360 Vision Technology

VisionKeyboard & VisionBMatrix Engineer Manual

THIS ENGINEER GUIDE IS TO BE READ IN CONJUCTION WITH THE OPERATOR AND CONTROLLER MANUALS

(VisionKeyboard & VisionBMatrix Operator Manual V2-00)
(VisionKeyboard & VisionBMatrix Controller Manual V2-00)

Matrix/DVR Keyboard
VKAVXBMM485 (Master), VKXBMM485 (Master), VKXBMS485 (Slave)

Vision BM Matrix Options

Non-cascading Matrix Options

VM0032-04,
VM0064-04
VM0064-12

Cascading Matrix Options

VM0064CT-12
VM0064C-12
VM0128C-12
VM0192C-12
VM0256C-12

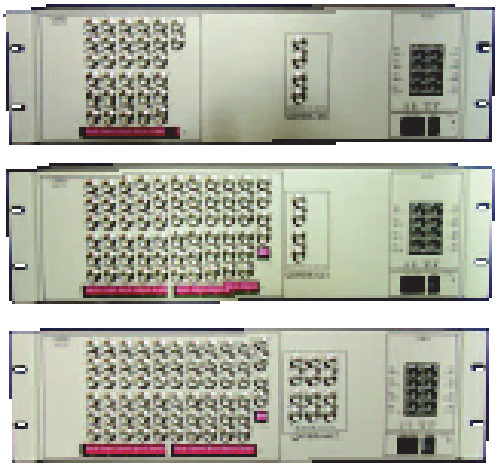


Table of Contents

1. VisionBMatrix Menu Access

3 levels of menu are available, Operator, Controller and Engineer.

Engineer Access

To obtain engineer level access press and hold 'lock' button, then '5', '4', '9', '8'

Engineer level access provides access to all VisionBMatrix programmable settings.

This guide describes the settings that are only available using the engineer level access.

Operator Access

To obtain operator level access press and hold 'lock' button, then '3', '6', '0'

See VisionBMatrix_and_VisionKeyboard_Operator guide for details of the facilities that are available to the operator. Eg. For setting auto-sequence.

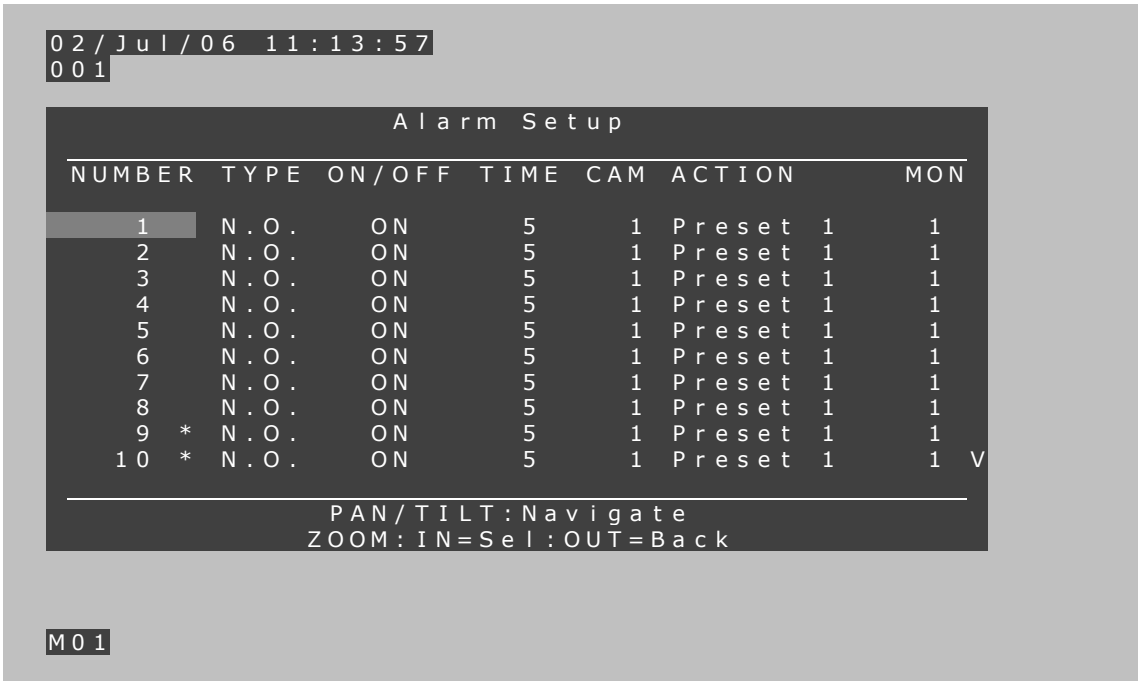
Controller Access

To obtain controller level access press and hold 'lock' button, then '1', '3', '7', '9'

See VisionBMatrix_and_VisionKeyboard_Controller guide for details of the facilities that are available to the controller. Eg. For setting time/date.

2. Alarm Setup

Using the Joystick, move down until ‘Alarm Setup’ is highlighted and twist the joystick clockwise to select it. When the highlighting is on number, press numbers buttons to quickly select a particular external alarm box or alarm input. This shortcut eliminates scrolling through very long lists.



The Alarm Setup consists of the following:-

NUMBER — The number of the Alarm Input to which the action relates to. An asterix appears after the number to show references to alarm cards that are not currently connected.

TYPE — Defines if the alarm is a normally open going closed or closed going open upon contact closure

ON/OFF — Defines if the alarm should be active or not (useful for disabling if the alarm device has gone faulty)

TIME — Defines the time that the alarm picture should be displayed on the monitor **AFTER** the alarm input clears (measured in seconds)

CAM — Defines the camera to which the alarm input relates.

ACTION — Defines the Preset or Tour (or Mimic) that is to be used. Press ‘preset’ or ‘tour’ followed by ‘numbers’. To select a mimic use the ‘tour’ button to toggle between ‘tour’ and ‘mimic’. Selecting ‘preset 0’ will not select any preset (or tour) when the alarm activates.

MON — Defines the monitor to be used to display the alarm. (Any monitor in the range 1 to 12 can be selected)

Use the joystick to move the cursor to the parameter that is to be changed. Twist joystick clockwise to change ‘type’ and ‘ON/OFF’.

If the joystick is held in the up, down, left or right position, it will auto-repeat.

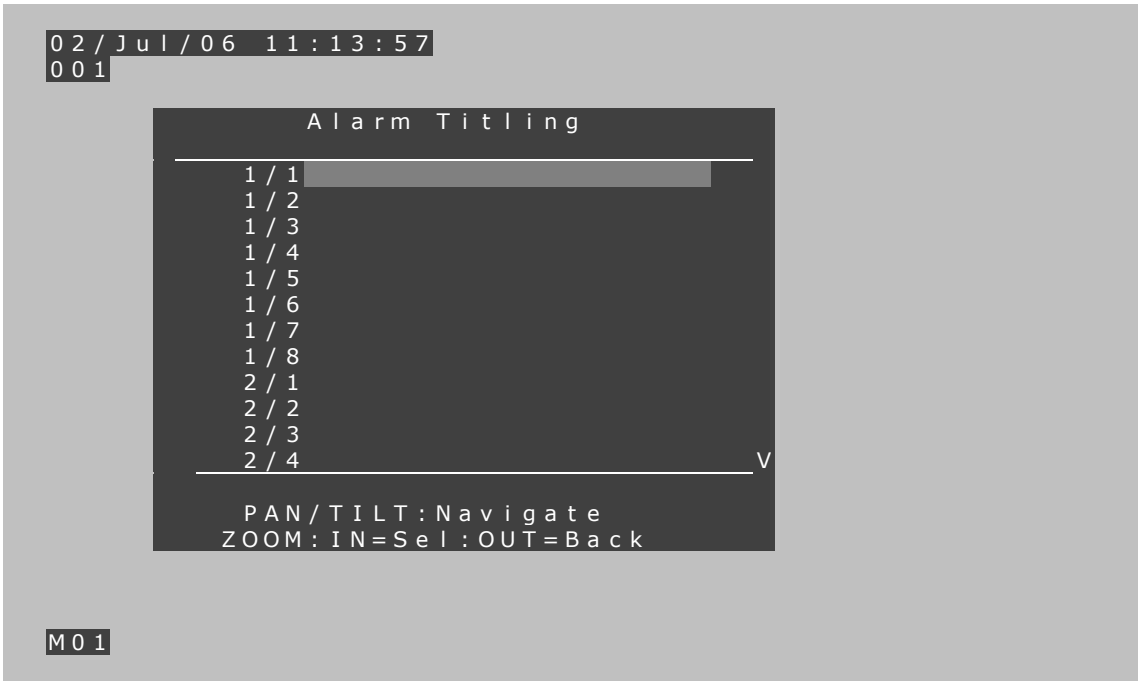
For numerical changes, use the VisionKeyboard numeric keyboard to enter numbers. All the digits for a particular setting should be entered quickly.

Scroll arrows indicate that there are more alarms available to view.

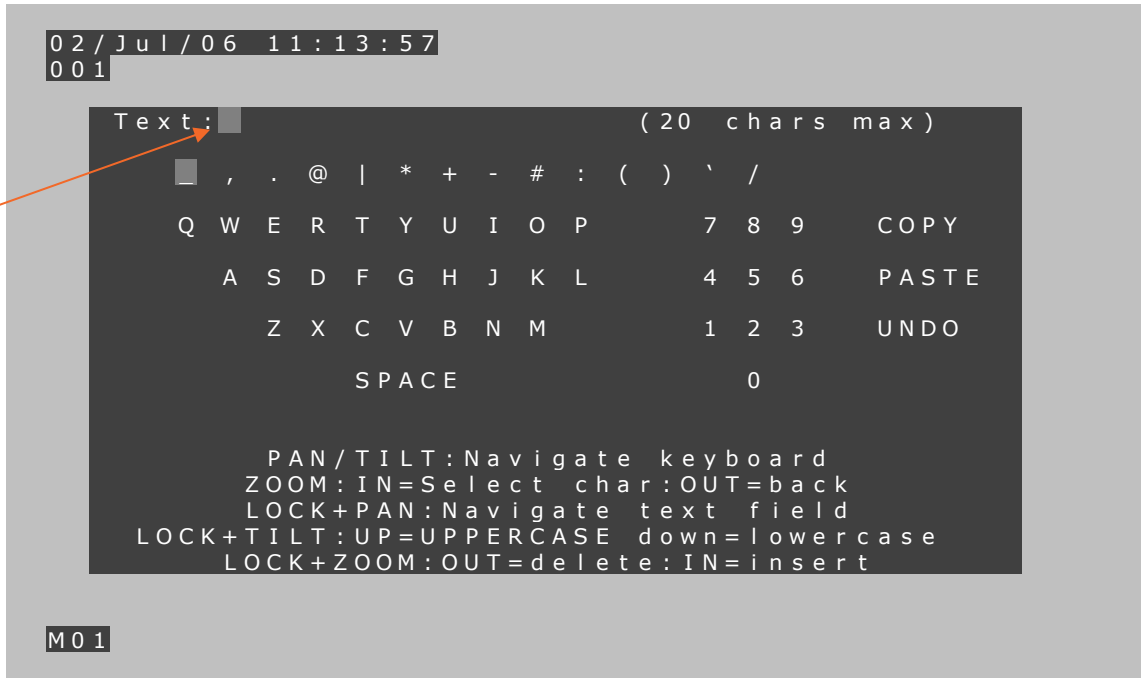
See also Alarm Options in section 20 later in this manual.

3. Alarm Titling

Using the Joystick, move down until ‘Alarm Titling’ is highlighted and twist joystick clockwise to select it.



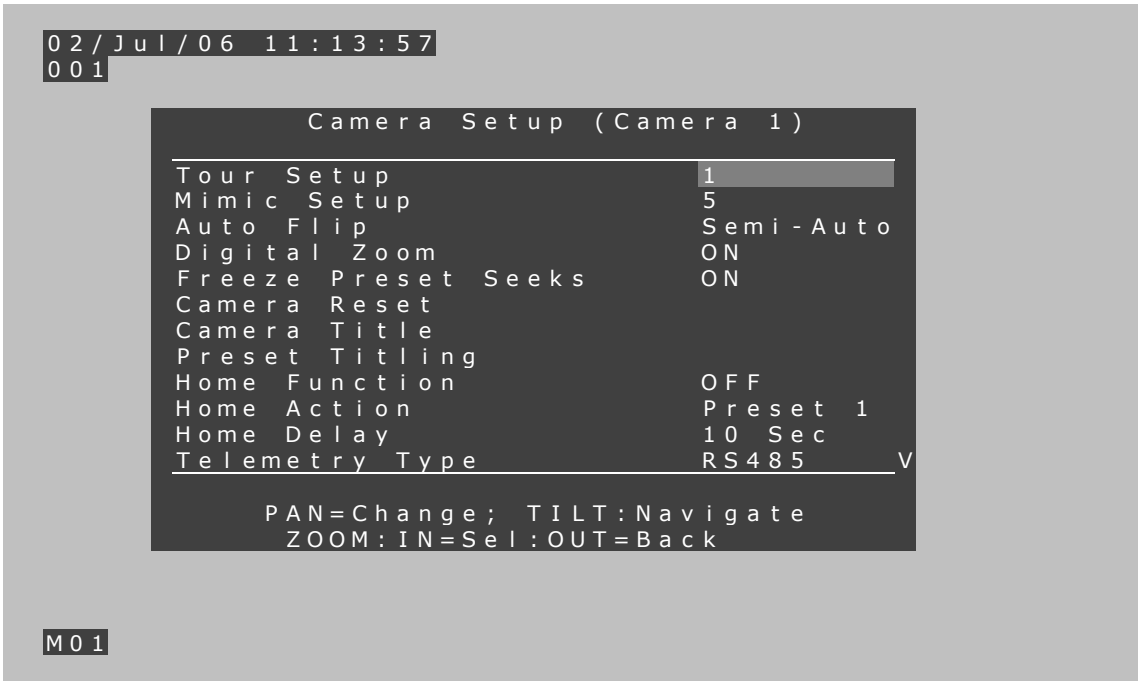
Using the Joystick again, move up or down to highlight the required camera number and then twist joystick clockwise to select it.



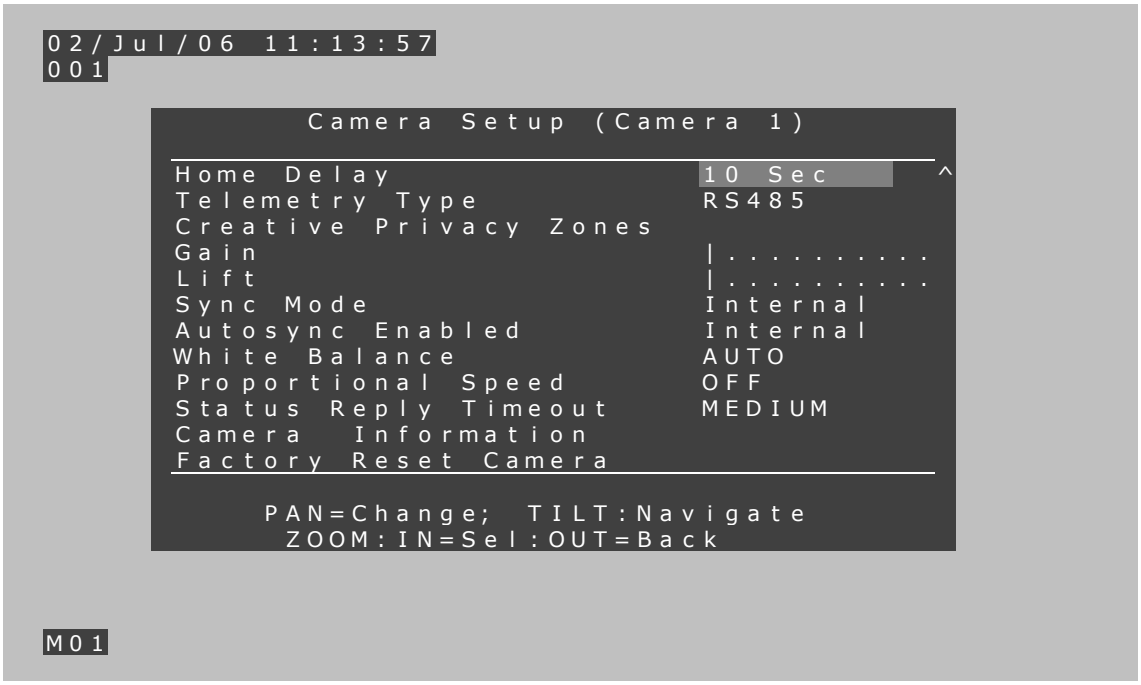
There are 20 characters per preset available for Titling.

Alarm Titles are edited in the same way as described for camera titles in the operator manual.

4. Camera Setup



12 selectable items will be displayed at a time. Scroll arrows will be used to display the other options.



Scroll arrows will be used to display the other options.
The camera number can be selected by:

Press and hold the ‘camera’ button

Enter the camera number

Release the ‘camera’ button.

In some applications it is not possible for the Predator, Black Hawk Dome or VisionDome to send data back to the Vision BM Matrix. Under these circumstances the parameter will be shown in the menu as --- or <->. When these parameters are adjusted, the appropriate commands are sent to the Predator, Black Hawk Dome or VisionDome but the menu will not be updated with the data from the Predator, Black Hawk Dome or VisionDome.

5. Telemetry Type Selection

The VisionBMatrix controls the cameras and the alarm expansion units using RS-485 Twisted-pair data as indicated.

6. Creative Privacy Zones (CPZ)

A Creative Privacy Zone is a ‘masked’ area of the Predator, Black Hawk Dome or VisionDome picture that ensures the chosen zone is not able to be viewed, even if the Predator, Black Hawk Dome or VisionDome is moving toward or away from the specific area. The Predator, Black Hawk Dome or VisionDome can have up to 32 CPZs, with up to 8 CPZs within one monitor view.

The height and width of the CPZ can be adjusted.

The intensity of the CPZ can also be adjusted to allow some indication of the image that is blocked out by the CPZ without the need to remove the CPZ all together. It is usual for privacy zones to be totally opaque so that nothing can be seen.

To set up a Creative Privacy Zone.

To program a creative privacy zone select creative privacy zones from the camera set-up menu. The screen will change to:

Use the joystick to put the new desired CPZ in the middle of the screen, i.e. zoom in on it.

Press and hold ‘preset’ button.

Press number buttons (in the range 1 to 32) to select the CPZ that is being defined. (If the number for a CPZ that was previously defined is used, the old CPZ is removed. To create a new additional CPZ the number selected must not be the same as the existing CPZs).

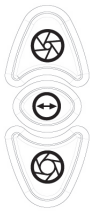
Release the preset button.

The CPZ will appear on the screen, semi transparent and set to the smallest size, the camera fully zooms out.

The CPZ can be stretched right, left, up, down, by moving the joystick.

The CPZ can be made smaller by twisting the joystick clockwise and keeping it turned and then move the joystick in the appropriate direction to make the zone smaller.

The CPZ can be made brighter or darker (4 levels) by pressing iris open/close.



IRIS close

Auto IRIS

IRIS open

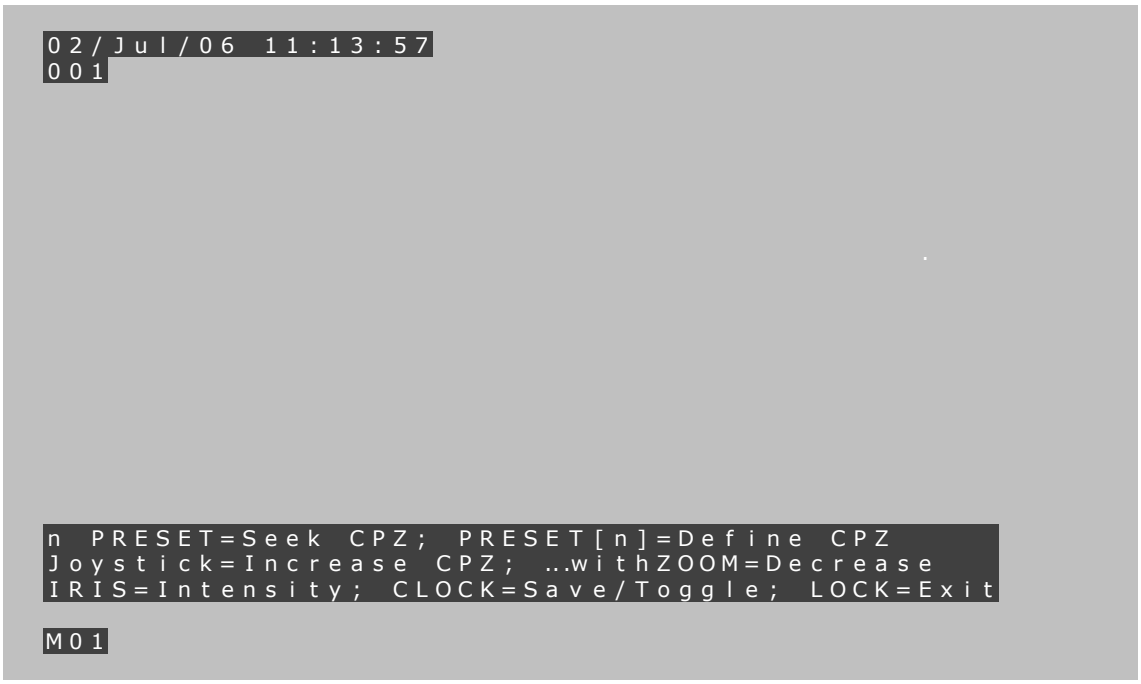
To save the defined CPZ and define the next CPZ press the ‘clock/timer’  button,

Otherwise press the press the ‘lock’  button to exit.

If the iris buttons were not used, the CPZ will change to fully opaque when the lock button is pressed.

To edit a Creative Privacy Zone.

To edit a creative privacy zone select creative privacy zones from the camera set-up menu. The screen will change to:



Select the CPZ that is to be edited.

Press number buttons (in the range 1 to 32) followed by ‘preset’  button

This can be done several times to help choose a particular CPZ to edit.

Edit this CPZ using the same method described above to set up a Creative Privacy Zone’.

7. Adjusting Video Gain

Gain adjustment provides the means to adjust for 1 volt peak to peak video at the control equipment end of the cable run.

From the Engineer Main Menu, move the Joystick down until ‘Camera Setup’ is highlighted. Twist joystick clockwise to select it. The ‘setup menu for Camera 1’ will appear. To select a different camera press and hold camera button followed by number buttons to select the camera, then release the camera button. Alternatively press and release the camera button to select the next camera. Move the Joystick down until ‘Gain’ is highlighted.

The Gain can be adjusted by moving the joystick to the left or right.

‘<->’ is displayed when it is not possible to determine the current setting from the Predator, Black Hawk Dome or VisionDome, or an indicator line on the screen shows the current setting. The number of dots shown next to the indicator line will be different depending upon the model of the Predator, Black Hawk Dome or VisionDome and it’s DIL switch settings..

If it has been necessary to adjust the video level it is likely that the lift will also require adjustment to attain the best possible picture.

8. Adjusting Video Lift

Lift is adjusted to attain the best overall contrast level with correct highlight content. Over adjustment of lift will result in “flaring” of white and highlights and instability of the image.

From the Engineer Main Menu, move the Joystick down until ‘Camera Setup’ is highlighted. Twist joystick clockwise to select it. The ‘setup menu for Camera 1’ will appear. To select a different camera press and hold camera button followed by number buttons to select the camera, then release the camera button. Alternatively press and release the camera button to select the next camera. Move the Joystick down until ‘Lift’ is highlighted.

The Lift can be adjusted by moving the joystick to the left or right.

‘<->’ is displayed when it is not possible to determine the current setting from the Predator, Black Hawk Dome or VisionDome, or an indicator line on the screen shows the current setting. The number of dots shown next to the indicator line will be different depending upon the model of the Predator, Black Hawk Dome or VisionDome and it’s DIL switch settings.

9. Sync Mode, Autosync

From the Engineer Main Menu, move the Joystick down until ‘Camera Setup’ is highlighted. Twist joystick clockwise to select it. The ‘setup menu for Camera 1’ will appear. To select a different camera press and hold camera button followed by number buttons to select the camera, then release the camera button. Move the joystick down until ‘Sync Mode’ is highlighted.

The type of camera synchronisation can be selected by moving the joystick left or right.

The available options are line-lock or internal.

Line-lock makes the camera synchronise the picture with the 24Vac power supply. Line locked cameras can be synchronised to prevent picture roll when switching from camera to camera.

Internal synchronisation is used if the frequency of the supply to that camera is not synchronised with the power supplies for the rest of the VisionBMatrix system. This could occur if the camera was powered from a separate generator or battery powered inverter or UPS.

It is not possible to select line-lock for a camera that has an unsuitable supply e.g. a PAL camera can not synchronise to a 60Hz supply. If this is attempted, the Predator, Black Hawk Dome or VisionDome will automatically select ‘internal synchronisation’.

When switching the camera synchronisation, the picture from the camera will waver for a few seconds as the change takes effect.

Autosync enabled can be turned off to prevent the VisionBMatrix from attempting to synchronise cameras each time they are selected. This will prevent the wavering in situations where the cameras cannot be synchronised.

10. White Balance

From the Engineer Main Menu, move the Joystick down until ‘Camera Setup’ is highlighted. Twist joystick clockwise to select it. The ‘setup menu for Camera 1’ will appear. To select a different camera press and hold camera button followed by number buttons to select the camera, then release the camera button. Move the joystick down until ‘White Balance’ is highlighted.

The white balance option can be selected by moving the joystick left or right.

The available options are Auto-white balance, Indoor white balance, Outdoor white balance.

The Predator, Black Hawk Dome or VisionDomes are set to Auto-white balance and this will be satisfactory in most installations. If unusual lighting conditions are present in an installation, the white balance setting can be used to force the camera to a suitable setting to improve the colours.

11. Proportional Speed

From the Engineer Main Menu, move the Joystick down until ‘Camera Setup’ is highlighted. Twist joystick clockwise to select it. The ‘setup menu for Camera 1’ will appear. To select a different camera press and hold camera button followed by number buttons to select the camera, then release the camera button. Move the joystick down until ‘Proportional Speed’ is highlighted.

Proportional speed can be set to ON or OFF by moving the joystick left or right.

When proportional speed is OFF, the pan and tilt speeds are directly controlled by the joystick. When proportional speed is ON, the pan and tilt speeds are adjusted depending on the current zoom setting. When the camera is not fully zoomed out, the zoom ratio is used to adjust the pan and tilt speeds. This effectively reduces the speeds to make the joystick more sensitive when zoomed in.

Set Proportional Speed ON to improve the control if the use of intermediate equipment such as video transmission, data modems etc. cause delays.

12. Status Reply Timeout

From the Engineer Main Menu, move the Joystick down until ‘Camera Setup’ is highlighted. Twist joystick clockwise to select it. The ‘setup menu for Camera 1’ will appear. To select a different camera press and hold camera button followed by number buttons to select the camera, then release the camera button. Move the joystick down until ‘Status Reply Timeout’ is highlighted.

Status Reply Timeout can be set to SHORT, MEDIUM, LONG, V.LONG by moving the joystick left or right.

When the Vision BM Matrix requests information from the Predator, Black Hawk Dome or VisionDome or VisionAlarm card it waits for a reply. During this wait the RS485 cannot be used for sending commands to other units. Predators, Black Hawk Domes, VisionDomes and VisionAlarm cards reply very quickly resulting in optimum performance. However if there is a longer delay than is normally expected, the Vision BM Matrix must assume that the Predator, Black Hawk Dome, VisionDome or VisionAlarm card is disconnected and start sending commands to other devices. The time that the Vision BM Matrix will wait is called the ‘timeout’.

If the RS485 is delayed by transmission equipment such as a radio link, modem, IR link, Microwave link etc. the Vision BM Matrix could timeout and start to send a new command at the same time as the delayed reply data is received. This will cause corruption of the data.
The status from the Predator, Black Hawk Dome or VisionDome would no longer be displayed or will disappear and reappear, and alarms activations could be missed. The appearance of the symptoms described above indicate that the status reply timeout is too short and needs to be increased using this menu.

Status reply timeout is adjusted for each individual camera that exhibits the above symptoms. All other cameras should remain set to the default setting (MEDIUM). If for example all cameras were to be set to the V.LONG setting, the delay between moving the joystick and the movement of the camera in the Predator, Black Hawk Dome or VisionDome could increase.

Adjusting the Status Reply Timeout as described above ensures that Vision BM Matrix does not waste time unnecessarily so that optimum performance is achieved.

13. Camera Information

The approximate size of the sync pulses and the current synchronisation phase setting for the current camera can be viewed. From the Engineer Main Menu, move the Joystick down until ‘Camera Information’ is highlighted. Twist joystick clockwise to select it.

This information is useful to the installation engineer.

14. Factory Reset Camera. (Clear all)

This function will clear all the presets tours mimics etc from the camera and set it to have only the factory set defaults. All stored tours, mimics, presets etc will be erased (i.e. lost).
.
From the Engineer Main Menu, move the Joystick down until ‘Camera Setup’ is highlighted. Twist joystick clockwise to select it. The ‘setup menu’ for current camera 1 will appear. To select a different camera press and hold camera button followed by number buttons to select the camera, then release the camera button.

Move the joystick down until ‘Factory Reset Camera’ is highlighted.

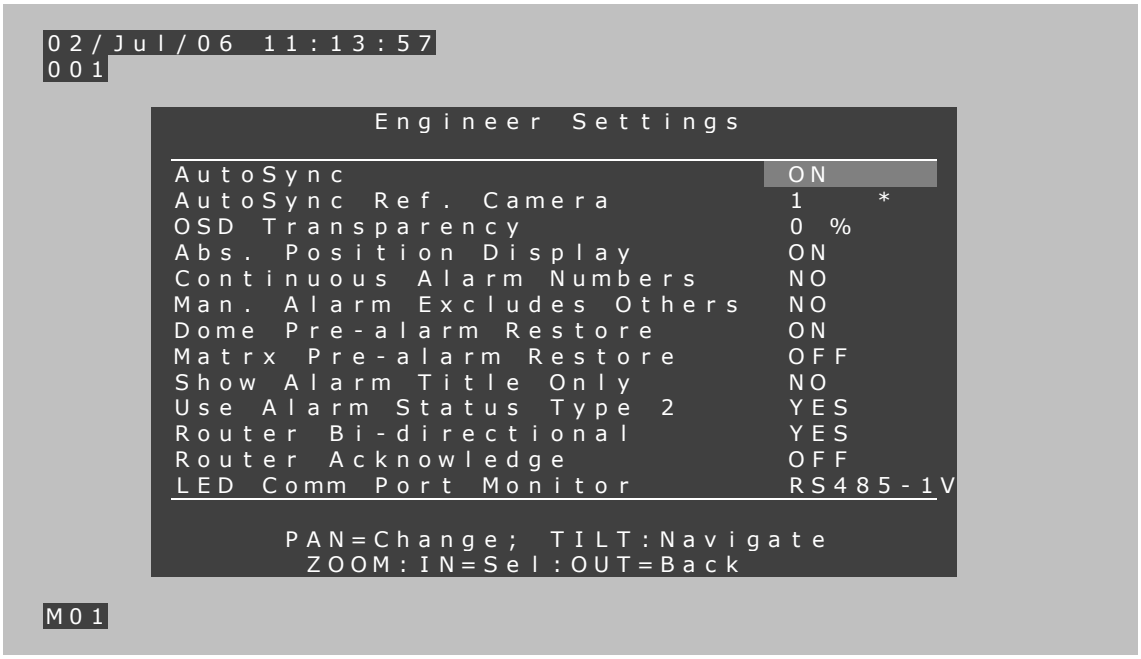
Twist joystick clockwise to reset the camera.

The message ‘Presets/tours will be lost! PROCEED CANCEL’ will appear. This PROCEED CANCEL step is included in the procedure to ensure it isn’t done by accident.

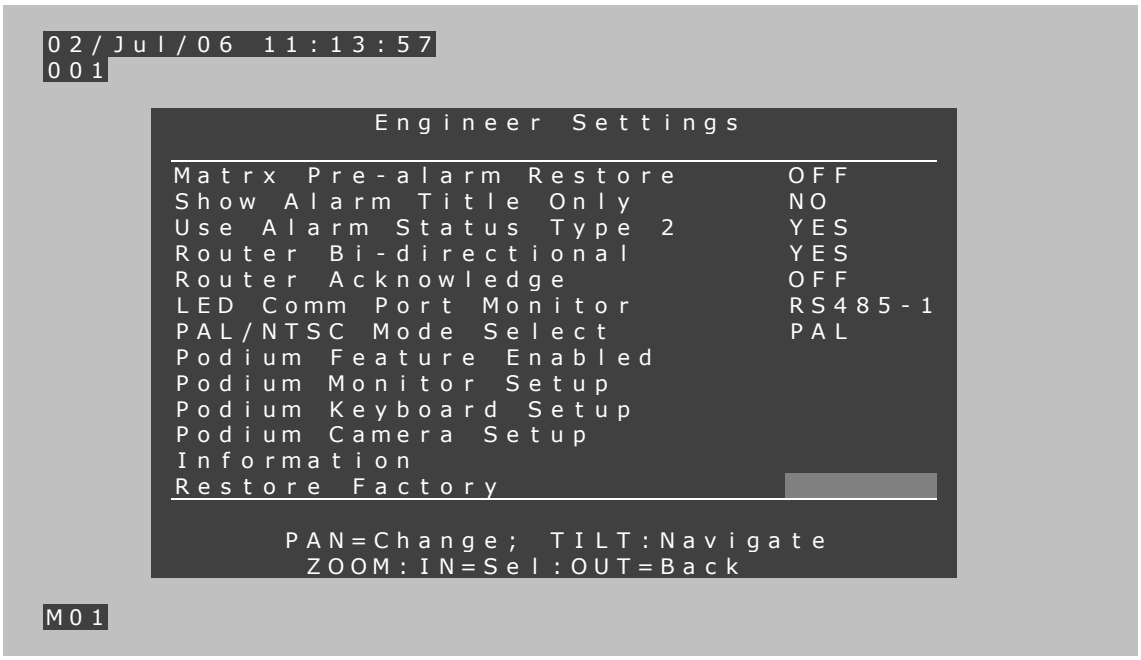
The highlighting is on ‘CANCEL’ Twist the joystick to return to the previous menu without changing the camera setting. Otherwise move the joystick to the left to highlight ‘PROCEED’ then twist the joystick clockwise to factory reset the camera. If ‘PROCEED’ is highlighted, twisting the joystick anti-clockwise will return to the previous menu without changing the camera settings.

15. Engineer Settings

From the Engineer Main Menu, move the Joystick down until ‘Engineer Settings’ is highlighted. Twist joystick clockwise to select it. The ‘Engineer Settings’ menu will appear:



13 selectable items will be displayed at a time. Scroll arrows are used to display the other options.



16. AutoSync

Vision BM Matrix will automatically synchronise the cameras that are set to line-lock mode
When Auto sync is ON, the Vision BM Matrix will synchronise all the Predator, Black Hawk Dome or VisionDomes that are line-locked to the Auto-sync reference camera. This will eliminate or reduce the “roll” often seen when switching unsynchronised video sources.

From the Engineer Main Menu, move the Joystick down until ‘Engineer Settings’ is highlighted. Twist joystick clockwise to select it. The ‘Engineer Settings’ menu will appear. Move the joystick down until ‘AutoSync’ is highlighted.

Select AutoSync to be ON or OFF by moving the joystick left or right.

When different line locked cameras are selected they will be synchronised to the reference camera automatically. If the phase of the video from the Predator, Black Hawk Dome or VisionDome is adjusted by the Vision BM Matrix the picture from the camera will waver for a few seconds as the change takes effect.

Please note the cameras may have to be selected more than once for perfect synchronisation but once this is achieved future camera selections will not show any picture roll or wavering.

To allow auto sync to eliminate picture roll all the cameras must be line locked. See section 9.

17. Set up AutoSync Ref Camera

From the Engineer Main Menu, move the Joystick down until ‘Engineer Settings’ is highlighted. Twist joystick clockwise to select it. The ‘Engineer Settings’ menu will appear. Move the joystick down until ‘AutoSync Ref Camera’ is highlighted.

Use the number buttons to select the camera that will be used as the reference camera. An asterix ‘*’ displayed after the camera number indicates that the selected camera is absent.

When the reference camera number is changed, Use the camera setup menu to set the reference camera to ‘line-lock’ and ‘AutoSync Enabled’ to ‘ON’.

If the line-lock or internal sync is changed, the picture from the camera will waver for a few seconds as the change takes effect.

18. OSD Transparency

This allows the operator to adjust the OSD background box for text on the monitor screen.
From the Engineer Main Menu, move the joystick down until ‘Engineer Settings’ is highlighted. Twist the joystick clockwise to select it. The ‘Engineer Settings’ menu will appear. Move the joystick down until ‘OSD Transparency’ is highlighted.

Move the joystick to right or left to adjust OSD transparency. 0% is opaque. Increase the number to increase the transparency.

19. Absolute Position Display

From the Engineer Main Menu, move the Joystick down until ‘Engineer Settings’ is highlighted. Twist joystick clockwise to select it. The ‘Engineer Settings’ menu will appear. Move the joystick down until ‘Absolute Position Display’ is highlighted.

Absolute position display can be set to ON or OFF by moving the joystick left or right.

Selecting this will allow the engineer to choose whether to display the co-ordinates for each Predator, Black Hawk Dome or VisionDome camera.

The co-ordinates are: XXX° (Pan) XXX° (Tilt) XX.X (Zoom)

If Camera Status Display is ON (see section 16 of the VisionBMatrix and VisionKeyboard controller manual) then preset information will be displayed in place of the absolute position display when the Predator, Black Hawk Dome or VisionDome is at or seeking a preset.

20. Alarm Options

When the alarm inputs have been configured and the monitor(s) have been defined for alarm display there are a few further alarm related options available.

21. Continuous Alarm Numbers

From the Engineer Main Menu, move the Joystick down until ‘Engineer Settings’ is highlighted. Twist joystick clockwise to select it. The ‘Engineer Settings’ menu will appear. Move the joystick down until ‘Continuous Alarm Numbers’ is highlighted.

Continuous (sequential) alarm numbers can be set to ON or OFF by moving the joystick left or right.

With the option set to “ON” all alarms will be displayed as numbers from 1-128.
With the option set to OFF the box address and input number (physical and sequential) will be displayed, for instance 02/02 will mean that input 2 of box 2 has triggered.
The alarm box manual includes a table showing both physical and sequential numbers.

22. Man. Alarm Excludes Others

It is possible to “force” the VisionBMatrix into an alarm state by pressing the ‘alarm’  button on the keyboard.

From the Engineer Main Menu, move the Joystick down until ‘Engineer Settings’ is highlighted. Twist joystick clockwise to select it. The ‘Engineer Settings’ menu will appear. Move the joystick down until ‘Man alarm excludes others’ is highlighted.

It can be set to ON or OFF by moving the joystick left or right.

If the ‘manual alarm excludes others’ is set to ON then any further external alarms that are triggered will not be displayed. Further alarm actions that are associated with the alarms will be ignored whilst the manual alarm function is active.

When the manual excludes others’ is set to OFF, if the VisionBMatrix is forced into manual alarm via the keyboard and an external alarm is triggered then the external alarms will be displayed and the alarm actions associated with it will be executed.

23. Predator, Black Hawk Dome or VisionDome Pre Alarm Restore

From the Engineer Main Menu, move the Joystick down until ‘Engineer Settings’ is highlighted. Twist joystick clockwise to select it. The ‘Engineer Settings’ menu will appear. Move the joystick down until ‘Dome Pre Alarm Restore’ is highlighted.

It can be set to ON or OFF by moving the joystick left or right.

This option affects the behaviour of a Predator, Black Hawk Dome or VisionDome when an alarm condition clears.

If restore is set to “ON” the Predator, Black Hawk Dome or VisionDome which received the alarm will return to the state that was saved before the alarm trigger, (tour/mimic/home/static position)

If set to “OFF” the camera will remain in the alarm state (tour/mimic/preset) until a command (from the VisionKeyboard or another alarm) tells it to do otherwise.

24. Vision BM Matrix Pre Alarm Restore

From the Engineer Main Menu, move the Joystick down until ‘Engineer Settings’ is highlighted. Twist joystick clockwise to select it. The ‘Engineer Settings’ menu will appear. Move the joystick down until ‘Matrix Pre Alarm Restore’ is highlighted.

It can be set to ON or OFF by moving the joystick left or right.

This option affects the behaviour of the Vision BM Matrix when an alarm condition clears.

If restore is set to “ON” the Vision BM Matrix will return to the state that was saved before the alarm trigger, (selected camera, auto sequence ON or OFF)

If set to “OFF” the picture on the alarm monitor will remain in the alarm state until a command (from the VisionKeyboard or another alarm) tells it to do otherwise.

25. Show Alarm Title Only

From the Engineer Main Menu, move the Joystick down until ‘Engineer Settings’ is highlighted. Twist joystick clockwise to select it. The ‘Engineer Settings’ menu will appear. Move the joystick down until ‘Show Alarm Title Only’ is highlighted.

It can be set to ON or OFF by moving the joystick left or right.

When ‘show alarm title only’ is set to “ON” and an alarm is triggered only the alarm title will be displayed on screen. No alarm numbering will be displayed.

When show alarm title only is set to “OFF” and an alarm is triggered the number will be displayed as defined by the “Continuous alarm numbers” setting (see section 21).

26. Use Alarm Status Type 2

From the Engineer Main Menu, move the Joystick down until ‘Engineer Settings’ is highlighted. Twist joystick clockwise to select it. The ‘Engineer Settings’ menu will appear. Move the joystick down until ‘Use Alarm Status Type 2’ is highlighted.

It can be set to ON or OFF by moving the joystick left or right.

When ‘Use Alarm Status Type 2’ is set to “ON”, the VisionBMatrix is optimised to use type 2 alarm input cards. All alarm cards supplied from July 2006 are type 2. This is the default.

Alarm cards supplied before July 2006 are referred to as ‘type 1’.

If a mixture of the old type 1 and current type 2 alarm input cards are used, the Vision BM matrix MUST have ‘use alarm status type 2’ set to OFF.

Type 2 alarm input cards can use both ‘type 1’ and ‘type 2’ alarm status commands.

27. Router Bidirectional, Router Acknowledge

From the Engineer Main Menu, move the Joystick down until ‘Engineer Settings’ is highlighted. Twist joystick clockwise to select it. The ‘Engineer Settings’ menu will appear. Move the joystick down until the appropriate ‘router’ option is highlighted.

When an external device, such as a DVR or transmission system, generates RS485 telemetry commands for the control of the Predators, Black Hawk Domes and VisionDomes, the telemetry cable from the controller is connected to one of the RS232 or RS485 keyboard ports on the Vision BM Matrix. The Vision BM Matrix will act as a router and will send the telemetry commands to the Predators, Black Hawk Domes and VisionDomes.

Some external controllers **must** receive the status replies from the Predator, Black Hawk Dome or VisionDome to work properly, and other controllers **must not** receive the replies. The option, ‘Router Bidirectional’ is uses to turn these status replies on or off.

The option, ‘Router Acknowledge’ should always be set to off.

28. LED Comms Port Monitor

From the Engineer Main Menu, move the Joystick down until ‘Engineer Settings’ is highlighted. Twist joystick clockwise to select it. The ‘Engineer Settings’ menu will appear. Move the joystick down until ‘LED Comm Port Monitor’ is highlighted.

Two of the Vision BM Matrix LEDs are labelled Rx and Tx. They are used to indicate data activity. The Tx LED indicates that data is being transmitted. The Rx LED indicates that data is being received.

The LEDs can be assigned to monitor any of the eight COMM ports.

Select a particular COMM port by moving the joystick left or right. The available settings are:
RS485-1, RS485-2, RS485-3, RS485-4, RS485-5, RS485-6, RS232-7, RS232-8
The last digit indicates the port connector on the Vision BM Matrix central box. The data type (RS485 or RS232) is also shown for clarity.

E.g. Set the Comm Port Monitor to RS485-1 to monitor data to/from the Predators, Black Hawk Domes, VisionDomes and VisionAlarms. Tx ON indicates that commands are being sent, Rx ON indicates that replies are being received.

E.g. Set the Comm Port Monitor to RS485-2 to monitor data to/from the main VisionKeyboard.

The LEDs are useful to assist the engineer to diagnose wiring faults or equipment malfunctions when e.g. a Predator, Black Hawk Dome or VisionDome does not respond to a command, the status information is not displayed, or keyboards or external control equipment does not work as expected.

29. PAL/NTSC Mode Select

From the Engineer Main Menu, move the Joystick down until ‘Engineer Settings’ is highlighted. Twist joystick clockwise to select it. The ‘Engineer Settings’ menu will appear. Move the joystick down until ‘PAL/NTSC Mode Select’ is highlighted.

Select a particular PAL or NTSC by moving the joystick left or right.

All cameras and monitors connected to the BMMatrix must be of the same video standard.

30. Podium Feature

In some retail installations using the BMMatrix, a podium position installed, which is located on the shop floor. The podium consists of one or more keyboards and one or more monitors. It may be used by contract security guards.

It is necessary that the podium position can only see cameras from the shop floor and can not see the other cameras that are also connected to the BMMatrix. E.g. cameras showing the cash office, stores, staff areas etc must never be displayed on the podium monitors.

When the podium feature is ON:

- Some keyboards, cameras and monitors are set to be for podium use.
- Podium keyboards can only control podium monitors.
- The podium monitors can only display pictures from cameras that have been set to be podium cameras.
- Podium monitors can only be controlled using keyboards that have been set to be podium keyboards.

After a factory reset the podium feature defaults to OFF.

To use the podium feature, set the podium cameras, monitors and keyboards, then turn the podium feature ON, as described below.

31. Podium Feature ON/OFF

It is usual to set up the podium monitors, cameras and keyboards before turning the podium feature ON.

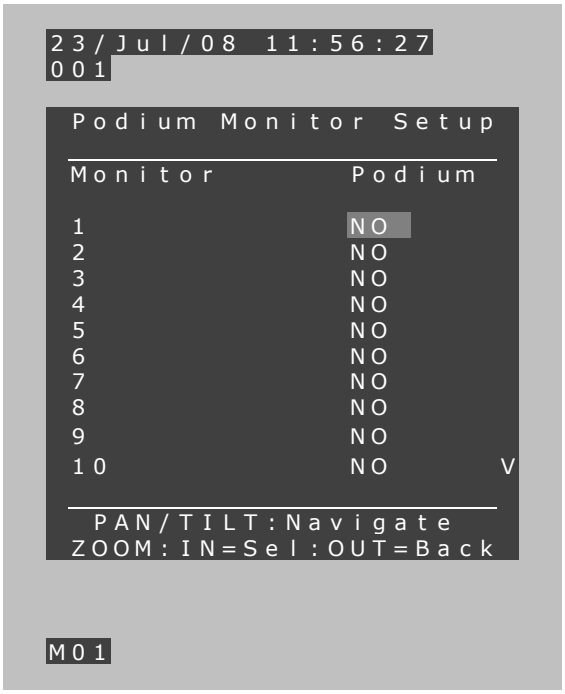
From the Engineer Main Menu, move the joystick down until ‘Engineer Settings’ is highlighted. Twist joystick clockwise to select it. The ‘Engineer Settings’ menu will appear. Move the joystick down until ‘Podium Feature Enabled’ is highlighted.

The highlight will show the current setting YES or NO.

To change the setting, move the joystick left or right.

32. Podium Monitor Setup

Using the Joystick, move down until ‘Podium Monitor Setup’ is highlighted and twist the joystick clockwise to change it.



To change whether monitors are to be podium monitors, use the joystick to move the highlighting to YES/NO next to the particular monitor number and move the joystick left or right to select it.

If a monitor is set to YES then it will be used as a podium monitor when the podium feature is turned ON.

If the monitor is set to NO then it is a normal display monitor that can see any camera, and be controlled by any non-podium keyboard.

33. Podium Keyboard Setup

Using the joystick, move down until ‘Podium Keyboard Setup’ is highlighted and twist the joystick clockwise to select it.

To select keyboards that are to be used as podium keyboards, use the joystick to move the highlighting to YES/NO next to the particular keyboard connector number and move the joystick left or right to select it.

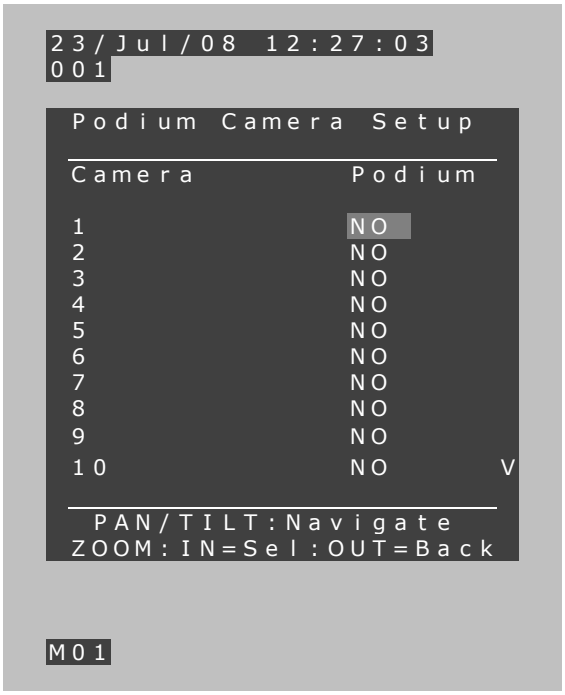
If a keyboard is set to YES then it will be used as a podium monitor when the podium feature is turned ON.

If the monitor is set to NO then it is a normal keyboard that can control any camera, and be used to select cameras for display on any non-podium monitor.

34. Podium Camera Setup

Using the joystick, move down until ‘Podium Camera Setup’ is highlighted and twist the joystick clockwise to select it.

Press numbers buttons to quickly select a particular camera number. This shortcut eliminates scrolling through very long lists.



To change whether cameras are to be podium cameras, use the joystick to move the highlighting to YES/NO next to the particular camera number and move the joystick left or right to select it.

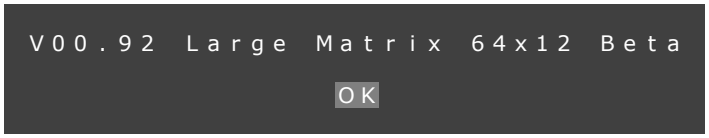
If a camera is set to YES then it will be used as a podium camera when the podium feature is turned ON.

Only cameras set to YES can be displayed on the podium monitor(s). All other cameras can not be seen. If a non-podium camera is selected by the podium keyboard, then colour bars are displayed and the camera ident will change to ‘NOT AVAILABLE’.

If the camera is set to NO then it is a normal camera that can only be displayed on non-podium monitors and controlled by non-podium keyboards.

35. Information

When ‘information’ is selected from the Engineer settings menu, the software reference for the software in the VisionBMatrix is displayed.
E.g.



Select OK to return to the previous menu.

36. Restore Factory Defaults (Clear all)

This command allows the matrix settings to be returned to factory defaults. **All user and engineer programmed settings will be lost.**

From the Engineer Main Menu, move the Joystick down until ‘Engineer Settings’ is highlighted. Twist joystick clockwise to select it. The ‘engineer settings’ menu will appear. Move the joystick down until ‘Restore Factory Defaults’ is highlighted.
Twist joystick clockwise to display:

The message ‘Autoseqs/titles etc will be lost! PROCEED CANCEL’ will appear. This PROCEED CANCEL step is included in the procedure to ensure it isn’t done by accident.

The highlighting is on ‘CANCEL’ Twist the joystick to return to the previous menu without changing the Vision BM Matrix setting.

Otherwise move the joystick to the left to highlight ‘PROCEED’ then twist the joystick clockwise to factory reset the Vision BM Matrix. If ‘PROCEED’ is highlighted, twisting the joystick anti-clockwise will return to the previous menu without changing the Vision BM Matrix settings.

Twist joystick clockwise to reset the Vision BM Matrix.
The following information is displayed for less than 1 minute:

After this the Vision BM Matrix displays:

Use the switch on the Vision BM Matrix to turn the power OFF, wait for several seconds and then turn the power ON.

If the Vision BM Matrix is ‘cascadable’ it is necessary to reconfigure the ‘Unit Number’, ‘Number of units’ and ‘ video bus termination’ settings after a Restore Factory Defaults (Clear all) as described in section 30.

37. Keyboard Tests

Joystick Calibration

Occasionally after prolonged use the joystick may require recalibration to its normal return centre position. Joystick calibration may be required if the following are evident on the system.

Pan and Tilt run on is being experienced. This is where the Predator, Black Hawk Dome or VisionDome continues on in the same direction as the last joystick movement, even after the joystick has been returned to centre.

“Creeping” of Predator, Black Hawk Dome or VisionDomes is experienced. This is where a Predator, Black Hawk Dome or VisionDome may move very slowly in a pan or tilt direction when the keyboard is not in use.

To recalibrate the joystick follow this procedure:

Ensure that the joystick is in the centre position

Press and hold the ‘lock’  button

With the lock key still held down press 4, 4, 4, 4

Release the ‘lock’  button

Joystick calibration is now complete.

Alternative way to recalibrate joystick

Simply remove power for 5 seconds, ensure that joystick is in its central position, and then re-apply power.

38. All Buttons Test

After prolonged heavy use or use in very dirty environments it is possible for the buttons to wear or experience bad contacts.
To assist engineers in verifying the buttons a test is built into the VisionKeyboard that checks the activation and release of every button.

To run the button test follow this procedure:

To begin the test press and hold 'lock' button

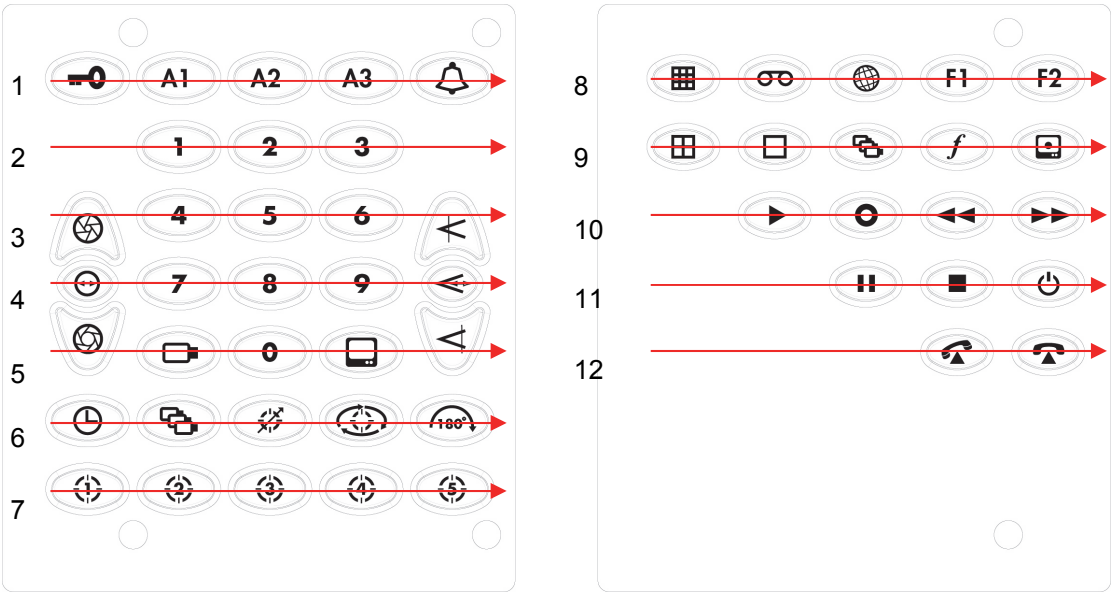
With the 'lock' button still held down press 7 5 4 8

Release the 'lock' button

All buttons with backlight capability will now be illuminated
The LCD will show:

```
    K e y s   I n   T e s t   M o d e
P r e s s   ' L O C K '
```

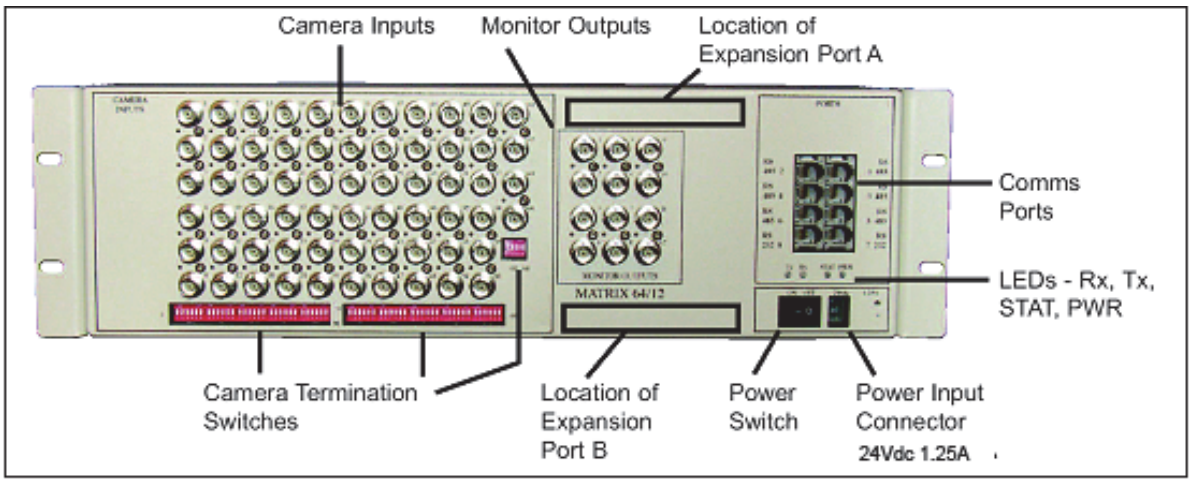
Now starting at the top left button press and release every button in the sequence shown on the diagram below. Each button should beep when pressed and will also beep again on release.



The button test will automatically finish after the last button has been tested (bottom RH button)

Should you press an out of sequence button the keyboard will emit a long error beep. This will have no affect on the test.

39. Vision BM Matrix (Identification of connectors)



40. Comms Ports for Stand Alone Vision BM Matrix

VM0032-04, VM0064-04, VM0064-12 or VM0064T-12

Connect Predators, Black Hawk Domes, VisionDomes and VisionAlarms to COMMS1 (RS485). See the separate Predator, Black Hawk Dome, VisionDome and VisionAlarms installation manuals to determine whether daisy chain connection can be used. Use daisy chained connections or VRS485-4DB-EU star distribution units as appropriate. Do not use ‘stubs’ on RS485

Connect VisionKeyboard VKXBMM485 or RS485 external controller (e.g. DVR) to each of the COMM ports 2 to 6, as required

Connect RS232 external controller (e.g. DVR) to each of the COMM ports 7 and 8, as required

41. Comms Ports for Cascaded Vision BM Matrix

VM0064CT-12, VM00128C-12, VM00192C-12 or VM00256C-12

Master VM0064C
Connect Predators, Black Hawk Domes, VisionDomes and VisionAlarms to COMMS1 (RS485). See the separate Predator, Black Hawk Dome, VisionDome and VisionAlarms installation manuals to determine whether daisy chain connection can be used. Use daisy chained connections or VRS485-4DB-EU star distribution units as appropriate. Do not use ‘stubs’ on RS485

Connect VisionKeyboard VKXBMM485 or RS485 external controller (e.g. DVR) to each of the COMM ports 2 to 4, as required.

Connect RS232 external controller (e.g. DVR or RS232 from special VisionKeyboard) to each of the COMM ports 7 and 8, as required.

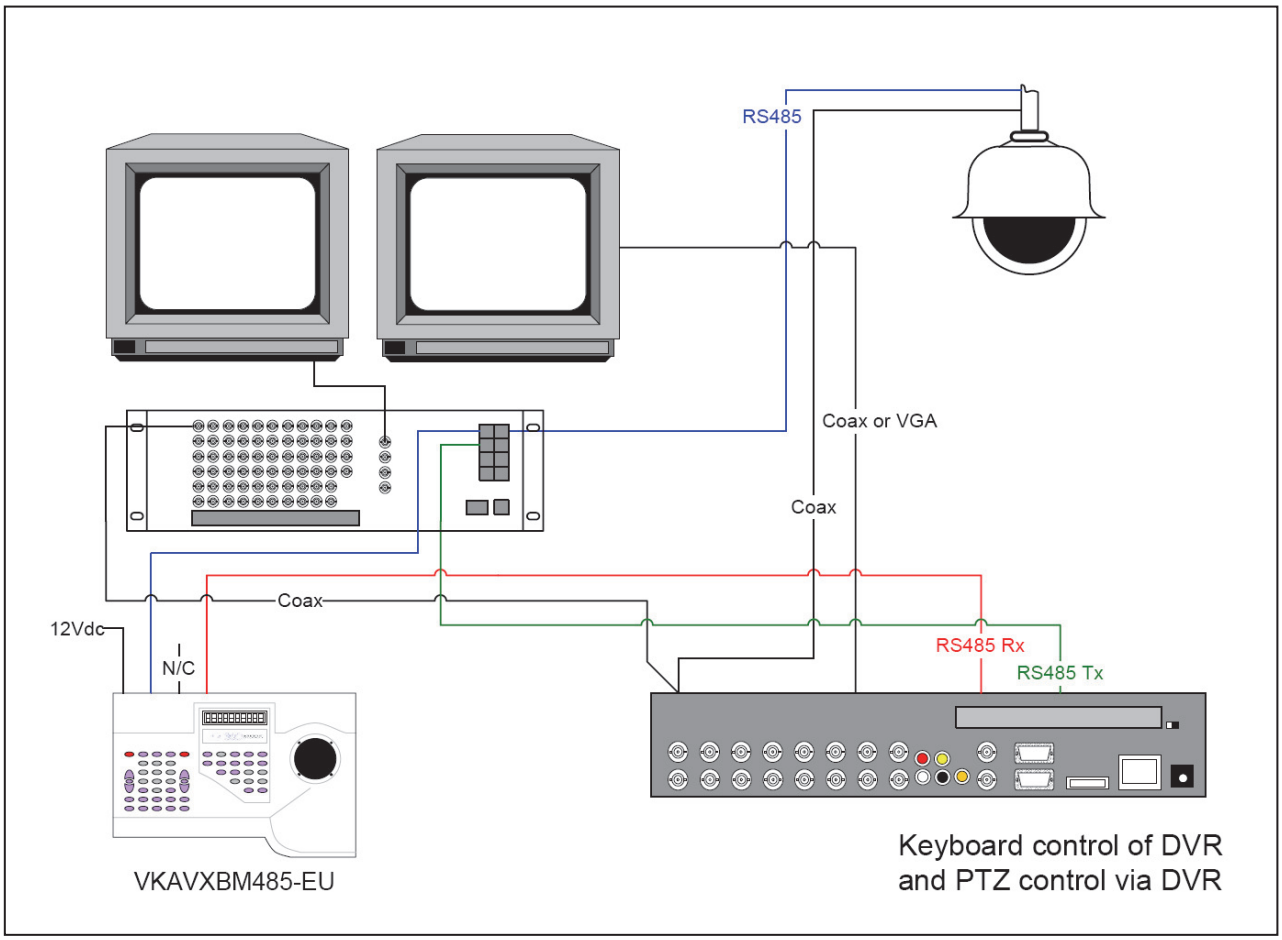
Note that no connection is to be made to COMM5 and COMM6 of the Master VM0064C.

Slave VM0064C
No connection is to be made to COMM 1 to 8 of any slave, except when configuring Unit number and video bus termination. See section 48.

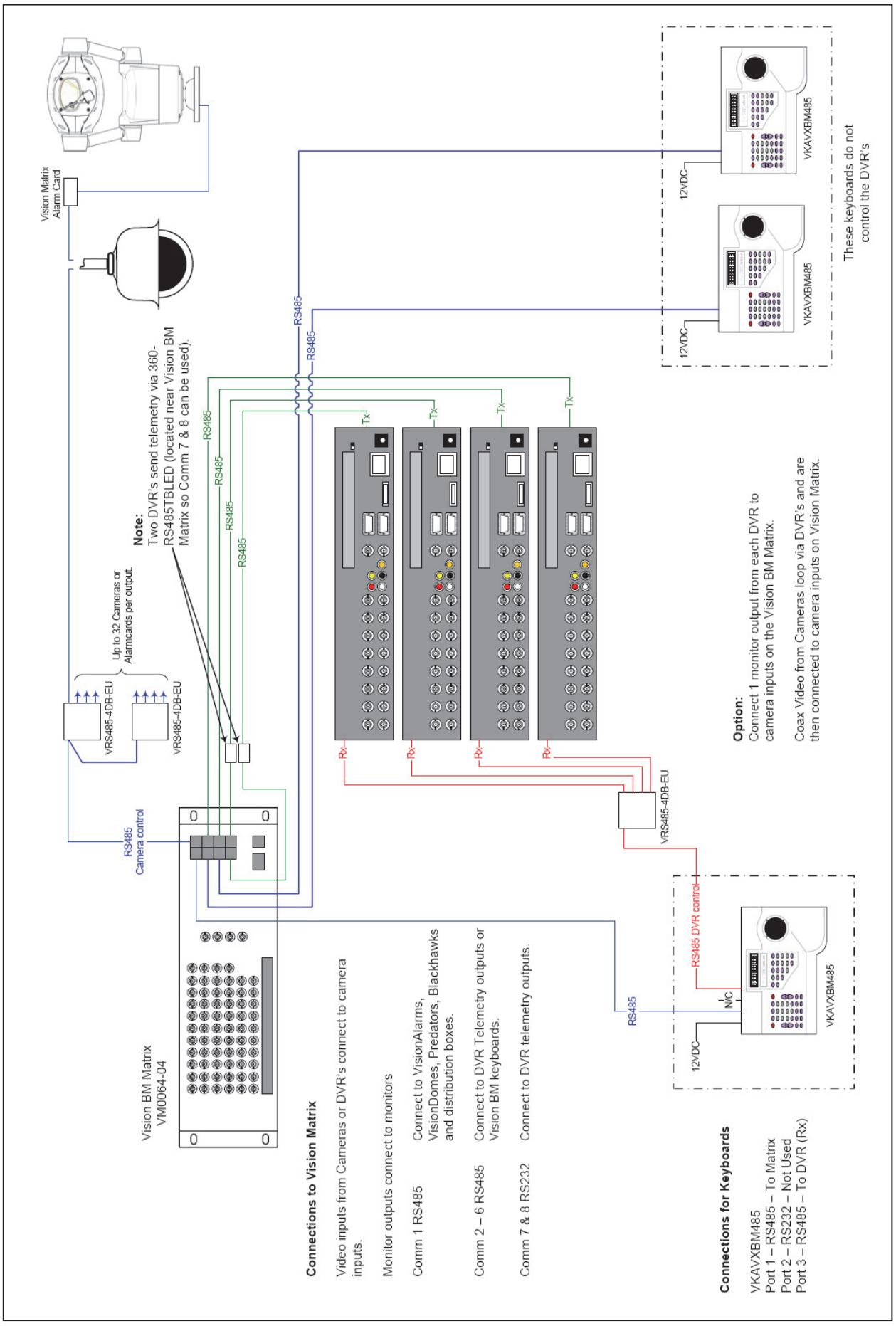
Predator, Black Hawk Dome, VisionDome and VisionAlarm Addresses
Set the address of the Predators, Black Hawk Domes, VisionDomes and VisionAlarms. See the separate Predator, Black Hawk Dome, VisionDome and VisionAlarms installation manuals for details of how this is done.

e.g. if VisionDome is to be used as camera 66, set the DIL switches of the VisionDome to 66.

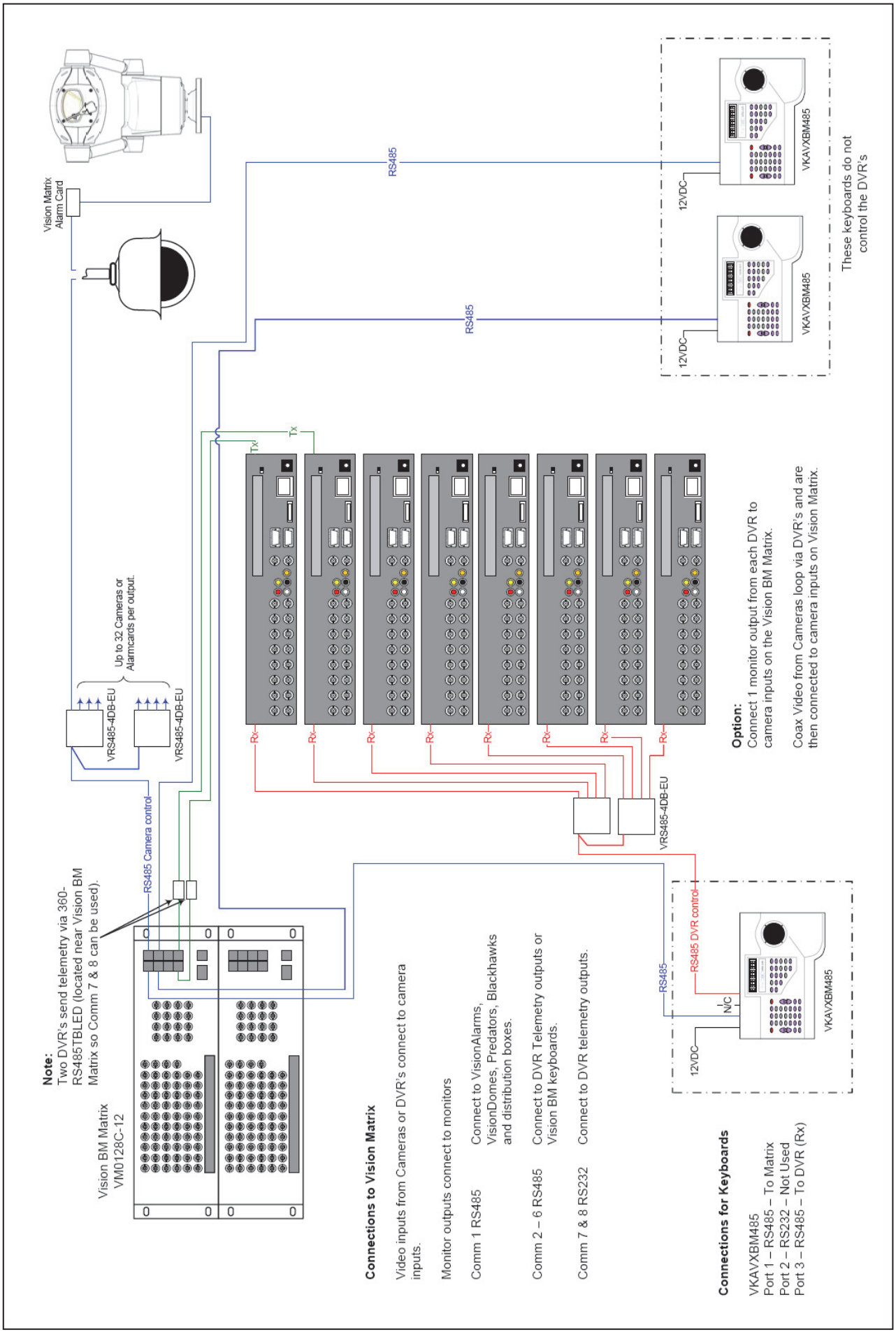
42. VisionBMatrix, VisionKeyboard and Avalon H DVR Connections



43. Stand alone Vision BM Matrix Connections



44. Cascaded Vision BM Matrix Connections



45. Vision BM Matrix Video Inputs

Connect the Video cables from the Predators, Black Hawk Domes, VisionDomes and cameras to the camera input BNC's.

46. Vision BM Matrix Video Termination Settings

The Vision BM Matrix units are supplied with all video inputs terminated. There is a single BNC for each video input. To loop the video to other equipment use BNC 'goal post' or 'T' adaptors on each input that is looped.

The video termination selection switches are located near to the camera input BNCs. ON indicates that the input is terminated. OFF is selected to turn the termination OFF so that the video input can be 'looped through' to other equipment. It is essential that the input to the last piece of equipment connected to a particular video signal is terminated.

47. VisionKeyboard VKXBMM485 Connections on Vision BM Matrix

Stand Alone (non cascadable) Vision BM Matrix

The VKXBMM485 VisionKeyboard uses RS485 to communicate with the stand alone Vision BM Matrix. The ports Comm 2 to Comm 6of the master unit are available for connecting VKXBMM485 VisionKeyboards. Up to 5 VKXBMM485 VisionKeyboards can be connected to the Vision BM Matrix.

The Vision Keyboard can control DVRs that are connected to it. The Vision Keyboard cannot control DVRs that are connected to a different Vision Keyboard.

Cascadeable Vision BM Matrix

The VKXBMM485 VisionKeyboard uses RS485 to communicate with the cascadable master Vision BM Matrix unit. The ports Comm 2 to Comm 4 of the master unit are available for connecting VKXBMM485 VisionKeyboards. Up to 3 VKXBMM485 VisionKeyboards can be connected to the Vision BM Matrix.

The Vision Keyboard can control DVRs that are connected to it. The Vision Keyboard cannot control DVRs that are connected to a different Vision Keyboard.

48. Controlling Vision BM Matrix from other controllers

The Vision BM Matrix can accept telemetry and matrix switching commands from remote equipment such as DVRs or transmission systems, provided that the appropriate communications protocol is used. The telemetry data cable from the remote equipment can be connected to any of the available Comm ports. Use one of the ports Comm 2 to Comm 6 for RS485 2-wire data, or Comm 7 or 8 for RS232C data. The remote equipment must not be connected to any Comm port on the Vision BM Matrix that is already being used by a VisionKeyboard or other piece of remote equipment. Similarly, the remote equipment can not be connected to the VisionKeyboard.

49. Alarm Connections on Vision BM Matrix

Alarm connections are made using remote alarm input units which are connected to the Comm 1 RS485, which is the same Comm port which is used for RS485 control of the Predators, Black Hawk Domes or VisionDomes.

Connect Predators, Black Hawk Domes, VisionDomes and VisionAlarms to COMMS1 (RS485). See the separate Predator, Black Hawk Dome, VisionDome and VisionAlarms installation manuals to determine whether daisy chain connection can be used. Use daisy chained connections or VRS485-4DB-EU star distribution units as appropriate. Do not use ‘stubs’ on RS485

The Relay on the first VisionAlarm card is used as the general alarm relay. The operation of this relay is referred to in the alarm descriptions elsewhere in the Vision BM Matrix manuals.

50. Vision Keyboard VKXBMM485 Connections

The VisionKeyboard type VKXBMM485 can control Predator, Black Hawk Dome or VisionDomes and DVRs

Connections to VisionKeyboard type VKXBMM485:
Port 0 (power) connects to 12vdc PSU.

Port 1 (to matrix RS485) connects to a control port (COMM 2..6) of the matrix.

Port 2 (to DVR RS232) Tx signal connects to the RS232 Rx signals on the DVRs. If several DVRs are being controlled, the DVR Rx signals are connected together in a daisy chain. The cable lengths for RS232 should be kept short (typically less than 5m total).

Port 3 Not used.

51. Cascading Vision BM Matrix VM0128C-12, VM0192C-12, VM0256C-12

The cascadable Vision BM Matrix consists of one or more identical 64 input and 12 output VM0064C-12 Vision BM Matrix boxes.

Fit the Vision BM Matrix boxes into a suitable 19” rack. The one at the top will be the master.
The one below the master is the ‘first slave’. Below the first slave is the ‘second slave’. The box at the bottom will be the ‘last slave’.

Interconnect the VM0064C-12 boxes using 64-way ribbon cables as follows:
Connect ‘expansion port B’ of the ‘master’ to ‘expansion port A’ of the first slave immediately below it.
Connect ‘expansion port B’ of this ‘slave’ to ‘expansion port A’ of the ‘slave’ immediately below it.
Continue interconnecting the boxes in this way until all the boxes are connected.

Expansion port A’ of the ‘master’ and ‘expansion port B’ of the ‘last slave’ must be left unconnected.

When the Vision BM Matrix is first switched on or has had its data cleared using Factory Reset command, it is necessary to set Unit number, Number of cameras and Video Bus termination as described in section xx.

52. Using VM0064CT-12 as a non-cascaded stand-alone matrix

The VM0064CT-12 Vision BM Matrix is the same 64 input and 12 output box that is used in the cascaded arrangement that is described above. This version is however supplied with a VBM-TERM termination unit, which is fitted to ‘expansion port B’. When the VBM-TERM is fitted, the auto configure command will configure the VM0064CT as a stand-alone 64 input and 12 output stand-alone Vision BM Matrix unit.

The VBM-TERM must be used to ensure that the video levels for the monitor outputs are satisfactory.

53. Using VM0064C-12 as a non-cascaded stand-alone matrix

The VM0064C-12 Vision BM Matrix is the same 64 input and 12 output box that is used in the cascaded arrangement that is described above. This version is however supplied with a VBMCABLE, which is fitted to ‘expansion port A’. It is necessary to remove the VBM-CABLE, and fit a VBM-TERM to ‘expansion port B’. When the VBM-TERM is fitted, the auto configure command will configure the VM0064CT as a stand-alone 64 input and 12 output stand-alone Vision BM Matrix unit.

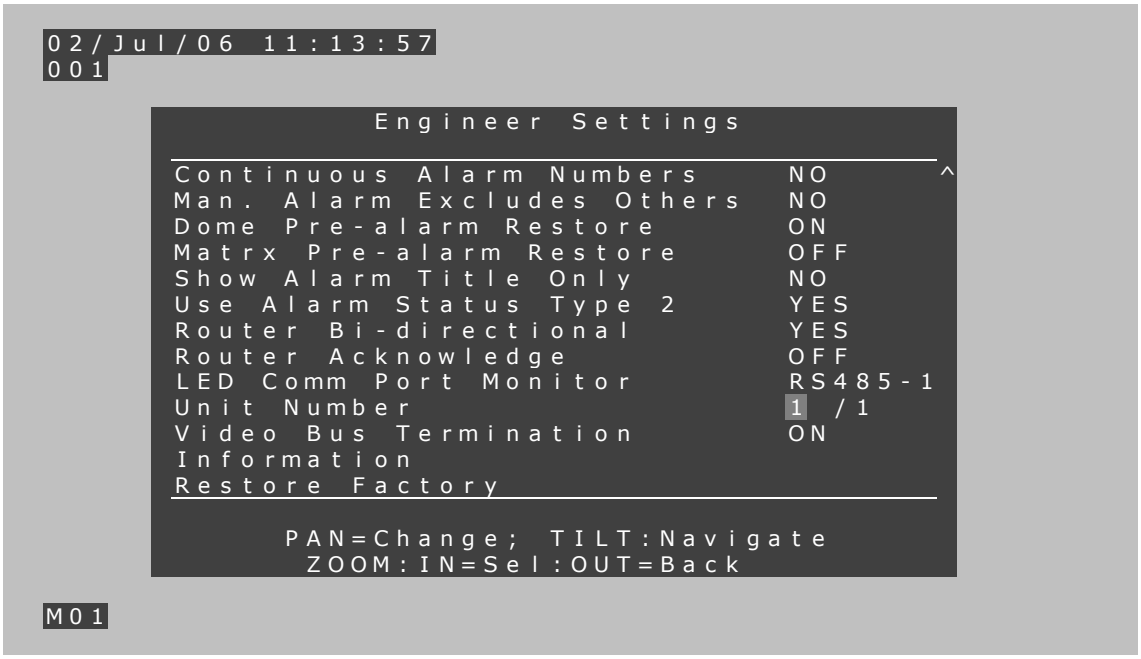
The VBM-TERM must be used to ensure that the video levels for the monitor outputs are satisfactory.

54. Cascadable Vision BM Matrix Configuration

The cascadable Vision BM Matrix must be configured when first switched on or after a Factory clear (reset) command has been used.

Master Unit
Connect a keyboard and monitor to the Master VM0064C-12 Vision BM Matrix box.

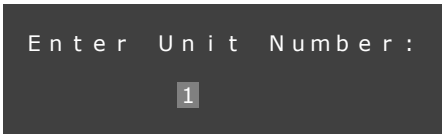
From the Engineer Main Menu, move the Joystick down until ‘Engineer Settings’ is highlighted. Move the joystick down to scroll down to ‘Unit Number’.



Note that if the unit is not cascadable, the ‘Unit Number’ and ‘Video Bus Termination’ options are not available and do not appear.

Twist the joystick clockwise to select ‘Unit Number’.

Enter Unit Number will appear:



Use the number keys to enter the ‘unit number’ (Unit ‘1’ is the master)

Twist the joystick clockwise to set it. The screen will change to:

Use the number keys to enter the ‘number of units’.
For a 64 camera system enter ‘1’
For a 128 camera system enter ‘2’
For a 192 camera system enter ‘3’
For a 256 camera system enter ‘4’

Twist the joystick clockwise to set it.

The engineer settings menu is displayed. Move the joystick down to select ‘video bus termination’

If video bus termination is set to OFF, move the joystick right to change it to ON. Video bus termination must be set to ON in the master unit.

Slave units
Connect a keyboard and monitor to the first slave VM0064C-12 Vision BM Matrix box which is located below the master unit.

From the Engineer Main Menu, move the Joystick down until ‘Engineer Settings’ is highlighted. Move the joystick down to scroll down to ‘Unit Number’.

For the first slave (cameras 65 to 128) enter unit number ‘2’.
For the second slave (cameras 129 to 192) enter unit number ‘3’.
For the third slave (cameras 193 to 256) enter unit number ‘4’.
Twist the joystick clockwise to set it. (Note that the ‘enter number of units’ screen does not get shown on slave units 2 to 4.

Move the joystick down to select the unit number.

The engineer settings menu is displayed. Move the joystick down to select ‘video bus termination’

The last slave must have ‘video bus termination’ set to ON. If there are any intermediate slaves between the master and the last slave, they must have video bus termination is set to OFF.
Twist the joystick clockwise to select it.

Repeat the ‘slave units’ section until all units have been set as indicated below:

55. Table of settings for Unit Number, Number of Units and Video Bus Termination

Cascadable 64 x 12 Vision BM Matrix (one VM0064CT-12)

Unit Number	Number of Units	Unit Description	Cameras	Video Bus Termination	VBM-TERM
1	1	Master	1 to 64	ON	fitted

128 x 12 Vision BM Matrix VM0128C-12 (Two VM0064C-12)

Unit Number	Number of Units	Unit Description	Cameras	Video Bus Termination	VBM-TERM
1	2	Master	1 to 64	ON	not fitted
2	n/a	Slave1	65 to 128	ON	not fitted

192 x 12 Vision BM Matrix VM0192C-12 (Three VM0064C-12)

Unit Number	Number of Units	Unit Description	Cameras	Video Bus Termination	VBM-TERM
1	2	Master	1 to 64	ON	not fitted
2	n/a	Slave1	65 to 128	OFF	not fitted
3	n/a	Slave2	129 to 192	ON	not fitted

256 x 12 Vision BM Matrix VM0256C-12 (Four VM0064C-12)

Unit Number	Number of Units	Unit Description	Cameras	Video Bus Termination	VBM-TERM
1	2	Master	1 to 64	ON	not fitted
2	n/a	Slave1	65 to 128	OFF	not fitted
3	n/a	Slave2	129 to 192	OFF	not fitted
4	n/a	Slave3	193 to 256	ON	not fitted

Non cascadable Vision BM Matrix VM0032-4, VM0064-4 VM0064-12

Unit Number	Number of Units	Unit Description	Cameras	Video Bus Termination	VBM-TERM
n/a	n/a	n/a	1 to 32 or 1 to 64	n/a	n/a

56. Monitor Connections on Cascaded Vision BM Matrix

Connect the 12 monitors to the monitor outputs located on the ‘master’.

There are 12 additional monitor output BNCs located on each ‘slave’. These outputs can be used to view the same pictures that are selected on the equivalent monitor outputs from the ‘master’. The monitor outputs from the ‘slaves’ do not have OSD.

57. Monitor Connections on stand-alone Vision BM Matrix

VM0032-4, VM0064-4 & VM0064-12
Connect the monitors to the monitor output BNCs.
Up to 4 monitors can be connected to VM0032-4, VM0064-4 and up to 12 monitors can be connected to VM0064-12.

58. 24vdc Power Connections

Each VisionBMatrix box requires 24vdc @ 1.25A. A single 24vdc power supply can be used to supply several boxes provided there is sufficient current available.

The VisionBMatrix has the facility to check the polarity of the 24vdc before the power switch is turned on. It is essential that the correct polarity is used for the power connections. A suitable procedure to prevent damage is described below.

Procedure for first application of power to the VisionBMatrix.

Ensure that the power switches on the VisionBMatrix panels are all set to OFF
Connect the 24vdc from the power supplies to the VisionBMatrices and turn on the power supplies. Do not turn the VisionBMatrix power switches on yet.

Use a voltmeter to measure the voltage between the two connections of the power supply connector. The upper pin is positive, the lower pin is negative. The voltage should be between
21.8 and 26.2 volts (i.e. 24vdc +/- 10%).

Observe the ‘power’ LEDs on each VisionBMatrix. They should all be OFF. If any are RED, this indicates that the 24vdc has the wrong polarity. Interchange the two power connections and confirm that the RED power LED is now OFF.

When the VisionBMatrix power switches are all OFF, and the power supplies are all ON, and the power LEDs on the panels of the VisionBMatrix are all OFF, then it is safe to switch the power switches ON. If all is OK, the power LEDs on the VisionBMatrices will all be GREEN.

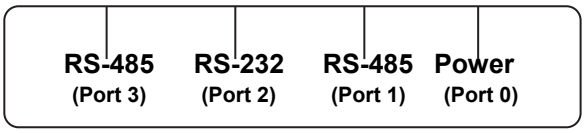
If the VisionBMatrix is new, the communications Tx LED will start to flash after a few seconds.
This indicates that the VisionBMatrix is sending commands to the Predators, Black Hawk Domes, VisionDomes and VisionAlarm cards.

59. Status LED

When the VisionBMatrix box is switched on and is in use, the status LED ('STAT') is on. When it is RED the VisionBMatrix processor is ACTIVE. When it is GREEN the processor is IDLE. It is usual for the LED to be ORANGE which indicates activity, with occasional flashes of RED indicating a high level of activity.

60. Cable Connections at the rear of the VisionKeyboards type VKAVXBMM485

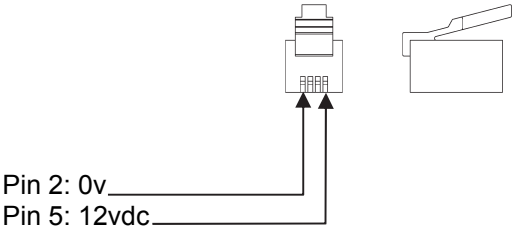
VisionKeyboard with LCD Display & DVR Control



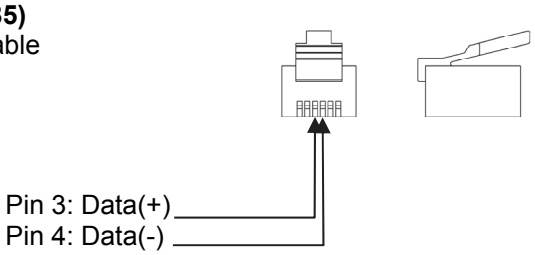
All connections to keyboards, RS 485 telemetry and power are made via RJ type connectors.
The pin assignments for the RJ type connectors are shown below.
The DVR is using RS232 using port 2 on the VisionKeyboard.

Port 0 Power
Connect the supplied 12vdc 500mA PSU to the 4 way RJ9 4P4C Port 0.

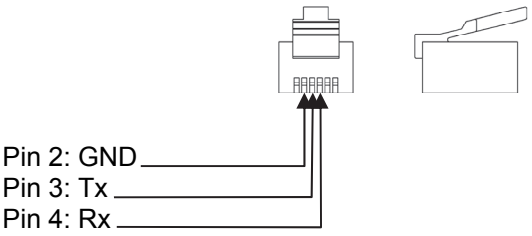
Note: The pins on the RJ9 are numbered 2 to 5.
Pins 1 and 6 are absent.



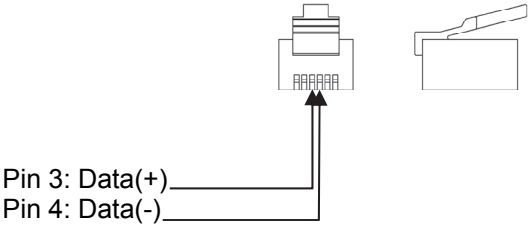
Port 1 Matrix/Dome Control (RS485)
Connect the RS485 dome control cable to the 6 way RJ11 6P4C Port 1.



Port 2 DVR Control (RS232)
If the DVR is to be controlled using RS232 then connect it to 6 way RJ11 6P4C Port 2.



Port 3 DVR Control (RS485)
If the DVR is to be controlled using RS485 then connect it to 6 way RJ11 6P4C Port 3.



61. DVR Control setup via the VisionKeyboard

The DVR can be controlled remotely by an external device or control system such as the VisionKeyboard.

The VisionKeyboard can control up to 8 DVRs, daisy chained via RS485. The VisionKeyboard associates cameras with the appropriate DVR e.g. if 16 camera DVRs are being used – cameras 1-16 will automatically relate to DVR 1, 17-32 to DVR 2 etc up to DVR 8 (cameras 113-128). Selecting a camera number on the VisionKeyboard will automatically be directed to the DVR associated to that camera i.e. camera 42 will be directed to DVR 3.

Alternatively 4 way and 8 way DVRs can be used together in any combination.

62. Connecting RS485 to (2U Avalon) DVR

On the DVR, please connect the RS485from ‘Port 3’ of the VisionKeyboard to rear panel of the Avalon H/T using Rx+ and Rx-.

63. Connecting VisionKeyboard to DVR

RS485

VisionKeyboard	**DVR alarm card or rear panel.**
Port 3, pin 3 Data(+)	RX+
Port 3 pin 4 Data(-)	RX-

64. Accessing the DVR Menu for connection of VisionKeyboard

When connected, go into the DVR menu in order to change the communication settings.

Press ‘menu’ on the front of the DVR, enter the password (default is ‘NO PASSWORD’) and press the enter key.

It is necessary to set the DVR ID and to set the ports to define the use (e.g. Remote control, PTZ or External Modem) and the communication settings.

65. DVR Menu - Unit ID

When multiple Avalon DVRs are used together, set the unit ID (i.e. the DVR ID) using the DVR’s System Information Menu. (DVR DVR1 = ID1).

66. DVR Menu - Port settings

Set communication parameters:

Use the DVR menus to select:
'MENU' – 'NETWORK' – 'Serial Configuration' – ' RS485

'TYPE – EXTERNAL CONTROLLER'
'Model – WTX-1500/2000'
'Baud Rate – 9600BPS'
'Data Bit – 8'
'Parity – NONE'
'STOP BIT – 1'

67. VisionKeyboard – Stand alone mode and DVR mode

The VisionKeyboard operates in one of two modes.

'Standalone' mode is used for controlling the Predator, Black Hawk Dome or VisionDomes.
'Avalon DVR' mode is for controlling the DVR.

To toggle between the two modes press the 

button

68. DVR Mode – select Avalon type

To select Avalon type and no of channels – (select DVR mode – see section 21)

press and hold the 'lock'  key,

press '5', '3', '2', '6' and then release  'lock'

Move the joystick up or down to select the DVR protocol.

Only one protocol can be selected for all the DVRs that are connected.

E.g the VisionKeyboard LCD could show:

```
DVR:1  Avalon  T  16ch
```

Move the Joystick to 'RIGHT' or 'LEFT' to select the item to change. 'ZOOM IN' to change the item. After changes have been completed 'ZOOM OUT' to finish.

DVR Type	T or S
Channels	4, 8 or 16

69. DVR Size Selection

You must tell the keyboard what size of DVRs you will be controlling. Generally, they will all be of the same model, but occasionally you may have call to have different models within the system.

To select a DVR size, (select DVR mode – see section 21)

Select the DVR

press number buttons followed by  button

select DVR size

press and hold the  button,

press number buttons to select DVR size (and press either ‘4’, ‘8’ or ‘1’ ‘6’ (using the grey number buttons)

release  button.

E.g set DVR 1 to be 16 camera

Press ‘1’ (for DVR 1) followed by  button .

Press and hold  button

Press ‘1’, ‘6’ (using the grey number buttons)

release  button.

Repeat this for all subsequent DVRs, replacing the ‘1’ with the subsequent DVR number, and setting the appropriate DVR sizes.

DVR number can be set in the range 1 to 100

70. Warranty

This information and/or any technical information - whether received verbally or in writing - is given in good faith but without warranty and this also applies where proprietary rights of third parties are involved. The information provided does not release you from your obligation to check its validity and to test the products suitability for the intended purpose(s) and use(s). The application, use and installation of the products either in isolation or in conjunction with other products used, provided and or installed by you on the basis of the technical advice issued are beyond our control and therefore remain entirely your own responsibility.