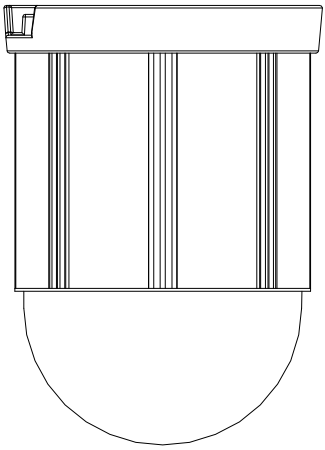
USER'S MANUAL

PTZ/PT Dome Camera



V 1. 2

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Please read this manual carefully before using, and save this manual for future reference

CONTENTS

Safety Information

Federal Communication Commission (FCC) Statement

NOTE: This equipment has been tested and found to comply with the limits of a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This device generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference, the user is encouraged to try to correct the interference by on or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Correct the equipment into an output o a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio / television technician for help
- FCC Caution: To assure continued compliance, any change or modification not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

CAUTION

- This Class B digital apparatus meets all requirements of the Canadian Interference Causing Equipment Regulations.

ATTENTION

- Cet appareil numerique de laclasse B respects toutes les exigencies du Reglement sur le materiel brouilleur du Canada

Preface

Congratulations for the purchasing of the world most compact PTZ (**P**an, **T**ilt and **Z**oom) camera. The camera is designed and manufactured not just to meet the requirements for traditional CCTV and modern digital surveillance, but also increase the systems' overall performance.

The PTZ camera is equipped with high resolution CCD sensor and powerful 30x zoom lens that can used for wide angle observation and detail viewing to the far-end object as well.

The PT mechanism provides controllable pan (360^{o}) and tilt (180^{o}) functions, giving users the capability to manipulate the camera for precise locating on targets for monitoring. The built-in micro-controller allows users to program up to 64 presets for quick and accurate capture to specific view positions. Moving speed, ranging from 0.5 to 240 degrees per second and is selectable to controller, is variable in 16 optional levels. Dwell time of each view position is also selectable from 1second up to 255 seconds.

System function includes I/O for alarm function for intrusion management, ID setup (maximum to 255) and impedance matching option for multiple node system, 2 control protocols, 3 options of baud rates, RS485 communication format. This device is driven by DC12V power. It can be controlled by keyboard, PC, video server or standalone DVR.

Majority of image related functions (such as DSP functions, lens functions, special effects of video…) are managed via OSD (On-Screen-Display) menu. These functions are explained in the section of OSD with details. The CCD can be set up for automatic switching to black-white mode for night-vision ready when illumination is low.

This camera is designed to be water-resistant for outdoor use, under the condition of normal temperature range from -10 ^{o} to 50^{o} C.

Features

- Compact Size of 5-1/4” (135 mm) diameter
- High resolution color CCD 520 TV lines
- 30 times optical zoom and 8 times in digital
- Continuous panning for 360°; Tilt for 180°
- Fast moving speed, up to 240° per second
- RS-485 digital control, supporting multi-nude topology
- BNC connector for video output
- Programmable for view position, speed and dwell
- View position preset, up to 64 points
- Auto-pan and 4 groups of tour
- 3 alarm inputs and 1 alarm output
- Compatible with Pelco D and Pelco P protocols
- Internal ID setup function, maximum to 255
- Compatible with keyboard and DVR for CCTV system
- Compatible with PC and video server for WAN / LAN surveillance
- 12V DC or 24V AC power input
- Water resistant design (IP-66 grade)
- Be able for surface, wall and ceiling mount

Appearance

5.1 To access DIP switches

Before the camera is mounted in place, be sure the following four settings are properly executed, or the camera may fail the control:

- **Camera ID setup**
- **Protocol selection**
- **Baud rate selection**
- **Terminator** (RS485 impedance) **setup**

Important Notice

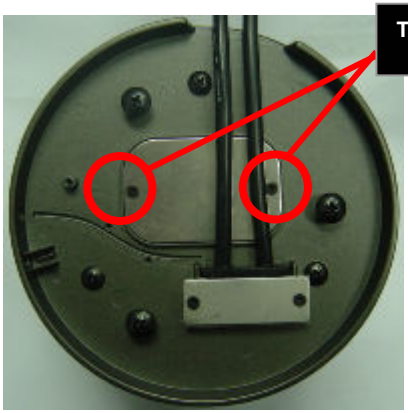
All the DIP switches for setting up camera ID, protocol, baud rate and RS485 terminator impedance are in the dome at the bottom side, and accessible via a opening. In normal condition, this opening is sealed with a piece of steel cover. The metal cover, together with a rubber around the opening, is for stopping water and dust going the camera. Therefore, installer must be very careful during the opening or putting back the steel cover.

Tools:

1. Philips (or “plus type”) screw driver #2, for opening and putting back the cover
2. Pincer, paper clip or small flat screw driver, to move the lever of DIP switch

Access point to DIP switches for setups:

To open the cover, take the two screws off from bottom chassis, as the instruction on below:



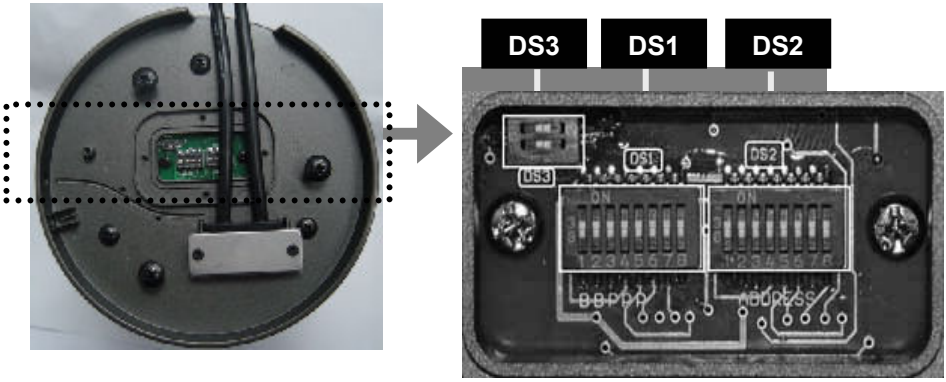
5.2 DIP switches

Overview of DIP switches

There are three sets of DIP switch on board for different setup purposes.

location #	bit quantity	used for
DS1	8	Protocol / baud rate setup
DS2	8	Device ID setup
DS3	2	Network impedance

Refer to the picture on below for DIP switch locations.



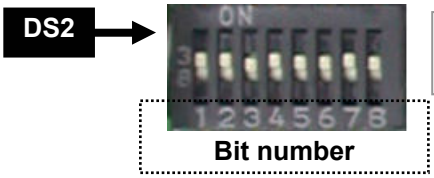
The following paragraphs are providing the detail descriptions of the three main setups. Installer should read it with care, before starts doing the hardware mounting and cabling work.

5.3 Set Up Device ID Number

To build correct network for control communication, every speed dome camera in the network must have an **unique ID number**, which is set by the bit 1 to 8 of a 8-bit DIP switch **DS2.**

Note:	**Factory default of device ID is 1**

- Find 8-bit DIP switch DS2 on the PC board



remark: Dash line "---" in table means to set the bit to "OFF" position

- Refer to the tables in the next two pages for ID setting (the tables shows the relation between pin assignments of DIP switch and ID numbers 1 to 255)
- The highest ID number of this camera is 255.
- All the speed domes in a network must have their unique ID. It is highly recommended to installers, for future maintenance efficiency and users' convenience, to mark the ID of each camera onto its corresponding location on the site map, and make out a list of cameras with their ID numbers.
- The DS2 pin assignment for ID setup is in binary format.

ID table (1 ~ 64)

ID	1	2	3	4	5	6	7	8
1	--	--	--	--	--	--	--	--
2	on	--	--	--	--	--	--	--
3	--	on	--	--	--	--	--	--
4	on	on	--	--	--	--	--	--
5	--	--	on	--	--	--	--	--
6	on	--	on	--	--	--	--	--
7	--	on	on	--	--	--	--	--
8	on	on	on	--	--	--	--	--
9	--	--	--	on	--	--	--	--
10	on	--	--	on	--	--	--	--
11	--	on	--	on	--	--	--	--
12	on	on	--	on	--	--	--	--
13	--	--	on	on	--	--	--	--
14	on	--	on	on	--	--	--	--
15	--	on	on	on	--	--	--	--
16	on	on	on	on	--	--	--	--
17	--	--	--	--	on	--	--	--
18	on	--	--	--	on	--	--	--
19	--	on	--	--	on	--	--	--
20	on	on	--	--	on	--	--	--
21	--	--	on	--	on	--	--	--
22	on	--	on	--	on	--	--	--
23	--	on	on	--	on	--	--	--
24	on	on	on	--	on	--	--	--
25	--	--	--	on	on	--	--	--
26	on	--	--	on	on	--	--	--
27	--	on	--	on	on	--	--	--
28	on	on	--	on	on	--	--	--
29	--	--	on	on	on	--	--	--
30	on	--	on	on	on	--	--	--
31	--	on	on	on	on	--	--	--
32	on	on	on	on	on	--	--	--

ID	1	2	3	4	5	6	7	8
33	--	--	--	--	--	on	--	--
34	on	--	--	--	--	on	--	--
35	--	on	--	--	--	on	--	--
36	on	on	--	--	--	on	--	--
37	--	--	on	--	--	on	--	--
38	on	--	on	--	--	on	--	--
39	--	on	on	--	--	on	--	--
40	on	on	on	--	--	on	--	--
41	--	--	--	on	--	on	--	--
42	on	--	--	on	--	on	--	--
43	--	on	--	on	--	on	--	--
44	on	on	--	on	--	on	--	--
45	--	--	on	on	--	on	--	--
46	on	--	on	on	--	on	--	--
47	--	on	on	on	--	on	--	--
48	on	on	on	on	--	on	--	--
49	--	--	--	--	on	on	--	--
50	on	--	--	--	on	on	--	--
51	--	on	--	--	on	on	--	--
52	on	on	--	--	on	on	--	--
53	--	--	on	--	on	on	--	--
54	on	--	on	--	on	on	--	--
55	--	on	on	--	on	on	--	--
56	on	on	on	--	on	on	--	--
57	--	--	--	on	on	on	--	--
58	on	--	--	on	on	on	--	--
59	--	on	--	on	on	on	--	--
60	on	on	--	on	on	on	--	--
61	--	--	on	on	on	on	--	--
62	on	--	on	on	on	on	--	--
63	--	on	on	on	on	on	--	--
64	on	on	on	on	on	on	--	--

ID table (65 ~ 128)

ID	1	2	3	4	5	6	7	8
65	--	--	--	--	--	--	on	--
66	on	--	--	--	--	--	on	--
67	--	on	--	--	--	--	on	--
68	on	on	--	--	--	--	on	--
69	--	--	on	--	--	--	on	--
70	on	--	on	--	--	--	on	--
71	--	on	on	--	--	--	on	--
72	on	on	on	--	--	--	on	--
73	--	--	--	on	--	--	on	--
74	on	--	--	on	--	--	on	--
75	--	on	--	on	--	--	on	--
76	on	on	--	on	--	--	on	--
77	--	--	on	on	--	--	on	--
78	on	--	on	on	--	--	on	--
79	--	on	on	on	--	--	on	--
80	on	on	on	on	--	--	on	--
81	--	--	--	--	on	--	on	--
82	on	--	--	--	on	--	on	--
83	--	on	--	--	on	--	on	--
84	on	on	--	--	on	--	on	--
85	--	--	on	--	on	--	on	--
86	on	--	on	--	on	--	on	--
87	--	on	on	--	on	--	on	--
88	on	on	on	--	on	--	on	--
89	--	--	--	on	on	--	on	--
90	on	--	--	on	on	--	on	--
91	--	on	--	on	on	--	on	--
92	on	on	--	on	on	--	on	--
93	--	--	on	on	on	--	on	--
94	on	--	on	on	on	--	on	--
95	--	on	on	on	on	--	on	--
96	on	on	on	on	on	--	on	--

ID	1	2	3	4	5	6	7	8
97	--	--	--	--	--	on	on	--
98	on	--	--	--	--	on	on	--
99	--	on	--	--	--	on	on	--
100	on	on	--	--	--	on	on	--
101	--	--	on	--	--	on	on	--
102	on	--	on	--	--	on	on	--
103	--	on	on	--	--	on	on	--
104	on	on	on	--	--	on	on	--
105	--	--	--	on	--	on	on	--
106	on	--	--	on	--	on	on	--
107	--	on	--	on	--	on	on	--
108	on	on	--	on	--	on	on	--
109	--	--	on	on	--	on	on	--
110	on	--	on	on	--	on	on	--
111	--	on	on	on	--	on	on	--
112	on	on	on	on	--	on	on	--
113	--	--	--	--	on	on	on	--
114	on	--	--	--	on	on	on	--
115	--	on	--	--	on	on	on	--
116	on	on	--	--	on	on	on	--
117	--	--	on	--	on	on	on	--
118	on	--	on	--	on	on	on	--
119	--	on	on	--	on	on	on	--
120	on	on	on	--	on	on	on	--
121	--	--	--	on	on	on	on	--
122	on	--	--	on	on	on	on	--
123	--	on	--	on	on	on	on	--
124	on	on	--	on	on	on	on	--
125	--	--	on	on	on	on	on	--
126	on	--	on	on	on	on	on	--
127	--	on	on	on	on	on	on	--
128	on	on	on	on	on	on	on	--

ID table (129 ~ 192)

ID	1	2	3	4	5	6	7	8
129	--	--	--	--	--	--	--	on
130	on	--	--	--	--	--	--	on
131	--	on	--	--	--	--	--	on
132	on	on	--	--	--	--	--	on
133	--	--	on	--	--	--	--	on
134	on	--	on	--	--	--	--	on
135	--	on	on	--	--	--	--	on
136	on	on	on	--	--	--	--	on
137	--	--	--	on	--	--	--	on
138	on	--	--	on	--	--	--	on
139	--	on	--	on	--	--	--	on
140	on	on	--	on	--	--	--	on
141	--	--	on	on	--	--	--	on
142	on	--	on	on	--	--	--	on
143	--	on	on	on	--	--	--	on
144	on	on	on	on	--	--	--	on
145	--	--	--	--	on	--	--	on
146	on	--	--	--	on	--	--	on
147	--	on	--	--	on	--	--	on
148	on	on	--	--	on	--	--	on
149	--	--	on	--	on	--	--	on
150	on	--	on	--	on	--	--	on
151	--	on	on	--	on	--	--	on
152	on	on	on	--	on	--	--	on
153	--	--	--	on	on	--	--	on
154	on	--	--	on	on	--	--	on
155	--	on	--	on	on	--	--	on
156	on	on	--	on	on	--	--	on
157	--	--	on	on	on	--	--	on
158	on	--	on	on	on	--	--	on
159	--	on	on	on	on	--	--	on
160	on	on	on	on	on	--	--	on

ID	1	2	3	4	5	6	7	8
161	--	--	--	--	--	on	--	on
162	on	--	--	--	--	on	--	on
163	--	on	--	--	--	on	--	on
164	on	on	--	--	--	on	--	on
165	--	--	on	--	--	on	--	on
166	on	--	on	--	--	on	--	on
167	--	on	on	--	--	on	--	on
168	on	on	on	--	--	on	--	on
169	--	--	--	on	--	on	--	on
170	on	--	--	on	--	on	--	on
171	--	on	--	on	--	on	--	on
172	on	on	--	on	--	on	--	on
173	--	--	on	on	--	on	--	on
174	on	--	on	on	--	on	--	on
175	--	on	on	on	--	on	--	on
176	on	on	on	on	--	on	--	on
177	--	--	--	--	on	on	--	on
178	on	--	--	--	on	on	--	on
179	--	on	--	--	on	on	--	on
180	on	on	--	--	on	on	--	on
181	--	--	on	--	on	on	--	on
182	on	--	on	--	on	on	--	on
183	--	on	on	--	on	on	--	on
184	on	on	on	--	on	on	--	on
185	--	--	--	on	on	on	--	on
186	on	--	--	on	on	on	--	on
187	--	on	--	on	on	on	--	on
188	on	on	--	on	on	on	--	on
189	--	--	on	on	on	on	--	on
190	on	--	on	on	on	on	--	on
191	--	on	on	on	on	on	--	on
192	on	on	on	on	on	on	--	on

ID table (193 ~ 255)

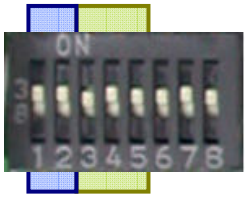
ID	1	2	3	4	5	6	7	8
193	--	--	--	--	--	--	on	on
194	on	--	--	--	--	--	on	on
195	--	on	--	--	--	--	on	on
196	on	on	--	--	--	--	on	on
197	--	--	on	--	--	--	on	on
198	on	--	on	--	--	--	on	on
199	--	on	on	--	--	--	on	on
200	on	on	on	--	--	--	on	on
201	--	--	--	on	--	--	on	on
202	on	--	--	on	--	--	on	on
203	--	on	--	on	--	--	on	on
204	on	on	--	on	--	--	on	on
205	--	--	on	on	--	--	on	on
206	on	--	on	on	--	--	on	on
207	--	on	on	on	--	--	on	on
208	on	on	on	on	--	--	on	on
209	--	--	--	--	on	--	on	on
210	on	--	--	--	on	--	on	on
211	--	on	--	--	on	--	on	on
212	on	on	--	--	on	--	on	on
213	--	--	on	--	on	--	on	on
214	on	--	on	--	on	--	on	on
215	--	on	on	--	on	--	on	on
216	on	on	on	--	on	--	on	on
217	--	--	--	on	on	--	on	on
218	on	--	--	on	on	--	on	on
219	--	on	--	on	on	--	on	on
220	on	on	--	on	on	--	on	on
221	--	--	on	on	on	--	on	on
222	on	--	on	on	on	--	on	on
223	--	on	on	on	on	--	on	on
224	on	on	on	on	on	--	on	on

ID	1	2	3	4	5	6	7	8
225	--	--	--	--	--	on	on	on
226	on	--	--	--	--	on	on	on
227	--	on	--	--	--	on	on	on
228	on	on	--	--	--	on	on	on
229	--	--	on	--	--	on	on	on
230	on	--	on	--	--	on	on	on
231	--	on	on	--	--	on	on	on
232	on	on	on	--	--	on	on	on
233	--	--	--	on	--	on	on	on
234	on	--	--	on	--	on	on	on
235	--	on	--	on	--	on	on	on
236	on	on	--	on	--	on	on	on
237	--	--	on	on	--	on	on	on
238	on	--	on	on	--	on	on	on
239	--	on	on	on	--	on	on	on
240	on	on	on	on	--	on	on	on
241	--	--	--	--	on	on	on	on
242	on	--	--	--	on	on	on	on
243	--	on	--	--	on	on	on	on
244	on	on	--	--	on	on	on	on
245	--	--	on	--	on	on	on	on
246	on	--	on	--	on	on	on	on
247	--	on	on	--	on	on	on	on
248	on	on	on	--	on	on	on	on
249	--	--	--	on	on	on	on	on
250	on	--	--	on	on	on	on	on
251	--	on	--	on	on	on	on	on
252	on	on	--	on	on	on	on	on
253	--	--	on	on	on	on	on	on
254	on	--	on	on	on	on	on	on
255	--	on	on	on	on	on	on	on

5.4 Control Protocol and Baud Rate

Control protocol and baud rate must be set correctly to the camera in order to establish proper communication between the camera and control device.
Be sure that the same protocol and baud rate are selected in control device, too.
Presently 2 types of protocol and 3 levels of baud rate are provided by this speed dome, through an 8-bit DIP switch labeled DS1.

DS 1



remark:

A. "--" means to set the bit to "OFF" position
B. Bit 1 and 2 are for baud rate setup
C. Bit 3, 4 and 5 are for protocol selection
D. Bit 6 is reserved future use
E. Bit 7 is for firmware upgrade mode
F. Bit 8 is for cooling fan on / off switching

- First, installer needs to choose a communication protocol with bit number 3, 4 and 5. Watch that the same protocol is chosen for speed dome and controller. The following table shows the three protocols provided in this speed dome. **Check what are available in the controller before choosing the protocol.**

3	4	5	Protocol
--	--	--	Pelco-D
on	--	--	Pelco-P
--	on	--	Reserved
on	on	--	Reserved

- Bit 1 and 2 are for baud rate setup. Same baud rate must be set up for the speed dome and control device, or communication for control will fail.

1	2	Baud rate
--	--	2,400 bps
on	--	4,800 bps
--	on	9,600 bps

5.5 RS485 Network and Impedance

Transmission distances of RS485 Bus

The 0.56mm (AWG#24) twisted pair or higher grade wires are recommended for data transmission cable

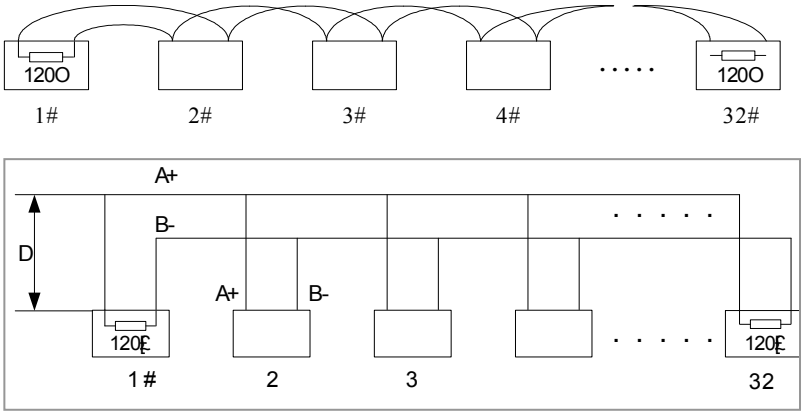
The maximum theoretical transmitting distances, for the AWG#24, are as follows:

Baud Rate	Maximum Transmitting Distance
2400 Bps	1800m
4800 Bps	1200m
9600Bps	800m

If user selects thinner cables, or installs the dome in an environment surrounded by strong electromagnetic interference, or connects lots of equipment to the RS485 bus, the maximum transmitting distance will decrease. To increase the maximum transmitting distance, do the opposite way, i.e. use thicker wire and keep the cable away from the interference.

Connection and terminator resistor

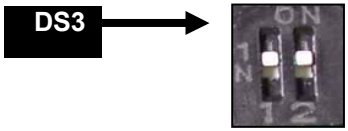
The RS485 requires daisy-chain connection among the equipments. There must be terminator resistors for impedance matching (typically 120 ohms, within the range from 90 to 250 ohms). Terminators are to be located at both ends of each RS-485 net.



Impedance setup for the speed dome

Each speed dome camera has a switchable terminator resistor built in, which is set to OFF position as the factory default.
In a network of RS485 chain, the speed domes are classified in two categories: **end unit** (unit #1 and #32) and **node** (#2 through #31). ← refer to chart in previous page.

To set up the resistor correctly, installer must decide if the specific dome camera is the termination device or not, i.e. if it is at the end of the RS485 chain.
The impedance setup is provided by the bit 1 and bit 2 of DIP switch **DS3 .**



Bit 1	Bit 2	Impedance
--	--	**Open (device on node)**
On	On	**Standard 120 ohms (device at end)**

- For nodes: Set both of Bit 1 and Bit 2 to **OFF** position
- For end unit: Set both of Bit 1 and Bit 2 to **ON** position

Impedance of the control unit

This is generally for two cases: controller with RS485, and controller with RS232.
Controller with RS485:

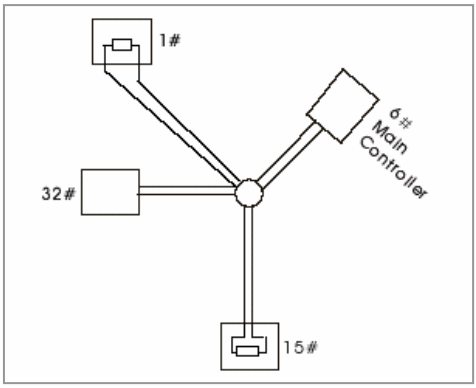
Most keyboard and video server in market have RS485, and are equipped with terminator resistor to drive a RS485 system.

Controller with RS-232

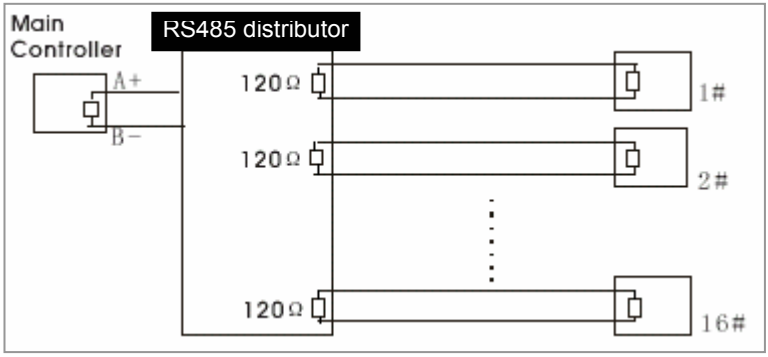
But most PC and notebook sort of devices have RS232 or USB port but no RS485. Therefore, for PC system, a RS232 or USB to RS485 converter is neded. Installer must check out if the converter has proper terminator resistor.

Problems in practical connection

In some circumstances user adopts a star configuration in practical connection. The terminator resistors must be connected to the two equipment that are farthest away from each other, such as equipment 1# and 15# in the following picture. As the star configuration is not in conformity with the requirements of RS485 standards, problems such as signal reflections, lower anti-interference performance arise when the cables are long in the connection. The reliability of control signals could be downgraded with the phenomena that your dome camera does not respond to or just responds at intervals to the controller, or does continuous operation without stop



In such circumstances the usage of RS485 distributor is recommended. The distributor can change the star configuration connection to the mode of connection stipulated in the RS485 standards. The new connection achieves reliable data transmission.



6. Mount The Dome Camera

There are 3 (Three) ways to mount the PTZ camera, which are:

1. **Attached to the ceiling surface directly**
2. **Held to ceiling surface through a bracket**
3. **Mounted to wall through a bracket**

Please find the accessory information in the list on the next page to get understand of what component is for which mounting.

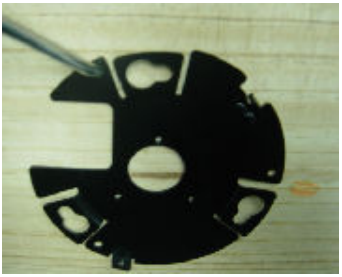
6.1 Mounting Accessory

The following items are supplied with the speed dome for the camera mounting.

	Description	Photo	Use
1	**Mounting base**		a To hold the camera on ceiling surface b Used together with item # 2 (bowl type holder) for ceiling hold or wall mount
2	**Metal bowl holder**		To work with item 1 for creating ceiling or wall mount
3	**Screw pack**		Screws for the build of camera's holding structure

6.2 Surface mount onto Ceiling

1. Locate the base onto the place the camera is to mount, and fix the base on the place tightly with screws through the 3 holes on the base (be sure screws are complete in the ceiling)
2. Get the camera and secure it to the base with the supplied metal chain.
3. Then fit the camera body to the base, rotate the camera body clockwise until it is completely locked into position.
4. Put the screw A (anti-loss) in position and screw it in



In case of dealing with a **concrete** wall:

a. Mark the locations for screw through the holes on the base
b. Make holes on the wall, then insert the supplied plastic plugs into the holes and squeeze them in until they are flush with the wall surface.
c. Mount the base on the desired place tightly with screws

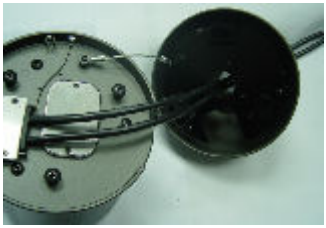
6.3 Wall-mounting

To mount the camera from ceiling, a metal wall-mount bracket in separate package will be needed.

The mounting procedure

Step 1 Get the metal bowl and mounting base, put them together with screws to make them a sub-assembly for mounting.

Step 2 Hook the sub-assembly and camera with the safety cable located on the bottom of camera (left picture on below), then put the signal cables throughout the sub-assembly (right picture).



Step 3 Fasten the sub-assembly and camera together. Rotate camera all the way clockwise. Fix the base to camera with the supplied screw and wrench.

Step 4 Get the wall-mount bracket. Remove the metal cover (sheet) from the bracket (Fig-1)

Step 5 Mount the bracket onto wall (Fig-2) but DO NOT tight the bracket to wall completely until the Step 6 and 7 are finished.

Caution: Be sure the wall is strong enough to hold the entire device (i.e. housing + camera)

Step 6 Lay all the signal cables (RS485, video, power and alarm-wires) in the trench of bracket, and have all connectors come out bracket through the cable outlet (Fig-3).

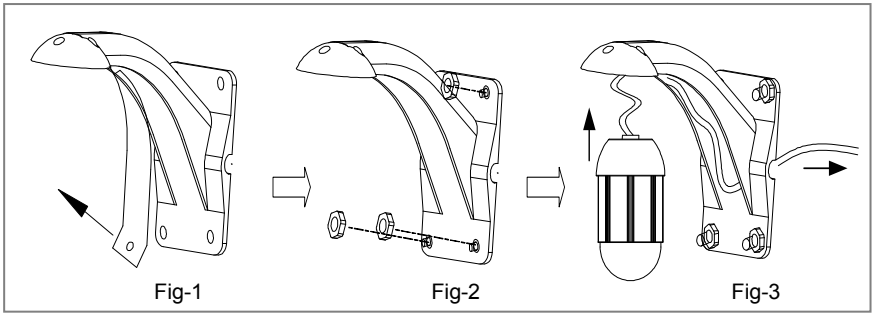


Fig-1 Fig-2 Fig-3

Step 7 Fix and tighten the camera module (assembly) to the bracket with supplied screws（Fig-4）

Step 8 Put the cover back to holder（Fig-5）

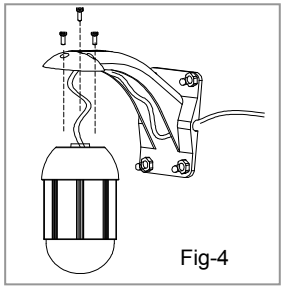


Fig-4

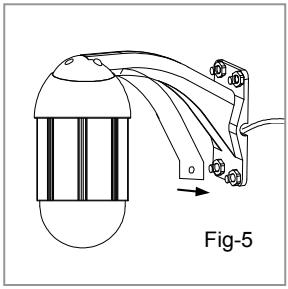


Fig-5

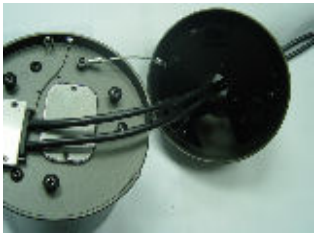
6.4 Ceiling -drop

To mount the camera from ceiling, a metal wall-mount bracket in separate package will be needed.

The mounting procedure

Step 1 Get the metal bowl and mounting base, put them together with screws to make them a sub-assembly for mounting.

Step 2 Hook the sub-assembly and camera with the safety cable located on the bottom of camera (left picture on below), then put the signal cables throughout the sub-assembly (right picture).



Step 3 Fasten the sub-assembly and camera together at the joint of D-sub connectors. Rotate camera all the way in direction of clockwise. Fix the base to camera with the supplied screw and wrench.

step 4 Get the ceiling mount bracket. Put cables into the tube,

advise: <u>start with the 9-pin alarm I/O; Take the male part off to reduce connector size,</u> <u>to make cabling through tube easier)</u>**.**

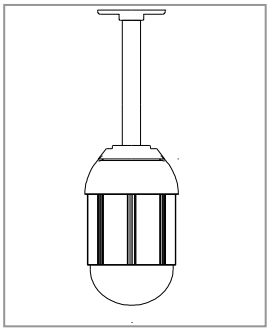
Have all connectors come out the tube from cable outlet near the top of the bracket.

Step 5 Fasten the camera module (sub-assembly) to

the bracket with the supplied screws

Step 6 Mount the bracket onto ceiling and tight the bracket completely.
Caution: Be sure the wall is strong enough to hold the entire device (i.e. housing + camera)

The figure on below shows how it looks like when ceiling-drop is finished



7. Connecting Wires

The cables, wires and connector attached to the speed dome are categories into 4 major functions of:

1. Power
2. Video
3. RS485
4. Alarm-in and out

They are easily distinguished from one to another, as being featured with different connectors. Refer to the picture on below to learn about cable and connector information.

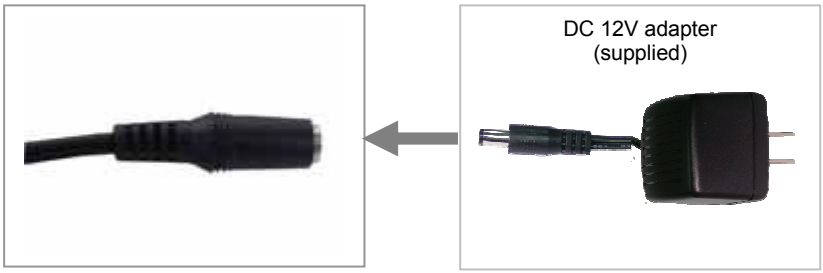
7.1 Power

The camera has two versions for power: DC12V or AC24V.

1. DC12V:

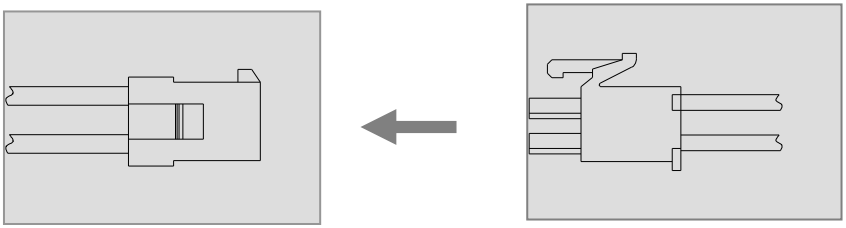
   When operated with DC12V, the camera may consume 1000mA DC current in full load condition. To secure the safety and maintain correct function, always use the 12V / 1.5A DC adapter supplied by the manufacturer.

   To power the speed dome is simple. Get the DC jack from the camera, and connect the adapter plug to the jack.



2. AC24V: (AC adapter of 24V / 1.66A is optional.)

   An AC adapter of 24V / 1.66A is supplied with the camera / housing for the AC version. To power the camera, connect adapter to camera's power connector.



Power Connector on Speed Dome

AC 24V Connector on Adaptor

As soon as power is supplied, the speed dome will enter "initial check" mode with the following procedures:

- Move the lens around automatically for system check and calibration
- Screen will show blue picture words in white for around 5 seconds
- Then the camera will show normal image and get ready for control

7.2 Video

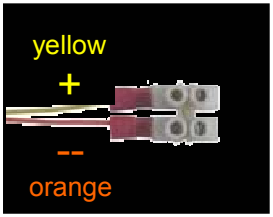
Video output of 1Vp-p is delivered at the female BNC end with 75 ohms impedance. To transmit the video to receiver properly, it is recommended to use RG59 A/U coaxial cable with stranded center conductor, with male BNC connectors on both ends.

RG59 is also in 75 ohm impedance, which matches the camera's output impedance. The A/U version is recommended, rather than the version B/U, due of its superior performance on flexibility for resisting severe twisting, bending and other stresses which occur in many CCTV installations.

In case the installation distance is over than 500 meters (1,500 feet), additional amplifier might be needed to keep the video level and image quality.
If superior video quality is strongly demanded, you may need to add the video buffer for each 300 meters or even 250 meters.

7.3 RS485

The camera adapts RS485 in half-duplex pattern, a two-pin connectivity as shown on the right picture.



Installer must pay attention to the polarity of these two pins – yellow wire is the POSITIVE end, and orange is the NEGATIVE. Communication between controller and camera will break and control will not function if they are reversely connected.

The RS485 communication may run for 4,000 feet if the system network is properly built. Two important factors should be handled with care during the system build-up--- baud rate and termination impedance. More information about RS485 are in sections "**Protocol** and **Baud rate**" and "**Applications**".

7.4 Alarm Input & Alarm Output

This camera is equipped with 3 alarm-in and one alarm-out for intrusion management. Installers may connect the inputs to various sensors and program the camera to move to specific spots for visual check when evens take place. Dwell time is programmable, subject to the controller (some controllers don't offer the access to dwell setting)
Refer to the table on below for function assignments to each alarm I/O.

Alarm in	Wire Color	Alarm GND	Wire Color	Alarm out	Wire Color
Alarm in 1	Black	Alarm 1	Brown	N.O.	Gray
Alarm in 2	Red	Alarm 2	Orange	N.C.	Purple
Alarm in 3	Yellow	Alarm 3	Green	Com.	Blue

Alarm inputs

This speed dome has three alarm inputs, and each input is given by the software a companion view preset. When trigger single is sent to alarm-in, the following reactions will be taken by the speed dome:

- The pan-tilt mechanism will move lens to the preset.
- The alarm-out port will act.
- Via RS485, the console (control unit) will be notified

The three inputs and their correspondent view presets are independent from one to another. Therefore, with the connections to three sensors, installer can set up camera to monitor three different spots with different dwell time.

Presets For Events

Default settings at the alarm-ins activations are:

If setting(s) is / are done to presets 17, 18 and 19 :

- At the trigger of alarm-in number 1, lens will move to preset 17.
- At the trigger of alarm-in number 2, lens will move to preset 18.
- At the trigger of alarm-in number 3, lens will move to preset 19.

If one or more positions of presets 17, 18 and 19 is / are empty:

- At the trigger of alarm 1, lens will move to preset 1 (preset 17 is empty)
- At the trigger of alarm 2, lens will move to preset 2 (preset 18 is empty)
- At the trigger of alarm 3, lens will move to preset 3 (preset 19 is empty)

Note:

- All the three alarm inputs are TTL level and triggered by negative signals.
- To utilize the default view positions, user must pre-set the desired monitor spots to presets number 17, 18 and 19 (or 1, 2 and 3).

Alarm-ON Management Protocol

With the arrangements pre-defined in its software, the PTZ camera will perform the following surveillance functions automatically at the triggering(s) to alarm-input(s):

- Camera is running Auto-run when alarm signal(s) kicks in

1. When the first alarm signal hits this camera, camera will move to the corresponding presets (see relative information on above) at its maximum speed of 240° per second
2. Camera will stay at the preset position for 60 seconds
3. Camera will be back to the original auto-pan function after 60 seconds, if no second alarm-in jumps in this 60 second time frame.
4. In case the second and third alarms occur during the 60 seconds, camera will move to the preset set for alarm-2, stay there for 10 seconds, then move to the next preset set for alarm-3, stay for 5 seconds and keeps moving around these presets until the 60 second time frame is over.
5. Camera will be back to its original auto-run function after the 60 seconds.

- Camera is in steady mode when alarm signal(s) kicks in

1. When the first alarm signal hits this camera, camera will move to the corresponding presets (see relative information on above) at maximum speed of 240° per second
2. Camera will stay at the preset position for 60 seconds
3. Camera will be back to the original position after 60 seconds, if no second alarm-in jumps in this 60 second time frame.
4. I In case the second and third alarms occur during the 60 seconds, camera will move to the preset set for alarm-2, stay there for 10 seconds, then move to the next preset set for alarm-3, stay for 5 seconds and keeps moving around these presets until the 60 second time frame is over.
5. Camera will be back to its original position after the 60 seconds.

☒

☒

Alarm output

The alarm output is a hardware toggle switch of NC (normal close) and NO (normal open). In the event the camera receives trigger signal from one of the three alarm-inputs, the two output ports will exchange their states (i.e. NC port will turn into OPEN condition, and NO port will become CLOSE). This is used for activating various external alarm devices, such as siren, recorder, alarm-light or call-out system.
Alarm-on status will be automatically relieved at the 30th minute from the triggering point and PTZ will be back to the original conditions. To relief system the alarm-on status manually, use the MANUAL OFF on the controller (subject to the function's availability to the controller)

Warning:

The NC/NO port provided by alarm-out is a mechanical contact relay.
Make sure the device connected to the alarm-output does not drain current over than 0.5A and the voltage is not higher than DC 24V or AC 250V.
Any load over these may damage the alarm output port permanently.

8 Applications

The PTZ camera, by itself alone or encompassed in different numbers of domes with comprehensive matrix switching, is mainly for link to 4 different control means (also known in different terms such as **controller**, **console** or **host**):

- **PC-based system**
- **Keyboard controller**
- **DVR** (Digital Video Recorder)
- **Video server**

8.1 Controllers and RS485

While most keyboards, DVRs and video servers are equipped with RS485 port, which can be directly connected to speed dome, desk top and notebook computers usually don't provide direct output of RS485. Therefore an interface device (signal converter) will be needed when computer is used as the controller.

RS485 converter

Note:

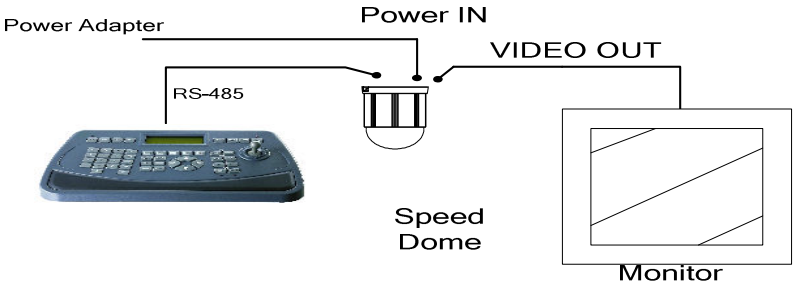
Check the PC first to see if RS232 port or USB port is available to the specific unit. Some may have both while others only have one of the two.

If you need the RS232 or USB to RS485 converter, check with your camera supplier for the information.

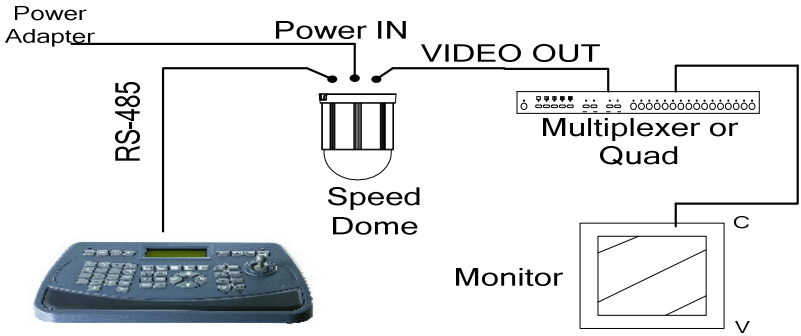
8.2 Connect RS485 from dome to console

- Connect the RS485 of camera to controller (such as a keyboard) with a pair of twisted cable. Tele-control to speed dome will be executed via this cable.
- Connect camera's video signal to multiplexer, monitor, DVR or video server directly.
- Power (DC12V or AC24V) shall be applied to the camera via separate DC or AC adapter.
- If there is only one PTZ camera connected to the controller, leave the terminator resistor in the PTZ camera OPEN.
- Select proper control protocol and baud rate at the controller and the speed dome. Be sure both sides (camera / controller) have the same protocol and baud rate.

Connect to keyboard + monitor

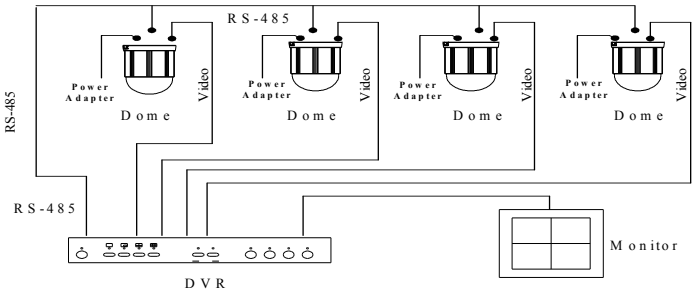


Connect to keyboard + MUX



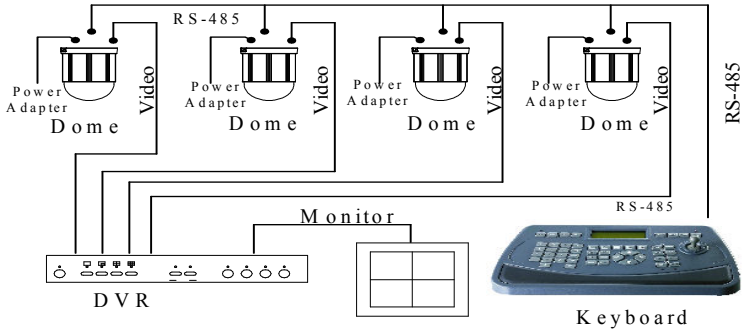
Connect Speed dome to standalone DVR

- Connect the RS485 of camera to controller (in this case, the DVR) with a pair of twisted cable. Tele-control to speed dome will be conducted from the DVR via the cable.
- Connect video signal to a multiplexer, matrix or DVR. If video is sent to a multiplexer or matrix instead of DVR, it needs to be relayed to DVR via the MUX or matrix for making record.
- Power (DC12V) shall be applied to the camera independently with the supplied power adaptor.
- Set the terminator resistor in speed dome to **OPEN** position, if only one speed dome is connected to the controller.
- If two or more speed domes are in the system, the terminator resistor of END unit must be loaded (more information is in the next section).
- Select a proper protocol and corresponding baud rate for the DVR. Be sure



both sides (PTZ camera and DVR) have the same protocol and baud rate.

- In case the DVR does not have PTZ control function, use a separate keyboard for the camera control. Protocol shall be properly selected, too.



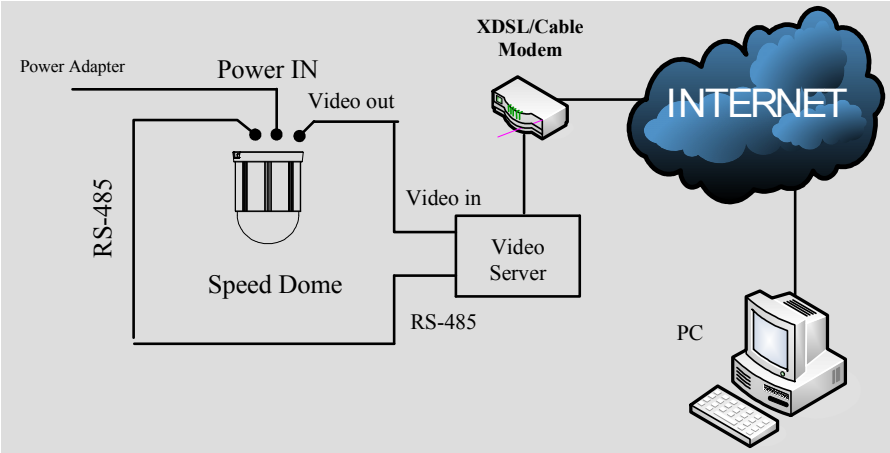
Connect Speed dome to video server

Video server, the contemporary device for conducting surveillance through LAN and WAN, can also be the controlling tool for this speed dome camera.

Most video servers in market are built with RS485 port and one video-in for connecting one camera. To work with this speed dome, installer must connect both signals (video and RS485) from the server to the camera, as the picture shown on below.

First of all, the **camera ID should be kept on number "0"** (zero) **or 1** (one) when it is linked to a video server, unless your video server requires different ID. Be sure the RS485 polarity is correctly handled. Once the wirings are completed, start the video server control panel on computer and follow the instructions on below during the video server setup

- Choose **Pelco D** as the control protocol
- choose **RS485** as the communication format
- baud rate matches the setting in camera; "**2400"** is recommended
- parity is set to "**0**" (zero) or "**None**"
- Data bit is "**8**" (eight)
- Stop bit is "**1**" (one)



You should be able to control to the speed dome after these are correctly set up. For advanced functions, you must follow the instructions given by the video server manual.

8.3 Connect two or more domes to console

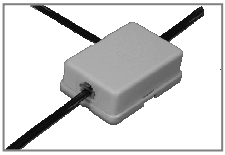
As the RS485 supports multi-drop topology, two or more devices can be connected to one controller as a system. For such application, the rules must be followed:

- Connect all speed domes to host in daisy chain pattern as possible as you can Star type configuration should be avoided to keep system away from instability.
- Each speed dome must have its unique ID so communication data can be delivered to the correct target device.
- Impedance-match setup is also required to keep RS485 communication quality.

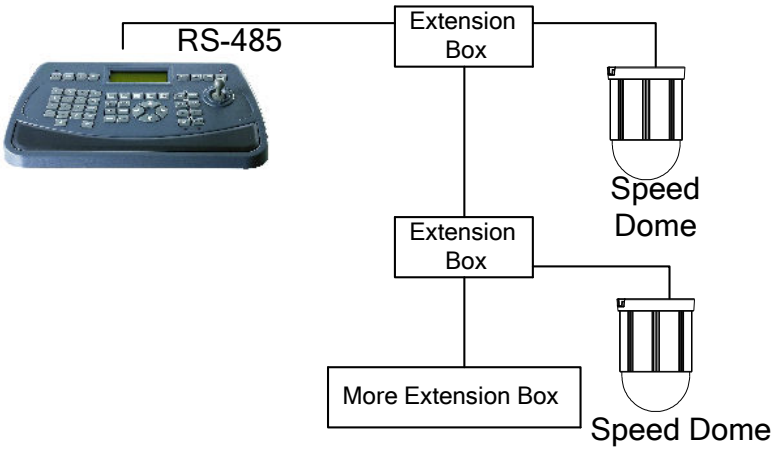
Make wire distribution

Connect the other end of the cable to a phone box with extension outlet of two. Installer must **pay attention to the pins** of the extension box to ensure the connection is correct.

To connect more cameras, copy the same procedure on above. You may continue extending the quantity of camera to its maximum number of 128 per network, if the control device has the capability of addressing that many ID..



Extension box



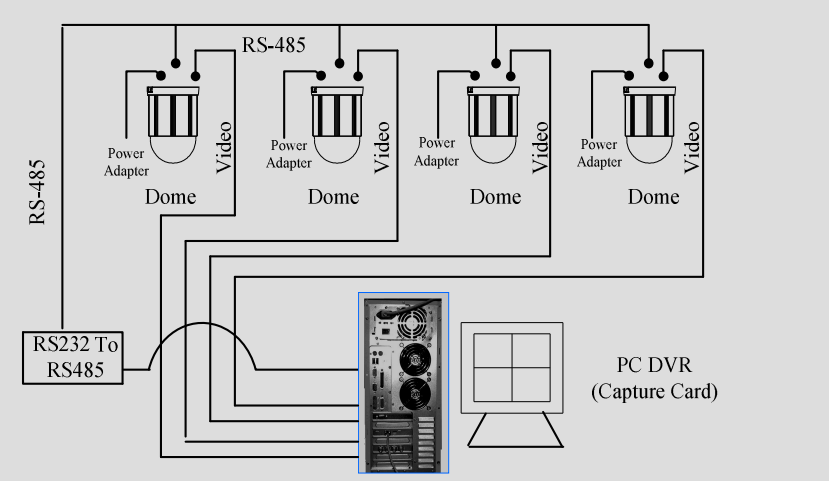
The extension wire and box are available in general electronic and phone shops.

■ Connect Speed Dome and PC (Capture Card)

When PC is used as the console, installer needs to connect both of video and RS-485 signals to PC but separately.

Most capture cards have 4 video input per card, and normally each PC has slots for 4 cards, meaning that up to 16 cameras can be hooked to one PC.

- Video: connect the camera video to the video-in of a capture card.
- RS485: the RS485 shall be connected to the RS232 or USB port through an signal converter. Refer to the previous section for the establishment of the RS485 network (watch the difference of impedance setup for terminal device against single or multiple domes in a network)



- Power: camera's power is to be connected locally with the supplied adapter.

9. Camera setup --- OSD functions

This PTZ camera has many functions available to users' for setting and adjusting. Most of these functions are accessible through OSD (On-Screen-Display) menu.

In OSD table 1 on the following page, you may find summary of all the OSD functions provided in the speed dome.

In OSD table 2, following the table A, you will find a table of the keys and buttons used for OSD operation, for different controllers you may choose.

hereunder is the briefing for the open of OSD

1.	AcutVista keyboard (MKB-3010 / DVR):	menu button
2.	keyboards from other makers:	call preset 88
		save preset 95
3.	GeoVision software	OSD button
4.	Other software	double click on preset 1 (quickly)

Advanced settings to DSP and optical functions are also available in the OSD menu, in the title "CAMERA" of the main page.

OSD table 1 : Function list

	Layer **1**	Layer **2**		Layer **3**	remark
1☒	System	Controller	Keyboard	AcutVista, Regular	
☒		☒	PC DVR	GeoVision, Kodicom, AverMedia, V-Guard☒	
☒		Info (4-items; see remark)			Protocol, ID, Baud rate, F/W version
2	Display	Cam ID / name, Preset name / number, PTZ position		name and number editing	
3	Camera	Zoom speed (level 1-8)			☒
☒		Advanced functions		cam title, white bal. backlight, motion detection,	DSP and optical function or adjustment
☒				focus, exposure, special, reset ➔ layer 4	
4	Scan	Auto pan		pan/tilt, pan only, circle ➔ layer 4	auto-pan between two spots or in circle
☒		All preset		speed, dwell, run (engage)	auto-run across all presets stored in the camera☒
☒		Group scan		group 1–4 ➔ layer 4	auto-run: group 1, 2, 3 or 4
☒		Tour scan		group 1–4 (add-in); speed, dwell, run (engage)	auto-run: mix of group 1 - 4
☒		Patrol		preset 1-32 (add-in); speed, dwell, run	mixed choice among preset 1-32,
5	Control	Auto-resume		preset. auto pan. all presets, group, tour. patrol, time-set (1–10 min) ➔ layer 4☒☒	retrieve PT position or auto-pan when control has been idle for some time (setting)
☒		Power-on resume			retrieve position or auto-pan after power is on
☒		Preset freeze		☒	☒
☒		Image flip		☒	☒
6	Privacy	Mask 1-8		position (setup), enable (On/off) ➔ layer 4	
7	Alarm	Relay. Input 1-3, Output☒			
8	Initialize	Power-on reset ....☒			re-start camera to calibrate the unit one-time
		Camera default			retrieve factory default (not include PT function)
		Factory default			retrieve entire factory default (include P/T)
		Lens refresh		off, 1, 2, 3, ---- 15 days	re-calibrate iris / focus / zoom system periodically
		Camera refresh		off, 1, 2, 3, ---- 15 days	re-calibrate camera's PT system periodically

OSD table 2 : Operation Key of Different Consoles

☒ ☒	Keyboard		PC-base DVR			
	AcutVista MKB-3010	**REG**ular **K**ey**B**oard	GeoVision	Kodicom	AverMedia	VGuard
Open up OSD	Menu button	Call Preset 88, or Set Preset 95	OSD button	Click Preset 1 twice		
Move cursor	left / right or up / down buttons; subject to different pages	Joystick left / right or up / down; subject to different pages	up / down buttons			
Enter sub-menu (next layer)	enter button	Joystick to right, or Iris open	right button or Iris open	right button or zoom-in		
Back to previous page	exit (OSD) or enter (keyboard)	Iris-open on End or Exit (OSD)	Iris-open on End or Exit (OSD)	Zoom-in on End or Exit (OSD)		
change the options	left / right or up / down buttons; subject to different pages	Joystick left / right or up / down; subject to different pages	Left / right or up /down buttons subject to different OSD page			
Save selection	enter button	Iris-open button	Iris-open	Zoom-in		
Quit menu	enter on Exit (OSD)	Iris-open on Exit (OSD)	Iris-open on Exit (OSD)	Zoom-in on the exit (OSD)		

1. **System Info**

To choose your controller and review the basic setup done to this unit.

- Controller: Keyboard and DVR are two most common devices used for PTZ control. However, controllers are different in some functions that makes PTZ control is perfect with some controllers but not with the others.
  This happens in DVR commonly as many DVR panels do have enough control buttons (especially for OSD operation) that make some PTZ controls impossible.
  To solve the issue, this camera offers choices – for the controllers don't have enough buttons, you may use alternative keys. (see OSD table B)
  Find controller option list in the sub-menu. Select the one matching your controller.
- Info: To show you the current setting of protocol, baud rate, camera ID and firmware version. Protocol, baud rate and ID are set up with the DIP switches
- Return: To return to the main OSD menu

2. Display

To decide whether to display the number and name of this camera, current preset and the zoom / focus information on the screen.

Camera ID: show or not show the number of this camera on display. Choose ON or off (default is OFF)

Camera Name: show or not show the name of this camera. Default is OFF. when ON is selected, give the name in the next layer. Naming is by choosing alphanumeric characters from the list (displayed one per time). Maximum length is 16.

Preset Name: show or not show the names of presets. Default is OFF when ON is selected, give the name in the next layer. Rule is the same as naming the camera (see above lines)

Preset Number: show or not show the numbers of presets. Default is OFF.

PTZ Position: show or not show pan, tilt, zoom positions. Default is OFF.

3. Camera

This section is to let you choose the correct camera version, define or adjust the image and optical functions, and decide the zooming speed.

Camera Type: two versions of menu are in list – 30x D/N and 30x W. The D/N and W versions are very different in mask setting and backlight process, so be sure your OSD menu matches the

camera version.

Zoom Speed: to set the speed of zooming. 8 levels are in option list. It is recommended you make test to different speed before make the choice. Fast speed saves time but may cause missing of the best position for image size. Slow speed does the opposite for the good and bad.

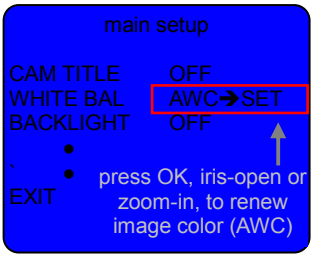
Advance Setting: Most of the camera's DSP and optical functions are to be setting or adjusted here, under the sub-title.

Cam Title: This is for setting and show camera name; Similar function is available in the main page, so we suggest you leave this OFF constantly.

White Bal: White balance function is for setting color temperature based on the environment the camera is in, or personal perferance:

ATW: Auto-Tracking-White balance. ATW checks the whole image, weights all colors in the picture and updates the white level and color temperature, which is good for constant changing scene.
Two ATW modes in option --- indoor and outdoor. Indoor mode tends to be more blue and outdoor gives more red to the whole image.

AWC: Auto-White-Balance. Camera will make color calibration to the picture for once and keep the color temperature until the next order is given. To refresh the color, you need to make a manual trigger to the AWC when it is shown on the display.



Manual: to adjust color preference manually. Manual setting is let you fix the color temperature, which can be good for indoor and static environment.
If the lighting is tungsten or alike (more natural), try to add more blue or reduce red a little; If lighting is fluorescent or within white spectrum, try to add more red or reduce the blue.
Default values are 32 for RED, 40 for BLUE; we suggest you not to give setting away from these two default numbers by too much.

Back light: Backlight function is for improving the image quality in the scene that strong light is behind the object, which usually will wash the image out considerably. Backlight function is to reduce exposure time and video gain, if necessary, to avoid over-exposure.

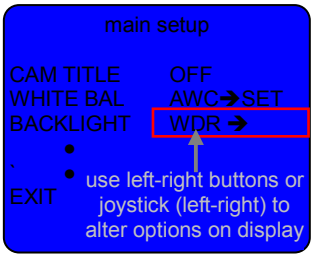
The Backlight function in 30x D/N version is different from the 30x W version – the later one has so-called WDR instead of regular backlight improvement.

30x D/N version

D/N version works on single time exposure. When backlight function is engaged, it reduces exposure time and video gain (if necessary) to avoid over-exposure.
You are suggested to make tests with all the options in list on site, then make final choice.

30x W version

30x W version, also known as WDR version, provides double exposures for one image. When this function is engaged, it takes one exposure at high speed (1/6,000 or 1/10,000 sec) and the other at normal speed (1/50 or 1/60), leverage the brightness and superimpose the two into one picture. WDR will deliver better contrast in the strong back-lighted condition.
You are suggested to make tests with all the options in list on site, then make final choice.



Motion DET: Not an available function for this model.

Focus: Focusing is one of the most important and frequently-used functions of a zoom camera. This camera offers 3 focusing modes, each can be in-tracking or not with the zoom control.

see OSD table 3 to know what focus function will react to different control or movement in each mode.

One push: The One-push function is to drive lens to make one-time auto-focusing per trigger. This function is embedded in certain controls, such as making zoom change in manual focus mode…

Auto: The AUTO mode will enforce the lens to adjust its focusing automatically when object moves or scene has changed.

suggestion: if the camera is used for watching static zone constantly with few moving object, you may set the AUTO FOCUS on;
If the camera is watching areas with heavy traffic, it is advised to choose other focus mode, or the image may look "shaking" due to unnecessary focusing.

Manual: To fine tune and obtain the optimum focusing.
In certain conditions, such as weak contrast, dark scene … camera's auto focus function may not get the best focus position. In such case, you can adjust the focus manually.

OSD table 3 --- focus action vs. settings

focus	One-push		full-AUTO		manual	
	zoom-tracking		zoom-tracking		zoom-tracking	
	ON	off	ON	off	ON	off
scene change	no action	no action	auto focus	auto focus	no action	no action
zooming	In-focus on trip	focusing at stop	In-focus on trip	auto focus	focusing at stop	focusing at stop
panning & tilting	focusing at stop	focusing at stop	auto focus	auto focus	no action	no action
preset moving	focusing at stop	focusing at stop	auto focus	auto focus	no action	no action

Zoom TRK: this is to drive focus-lens to move along and be coordinated with zoom-lens, so you will have in-focus image all the way during the entire zooming journey.

Zoom TRK SPD: the focusing speed during tracking to zooming.

Slow focus-speed may deliver better focus result when image or target is in mono pattern or weak ambient light.

D-Zoom: to utilize digital zoom or not. Range is from
D/N version: 2 to 10x
W version: 2 to 8x.
Digital zoom is to fill in the display with partial of the image, therefore will not give the same detail as the original image does. It could make help if the target object does not have much detail.

DISP Zoom MAG: to show or not show zoom number. Default is OFF.

Zoom INIT POS: To assign zoom position for power-up condition.

Lens Initialization: To re-calibrate the lens once. When you are seeing abnormal focusing (image is out-of-focus even you engage auto-focus), zooming or exposure (for example: complete white or black picture), you may refresh the camera with this function.

Exposure: Exposure is the key you can get good image with. Exposure setting is highly dependant to the ambient light (type and strength), and varies from one situation to another.

In this section there are 3 items can change actual exposure and 3 others are for image quality modification:

- exposure factor: iris, shutter, sens-up
- image quality factor: brightness, AGC, SNR

Some of these factors are conflict to each other in certain modes; refer to OSD table 4 for the details.

Brightness: Human eyes are more sensitive to brightness than other image factors, meaning that brightness control is quite important. Brightness is very personal subjective, therefore you need try the adjustment with your visual system.

.reminder: brightness control is also available on most display. Check your display to ensure the monitor has correct brightness setting.

Iris: Iris is one of the two major mechanisms for exposure level control, besides shutter speed.

Iris is the window for light to pass onto CCD (sensor), so the size of it will determine the energy of light can reach CCD at a time. Therefore, bigger iris provides brighter image, while smaller iris will give darker picture.

Iris options are AUTO and MANUAL;

suggestion: AUTO is more recommended for most conditions, unless you have particular environment (such as indoor with stable lighting), because it adapts better to the changing ambient illumination.

note: While iris is in auto mode, it has the priority for exposure control. Shutter speed will be fixed,("---" on shutter) unless you manually apply shutter with other setting.

note: Manual control allows you to adjust iris size from complete closed ("0") to fully open ("100").
If you set iris to "manual", then shutter takes over the priority position for exposure control (seeing "ESC" on shutter setting).

Shutter: Shutter is the "pseudo" mechanism for controlling exposure time. In normal indoor condition, shutter speed is usually set to 1/60 second (1/50 for PAL system). In stronger light condition, shutter must be reduced, or image could be washed out. For

darker scene, shutter should be increased. This camera offers 3 options to you:

ESC (auto): If iris is set to “manual” mode, ESC is the choice used for the most conditions. Software will check light level and set up shutter speed automatically.

Manual: to assign a fixed shutter speed
This can be the choice if camera stays indoor with constantly stable ambient light.
In normal light, try speed between 1/60 --- 1/500. Be advised that, for speed higher than 1/120, color rolling can be easily observed.
In constant faint or dark condition, use extended exposure (x2, x4, ---); Try the low number first. If picture is still dark and with much noise, try the higher times.
Extreme high (1/2000 and above) and sens-up exposure (x64, x128) are not recommended unless you have special condition to deal with.

Anti-Flicker: Automatically set the shutter speed to 1/50 (1/60 for PAL system) to avoid the flicker created by the normal lighting system (especially in the fluorescent light environment)

AGC : Auto-Gain-Control, for keeping video output level stable and stays within standard range. Turn AGC to high in dark, or low in strong light condition;
OFF, **low**, **mid** and **high** are the option

note: If you turn the AGC off, then SNR and sens-up functions will be defeated automatically. (see OSD table 4)

SSNR : Super Noise Reduction, for improving quality of the video captured in dark. **OFF**, **low**, **mid** and **high** are the options

When camera works in dark conditions, a lot of noise will be in video (snow-like spots, easily seen on display). Such noise will down grade the quality and performance of the entire security system, from surveillance to recording (DVR), significantly.
SNR function is to reduce the noise level when video level is down due to darkness.
Be aware that the SNR will also reduce image’s sharpness, so try different noise reduction grade , check sharpness change,

then decide which SNR level you will live with.

SENS-UP: sens-up is an useful function for increasing image brightness in dark condition, in 12 different levels of gain with auto-control:.

Auto: when surrounding is detected for too dark, extended exposure will be automatically applied to increase image's brightness to provide reasonable signal-to-noise ratio.
You need to give the limit in sub-page.
Limit: Maximum gain the function will do.

Off: to defeat this function.

note: If you turn the AGC off, or assign a fixed shutter speed (manual or A-FLK mode) the sens-up function will be defeated automatically. (see OSD table 4)

note: If you are familiar with still image camera, the sens-up is like the B-shutter.

suggestion: Because sens-up is carried out by extending exposure time, ghost-like image (in transparent and slow motion) will be unavoidable for moving objects. The higher number of sens-up is given, the worse such phenomena you may get. You are advised to make test to all the levels before making the final setting if the function is to be applied.

OSD table 4 … exposure setting combination

		iris		shutter				AGC		SNR		Sens-up	
		auto	manual	---	ESC	manual	A-FLK	off	ON	off	ON	off	AUTO
iris ☒	auto	※D : valid setting / the default											
	manual	※ : valid combination											
shutter ☒ ☒ ☒	--- (fixed)	※ D	☒	: invalid combination									
	ESC (auto)	☒	※ D										
	manual	※☒	※										
	A-FLK	※☒	※										
AGC ☒	off	※☒	※☒	※☒	※☒	※☒	※☒						
	ON	※☒	※☒	※☒	※☒	※☒	※☒						
SNR ☒	off	※☒	※☒	※☒	※☒	※☒	※☒	※☒	※☒				
	ON	※☒	※☒	※☒	※☒	※☒	※☒	☒	※☒				
Sens-up	off	※☒	※☒	※☒	※☒	※☒	※☒	※☒	※☒	※☒	※☒		
	AUTO	※☒	※☒	※☒	※☒	☒	☒	☒	※☒	※☒	※☒		

Special: In this section more advanced functions. However, some of them are not available in this model.

User Preset: not available to this model;
although you may access the sub-menu, do changes to the settings, they won't be executed nor saved.
➔ Keep it in OFF position all the time.

Privacy: Privacy setting and management function is moved to the main page, in title of "Privacy Mask"; see page __
➔ Keep it in OFF position all the time.

DAY/NIGHT: An IR (Infra-Red) filter is placed CCD and lens, to cut off non-visible light from going to CCD, for obtaining better image quality. Such filter must be removed when IR light source is provided in dark, or camera can not receive the IR signal and no image will be reproduced.

Mode: Color (light): (color) burst level is adjustable
B/W (dark): burst on / off switch; we suggest you keep OFF all the time, for having higher image resolution
Auto (cycle): no user changeable function

note: when you change to Auto from B/W, picture may remain in B/W
➔ Make change from Color mode to Auto.

SYNC: This model does not provide external sync option, so nothing needs to take care for this.

Comm. Adj.: this is the communication setup for camera and the main CPU, not a user function. Please leave it untouched.
If you make change to it, camera will re-start automatically to retrieve normal communication..

Image Adj: To adjust image quality by changing the number of each item.

FREEZE: to freeze image permanently until off is re-assigned. (freezing image for running presets is provided in CONTROL page)

H-rev	to turn image left to right
V-rev	to turn image up-side down
Sharpness	to improve the details of objects.
Color	give moderate adjustment to color

Reset This is to help you to get the camera factory default back (NOT include pan-tilt settings).
Such refreshment is helpful if you are lost with settings, or when camera needs re-calibration to iris, focus or zoom position.

Exit Back to the main menu

4. **Scan** You may choose the most suitable auto-run function among the various patterns given by this camera; When engaged, camera will move, in clockwise direction, from one preset to the next until stop is called.

Auto Pan 3 sub-items:

Pan / Tilt To carry out continuous pan / tilt between two positions A and B. Complete the settings of start position, end position, moving speed and dwell first . If you wish to engage it right away, press RUN on the menu.

Pan Only This is for continuous panning between two spots A / B. Camera will not move in vertical direction, however.

Circle To perform continuous panning in 360^{o}. You need to choose the start point and panning speed.

All Preset To make camera move around all the presets stored in this camera. Set up the speed and dwell, then start running the scan with RUN command on list.

Group Scan To make camera move around all the presets stored in this camera..
This camera automatically grouping the first 16 presets stored in it into 4 groups (1 ~ 4). The 4 groups can run separately, at their own speed and

dwell length per group.
In the sub-menu there is of 4 groups. Each has its own selection of speed and dwell, and you may run or stop one of these four alone

Tour Scan This function allows you to select and run the 4 groups in different combinations.

. In each Group in the list, you may choose to turn it on or off. You may also redefine the speed and dwell length, or skip them. Once the selection is done, press RUN on menu to start the journey.

Patrol Patrol is defined as the scanning to selected Presets (among 1 to 16). To organize the route, go through all the 16 presets one by one with decision of ON or OFF. Then choose the speed and dwell length for all the stops. Activate the function with RUN command on list.

5. **Control** In this section you can define how the camera will react to recovery from power down, long release from control, and make adjustment to image.

Auto Resume To decide whether camera will go auto-run after manual control stops for certain time. First you decide if you want to drive the camera into AUTO-RUN with ON / OFF selection, then you choose what type of auto-run and how long the camera will start doing it after control stops.

ON / OFF to turn this function on or shut it off

Mode the AUTO-RUN type you want to have.
6 modes are in option list::
Auto-pan (two spots), Auto-scan (all presets), Group scan (one of the 4 groups), Tour-scan (mixed groups) and Patrol (selected presets)

Time how long before the auto-run will go. Options are 1, 2, 3, 4, 5 and 10 minutes.

Power-on resume When this function is set ON and after power retrieves from breaking, this camera will automatically go the state it was running before power went down.

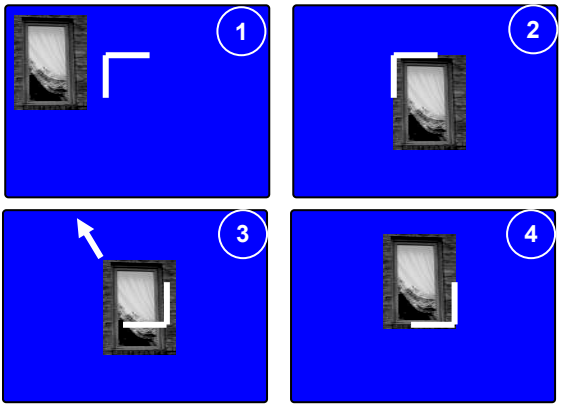
Preset Freeze This will keep image at rest when camera is running from one preset to another. It is useful if motion detection is set up in your DVR or you have network surveillance.
(a moving picture will cause false alarm)

Image Flip To turn the image up side down and left to right.

Return Back to the main menu

6. **Privacy Mask** To provide mask for privacy protection. Total 8 masks are available in this camera (D/N version has these 8 masks into 2 groups equally -- each group has 4; The two groups can not be applied on working simultaneously). The 8 masks can be configured independently – save, delete, sizing, positioning, and ON/off.
Setup procedure for all the 8 masks is identical:

Position: To locate your mask and define its size.



(1) Enter “POSITION”, a mark “⌐“ (capital L in horizontal position) will be on display, as the first boarder

note: For W version, mark is ■ - a square, instead of the L)

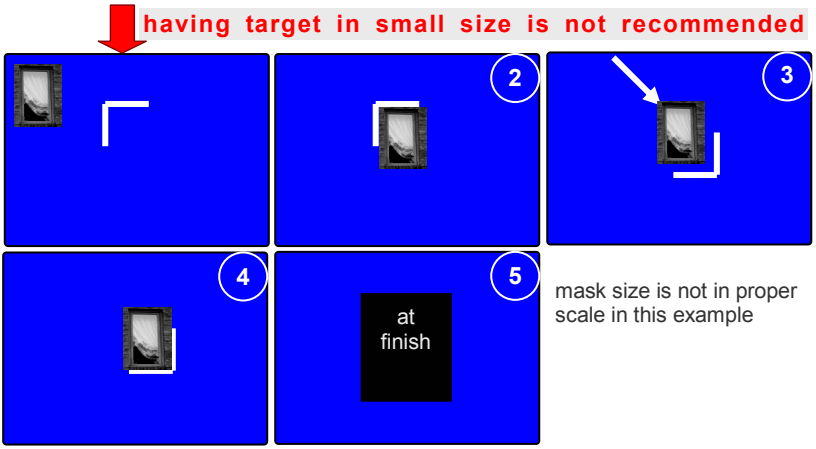
(2) Move the target to the lower-right area of boarder -- DO NOT let your target over the boarder. Press “ENTER” when you are OK with the position.
(3) As soon as you press ENTER, the second boarder will appear on the screen. If it resides your target area,
(4) move lens into left-upper direction until the target is on the left-upper of the second boarder completely.

important:

It is strongly suggested to set up mask in comply with factors:

1. have the target in relative large size
2. give mask size twice big as the target’s, or even larger

Although not recommended, it is also possible that the second boarder is out of the target area (fig.3; target is in small size). In this case, move the lens to right-lower direction until target hits the second boarder. This is not recommended because target may come out the mask when you zoom it in.



At the confirmation of the second boarder, black mask will appear in a proper size and block the target from being viewed. The black mask will also move to new position or change to new size, along with your PT and zoom in/out controls.

Enable: After the mask is created, you need to decide if it will be engaged. This is the place for you to enable or shut off the individual mask.

Return Back to the main menu

7. **Alarm** This camera has 3 sensor inputs, one relay out (toggle) and software motion detection function.

Relay The relay (marked as "alarm-out" on unit) has three pins – NC (normal close), NO (normal open) and common point.

Relay, as the alarm-out, is usually controlled by the residential software for reacting to trigger given by the alarm inputs.

Here you can use the relay as a manual switch.

On To drive the device connected to this relay for desired function

Off To turn the device to stop the function

Factor default position is “DEFEAT”. Make sure you have device connected to the correct pins.

Input 1 -3 The 3 alarm inputs have almost identical functions, except different PRESET positions are appointed to each input as default.

Default position: INPUT 1 ➔ PRESET 17
INPUT 2 ➔ PRESET 18
INPUT 3 ➔ PRESET 19

Through this OSD menu, you may redefine one or all the presets.

Options are from preset 1 to 32.

Overlap (multi-input to one preset) is allowed.

Output This is to decide if running to preset at trigger will be applied. Choose ON is you want this function armed. Default is ON.

Return Back to main menu

8. Initialize Functions in this section are for retrieving the camera from hang-up, or refreshing internal mechanism and software to avoid malfunction.

Device hang-up may occur due to misuse, interference, electrical surge or instability, cable-failure …. It happens in real live.

This camera provides restoring options for taking function back to normal through RS485 from remote end:

	Function	What it does	When to use
1	Power-On reset	Turn power off and restart the device automatically	Control of device fails (camera or PT function)
2	Camera Default	Restore camera’s default setting (not include pan-tilt function) Software reboot only; NOT turning power off and on	Get lost in making camera setup, or iris, focus or zoom functions abnormally, or seeing white / dark picture
3	Factory Default	Restore unit’s default settings given by factory (include camera and PT functions)	Mostly for device relocation or new installation. Operation setting are back to factory mode for new configuration

4	Lens Refresh	Re-calibrate lens mechanism and control to avoid improper lens function (focus, iris or zoom)	Suggest to make it routine; 3 to 5 days if zoom and focus are frequently used; otherwise 15 days should be fine.
5	Camera Refresh	Re-align both of the lens and Pan and Tilt mechanisms, to avoid malfunctions of PT and lens	Suggest to make it routine; 3 to 5 days if controls (PT and lens) are frequently used; otherwise 15 days should be fine.

10. Supplementary Notice --- Advanced Setting via Preset function

Note:

Functions in the following table MAY NOT be applied to other keyboards.

Preset Function for Keyboard		
Preset No.	**Call preset** Number key ➔ Preset	**Save Preset:** Number key ➔ Preset / **hold for 3 sec**
34	Return to home position	
70	Start All Preset Scan	
71	Start Group 1 (Preset 1~4) Scan	
72	Start Group 2 (Preset 5~8) Scan	
73	Start Group 3 (Preset 9~12) Scan	
74	Start Group 4 (Preset 13~16) Scan	
75		
76		
77		
78		
79		
80		
81	Set Alarm Out OFF	
82	Set Alarm Out ON	

88	Set OSD Menu ON	
92		Set Line scan left stop(F1)
93		Set Line scan right stop(F2)
95		Set OSD Menu ON
96	Stop Scan	
99	Star Line Scan(F4)	

Preset No. + Preset button = Call Preset Function

Preset No. + Preset button (hold for 3 sec.) = Set Preset Function

11. Specification

■ 30x Power Zoom — WDR version

CCD	Manufacturer	Sony
	Resolution	520 TV lines – color 570 TV lines – B/W
	Size / type	1/4 " Ex-view
Image control		OSD menu
Zoom	Optical	30 times
	Digital	8 times
Focal length		3.3 ~ 99 mm
Aperture size		F 1.6 ~ 3.2
Light sensitivity	Color mode	0.4 lux
	B/W mode	0.08 lux
	ICR-ON mode	0 lux (with IR illumination)
WDR	Range	52dB

■ 30x Power Zoom — D/N version

CCD	Manufacturer	Sony
	Resolution	520 TV lines -- color 570 TV lines – B/W
	Size	1/4 inch Super HAD CCD
Image control		OSD menu
Zoom	Optical	30 times
	Digital	10 times
Focal length		3.3 ~ 99 mm
Aperture size		F 1.6 ~ 3.4
Light sensitivity	Color mode	0.6 lux
	B/W mode	0.1 lux

	ICR-ON mode	0 lux (with IR illumination)

■ Pan / Tilt Functions

PT driving system		Stepping motors
Scan / Search	Navigation range	Pan 360° / continuous Tilt 180°
	Navigation speed	0.5 ~ 240° / sec; programmable
	Preset Search	240° per second
Preset	Quantity	Max to 64 positions
	Dwell time	1 ~ 255 seconds
	Tour group	4
	Auto-pan	Yes
Communication		RS-485
Protocol		Pelco D, Pelco P
Baud rate		2400, 4800, 9600
Camera ID		1 ~ 255

■ Miscellaneous

Video	Format	NTSC or PAL (optional)
	Output Level	1.0 V (typical)
Alarm function	Input	3 sets
	Input level	TTL 5V; Negative trigger
	Output	1 set; NC / NO
	Max. load of O/P	DC24V / 1A or AC120V / 0.5V
Connectivity	Video	BNC female
	RS485	Terminal block
	Power	DC input jack
Power consumption		DC 12V / 1.0A or AC 24V / 1.66A
Operation	Temperature	-10 ~ 50□
	Humidity	20 ~ 85% RHD
Storage	Temperature	-20□ ~ 60□
	Humidity	20 ~ 85% RHD
Water proof		IP-66
Certification		FCC, CE
Inside the box	Dome camera	1 set
	User's manual	1 set
	Power adapter	1 set
	Screw Pack	1 set

Installation base	1 piece
Metal bowl holder	1 piece