X2150
Multi-Format CCTV
Control Console
Operating Instructions

X2150 Multi-Format CCTV Control Console

The X2150 operates in three distinct modes: Matrix, Multiplexer and VCR as follows:

(Exact operation depends upon each particular system set-up. The example instructions that follow refer to a system comprising 4 ITL multiplexers connected to 4 Sanyo TLS-9024P VCRs with 64 high-speed dome cameras. An NG Systems 8 way multiplex combiner is connected to form a 2 output, 64 input matrix by use of the auxiliary multiplexer outputs. Two further Sanyo VCRs are connected as spot and incident recorders).

1. Matrix Mode – this is the default mode and is selected by pressing the blue [MAT] key located in the lower-left portion of the keyboard. In this mode the top line of the LCD display will show 'MAT:1' and any of the camera inputs may be selected for display and control on the default monitor as indicated on the LCD display.

To select a camera on monitor 1:

    a) Ensure 'Matrix' mode is selected as described above.

    b) Check that 'MON:1' is indicated on the display – if not, select monitor 1 by first pressing [1] on the numeric keypad followed by [MON].

    c) Enter the camera number required (1 – 64) on the numeric keypad followed by [ENT] and the chosen camera will be selected on monitor 1.

To select a camera on monitor 2:

    Repeat the above, substituting the numeric key [2] in (b).

Example:

Select camera 37 on monitor 2:

    a) Press [MAT] to select 'Matrix' mode.

    b) Press [2] followed by [MON] to select monitor 2

    c) Press [3] then [7] followed by [ENT]

    d) Camera 37 will appear on monitor 2.

When a camera is selected, the LCD display will indicate the type of camera chosen e.g. "FIXED" indicates a camera with a fixed view that cannot be remotely controlled by the X2150, "PAN-002" indicates a controllable Panasonic high-speed dome which may be controlled using the joystick and (grey) telemetry control keys. (See section 5 – Camera Control).

(2) Multiplexer (MPX) mode – this mode is selected by pressing the (black) [MPX] key. In this mode, the blue LED indicator will illuminate and the top line of the LCD display will show 'MPX:n' where 'n' is the number of the selected multiplexer.

Multiplexer mode is used to control each of the connected multiplexers and their associated VCRs and screens.

Each multiplexer is connected to sixteen cameras, any of which may be chosen to display its output in full-screen format. Alternatively, all sixteen cameras (or a selection of the sixteen) may be displayed either sequentially in full-screen format, or simultaneously in a split-screen arrangement.

Multiplexers are connected to the numbered cameras as follows:

Multiplexer 1:	Camera 1 – 16
Multiplexer 2:	Camera 17 – 32
Multiplexer 3:	Camera 33 – 48
Multiplexer 4:	Camera 49 – 64

To select a single, full-screen camera for display on a multiplexer screen:

  a) Ensure 'MPX' mode is selected as described above.

  b) Enter the camera number required (1 – 64) on the numeric keypad followed by [ENT] and the chosen camera will be selected on its associated multiplexer screen.

Pressing [ENT] a second time will cause the multiplexer to automatically sequence through each of its cameras in full-screen and this is indicated on the LCD display by an asterisk (*) next to the camera number. To cancel auto-sequencing, press [ENT] once more, or select a different camera on that multiplexer.

By selecting a camera 1 – 64, the relevant multiplexer will be automatically selected according to the above table. Alternatively, any multiplexer may be manually selected by pressing a number key ([1] to [4]) followed by [MPX].

To select simultaneous display of all sixteen (or a selection) of the associated cameras on a particular multiplexer screen:
  a) Ensure the required multiplexer (1 – 4) is active – if not, manually select it as described above.

  b) Press [MON] – all sixteen cameras will be displayed on the selected multiplexer screen in a 4 x 4 arrangement. Subsequent presses of the [MON] key will select various 8-way and 4-way combinations.

To revert to full-screen mode, press [ENT] at any time.

In 'Multiplexer' mode, the selected camera may be controlled using the joystick and (grey) telemetry control keys to pan, tilt, zoom and focus any non-fixed camera (See section 5 – Camera control).

Video Loss

If any multiplexer loses one or more of its input signals due to camera failure or other system fault, the message "VIDEO LOSS!" will be displayed on the LCD screen. This warning may be cancelled at any time by pressing [SHIFT} two or three times whilst in MPX mode.

(2.1) Multiplexer recording

Each multiplexer is connected to its own Video Cassette Recorder (VCR) that simultaneously records all of the multiplexer's sixteen cameras in 24-hour time-lapse mode.

Whilst in MPX mode, the VCR associated with the selected multiplexer may be simultaneously controlled by use of the green VCR keys beneath the LCD display. For example, pressing the record key [●] will select 'Record' mode on the MPX and simultaneously start the VCR recording. It should be noted that, in order to prevent inadvertent interruption of recordings, record mode may only be terminated by pressing play [▶].

Examples:

> To start the VCR connected to multiplexer 1 recording:
>
> > a) Ensure multiplexer 1 is selected as described above (MPX:1 appears on the display and the blue LED is illuminated).
> >
> > b) Select playback mode on the multiplexer by pressing play [▶].
> >
> > c) If necessary, rewind the tape by first pressing stop [■] followed by rewind [◀◀].
> >
> > d) Start the recording by pressing record [●].
>
> *To stop recording and play the tape from the beginning on multiplexer 1's VCR*:
>
> > a) Ensure multiplexer 1 is selected as described above.
> >
> > b) Stop the recording by pressing play [▶].
> >
> > c) Rewind the tape by pressing rewind [◀◀].
> >
> > d) Press play once again.

(2.2) Multiplexer Playback

During playback, (as in record) cameras images may be either individually displayed in full-screen mode or all sixteen (or a selection of the sixteen) displayed in split-screen format on the multiplexer screen.

> *To* select an individual camera during *playback:*
>
> > a) Ensure the relevant multiplexer and its VCR are switched to 'Playback' mode as described above.
> >
> > b) Enter the required camera number on the numeric keypad followed by [ENT].

The chosen camera image will be displayed on its multiplexer screen.

> *To select* multiple *camera*s during *playback:*
>
> > a) Ensure the relevant multiplexer and VCR is switched to 'Playback' mode as described above.

b) Press [MON] repeatedly until the required format (16 way, 8 way or 4 way) is displayed.

During playback, the pause key [II], stop [■], fast-forward [▶▶], rewind [◀◀] and play [▶] keys may be used to search and freeze-frame the images.

(3) VCR Mode – this mode is selected by pressing the (green) VCR key**.** In this mode, the green LED indicator will illuminate and the top line of the LCD display will show 'VCR:1' or 'VCR:2' indicating the current VCR to be controlled.

VCR mode is used to control the two VCRs connected to matrix monitors 1 and 2.

To control the VCR connected to monitor 1 (VCR 1):

Ensure VCR 1 is showing on the top line of the LCD display – if not, press [1] followed by [VCR].

To control the VCR connected to monitor 2 (VCR 2):
Ensure VCR 2 is showing on the top line of the LCD display – if not, press [2] followed by [VCR].

The (green) VCR keys located beneath the LCD display may now be used to control the selected VCR as follows:

[●] Record   [◀◀] Rewind   [▶] Play   [▶▶] Fast-Forward
                [■] Stop   [II] Pause

(3.1) Search and Field Advance
During 'Play' mode, the fast-forward and rewind keys act as forward and reverse search keys respectively. Similarly, these two also keys duplicate as field advance and reverse keys when in paused play.

Examples:
To fast search in 'Play' mode:
a) Press 'Play' [▶] – the tape will play at normal speed.
b) Press 'Fast-forward' [▶▶] – the tape will play at search forward speed or press 'Rewind' [◀◀] to search backwards.
To return to normal speed, press [▶].

To step through a recording frame by frame:
a) At the point of interest, freeze the image by pressing 'Pause' [II]
b) Press 'Fast-forward' [▶▶] to step one frame forward or press 'Rewind' [◀◀] to step one frame backward through the sequence.
To return to normal speed, press [▶].

(4) Event Recording
By pressing the (red) [EVENT] key, the most recently selected camera will be automatically switched to the Event Monitor (matrix monitor 2) and the Event Recorder (VCR 2) will be switched to 'Record' mode. The red LED adjacent to the [EVENT] key will illuminate to indicate that 'event recording' is in progress.

If, during event recording, a different camera is selected on monitor 1 for example, re-pressing the [EVENT] key will switch the event monitor to the new camera.

To terminate event recording, press [DEL], the VCR will stop recording and the red LED will extinguish.

In 'VCR' mode, the selected camera may be controlled using the joystick and (grey) telemetry control keys to pan, tilt, zoom and focus any non-fixed camera (See the following section).

(5) Camera Control

In addition to standard fixed field cameras, the X2150 supports a wide range of high-speed dome and other remote-controlled camera units, each of which may be panned, tilted, zoomed and focussed directly from the console.

Whenever a controllable camera is selected, a 7-character code such as "PAN-002" appears on the LCD display next to the camera number to indicate the camera's manufacture and type.

Using the joystick
By moving the joystick, the selected camera will pan and tilt at a speed proportional the extent of the joystick's movement, i.e. as the joystick is moved further to the right of its central (parked) position, the faster the camera will pan right etc. A twist-action zoom control is provided such that the joystick may be turned clockwise to zoom in or anti-clockwise to zoom out.

Focus control
Cameras that are not set to 'auto-focus' may be manually focussed by depressing the (grey) focus [Near] and focus [Far] buttons.

The following commands are device-dependent. The exact function will vary according to the type of camera unit being controlled and some or all may not be implemented at all for some cameras.

Preset Positioning
A number of preset-positions (depending on camera type) may be programmed into moveable cameras such that, when recalled, the camera will automatically pan, tilt and zoom to a pre-determined field of view.

Four (grey) preset keys allow for single-press recall of presets 1 to 4, whereas presets 5-8 may be recalled by first pressing the (yellow) [SHIFT] key. For preset position 9 and beyond the [P1/n] key is used.

Examples:

> *To recall preset 1*
>> Press [P1/n]
>
> *To recall preset 7*
>> Press [SHIFT] followed by [P3]
>
> *To recall preset 15*
>> Press [1], [5] followed by [P1/n]

Home, Flip, Tour and Auto-pan

Home – this is a special preset position that may be returned to after a pre-programmed time of inactivity*

> *To return the camera to its predefined 'Home' position:*
>> Press [SHIFT] followed by 'Home' [Tour]

Flip – this command causes the camera to perform a 180° turn

> *To pan the camera through 180°*
>> Press [SHIFT] followed by 'Flip' [Pan]

Tour – automatically moves the camera in a pre-defined tour*

> *To start the tour:*
>> Press [Tour]

> *To cancel tour:*
>> Move the joystick or press a preset key.

Auto-pan – continuously pan the camera between two pre-defined points*

> *To start auto-pan:*
>> Press [Pan]

> *To cancel auto-pan:*
>> Move the joystick or press a preset key.

Aux1 to Aux4 – device specific auxiliary controls*

These keys are provided to provide switching to auxiliary functions and equipment connected to the camera unit such as lights, wash & wipe units, colour/mono changeover etc. Exact implementation will vary from camera to camera.

> *To implement Aux 1 or 2*
>> Press either [Aux1] or [Aux2]

> *To implement Aux 3 or 4*
>> First press the [SHIFT] key followed by either [Aux1] or [Aux2] respectively.

* Refer to relevant camera manufacturers data

(6) Programming - System

Programming functions may only be performed when the programming key-switch is in the ON position.

> *To access the programming menu:*
> Press [SHIFT] followed by 'Menu' [MON]

The Main Set-up Menu will be displayed

The first item on the menu, 'SYSTEM', is used to assign control protocols and ports to cameras, multiplexers, VCRs and matrices. In addition, a physical address may be assigned to each camera, different to its logical number, to prevent the need to re-address the camera itself.

(6.1) Protocol and Port Assignment

Each of the cameras, multiplexers, VCRs and matrices may be individually assigned a specific manufacturers' communication protocol and one of the X2150's seven output ports as follows:

a) Ensure the program key is turned to 'ON' and select 'Menu' by first pressing [SHIFT] (the yellow LED will illuminate) followed by 'Menu' [MON]. The main set-up menu will appear.

b) Press [1] on the numeric keypad. The 'SYSTEM SET-UP' menu will appear.

c) Press a number [2] to [5] on the numeric keypad to select the device type to be programmed (e.g. press [2] to program the cameras). The display will show the currently selected device to be programmed (e.g. CAM:1(1)*) along with the protocol and port number currently assigned to that particular device, in the form T:x N:n (where x is the protocol type and n is the network (port) number 0 - 7).

* The number in brackets is the physical address assigned to camera 1, this may be changed as described in section 6.11 below.

d) Use the blue, up [2] and down [8] arrow keys on the numeric keypad to sequence through the protocols available for the chosen device. Use the blue, left [4] and right [6] arrow keys on the numeric keypad to sequence through the available ports 0 – 7 (where 0 = none) until the desired port is shown next to N:

e) When the desired protocol and port are showing on the LCD display, press [ENT] to save the new device settings in the 'Smartcard' memory.

f) Press [NEXT] to select the next device in that category to be programmed (e.g. CAM:1 will change to CAM:2)** and repeat the above (remembering to press [ENT] each time to save the new settings). Press [DEL] to exit the set-up routine.

** Each time [NEXT] is pressed, the settings selected for the previous device will be retained on the LCD display, so that multiple consecutive cameras using the same parameters may be quickly assigned by repeatedly pressing the two keys [NEXT] and [ENT].

Option 6:KBD is used to assign a number to the keyboard itself for use on multiple keyboard systems. The keyboard may be numbered 1 to 8 by using the blue left [4] arrow key and right [6] arrow keys to increment and decrement the number respectively. Press [ENT] to save the new value.

Examples:
To assign cameras 1 to 6 to PAN-002, port 4, cameras 7 – 9 to NG-SYST, port 4 and cameras 10 – 12 to PAN-002, port 5:

a) Select the first camera to be programmed – camera 1, by pressing [1] then [ENT].

b) Enter the 'SYSTEM SET-UP' menu by pressing [SHIFT] followed by 'Menu' [MON] then [1].

c) Select 'CAM' by pressing [2].

d) Repeatedly press the blue up arrow [2] until 'T:PAN-002' appears as the protocol type.

e) Press the left arrow [4] or right arrow [6] until the number 4 appears next to N:

f) Press [ENT] to save the setting for camera 1.

g) Press [NEXT] to select camera 2 for programming – 'T:PAN-002 and N:4' will show for this camera regardless of any previously entered parameters, then press [ENT] to store these new parameters for camera 2. (If [ENT] is not pressed before moving on to the next camera, the original parameters will remain unchanged.)

h) Repeat (g) for cameras 3 to 6.

i) When 'CAM:7' is showing on the LCD display, press the up arrow until 'T:NG-SYST' appears and press [ENT] to store these settings for camera 7.

j) Repeat (g) until 'CAM:10' is reached.

k) Change the settings to read 'T:PAN-002 N:05' and program cameras 10 to 12 as previously described in steps (d) to (g). End the session by pressing [DEL].

To assign multiplexers 1 to 4 to 'ITL16-1', port 1.

a) Select the first multiplexer to be programmed – multiplexer 1, by pressing [1] then [MPX].

b) Enter the 'SYSTEM SET-UP' menu by pressing [SHIFT] followed by 'Menu' [MON] then [1].

c) Select 'MPX' by pressing [3].

d) Repeatedly press the blue up arrow [2] until 'T:ITL16-1' appears as the protocol type.

e) Press the left arrow [4] or right arrow [6] until the number 1 appears next to N:

f) Press [ENT] to save the setting for multiplexer 1.

g) Press [NEXT] to select multiplexer 2 for programming then press [ENT] to store these new parameters for multiplexer 2.

h) Repeat (g) for multiplexers 3 and 4 remembering to press [ENT] each time to store the new settings.

i) Press [DEL] to end the session.

(6.11) Camera physical address assignment

Each camera may be assigned a physical address that differs from its logical number. To re-assign the camera address, first select the camera to be re-assigned, enter the camera protocol and port assignment mode as described in section 6.1, steps a, b and c. and press [5] on the numeric keypad. The protocol and port information will disappear and the arrowed numeric keys may be used to alter the camera address as follows:

The right arrow [6] will increment the address

The left arrow [4] will decrement the address

The up arrow [2] will add 10 to the address

The down arrow [8] will subtract 10 from the address

The zero [0] key may be used to reset the address to the default

Once the required address is displayed between the brackets, press [ENT] to save the setting.

Pressing [NEXT] will move on to the next logical camera and pressing [5] will return to the protocol and port assignment mode.

(7) Programming – Device Specific

Procedures for programming and setting up of connected devices will vary from brand to brand and reference should be made to the relevant manufacturers literature and/or specific set-up instruction sheets where available.

Device set-up menus - generic

Wherever possible, if the connected device offers remote access to set-up menus, the X2150 keyboard may be used to programme the device by this means.
To access a device's set-up menu:

a) Select the number of the device to be accessed by entering the device number on the numeric keypad followed by [ENT], [MPX] or [VCR].

b) Ensure the program key is turned to 'ON' and select 'Menu' by first pressing [SHIFT] (the yellow LED will illuminate) followed by 'Menu' [MON]. The main set-up menu will appear.

c) Press a number [2] to [5] on the numeric keypad to select the device type to be programmed (e.g. press [2] to access the currently selected camera).

d) If a function is requested (as shown in the example below), enter a function number by first pressing 'Func' [SHIFT] followed by [1] on the numeric keypad. (Function number 1 is reserved for access to the device set-up menu.)

e) The device will display its menu on the relevant screen, which may be negotiated using the (blue) arrowed keys on the numeric keypad. Options may

be selected using the (blue) [ENT] key, (green) [◀◀] and [▶▶] keys and/or the joystick. The [NEXT] key will often serve to select the next menu if available.

f)   To exit the device menu, press [DEL].

X2150 Connections

Ports

There are seven serial port outputs on the X2150, six RS485 and one RS232. All six RS485 ports are available from two, 8-way RJ45 connectors and a standard D9 male connector is provided for the RS232 interface.
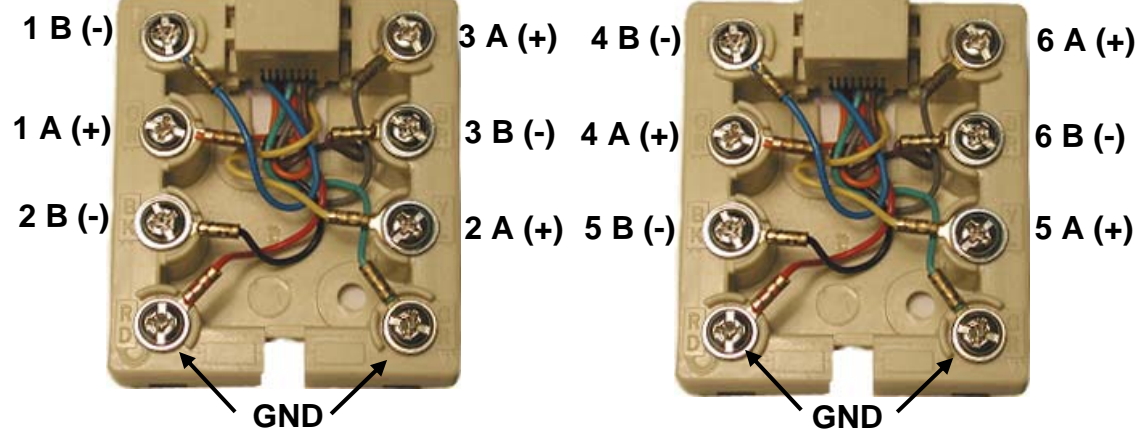
CN1: RS232
Port 7

CN2: RS485
Ports 1 - 3

CN3: RS485
Ports 4 - 6

CN4: Power
9 - 12v dc
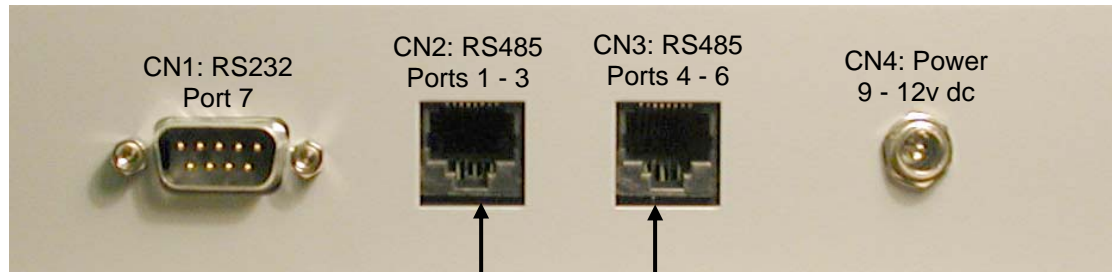
RS232

2	TXD
3	RXD
4	DSR
5	GND
6	DTR
7	CTS
8	RTS

Power input
9v – 12v DC 500mA
Centre pin=+ve

CAT 5 Lead

CAT 5 Lead

1 B (-)

1 A (+)

2 B (-)

3 A (+)

3 B (-)

2 A (+)

4 B (-)

4 A (+)

5 B (-)

6 A (+)

6 B (-)

5 A (+)

GND

GND

<div align="center">**X2150 Li-Lin Protocol handling**</div>

Controlling the PIH-8XX series matrices.

The following PIH-2150 keys are directly equivalent to those on the Li-Lin PIH-800II Keyboard:
Numeric keys 0 – 9, CAM, MON, ENT, P2, P3, P4

Keys with different legends are related as follows:

PIH-800II	P1	CLR	Focus Far	Focus Near	Ctrl1	Ctrl2
PIH-2150	P1/n	DEL	FAR	NEAR	Aux1	Aux2

The remaining functions are obtained as follows:

PIH-800II	PIH-2150	Key sequence
[ESC]	Off	[Shift], [DEL]
[Alarm Reset]	Reset	[Shift], [0]
[SEQ]	Auto	[Shift], [CAM]
[PRESET]	P1/n	{Preset Number}, [P1/n] or [Tour]*
[Auto Iris]		[Shift], [Open]+[Close]**
[Auto Focus]		[Far]+[Near]**
[Iris O]	Open	[Shift], [Open]
[Iris C]	Close	[Shift], [Close]
[AUTOPAN]	Pan	[Pan]
[AUXLIGHT]	Home	[Shift],[Tour]
[SPRAY]	Aux3	[Shift],[Aux1]
[WIPER]	Aux4	[Shift],[Aux2]
[F1]	Function 1	[Shift], [1]
[F2]	Function 2	[Shift], [2]
[F3]	Function 3	[Shift], [3]
[F4]	Function 4	[Shift], [4]

To obtain shifted functions [Shift], first press and release the yellow shift key to light the LED followed by the appropriate function key.

* P1/n acts as a Preset 1 key unless it is preceded by a value from 1 to 128 entered on the numeric keypad when it will perform as the 'Preset' key. Alternatively, [Tour] may be used where there is no preceding numeric value (e.g. during Menu operations)

**Auto iris and Auto focus are invoked by pressing both iris/focus buttons simultaneously.

To enter the matrix SETUP menu:
1. Ensure that the programming key-switch is set to 'Program'
2. Obtain a prompt character by entering the monitor number followed by [MON].
3. Press [Shift] followed by [MON] – the set-up menu will appear on the PIH-2150 LCD display
4. Press [5] and the matrix will display its SETUP MENU on the chosen monitor.
5. The menu items may be navigated in the usual manner. Press ESC ([Shift],[DEL]) to exit.

X2150 Li-Lin Protocol handling

Controlling the PIH-7600 series high-speed dome.

Presets

When the dome is being controlled via a PIH-8XX series matrix, presets maybe set through the matrix menu commands.
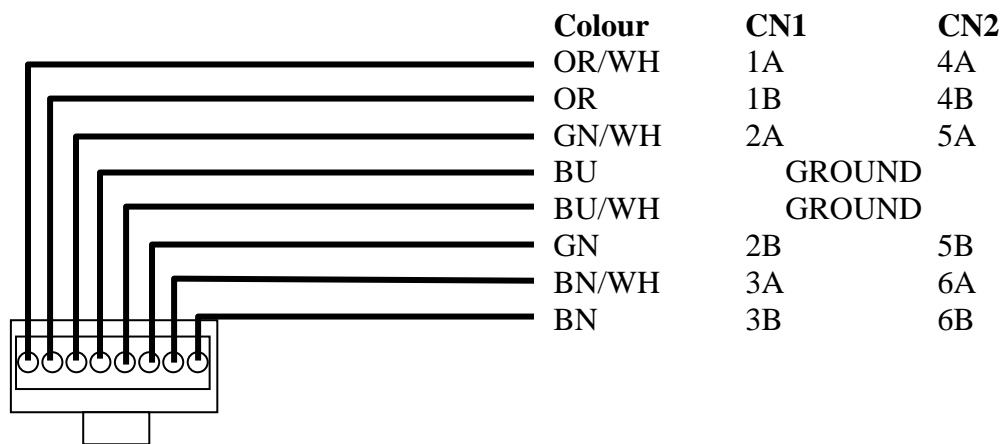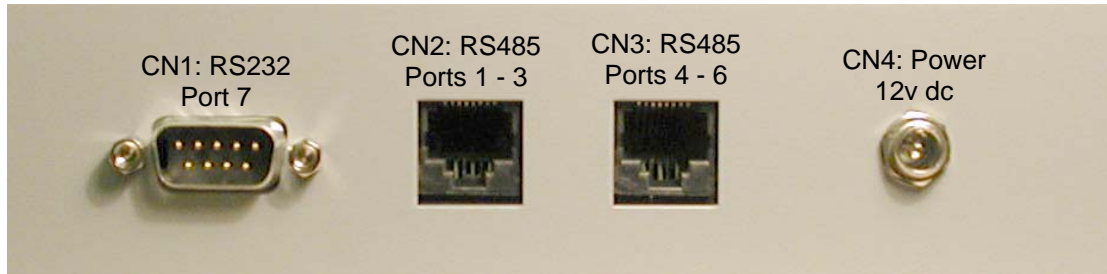
When controlled directly from the matrix keyboard, presets are set directly from the PIH-2150 keyboard as follows:

1. Ensure the camera to be programmed is selected by entering the camera number on the numeric keypad and pressing [CAM].
2. Ensure that the program key is switched to 'ON' and enter the keyboard menu by pressing [SHIFT] followed by 'Menu' [MON].
3. Select option 2, 'CAM' by pressing [2] on the numeric keypad.
4. Select function 2, 'SET PRESET'
5. Enter the number of the preset to be stored on the numeric keypad followed by [P1/n]. e.g. for preset 12, press [1], [2], [P1/n]
6. Move the camera to the desired preset view and enter a dwell time on the numeric keypad followed by [ENT]. e.g. for a dwell period of 5 seconds press [5], [ENT].
7. Enter a preset speed value on the numeric keypad followed by [ENT]. e.g. for maximum speed of 255, press [2], [5], [5], [ENT]
8. Repeat the operation for all required presets on the current camera or press [DEL] to return to normal operation.

X2150 Connections

Ports

There are seven serial port outputs on the X2150, six RS485 and one RS232. All six RS485 ports are available from two, 8-way RJ45 connectors and a standard D9 male connector is provided for the RS232 interface.

Colour	CN1	CN2
OR/WH	1A	4A
OR	1B	4B
GN/WH	2A	5A
BU	GROUND	
BU/WH	GROUND	
GN	2B	5B
BN/WH	3A	6A
BN	3B	6B

CN1: RS232
Pinout: 2:RXD 3:TXD 4:DTR 5:GND 6:DSR 7:CTS 8:RTS

CN2: RS485
Port 1 [B,A]=[1,2] : Port 2 [B,A]=[3,6] : Port 3 [B,A]=[7,8] : GND=[4,5]

CN3: RS485
Port 4 [B,A]=[1,2] : Port 5 [B,A]=[3,6] : Port 6 [B,A]=[7,8] : GND=[4,5]

CN4: Power
12Vdc:Centre pin positive

Panasonic Connections Using Standard CAT5 Patch Lead Colouring

CAT5   **Panasonic CS850 series**
Port 1 (CN2)
A   Orange   (A) Green
B   Orange/White   (B) Yellow

Port 2 (CN2)
A   Green   (A) Green
B   Green/White   (B) Yellow

Port 3 (CN2)
A   Brown   (A) Green
B   Brown/White   (B) Yellow

Port 4 (CN3)
A   Orange   (A) Green
B   Orange/White   (B) Yellow

Port 5 (CN3)
A   Green   (A) Green
B   Green/White   (B) Yellow

Port 6 (CN2)
A   Brown   (A) Green
B   Brown/White   (B) Yellow

X2150 Smartcard Software Upgrade

The X2150 software may be upgraded using the X2150's internal smartcard reader from specially created upgrade cards. To upgrade the software using this method:

1. Power down the X2150 and remove the base of the unit.
2. Carefully remove the installed system card from its holder by sliding towards the front of the keyboard and store in a safe place. (Avoid touching the gold contacts).
3. Slide the software upgrade card into the vacated card slot.
4. Hold down the record and fast-forward keys whilst restoring power.

The yellow 'SHIFT' light will illuminate to indicate that the inserted card has been recognised as containing valid software update code and the software will start to load. Do not interrupt this process once the yellow light is showing as this may permanently corrupt the existing and/or new software version.

After approximately 35 seconds, the yellow light will extinguish and the green 'VCR' light will illuminate to indicate a successful update.

5. Power down the X2150 and <u>carefully remove the upgrade card</u>*.
6. <u>Re-install the system card</u> and refit the metal base plate.

The new software will be installed and ready to run. You may check the version number by selecting 1.SYSTEM, 6.KBD *from the main menu.*

*IMPORTANT Always remember to remove the upgrade card before attempting to change any of the X2150 parameters. Failure to do so will corrupt the software upgrade data on the card.