3D Keypad with 5" LCD

Installation and Operation Manual

Model PTZ722

Version 1.0

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1. Summary

The PTZ722 3 axis keyboard controller can be used with a wide range of PTZ cameras. The RS485 interface between the keyboard and the receiver, allows one keyboard to control as many as 255 intelligent speed domes with a maximum communication distance of up to 1.2 km. The keyboard is very easy to operate and control the PTZ camera including functions to control pan, tilt, zoom, focus and iris etc.
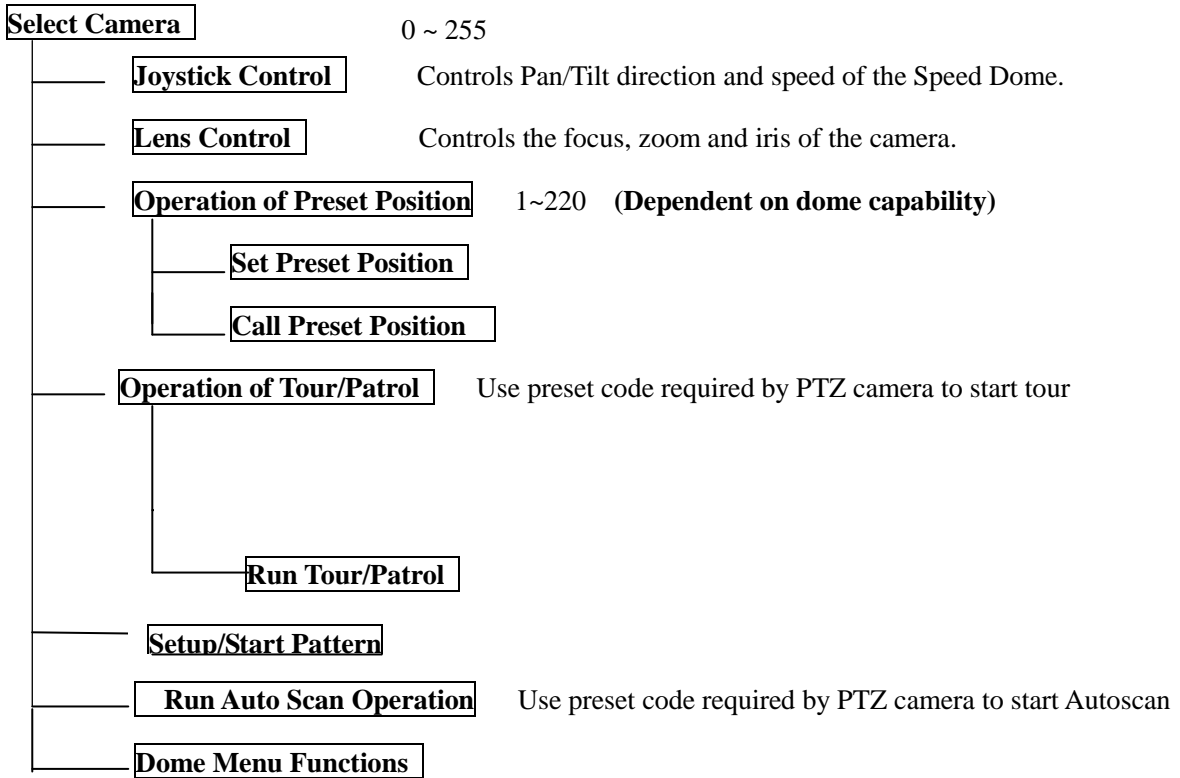
Main Functions
- Sets the address range of the dome camera up to 255.
- Stores a unique protocol, baud rate and ID for each camera.
- Up to 11 different protocols can be selected.
- Up to 4 different baud rates can be selected.
- Controls functions of the dome camera such as accessing the menu.
- Operates the pan/tilt of the Speed Dome Camera moving at different speeds.
- Allows up to three different analogue video feeds to be viewed on internal LCD screen.
- Manually controls the focus, zoom and iris of the camera.
- Provides a facility to create a pattern and play it back.
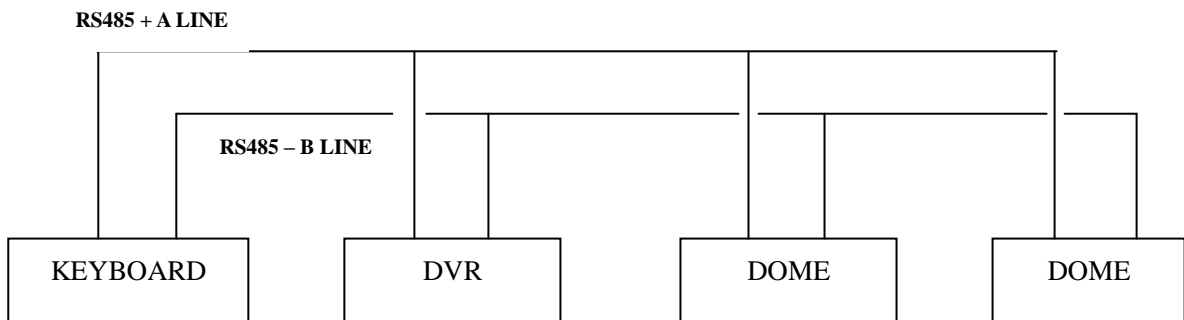- Button on joystick to initiate CALL 99 for continuous panning.*

Specifications
- 5" Colour LCD screen (measured diagonally)
- Three separate video input or menu displays
- 11 protocols and baud rate range 2400bps ~ 19200 bps
- RS485 output
- 3 axis joystick movement
- Communication distance: at best 1200 metres
- Power Supply 12V DC 500mA
- Measurements: 239mm x 190mm x 100mm
- Controls a maximum of 255 domes
- Allows the setting and calling of up to 220 preset points
- Record a pattern with up to 100 recordable operations
- Sound button that can be switched on and off
- Backlight Timeout option
- Change video format from PAL to NTSC
- Factory Reset Option

* only applies to PTZ cameras that use CALL99 for continuous rotation

2. Keyboard Functions

Select Camera   0 ~ 255

    Joystick Control   Controls Pan/Tilt direction and speed of the Speed Dome.

    Lens Control   Controls the focus, zoom and iris of the camera.

    Operation of Preset Position   1~220   **(Dependent on dome capability)**

        Set Preset Position

        Call Preset Position

    Operation of Tour/Patrol   Use preset code required by PTZ camera to start tour

        Run Tour/Patrol

    Setup/Start Pattern

    Run Auto Scan Operation   Use preset code required by PTZ camera to start Autoscan

    Dome Menu Functions

3. External Connections

RS485 + A LINE

RS485 – B LINE

| KEYBOARD	DVR	DOME	DOME

DO NOT CROSS CONNECT KEYBOARD TO EQUIPMENT

4. The keyboard Front Panel

Description

The keyboard has a speed joystick, press buttons and an illuminated display on the front panel. The display is used to show the video camera feed from three separate cameras by selection, the Video feed number, the Dome address, Protocol and Baud Rate or the command input to the keyboard. The joystick controls the upward, downward, and sideways movement of the speed dome. The description of buttons is as follows:
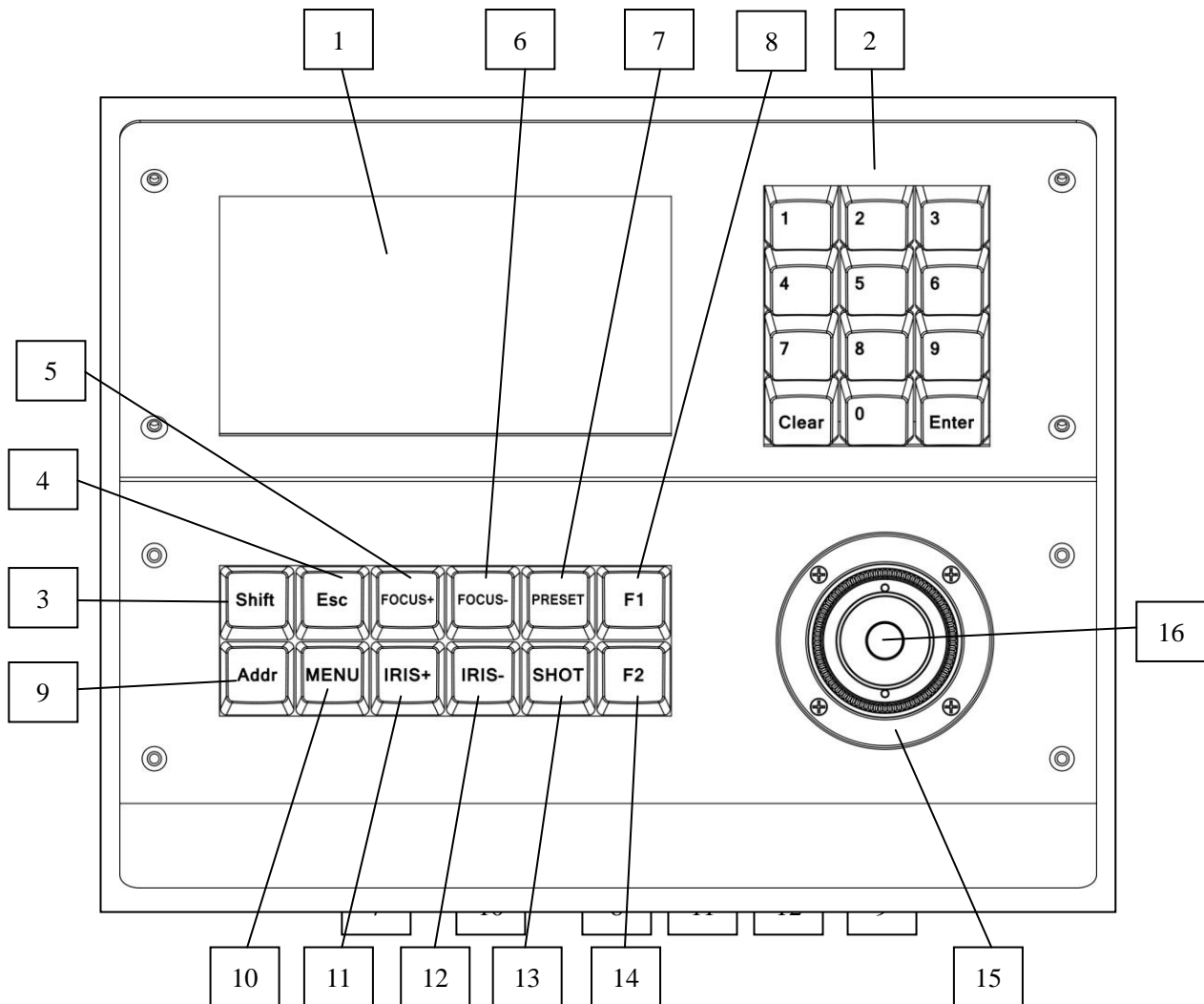

1.   LCD DISPLAY…………….   5" LCD for video/function display
2   NUMERIC KEYPAD……… Numerics, Clear and Enter buttons
3.   SHIFT   …………………..   Switches between video channels 1, 2 and 3
4.   ESC   ………………...……..   Escape or exit
5.   FOCUS +   ………………..   Focus near
6.   FOCUS - …………………..   Focus far
7.   PRESET ……………………   Preset setup   e.g Preset <no.> Enter

8. F1 ……………………… Pattern setup

9. ADDR …………………… Camera address number set in camera

10. MENU …………………… System and Dome setup (see later info)

11. IRIS + …………………… Increase aperture / Open

12. IRIS - …………………….. Decrease aperture / Close

13. SHOT …………………….. Call a preset   e.g Shot <no.> Enter

14. F2 ……………………… Run Pattern

15. Joystick ………………….. Left, right, up, down, twist to zoom in/out,

16. Joystick Button ………… for PTZ continuous rotation.

LCD DISPLAY

On the back of the keyboard there are three video input BNC connections. These are for connecting video from three separate cameras that can be individually selected using the Shift button. The video channel will relate to video channel connected to the back of the keyboard. A display of the channel number will be shown for approximately 15 seconds as shown below:
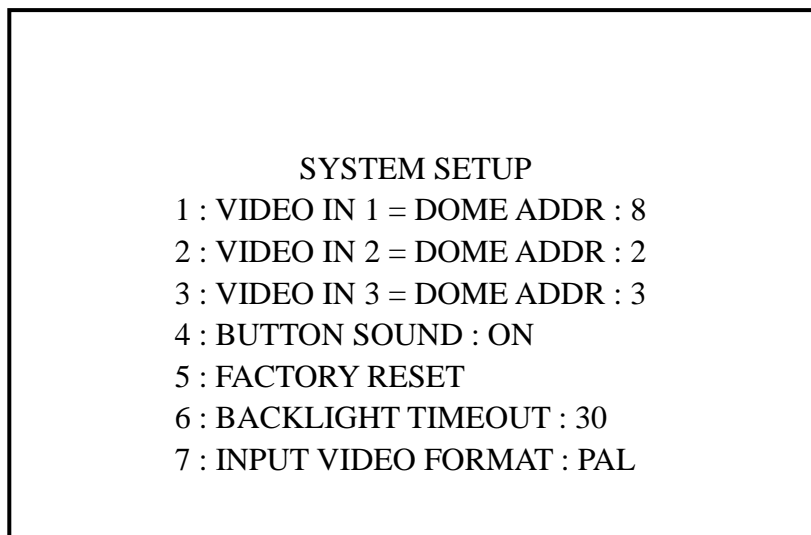
VIDEO – 1
DOME – 8   P:PELCOD   B:2400   DA:
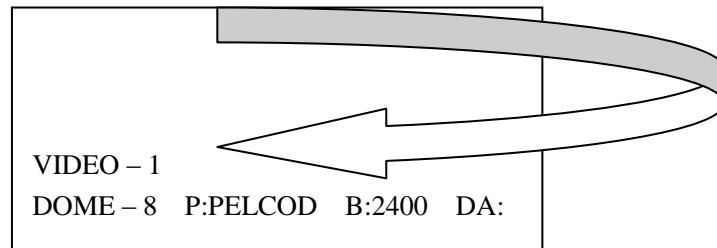
5. Menu Options

Press the Menu button for Keyboard Setup.   There are 2 options – System Setup & Dome Setup.

```
                    SETUP
           1 : SYSTEM SETUP <
           2 : DOME SETUP
```
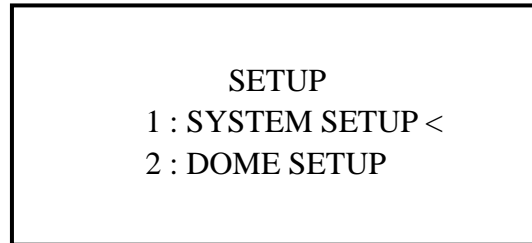
SYSTEM SETUP

This option is for the initial setup of the keyboard. To access this option move the joystick to the right.

```
                SYSTEM SETUP
        1 : VIDEO IN 1 = DOME ADDR : 8
        2 : VIDEO IN 2 = DOME ADDR : 2
        3 : VIDEO IN 3 = DOME ADDR : 3
        4 : BUTTON SOUND : ON
        5 : FACTORY RESET
        6 : BACKLIGHT TIMEOUT : 30
        7 : INPUT VIDEO FORMAT : PAL
```

1./2./3. VIDEO IN x DOME ADDR xxx   (1 ~ 255)

You can display a camera video using the video in connections on the rear of the keyboard. There are three inputs labelled 1, 2 and 3. If you want to connect a camera with an internal ID of 8 for example, you need to change the Dome Address to that number. This is shown above. The dome address can be set from 1 ~ 255. You can use the joystick left or right movement to select the address or use the numeric keyboard.

4. BUTTON SOUND   ON / OFF

Allows user to switch off / on sound when keys on keyboard are depressed.

5. FACTORY RESET
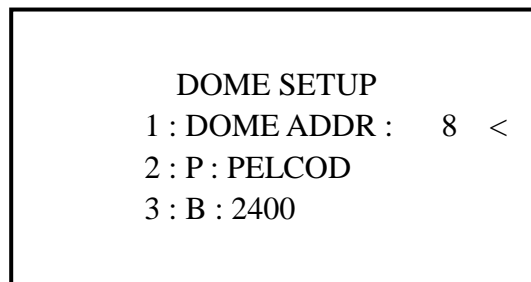Reset keyboard back to manufacturer's settings.

6. BACKLIGHT TIMEOUT   20 / 30 / 60 / 120 / 180 / OFF (always ON)
This allows the setting of backlight remaining on for number of seconds or off.

7. INPUT VIDEO FORMAT   PAL / NTSC
Allows switching video mode from PAL to NTSC.

DOME SETUP

```
          DOME SETUP
1 : DOME ADDR :    8   <
2 : P : PELCOD
3 : B : 2400
```

PTZ domes generally have three settings to uniquely identify it: 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.

The DOME SETUP menu allows you to set the ID number of the camera, the protocol and baud rate for each camera. There are no dipswitches used, so this provides the option to use different protocols and baud rates on different cameras.

1. DOME ADDR   (1 ~ 255)
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 Addr button followed by the dome number and Enter.

Note: If you set a higher address than 255 the keyboard will change the address to 255 automatically. For cameras requiring 0 address that can be set but only using keyboard rather than joystick.

2. P: PROTOCOL   (select from 11 different protocols)

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.

List of Protocols:

PELCOD / PELCOP / SAE / SONIC1 / SONIC2 / SAMSUNG / RULE / B01 / DAHUA / HIK / VISCA

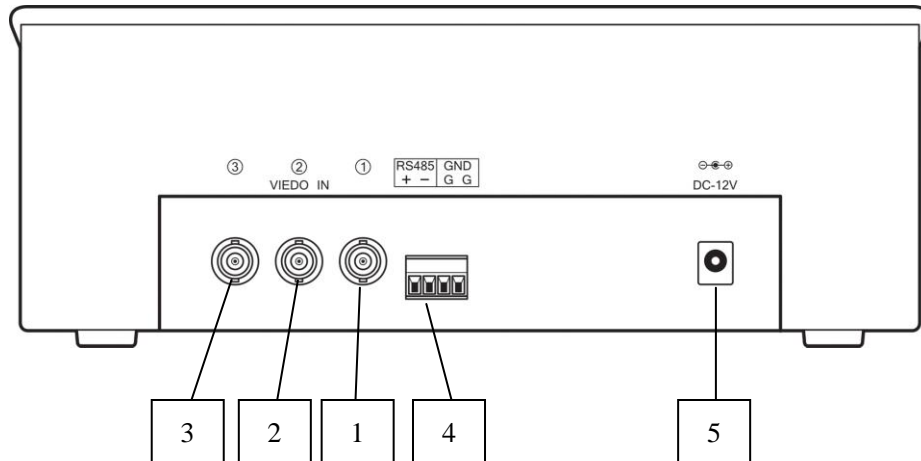**3. B: BAUD RATE   (select from four different baud rates)**

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.

List of Baud Rates:

2400 / 4800 / 9600 / 19200

6. Rear keyboard connections

Rear Panel

1. VIDEO IN CHANNEL 3
2. VIDEO IN CHANNEL 2
3. VIDEO IN CHANNEL 1

4. RS485 OUTPUT: TO CONTROL THE PTZ CAMERA
Connect PTZ RS485 Transmit T+ and T- to + and – connections.

5. DC POWER SUPPLY INPUT: DC12V / 500mA

7. Installation and Connection

Please read the keyboard and speed dome manuals carefully before connecting wires. Any incorrect connections may cause permanent damage to the equipment. When connecting wires, always switch off the power supply first. The PTZ722 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 500mA minimum 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 PTZ722 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 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 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 PTZ722 adopts the following RS485 convention:

RS485 +   or   A   RS485 −   or   B
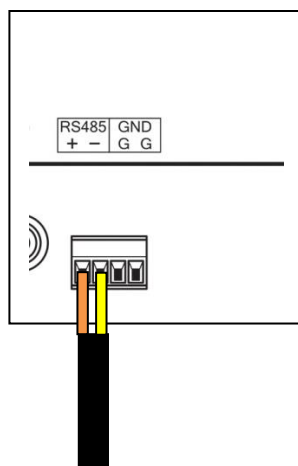
Connect the RS485 data cable to the connections on the rear of the keyboard (see diagram above). Note that the brown connection is the RS485 + A Line connection and the blue is the RS485 − B Line connection.

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 PTZ722 Keypad
The PTZ722 requires a 12v DC regulated power supply and draws in the region of 500mA. It is suggested that to ensure longest life from the power supply that a minimum specification of a 12v DC 1A 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.

8. Keyboard Operation

1. Switch Video Channel input: Press <Shift> key

2. Setting Presets: <Preset xxx   Enter>

3. Calling Presets: <Shot xxx Enter>

4. Selecting PTZ/Camera ID number :   <Addr xxx Enter>

5. Pattern Setup: Press <F1> key
   Press and hold down F1 key for 3 seconds until information is displayed on the screen. The movements with the joystick and functions will be recorded until the F1 is pressed again to finish pattern.   Note this only applied to PTZ cameras that have the pattern functionality.

6. Run Pattern: Press <F2> key
   Start the pattern by pressing the F2 key. Moving the joystick or pressing a key will close the pattern.

Camera Address

In order to control the dome you will need to uniquely address it. The address is called from the keyboard by pressing the Addr button followed by the dome number and Enter.

Press the Addr button followed by the Camera number and Enter key.
Example: Press **Addr** followed by **1** and **Enter** button. This will allow you to control camera 1.
                    Press **Addr** followed by **3** and **Enter** button. This will allow you to control camera 3.

Introduction to PTZ camera's functionality

Most PTZ dome cameras store 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.

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 220 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 : **PRESET <xx> Enter**   (where **xx** is the preset number you wish to store). For example   **PRESET 01 Enter** 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 **SHOT <xx> Enter**   (where **xx** is the preset number you wish the camera to go to). In this example if you press **SHOT 01 Enter** 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
SHOT 01 Enter
To go to the EMERGENCY EXIT he would press   **SHOT 04 Enter** and so on.

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

Deleting a preset

You may wish to delete a preset.
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 1st position and then press **PRESET 1 Enter**
STEP 2- Now move to the next location and press **PRESET 2 Enter**
STEP 3- Now move to the third location and press **PRESET 3 Enter**
STEP 4- Finally move to where you wish to end the tour and press **PRESET 4 Enter**

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.

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 SHOT followed by the Tour/Patrol call number and Enter. Example **SHOT xx Enter** where xx is the tour/patrol preset or call code number used by the PTZ camera to start a tour.

Setting up an Auto Pan/Scan

Refer to your instructions on the PTZ dome. This will detail how the Auto Pan/Scan is set up and initiated. If the PTZ camera has the Auto Scan facility you may be able to use the PTZ menu to set it up using the joystick and or command keys. Alternatively you may be able to set up an Auto Pan/Scan directly using preset/shot commands.

Running an Auto Pan/Scan

Refer to your PTZ camera instructions. This will detail how to initiate the Auto Pan/Scan via the PTZ menu if the PTZ camera has this functionality. You may be able to use the PTZ menu to run the Auto Scan using the joystick and or command keys. Alternatively you may be able to run an Auto Pan/Scan directly using preset/shot commands.

Setting up a Record Pattern

Press and hold down F1 key for 3 seconds until information is displayed on the screen. The movements with the joystick and functions will be recorded until the F1 is pressed again to finish pattern.   Note this only applied to PTZ cameras that have the pattern functionality.

Alternatively refer to your instructions on the PTZ camera. This will detail how the Record Pattern is set up via the menu if it has this functionality. You may be able to select items in the PTZ camera 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

If the pattern has been setup using the keyboard F1 key, you can run the pattern by pressing the F2 key. Moving the joystick or pressing a key will close the pattern.

Alternatively refer to your instructions on the PTZ camera. This will detail how the Record Pattern is run via the menu if it has this functionality. You may be able to select items in the PTZ camera menu by using the joystick left and right movement and changing and selecting items using the up and down joystick movement.

9.   Joystick Operation

Move the joystick until the camera reaches the desired position. Twist the joystick clockwise to zoom in and counterclockwise to zoom out. Pressing the joystick button will initiate a CALL 99 that will normally start a continuous pan on the PTZ camera but this depends on whether the PTZ has the preset allocated for this purpose.

10.   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 4. RS485 connection 5. RS485 cable	Protocol and baud rate must be matched in keyboard and dome. Correct address must be called. Incorrect polarity connections Test for continuity

11.   Technical Specifications

Name	Function
Backlight	Yes
Baud Rate	2400, 4800, 9600, 19200 bps
Protocols	PELCOD / PELCOP / SAE / SONIC1 / SONIC2 / SAMSUNG / RULE / B01 / DAHUA / HIK / VISCA
Housing	Metal with anodised finish in grey
Joystick	4D (3D plus button for continuous scan)
LCD screen	5" colour display (allows up to three individual channel displays)
Pattern Record	Using function buttons can record and playback patterns
Operating Temperature	-10ºC ~ +70ºC
Power Rating	12vDV 500mA
Power Supply	12vDC 1A
Power connection	2.1mm DC Socket
Dimensions	239 x 190 x 100mm