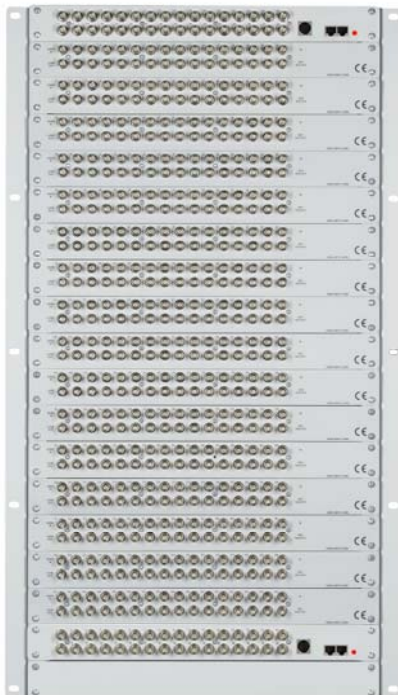




# FBM Video Matrix



## Installation Guide



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# Pre-Installation checks and procedures

## Unpacking

**Check packaging** – Upon delivery of the unit, inspect the packaging for signs of damage. If damage has occurred, inform the carrier and or the suppliers immediately

**Check Contents** – After unpacking, check that all items are present. If any items are missing or damaged, contact the equipment supplier.

## Important Safety Precautions

**Read Instructions** – All relevant safety, installation and operating instructions should be read before attempting to install, connect or operate the unit

**Retain Instructions** – All safety, installation and operating instructions should be retained for future reference.

**Heed Warnings** - All warnings on the unit and in any relevant safety, installation or operating instructions should be adhered to.

**Cleaning** - Switch off and unplug the unit from the power outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.

**Attachments** – Do not use attachments which are not recommended by the product manufacturers as they may cause a hazard or damage the unit.

**Water and Moisture** - Do not expose this unit to water or damp.

**Installation and mounting** – Only install the unit in a suitable enclosure or mount.

**Power Sources** – This unit should only be operated from the type of power source indicated in the manufacturer's label. If you are not sure of the type of power supply you intend to use, consult your equipment dealer or local power company. For units intended to operate from battery power or other sources, refer to operating instructions.

**Object and liquid entry** – Never push objects of any kind into the unit, as they may touch dangerous voltage points or short out parts that could result in fire or electric shock. Never spill liquid of any kind on or inside the unit.

**Servicing** – Servicing of the unit should only be undertaken by qualified service personnel, as opening or removing covers may expose you to dangerous voltages or other hazards.

**Damage Requiring Service** – Servicing by qualified personnel should be carried out under the following conditions:

- (a) When the power supply cord or plug is damaged.
- (b) If liquid has been spilled, or objects have fallen into the unit.
- (c) If the unit does not operate normally by following the operating instructions.
- (d) If the unit has been dropped or the enclosure is damaged.
- (e) If the unit indicates a distinct change in performance.

**Replacement Parts** – If replacement parts are required, ensure that only replacement parts recommended by the product manufacturer are used.

**Safety Check** – Upon completion of any service or repairs to the unit, safety checks should be performed to ensure that the unit is in proper operating condition.

**Coax Grounding** – If an outside cable system is connected to the unit, be sure the cable system is properly grounded.

**Adhere to safety standards** – All normal safety precautions as laid down by British Standards and the Health and Safety at Work Act should be observed.

## Technical Specification

<b>Power Requirements</b>	<b>12Vdc 6.7A FBM matrix</b> <b>12Vdc 6.7A FBM CPU MK2</b>
<b>Inputs</b>	<b>16 – 4096 Camera inputs per matrix*</b>
<b>Outputs</b>	<b>16 – 64 monitor outputs per matrix*</b>
<b>Telemetry</b>	<b>BBV422 @ 9600 N 8 1** (this protocol is available on our support website <a href="http://www.support.bbvctv.com">www.support.bbvctv.com</a>)</b>

### Items included:

- 1 x FBM Video Matrix (including 19 inch rack mounting ears)
- 1 x FBM CPU2
- 2 x 12VDC 6.7A Inline PSU
- 2 x IEC leads (fitted with UK 13A plugs)
- 1 x 17 inch TFT flat screen monitor
- 2 x 0.5m blue patch cable
- 2 x 2m grey patch cable
- 2 x RJ45 break out box
- 1 x USB Qwerty keyboard
- 1 x USB mouse
- 1 x TX1500 system keypad

\* Please contact BBV Technical support ([support@bbvctv.com](mailto:support@bbvctv.com)) for configuration options

\*\* Third party telemetry protocols are supported by the FBM matrix if a BBV Starcard Converter is used please contact BBV Technical support for a complete list of supported protocols or visit our website.

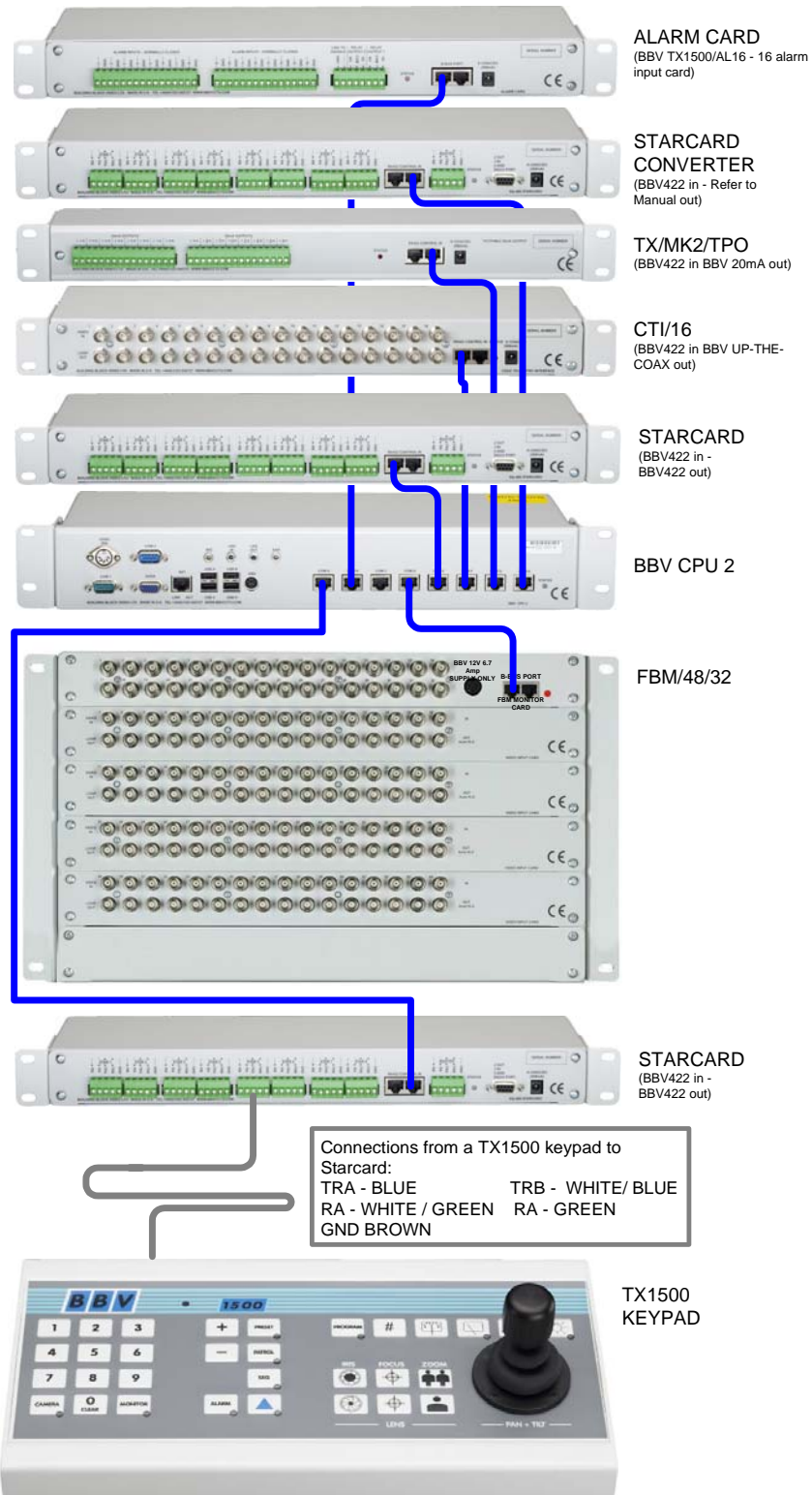
[www.bbvctv.com](http://www.bbvctv.com)

# Description

The FBM is a video matrix and telemetry control system offering control of up to 4096 cameras from 8 control / operator positions and capable of supporting up to 64 monitor outputs. BBV RS422 telemetry is employed as the standard protocol. This will provide control for RX45X and RX55X telemetry receivers. Other RS485 / RS422 protocols are supported if a BBV Starcard Converter is used. BBV 20mA & up-the-coax telemetry can also be supported by the inclusion of either a TX/MK2/TPO for 20mA and or a Coax Telemetry Interface (CTI Card) in the system design.

In order to simplify RS422 site wiring, a Starcard should be used. This will provide 8 x RS422 telemetry ports, each port will support up to 32 cameras. The inclusion of a Starcard in the system design also provides a degree of fault tolerance, for example if a cable connected to a telemetry port should fail, control of the cameras connected to that port only will be affected, all other cameras connected to the system should continue to operate as normal.

Figure1. Basic System Telemetry options



# System Component Details

## FBM CPU

The CPU is the main controller for the system the connector details are shown below:

Figure 2. FBM CPU2

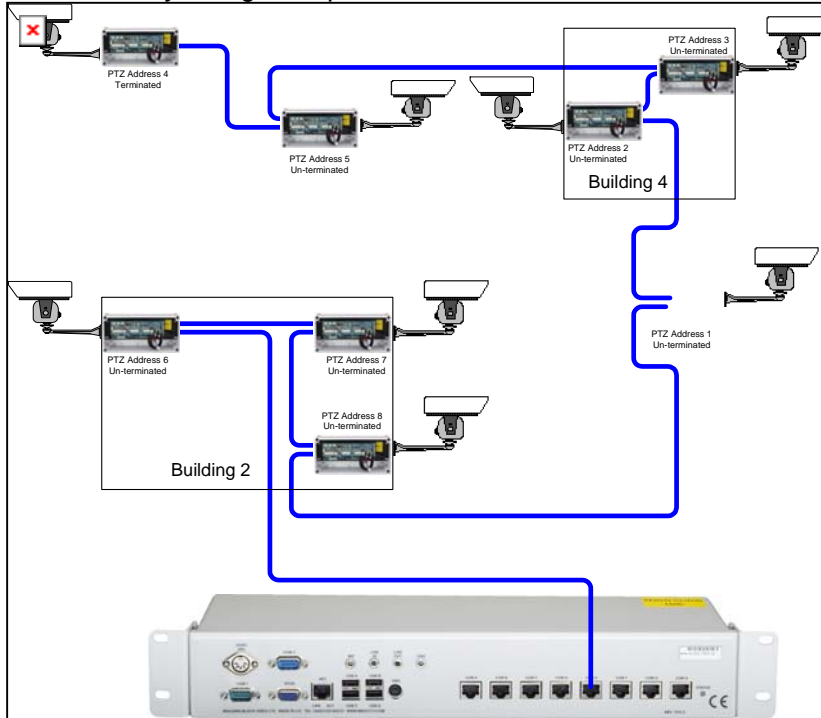


Power	12V 6.7 Amp
Com A	Keypad or BBUS interface
Com B	Alarm Port 1, Alarms 1 – 256 via TX1500/AL16
Com C	Alarm Port 2, Alarms 257 – 512 via TX1500/AL16
Com D	Matrix control port via RS485 (RJ45) patch lead
Com E	Telemetry port
Com F	Telemetry port
Com G	Telemetry port
Com H	Telemetry port
Com 1	Serial Alarms
Com 2	Not implemented
USB	USB – Mouse (memory sticks may be used for system backup)
KBD	Qwerty keyboard
SVGA	SVGA system management monitor
NET	Not implemented

## BBV Starcard

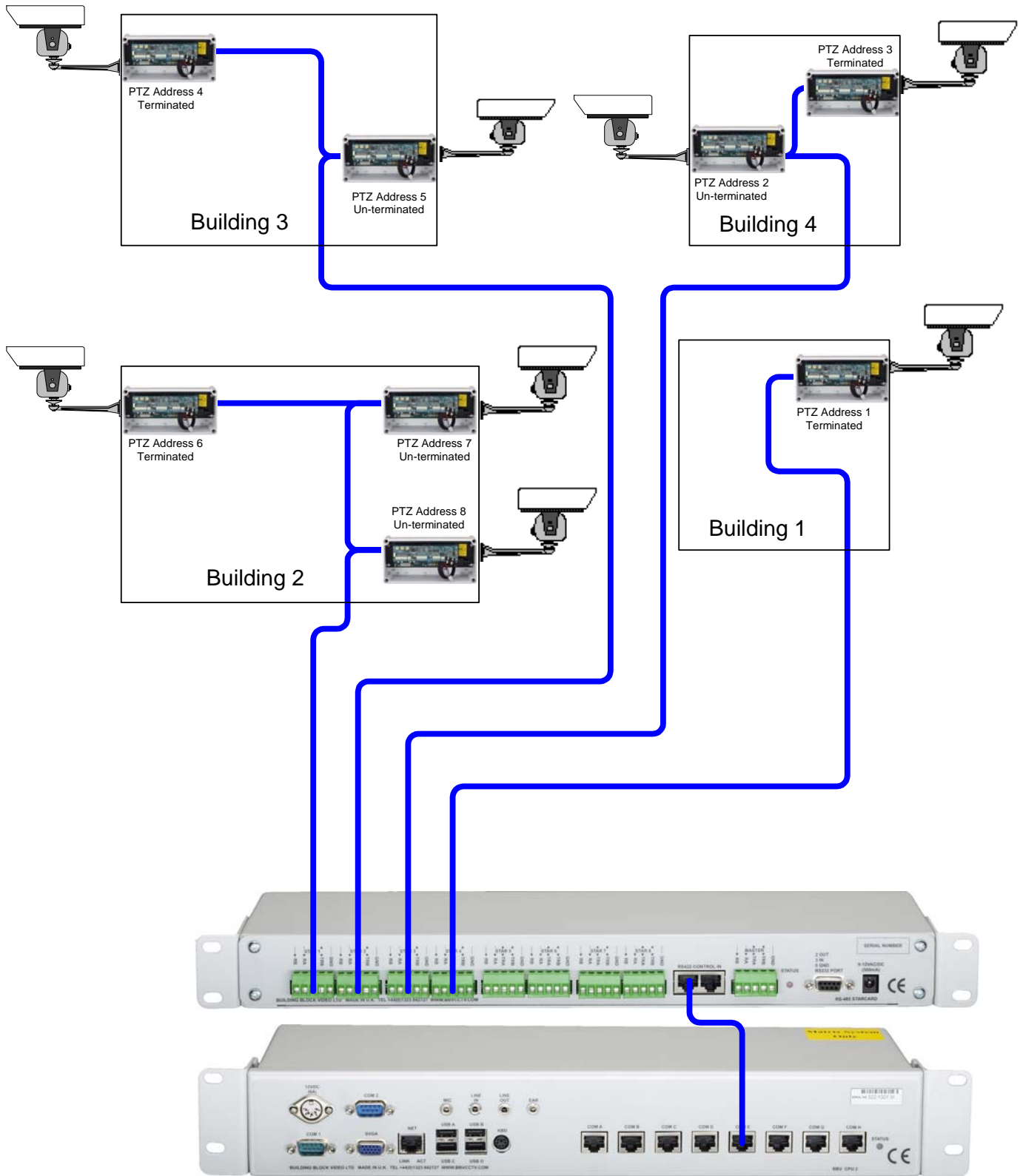
A Starcard will normally be required in a system where telemetry is employed. Usually it will not be feasible to wire the telemetry in a daisy chain fashion see examples below:

Figure 3. Direct Daisy chain telemetry wiring example



As can be seen from Figure 3, direct daisy chained telemetry is not a practical solution. The cable lengths can rapidly become excessive (*maximum allowable cable length = 1200m*) and the labour cost to implement this option will be significant. A much better solution is shown in figure 4 below which shows the same system wired utilising a star card.

Figure 4. Star wired telemetry example



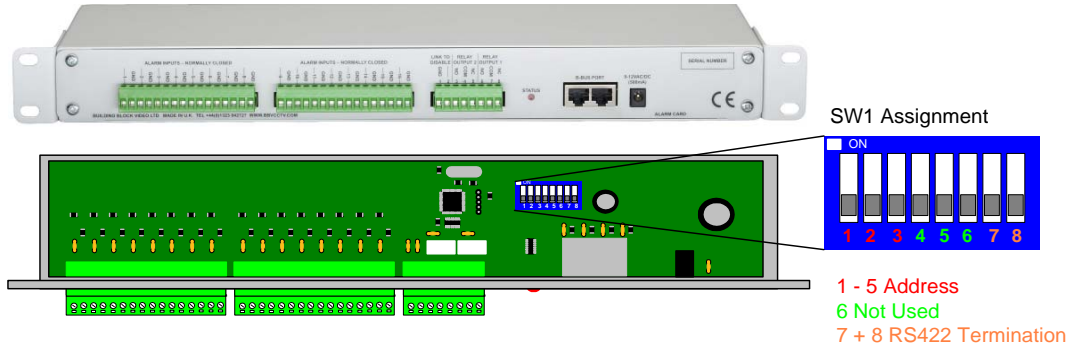
**BBV Starcard Converter**

This device offers the same connectivity options as the Starcard, but in addition, performs a protocol conversion to allow third party domes and telemetry receivers to be used with an FBM system. Only one protocol can be supported on each star card converter. The protocols are selectable via internal dip switches. Please refer to the BBV Starcard manual for available protocol options.

# Alarm Input Card

Each alarm card has 16 inputs. A total of 32 alarm cards may be installed on a system (512 individual alarms). The alarm cards may be incorporated into the matrix sub-rack, installed in a separate sub-rack or supplied in an individual 1U box. Figure 5 illustrates how to set the alarm card to a required address range.

Figure 5.



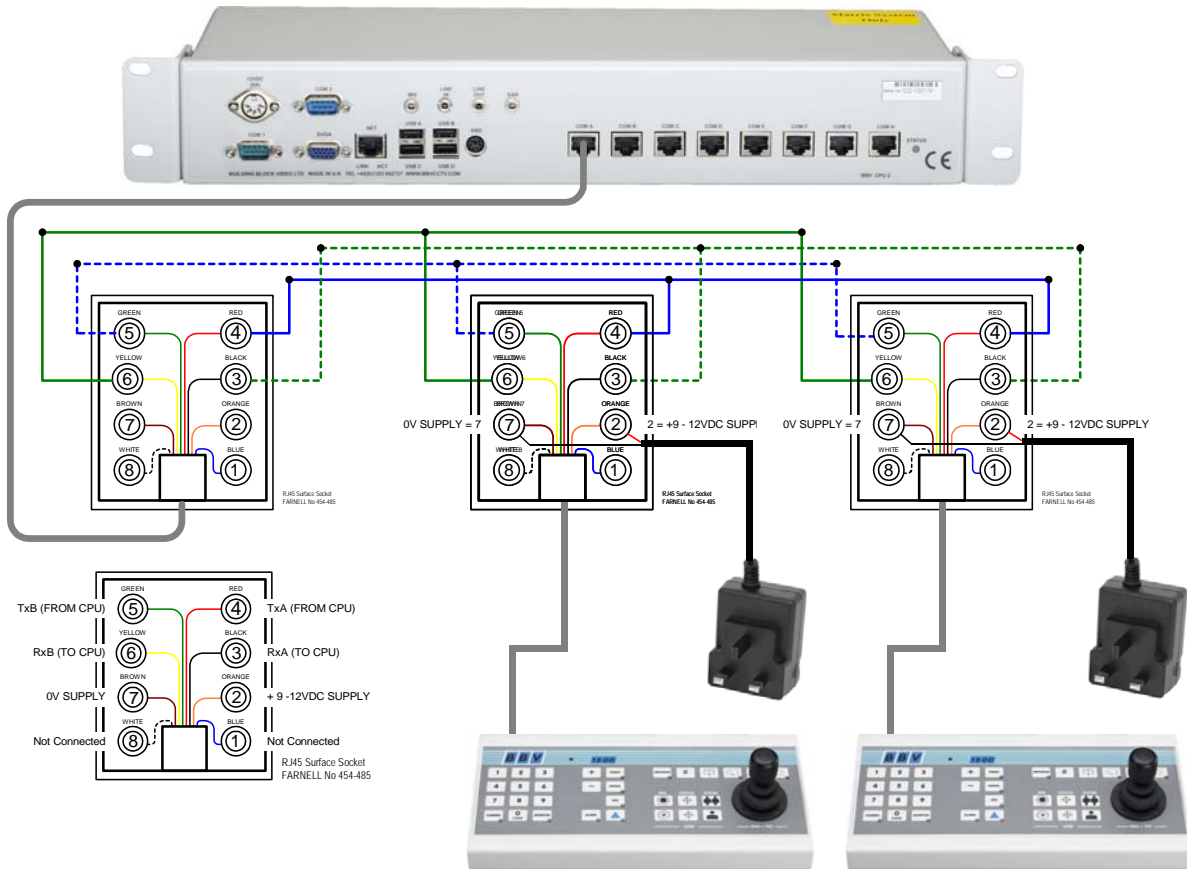
Switches 7 & 8 = Termination Only terminate the last Alarm Card on the RS422 bus.

Note.  
Com B & C are both used for Alarm cards. If you require the use of com C, the addresses are repeated as shown above and you will need to add 512 to the alarm input. (i.e. if you are using com C and it is address 0, the alarm range will be 513 to 825).

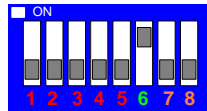
# Keyboard Connection Details

Figure 6 below shows a typical keyboard arrangement. The FBM is capable of supporting up to 8 individual keyboards.

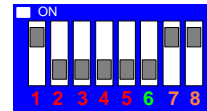
Figure 6



Keypad 1 Dip SW

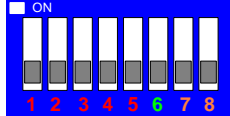


Keypad 2 Dip SW



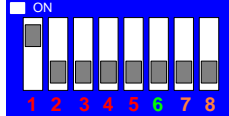
Keypad 1

Address 0



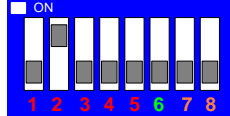
Keypad 2

Address 1



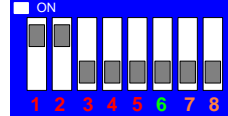
Keypad 3

Address 2



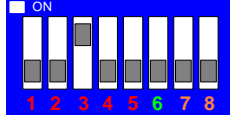
Keypad 4

Address 3



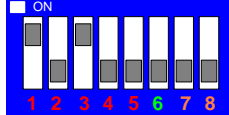
Keypad 5

Address 4



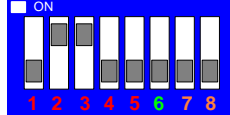
Keypad 6

Address 5



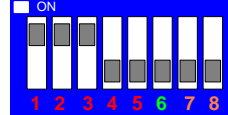
Keypad 7

Address 6

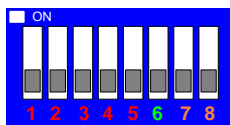


Keypad 8

Address 7



SW1 Assignment



1-5 Address

6 Keyboard Program & # Button Enable

7 + 8 RS422 Termination

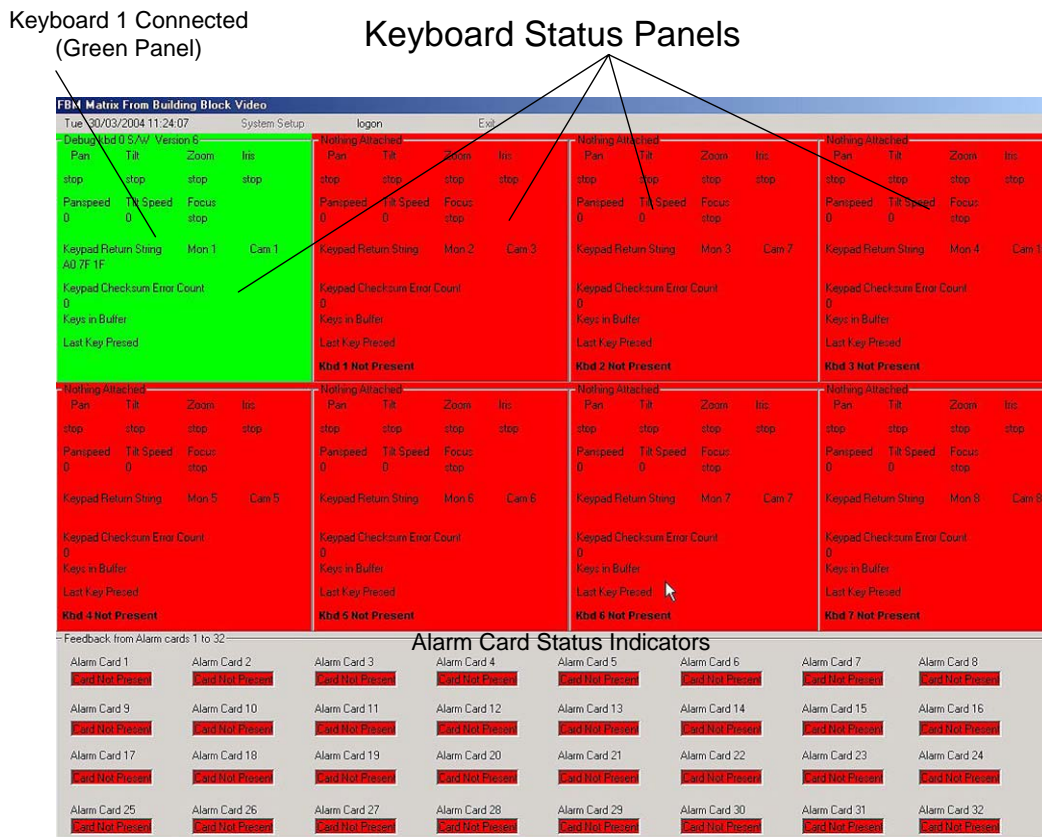
# The FBM Management Console

To simplify the configuration of the FBM, an SVGA monitor, keyboard and mouse is connected to the FBM CPU. This allows access to all of the system parameters which are required to configure the system. The following section outlines the configuration options.

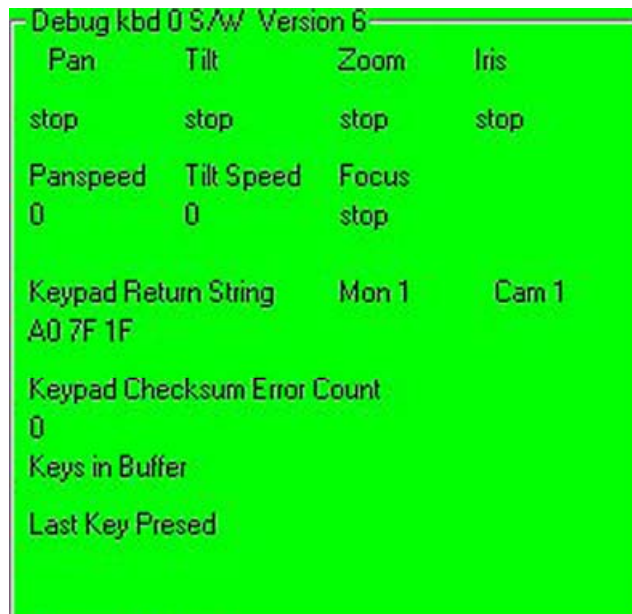
## Main Screen

The main screen of the CPU shows system status and simple diagnostic information. The screen is divided into 8 keyboard status panels and an alarm card status section at the bottom of the screen. If a keyboard is connected to the system, the corresponding status panel will be green. See figure 7 below.

Figure 7.



## Keyboard Status



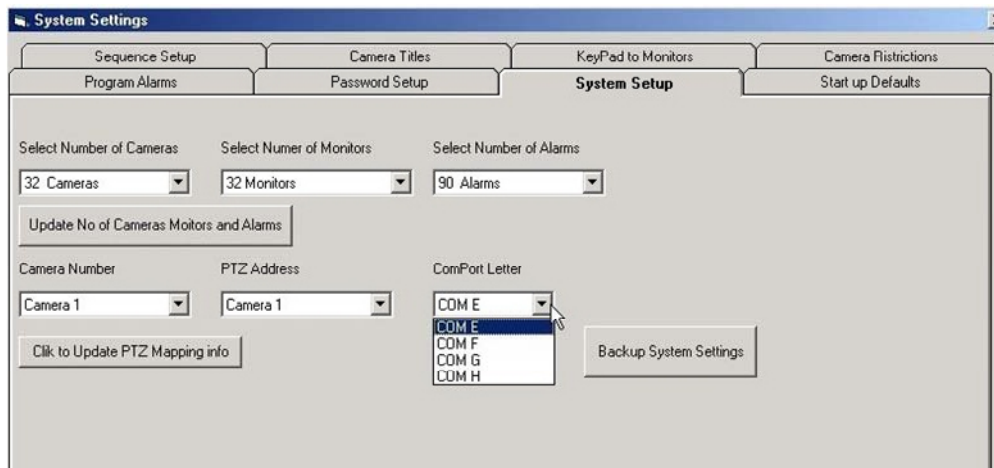
## Logging On

In order to configure the various options on the FBM, you must first log on to the system via the management console. To log on simply click the logon button at the top of the screen and enter 6 x today's date as a 4 digit number into the dialogue box which will appear on the screen.

## Configuring the system for operation

After logging onto the FBM, you will be able to access the system parameters via the system settings menu option. Firstly, select the 'System Setup' Tab. This allows the number of cameras, monitors, alarms and PTZ mapping to be set.

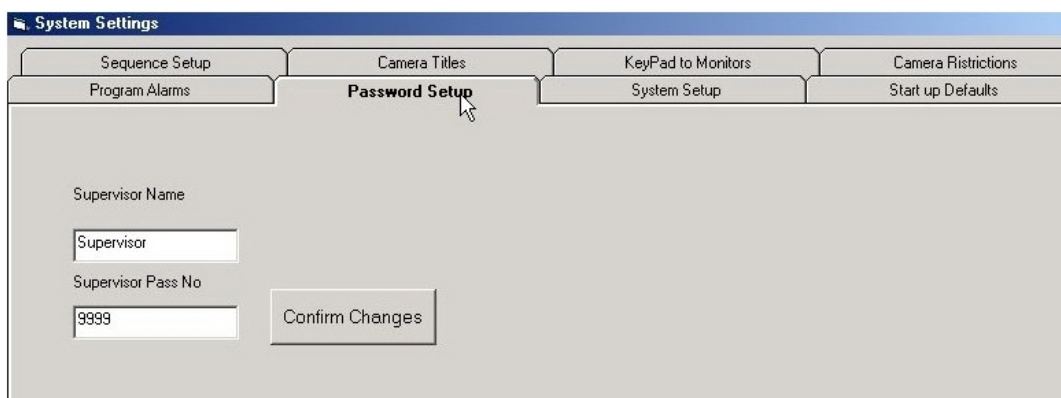
*(The PTZ mapping section allows a telemetry receiver with a different address to the camera number to be assigned. However, it is recommended where possible to match the PTZ address with the camera number.)*



The screenshot shows the 'System Settings' window with the 'System Setup' tab selected. The window has a title bar and a close button. Below the title bar are four tabs: 'Sequence Setup', 'Camera Titles', 'KeyPad to Monitors', and 'Camera Restrictions'. Underneath these are four sub-tabs: 'Program Alarms', 'Password Setup', 'System Setup', and 'Start up Defaults'. The 'System Setup' sub-tab is active. It contains three dropdown menus for 'Select Number of Cameras' (32 Cameras), 'Select Number of Monitors' (32 Monitors), and 'Select Number of Alarms' (90 Alarms). Below these is an 'Update No of Cameras Motors and Alarms' button. Further down are three more dropdown menus: 'Camera Number' (Camera 1), 'PTZ Address' (Camera 1), and 'ComPort Letter' (COM E). The 'ComPort Letter' dropdown is open, showing options COM E, COM F, COM G, and COM H. A 'Click to Update PTZ Mapping info' button is located below the PTZ Address dropdown. To the right of the ComPort Letter dropdown is a 'Backup System Settings' button.

## Changing the Password-Pin number

Select the Password Setup tab. Operator pass number can be added from here. The default pin is 9999. Press 'Confirm Changes' for the new PIN number to take effect.



The screenshot shows the 'System Settings' window with the 'Password Setup' tab selected. The window has a title bar and a close button. Below the title bar are four tabs: 'Sequence Setup', 'Camera Titles', 'KeyPad to Monitors', and 'Camera Restrictions'. Underneath these are four sub-tabs: 'Program Alarms', 'Password Setup', 'System Setup', and 'Start up Defaults'. The 'Password Setup' sub-tab is active. It contains a 'Supervisor Name' label above a text input field containing the word 'Supervisor'. Below that is a 'Supervisor Pass No' label above a text input field containing the number '9999'. To the right of the 'Supervisor Pass No' field is a 'Confirm Changes' button.

## Programming Alarms

Each alarm may have up to 4 actions these are set in the 'Program Alarms' tab. To assign an action to an alarm, select the alarm number, then in the action fields, select the required action. The message can also be assigned to an alarm, this is entered in the 'Alarm Information Text' field.

The screenshot shows the 'System Settings' window with the 'Program Alarms' tab selected. The 'Details For Alarm Number 1' section is visible. It includes an 'Alarm Number' dropdown menu, four 'Action' rows (Action 1 to Action 4), each with dropdowns for 'Camera', 'Preset', 'Monitor', and 'Key Pad'. Below these is the 'Alarm Information Text' field containing 'Help Point 1'. At the bottom, there are fields for 'STX (enter in decimal)', 'Alarm string', and 'ETX (enter in decimal)'. An 'Update Settings' button is located at the bottom right. Annotations with arrows point to the 'Alarm Number' dropdown, the 'Action 1' dropdowns, the 'Alarm Information Text' field, and the 'Update Settings' button.

Select Alarm Number

Select required action for the alarm

Alarm text to be displayed

Click to update

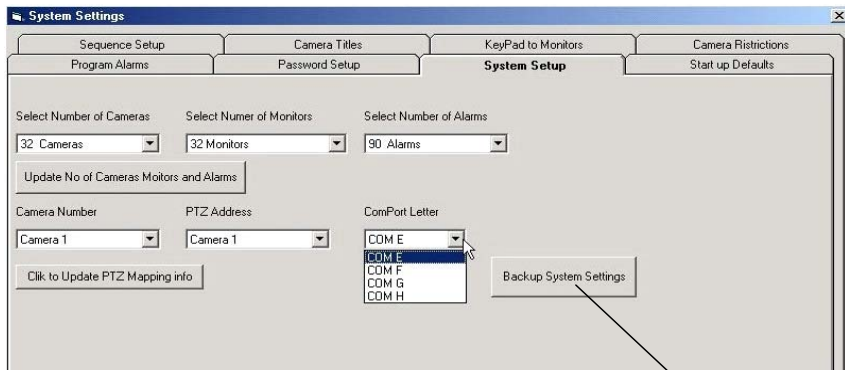
## Start up Defaults

This tab set the default state of the system after power up, i.e. which monitor is assigned to a particular keyboard, and which camera is assigned to a particular monitor. Click 'Update' after every alteration.

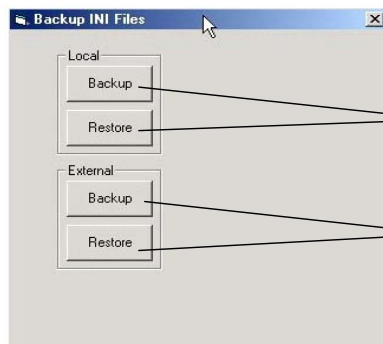
The screenshot shows the 'System Settings' window with the 'Start up Defaults' tab selected. It features two main sections. The first section is labeled 'KEY PAD' and contains a dropdown menu set to 'Keypad 0', a 'Start Monitor' dropdown menu set to 'Monitor 1', and an 'Update Mon to Keypad' button. The second section is labeled 'Monitor' and contains a dropdown menu set to 'Monitor 1', a 'Camera at Start up' dropdown menu set to 'Camera 1', and an 'Update Mon cam start' button.

## Backup and Restore System Settings

After the system has been correctly configured, it is recommended the configuration settings are backed up. The configuration data may be saved to either the CPU itself (Local) or to a removable USB memory stick (External). The backup and restore option screens are shown below



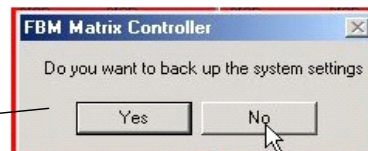
Click to open Backup/  
Restore Options



Click to backup or restore  
Configuration data to local  
CPU

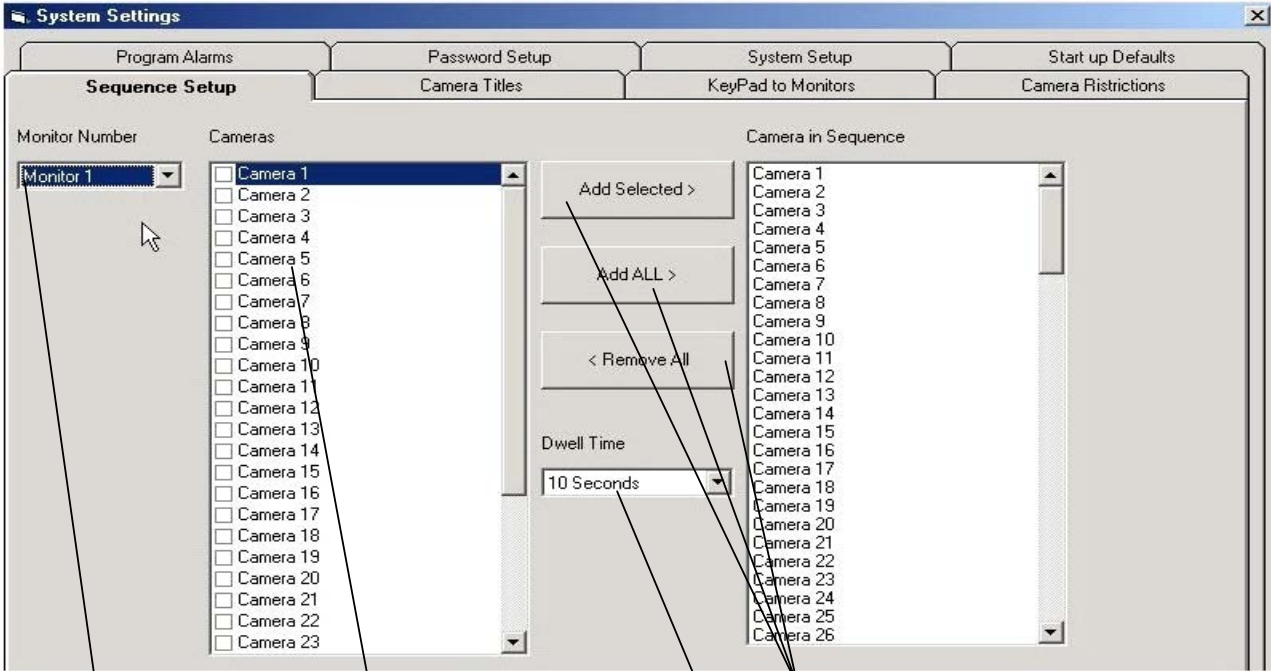
Click to backup or restore  
Configuration data to  
removable USB memory  
stick

Confirmation screen



## Sequence Setup

One sequence may be assigned to each monitor connected to the system, with up to 1024 steps in each sequence. Firstly open the 'Sequence Setup' tab and select the required monitor for the sequence. Next check the box to the left of the camera number required in the sequence, click add selected. If all of the cameras are required in the sequence, click the 'Add ALL' button. If an incorrect camera is selected in the sequence, all of the cameras within the sequence will have to be removed by clicking 'Remove ALL', and re-entered from the beginning. Finally set the required dwell time from the drop down box.



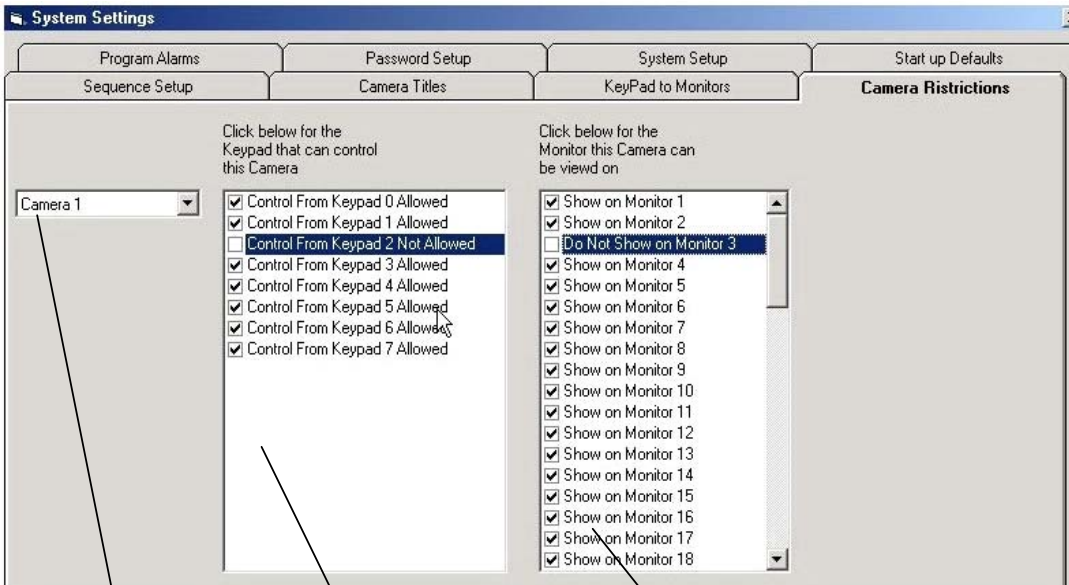
Select Monitor

Select Cameras to be included  
in sequence

Choose appropriate action  
Set Dwell Time

## Camera Restrictions

The camera restrictions option, allows camera viewing and control to be restricted to specified monitors and keyboards. By default all cameras can be controlled by all attached keyboards and viewed on any monitor.



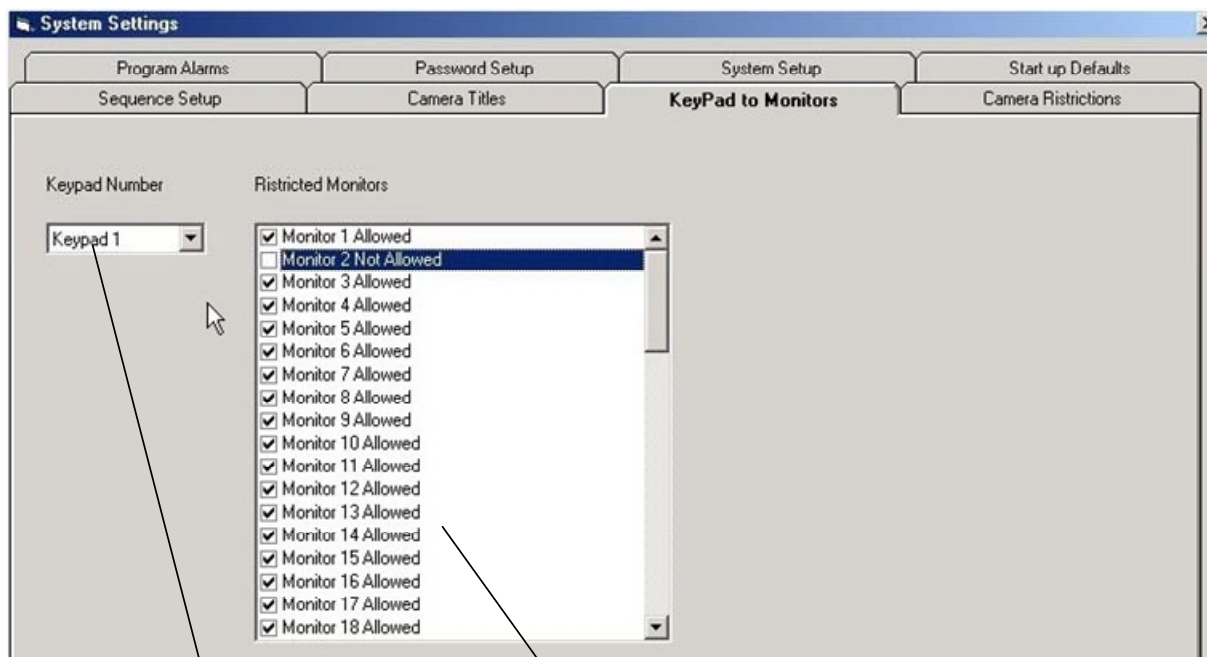
Select Camera

Select Keyboards

Select Monitors

## Monitor Restrictions

This option prevents the selected keyboards from switching cameras to specified monitors.

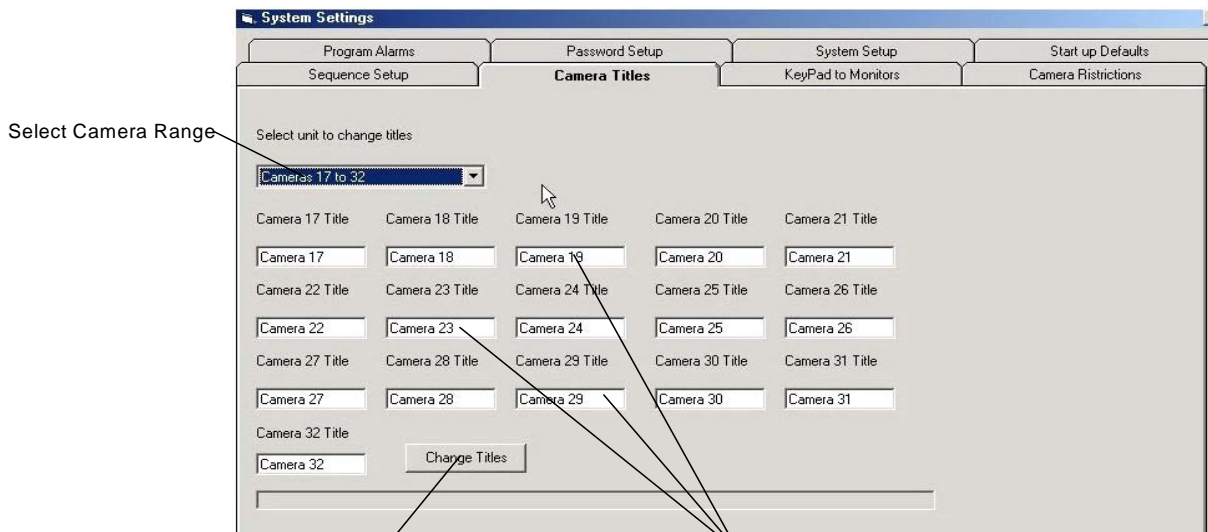


Select Keypad

Select Monitors

## Camera Titles

This option allows the individual title of the camera to be edited. The text will be displayed on the monitor along with the camera image. The maximum number of characters allowed is 15.



Select Camera Range

Edit camera titles

Click to update

## NOTES



## Other BBV products

Product	Description
<b>TX300</b>	Single camera desktop telemetry transmitter with BBV up-the-coax & 20mA telemetry, Pan/Tilt/Lens & Lights
<b>TX400</b>	As TX300 inc Wash, Wipe, Autopan, 8 presets, preset patrol.
<b>TX400DC</b>	As TX400 including joystick for proportional Pan/Tilt control.
<b>TX1000 MK2</b>	8 or 16 camera, 2 monitor telemetry transmitter. Up to 2 keyboards. BBV up-the-coax and RS422 standard with options for alarm inputs and 20mA telemetry.
<b>TX1500</b>	Mid size matrix 16 – 96 camera, 8 monitor. Up to 4 control positions (keyboard & remote control) options for alarms, remote control, BBV up-the-coax and RS485 telemetry.
<b>FBM range</b>	Large size matrix. Configurable up to 4096 cameras and 64 monitor outputs. Up to 16 control positions (keyboard & remote control) options for alarms, remote control RS485/RS422 telemetry with various options. Please call to discuss requirements.
<b>RX100</b>	Dome Interface with options to drive a large library of dome cameras. BBV up-the-coax and 20mA telemetry.
<b>RX100/BAX</b>	Dome Interface with options to drive a large library of dome cameras. BAXALL up-the-coax telemetry.
<b>RX200</b>	AC receiver for Pan only heads or static cameras, Wash/Wipe/Lights. BBV up-the-coax and 20mA telemetry.
<b>RX300</b>	AC receiver for Pan/Tilt/Zoom/Focus/Iris Override and 1 Auxiliary output. BBV up-the-coax and 20mA telemetry.
<b>RX400P</b>	AC full function receiver. PTZFI 4 Auxiliary outputs, 16 presets. BBV up-the-coax and 20mA telemetry.
<b>RX45X (AC) RX55X (DC)</b>  Multi RS485 protocol and BBV up-the-coax telemetry receivers	Multiple RS485/422 and BBV up-the-coax controllable AC and DC receivers. These receivers are controlled from an expanding range of serial protocols as listed below. 110/230Vac supply. PTZFI, 64 presets, preset patrol, 8 local alarm inputs, 12V 500mA supply output. OSD for remote diagnostics. 3 Aux. outputs RX55X or 4 Aux. outputs RX45X. Optional Privacy board. BBV RS485, COAX & 20mA, BAXALL COAX, DENNARD RS485, MOLYNX PELCO P/D RS485, VCL/HONEYWELL RS485, PHILIPS/BOSCH RS485 (OPTIONAL BI-PHASE INPUT), SENSORMATIC/AD RS422 VICON RS422 CIRRUS AUDIO MONITORING
<b>CTI/16</b>	Multi-protocol serial converter that gives up-the-coax control to 16 cameras. BBV RS422, Dennard RS485, Pelco P, Pelco D, Philips/Bosch RS485/232, VCL RS485, Sensormatic RS422, Molyntx, Vicon
<b>STARCARD</b> STARCARD/CONVERTER	8 * RS485 output, 2 wire simplex RS422, 4 wire full-duplex RS422, 2 wire half-duplex RS485. Optional STARCARD/CONVERTER offering protocol conversion to drive an increasing range of 3 <sup>rd</sup> party protocols.
<b>ACCESSORIES</b>	CTI/16 16 camera, RS422 to up-the-coax converter TxLD (bidirectional RS422-RS232 converter) 98005 (bidirectional 20mA-RS232 converter) AD RS422 (American Dynamics) protocol converters