

the excelPTZ range

Installation and Operation Manual

3 Axis Keypad Controller with LCD

MODEL PTZ720



Version 1.0

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1. Summary

The PTZ720 3 axis keyboard controller is used with terminal receivers such as the excelPTZ range of Speed Domes. The RS485 interface between the keyboard and the receiver, allows one keyboard to control as many as 32 intelligent speed domes with a maximum communication distance of up to 1.2 km. The keyboard is very easy to operate and control the Speed Dome Camera including functions to control pan, tilt, lens, light, wiper etc.

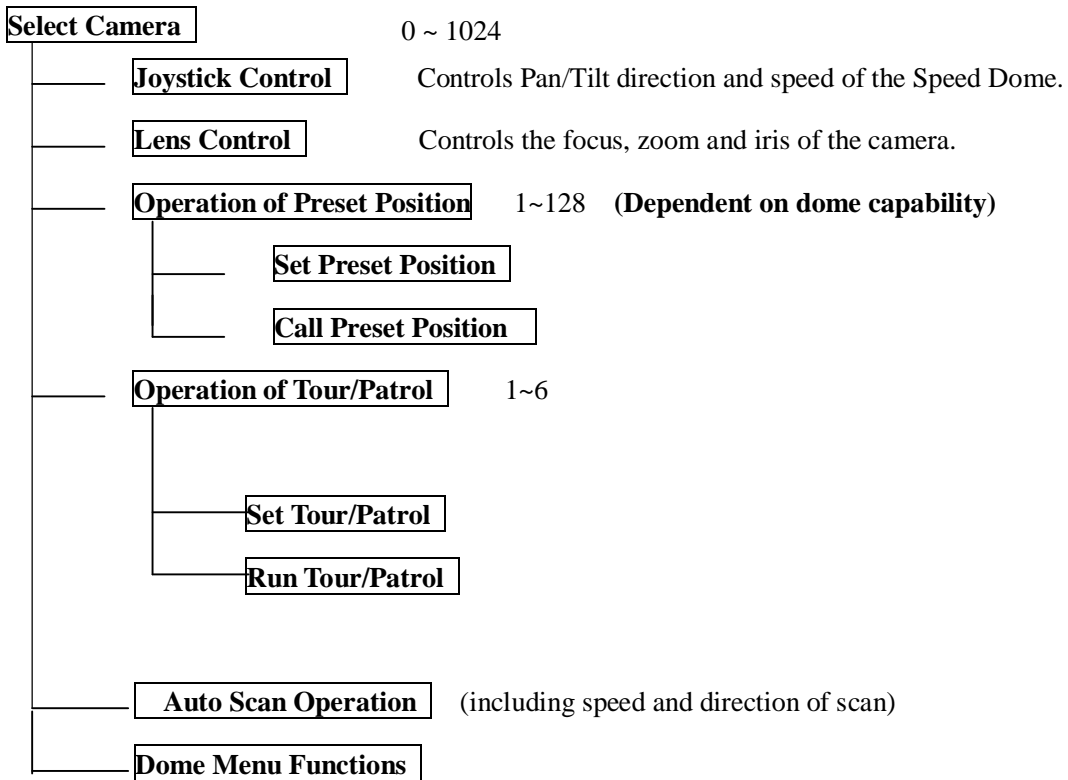
Main Functions

- u Sets the address range of the dome camera and the decoder.
- u Controls all functions of the dome camera such as powering on and off.
- u Operates the pan/tilt of the Speed Dome Camera moving at different speeds.
- u Allows the setting and calling of up to 128 preset points and six tours each containing 16 presets.
- u Controls the dome camera manually or automatically and allows the changing of camera settings.
- u Manually controls the focus, zoom and iris of the camera.

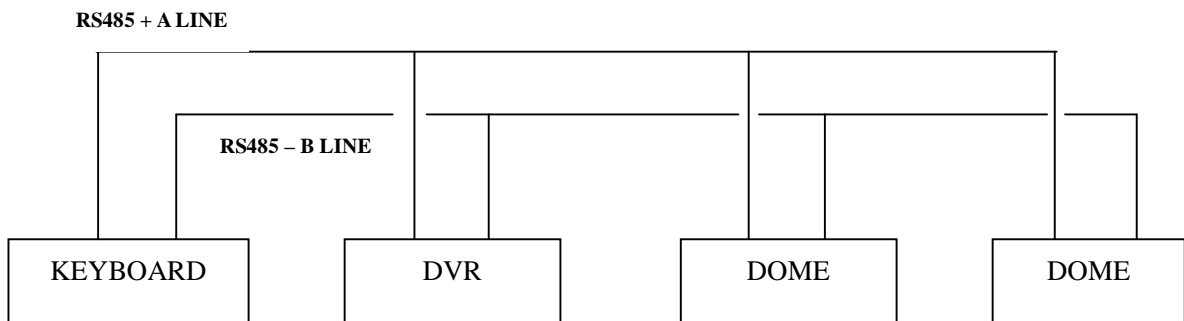
Specifications

- u 5" Colour LCD screen (menu control only)
- u OSD menu function
- u Integrated 16 protocols and baud rate range 2400bps ~ 19200 bps
- u RS485 and RS232 outputs
- u 3 axis joystick movement
- u Communication distance: at best 1200 metres
- u Power Supply 12V DC / 2.0Amps
- u Weight: 2 Kg
- u Measurements: 390mm x 165mm x 80mm
- u Controls a maximum of 32 domes

2. Keyboard Functions



3. External Connections

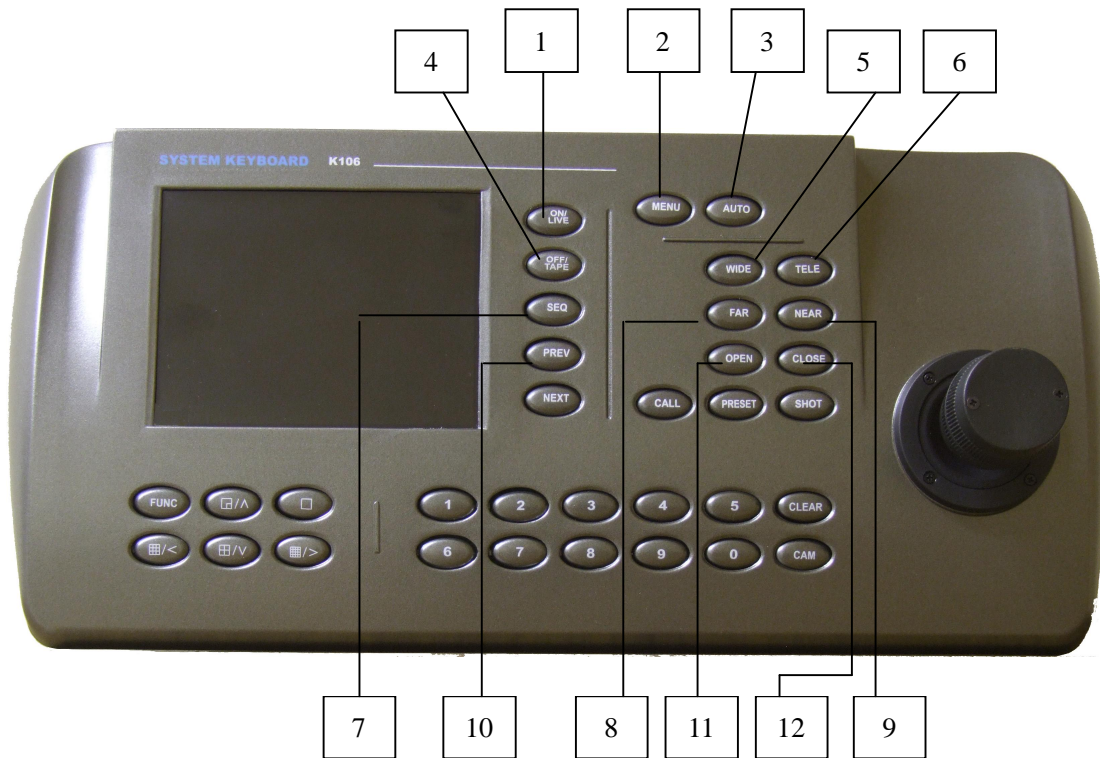


DO NOT CROSS CONNECT KEYBOARD TO EQUIPMENT

4. The keyboard Panel

Description of Buttons (Figure 1)

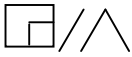
The keyboard has a speed joystick, press buttons and an illuminated display on the front panel. The display is used to show the address of the speed dome as well as the number inputted. The joystick controls the upward, downward, and sideways movement of the speed dome. The description of buttons is as follows:




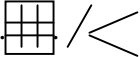
- | | | |
|---------------|-------|------------------------------|
| 1. ON / LIVE | ..... | SWITCH FUNCTIONS ON |
| 2. MENU | ..... | PRESS TO ENTER CAMERA MENU |
| 3. AUTO | ..... | AUTOSCAN FUNCTIONS |
| 4. OFF / TAPE | ..... | SWITCH FUNCTIONS OFF |
| 5. WIDE | ..... | INCREASE WIDE ANGLE VIEW |
| 6. TELE | ..... | TELESCOPIC RANGE |
| 7. SEQ | ..... | SEQUENCE THROUGH CAMERAS |
| 8. FAR | ..... | LONG RANGE FOCUS |
| 9. NEAR | ..... | CLOSE UP FOCUS |
| 10. PREV | ..... | MOVE TO PREVIOUS CAM ADDRESS |
| 11. OPEN | ..... | OPEN IRIS |
| 12. CLOSE | ..... | CLOSE IRIS |


- 13. NEXT MOVE TO NEXT CAM ADDRESS
- 14. CALL CALL THE PRESET POSITION
- 15. PRESET SET THE PRESET POSITION
- 16. SHOT TO SET UP OR CALL TOUR SEQUENCE
- 17. CLEAR CLEAR INPUT DATA
- 18. CAM SELECT CAMERA ADDRESS
- 19. 1 ~ 0 1 ~ 0 NUMERIC SELECTION

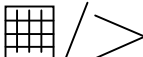
- 20. FUNC FUNCTION KEY

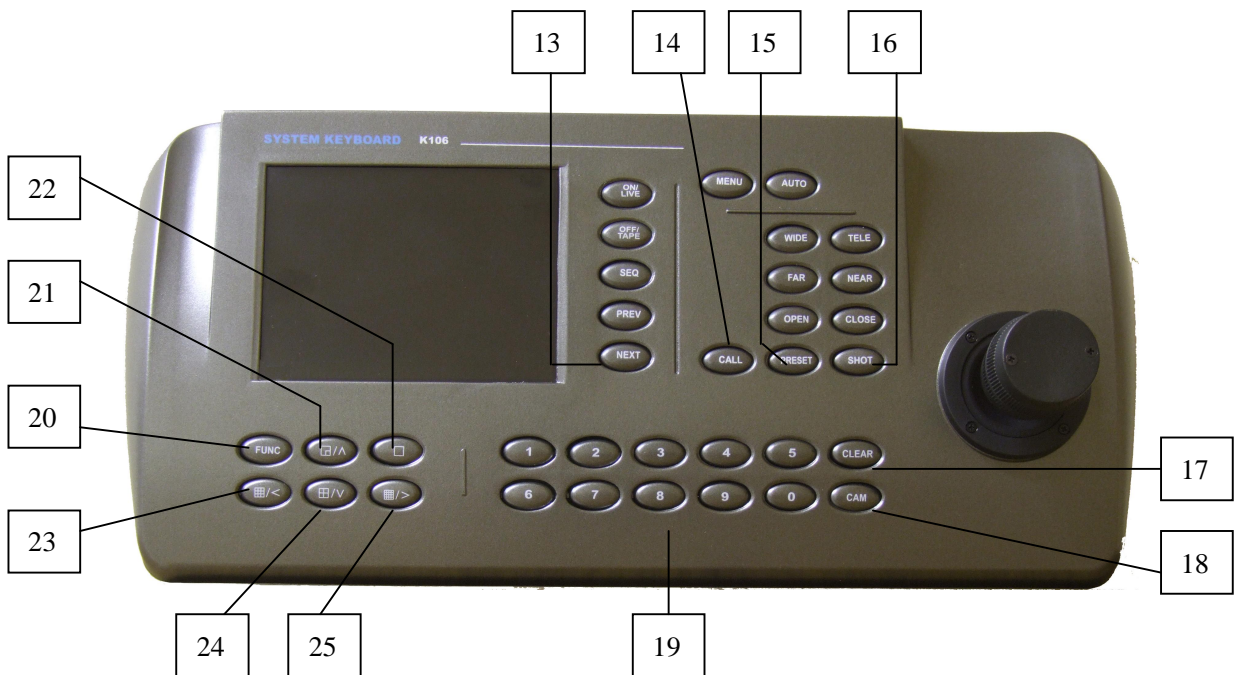
- 21.  UP ARROW KEY

- 22.  FULL SCREEN MODE (not operable on PTZ720)

- 23.  LEFT ARROW KEY

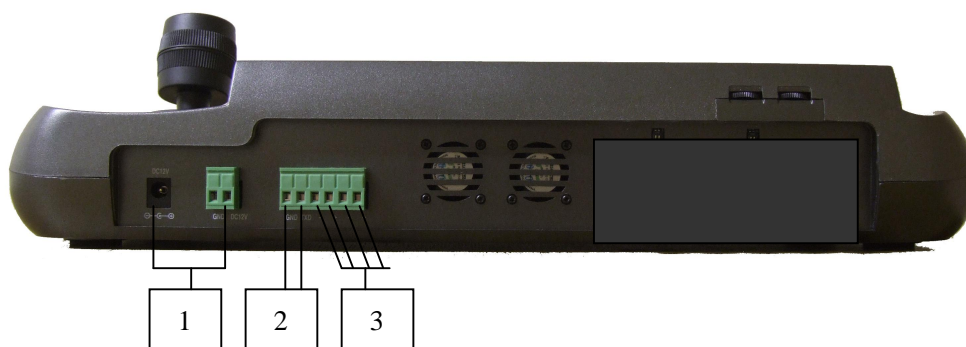
- 24.  DOWN ARROW KEY

- 25.  RIGHT ARROW KEY



5. Rear keyboard connections

Rear Panel (Figure 2)



1. DC POWER SUPPLY INPUT: DC12V / 2AMP
2. RS232 OUTPUT: TO CONTROL EXTERNAL MULTIPLEXER (NOT SUPPORTED)
3. RS485 OUTPUT: TO CONTROL THE DOME CAMERA OR THE PAN/TILT

6. Setting the Address, Protocol and Baud Rate of the Dome

An excelPTZ dome has three functions set by dip switches: a unique address, the protocol and the baud rate. The keyboard must call the correct dome address and will only be able to communicate if the protocol and baud rate are correctly set. The protocol is the language used by the dome and the baud rate is the speed of the messages sent to the dome.

Camera Address

Each dome has a unique “address” 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. The address is called from the keyboard by pressing the numeric address set in the dome followed by the “CAM” button. A menu is used to set the address.

Protocol

This is the language that the dome uses when you are sending messages from the keyboard. The protocol set in the dome must agree with the protocol set in the keyboard. The protocol used by the keyboard is set in the keypad menu.

Baud Rate

This is the speed of the messages sent to the dome. The baud rate set in the keyboard menu must agree with the baud rate set in the dome.

7. Keyboard Specification

When the keyboard is powered on, the address, baud rate, protocol and version code will be displayed for 10 seconds.

CAMERA ID:	001
BAUD RATE:	2400BPS
PROTOCOL:	P003
VERSION:	V1.0

The CAMERA ID refers to camera address 001, Baud Rate is 2400 bps, the protocol is P003 which is PELCO-D (see table of protocols and codes), and the keyboard software level is version 1.0.

After the 10 second duration, the unit will display the content of the data buffer and the camera address at the bottom of the display window.

DATA: 0000	DOME	ID: 001
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ONLY CONNECT THE PTZ DOME **AFTER** SETTING UP THE DOME DETAILS IN THE KEYBOARD MENU.

8. Keyboard Operation

FUNCTION	PRESS	THEN PRESS	COMMENTS
SET CAMERA ID	<1 ~ 1024>	CAM	
SET WIDE ANGLE LENS	WIDE		
SET TELEPHOTO LENS	TELE		
SET FOCUS TO FAR	FAR		
SET FOCUS TO NEAR	NEAR		
OPEN APERTURE	OPEN		
CLOSE APERTURE	CLOSE		
SET A PRESET	<1 ~ 128>	PRESET	
CALL A PRESET	<1 ~ 128>	CALL	
START A TOUR	<1 ~ 6>	SHOT	(up to 6 tours available)
SETUP AUTOSCAN START	AUTO	ON	
SETUP AUTOSCAN END	AUTO	OFF	
RUN AUTOSCAN	AUTO	SHOT	
SWITCH ON AUX FUNCTION	FUNC	<1 ~ 10> ON	(see following table)
SWITCH OFF AUX FUNCTION	FUNC	<1 ~ 10> OFF	(see following table)

NOTE: If the dome functions out of control, it is usually because the protocol does not support the function.

NUMBER	CONTROL FUNCTION	KEYBOARD OPERATION	
		FUNC + N + ON	FUNC + N + OFF
0	Camera Power Supply/Reset	On/Off Switchable	Renew camera values
1	Backlight Compensation	ON	OFF
2	Zero Lux (see camera specs)	ON	OFF
3	Menu Screen (see camera specs)	ON	OFF
4	Digital Magnification	ON	OFF
5	Reserved	Reserved	Reserved
6	Focus	AUTO	MANUAL
7	Iris	AUTO	MANUAL
8	White Balance	AUTO	MANUAL
9		INDOOR	OUTDOOR

10		ATW	One Push WB
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9. Control of the Dome / Pan / Tilt

Move the joystick until the camera reaches the desired position. The speed of movement can be controlled on the High Speed dome by the speed of movement on the joystick. Twist the joystick clockwise to zoom in and counterclockwise to zoom out.

10. Operation of the keyboard menu - Main Menu

Press MENU to enter and press again to exit. After entering the menu, move the joystick up or down to move the cursor up or down. Move the joystick left or right to enter the menu

<p style="text-align: center;">MAIN MENU</p> <ol style="list-style-type: none">1. SYSTEM SETTING2. CAMERA SETUP3. PROGRAM4. CONTROL MODE DOME5. EXIT <p style="text-align: center;">MENU 1</p>
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11. Main Menu - System Setting

Select SYSTEM SETTING by moving joystick up or down and move joystick to the right or left.

MAIN MENU
1. SYSTEM SETTING
2. CAMERA SETUP
3. PROGRAM
4. CONTROL MODE DOME
5. EXIT
MENU 1

SYSTEM SETTING
1. PROTOCOL A01
2. BAUD RATE 2400BPS
3. RETURN
MENU 1.1

1. PROTOCOL <code>

Move joystick right or left to select protocol from list:

CODE	PROTOCOL NAME
P000	A01
P001	B01
P002	SANTACHI
P003	PELCO-D
P004	PELCO-P
P005	PANASONIC
P006	LONGCOMITY
P007	HD600
P008	LILIN
P009	VICON
P010	MOLYNX
P011	KALATE
P012	VCL
P013	RESERVED
P014	ALEC
P015	ULTRAK

2. BAUD RATE <rate>

Move joystick to right or left to select baud rate :-
2400bps – 4800bps – 9600bps – 19200bps

3. RETURN

Move the joystick to return to the Main Menu.

11. Main Menu - Camera Setup

MAIN MENU

1. SYSTEM SETTING
2. **CAMERA SETUP**
3. PROGRAM
4. CONTROL MODE DOME
5. EXIT

MENU 1

CAMERA SETUP

1. BACKLIGHT ON/OFF
2. ICR SHOT AUTO ON/OFF
3. IRIS AUTO/MANUAL
4. D-ZOOM ON/OFF
5. FOCUS AUTO/MANUAL
6. WB SET AUTO/MANUAL/
OUTDOOR/INDOOR/

ATW/ONEPUSH

7. OSD OF CAM ON/OFF
8. RETURN

MENU 1.2

1. **BACKLIGHT** <ON / OFF > Move joystick right or left to switch light on or off.
2. **ICR SHOT AUTO** <ON / OFF > Move joystick right or left to switch ICR SHOT on or off..
3. **IRIS** <AUTO / MANUAL > Move joystick right or left to switch IRIS to auto or manual.
4. **D-ZOOM** < ON / OFF > Move joystick right or left to switch digital ZOOM on or off..
5. **FOCUS** < AUTO / MANUAL > Move joystick right or left to switch FOCUS to auto or manual.
6. **WB SET** < AUTO / MANUAL / OUTDOOR / INDOOR / ATW / ONEPUSH >
Move joystick right or left to white balance option.
7. **OSD OF CAM** < ON / OFF > Move joystick right or left to switch camera menu on off.
8. **RETURN** Move joystick right or left to RETURN to main menu.

11. Main Menu - Program

MAIN MENU	
1.	SYSTEM SETTING
2.	CAMERA SETUP
3.	PROGRAM
4.	CONTROL MODE DOME
5.	EXIT
MENU 1	

PROGRAM	
1.	AUTO PAN START POS
2.	AUTO PAN END POS
3.	RUN AUTO PAN NORMAL
4.	SET PATROL 01
5.	RUN PATROL 01
6.	RETURN
MENU 1.3	

1. **AUTO PAN START POS** Sets the start position of an AUTOSCAN
2. **AUTO PAN END POS** Sets the end position of an AUTOSCAN
3. **RUN AUTO PAN NORMAL** Runs the Autoscan until joystick is activated
4. **SET PATROL < NN >** Move the joystick left or right to select the tour number 01 ~ 06. Press OPEN to enter submenu. Move joystick left or right to move cursor position and up and down to set menu value. SEQ = Tour number. After editing press CLOSE to exit & save.

In the example we are setting four presets in the first patrol sequence.

To edit a patrol sequence

NO Patrol Item No.
POS No. of Preset Position
SP Dome speed (0, 1~8)
 0 and 1 are fastest speed –
 8 is slowest speed
TM Dwell time at this position
 Time 0 ~ 99 seconds

SEQ:nn The Patrol number. (01 ~ 06)

NO	POS	SP	TM	POS	SP	TM
01	001		01	01	002	01
01						
03	003	01	01	004	01	01
05	---	--	--	---	--	--
07	---	--	--	---	--	--
09	---	--	--	---	--	--
11	---	--	--	---	--	--
13	---	--	--	---	--	--
15	---	--	--	---	--	--
SEQ:01				CLOSE/EXIT		

Special Note: The patrol item number (**NO**) is an ascending number list of the preset items within this sequence. It may not necessarily reflect the actual preset number. You could for instance have preset item (NO) 01 with preset position 004 as the first preset required.

Enter the preset position number (**POS**), the dome speed (**SP**) and the dwell time (**TM**) for each preset by using the Joystick up/down movement. Move the Joystick to the right to move to the next field.

After including all the presets required in this patrol/tour, press the Keypad **CLOSE** button to exit. If you add extra presets later and wish to incorporate into a patrol/tour already created, you must add the additional preset positions in the necessary SET PATROL table sequence.

5. RUN PATROL < NN > Move joystick to left or right to select tour number and press OPEN to start tour.

6. RETURN Move the joystick left or right to return to MAIN MENU.

11. Main Menu - Control Mode Dome

MAIN MENU
1. SYSTEM SETTING
2. CAMERA SETUP
3. PROGRAM
4. CONTROL MODE DOME
5. EXIT
MENU 1

CONTROL MODE <DOME> / <MPX> Multiplexer

Move joystick to the right to switch between Control Mode Dome and Multiplexer.

Switching to this mode enables the LIVE and TAPE buttons. Alternatively pressing the FUNC and NEXT buttons simultaneously will also switch from Control Mode Dome to Multiplexer.

When the keyboard is first powered up the default state is Control Mode.

NOTE: The Multiplexer mode requires additional equipment that is neither supplied nor supported for this product.

12. Troubleshooting

Problem	Possible Cause	Possible Solution
No video	No power supply	1. Check power connection 2. Check 12vDC power supply 3. Check video connection
No telemetry control	1. Incorrect protocol 2. Incorrect baud rate 3. Incorrect address	Protocol and baud rate must be matched in keyboard and dome. Correct address must be called.

13. Installation and Connection

Please read the keyboard and speed dome manuals carefully before connecting wires. Any incorrect connections can cause permanent damage to the equipment. When connecting wires, always switch off the power supply first. The PTZ720 keyboard must not be exposed to damp or wet conditions that may short circuit the unit or cause electric shock.. Always check that the keyboard is correctly connected to a regulated 12v power supply and that the polarity is correct.

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



The dome is controlled by an RS485 data signal that is produced by the PTZ720 keypad or a compatible DVR. This data signal tells the dome to pan, tilt, zoom etc.

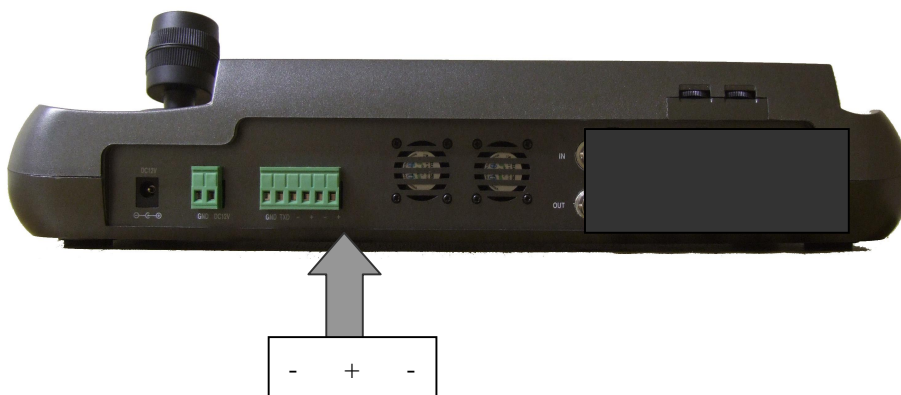
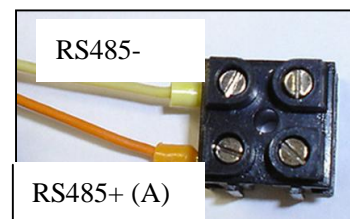
RS485 has two cores, A and B or sometimes known as RS485 + (A) and RS485 – (B) if you get these two the wrong way around then you will not be able to control the dome. Sometimes installers get the connections right on one dome but not on the other and find only one dome works. They then swap the wires 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 realise 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 excelPTZ range series adopts the following RS485 convention:

ORANGE = RS485 + or A
YELLOW = RS485 – or B

Figure 9



Connect the RS485 data cable to the connections on the rear of the keyboard (see diagram above). Note that the orange connection is the RS485 + A Line connection and the yellow is the RS485 – B Line connection. Note that there are two sets of RS485 connections.

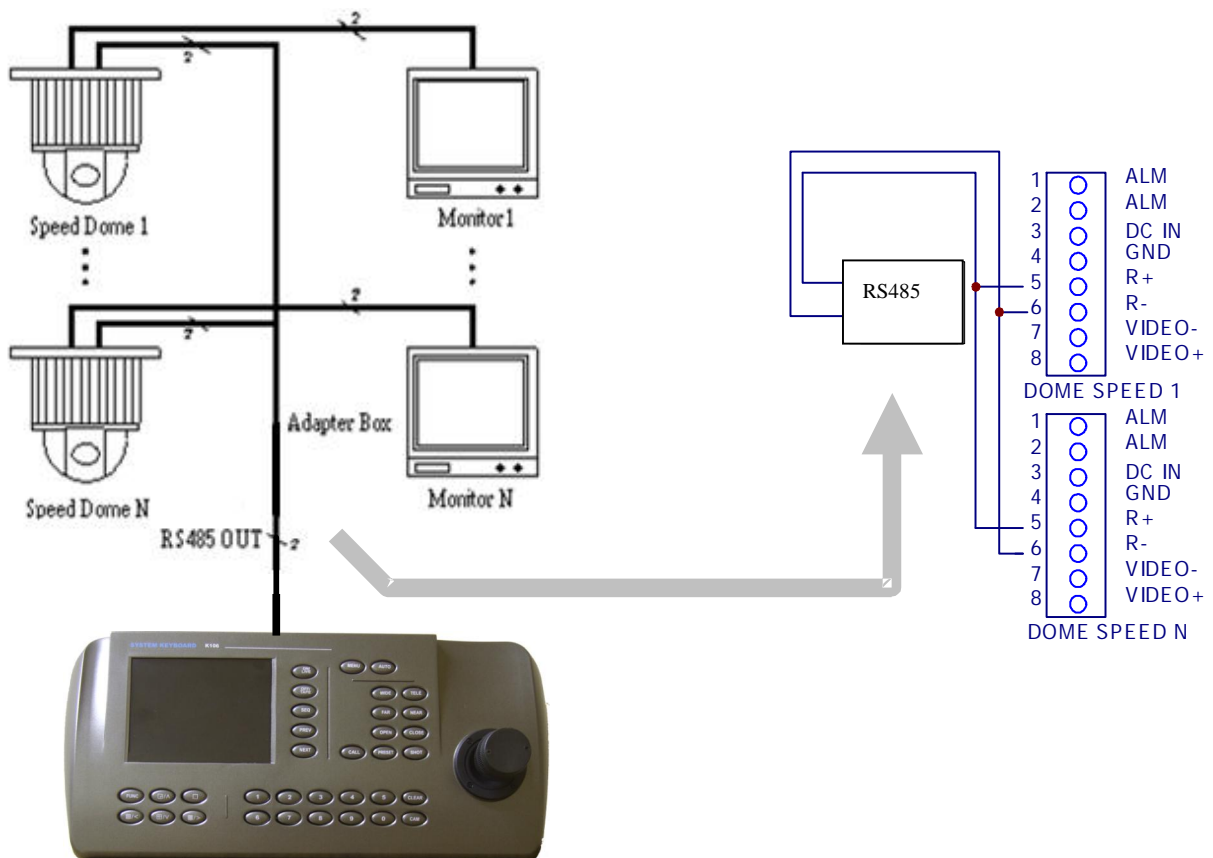
It is advisable to use CAT5 cable to connect the RS485 data cable from the dome to the keypad. You could use any pair out of the CAT5 cable but they must be two cores from the same pair. Why not use for example the orange pair so that the colours tie together a little? If you use cores from two different 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!! When installing cables they should be far away from high voltage lines or other possible sources of electrical interference.

Powering the PTZ720 Keypad

The PTZ720 requires a 12v DC regulated power supply and draws in the region of 2Amps. It is suggested that to ensure longest life from the power supply that a minimum specification of a 12v DC 2.8A power supply is fitted. The power supply fitting required is a 2.1mm mini power jack plug that fits into the 2.1mm mini power jack socket on the rear of the keypad.

Connecting the Keypad to Multiple Domes

The diagram below shows how to connect multiple domes to the PTZ720 keyboard controller. Connections at the camera end are shown below.



Note: As the protocol and baud rate of the dome camera are set by menu in this keypad, multiple domes must use the same protocol and baud rate.

14. Keyboard Operation

Camera Address.

In order to control the dome you will need to uniquely address it. The dome will usually have dip switches to set the address. When the address is set you will need to use this address to access the specific dome.

Press the dome address followed by the CAM key.

Example: Press '1' followed by CAM button. This will allow you to control camera 1.

Press '3' followed by CAM button. This will allow you to control camera 3.

Introduction to Dome's functionality

The dome stores preset positions, preset tours and other functionality associated with the dome equipment. The keyboard merely instructs the dome to carry out those functions. Think of the keyboard as a switch that activates a particular function in the dome that you require. Not all domes have the same functionality so if your dome does not have presets built into it you obviously cannot use presets, regardless of the keyboard you use. The 5" (measured diagonally) colour LCD screen displays menus only.

PRESETS and other functions.

What is a preset? A preset is a particular area or object that the dome camera was looking at and has been stored into its memory so when the preset is "called-up" from the keypad, the dome will select the area again without the operator using the joystick to do this. Even the zoom at the time can be stored with the preset. This means that you could for example store a PRESET of a car-park entrance. When the operator calls up this preset from the keypad, the camera automatically zooms in on this area. This keypad can select up to 128 different presets. Of course this is dependent on the total number that can be programmed into the dome. Once programmed they will stay in the dome's non-volatile memory so they will be retained even after a power cut. By storing more than one preset you can add even more functionality to the dome. By having two presets, you can then get the dome to "SCAN" between the two locations. You can even vary the speed of this scan. Having 3 or more presets you can get the dome to go on a TOUR (PATROL) of the presets. When you run the patrol, the dome goes to one preset, then waits a short period then on to the next preset and so on. The dome continues to cycle around this patrol until you cancel it.

Please note that the ability to use presets, auto scans, tours, record patterns, the length of time the camera stays at one location and the speed of travel between each preset, are dependent on the functionality available in the dome. Always refer to the relevant dome instruction manual.

PRESETS -How to set up a preset

Aim the dome where you want it to look, zoom in or out to get the correct scene and let the camera auto focus. Now press the following keys on the keypad : **xx PRESET** (where **xx** is the preset number you wish to store). For example **01 PRESET** would set preset 1 and the camera would always go to this location when preset 01 is "CALLED".

To test if the preset is stored correctly in the dome, use the joystick to move the camera to point in a new

location. Now press **xx CALL** (where **xx** is the preset you wish the camera to go to). In this example if you press **01 CALL** the dome should go straight to the PRESET 01 location.

TIP -You may wish to write down a list of presets that you have stored next to the keypad for the operator.

CALLING a preset

This may be as follows;

PRESET 01 = MAIN GATE (a long zoom shot)

PRESET 02 = ENTRANCE DOOR

PRESET 03 = FIRE ESCAPE

PRESET 04 = EMERGENCY EXIT

PRESET 05 = CAR PARK (zoomed-out wide angle)

PRESET 06 = CAR PARK (zoomed-in narrow angle)

When the operator wishes to quickly zoom in on the MAIN GATE all he has to do is press

01 CALL

To go to the EMERGENCY EXIT he would press **04 CALL** and so on.

To call up any previously stored preset camera location, simply press **xx CALL** where **xx** is the preset number.

Deleting a preset

You may wish to delete a preset.

To do this press **xx PRESET OFF** (xx = preset number).

For example to delete preset 1, press **PRESET + 01 + OFF**. Obviously if you wish to overwrite a preset with a new location, simply aim the camera at the new location and store the same preset again.

Patrols (Tours) – How to set them up and use them

A patrol (tour) is simply a collection of at least three preset camera locations that are run in sequence with the dome stopping at each location for a brief period of time and then moving on to the next preset.

For example, you could use a patrol so that an outside dome camera points at a gate, then at a side doorway, then zooms out to get an overall shot of a car park and finally zooming in on a delivery bay, before repeating the whole cycle again. Patrols can be useful for both outside and internal PTZ's. For a shop they could be used to cover key areas like clothes rails, tills and changing rooms in a sequence.

To set up a patrol you need to set up the individual stop points where the camera will pause. These are called *presets*.

An example four preset mini-tour

Setting the presets using the keypad

STEP 1- Using the keypad joystick, move to the first position and then press **01 PRESET**

STEP 2- Now move to the next location and press **02 PRESET**

STEP 3- Now move to the third location and press **03 PRESET**

STEP 4- Finally move to where you wish to end the tour and press **04 PRESET**

Setting up a Tour/Patrol

Refer to your instructions on the dome. This will detail how the tour is set up and initiated via the dome menu.

In order to access the dome menu press menu. You can select items in the menu by using the joystick left and right movement and changing and selecting items using the up and down joystick movement. Alternatively you can use the keyboard program menu.

Running a Tour/Patrol

Refer to your dome instructions. This will detail how to initiate the Tour/Patrol via the dome menu. In order to access the dome menu press menu. You can select items in the menu by using the joystick left and right movement and changing and selecting items using the up and down joystick movement. Alternatively you may be able to initiate the Tour/Patrol directly from the keypad by pressing the sequence number of the Tour/Patrol already stored in the dome followed by the SHOT button.

Example **01 SHOT** where 01 is the stored tour/patrol selected.

Setting up an Auto Pan/Scan

Refer to your instructions on the dome. This will detail how the Auto Pan/Scan is set up and initiated via the dome menu. In order to access the dome menu press menu. You can select items in the menu by using the joystick left and right movement and changing and selecting items using the up and down joystick movement. Alternatively you may be able to set up an Auto Pan/Scan directly from the keypad. First move dome to start position and then press the **AUTO + ON** buttons. Next move dome to the end position of the Auto Pan/Scan. Now press the **AUTO + OFF** buttons.

Running an Auto Pan/Scan

Refer to your dome instructions. This will detail how to initiate the Auto Pan/Scan via the dome menu. In order to access the dome menu press menu. You can select items in the menu by using the joystick left and right movement and changing and selecting items using the up and down joystick movement. Alternatively you may be able to initiate the Auto Pan/Scan directly from the keypad by pressing the **AUTO** and **SHOT** buttons. Example **AUTO SHOT**.

Setting up a Record Pattern/Self Learning Scan (PTZ400/680 series)

Refer to your instructions on the dome. This will detail how the Record Pattern is set up and initiated via the dome menu. In order to access the dome menu press menu. You can select items in the menu by using the joystick left and right movement and changing and selecting items using the up and down joystick movement.

Running a Recorded Pattern/Self Learning Scan (PTZ400/680 series)

Refer to your dome instructions. This will detail how to initiate the Record Pattern via the dome menu. In order to access the dome menu press menu. You can select items in the menu by using the joystick left and right movement and changing and selecting items using the up and down joystick movement. To stop the running of a Record Pattern just move the joystick.

Remember that the keyboard does not store presets or commands. This is done by the dome's non-volatile memory, which retains settings even through loss of power. Note however that this keyboard has been designed to control a wide variety of PTZ domes and that some functions may not be operable according to the functions provided by the dome.

16. Technical Specifications

Communication between dome camera & PTZ720	Asynchronous interface half duplex serial communication
Communication connector	RS485 and RS232
Communication Baud Rate	2400bps, 4800bps, 9600bps and 19200bps
Maximum communication distance	1200 metres maximum
Power Supply	12v DC 2Amp
Size	390mm x 165mm x 80mm
Weight	2Kg
Number of domes controlled by keyboard	32