the excel*PTZ range*

Installation and Operation Manual

Economic PTZ Dome

Models covered
PTZ220

Version 1

For updates to these instructions visit www.excelPTZ.com

CONTENTS TABLE

Please read this operation manual carefully
before installing and using this unit !!!!

Please read the following;

1. Please read the operation manual carefully before installing and operating the product.
2. The actual dome requires a 24v AC power supply. The rated input voltage of the camera is 12V!!!! This gets its power from the dome and does not require a separate PSU. Do not connect 24V AC to the camera under any circumstances!!
3. During the course of transportation, storage and installation, the product should be handled with care avoiding vibration and any weight pressure, which may cause damage to the sophisticated optical and electronic equipment inside the machine.
4. Do not attempt to disassemble the camera. In order to prevent electric shock, do not remove screws or covers. There are no user-serviceable parts inside the camera.
5. Always use and stick to current electrical safety standards to install and use the dome. Use a correctly rated power supply. The RS-485 and video signal cables should be kept way from other high voltage equipment such as mains cables and especially fluorescent lights. Using an anti surge protection device is recommended to prevent damage to the domes from lightning and mains surges. Damage to domes by lightning or mains voltage surges is not covered under the dome's warranty.
6. Do not operate in areas exceeding the stipulated limitations concerning temperature, humidity and power supply.
7. Do not aim the camera directly towards the sun or an extreme light source whether it is switched on or not. Do not let the camera focus on bright and stationery objects for a long time. Doing either of these may damage the camera.
8. Do not use strong detergents to clean the main body of the camera as these may damage the dome cover or paintwork. Wipe dirt with dry cloth. If needed a *mild* detergent can be used.
9. Operate the dome camera with great care to avoid shock or vibration. If operated incorrectly, the Dome could be damaged.
10. Ensure the dome is not dropped. Never mount the unit on a ceiling that cannot support its weight.
11. If necessary, use a commercial lens cleaning paper to clear the lens windows. Gently wipe the lens window until clean.

The excelPTZ dome range –

Economic Range

A basic PTZ dome camera for budget applications which incorporates a high-clarity colour camera. It has a multifunctional decoder and an on-board processor for logic handling. The dome is easy to connect, install, maintain and operate. The dome is compact with a modern and appealing appearance.

The Economic range of excelPTZ is obviously manufactured to a tighter budget than the standard excelPTZ range.

The key differences are in the dome construction, which is plastic but metal in the other ranges. The wall bracket is also plastic and is not as robust as the metal wall bracket in the 300 and 400 series domes.

Inside the Economic series the PTZ mechanism is more basic and it does not have the capabilities of presets and the other advanced functions of the 300 and 400 series.

Typical uses of the Economic dome would be for budget quoting, basic indoor PTZ for larger warehouses and so on.

For high-end applications please choose the higher series 300 and 400 excelPTZ domes.

Description of Functions

1. **Integrated Multi-Protocol Decoder**
   The integrated multifunctional decoder can communicate with 16 different protocols. The baud rate can be independently set allowing compatibility with numerous systems with selectable baud rates from 2400 bps to 19200 bps.

2. **Dip Switches**
   Dip switches control the selection of the protocol, baud rate, camera addresses and termination resistor making this dome camera easy to set up and use.

3. **RS485 Interface**
   This dome uses RS485 serial control and can address from 1 to 511 cameras using binary addresses.

4. **Rotation Range, Speeds and Limitations**
   The dome can turn 0-355° horizontally at a speed of 12° per second and 0-90° vertically at 8° per second with a precision rate of $\pm$ 2%. The unit is adjustable in the horizontal direction.

5. **Scan Facilities**
   The dome can scan horizontally between two points. The points are manually set in the dome by two limit switches secured by screws. The scan can be initiated by using a keypad.

6. **Test Button**
   This dome is fitted with a test button to manually undertake a self-check test. The dome will pan and tilt in a horizontal and vertical direction continuously. Press the test button again to stop.

<u>Getting the dome up and running!</u>

You MUST connect up the dome and your control equipment on a workbench or kitchen table before the actual site installation and CHECK YOU KNOW HOW TO INSTALL IT CORRECTLY!!!!!!!!!!!!!!!!!!.

By doing this you can set-up any DIP switches, adjust the camera, and learn about how it operates before taking it to site. This will save you hours of time on-site trying to work out why a particular item doesn't function as you expected it to. There is nothing worse than installing something and then having to take it down to see how to get it working!! Do the learning curve in the comfort of your own premises!!!!

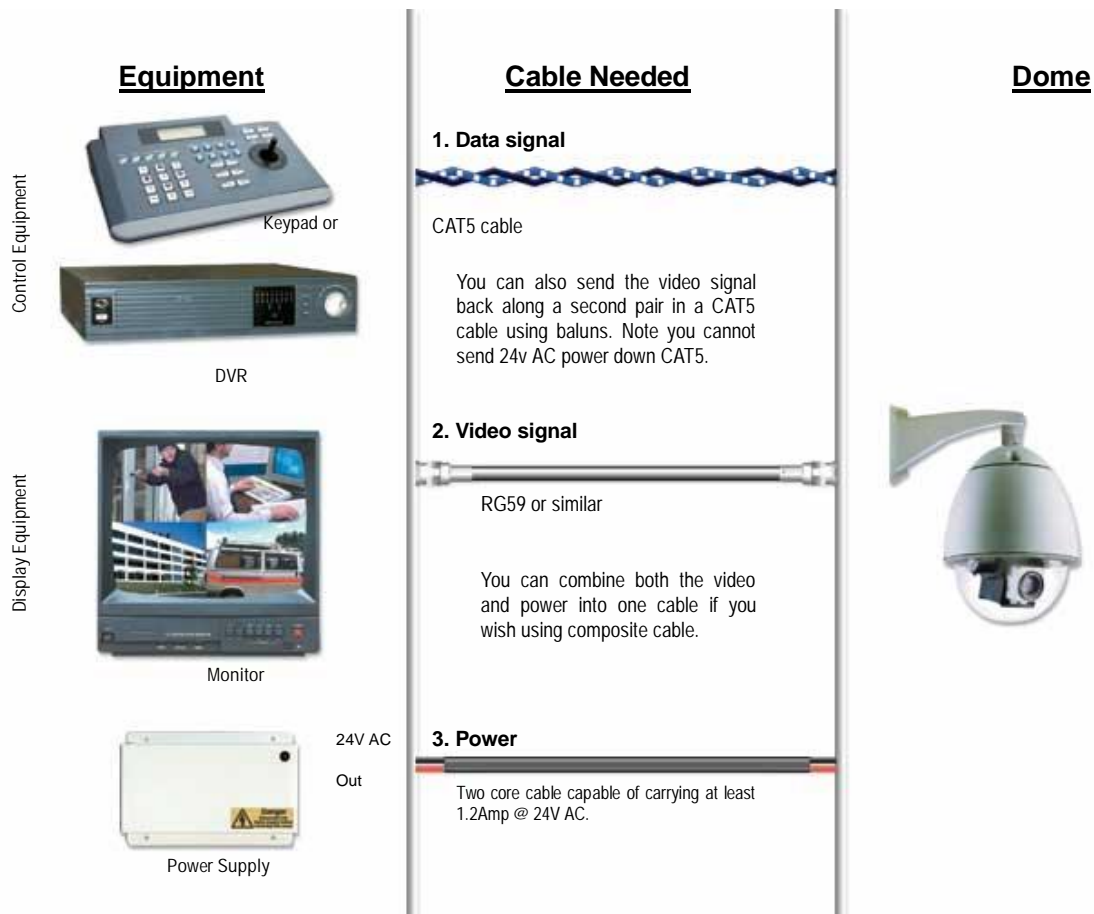> # Do you KNOW how to install PTZ equipment that is controlled by RS485 data signals?
>
> ## *If not please read the following introduction to PTZ   >>>….*

<u>Overview-</u> introduction to fitting PTZ equipment

Generally speaking, PTZ Domes requires four things;

1- They require a power supply and a cable to supply this power to the dome. Often, external domes are 24V A.C but some mini pan and tilt domes are 12V.
2- They require a cable to get the video signal back to the monitor or recording device.
3- They require a cable to transmit the "RS485 control signal" from the keypad or DVR to tell the dome to pan, tilt and zoom etc.
4- They require something to control them, either a keypad or a DVR.

The following diagram indicates the basic cable requirements for a PTZ system.

<u>**Equipment**</u>	<u>**Cable Needed**</u>	<u>**Dome**</u>
Control Equipment Keypad or DVR	**1. Data signal** CAT5 cable You can also send the video signal back along a second pair in a CAT5 cable using baluns. Note you cannot send 24v AC power down CAT5.	
Display Equipment Monitor	**2. Video signal** RG59 or similar You can combine both the video and power into one cable if you wish using composite cable.	
24V AC Out Power Supply	**3. Power** Two core cable capable of carrying at least 1.2Amp @ 24V AC.	

You can get "composite" cables that will carry both the power and the video signals and this has the benefit of combining two of the three cables into one. You may choose to power the dome locally to it, so you may only need to get the video signal back from the dome and the RS485 control signals to it. If this is the case you may choose to use a pair of BALUNS. By using baluns you can send the video signal and control signal down the same CAT5 cable just using different cores for each signal.

The control signal (RS485) is nearly always sent along a "twisted-pair" type cable. The twists in the cable help prevent interference affecting the data signal by "shielding" it. Many installation companies use a CAT5 type or similar cable to run out to the domes to carry the data signal.

If you are considering using baluns please note - DVR's tend to require very good video signals to function correctly and "passive baluns" can loose some signal strength over the 50 meter mark so try to restrict the use of passive baluns to below 50 meter cable runs when using them with DVRs. Above this distance perhaps consider an active balun. Active baluns require power, passive baluns do not.

You can mix and match how you wire up your PTZ installation and the following general diagram gives you a guideline about how to do it. Remember this is a GUIDE and is not an instruction what to fit!
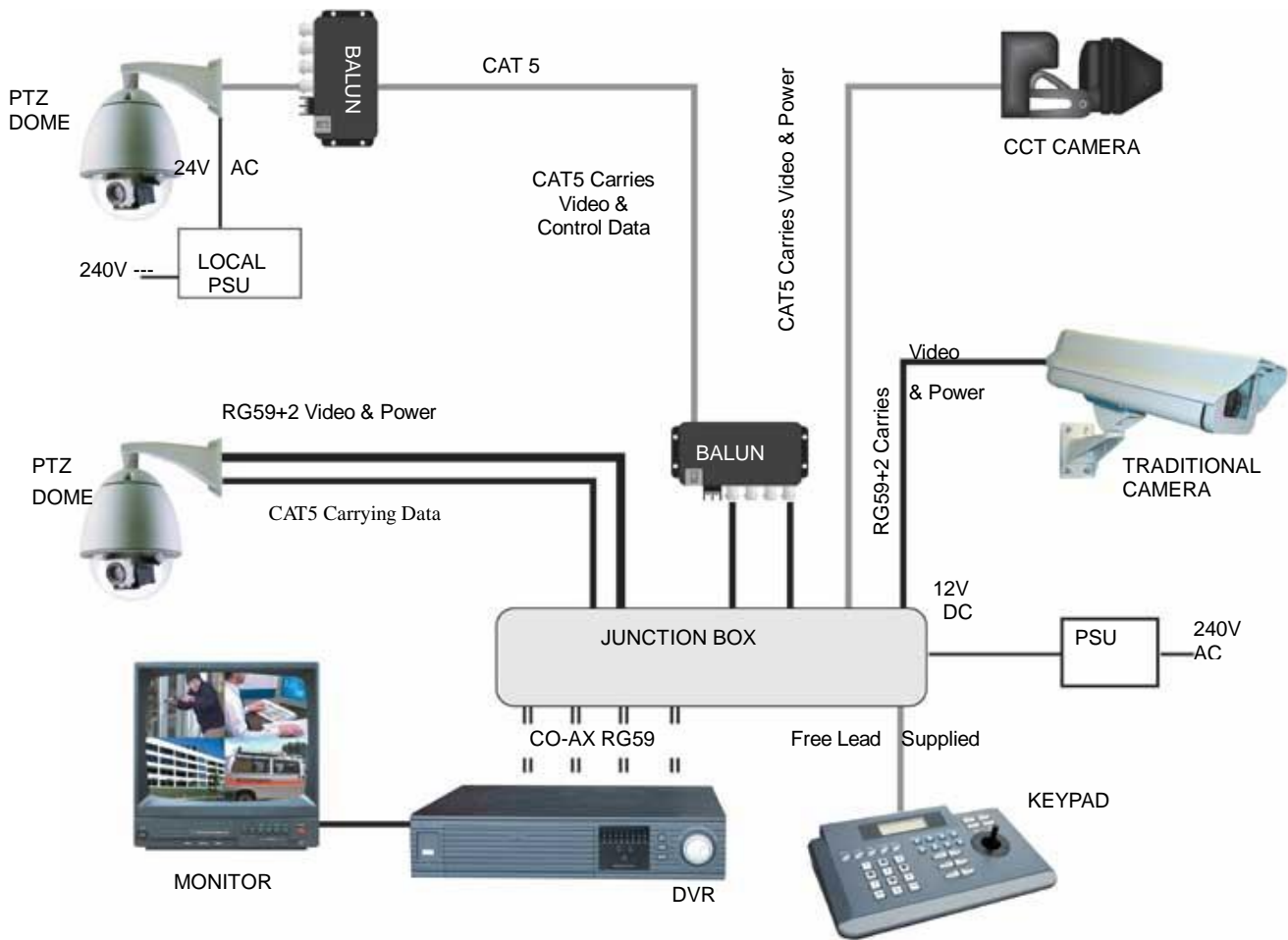
Many installation companies can get the power and video signal correct, but struggle with the control of the dome using the keypad or DVR using the RS485 data.

The key to successfully installing the data cabling to the dome is to get the basics right. Use a quality data cable such as CAT5 (never use just a standard untwisted cable such as alarm cable for the RS485 signal).

Also, you must follow the RS485 wiring convention; the following section explains this;

RS485 Wiring methods & Tips >>>>>

1. Characteristics of RS485

As specified by RS485 standards, RS485 is a half-duplex data transmission type with characteristic impedance of $120\,\Omega$. The maximum load capacity is 32 units (domes, keyboards and DVRs).

2. Transmission distances of RS485 Signals using CAT5 or similar cables

Selecting a CAT5 or similar sized twisted pair data transmission cable, the maximum theoretical transmitting distances are as follows:

Baud Rate	**Maximum** Transmitting Distance
2400 Bps (PELCO-D)	1500m
4800 bps	1000m
9600 bps	600m

PLEASE NOTE - Using inferior cables, or installing the dome in an environment with strong electromagnetic interference, or connecting a lot of PTZ domes to the same cable carrying the RS485 signal will reduce the maximum transmitting distance.

3. RS485 Connection methods

METHOD 1 – *DAISY CHAIN CONNECTION.*

The general RS485 standard recommends a "daisy chain" connection of equipment that is to be controlled. This means that the control cable is looped out of the one dome to the next dome and so on. The last dome in the line is then fitted with what is known as a "termination resistor". This has a value of $120\,\Omega$.

The resistor is built in the PTZ domes and is activated by setting DIP-10 on the SW1 bank of 10 dip switches to ON. The keyboard itself generally has a built-in $120\,\Omega$ resistor. These termination resistors help make the signal more stable and give the system better reliability so that the domes function as expected. A common mistake installer's make is not making sure the $120\,\Omega$ resistor is switched ON in the LAST dome. Also installers often select the resistor to ON in another dome in the chain, these errors will make control of the dome unpredictable.

A simplified Daisy chain is shown below;

This first diagram shows the cables looping in one dome and out of another;

120Ω					120Ω
1#	2#	3#	4#	. . . . .	32#
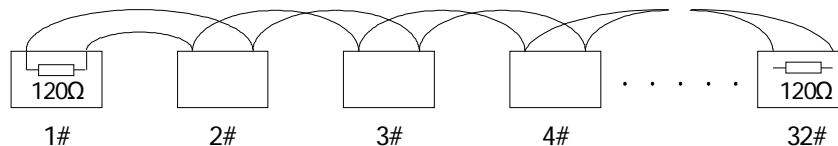
Standard Daisy-Chain connection for the RS485 PTZ control signal

(just the last dome only has the $120\,\Omega$ resistor set to on, the first device is the keyboard and has the $120\,\Omega$ built in as default)

This next diagram is a slight variation on the Daisy Chain arrangement. Again it's one cable going out to all the domes but instead of the cable going into each dome then back out to the next one, a junction box is used to "Spur-Off" to each dome. Whilst this can be done THE SPUR LENGTH (D) must be NO MORE THAN 7 meters!!!!!!!!!!!! The overall cable length between the Controller and the last dome is limited to around 300 meters in such an arrangement.
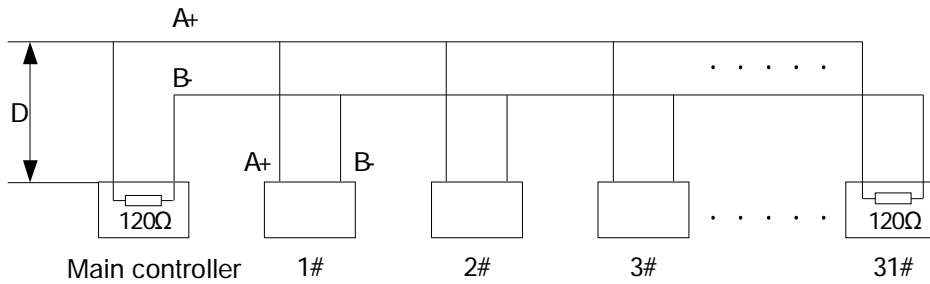
Daisy-Chain connection WITH SHORT SPURS for the RS485 PTZ control signal

(one main radial with very short spurs to each dome off it, keeping the spurs to less than 7 meters)

TIP - The connection of a 120 Ω termination resistor: The termination resistor is ready fitted on the domes pcb, all you have to do, to set it, is move switch 10 to ON on the SW1 dip switch.

■ = SWITCH
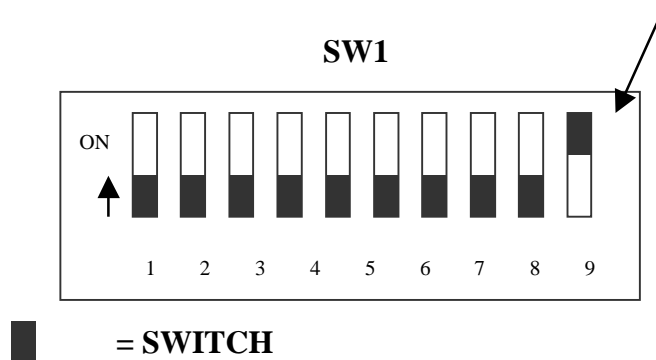
STAR method of connection.

In some circumstances you may need to adopt a star configuration for practical purposes. For instance, all the domes may be so scattered on a large site that running out separate spurs to each dome in a "STAR" array is the only practical solution.

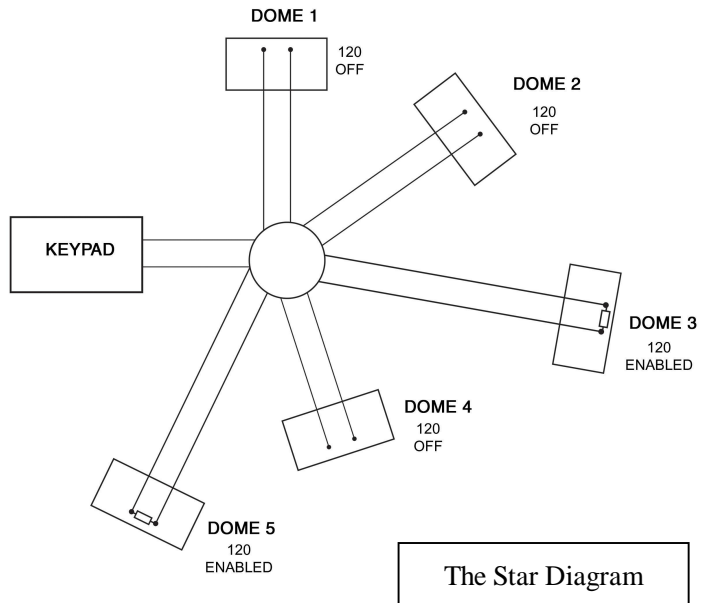*So how do you do this in practice?*

The termination resistors must be connected to the two domes that are farthest away from each other, such as domes 3 and 5 in the following "Star diagram". Note that all the other domes do not have the 120ohm resistor connected. The resistors are already fitted to the domes PCB but by default are not in circuit. To put them in circuit you must move the DP10 dip switch on SW1 to "ON" as previously indicated.

As the star configuration is not in conformity with the requirements of RS485 standards, problems such as signal reflections may arise, especially when there are long cable connections. The results are that control signals are decreased and the dome may not respond to, or just responds intermittently to the controller.

If your STAR circuit is not too extensive with each spur in the region of 20-50 meters you can expect quite good reliable performance using this technique. If you experience any problems though, there is a RS485 distribution box available CODE PT750 to help overcome any problems.

The Star circuit for wiring PTZ's.
The two furthest domes need the 120ohm resistors enabling, by moving the dip switch. *In this example it's domes 3 &5.*

DOME 1
120 OFF

DOME 2
120 OFF

KEYPAD

DOME 3
120 ENABLED

DOME 4
120 OFF

DOME 5
120 ENABLED

The Star Diagram

Overcoming RS485 data loss using an RS485 distributor

In the real world not everything always works exactly as it's expected to!

RS485 data signals that control the dome's movements are tiny signals that can get corrupted for many reasons. Poor cable quality, not using a PAIR of cores from a CAT5 but using one core from TWO separate pairs, running the CAT5 cable near mains equipment such as florescent lighting all will have a detrimental effect on the signal. These are things that you can correct with good installation practices.

Where you wish to run several separate CAT5 cables out to send the RS485 data signal out to the domes you are in effect correcting the STAR method of RS485 data distribution. As previously mentioned the problem with the Star method is that it is not actually designed for RS485 but generally works okay if you follow the previous notes on getting the 120ohm resistor setting right, as per the previous notes.

One way that takes the guesswork out of installing the Star method is to utilise an RS485 distributor. This has the advantage that the RS485 signal is correctly distributed to the domes so that they behave as expected. You can create up to 4 spurs to the domes and put up to 4 domes on each spur. Just like the Daisy chain method the end dome on each spur needs to have the 120ohm resistor enabled.

Although the RS485 distributor is a small additional expense, it takes some of the guess work out of the installation design and gives a more flexible approach to cabling which itself can save time and money on the installation. Not forgetting you get more predictable results!

The RS485 distributor (PTZ750) amplifies the RS485 control signal and distributes it evenly to 4 separate spurs, each spur can have up to 4 domes. This means that you could theoretically have up to 4 individual spurs of over 1000mtrs each to control up to 16 PTZ domes in total.

Ideally you would put just one dome on each spur from the PTZ750 but up to 4 domes is generally acceptable. The following diagram shows a typical use of the PTZ750 RS485 distributor.

In the following example and diagram, domes 1,4,5 and 7 are at the end of each spur and therefore require the 120ohm resistor enabling by moving the DP10 dip switch setting to 'ON' on the SW1 dip switch in the domes. Domes 2,3 and 6 are all "midway" in each spur and do not need the 120ohm resistor and can be left as default. The PTZ750 itself has four 120ohm resistors built in as shown and you do not have to do anything with the PTZ750 as the resistors are permanently connected within it.
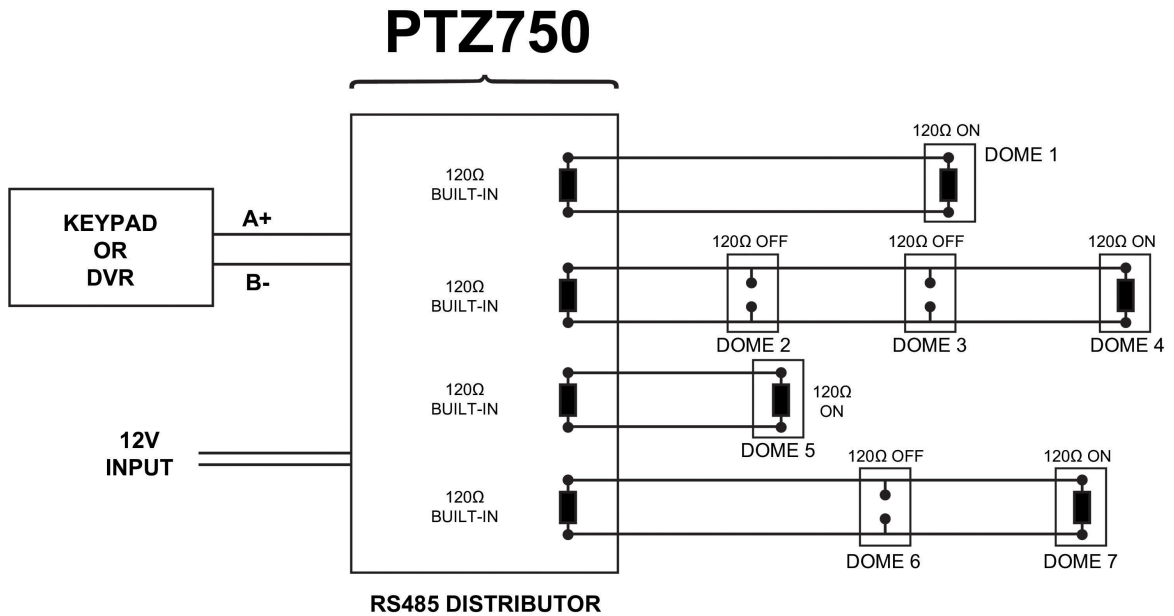
(*Diagram showing how to use an RS485 distributor to improve PTZ control reliability*)

Please note if you have the PTZ750 located within 5mtrs of the keypad or DVR you can connect up to 3 of them in parallel.
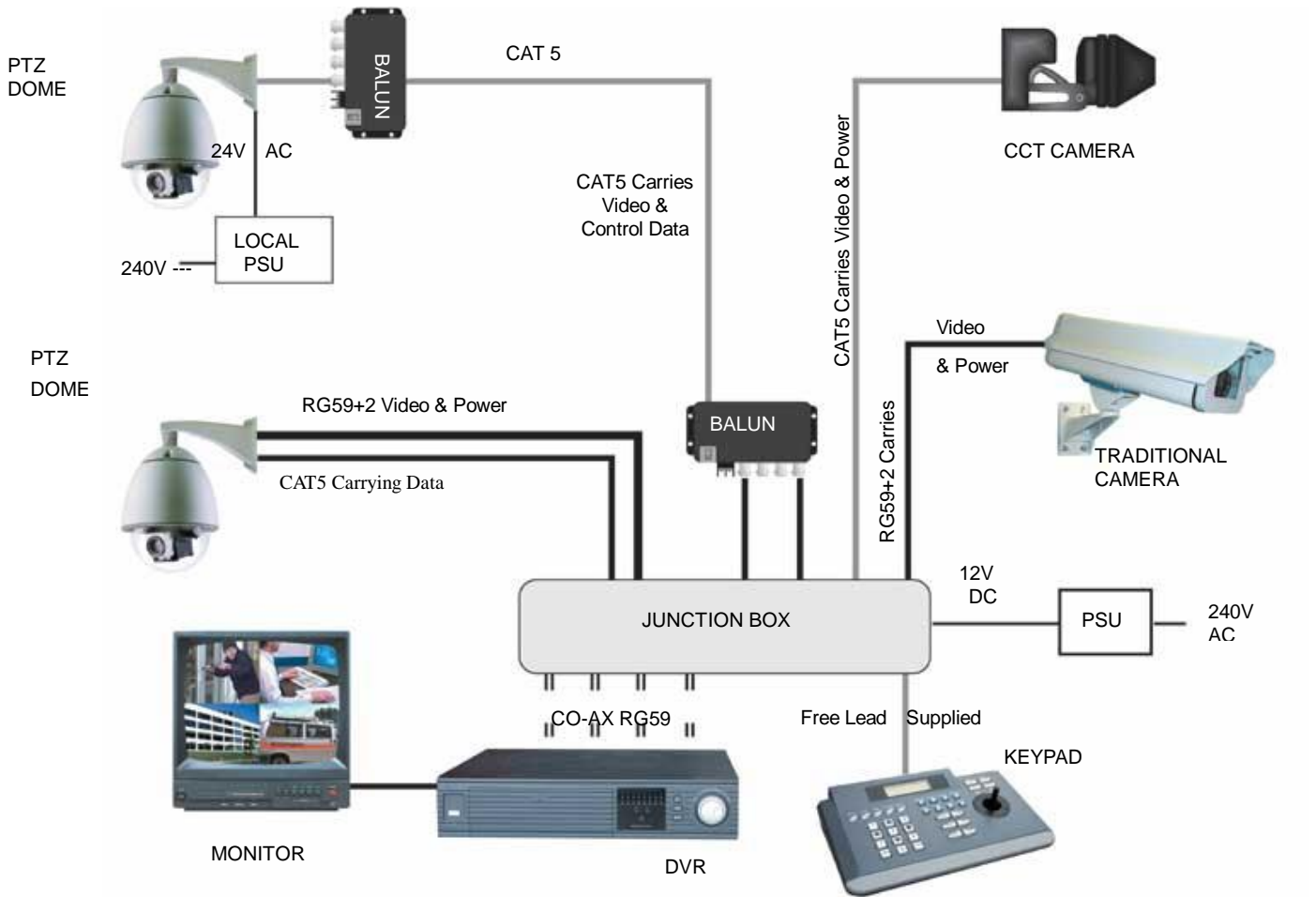
Setting up the Dome Camera

Connection of the System

There are many ways to wire up a PTZ system.

If you have read the introduction at the beginning of these instructions you should have got a good idea what your options are.

Below is a general schematic diagram showing you some of these options.


Powering the domes-

All the domes will need power. For this dome it is a 24V A.C power supply. The power supply must be capable of delivering at least 1.25A per dome.

You can either power each dome with its own PSU locally to it or have the PSU's remotely situated perhaps near the keyboard or DVR. The domes require a current of about 1.25A when the heater is on and you must take this in to consideration when working out maximum cable runs.

Please note - The domes heater doesn't come on until it senses the temperature drops below 0 degrees Celsius. At this point the dome will need up to 1.25A @ 24V A.C to operate. Please make sure that you have a sufficient power supply and cable installed to cope with this. Obviously the dome may work okay in the summer but when winter kicks in and the dome's current draw jumps from 400ma to 1.25A, an inadequate

power supply or a cable with too much voltage drop may stop the dome from working properly. When winter comes don't be suddenly caught off guard when your customer rings you to say the dome has suddenly packed in because it's gone cold!!

A popular way to power the domes is using our COMPOSITE VIDEO cable (or shotgun as its also known) as this cable can carry the power to the dome and the video signal back to the monitor or DVR.
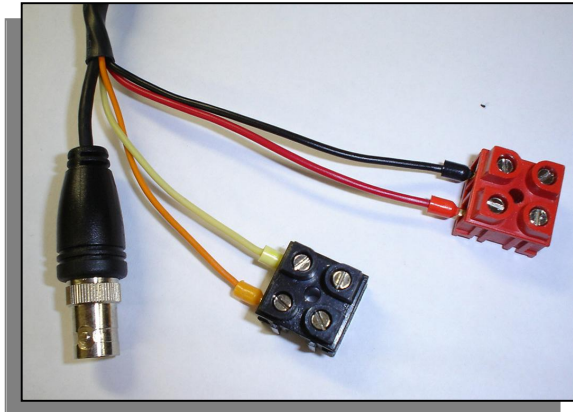
The power connection

The RED & BLACK cable coming out of the dome connected to the RED terminal block are for power. Connect a suitable 24V A.C power supply to this pair of cores.

The BNC connector is the "VIDEO-OUT" from the camera and goes to the monitor or "VIDEO-IN" of a DVR camera input.

The Orange and Yellow pair of cores that go in to the BLACK terminal block are the data cables. These are the cores that carry the RS485 control signal to the dome from either the keyboard or the DVR. The next section of the instructions gives more detail on how to connect the RS485 data. Please also read the RS485 WIRING METHODS & TIPS section towards the beginning of these instructions.

The following table gives you an indication of the maximum lengths that you can achieve using this cable the composite cable and the PTZ400 range domes.

Power cable requirement – Assuming a starting voltage of 24V A.C is applied at the PSU end.

Composite cable	Heater OFF	Heater ON
Maximum run	80mtr	70mtr

The distances are relatively short due to the high load of the dome when it starts up. If the voltage of the dome drops below around 20V A.C it will fail to initialize. Obviously you can power the domes locally if you wish.

RS485 connection - *Connecting the Keypad or DVR to the Dome*.

The dome is controlled by an RS485 data signal that is given by either a KEYPAD or a suitable DVR. This data signal tells the dome to pan, tilt, zoom etc. Its important that you read the early section of these instructions to understand the fundamental principle of RS485 cabling techniques so that you get it right.

RS485 has two cores, A and B or sometimes known as RS485 + (A) and RS485 – (B) if you get these two the wrong away around then you will not be able to control the dome. Sometimes installers get the connections right on one dome but not on the other and find only one dome works. They then swap the wires around at the keyboard only to find out one dome has now burst in to life and the other one now failed!! But they don't put 2 + 2 together and realize their mistake that they have wired one dome different to the other. Take great care getting these the right way around and make sure you wire each dome IDENTICALLY so

that if you have to swap the A & B lines over at the keyboard you know all domes are wired the same!!

The PTZ400 series adopts the following RS485 convention;

ORANGE = RS485 + or A
YELLOW = RS485 – or B
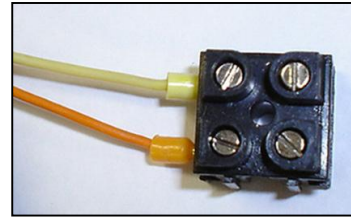
You should initially be wiring the dome to the keyboard or DVR on your workshop bench or at least your kitchen table to prove you know how to get everything to work. Once you have done this, it is just a job of extending the cables and physically installing the domes on site. You must obviously take note of the RS485 wiring techniques mentioned at the beginning of these instructions and get the 120ohm resistors correct in the "End of line" domes. Generally speaking you will always be extending the RS485 signal from either the keypad or the dome using a CAT5 or similar cable.

The Keyboard models type CCT786 & CCT768 are supplied with a connecting lead and a break out box that looks like the following picture.
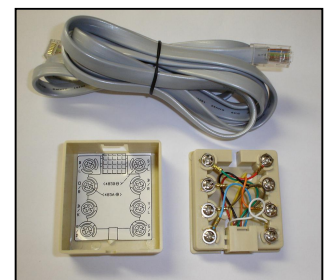
The RJ45 lead supplied with the keyboard connects into the rear of the keyboard into the slot marked "OUT" do not connect it to the "IN" position by mistake.

This lead provides the RS485 A and RS485 B connections from the keyboard. It is this cable that you would extend using 1 pair of conductors from a CAT5 cable. To test the dome on your workbench you can obviously omit the "extension" cable as the dome and keyboard are next to each other.

Now connect the RS485 data cable to the breakout box. Note that the orange connection is the RS485 + A Line connection and the yellow is the RS485 – B Line connection. The following picture shows the breakout box with the actual dome connected straight to it. The orange of the dome connects with the orange of the breakout box and the yellow of the dome connects with the white of the breakout box.
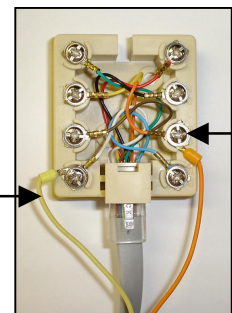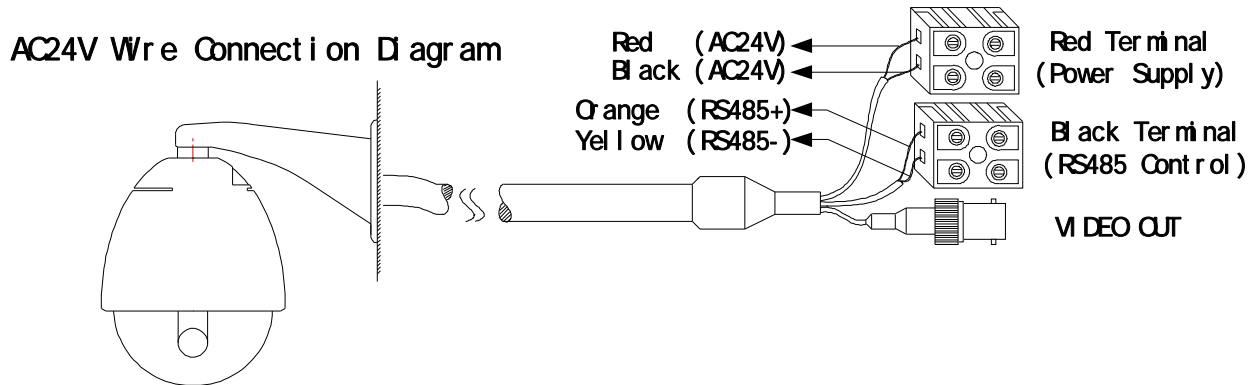
Obviously if the dome was on site you could not connect it to the breakout box directly. This is where you would use the CAT5 cable to connect the two together. You could use any pair out of the CAT5 cable but they must be two cores from the same pair. Why not use for example the orange pair so that the colours tie together a little? If you use cores from two different pairs in the CAT5 cable you will not get the benefit of the shielding effect of the cable twists and the dome will function erratically. You must always use a core from a PAIR, not two cores from two different pairs!!

ORANGE

YELLOW

Connecting the video out of the dome.

The dome has a short BNC lead attached to it, this is the lead that carries the video signal from the built-in camera. You need to extend this lead to the "VIDEO-IN" of the DVR or monitor. Use a good quality RG59 coax cable or similar to do this.

AC24V Wire Connection Diagram

Red   (AC24V)
Black (AC24V)
Orange   (RS485+)
Yellow   (RS485-)

Red Terminal
(Power Supply)
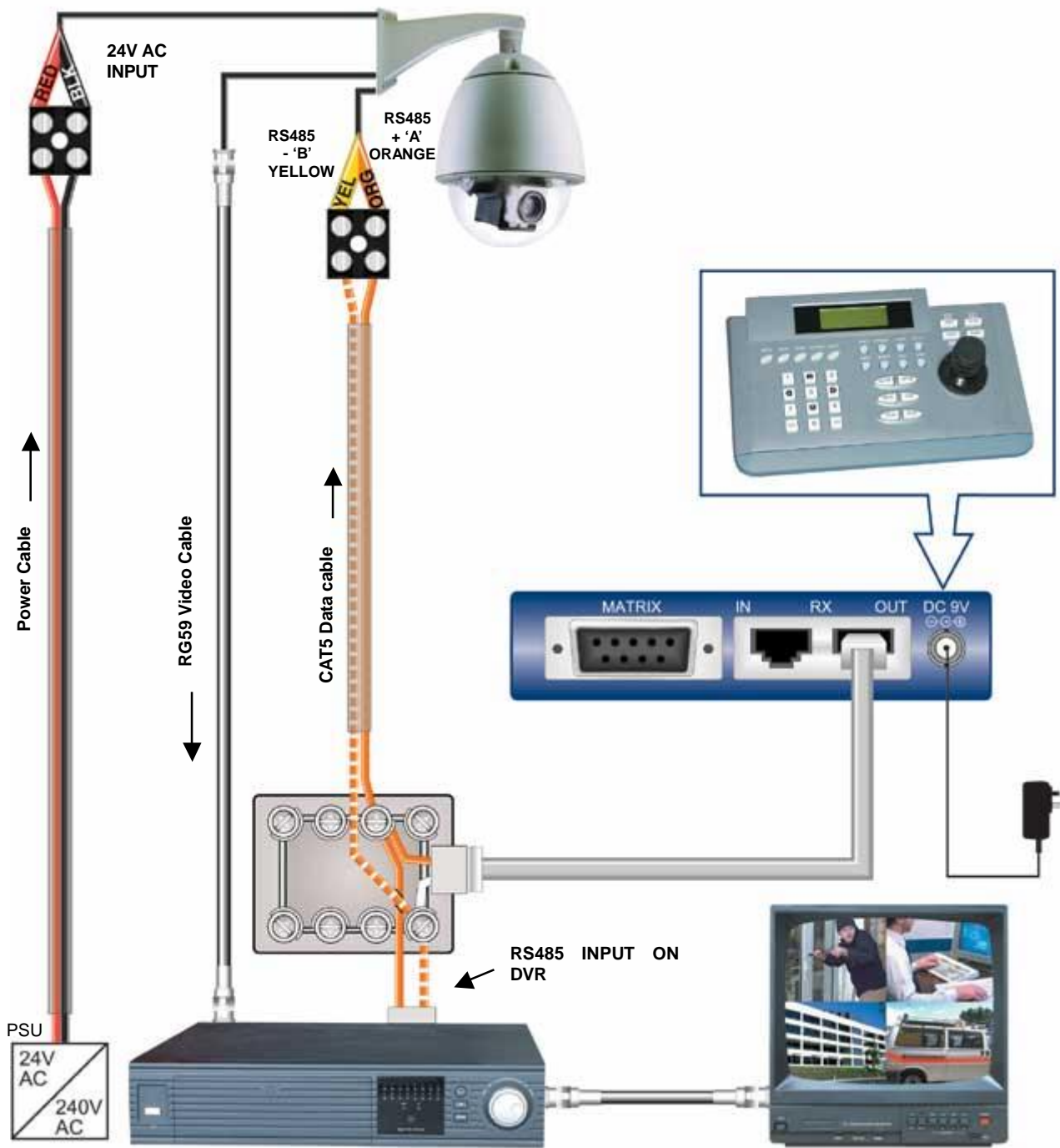
Black Terminal
(RS485 Control)

VIDEO OUT

TIP – If you can't get a picture at the remote end you could always take your test monitor to your PTZ dome and check the picture quality on its own short BNC lead.

If you're testing the equipment on a workbench you now have a one dome system.
You can use a keyboard or a suitable DVR to control the dome. A suitable DVR would be one with PTZ functionality built into it and preferably Pelco-D protocol. If your DVR has a list of protocols it's always best to try "JEC" first or "Pelco-D" protocol, as these are very widely available. In the DVR, with either JEC or Pelco-D set, you must also make sure you set up the "baud-rate" to 2400. JEC protocol is very similar to Pelco-D but has a wider tolerance.

 A typical site installation would look like the following diagram on the next page.

It shows the dome connected to the keypad plus how the dome could also be connected to a DVR instead of the keypad or at the same time. DVR's that have the capabilities of PTZ control will have a terminal or connection on them somewhere, where the dome's RS485- A and RS485- B line can connect to. Please refer to the individual DVR instructions of how to do this.

24V AC INPUT

RED BLK

RS485 - 'B' YELLOW

RS485 + 'A' ORANGE

YEL ORG

Power Cable

RG59 Video Cable

CAT5 Data cable

MATRIX   IN   RX   OUT   DC 9V

**RS485 INPUT ON DVR**

PSU

24V AC

240V AC

Setting the PTZ dip switches

In order that the PTZ dome can communicate with a control keyboard or DVR, it needs to be set with communication parameters. These are the communication Protocol and the Baud Rate plus a unique numeric address. These parameters are set using dip switches and this dome has two switches, SW1 and SW2.
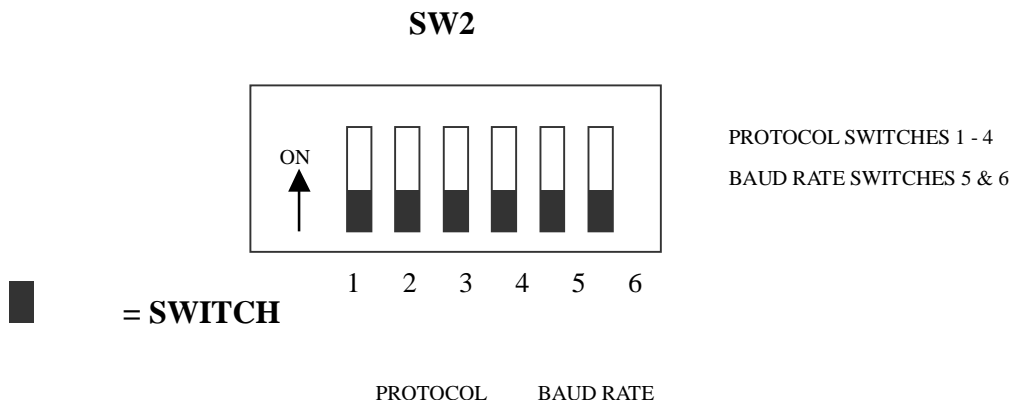
SW1 Dip Switch
The SW1 dip switch has a bank of 10 switches and switches 1 – 9 are used for setting the unique dome address. Note that SW1 is also used to set the 120 ohm termination resistor (switch 10).

SW1

ON

1 2 3 4 5 6 7 8 9

■ = SWITCH

DIP SWITCHES

Test Button

<Figure 7>
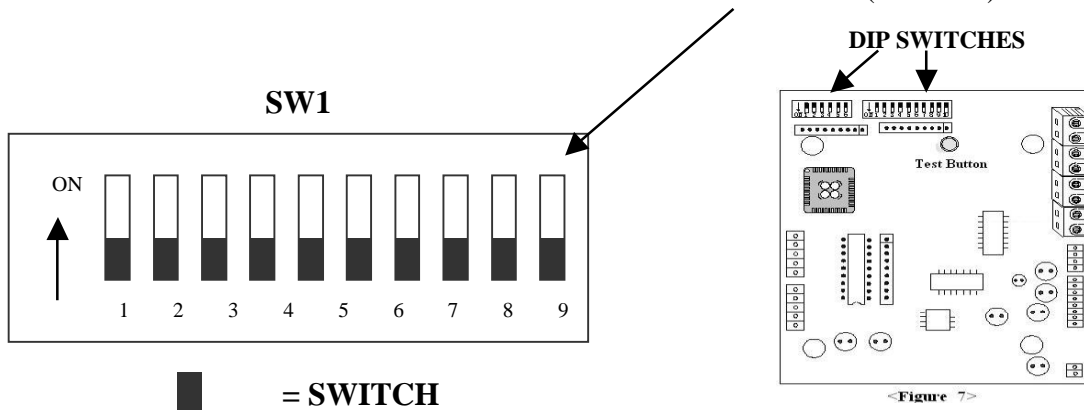
The unique "address" is needed so that if you are using more than one on a site, the keyboard "talks" to the right dome when you want it to PTZ. If you only have the one dome on the site then the default "address" of "1" is okay and you have no reason to change the dome from this. With multiple dome sites you need to set up each dome address separately. This is accomplished by setting the SW1 dip switch to reflect a unique numeric address. Please see the section **"Setting up a unique ADDRESS in a dome."**

SW2 Dip Switch
The SW2 dip switch has a bank of 6 switches and is used for setting the protocol and baud rate.
Note that for most SystemQ equipment they should always be set to PELCO-D with 2400 baud rate.
Please see the section **"Setup of the Protocol and the Default Baud Rate."**

SW2

ON

1 2 3 4 5 6

■ = SWITCH

PROTOCOL SWITCHES 1 - 4

BAUD RATE SWITCHES 5 & 6

PROTOCOL   BAUD RATE

Setting up a unique ADDRESS in a dome –

SW1 is the dip switch used to set the address of the dome camera from 1 – 511. This dome uses binary notation to allocate the dome address. Note that switches 1 – 9 are used for the dome address and switch 10 is used to set the 120 ohm resistor.
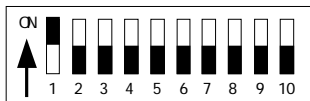For example:
To set the dome address at 1 put switch 1 up.
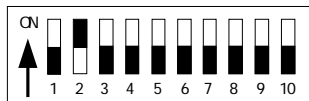To set the dome at address 2 put switch 2 up
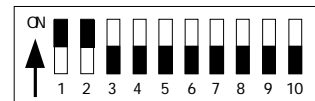To set the dome at address 3 put switches 1 & 2 up.

..and so on..

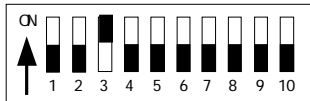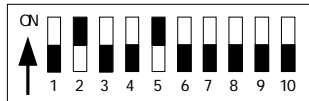*The following table indicates how this is done.*

ADDRESS 1

ADDRESS 2

ADDRESS 3

ADDRESS 4

ADDRESS 18

Dome	ID-CODE Status									
Address	DIP-1	DIP-2	DIP-3	DIP-4	DIP-5	DIP-6	DIP-7	DIP-8	DIP-9	DIP-10
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	
17	ON	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF	
18	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF	
…	…	…	…	…	…	…	…	…	…	…
511	ON	ON	ON	ON	ON	ON	ON	ON	ON	

Table 1   Dip Switch Settings for SW1

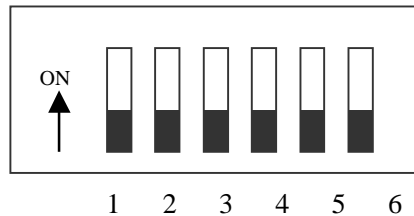## *Setup of the Protocol and the Default Baud Rate*

As shown in Table 2, SW2 is used to set the protocol of communication and the baud rate used by the dome camera. DIP-1 to DIP-4 of SW2 is used to select protocols and a maximum of 16 different protocols can be selected.

Pelco-D 2400 is used for most System Q equipment. PELCO D 2400Bps
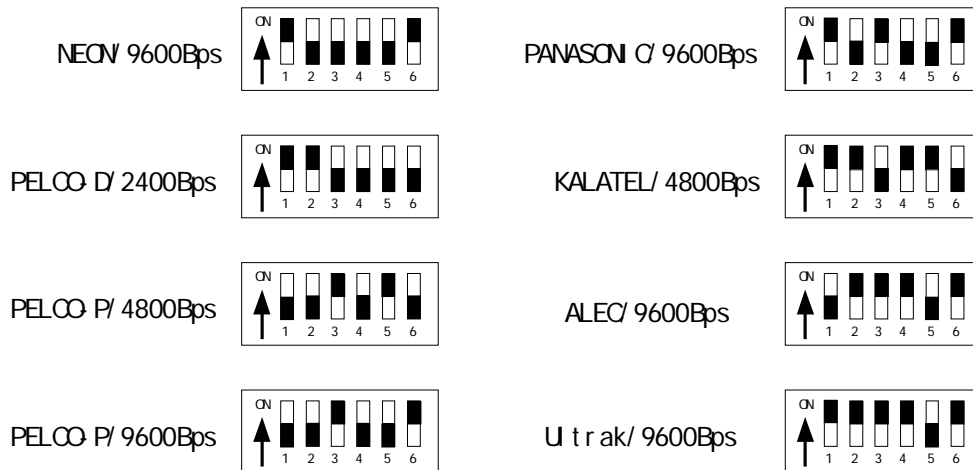
SW2

PROTOCOL SWITCHES 1 - 4

BAUD RATE SWITCHES 5 & 6

Protocols	DIP status				Normal Baud Rate	
	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

Table 2

Some protocols and the states of the coding switches of normal baud rates of these protocols are shown as follows:

NEON/ 9600Bps   [ON ↑ | 1 2 3 4 5 6 DIP switch]   PANASONIC/ 9600Bps   [ON ↑ | 1 2 3 4 5 6 DIP switch]

PELCO-D/ 2400Bps   [ON ↑ | 1 2 3 4 5 6 DIP switch]   KALATEL/ 4800Bps   [ON ↑ | 1 2 3 4 5 6 DIP switch]

PELCO-P/ 4800Bps   [ON ↑ | 1 2 3 4 5 6 DIP switch]   ALEC/ 9600Bps   [ON ↑ | 1 2 3 4 5 6 DIP switch]

PELCO-P/ 9600Bps   [ON ↑ | 1 2 3 4 5 6 DIP switch]   Ultrak/ 9600Bps   [ON ↑ | 1 2 3 4 5 6 DIP switch]

Setup of the Baud Rate of Communication

As shown in Table 2, SW2 is used to set the protocol of communication and the baud rate used by the dome camera. DIP-5 and DIP-6 of SW2 are used to select the baud rate of communication and a maximum of 4 different baud rates can be selected. If the controller adopts a non-standard baud rate, you can adjust it to be identical with that of the controller, as per the following table.

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

Using the CCT786 and CCT768 keyboard with the excelPTZ series

NOTE: For MINI 2D Keyboard type PTZ700 please refer to the instructions supplied with the actual PTZ700 keyboard.

The CCT768 & CCT786 keyboards require a 12V PSU (350ma) that is usually the plug in type. When you first take the keyboard out of the box you will need to set it up for the domes that you are using.

The dome you have purchased has the default settings of; **PELCO-D   2400-BAUD rate   Address 1**

If you look at the image of the LCD display below you can see the CAM=001 indicates that the keyboard is ready to talk to camera with address 1, if you have another dome set at camera address 2, press 2 followed by CAM. This would change the screen to CAM=002.

If you have multiple domes you will need to change the address of each dome so they are different but PLEASE LEAVE THE DOMES ON PELCO-D 2400 BAUD RATE.

There is an LCD display on the keypad.
When power is connected this will display
something like the following: >>>

The current protocol (protocol D or P)
The current camera address (each P/T device
requires a unique address 1-32)
The current baud rate
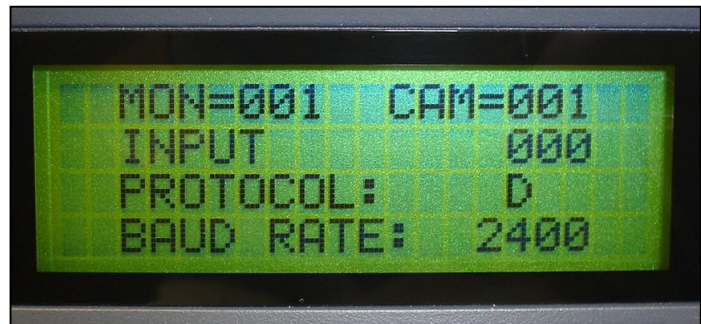
LCD of keypad CCT786 & CCT768 with correct default setting for this dome at address 1

To set up the keyboard to the correct settings for this dome do the following;

KEY SETTINGS FOR THE DOME – ENTER THESE into the keyboard type CCT768 & CCT786

For **2400-BAUD** rate: Input 24 and press the PRG key (default dome setting)
To select **PROTOCOL D**: enter 44 and press the PGM key (default dome setting)
To select **CAMERA ADDRESS 1** press 1 and then press the CAM key (default dome setting)

TIP - For advanced uses the keyboard also can also adopt the following features
(these settings are not used for this dome!!!)
These parameters can all be changed in the following manner:
To select PROTCOL P: enter 50 and press the PGM key
For 1200-BAUD rate: Input 12 and press the PRG key
For 4800-BAUD rate: Input 48 and press the PRG key
For 9600-BAUD rate: Input 96 and press the PRG key

AUTO SCAN- How to run it.

Auto-scan scans between two points.

STEP 1 - Select the required camera by entering <camera address> and pressing the **CAM** button on the keypad.

STEP 2 - Remove the screws in the two limit switches in the dome mechanism.

STEP 3 - Using the joystick pan left or pan right, position the camera where you wish to start scanning from.

STEP 4 - Secure the first limit switch.

STEP 5 - Using the joystick pan left or pan right, position the camera where you wish to complete the scan.

STEP 6 - Secure the second limit switch.

STEP 7 -To start the Auto Scan you will need to call via the keypad one of three call settings. These are :- 51 CALL, 52 CALL or 53 CALL to start the linear scan. Note that this dome does not use presets.

To halt the Auto Scan just touch the joystick.

Test Button- How to use it.

The dome has a test button located alongside the two dip switches. If this is pressed the dome will start a self check routine, moving the camera in a horizontal and vertical direction. This is run continuously until the test button is pressed again.

Controlling one camera then another.

If you look at the image of the LCD display you can see the CAM=001 indicates that the keyboard is ready to talk to camera with address 1. In the dome the address 1 is set as default in the factory. You need to alter the DIP-switches within the domes to address 2, 3 etc if you have multiple domes on the same site, refer to the previous instructions how to set the DIP Switches. If you have another dome set at camera address 2, press 2 followed by CAM. This would change the screen to CAM=002. And so on.
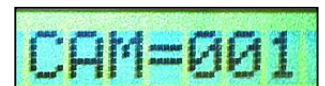
This dome camera has very basic functionality. Apart from the Auto Scan and manual self-check test, it is operated manually via the keypad joystick or a compatible DVR. It has no programmable presets, functions or menu options.

Installation Instructions

1. Requirement of Installation

1.1) **Cables & Power Supply:**   Ensure suitable cables, transmission distance and power supplies are used for this installation. More information is available in the front of this manual.

1.2) **Installation Fixing:**   For safety reasons ensure that adequate measures for fixing this dome are taken regarding the weight of the unit and the surface strength to which the unit is connected.
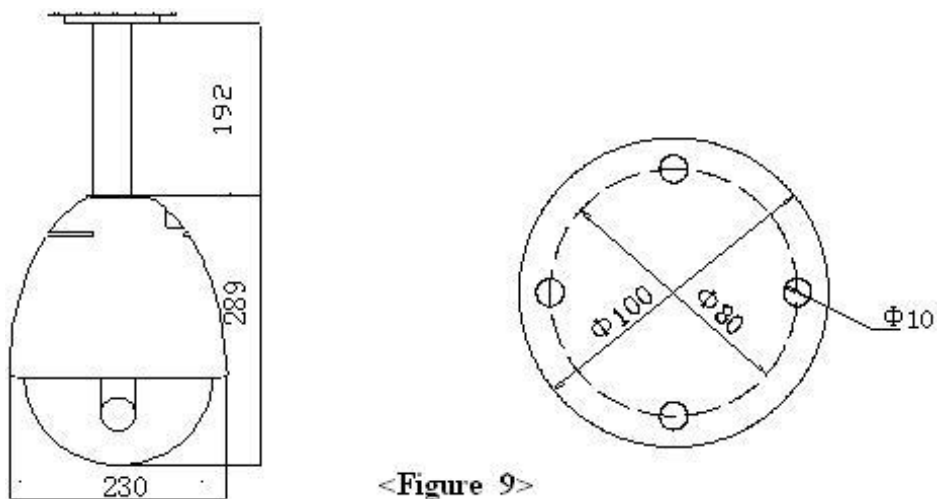
2. Description of Unit

2.1)   Installation of Indoor Wall-Hanging Unit

<Figure 8>
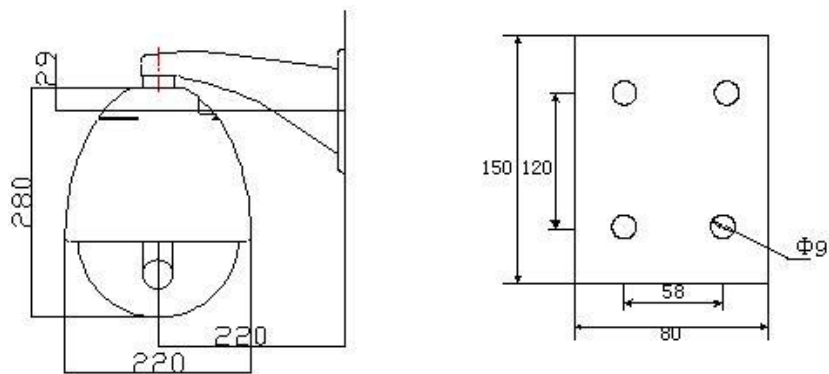
2.2)   Installation of Indoor Ceiling-Hanging Unit

<Figure 9>

SPECIAL NOTE

Only fix this dome to a surface strong enough to take the weight of this unit taking into consideration the possible effects from storms, snow and strong winds if using the equipment externally. Ensure that the dip switch settings are made before the physical installation is commenced.

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3. Installation Steps

3.1   Installation of Wall Mount fitting

a)   Select the position for installation on a secure wall, marking the four screw hole positions using the bracket support as a template.

b)   Drill four M8 size installation holes in the wall and fit the expansion screws.

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

1. Support
2. M8 Expansion Screws
   (four pieces)

<Figure   10>
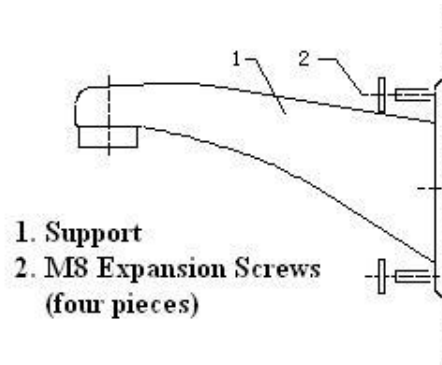
#### 3.2   Installation of the Ceiling Mount fitting

a)   Select the position of installation on a secure ceiling, marking the four screw hole positions using the bracket support as a template.

b)   Drill four M8 size installation holes in the wall and tap in the expansion screws.

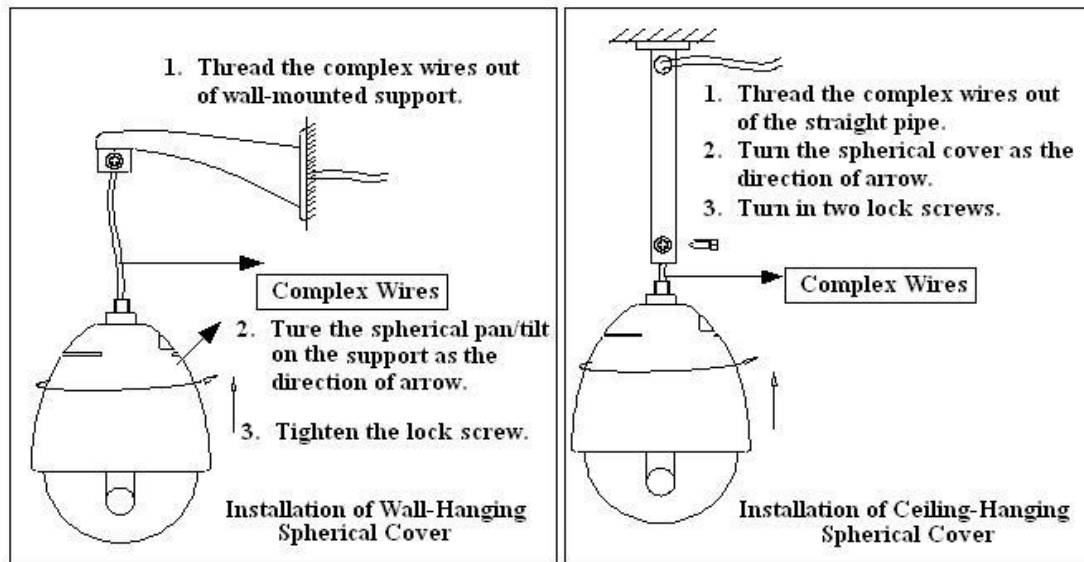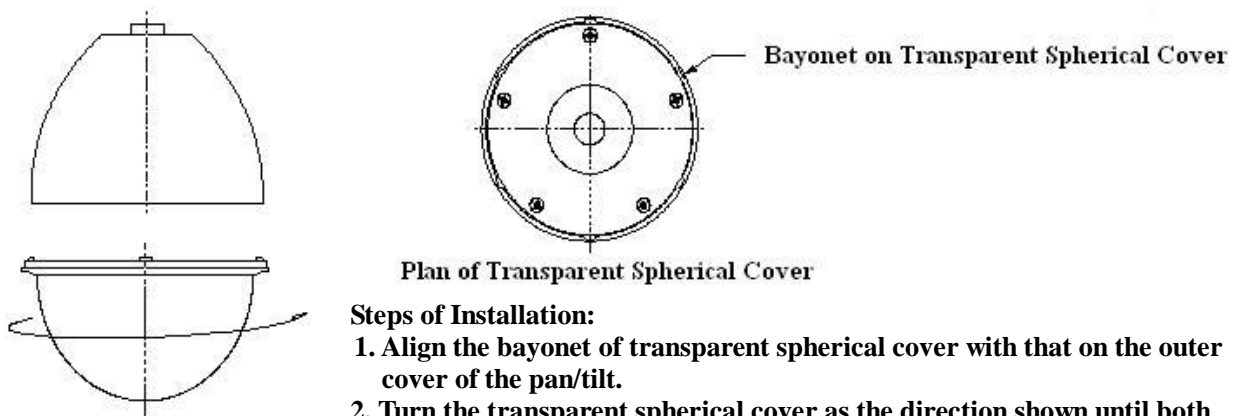c)   Fasten the hanging support on the ceiling (as per Figure 12).

1. M8 expansion
   screws (4 pcs)
2. M8 washers (4 pcs)
3. M8 nuts (4 pcs)
4. Hoisting support

<Figure   11>   **<Figure   12>**
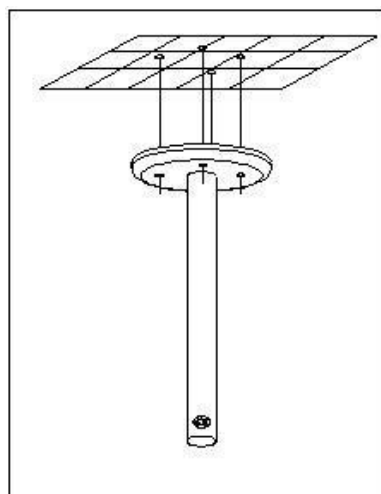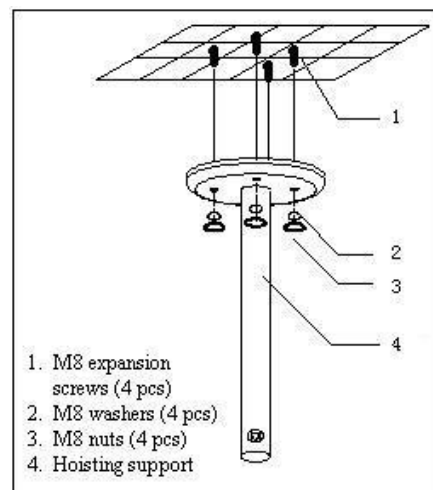
3.3 Installation of the spherical Pan/Tilt and the Support

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>
1. Thread the complex wires out of wall-mounted support.

Complex Wires

2. Ture the spherical pan/tilt on the support as the direction of arrow.

3. Tighten the lock screw.

Installation of Wall-Hanging Spherical Cover

1. Thread the complex wires out of the straight pipe.
2. Turn the spherical cover as the direction of arrow.
3. Turn in two lock screws.

Complex Wires

Installation of Ceiling-Hanging Spherical Cover
</figure>

<Figure 13>

3.4 Installation of the Transparent Spherical Cover

<figure>
Bayonet on Transparent Spherical Cover

Plan of Transparent Spherical Cover
</figure>

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.
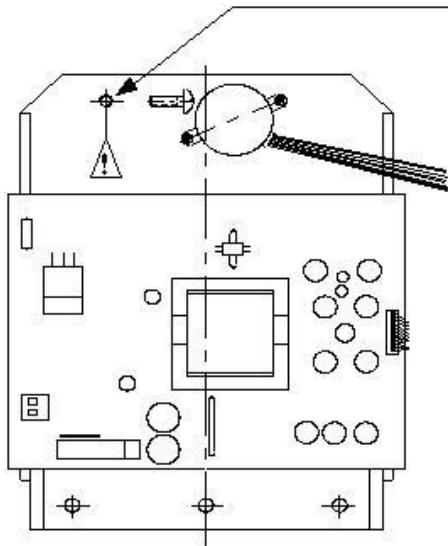
<Figure 14>

IMPORTANT!

3.5   Removal of Camera Transit Lock Screw

In order to protect the camera during the course of transportation, this screw may be used to secure the camera when leaving the factory. You must remove it before use. Failure to do this will damage the camera and dome.
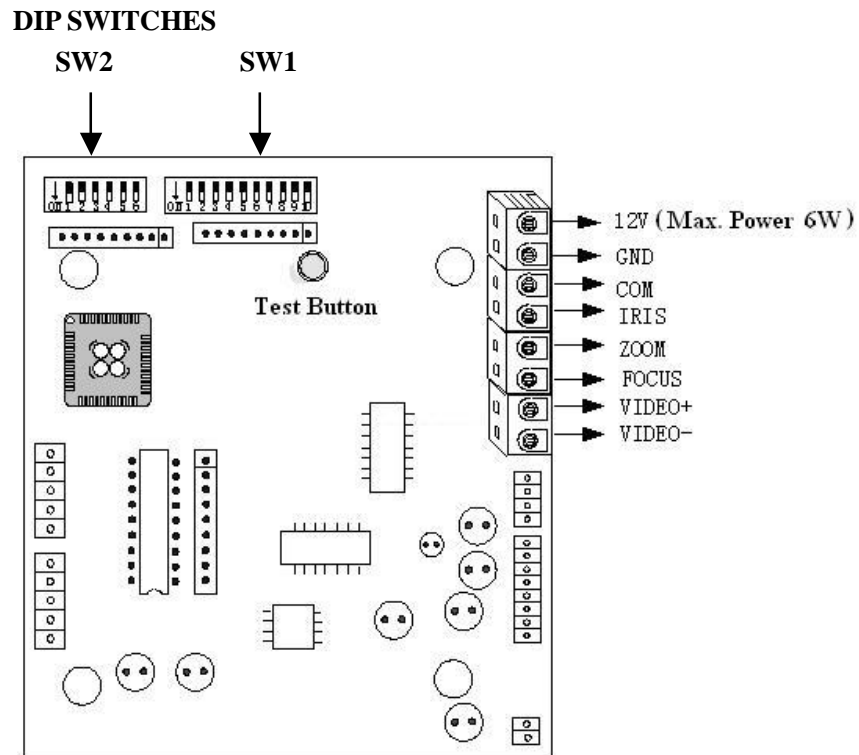
<Figure 15>

Technical Data

Input Voltage	AC24V ± 10% 50/60 HZ
Input Power	Indoor：12W Outdoor：30W – 1.25A
Baud Rate	2400 bps, 4800 bps, 9600 bps, 19200 bps selectable
Range of Address	0~511
Communication Style	RS-485
Communication Protocol	16 protocol options
Rotation Range	Horizontal 0~355° Vertical 0~90°
Rotation Limitation	Adjustable in horizontal direction
Rotation Speed	Horizontal 12°/sec ± 2% Vertical 8°/sec ± 2%
Working Temperature	Indoor 0°c ~ 45°c Outdoor -15°c ~ 55°c
Installation Sizes of Camera	112mm (L) × 60mm (W) × 70mm (H)

Camera connection data

1) This dome uses voltage to control the camera zoom, focus and iris. Positive outputs control the **zoom out, focus out and iris opening** and negative voltage controls the **zoom in, focus in and iris closing.**

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

<Figure 7>