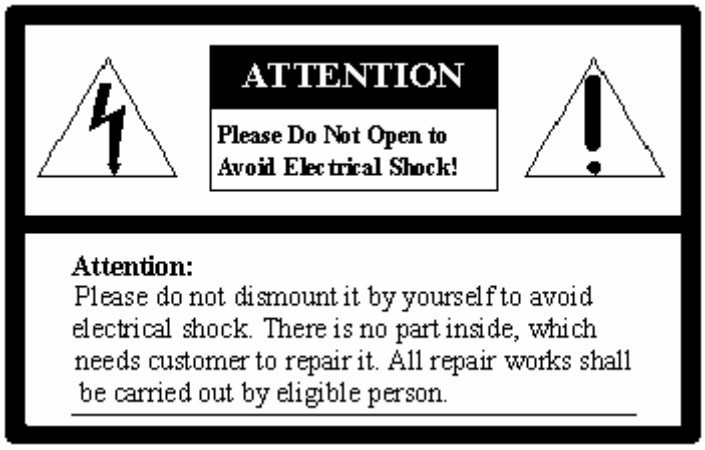
Operation Manual of
7.5 Inches Spherical Pan/Tilt

CD51W - 7 Inches Dome Pan Tilt			
	AU40E	**AU40B**	**DVR Linux**
Auto Scan Function Speed 1	**51+Call**	**Call + 51 + Enter**	**Insert 51 in to preset box**
Auto Scan Function Speed 2	**52+Call**	**Call + 52 + Enter**	**Insert 52 in to preset box**
Auto Scan Function Speed 3	**53+Call**	**Call + 53 + Enter**	**Insert 53 in to preset box**

Sign of Safety：



The flashing arrow in the upward triangle is used to remind customer that there is larger "non-insulated dangerous voltage" exists near the product, which can cause danger upon human body.

The notice mark in the upward triangle is used to remind customer to refer to instructions of important operation and maintenance of the product.

The manufacture no. of the machine is marked on the bottom or on the side. Please fill out the manufacture no. on the blank below and keep the operation manual well for reference if needed.

Model: _____

Manufacture No. _____

I. Notes for Attention

1. Read the manual carefully before installing and use the product.
2. Do not install the device under over-cold or overheat environment.
3. Do not install the device on the place with much moisture, dust, ash or smoke.
4. Do not install the spherical machine on the loosen bracket or the roof to avoid damage of machines or injury of human body.
5. It should prevent foreign objects drop into the machine to avoid short circuit of the spherical machine.
6. Do not let the device to be stricken or vibrated.
7. Before wiping, switch off power supply first and do not wipe with liquid or aerosol cleaner. Please wipe with wet cloth.
8. Before connecting power supply wires and communication wires please check outer terminals and take care of connections with correct polarities.
9. Do not aim the camera at the sun or other bright object weather the device is in use or not in use, otherwise the CCD of camera could be damaged permanently.
10. Observe all electrical safety standard when connecting wires. This product has two specifications, i.e. AC24V and AC220V. Confirm power supply when this product is used. The RS485 and video frequency signal of the product adopt the lightning protection technique, which can effectively prevent damages caused by various kinds of pulse signals such as lightning and surging against the device. The RS485 and video frequency signal should keep enough distance with high voltage equipment and cables during the course of transmission, and make protection measures against lightning and surging well if necessary.
11. Stop use of the device and switch off power supply if abnormal smell or smoke occurs.
12. In case the machine has trouble, do not make any repair operation upon the machine liberally. Referring to the manual first to check the trouble or ask the professional to find out the reasons. All service works should be provided by the serviceman authorized by our company.

II. The Latest Characteristics

- Long service life, small disturbance and high reliability.
- Novel and beautiful appearance.
- Horizontal limitations are adjustable.
- Lower price and stable performance.
- Lower power consumption and compact size.
- Easy wire distributions.

III. Brief Introduction

The built-in decoded spherical pan/tilt incorporates a lot of protocols. Its baud rates are adjustable. Adopting chip elements and in-line elements in design, it has small size and top quality instead of shortcomings of bulky volume and uneasy installation of traditional pan/tilt. Due to its reliable performance and cheap price, it is a product with good ratio of performance/price.

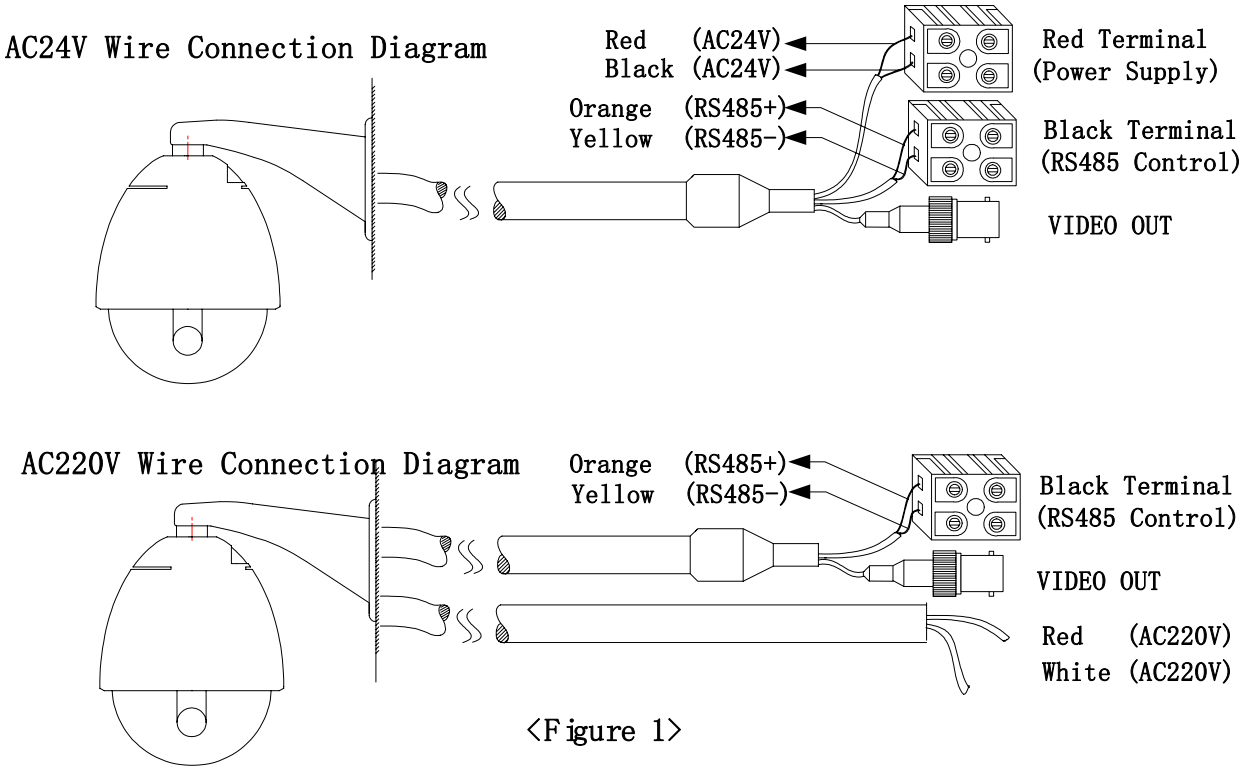
New technologies adopted by the spherical pan/tilt are as follows:

1. The switching power supply is used, which has high efficiency and wide suitable range and is popular in industries, especially suitable for the area where larger fluctuation exists in power network of supervision and monitor project.

2. Most common parts and components are chip element, light-isolated and semi-conductor elements I order to rise up the reliability of the spherical pan/tilt.
3. The RS485 and video frequency signal adopt the lightning protection technique, which can effectively prevent damages caused by various kinds of pulse signals such as lightning and surging against the device.
4. The control part of the camera is driven by the power chip which has the maximum output current of 200 mA.

IV. Designation of Output Wires

The output wires of the spherical machine are shown as Figure 1. Red and black wires are for AC24V and AC220V power supplies respectively. When AC24V is applied, orange wire is RS485+ while yellow wire is RS485-. BNC connector is the output of video frequency (**do not make wrong wire connections**).

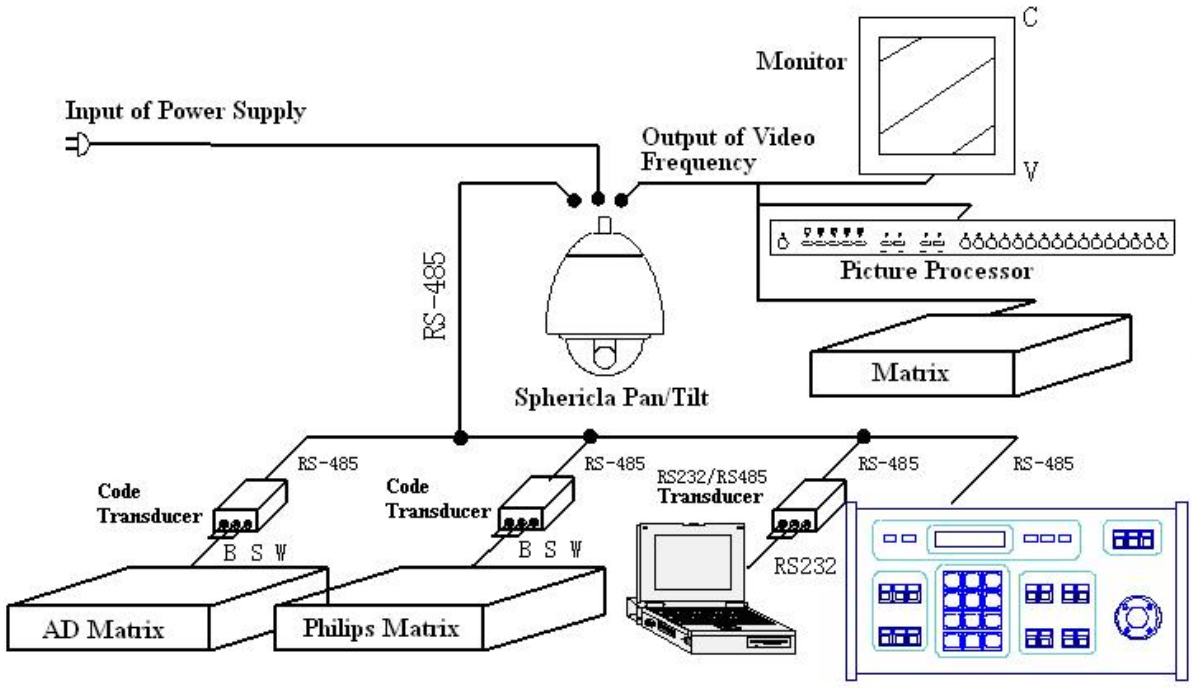


<Figure 1>

V. Setup of Dip Switch

Connection of the System

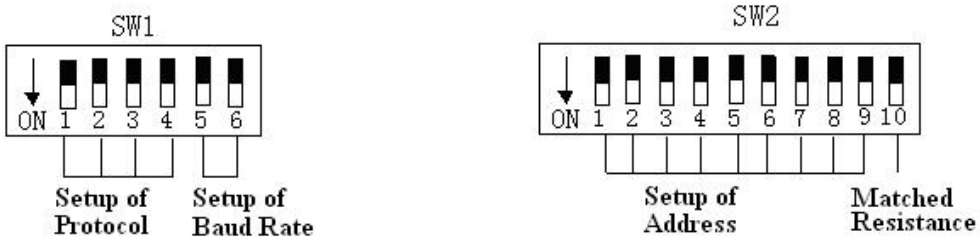
1) Connection Diagram of the System



<Figure 2>

2) Dip-Switch Diagram of Address/Protocol

As shown in Figure 3, there are one 6-bit and one 10-bit dip-switches on PCB, which are used to set communication protocol and baud rate, address of the spherical machine and 120-ohm terminal resistor respectively.



<Fighure 3>

Selection of Communication Protocols

As shown in Figure 3, SW1 is used to set communication protocol and baud rate used by the spherical machine. Those from DIP-4 to DIP-1 of SW1 are used to select protocols and 16 protocols in maximum can be selected. The dip-switch table of protocols of the spherical pan/tilt is as follows.

Type of Protocols	Selection of Communication Protocols				Common Baud Rates	
	DIP-1	DIP-2	DIP-3	DIP-4	DIP-5	DIP-6
SAMSUNG	ON	OFF	OFF	OFF	OFF	ON
B01	ON	OFF	OFF	OFF	OFF	ON
NEON	ON	OFF	OFF	OFF	OFF	ON
Santachi	OFF	ON	OFF	OFF	OFF	ON
PELCO-D	ON	ON	OFF	OFF	OFF	OFF
PELCO-P/4800	OFF	OFF	ON	OFF	ON	OFF
PELCO-P/9600					OFF	ON
PANASONIC	ON	OFF	ON	OFF	OFF	ON

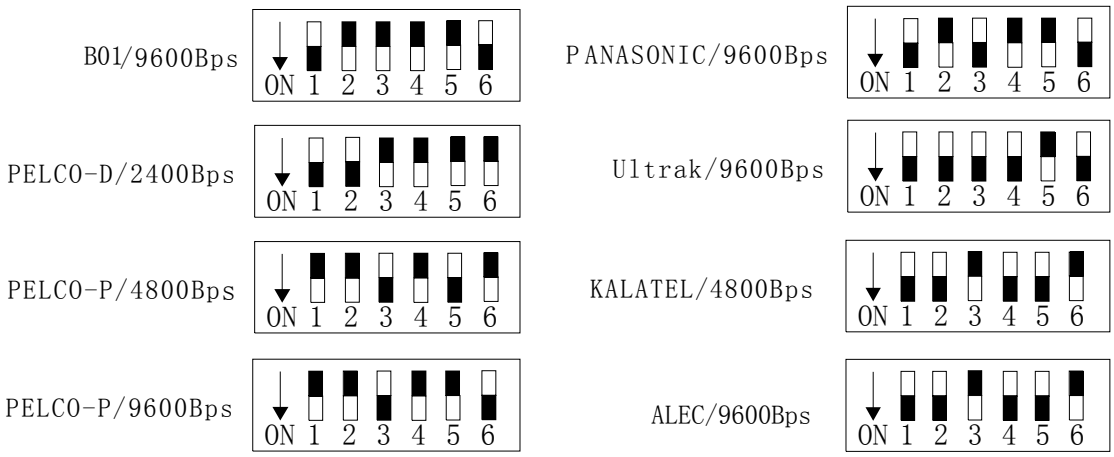
Longcomity	OFF	ON	ON	OFF	OFF	ON
HUNDA600	ON	ON	ON	OFF	OFF	ON
LILIN	OFF	OFF	OFF	ON	OFF	ON
VICON	ON	OFF	OFF	ON	ON	OFF
MOLYNX	OFF	ON	OFF	ON	OFF	ON
KALATEL	ON	ON	OFF	ON	ON	OFF
VCL	OFF	OFF	ON	ON	OFF	ON
Reserved	ON	OFF	ON	ON	OFF	ON
ALEC	OFF	ON	ON	ON	OFF	ON
Ultrak	ON	ON	ON	ON	OFF	ON

Setup of Communication Baud Rates

The DIP-5 and DIP-6 of SW1 on PCB are used to select baud rates of communication from 2400BIT/S, 4800BIT/S, 9600BIT/s and 19200BIT/s. When leaving the factory, common baud rate is set up.

Communication Baud Rates					**Setup of Baud Rates**	
	DIP-1	DIP-2	DIP-3	DIP-4	DIP-5	DIP-6
2400bps					OFF	OFF
4800bps					ON	OFF
9600bps					OFF	ON
19200bps					ON	ON

Some protocols and its common baud rates are set and shown as follows:



<Figure 4>

Setup of Addresses of Spherical Pan/Tilt

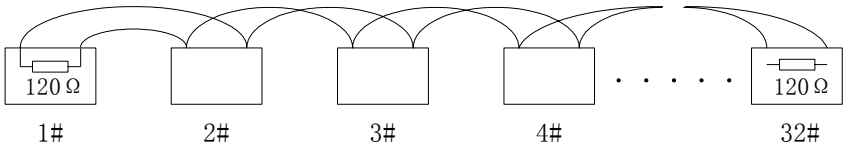
Before the application of the spherical pan/tilt, the address codes should be set first by DIP1 to DIP9 of SW2 on PCB in binary 8421 coding system, in which DIP1 means lower bit and the maximum address is 511. State ON of the dip-switch means 1 while OFF means 0. Some address codes of the dip-switch are set as follows.

Address	**DIP1**	**DIP2**	**DIP3**	**DIP4**	**DIP5**	**DIP6**	**DIP7**	**DIP8**	**DIP9**
0	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
1	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
2	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF

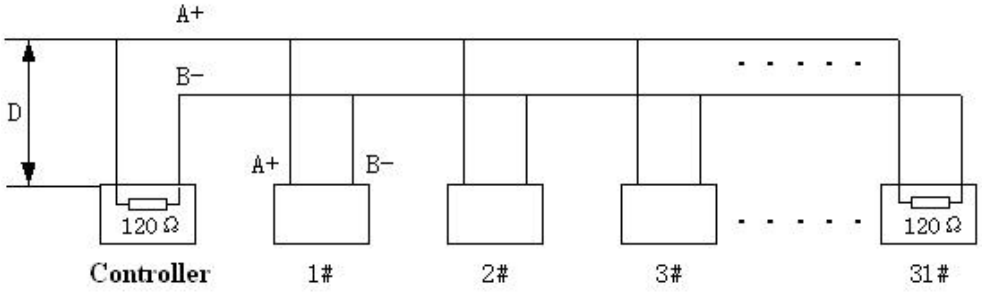
3	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF
4	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF
5	ON	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF
6	OFF	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF
7	ON	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF
8	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF
9	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF
10	OFF	ON	OFF	ON	OFF	OFF	OFF	OFF	OFF
11	ON	ON	OFF	ON	OFF	OFF	OFF	OFF	OFF
12	OFF	OFF	ON	ON	OFF	OFF	OFF	OFF	OFF
13	ON	OFF	ON	ON	OFF	OFF	OFF	OFF	OFF
14	OFF	ON	ON	ON	OFF	OFF	OFF	OFF	OFF
15	ON	ON	ON	ON	OFF	OFF	OFF	OFF	OFF
16	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF
…	…	…	…	…	…	…	…	…	…
511	ON	ON	ON	ON	ON	ON	ON	ON	ON

5. Selection of 120-ohm Terminal Resistor

The DIP-10 of SW2 is used to select 120-ohm terminal resistor. In order to remove the reflection of echo wave in communication circuit, you can connect a 120-ohm terminal resistor in parallel between 485+ and 485- of the spherical machine (set the selection bit of 120-ohm terminal resistor at ON). The standard of RS485 industrial bus requires all equipment should be connected in daisy-chain style and both ends should be connected with 120-ohm terminal resistor (see Figure 5). The simplified connection can be done as Figure 6 but distance “D” couldn’t be larger than 7 meters.



<Figure 5>



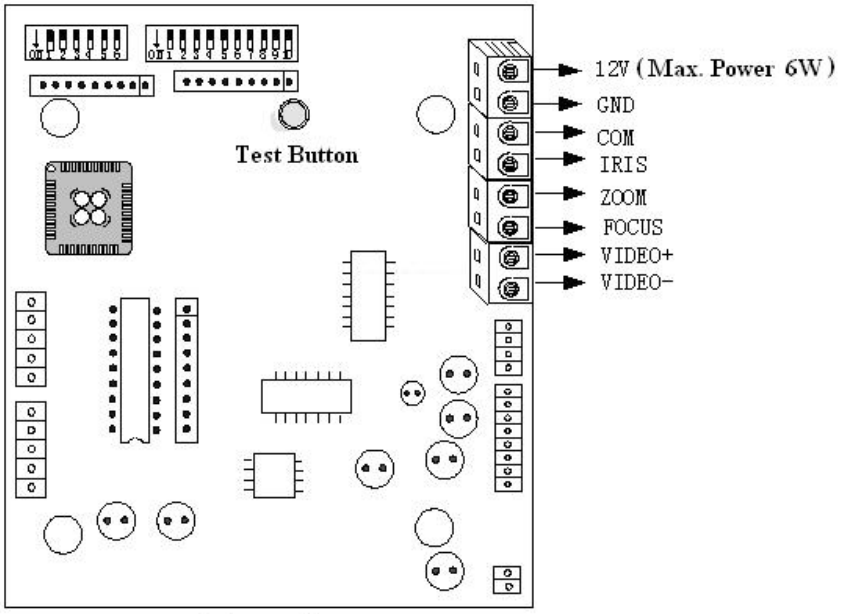
<Figure 6>

VI. Description of Functions

Control of Lens

1) The spherical pan/tilt takes voltage style to control zoom, focus and iris. When receiving **zoom out, focus out and iris large** orders of the lens it outputs positive voltage while receiving **zoom in, focus in and iris small** orders of the lens it outputs negative voltage. If output voltages of some cameras are different with it, connect their wires in reverse.

2) Output of Control Voltage of the Lens: ±**DC12V.**



<**Figure 7**>

Linear Scan Function

Start the Linear Scan：

When receiving the order to start the linear scan, the spherical pan/tilt shall make linear scan in default speed between left and right limits> If no order of linear scan in the protocol, you can call preset points 51, 52 and 53 to start linear scan.

Stop the Linear Scan:

When receiving the order to stop the linear scan or the order of manual stop, the spherical pan/tilt shall stop the scan.

Test Button

The pan/tilt has a test button shown as Figure 7, which can be used to test the pan/tilt if its states are normal. Press down the test button, the pan/tilt shall make self-check in horizontal and vertical directions. Press down the test button again or when the pan/tilt receives an effective control order, the pan/tilt shall stop the test.

VII. Technical Data

Input Voltage	AC24V±10%　50/60 HZ AC220V±10%　50/60 HZ (two options)
Input Power	Indoor：12W　Outdoor：30W
Baud Rate	2400 bps, 4800 bps, 9600 bps, 19200 bps selectable
Range of Address	0～511
Communication Style	RS-485
Communication Protocol	A lot of protocols for option
Rotation Range	Horizontal：0～355°　Vertical：0～90°
Rotation Limitation	Adjustable in horizontal direction
Rotation Speed	Horizontal：12°/s±2%　Vertical：8°/s±2%
Working Temperature	Indoor：0～45℃　Outdoor：-15～55℃
Installation Sizes of Camera	112mm (L) × 60mm (W) × 70mm (H)

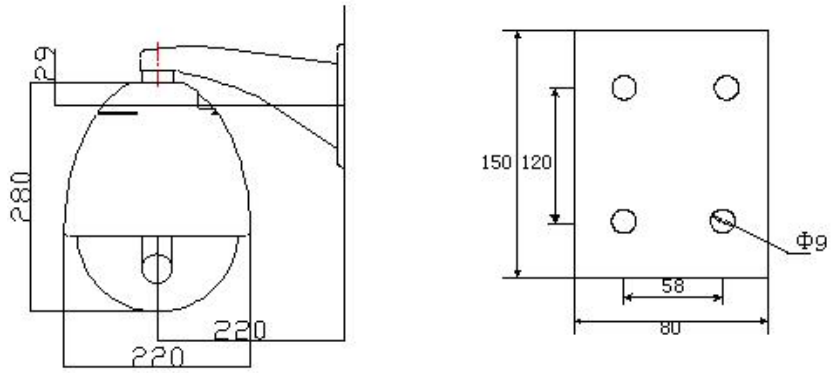
VIII. Description of Installation

1. Requirement of Installation

1) Requirement of Power Supply: select proper size of wires and transmission distance to suit required power supply.
2) Requirement of Installation: for the sake of safety, all mechanical joints and connectors to support the device should withstand enough load.

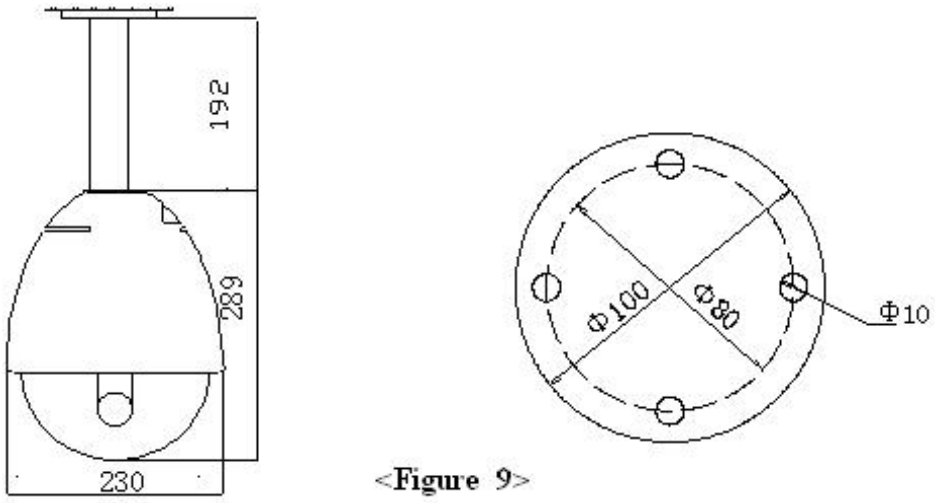
2. Sizes of Installation

1) Installation of Indoor Wall-Hanging Style



<Figure 8>

2) Installation of Indoor Ceiling-Hanging Style



<Figure 9>

Installation of the Support

1) Installation of the Wall-Hanging Support

⚠ The wall selected to install should be robust without peeling off.

⚠ Ensure the support is installed on the wall rather than on the coating.

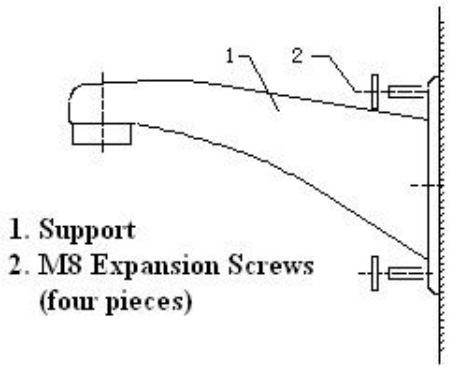
⚠ In case the protocol or the baud rate of address of the machine should be adjusted, please adjust well first as per Figure 3.

Steps of Installation：

a) Select the position of installation on the robust wall, draw the center of the installation hole by pencil as per the sample of the wall-mounted support.
b) Drill four M8 installation holes of expansion screws on the wall surface by electric drill

and put into M8 expansion screws (as per Figure 10).

c) Fasten the support by four nuts and washers on the wall.



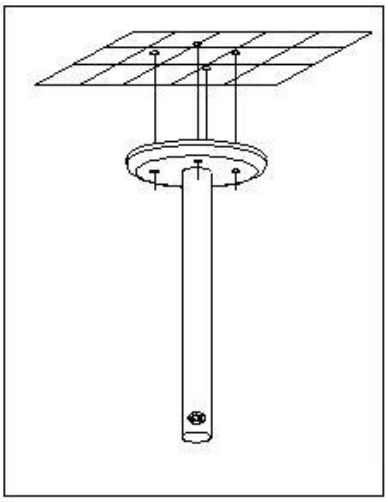
<Figure 10>

2) Installation of the Ceiling-Hanging Support

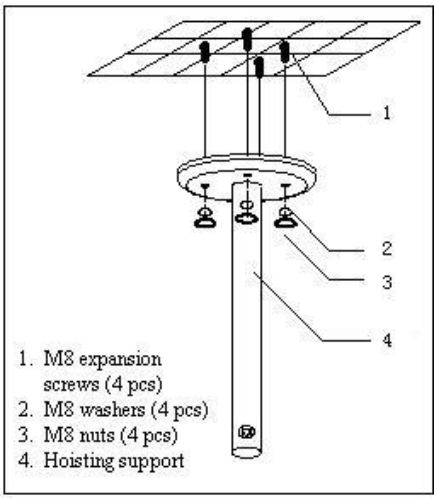
a) Select the position of installation on the robust ceiling, draw the center of the installation hole by pencil as per the sample of the hanging seat (as per Figure 11).

b) Drill four M8 holes of expansion screws on the installation surface by electric drill and knock into M8 expansion screws.

c) Fasten the hanging support as per Figure 12 on ceiling (as per Figure 12).



<Figure 11>



<Figure 12>

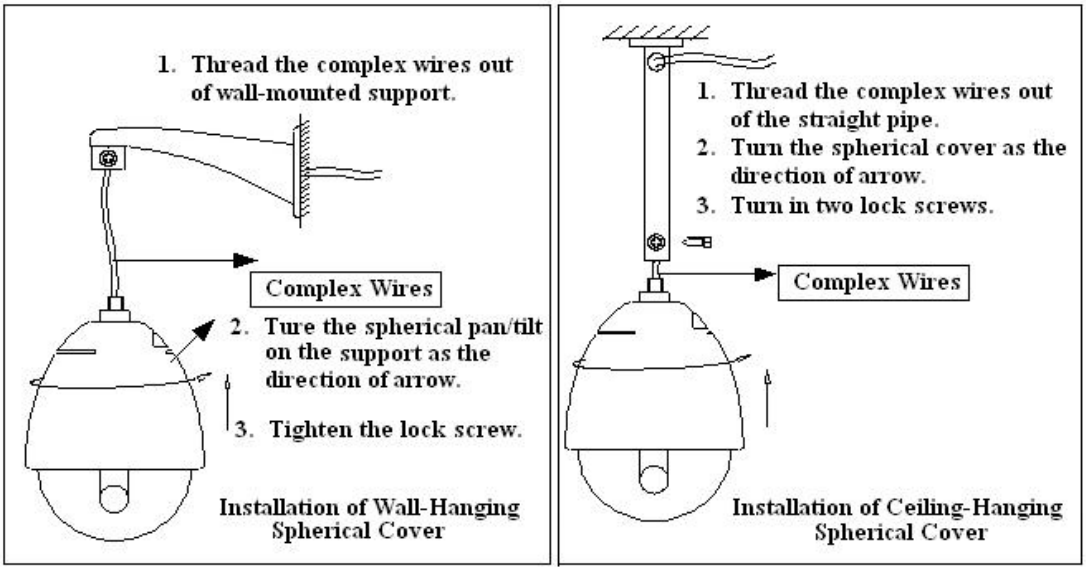
Installation of the spherical Pan/Tilt and the Support

a) Take out the spherical pan/tilt from the package.

b) Thread the complex wires out of the support.

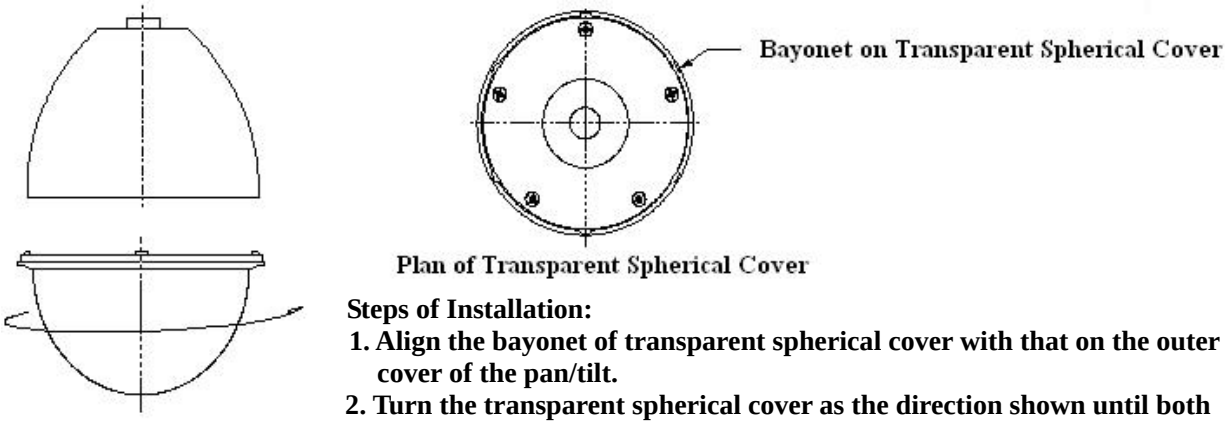
c) Turn the spherical pan/tilt on the support as per the direction of the arrow.

d) Fasten the spherical cover by lock screws (as per Figure 13).



<Figure 13>

3. Installation Style of the Transparent Spherical Cover



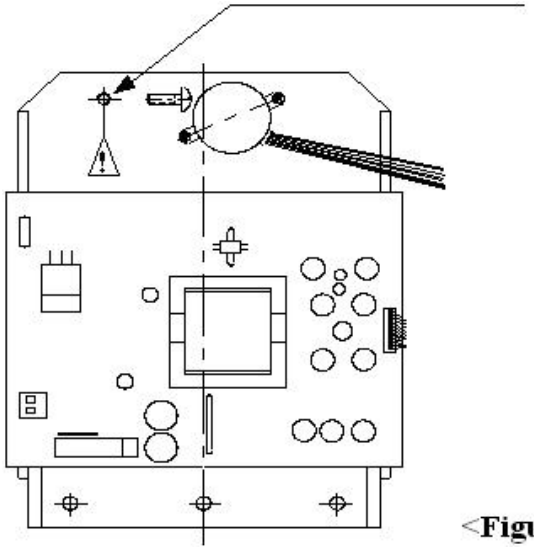
Steps of Installation:

1. **Align the bayonet of transparent spherical cover with that on the outer cover of the pan/tilt.**
2. **Turn the transparent spherical cover as the direction shown until both covers are completely fastened.**

<Figure 14>

4. Removal of Lock Screw of the Camera

In order to avoid shaking of the camera during the course of transportation, the screw is used to fix the camera when leaving the factory. You should turn it out before application of the machine.



<Figure 15>

IX. Removal of Simple Troubles

Trouble	Possible Reasons	Countermeasures
Press test button after switching on, no action and images (it means the pan/tilt has no self check after switching on).	Power supply is damaged or power is not enough.	Replace.
	Wrong connection of power supply wires.	Correct.
	Trouble in engineering circuit.	Remove.
Press test button it has normal action but no images.	Wrong connection of video frequency circuit.	Correct.
	Bad connection of video frequency circuit.	Remove.
	Damage of camera.	Replace.
Spherical pan/tilt couldn't be controlled	Wrong connection of control signal wire.	Correct.
	Address of spherical pan/tilt is not matched.	Reselect.
	Protocol or baud rate of communication is not matched.	Adjust protocol to be matched with the controller and switch on again.
Images are not stable.	Bad connection of video frequency circuit.	Remove.
	Electric power is not enough.	Replace.
Spherical pan/tilt is out of control.	Bad connection of control wire.	Remove.
	Operation problem of master machine.	Switch on the master machine again.
	Too load or too long distance of communication.	1. Set the farthest spherical machine from the controller at ON and others at OFF. 2. Add code distributor.