:

- a. Choose the “Exposure” option;
- b. Click the “RIGHT” button, and then enter the exposure settings page.



6.7.1 Exposure Mode Settings:

- a. Choose the “Mode” item;
- b. Click the “RIGHT” button, then enter then exposure settings page;
- c. Click “UP”/ “DOWN” button to select the specifications of “Full auto”/ “Manual auto”/ “Iris prior”/ “Shutter prior”;
- d. Click the “RIGHT” button to save the settings;
- e. Click the “LEFT” button to quit the settings page.

6.7.2 Manual Exposure Settings:

- a. The exposure mode should be “Manual”;
- b. Click the “RIGHT” button, then the settings menu page of “Shutter/ Iris / Gain” will pop up.

6.7.3 Manual Shutter Settings

- a. Select the “Shutter” option;
- b. Click the “RIGHT” button to enter Manual 1/2
- c. Click “UP” 1/2 to select the specifications of 1/ 2/ 3/ 6/ 12/ 25/ 50/ 75/ 100/ 120/ 150/ 215/ 300/ 425/ 600/ 1000/ 1250/ 1750/ 2500/3500/ 6000/ 10000, and the shutter time is 1 sec;
- d. Click the “RIGHT” button to save the settings.
- e. Click the “LEFT” button to quit the settings page;

6.7.4 Manual Iris Settings:

- a. Choose the “Iris” item;
- b. Click the “RIGHT” button to enter the manual Iris settings page;
- c. Click the “UP”/ “DOWN” button to select the specifications of “Closed/ F1.4/ F1.6/ F2.0 / F2.4/ F2.8/ F3.4/ F4.8/ F5.6/ F6.8/ F8.0/ F9.6/ F11/ F14/ F16/ F19/ F22”.
- d. Click the “RIGHT” button to save the settings;
- e. Click the “LEFT” button to quit the settings page.

6.7.5 Manual Gain Settings:

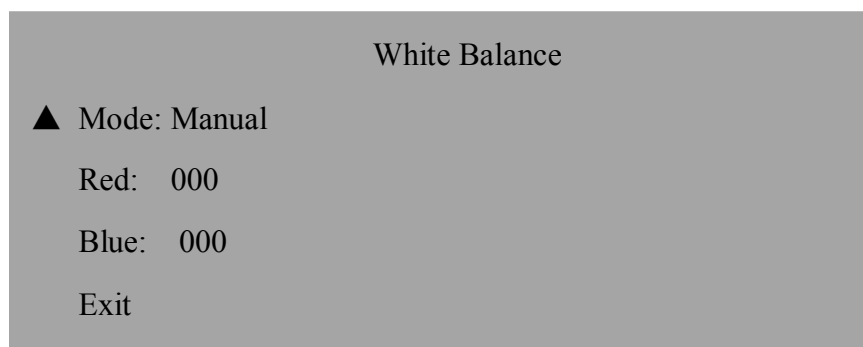
- a. Select the “Gain” item;
- b. Click the “RIGHT” button to enter the gain settings page;
- c. Click the “UP”/ “DOWN” to select the specifications of “-3/ 0/ 2/ 4/ 6/ 8/ 10/ 12/ 14/ 16/ 18/ 20/ 22/ 24/ 26;
- d. Click the “RIGHT” button to save the settings;
- e. Click the “LEFT” button to quit the settings page.

6.7.6 Backlight settings

- a. Choose the “Backlight” option;
- b. Click the “RIGHT” button to enter the backlight settings page;
- c. Click the “UP”/ “DOWN” button to select “Choose “/ “Not choose”;
- d. Click the “RIGHT” button to save the settings;
- e. Click the “LEFT” button to quit the settings page.

6.8 White Balance Settings

- a. Choose the “White balance” option;
- b. Click the “RIGHT” button to enter the white balance settings page;



6.8.1 White Balance Mode Settings:

- a. Select “Mode” item in current operation;
- b. Click the “RIGHT” button to enter the white balance settings page;
- c. Click the “UP”/ “DOWN” button to choose the specifications of “auto”/ “auto tracking”/ “fluorescent lamp”/ “Outdoor”/ “Indoor”/ “Manual”
- d. Click the “RIGHT” button to save the settings;
- e. Click the “LEFT” button to quit the settings page.

6.8.2 White Balance Manual Settings:

- a. White balance mode should be “Manual”
- b. Click the “RIGHT” button, then the settings menu of “Red”/ “Blue” pop up. Enter the white balance manual settings;

6.8.3 Red Color Settings:

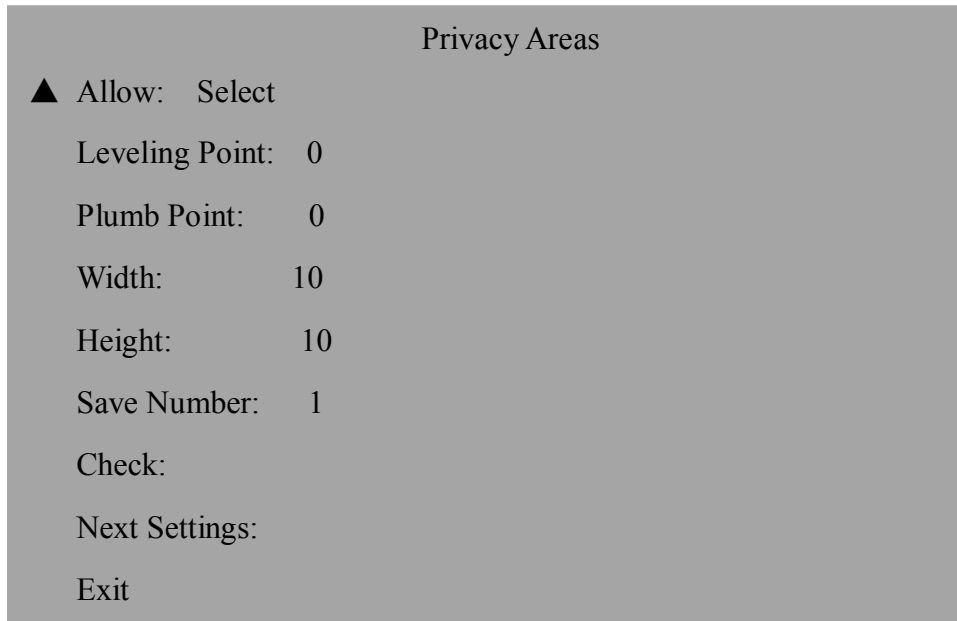
- a. Choose the “Red” option;
- b. Click the “RIGHT” button to enter the red settings;
- c. Click the “UP”/ “DOWN” button. Then choose the red specifications in the range of 0~255;
- d. Click the “RIGHT” button to save the settings;
- e. Click the “LEFT” button to quit the settings page.

6.8.4 Blue Color Settings:

- a. Choose the “Blue” option;
- b. Click the “RIGHT” button to enter the blue settings;
- c. Click the “UP”/ “DOWN” button. Then choose the blue specifications in the range of 0~255;
- d. Click the “RIGHT” button to save the settings;
- e. Click the “LEFT” button to quit the settings page.

6.9 Privacy Areas Settings:

- a. Choose the “Privacy areas”;
- b. Click the “RIGHT” button to enter the privacy areas settings page;



6.9.1 Cancel the Privacy Areas Settings:

- a. “Allow” option should be set as “Not select”
- b. “Save numbers” will be set as the cancelling the privacy areas number (1-8);
- c. Click the “RIGHT” button to cancel the settings of privacy areas;
- d. Click the “Next settings” to cancel other privacy Areas.

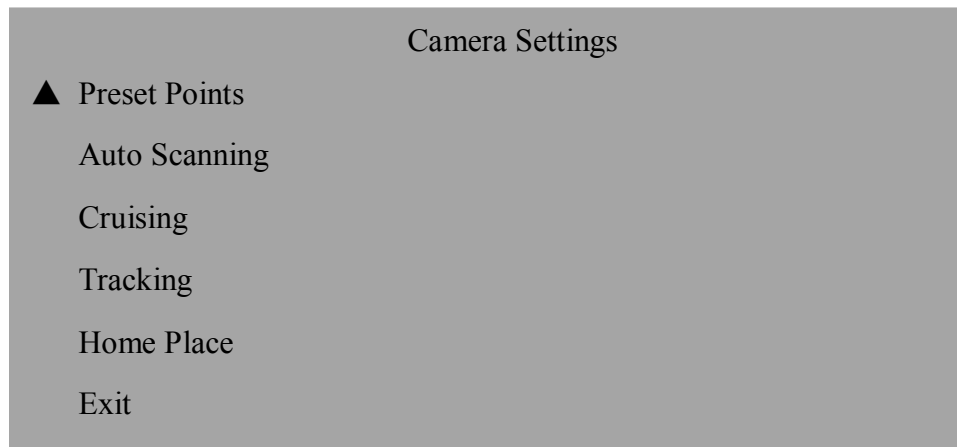
6.9.2 Set Privacy Area:

- a. The “Allow” item will be change into “Select”, then a settings page of privacy areas specifications pop up;
- b. Set the privacy areas width (-80~+80) and height (-60~+60);
- c. Set the privacy areas central position, leveling point -80~+80, plumb point -60~+60;
- d. Choose the numbers to be saved (1~8);
- e. Click the “RIGHT” button to save the settings;
- f. Select “Check”, and then click the right button. Finally the screen will show all the privacy areas; Select “Next settings”, and then click the right button and continue to set other privacy areas;

6.10 Camera Settings

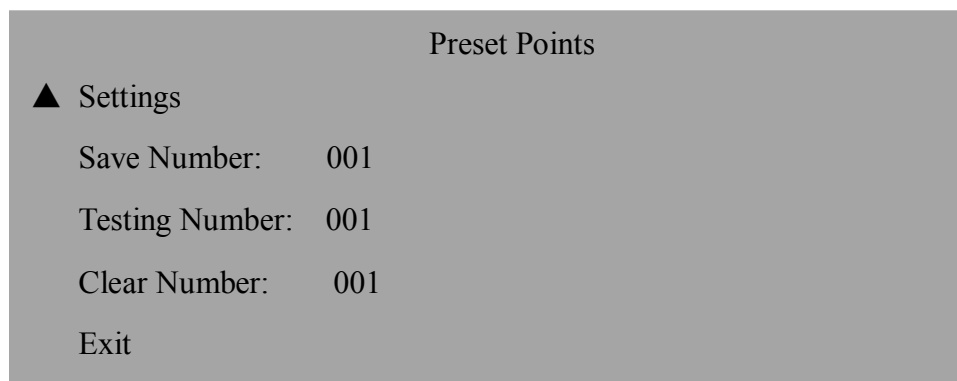
- a. Select the “Camera Settings” in the main menu;

- b. Click the “RIGHT” button, and then enter the Camera settings page:



6.11 Preset settings

- a. Choose the “Preset” in the current operation;
b. Click the “RIGHT” button, and then enter the preset settings page;



6.11.1 Set Preset

- a. Choose the “Settings” item;
b. Click the “RIGHT” button, and adjust the camera position by pressing the “UP”/ “DOWN” / “LEFT”/ “RIGHT” buttons;
c. Call the preset 1 to save the settings, while call the preset 2 to cancel the settings.
d. Choose the “Saving numbers” in current operation;
e. Click the “RIGHT” button to enter the preset number settings page;
f. Click the “UP”/ “DOWN” button to set the preset number in the range of 1~128;
g. Click the “RIGHT” button to save the settings;
h. Click the “LEFT” button to quit the settings page.

6.11.2 Preset Test

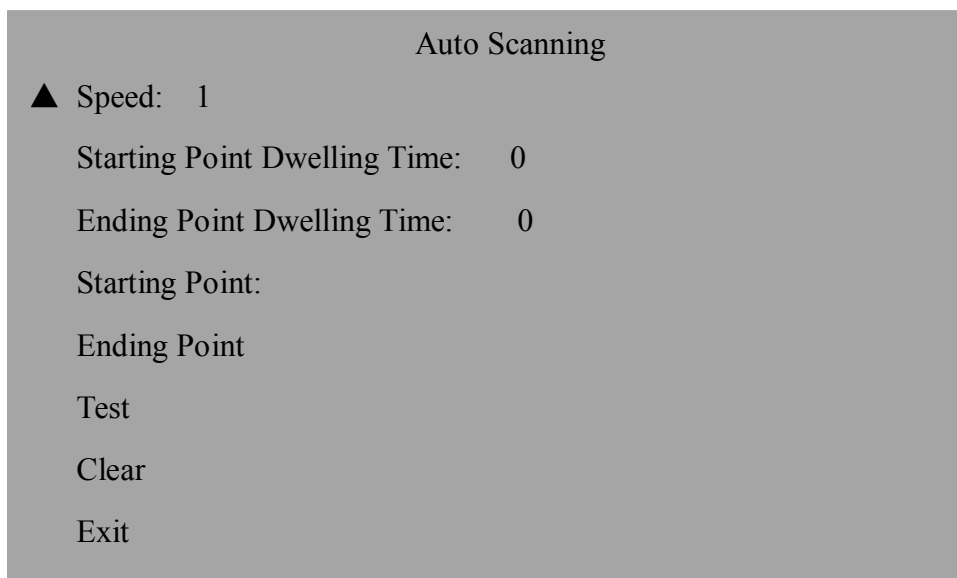
- a. Choose the “Testing number” option;
- b. Click the “RIGHT” button to enter the preset testing number settings page;
- c. Click “UP”/ “DOWN” button to choose preset testing number in the range of 1~128;
- d. Click the “RIGHT” button to start testing this preset; preset test will be stopped as soon as it arrives at the preset.

6.11.3 Clear Preset

- a. Choose the “Clear number” option;
- b. Click the “RIGHT” button, and then enter the “clear preset number” setting page;
- c. Click the “UP”/ “DOWN” button to choose the preset number to be cleared in the range of 1~128;
- d. Click the “RIGHT” button, then the preset is cleared.
- e. Click the “LEFT” button to quit the settings page of clearing the preset.

6.12 Auto Scanning Settings

- a. Choose the “Auto Scanning” option in the menu of “Camera settings”;
- b. Click the “RIGHT” button to enter the auto scanning settings page:



6.12.1 Auto Scanning Speed Settings

- a. Click the “Speed” option;
- b. Click the “RIGHT” button, then enter auto scanning speed settings page;

- c. Click the “UP”/ “DOWN” button to choose the auto scanning speed in the range of 1~8;
- d. Click the “RIGHT” button to save the settings;
- e. Click the “LEFT” button to quit the settings page.

6.12.2 Starting Point Dwelling Time Settings

- a. Choose the “Starting point dwelling time” option;
- b. Click the “RIGHT” button, and then enter the starting point dwelling time settings page;
- c. Click the “UP”/ “DOWN” button to choose dwelling time in the range of 0~60 secs;
- d. Click the “RIGHT” button to save the settings;
- e. Click the “LEFT” button to quit the settings page.

6.12.3 Ending Point Dwelling Time Settings

- a. Choose the “Ending point dwelling time” option;
- b. Click the “RIGHT” button, and then enter the ending point dwelling time settings page;
- c. Click the “UP”/ “DOWN” button to choose dwelling time in the range of 0~60 secs;
- d. Click the “RIGHT” button to save the settings;
- e. Click the “LEFT” button to quit the settings page.

6.12.4 Starting Point Settings

- a. Choose the “Starting point” in the current operation;
- b. Click the “RIGHT” button to enter auto scanning starting point settings. Adjust the starting point position by pressing the “UP”/ “DOWN”/ “LEFT”/ “RIGHT” buttons;
- c. Call the preset 1 to save the settings
- d. Call the preset 2 to cancel the settings

6.12.5 Ending Point Settings

- a. Choose the “Starting point” in the current operation;
- b. Click the “RIGHT” button to enter auto scanning ending point settings. Adjust the ending point position by pressing the “UP”/ “DOWN”/ “LEFT”/ “RIGHT” buttons;

- c. Call the preset 1 to save the settings
- d. Call the preset 2 to cancel the settings

6.12.6 Auto Scanning Test

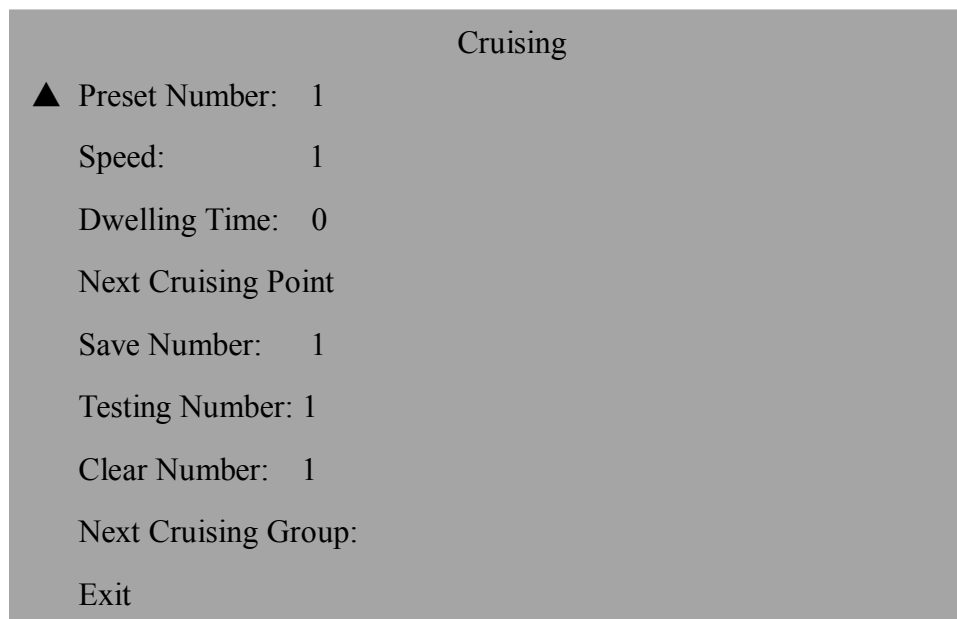
- a. Choose the “Test” in the current operation;
- b. Click the “RIGHT” button to enter the auto scanning test; Quit from the auto scanning test after it is finished.

6.12.7 Auto Scanning Clear

- a. Choose the “Clear” option;
- b. Click the “RIGHT” button to clear the auto scanning settings;

6.13 Cruising Settings

- a. Choose the “Cruising” item from the Camera settings;
- b. Click the “RIGHT” button to enter the cruising settings page:



6.13.1 Cruising Point Settings

- a. Set the preset number of the cruising point in the range of 1~128;
- b. Set the speed to the cruising point in the range of 1~8;
- c. Set the dwelling time of the cruising point in the range of 0~60 secs;
- d. Choose the “ Next cruising point” , and then click the “RIGHT” button to enter the next cruising point settings with no more than 16 cruising points.

6.13.2 Cruising Group Settings

- a. Set each cruising point in the cruising group;

- b. Choose the “Saving number” option, and then click the “RIGHT” button to enter the cruising group number settings page;
- c. Click the “UP”/ “DOWN” button to choose cruising group number in the range of 1~6;
- d. Click the “RIGHT” button to save the settings;
- e. Click the “LEFT” button to quit the settings page;

6.13.3 Cruising Group Test

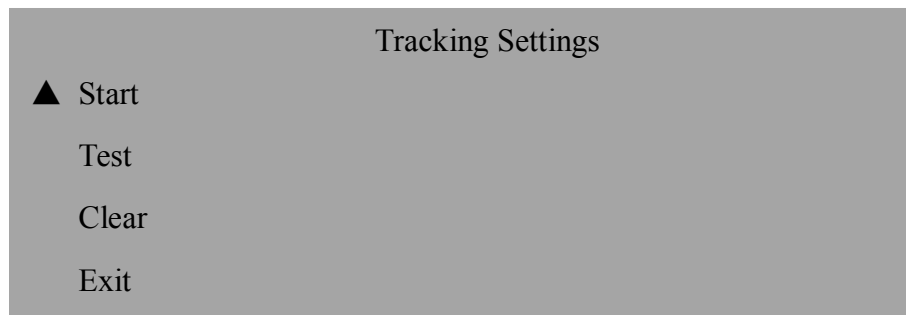
- a. Choose the “Testing number”, and then click the “RIGHT” button;
- b. Click the “UP”/ “DOWN” button to choose the cruising group testing number;
- c. Click the “RIGHT” button to start the cruising group test, and quit from the test as soon as it is finished.

6.13.4 Cruising Group Clear

- a. Choose the “Clear number” option;
- b. Click the “RIGHT” button to clear the cruising group settings;

6.14 Tracking Settings

- a. Choose the “Tracking” item in the current operation.
- b. Click the “RIGHT” button to enter the tracking settings page:



6.14.1 Tracking Settings Start

- a. Choose the “Start” option;
- b. Click the “RIGHT” button to enter the tracking settings page. Control the Camera by pressing the “UP”/ “DOWN”/ “LEFT”/ “RIGHT” button. The mnemonic instruction code is no more than 100, and the memory time is within 60 secs.
- c. Call the preset 1 to save the settings; and call the preset 2 to exit.

6.14.2 Tracking Test

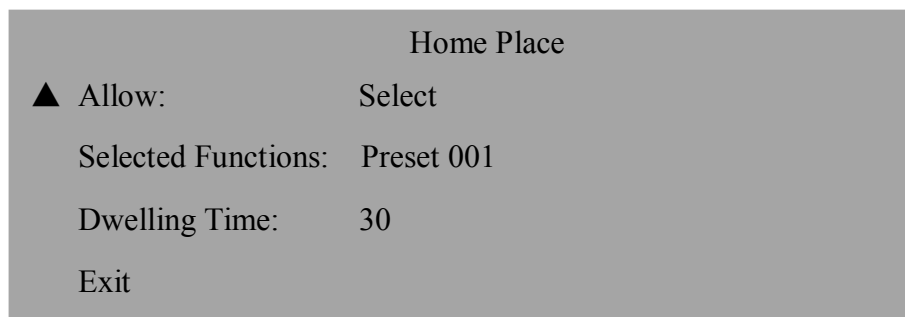
- a. Choose the “Test” option;
- b. Click the “RIGHT” button to start the tracking test; Quit from the test as soon as it is finished;

6.14.3 Tracking Clear

- a. Choose the “Test” option;
- b. Click the “RIGHT” button to clear the tracking settings

6.15 Home Place Settings

- a. Choose the “Home Place” option in the Camera settings;
- b. Click the “RIGHT” button to enter the home place settings page;



6.15.1 Forbid / Allow the Home Place Settings

- a. Choose the “Allow” option;
- b. Click the “RIGHT” button to enter the home place allowable settings page;
- c. Click the “UP”/ “DOWN” button to choose “Selected” or “Not selected”;
- d. Click the “RIGHT” button to save the settings;
- e. Click the “LEFT” button to quit the settings page;

6.15.2 Selected Functions Settings

- a. Choose the “Selected” option in “Allow” menu, and then click the “RIGHT” button to save the home place allowable settings. Then the menu of “Selected functions/ Latency time” pops up.
- b. Choose the “Selected functions” option;
- c. Click the “RIGHT” button to enter the selected functions settings page;
- d. Click the “UP”/ “DOWN” button to choose the following options:

Preset point 001~128

Tracking

2-spot scanning

360° scanning

Cruising group 001~006

- e. Click the “RIGHT” button to save the settings;
- f. Click the “LEFT” button to quit the settings page;

6.15.3 Latency Time Settings

- a. Choose the “Selected” option in “Allow” menu, and then click the “RIGHR” button to save the home place allowable settings. Then the menu of “Selected functions/ Latency time” pops up.
- b. Choose the “Latency time” option;
- c. Click the “RIGHT” button to enter the Latency time settings page;
- d. Click the “UP”/ “DOWN” button to choose the home place latency time in the range of 30~240 secs;
- e. Click the “RIGHT” button to save the settings;
- f. Click the “LEFT” button to quit the settings page;

7. TROUBLESHOOTING

Problems	Possible reasons	Solutions
No action, no pictures when power is on	Power supply damaged or under power	Replace
	Wrong connection of power	Correct
	Project line fault	Eliminate
Abnormal self-check. Images with motor noise	Mechanical failure	Recondition
	Camera inclined	Reinstall
	Power supply not enough	Replace required power supply; Put power supply close to Dome Camera
Normal self-check, but no images	Wrong connection of video	Correct
	Bad connection of video	Eliminate
	Camera damaged	Replace

Normal self-check, but out of control	Wrong connection of signal control cable	Correct
	Dome ID setup is wrong	Reselect
	Protocol or communication baud rate is not matched	Adjust protocol to match with the controller, and power on again
Unstable images	Bad connection of video	Press to connect well
	Power not enough	Replace
Dome Camera out of control	Self-check error	Power on again
	Bad connection of control cable	Eliminate
	Bad host operations	Power on again
	Overload or communication distance too far	Add code distributor

8. Appendix 1: Lightning and Surge Protection

The product adopts TVS plate lightning protection technology, which is effective for avoiding the damage of equipments from pulse signal under 1500W HP, such as those from instant lightning or surge. However, for outdoor installation, necessary protection must be adopted according to the situation on condition that the electric safety must be guaranteed.

- The transmission line must be at least 50 meters away from high-voltage equipments and cable; try to arrange the line along the eaves.
- The underground sealed steel tube arrangement must be adopted in open area, and the single point earthing must be used. The overhead ground arrangement is absolutely forbidden.
- In the intense thunderstorm or high induced voltage area (e.g. High-Voltage Junction Box), such methods as the installation of extra superpower lightning protection equipments or lightning rod must be adopted.
- The design of outdoor device and the lightning protection and earthing of line must meet the requirements of the building's lightning protection, and be in accordance with relevant national and industrial standards.

- The system must be earthed with equal potential. The earthing device must meet the requirements of both anti-interference and electric safety, and mustn't connect to, or mix with the zero line of any strong power grid. When the system adopts the earth connection alone, the impedance should be no more than 4Ω , and section surface should not exceed 25mm^2 .

Appendix II : Cleanness of Transparent Cover

- To ensure the image quality, the lower cover of the dome camera should be cleaned periodically
- When cleaning, take the lower cover down by holding the outer ring carefully, avoiding direct touch; the acidic sweat on one's finger might corrode the coating of the cover. And the scratches made by hard objects might also result in a blurry image.
- Please use a tender dry cloth or other substitutes to clean both the inner and outer side of the cover.
- If the dirt is hard to clean, a neutral detergent could be used; any cleanser which is for luxury furniture can be used for the lower cover.

Appendix III: General Knowledge of RS485

1. Basic Characteristics of RS485

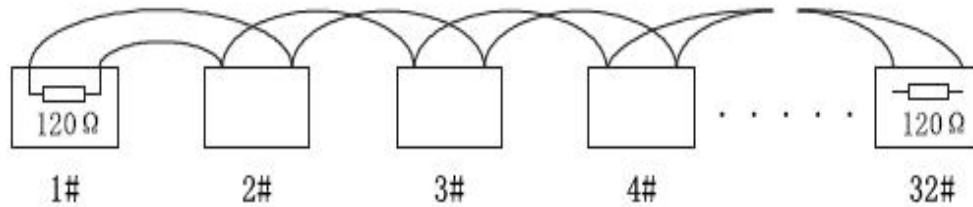
According to its standard, RS485 industrial bus is a half-duplex C-bus of special impedance $120\ \Omega$, whose largest loading capacity is 32 payloads. (Including master device and controlled device)

2. The transmission distance of RS 485

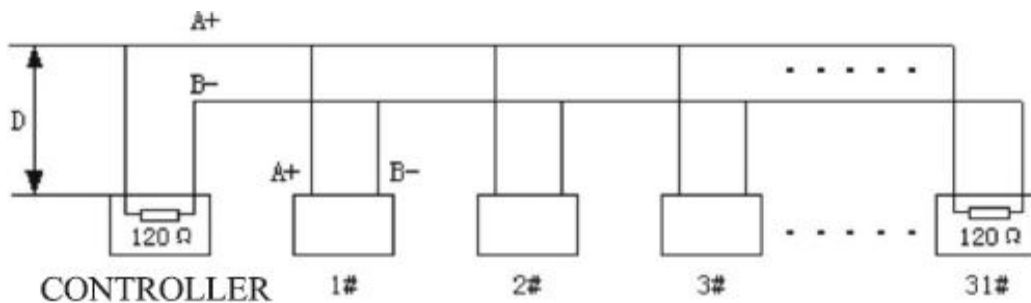
Band Rate	Maximum Transmission Distance
2400Bps	1800m
4800 Bps	1200m
9600 Bps	800m

3. Connection mode and terminal resistance

a) RS 485 industrial bus standard requires that daisy chained ways should be adopted among devices with 120Ω terminal resistors at both ends. The connection (picture 31) can be simplified as that in picture 32, but “D” distance should not be more than 7m.



Picture 31



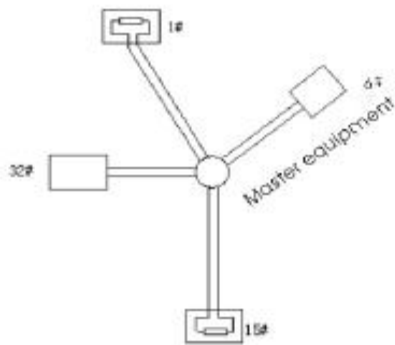
Picture 32

A) The connection mode of device terminal 120Ω : (As picture 32) there are device terminal resistances on controller board, which have two connection modes. Picture 43 shows the factory default connection mode. In this case, the wire jumper cap on controller board is connected to the position between 2-3 sockets without 120Ω resistor connected. When 120Ω resistor is required, the wire jumper cap on controller board should be pulled out of 2-3 sockets to plug into the 1-2 ones. Then the 120Ω resistor is connected to circuits.

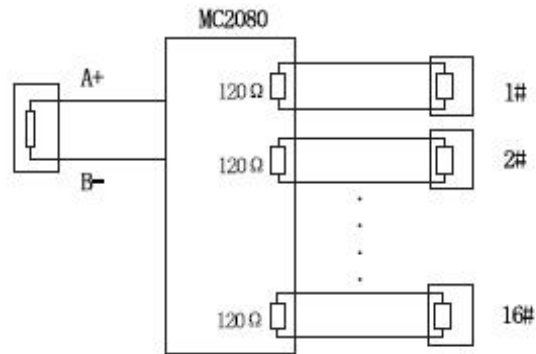
4. Some problems in application

Star connection is always adopted by users in application. In this situation, the terminal resistors should be on the 1# and 15# (as it is shown in picture 33) of two devices with maximum line distance. However, this connection type is not consistent with the operating requirements of RS 485 industrial standard, so the problems, like signal reflex and the decrease of anti-jamming capability, easily occur, which may reduce the reliability of controlled signal. The phenomenon reflected is that balling

machine is completely or discontinuously out of control, or that it can not stop running. To solve these problems, we propose to use MC 2080 Rs485 distributor, because this product can convert the star connection mode to that one accord with RS 485 industrial standard, avoiding problems to improve the reliability. (Picture 34)



Picture 33



Picture 34

Appendix IV

Relational Table of 24V AC Line Diameter and Transmission Distance

The maximum transmission distance is recommended in the situation that the line diameter is fixed and 24V AC voltage wastage rate is below 10%. As for the AC main power supply devices, their maximum allowable voltage wastage rate is 10%. For example, a device with an 80 VA rated power is installed in a place 35 feet away from the transformer, then the required minimum line widths should be 0.8000 mm.

		Wire radii(mm)			
Distance feet(m)	Power	0.8000	1.000	1.250	2.000
		10	283 (86)	451 (137)	716 (218)
20	141 (42)	225 (68)	358 (109)	905 (275)	
30	94 (28)	150 (45)	238 (72)	603 (183)	
40	70 (21)	112 (34)	179 (54)	452 (137)	
50	56 (17)	90 (27)	143 (43)	362 (110)	
60	47 (14)	75 (22)	119 (36)	301 (91)	
70	40 (12)	64 (19)	102 (31)	258 (78)	
80	35 (10)	56 (17)	89 (27)	226 (68)	
90	31 (9)	50 (15)	79 (24)	201 (61)	
100	28 (8)	45 (13)	71 (21)	181 (55)	
110	25 (7)	41 (12)	65 (19)	164 (49)	
120	23 (7)	37 (11)	59 (17)	150 (45)	
130	21 (6)	34 (10)	55 (16)	139 (42)	
140	20 (6)	32 (9)	51 (15)	129 (39)	
150	18 (5)	30 (9)	47 (14)	120 (36)	
160	17 (5)	28 (8)	44 (13)	113 (34)	
170	16 (4)	26 (7)	42 (12)	106 (32)	
180	15 (4)	25 (7)	39 (11)	100 (30)	
190	14 (4)	23 (7)	37 (11)	95 (28)	
200	14 (4)	22 (6)	35 (10)	90 (27)	

Attachment V : Domestic and overseas gauge table

Metric naked wire radii (mm)	Approximately American radii AWG	Approximately England radii SWG	naked wire cross section area (mm ²)
0.050	43	47	0.00196
0.060	42	46	0.00283
0.070	41	45	0.00385
0.080	40	44	0.00503
0.090	39	43	0.00636
0.100	38	42	0.00785
0.110	37	41	0.00950
0.130	36	39	0.01327
0.140	35		0.01539
0.160	34	37	0.02011
0.180	33		0.02545
0.200	32	35	0.03142
0.230	31		0.04115
0.250	30	33	0.04909
0.290	29	31	0.06605
0.330	28	30	0.08553
0.350	27	29	0.09621
0.400	26	28	0.1237
0.450	25		0.1602
0.560	24	24	0.2463
0.600	23	23	0.2827
0.710	22	22	0.3958
0.750	21		0.4417
0.800	20	21	0.5027
0.900	19	20	0.6362
1.000	18	19	0.7854
1.250	16	18	1.2266
1.500	15		1.7665
2.000	12	14	3.1420
2.500			4.9080
3.000			7.0683

Appendix VI: Address coding table

binary code	address	binary code	address	binary code	address
00000001	1	00010111	23	00101101	45
00000010	2	00011000	24	00101110	46
00000011	3	00011001	25	00101111	47
00000100	4	00011010	26	00110000	48
00000101	5	00011011	27	00110001	49
00000110	6	00011100	28	00110010	50
00000111	7	00011101	29	00110011	51
00001000	8	00011110	30	00110100	52
00001001	9	00011111	31	00110101	53
00001010	10	00100000	32	00110110	54
00001011	11	00100001	33	00110111	55
00001100	12	00100010	34	00111000	56
00001101	13	00100011	35	00111001	57
00001110	14	00100100	36	00111010	58
00001111	15	00100101	37	00111011	59
00010000	16	00100110	38	00111100	60
00010001	17	00100111	39	00111101	61
00010010	18	00101000	40	00111110	62
00010011	19	00101001	41	00111111	63
00010100	20	00101010	42	01000000	64
00010101	21	00101011	43	01000001	65
00010110	22	00101100	44	01000010	66
binary code	address	binary code	address	binary code	address
01000011	67	01101101	109	10010111	151
01000100	68	01101110	110	10011000	152
01000101	69	01101111	111	10011001	153
01000110	70	01110000	112	10011010	154
01000111	71	01110001	113	10011011	155

01001000	72	01110010	114	10011100	156
01001001	73	01110011	115	10011101	157
01001010	74	01110100	116	10011110	158
01001011	75	01110101	117	10011111	159
01001100	76	01110110	118	10100000	160
01001101	77	01110111	119	10100001	161
01001110	78	01111000	120	10100010	162
01001111	79	01111001	121	10100011	163
01010000	80	01111010	122	10100100	164
01010001	81	01111011	123	10100101	165
01010010	82	01111100	124	10100110	166
01010011	83	01111101	125	10100111	167
01010100	84	01111110	126	10101000	168
01010101	85	01111111	127	10101001	169
01010110	86	10000000	128	10101010	170
01010111	87	10000001	129	10101011	171
01011000	88	10000010	130	10101100	172
01011001	89	10000011	131	10101101	173
01011010	90	10000100	132	10101110	174
01011011	91	10000101	133	10101111	175
01011100	92	10000110	134	10110000	176
01011101	93	10000111	135	10110001	177
01011110	94	10001000	136	10110010	178
01011111	95	10001001	137	10110011	179
01100000	96	10001010	138	10110100	180
01100001	97	10001011	139	10110101	181
01100010	98	10001100	140	10110110	182
01100011	99	10001101	141	10110111	183
01100100	100	10001110	142	10111000	184
01100101	101	10001111	143	10111001	185
01100110	102	10010000	144	10111010	186

01100111	103	10010001	145	10111011	187
01101000	104	10010010	146	10111100	188
01101001	105	10010011	147	10111101	189
01101010	106	10010100	148	10111110	190
01101011	107	10010101	149	10111111	191
01101100	108	10010110	150	11000000	192
binary code	address	binary code	address	binary code	address
11000001	193	11010110	214	11101011	235
11000010	194	11010111	215	11101100	236
11000011	195	11011000	216	11101101	237
11000100	196	11011001	217	11101110	238
11000101	197	11011010	218	11101111	239
11000110	198	11011011	219	11110000	240
11000111	199	11011100	220	11110001	241
11001000	200	11011101	221	11110010	242
11001001	201	11011110	222	11110011	243
11001010	202	11011111	223	11110100	244
11001011	203	11100000	224	11110101	245
11001100	204	11100001	225	11110110	246
11001101	205	11100010	226	11110111	247
11001110	206	11100011	227	11111000	248
11001111	207	11100100	228	11111001	249
11010000	208	11100101	229	11111010	250
11010001	209	11100110	230	11111011	251
11010010	210	11100111	231	11111100	252
11010011	211	11101000	232	11111101	253
11010100	212	11101001	233	11111110	254
11010101	213	11101010	234	11111111	255