



Vi-R4000 Series Net Recorder User Manual

Products covered by this manual

Vi-R4005, Vi-R4105



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1 Getting Started

1.1 Monitors

The DVR can provide the follow output screens:

- **Main** This is used for full-screen or multi-screen live, play and configuration
- **Aux** This is used for full-screen or multi-screen live and play
- **Spot** Spot monitors are used for live full-screen viewing

These output screens are displayed on the monitors with a priority depending on what types of monitor are connected:

HDMI	VGA	BNC x4	Main	Aux	Spot
-	Connected	Optional	VGA	BNC	BNC x3
Connected	-	Optional	HDMI	BNC	BNC x3
Connected	Connected	Optional	HDMI	BNC	BNC x4
-	-	Yes	BNC	n/a	BNC x3

Note that the HDMI and VGA monitors VGA Monitor must be connected prior to power-up so that they are detected and given the correct usage.

1.1.1 VGA Monitor

A VGA monitor is recommended for most application for ease of interface and to benefit from high resolution images. Supported resolutions are: 1920×1080, 1600×1200, 1280×1024, 1280×720 and 1024×768. The Vi-R4000 series allows units to be cascaded and to share a common VGA monitor (and mouse). Refer to section 3.5.

1.1.2 Low Resolution VGA Monitor

If you are using a VGA monitor with a resolution lower than the factory default (1280×1024), there is a macro command to lower the resolution to 1024×768 so that the menu and images will be visible on the monitor: Press and hold **LIVE key and enter 9001, release LIVE key. Press and hold LIVE key and enter 8000, release LIVE key.** Refer to section 3.5 for details if interface commands.

1.1.3 HDMI / DVI Monitor

A HDMI or DVI Monitor may also be connected and is especially useful when used in conjunction with a VGA monitor to provide dual independent high-resolution displays. Supported resolutions are: 1920×1080, 1600×1200, 1280×1024, 1280×720 and 1024×768. Note that a HDMI to DVI cable is required to use a monitor with a DVI port.

1.1.4 BNC Monitors

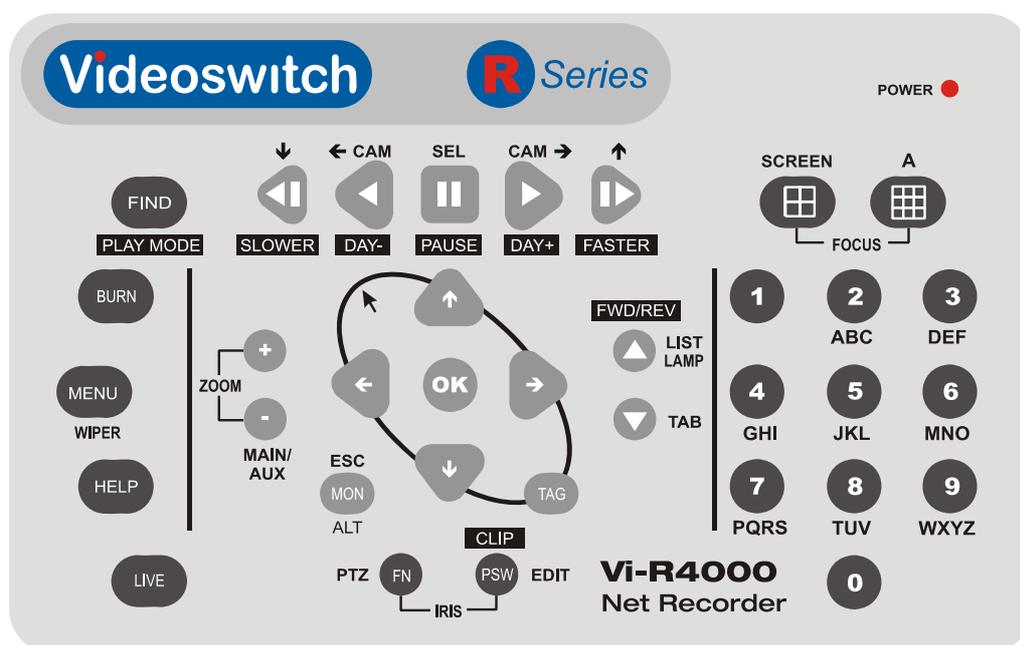
Four BNC monitor outputs are provided which may be used for Main, Aux and Spot displays.

1.2 Control

The R-series Recorders offer various methods of control. A single method or a mixture of methods can be employed according to personal preference:

- Control by keys in keyboard mode - arrow keys step from field to field in the menus.
- Control by external mouse – a mouse moves pointer smoothly around the screen.
- Control by mouse emulator – the Up/Down/Left/Right, **OK** and **TAG** keys perform the functions of a mouse, moving the pointer smoothly around the screen. Turn mouse emulator ON or OFF by pressing **ESC** and **TAG** together.

1.2.1 Keyboard Control



Key	Live or Play Modes	Menu/Password Modes
1, 2, 3, 4, 5, 6, 7, 8, 9, 0	0 - 9 Select full screen cameras. When entering multiple digits, enter them within ½ second of each other.	Press EDIT key until “123” appear in edit box. Hold ESC down while using 0-9 for data entry
Up, Down, Left, Right	Select cameras 1-4 or 5-8 in quad mode, or 1-9 or 10-16 in Multi-screen x9 mode	Move from field to field or move mouse pointer around screen in mouse emulator mode. Hold ESC to move faster.
OK	Start/stop auto sequence	Select menu option Press and hold ESC then press OK key for double click in mouse emulator mode.

FN/PTZ	Press to enter PTZ dome mode	
EDIT		Enter edit mode when a numeric entry is required in for password or menu. Also used to delete character when in edit mode.
A		Select numeric, alphabetic or symbols
FWD/REV/LIST/LAMP	Control LAMP in PTZ mode. Set Play in Forward or Reverse	
TAB		Step through tabbed pages
SCREEN	Step through multi-screens.	
FIND/PLAY MODE	Enter play mode	
BURN	Enter Export Mode	
MENU	Controls wiper in PTZ mode. Enter MENU mode.	
HELP	View firmware revision, go to system maintenance menu.	
LIVE	Return to LIVE mode from any other mode. Shift key for programming functions.	
MON/ESC/ALT	Shift key for alternate functions.	Escape one level in menu.
TAG	Right mouse click in mouse emulator mode. To turn mouse emulator on or off: press and hold ESC key and also press the TAG key When mouse emulator is ON the arrow pointer appears on screen. Note that pointer will also be present if a mouse is connected.	
SLOWER	Makes replay speed slower	
DAY-	Steps back to prior day. Hold ESC while pressing to step back by 10 minutes (programmable)	
PAUSE/SELECT	Switch between play and pause	Select menu items or acknowledge pop-up boxes
DAY+	Steps forward next day. Hold ESC while pressing to step back by 10 minutes (programmable)	
FASTER	Makes replay speed faster	

Note: some key functions require you to log on. If so, log on and press the key again.

1.2.2 Mouse Control

The DVR can be fully controlled by a mouse and this is recommended especially for ease of system configuration.

- Move mouse to move pointer around screen
- Right click to bring up menu
- Left click to select items pointed to by the on-screen mouse pointer

Note: The mouse would normally plug into the **USB MOUSE** port on the rear of the DVR. If you enable the mouse emulator (i.e. use keys to simulate mouse), the mouse will be disabled.

1.2.3 Mouse Emulator Control

The mouse emulator provides all the control of a mouse but using the front panel keys. The mouse emulator function may also be used via a remote keyboard,

- Press **Left, Right, Up, Down** keys to move pointer around screen
- Press **TAG** key to bring up menu when in live mode.
- Press **OK** key to select items pointed to by the on-screen mouse pointer.

To enable/disable the mouse emulator, press **ESC** key and at same time, press the **TAG** key.

1.2.4 External Keyboards

The external keyboard ports support Vi-K1 and Vi-K2 series keyboards and allow remote control of the DVR. The DVR sends video over CAT5 to the BNC output connectors on each keyboard for connection to a monitor. When DVRs are cascaded, the keyboard monitor outputs can display images from any of the DVRs.

1.3 Cascading

Cascading is a feature that allows multiple recorders to be linked together.

- Cameras can be called up simply by entering 1-256 on one or more connected keyboards (e.g. Vi-K1 or Vi-K2).
- All functions including live view, playback and menus from any unit can be accessed via a single keyboard
- A single VGA or BNC main monitor can be used
- A single BNC spot monitor can be used on each of the three spot outputs
- A single mouse can be used to control all units.

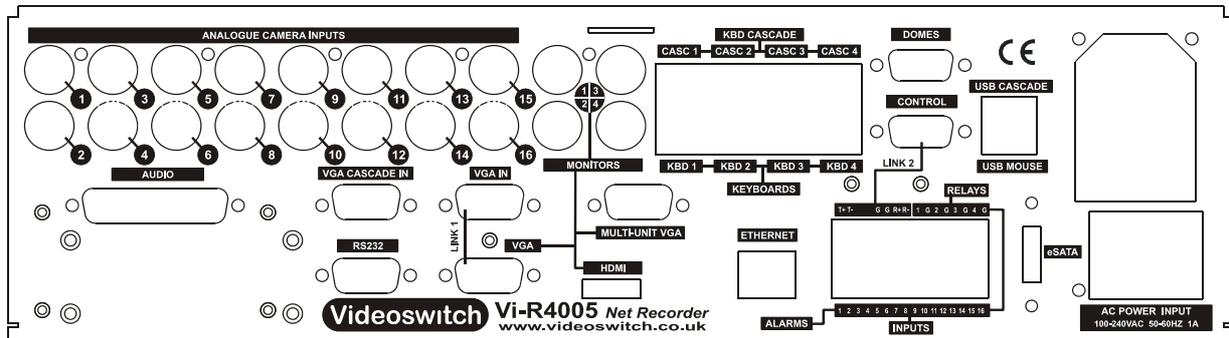
2 Installation

2.1 Preventive and Cautionary Tips

Before connecting and operating your device, please be advised of the following tips:

- Ensure unit is installed in a well-ventilated, dust-free environment.
- Unit is designed for indoor use only.
- Keep all liquids away from the device.
- Ensure environmental conditions meet factory specifications.
- Ensure unit is properly secured to a rack or shelf. Major shocks or jolts to the unit as a result of dropping it may cause damage to the sensitive electronics within the unit.
- Use the device in conjunction with an UPS if possible.
- Power down the unit before connecting and disconnecting accessories and peripherals.
- A factory recommended HDD should be used for this device.
- Improper use or replacement of the battery may result in hazard of explosion. Replace with the same or equivalent type only. Dispose of used batteries according to the instructions provided by the battery manufacturer.

2.2 Rear Panel Connections



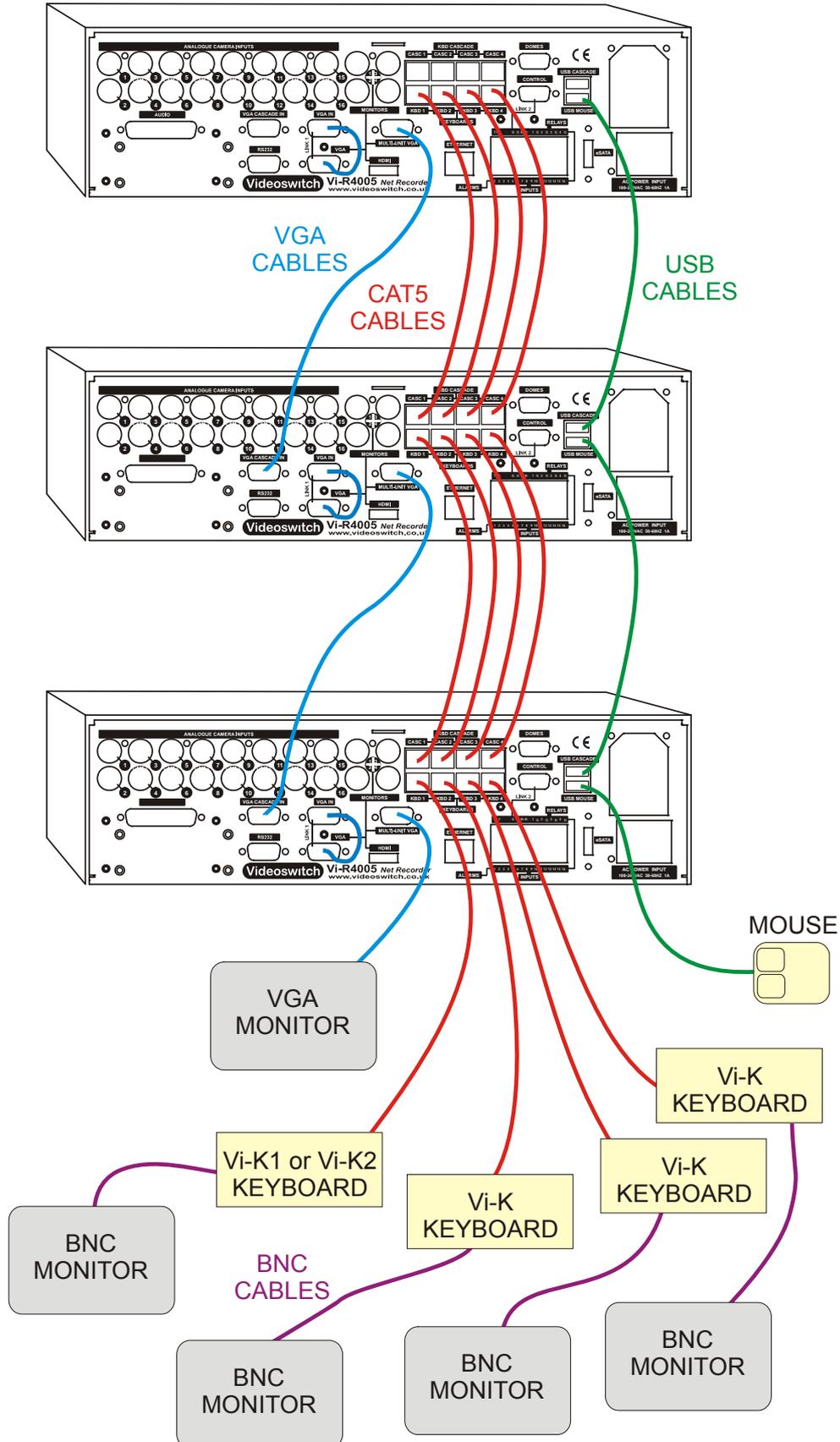
2.2.1 Essential Connections

- Connect Cameras to camera inputs 1-8
- Connect VGA monitor to VGA port and/or connect a BNC monitor to MONITOR (CVBS) port. The two monitors can display different full screen and multi-screens. Note that the VGA monitor must be connected prior to switching on the DVR as it is auto-detected on boot-up unless specified as main monitor in the menu.
- Connect mains supply to IEC mains input connector on using IEC cable (included).

2.2.2 Optional Connections

- Connect an HDMI monitor or a DVI monitor (via adaptor cable) to the HDMI port. This will be the main monitor. Note that the HDMI/DVI monitor must be connected prior to switching on the DVR as it is auto-detected on boot-up.
- Connect mouse to the rear MOUSE port. Note that while the mouse emulator is enabled, the mouse is disabled
- Connect Ethernet network to ETHERNET port using CAT5 cable (included)
- Connect Videoswitch remote keyboards to KBD1, KBD2, KBD3, KBD4 ports (Vi-K1 or Vi-K2 range). A BNC video monitor may be connected to the BNC connector on the keyboards.
- Connect dome(s) to outputs 1, 2, 3 and 4 of RS485 Dome port
- Connect alarm device and alarm sensor contacts to ALARMS port
- Connect a USB memory stick to the USB port on the front of the unit (beside the DVD drive) for exporting video, importing/exporting configuration and for importing firmware updates.
- Connect line level audio input and output equipment. 16 channels of audio are supported. An audio breakout module is available that provides RCA phono connectors for all channels.
- Cascading – see next section

2.2.3 Connecting for Cascade Operation



2.3 Replacing a Hard Drive

If a hard drive needs replacing, the DVR will product an audible warning.

The status of all drives fitted can be checked in this menu:

Menu>HDD>General Status for each drive should be: **Normal**

If you need to replace a drive:

- Turn off power to the DVR
- Open the door of drive bay using the key provided
- Pull out the drive plate with the drive to be replaced (Drive 1: bottom, Drive 2: top)
- Replace the drive on the metal plate using a small screwdriver
- Push in the drive plate with the new drive back into the bay
- Close the door and lock it
- Power up the DVR and wait until boot has completed. The audible alarm will be sounding.
- Go into this menu: **Menu>HDD>General**
- Tick the box relating to new drive
- Click on **Init** to format the drive
- Wait until complete.

3 Commissioning

3.1 Password Access

If password protection is enabled, a password will need to be selected to gain access to protected functions such as the menu. When the password box appears, enter the password using one of these methods:

3.1.1 Keyboard Mode

- If you want to select a different User Name press arrow keys to highlight User Name field, press OK, press down arrow, press OK again.
- Press arrow keys to select Password field
- Press **EDIT** key to enter edit mode
- Enter the password using **0-9** keys
- Press **OK**
- Press arrow keys to select **OK** on screen
- Press **OK**

3.1.2 Mouse

- Click on user name if you wish to change it and select another use
- Click on password field, enter password numbers and click on **ENTER**.
- Click on **OK**

3.1.3 Mouse Emulator Mode

This is the same as using a mouse, except the up, down, left, right keys are used to move the mouse pointer and the **OK** keys act s as a left mouse click.

- Click on user name if you wish to change it and select another use
- Click on password field, enter password numbers and press **OK** while on **ENTER**.
- Click on **OK**

3.1.4 Default Passwords

The DVR is shipped with default users and passwords pre-configured as shown in this table (note Username is case sensitive). Access rights may be changed and other users may be added when logged in as **admin**. Default settings may be restored in **Menu->Maintenance->Default**

Username	Default Password	Access Rights
admin	12345	Access to everything for system configuration
User1	111111	Full local and remote access and configuration
User2	222222	Local and remote viewing, playback and export.
User3	333333	Local viewing, playback and export
User4	444444	Local manual operation of cameras

3.2 Default Configuration

3.2.1 Factory Configuration

The DVR is delivered with the system configuration already defaulted.

These settings ensure that it will record and play cameras once correctly connected up. The configuration settings may be adjusted in the menu to suit the particular installation.

To restore the factory defaults, use this menu page:

Menu->maintenance->Default

3.2.2 Import/Export Configuration

To import or export a configuration for backup or use on another DVR, go to this menu:

Menu >System Maintenance > Import/Export

You can now import or export the configuration from/to a USB stick or CD/DVD.

Note: The configuration file only works with the same version of firmware. If you upgrade the DVR firmware you will need to export the configuration again if you wish to retain a copy of the settings for future use.

3.2.3 Interface Configuration

The DVR is delivered with the Interface configuration already defaulted.

There are a number of settings relating to the cameras and multi-unit operation that are set by means of simple 4 digit codes. To prevent accidental operation, the LIVE key must be pressed and held while these codes are entered. Further protection is provided by a locking facility. The unlock command must be used to unlock access to the other functions.

The interface settings can be displayed on the screen by pressing the **HELP** key or by selecting the menu page:

Menu->configuration>interface settings

3.2.3.1 Unlock Interface Settings

The interface system is locked on power up. It must be unlocked before any other settings can be changed. When unlocked, the power LED on the front panel will be OFF.

Press and hold LIVE key, enter 9001, release LIVE key

3.2.3.2 Lock Interface Settings

The interface will lock when the LIVE key is pressed on its own..

3.2.3.3 Display Interface Firmware Revision

The revision of the Interface Controller can be displayed on the power LED by entering this command:

Press and hold LIVE key, enter 9002, release LIVE key

The LED stays on for a few seconds then displays three groups of flashes, encoding a 3-digit revision number. The sequence is repeated until cancelled.

3.2.3.4 Default all Interface Settings

All Interface setting scan be defaulted by issuing this command:

Press and hold LIVE key, enter 9999, release LIVE key

3.2.3.5 Summary of commands

For all commands, press and hold the LIVE key while entering the four command digits, then release the LIVE key.

Command Description	Command code	Comments
Lock access to settings	9000	Front panel power LED goes ON
Unlock access to settings	9001	Front panel power LED goes OFF
Display interface firmware revision on LED	9002	Front panel power LED flashes long flash then 3-digit firmware revision*
Default all settings	9999	Set all interface settings to default values
Turn 75 Ohm camera termination ON	11XX	XX is camera 01 to 16, or 00 for all cameras
Turn 75 Ohm camera termination OFF	12XX	XX is camera 01 to 16, or 00 for all cameras
Set unit address	13XX	XX is unit address 01 to 16
Set unit range	14XX	XX is range of unit address 1 or 2
Set monitor 2 to covert	22XX	XX is camera 01 to 16, or 00 for all cameras.
Set monitor 3 to covert	23XX	XX is camera 01 to 16, or 00 for all cameras.
Set monitor 4 to covert	24XX	XX is camera 01 to 16, or 00 for all cameras.
Set monitor 2 to normal	32XX	XX is camera 01 to 16, or 00 for all cameras.
Set monitor 3 to normal	33XX	XX is camera 01 to 16, or 00 for all cameras.
Set monitor 4 to normal	34XX	XX is camera 01 to 16, or 00 for all cameras.
Allocate up-the-coax PTZ cameras	41XX	XX is camera 01 to 16, or 00 for all cameras.
Allocate PTZ cameras to RS485 ouputs 1 & 2	42XX	XX is camera 01 to 16, or 00 for all cameras.
Allocate PTZ cameras to RS485 ouputs 3 & 4	43XX	XX is camera 01 to 16, or 00 for all cameras.
Set protocol for up-the-coax	44XX	Not used – always BBV
Set protocol for RS485 ouputs 1 & 2	45XX	XX is protocol 00 – 99 (see section 3.3)
Set protocol for RS485 ouputs 3 & 4	46XX	XX is protocol 00 – 99 (see section 3.3)
Protocol convert from PelcoD 9600 set in main menu to interface settings	47XX	00-off, 01-on

Dome address offset	48XX	XX is dome address offset (default = 0)
Coax telemetry timeout	49XX	XX = 00 to always transmit, else 01 to 99 seconds (default = 10 seconds)
Auto sequencing dwell time for monitor 1	51XX	XX is dwell time in seconds, 01 to 99, or 00 for default of 5 seconds
Auto sequencing dwell time for monitor 2	52XX	XX is dwell time in seconds, 01 to 99, or 00 for default of 5 seconds
Auto sequencing dwell time for monitor 3	53XX	XX is dwell time in seconds, 01 to 99, or 00 for default of 5 seconds
Auto sequencing dwell time for monitor 4	54XX	XX is dwell time in seconds, 01 to 99, or 00 for default of 5 seconds
Select unit for programming multi-unit auto-sequence	60XX	XX is unit number 01-16
Enable cameras to auto-sequence on monitor 1 on selected unit	61XX	XX is camera 01 to 16, or 00 for all cameras.
Enable cameras to auto-sequence on monitor 2 on selected unit	62XX	XX is camera 01 to 16, or 00 for all cameras.
Enable cameras to auto-sequence on monitor 3 on selected unit	63XX	XX is camera 01 to 16, or 00 for all cameras.
Enable cameras to auto-sequence on monitor 4 on selected unit	64XX	XX is camera 01 to 16, or 00 for all cameras.
Disable all cameras to auto-sequence on all units	7000	
Disable cameras to auto-sequence on monitor 1 on selected unit	71XX	XX is camera 01 to 16, or 00 for all cameras.
Disable cameras to auto-sequence on monitor 2 on selected unit	72XX	XX is camera 01 to 16, or 00 for all cameras.
Disable cameras to auto-sequence on monitor 3 on selected unit	73XX	XX is camera 01 to 16, or 00 for all cameras.
Disable cameras to auto-sequence on monitor 4 on selected unit	74XX	XX is camera 01 to 16, or 00 for all cameras.
Command macro	80XX	Xx=00: Decrease VGA resolution by 2 steps

3.3 RS485 Protocols

Protocol	Protocol Number
JVC	02
MOLYNX	03
DENNARD	04
VCL	05
SANYO	06
FORWARD VISION (VCL)	09
MERCER	10
LILIN MLP1	11
PELCO-D 2400	14
VIDEOSWITCH VXP4	15
VCL for SPEED DOME	16
FORWARD VISION	17
BBV RS485	18
PELCO-D2400 for VISTA	19
LILIN MLP2	20
PELCO-D 9600	21
PELCO-P 4800	22
PELCO-P 9600	23

3.4 Record Settings

If you use the default configuration supplied (which may be reloaded at any time from a USB memory stick), recording will be enabled for all cameras at Medium quality at a default frame rate.

To adjust record setting to suit your application, enter the Record menu by pressing MENU key and selecting the **Record** menu. The most important things that need to be set are outlined in the following sections.

3.4.1 Schedule

For most applications, make sure the schedule is enabled for all connected cameras and for all times of each day. This is indicated by all blocks being BLUE. If you need to set the whole schedule:

- Select Enable Schedule
- Click **Edit**
- Select **All Day**
- Select **Copy**
- Select **All**
- Click **OK**
- Click on **Apply**
- Click on **OK**
- Click on **Apply**

Note: If some of the 16 camera inputs are not used, make sure the schedule for those inputs are disabled so disc space is not wasted.

3.4.2 Resolution

Resolution determines the number pixels recorded. For analogue (BNC) cameras the recommended setting to use is either 2CIF or 4CIF.

Resolution	Usage
704x288 (2CIF)	Recommended when smaller capacity hard drives are fitted (2Tbytes or less)
704x576 (4CIF)	Recommended for best quality when larger capacity hard drives are fitted (4Tbytes or more) or if event triggered recording is used.

Set the resolution for both **Normal** and **Event** recording. Event recording applies when Activity detection or external alarm inputs are used.

Note: 4CIF resolution is equivalent to D1 resolution (720x576). Higher resolutions are available for IP cameras.

3.4.3 Quality

Medium quality is appropriate for most applications but this can be adjusted to achieve required playback quality. Setting this higher will use disc space up more quickly.

When you change the quality, make sure you also change the **Max Bitrate (Kbps)** accordingly.

3.4.4 Frame Rate

The frame rate has the next greatest impact on disc space usage. Refer to the tables in section **Error! Reference source not found.** to choose highest record rates whilst achieving sufficient retention of recordings. Set this for **Normal** and **Event** recording. Typically, normal recording would have a lower frame rate to conserve disc space and achieve the required retention period whereas activity recording would use the maximum rate to maximise evidence during periods of particular interest.

When you change the quality, make sure you also change the **Max Bitrate (Kbps)** accordingly. It should be within the range indicated by **Max Bitrate Range Recommended** which is displayed on the screen.

3.4.5 Max Bitrate

This should be set once the Resolution, Quality and Frame Rate have been selected. Set Max Bitrate within the range indicated by **Max Bitrate Range Recommended**, somewhere near the higher figure is recommended.

Note:

If Max Bitrate Mode is set to **General** you can chose Max Bitrate from a list of options

If Max Bitrate Mode is set to **Customer** you can enter any value for Max Bitrate.

Recommended max bit-rates are shown in this table:

Frames per second	2CIF						4CIF					
	Lowest	Lower	Low	Medium	Higher	Highest	Lowest	Lower	Low	Medium	Higher	Highest
1	147	221	258	295	370	518	295	370	445	518	592	890
2	167	252	295	336	421	590	336	421	506	590	675	1012
4	208	313	366	418	523	733	418	523	626	733	838	1258
6	250	375	438	500	626	877	500	626	751	877	1002	1503
8	291	436	510	582	728	1020	582	728	875	1020	1166	1750
10	331	497	581	663	831	1163	663	831	997	1163	1330	1996
12	372	558	653	746	933	1307	746	933	1120	1307	1493	2241
15	433	651	761	868	1087	1522	868	1087	1305	1522	1740	2610
16	455	682	796	910	1138	1593	910	1138	1366	1593	1821	2732
18	495	743	868	991	1241	1737	991	1241	1488	1737	1985	2978
20	536	803	940	1073	1343	1880	1073	1343	1612	1880	2148	3225
22	577	866	1011	1155	1446	2023	1155	1446	1735	2023	2312	3470
25	640	960	1120	1280	1600	2240	1280	1600	1920	2240	2560	3840

3.4.6 Copy settings to all other Cameras

Once you have set everything for one camera, you can copy its settings to all other cameras:

- Click on Copy
- Click on Analog to select all cameras
- Click on OK
- Click on Apply

3.4.7 Retention Period

The displayed retention period is very much the worst case and assumes the maximum bit-rate on all cameras at all times and also assumes that event recording is occurring all the time.

3.4.8 Retention Period Tables

The time period for which video recording is retained for before being over-written depends on these factors:

- Hard drive capacity (1 to 8 Tbyte)
- Frame rate (1 to 25)
- Quality setting (Highest, higher, medium, low, lower, lowest)
- Resolution (4CIF, 2CIF)
- Number of cameras (1 to 16)
- Complexity and movement in each camera view

The tables below give a guide to how many **days** retention to expect, assuming recommended max bit rates, continuous recording and the same settings on all cameras. The exact retention period achieved may differ according to how complex the images are that the cameras are looking at and how much movement there is.

Depending on how many cameras you have and what hard drive capacity is available, you can see the trade off between resolution, quality, frame-rate and retention period.

3.4.8.1 16 Camera Systems

3.4.8.1.1 Retention Period for 1Tbyte, 16 cameras

Frames per second per camera	2CIF						4CIF					
	Lowest	Lower	Low	Medium	Higher	Highest	Lowest	Lower	Low	Medium	Higher	Highest
1	42	28	24	21	17	12	21	17	14	12	10	7
2	37	25	21	18	15	11	18	15	12	11	9	6
4	30	20	17	15	12	8	15	12	10	8	7	5
6	25	17	14	12	10	7	12	10	8	7	6	4
8	21	14	12	11	9	6	11	9	7	6	5	4
10	19	13	11	9	7	5	9	7	6	5	5	3
12	17	11	10	8	7	5	8	7	6	5	4	3
15	14	10	8	7	6	4	7	6	5	4	4	2
16	14	9	8	7	5	4	7	5	5	4	3	2
18	13	8	7	6	5	4	6	5	4	4	3	2
20	12	8	7	6	5	3	6	5	4	3	3	2
22	11	7	6	5	4	3	5	4	4	3	3	2
25	10	6	6	5	4	3	5	4	3	3	2	2

3.4.8.1.2 Retention Period for 2Tbyte, 16 cameras

Frames per second per camera	2CIF						4CIF					
	Lowest	Lower	Low	Medium	Higher	Highest	Lowest	Lower	Low	Medium	Higher	Highest
1	85	56	48	42	34	24	42	34	28	24	21	14
2	74	49	42	37	30	21	37	30	25	21	18	12
4	60	40	34	30	24	17	30	24	20	17	15	10
6	50	33	28	25	20	14	25	20	17	14	12	8
8	43	29	24	21	17	12	21	17	14	12	11	7
10	38	25	21	19	15	11	19	15	12	11	9	6
12	33	22	19	17	13	10	17	13	11	10	8	6
15	29	19	16	14	11	8	14	11	10	8	7	5
16	27	18	16	14	11	8	14	11	9	8	7	5
18	25	17	14	13	10	7	13	10	8	7	6	4
20	23	15	13	12	9	7	12	9	8	7	6	4
22	22	14	12	11	9	6	11	9	7	6	5	4
25	19	13	11	10	8	6	10	8	6	6	5	3

3.4.8.1.3 Retention Period for 4Tbyte, 16 cameras

Frames per second per camera	2CIF						4CIF					
	Lowest	Lower	Low	Medium	Higher	Highest	Lowest	Lower	Low	Medium	Higher	Highest
1	169	112	96	84	67	48	84	67	56	48	42	28
2	149	99	84	74	59	42	74	59	49	42	37	25
4	119	79	68	59	48	34	59	48	40	34	30	20
6	99	66	57	50	40	28	50	40	33	28	25	17
8	85	57	49	43	34	24	43	34	28	24	21	14
10	75	50	43	37	30	21	37	30	25	21	19	12
12	67	45	38	33	27	19	33	27	22	19	17	11
15	57	38	33	29	23	16	29	23	19	16	14	10
16	55	36	31	27	22	16	27	22	18	16	14	9
18	50	33	29	25	20	14	25	20	17	14	13	8
20	46	31	26	23	19	13	23	19	15	13	12	8
22	43	29	25	22	17	12	22	17	14	12	11	7
25	39	26	22	19	16	11	19	16	13	11	10	6

3.4.8.1.4 Retention Period for 8Tbyte, 16 cameras

Frames per second per camera	2CIF						4CIF					
	Lowest	Lower	Low	Medium	Higher	Highest	Lowest	Lower	Low	Medium	Higher	Highest
1	338	225	193	169	134	96	169	134	112	96	84	56
2	298	197	169	148	118	84	148	118	98	84	74	49
4	239	159	136	119	95	68	119	95	79	68	59	40
6	199	133	113	99	79	57	99	79	66	57	50	33
8	171	114	97	85	68	49	85	68	57	49	43	28
10	150	100	86	75	60	43	75	60	50	43	37	25
12	134	89	76	67	53	38	67	53	44	38	33	22
15	115	76	65	57	46	33	57	46	38	33	29	19
16	109	73	62	55	44	31	55	44	36	31	27	18
18	100	67	57	50	40	29	50	40	33	29	25	17
20	93	62	53	46	37	26	46	37	31	26	23	15
22	86	57	49	43	34	25	43	34	29	25	22	14
25	78	52	44	39	31	22	39	31	26	22	19	13

3.4.8.2 12 Camera Systems

3.4.8.2.1 Retention Period for 1Tbyte, 12 cameras

Frames per second per camera	2CIF						4CIF					
	Lowest	Lower	Low	Medium	Higher	Highest	Lowest	Lower	Low	Medium	Higher	Highest
1	56	37	32	28	22	16	28	22	19	16	14	9
2	50	33	28	25	20	14	25	20	16	14	12	8
4	40	26	23	20	16	11	20	16	13	11	10	7
6	33	22	19	17	13	9	17	13	11	9	8	6
8	28	19	16	14	11	8	14	11	9	8	7	5
10	25	17	14	12	10	7	12	10	8	7	6	4
12	22	15	13	11	9	6	11	9	7	6	6	4
15	19	13	11	10	8	5	10	8	6	5	5	3
16	18	12	10	9	7	5	9	7	6	5	5	3
18	17	11	10	8	7	5	8	7	6	5	4	3
20	15	10	9	8	6	4	8	6	5	4	4	3
22	14	10	8	7	6	4	7	6	5	4	4	2
25	13	9	7	6	5	4	6	5	4	4	3	2

3.4.8.2.2 Retention Period for 2Tbyte, 12 cameras

Frames per second per camera	2CIF						4CIF					
	Lowest	Lower	Low	Medium	Higher	Highest	Lowest	Lower	Low	Medium	Higher	Highest
1	113	75	64	56	45	32	56	45	37	32	28	19
2	99	66	56	49	39	28	49	39	33	28	25	16
4	80	53	45	40	32	23	40	32	26	23	20	13
6	66	44	38	33	26	19	33	26	22	19	17	11
8	57	38	32	28	23	16	28	23	19	16	14	9
10	50	33	29	25	20	14	25	20	17	14	12	8
12	45	30	25	22	18	13	22	18	15	13	11	7
15	38	25	22	19	15	11	19	15	13	11	10	6
16	36	24	21	18	15	10	18	15	12	10	9	6
18	33	22	19	17	13	10	17	13	11	10	8	6
20	31	21	18	15	12	9	15	12	10	9	8	5
22	29	19	16	14	11	8	14	11	10	8	7	5
25	26	17	15	13	10	7	13	10	9	7	6	4

3.4.8.2.3 Retention Period for 4Tbyte, 12 cameras

Frames per second per camera	2CIF						4CIF					
	Lowest	Lower	Low	Medium	Higher	Highest	Lowest	Lower	Low	Medium	Higher	Highest
1	225	150	128	112	90	64	112	90	74	64	56	37
2	198	132	112	99	79	56	99	79	65	56	49	33
4	159	106	91	79	63	45	79	63	53	45	40	26
6	133	88	76	66	53	38	66	53	44	38	33	22
8	114	76	65	57	46	32	57	46	38	32	28	19
10	100	67	57	50	40	28	50	40	33	28	25	17
12	89	59	51	44	36	25	44	36	30	25	22	15
15	77	51	44	38	30	22	38	30	25	22	19	13
16	73	49	42	36	29	21	36	29	24	21	18	12
18	67	45	38	33	27	19	33	27	22	19	17	11
20	62	41	35	31	25	18	31	25	21	18	15	10
22	57	38	33	29	23	16	29	23	19	16	14	10
25	52	35	30	26	21	15	26	21	17	15	13	9

3.4.8.2.4 Retention Period for 8Tbyte, 12 cameras

Frames per second per camera	2CIF						4CIF					
	Lowest	Lower	Low	Medium	Higher	Highest	Lowest	Lower	Low	Medium	Higher	Highest
1	451	300	257	225	179	128	225	179	149	128	112	74
2	397	263	225	197	157	112	197	157	131	112	98	65
4	319	212	181	159	127	90	159	127	106	90	79	53
6	265	177	151	133	106	76	133	106	88	76	66	44
8	228	152	130	114	91	65	114	91	76	65	57	38
10	200	133	114	100	80	57	100	80	66	57	50	33
12	178	119	102	89	71	51	89	71	59	51	44	30
15	153	102	87	76	61	44	76	61	51	44	38	25
16	146	97	83	73	58	42	73	58	49	42	36	24
18	134	89	76	67	53	38	67	53	45	38	33	22
20	124	83	71	62	49	35	62	49	41	35	31	21
22	115	77	66	57	46	33	57	46	38	33	29	19
25	104	69	59	52	41	30	52	41	35	30	26	17

3.4.8.3 8 Camera Systems
3.4.8.3.1 Retention Period for 1Tbyte, 8 cameras

Frames per second per camera	2CIF						4CIF					
	Lowest	Lower	Low	Medium	Higher	Highest	Lowest	Lower	Low	Medium	Higher	Highest
1	85	56	48	42	34	24	42	34	28	24	21	14
2	74	49	42	37	30	21	37	30	25	21	18	12
4	60	40	34	30	24	17	30	24	20	17	15	10
6	50	33	28	25	20	14	25	20	17	14	12	8
8	43	29	24	21	17	12	21	17	14	12	11	7
10	38	25	21	19	15	11	19	15	12	11	9	6
12	33	22	19	17	13	10	17	13	11	10	8	6
15	29	19	16	14	11	8	14	11	10	8	7	5
16	27	18	16	14	11	8	14	11	9	8	7	5
18	25	17	14	13	10	7	13	10	8	7	6	4
20	23	15	13	12	9	7	12	9	8	7	6	4
22	22	14	12	11	9	6	11	9	7	6	5	4
25	19	13	11	10	8	6	10	8	6	6	5	3

3.4.8.3.2 Retention Period for 2Tbyte, 8 cameras

Frames per second per camera	2CIF						4CIF					
	Lowest	Lower	Low	Medium	Higher	Highest	Lowest	Lower	Low	Medium	Higher	Highest
1	169	112	96	84	67	48	84	67	56	48	42	28
2	149	99	84	74	59	42	74	59	49	42	37	25
4	119	79	68	59	48	34	59	48	40	34	30	20
6	99	66	57	50	40	28	50	40	33	28	25	17
8	85	57	49	43	34	24	43	34	28	24	21	14
10	75	50	43	37	30	21	37	30	25	21	19	12
12	67	45	38	33	27	19	33	27	22	19	17	11
15	57	38	33	29	23	16	29	23	19	16	14	10
16	55	36	31	27	22	16	27	22	18	16	14	9
18	50	33	29	25	20	14	25	20	17	14	13	8
20	46	31	26	23	19	13	23	19	15	13	12	8
22	43	29	25	22	17	12	22	17	14	12	11	7
25	39	26	22	19	16	11	19	16	13	11	10	6

3.4.8.3.3 Retention Period for 4Tbyte, 8 cameras

Frames per second per camera	2CIF						4CIF					
	Lowest	Lower	Low	Medium	Higher	Highest	Lowest	Lower	Low	Medium	Higher	Highest
1	338	225	193	169	134	96	169	134	112	96	84	56
2	298	197	169	148	118	84	148	118	98	84	74	49
4	239	159	136	119	95	68	119	95	79	68	59	40
6	199	133	113	99	79	57	99	79	66	57	50	33
8	171	114	97	85	68	49	85	68	57	49	43	28
10	150	100	86	75	60	43	75	60	50	43	37	25
12	134	89	76	67	53	38	67	53	44	38	33	22
15	115	76	65	57	46	33	57	46	38	33	29	19
16	109	73	62	55	44	31	55	44	36	31	27	18
18	100	67	57	50	40	29	50	40	33	29	25	17
20	93	62	53	46	37	26	46	37	31	26	23	15
22	86	57	49	43	34	25	43	34	29	25	22	14
25	78	52	44	39	31	22	39	31	26	22	19	13

3.4.8.3.4 Retention Period for 8Tbyte, 8 cameras

Frames per second per camera	2CIF						4CIF					
	Lowest	Lower	Low	Medium	Higher	Highest	Lowest	Lower	Low	Medium	Higher	Highest
1	676	450	385	337	269	192	337	269	223	192	168	112
2	595	395	337	296	236	169	296	236	196	169	147	98
4	478	318	272	238	190	136	238	190	159	136	119	79
6	398	265	227	199	159	113	199	159	132	113	99	66
8	342	228	195	171	137	97	171	137	114	97	85	57
10	300	200	171	150	120	85	150	120	100	85	75	50
12	267	178	152	133	107	76	133	107	89	76	67	44
15	230	153	131	115	91	65	115	91	76	65	57	38
16	219	146	125	109	87	62	109	87	73	62	55	36
18	201	134	115	100	80	57	100	80	67	57	50	33
20	185	124	106	93	74	53	93	74	62	53	46	31
22	172	115	98	86	69	49	86	69	57	49	43	29
25	155	104	89	78	62	44	78	62	52	44	39	26

3.4.8.4 4 Camera Systems

3.4.8.4.1 Retention Period for 1Tbyte, 4 cameras

Frames per second per camera	2CIF						4CIF					
	Lowest	Lower	Low	Medium	Higher	Highest	Lowest	Lower	Low	Medium	Higher	Highest
1	169	112	96	84	67	48	84	67	56	48	42	28
2	149	99	84	74	59	42	74	59	49	42	37	25
4	119	79	68	59	48	34	59	48	40	34	30	20
6	99	66	57	50	40	28	50	40	33	28	25	17
8	85	57	49	43	34	24	43	34	28	24	21	14
10	75	50	43	37	30	21	37	30	25	21	19	12
12	67	45	38	33	27	19	33	27	22	19	17	11
15	57	38	33	29	23	16	29	23	19	16	14	10
16	55	36	31	27	22	16	27	22	18	16	14	9
18	50	33	29	25	20	14	25	20	17	14	13	8
20	46	31	26	23	19	13	23	19	15	13	12	8
22	43	29	25	22	17	12	22	17	14	12	11	7
25	39	26	22	19	16	11	19	16	13	11	10	6

3.4.8.4.2 Retention Period for 2Tbyte, 4 cameras

Frames per second per camera	2CIF						4CIF					
	Lowest	Lower	Low	Medium	Higher	Highest	Lowest	Lower	Low	Medium	Higher	Highest
1	338	225	193	169	134	96	169	134	112	96	84	56
2	298	197	169	148	118	84	148	118	98	84	74	49
4	239	159	136	119	95	68	119	95	79	68	59	40
6	199	133	113	99	79	57	99	79	66	57	50	33
8	171	114	97	85	68	49	85	68	57	49	43	28
10	150	100	86	75	60	43	75	60	50	43	37	25
12	134	89	76	67	53	38	67	53	44	38	33	22
15	115	76	65	57	46	33	57	46	38	33	29	19
16	109	73	62	55	44	31	55	44	36	31	27	18
18	100	67	57	50	40	29	50	40	33	29	25	17
20	93	62	53	46	37	26	46	37	31	26	23	15
22	86	57	49	43	34	25	43	34	29	25	22	14
25	78	52	44	39	31	22	39	31	26	22	19	13

3.4.8.4.3 Retention Period for 4Tbyte, 4 cameras

Frames per second per camera	2CIF						4CIF					
	Lowest	Lower	Low	Medium	Higher	Highest	Lowest	Lower	Low	Medium	Higher	Highest
1	676	450	385	337	269	192	337	269	223	192	168	112
2	595	395	337	296	236	169	296	236	196	169	147	98
4	478	318	272	238	190	136	238	190	159	136	119	79
6	398	265	227	199	159	113	199	159	132	113	99	66
8	342	228	195	171	137	97	171	137	114	97	85	57
10	300	200	171	150	120	85	150	120	100	85	75	50
12	267	178	152	133	107	76	133	107	89	76	67	44
15	230	153	131	115	91	65	115	91	76	65	57	38
16	219	146	125	109	87	62	109	87	73	62	55	36
18	201	134	115	100	80	57	100	80	67	57	50	33
20	185	124	106	93	74	53	93	74	62	53	46	31
22	172	115	98	86	69	49	86	69	57	49	43	29
25	155	104	89	78	62	44	78	62	52	44	39	26

3.4.8.4.4 Retention Period for 8Tbyte, 4 cameras

Frames per second per camera	2CIF						4CIF					
	Lowest	Lower	Low	Medium	Higher	Highest	Lowest	Lower	Low	Medium	Higher	Highest
1	1353	900	771	674	537	384	674	537	447	384	336	223
2	1191	789	674	592	472	337	592	472	393	337	295	196
4	956	635	543	476	380	271	476	380	318	271	237	158
6	795	530	454	398	318	227	398	318	265	227	198	132
8	683	456	390	342	273	195	342	273	227	195	171	114
10	601	400	342	300	239	171	300	239	199	171	150	100
12	535	356	305	267	213	152	267	213	178	152	133	89
15	459	305	261	229	183	131	229	183	152	131	114	76
16	437	292	250	219	175	125	219	175	146	125	109	73
18	402	268	229	201	160	114	201	160	134	114	100	67
20	371	248	212	185	148	106	185	148	123	106	93	62
22	345	230	197	172	138	98	172	138	115	98	86	57
25	311	207	178	155	124	89	155	124	104	89	78	52

3.4.9 Retention Period Calculator

A PC application is also available to calculate update rates and disc capacity requirements. This application caters for configurations with different setting for each camera.

Program name: DiskCalculator.exe

Download from: www.videoswitch.co.uk located in **Free Software**

3.5 Network Cameras

The Vi-R4105 Hybrid recorder can support IP Network cameras in addition to analogue cameras. There can be up to 32 cameras in total, with a maximum of 16 analogue camera.

The analogue cameras are numbered 01 to 16 and the IP Network cameras are numbered 17 to 48..

A Vi-R4005 DVR can be upgraded to a Vi4105 for use with network cameras.

3.5.1 Connecting network cameras

If you only have one network camera, it can connect direct into one of the ethernet ports of the digital recorder.

If you have more than one network camera, you will need to use an ethernet switch. In this case, one of the ports of the ethernet switch must be connected to either of the ethernet ports of the digital recorder.

If you use an ethernet switch that supports PoE (Power over Ethernet), the cameras will be automatically powered via the CAT5 cable. This is recommended. Otherwise, you will need to power each camera from a suitable power adaptor.

3.5.2 Installing network cameras

Each network camera has to be registered in the configuration of the Vi-R4000 series recorder. It is recommended that you add the cameras one at a time, as they may all have the same IP address which can make it harder to identify which is which.

Once you have connected the camera to the Vi-R4000 you will need to add it to the IP camera list via this menu item:

- **Menu->Camera->IP Camera(tab)**
- Now click **Search** to find all connected IP cameras. Your camera should appear in the search area top right of the screen.
- You can now select the edit option which allows you to change the camera IP address to suit the recorder address. For example, if the recorder is set to address 192.168.0.50 you can set the IP camera addresses to 192.168.0.101, 192.168.0.102, 192.168.0.103 etc.
- Enter the password and **Apply** then select **OK**.
- Now tick the box for the camera and select **Quick add**. The camera should now be in the camera list below. You can select the 'Play Live' button to view the camera image. You can also edit and delete cameras here.
- Repeat process above to add more IP cameras.
- Select Back to exit this menu and return to the main menu.

Note:

It is essential that all the cameras are in the same subnet range as the recorder, or no images will be seen. This means that if the Subnet mask is set to 255.255.255.0, then the IP addresses for the recorder and all the cameras must be the same except for the digits after the third full stop.

3.5.3 Setting Network Camera Schedule

In order for network cameras to record, they need to be included in the schedule exactly as for analogue cameras:

- Go to the menu page: **Menu->Camera->Schedule->Record (tab)**
- Select Camera 17 which is the first IP camera, and edit the record schedule as required.
- You can press **Copy** to copy the same schedule to the other IP cameras if the same schedule is required. The IP cameras (IPC) are identified as cameras D1 to D32 in the copy dialogue. Press **OK** to exit.
- Now press **Apply** to save settings
- You can also set a **Capture** schedule: that takes regular snap-shots from the IP camera independently of the normal record schedule.

3.5.4 Setting Network Camera Parameters

As with analogue cameras, there are parameters to set of IP cameras. Go to this menu page:

- **Menu->Camera->Parameters**
- Now select Camera 17 which is the first IP camera.
- Select the resolution required, quality & frame rate.
- Set the Bitrate to the range recommended
- **Apply** settings after changes.
- Now repeat Parameter settings for any other IP cameras, remember to **Apply** settings after making changes.

Network cameras provide much better image quality but by their nature use up more hard drive space than analogue cameras. Refer to the calculator mentioned in section 3.4.9 to determine how long you can record for at different hard drive capacities

3.5.5 Setting Substream Parameters

You can also set **Substream** parameters such that a low resolution stream is available for remote viewing on a smartphone or PC. Substream typically provides faster update but lower resolution.

Apply settings after changes

3.5.6 Setting Capture Parameters

The capture settings set the rate and resolution of regular snapshot images that are recorded in addition to the normal record images.

3.5.7 Viewing Network Cameras

Exit menu and select cameras 17, 18 , 19 etc to view the IP cameras exactly as for analogue cameras.

Camera mapping in the **Menu->Configuration->LiveView->View** screen allows you can move cameras to the desired location in various screen formats for viewing.

3.6 Casacading

3.6.1 Vi-R4000 Recorders (address range 2)

If multiple Vi-R4000 series Recorders are cascaded (see connection details in section 2.2.3) no address configuration is required. The DVRs by default have an an address range of 2 so addresses will be assigned automatically as follows:

DVR	Unit Address	Analogue Cameras	Network Cameras
1	1 & 2	1 - 16	17 - 32
2	3 & 4	33 - 48	49 - 64
3	5 & 6	65 – 80	81 – 96
4	7 & 8	97 – 112	113 – 128
5	9 & 10	129 – 144	145 – 160
6	11 & 12	161 – 176	177 – 192
7	13 & 14	193 – 208	209 - 224
8	15 & 16	225 – 240	241 - 256

3.6.2 Vi-R4000 Recorders (address range 1)

If you have only analogue cameras and you want consecutive camera numbering without gaps, set each unit address range to 1. The addresses will then be automatically assigned as follows:

DVR	Unit Address	Analogue Cameras
1	1	1 - 16
2	2	17 - 32
3	3	33 - 48
4	4	49 - 64
5	5	65 - 80
6	6	81 - 96
7	7	97 - 112
8	8	113 - 128
9	9	129 - 144
10	10	145 - 160
11	11	161 - 176
12	12	177 - 192
13	13	193 - 208
14	14	209 - 224
15	15	225 - 240
16	16	241 - 256

3.6.3 Vi405 and Vi-R4000 Recorders (address range 1)

If Vi-R4000 Series Recorders are being cascaded with existing Vi405 DVRs, follow the following guidelines:

- Make sure the Vi405 DVRs are first in the cascading chain i.e. the including. master unit
- Add Vi-R4000 series units at the end of the chain
- Manually allocate Vi405 and Vi-R4005 addresses in the order the units are physically connected (see below)
- Manually set each Vi-R40905 address range to 1 (see below)
- Note that Vi405's do not have VGA or mouse control so cascading of these features is not possible.

When DVRs each have an address range of 1 (which Vi405's always do), the cameras are allocated as follows:

DVR	Unit Address	Analogue Cameras
1	1	1 - 16
2	2	17 – 32
3	3	33 – 48
4	4	49 - 64
5	5	65 – 80
6	6	81 – 96
7	7	97 – 112
8	8	113 – 128
9	9	129 - 144
10	10	145 – 160
11	11	161 – 176
12	12	177 – 192
13	13	193 – 208
14	14	209 – 224
15	15	225 – 240
16	16	241 - 256

3.6.3.1 Manually Set DVR Address

If the DVR is being cascaded with Vi405 DVRs, you will need to manually set its address. Set the address as follows:

Press and hold LIVE key, enter 13xx, release LIVE key

Where XX is the unit number 01 to 16.

3.6.3.2 Manually Set Address Range

If you are not using network cameras, you may wish to set the address range to 1. Set the address range as follows:

Press and hold LIVE key, enter 14xx, release LIVE key

Where XX is the unit address range 01 or 02.

3.6.4 Sharing a VGA Monitor

If you wish to share a VGA monitor, you will need to set the monitor output on each unit to VGA as they will not all be able to automatically detect the monitor on power-up.

To set the main monitor to VGA on each unit, navigate to this menu option:

Menu>configuration>General>More Settings->Menu Output Mode set to: **VGA**

3.7 Termination

3.7.1 Turn Camera Termination ON

To turn the 75 Ohm camera termination ON (default) enter this command:

Press and hold LIVE key, enter 11XX, release LIVE key

Where XX is the camera number 01 to 16, or 00 for all cameras off at once.

3.7.2 Turn Camera Termination OFF

To turn the 75 Ohm camera termination ON (default) enter this command:

Press and hold LIVE key, enter 12XX, release LIVE key

Where XX is the camera number 01 to 16, or 00 for all cameras off at once.

3.8 Auto-Sequencing

3.8.1 Auto-Switch

Menu auto-switch is simple to set up and applies to the main monitor (HDI, VGA or BNC). Auto-switching is enabled by setting a dwell time in this part of the menu:

Menu>Configuration>Live View>Dwell Time

3.8.2 Start/Stop Auto-Switching

To start switching,:

Press OK

To stop switching:

Right click mouse and select Stop-Auto-Switch

3.8.3 Auto-Sequencing

Each monitor can be set to auto-sequence using interface commands. For each monitor you can specify which cameras you wish to be included in the sequence.

For example, to enable auto-sequencing for all cameras on monitor 1:

Press and hold LIVE key, enter6100, release LIVE key

For example, to enable auto-sequencing for all cameras on monitor 2:

Press and hold LIVE key, enter6200, release LIVE key

For example, to enable auto-sequencing for all cameras on monitor 3:

Press and hold LIVE key, enter6300, release LIVE key

For example, to enable auto-sequencing for all cameras on monitor 4:

Press and hold LIVE key, enter6400, release LIVE key

Note:

See full listing of interface commands in section 16.

Before issuing any commands, issue an un-lock command as follows:

Press and hold LIVE key, enter 9001, release LIVE key

3.8.4 Auto-Sequencing across Cascaded Units

The master unit (DVR) can also be programmed to auto-sequence cameras across multiple cascaded DVRs. For each monitor that you want to have auto-sequencing on, specify which cameras and which units you want to be included in the sequence.

For example, use these commands on the master unit (unit 1) to setup Monitor 2 auto-sequencing of all cameras on units 1, 2 and 3:

Press and hold LIVE key, enter 620001, release LIVE key

Press and hold LIVE key, enter 620002, release LIVE key

Press and hold LIVE key, enter 620003, release LIVE key

3.8.5 Start/Stop Auto-sequencing

To start auto-sequencing:

Press and hold ESC key, press PAUSE key

If a Vi-K1/Vi-K1000 remote keyboard is attached to keyboard port

To stop auto-sequencing:

Select any camera by entering a number.

Notes:

- Remember to stop auto-sequencing on the main monitor before going into the menu
- See full listing of interface commands in section 16.
- Before issuing any interface commands, issue an un-lock command as follows:

Press and hold LIVE key, enter 9001, release LIVE key

3.9 Covert Cameras

Covert cameras are camera that are hidden from view by are nevertheless recording. They are hidden from view for all users, but can be made available for playback on selected user login-ins.

3.9.1 Main Monitor (Monitor 1)

3.9.1.1 Set Covert

- Go into this menu: **Menu>Configuration>Live View**
- Select **View** tab
- Select the monitor you wish covert to apply to in: **Video Output Interface**
- Select the 4x4 grid icon so a grid of 16 cameras is displayed
- Make sure that covert cameras are removed from view by clicking on the “x” next to the camera number displayed on the screen. For example, if you wish to make camera 16 covert, click on the “x” wherever “A16 x” is displayed. It will now display “X x”. This indicates that this camera will not be displayed.
- Click on **Apply**

The above will prevent cameras from being viewed in live mode. To prevent them being viewed remotely or in playback, you must also make sure the user logins restrict viewing of any covert cameras:

- Go into this menu (must be admin login): **Menu>Configuration>User**
- Click on green tick icon
- Select this tab: **Camera Configuration**
- Select this drop down option: **Local Playback**
- Disable any cameras that you wish this user to be unable to replay.
- Select this tab: **Local Configuration**
- Disable **Local Camera Management**
- Click **Apply**

3.9.1.2 Clear Covert

To restore cameras to view (or re-arrange the displays), selected one of the screen areas and click on the camera symbol to the left of the camera reference A1, S2 A3 etc. This will allocate the corresponding camera to the selected screen zone.

Make sure the user login allows local playback of that camera again (see previous section).

3.9.2 Monitor 2

3.9.2.1 Set Covert

To set a camera to covert enter this command:

Press and hold LIVE key, enter 22XX, release LIVE key

Where XX is the camera number 01 to 16, or 00 for all cameras off at once.

3.9.2.2 Clear Covert

To set a camera to normal enter this command:

Press and hold LIVE key, enter 22XX, release LIVE key

Where XX is the camera number 01 to 16, or 00 for all cameras off at once.

3.9.3 Monitor 3

3.9.3.1 Set Covert Camera

To set a camera to covert enter this command:

Press and hold LIVE key, enter 23XX, release LIVE key

Where XX is the camera number 01 to 16, or 00 for all cameras off at once.

3.9.3.2 Clear Covert Camera

To set a camera to normal enter this command:

Press and hold LIVE key, enter 23XX, release LIVE key

Where XX is the camera number 01 to 16, or 00 for all cameras off at once.

3.9.4 Monitor 4

3.9.4.1 Set Covert Camera

To set a camera to covert enter this command:

Press and hold LIVE key, enter 24XX, release LIVE key

Where XX is the camera number 01 to 16, or 00 for all cameras off at once.

3.9.4.2 Clear Covert Camera

To set a camera to normal enter this command:

Press and hold LIVE key, enter 24XX, release LIVE key

Where XX is the camera number 01 to 16, or 00 for all cameras off at once.

3.9.5 Video export and Remote View

User rights can be set to restrict exporting or viewing of particular cameras in this menu:

Menu>Configuration>User

Click on **green** tick symbol to edit user viewing rights (you need to be logged in as admin)

3.10 PTZ Control

There are several methods of PTZ control:

3.10.1 Up-the-coax

PTZ domes that support BBV up-the-coax telemetry can be controlled from the Vi-R4000 series DVR when connected to a Videoswitch joystick keyboard (Vi-K2, Vi-K3 , Vi-K2A, Vi-K2000). The domes are simply connected to the BNC inputs and control occurs back up the coax cable.

Interface commands are required to configure cameras for up-the-coax control.

Before issuing the commands, issue an un-lock command as follows:

Press and hold LIVE key, enter 9001, release LIVE key

These commands may then be issued to configure one or more cameras for up-the-coax control:

3.10.1.1 Disable PTZ Control

To set a camera have no PTZ local control enter this command:

Press and hold LIVE key, enter 40XX, release LIVE key

Where XX is the camera number 01 to 16, or 00 for all cameras off at once.

3.10.1.2 Enable Coax Control

To set a camera to have up-the-coax PTZ control, enter this command:

Press and hold LIVE key, enter 41XX, release LIVE key

Where XX is the camera number 01 to 16, or 00 for all cameras off at once.

3.10.1.3 Set Coax Transmission Timeout

To set a up-the-coax PTZ timeout, enter this command:

Press and hold LIVE key, enter 49XX, release LIVE key

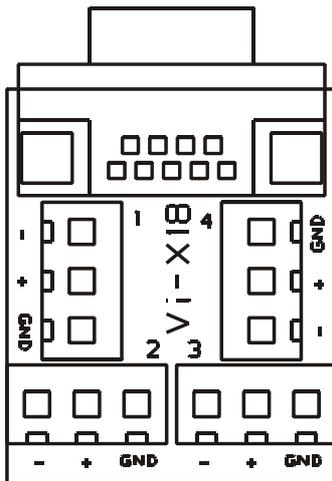
Where XX is the timeout in seconds 01 to 99, or 00 for continuous transmission. If you see telemetry interference on the display the timeout can be used to minimise this.

3.10.2 Connecting up Domes for RS485 Control

The Vi-R4000 series DVR has four RS485 dome outputs. These may be used directly to control domes or may be fed via RS485 port expanders where more than four domes are to be connected in star configuration.

Daisy-chaining of domes is also possible from each of the four outputs, in which case the RS485 receiver of the furthest dome on each daisy-chain should be terminated and the others un-terminated.

Using a Vi-X18 break-out module, connect the domes to the DOMES connector on the rear of the DVR. Four RS485 output are provided identified as 1, 2, 3 and 4.



3.10.3 Connection for dome control via menu or ethernet

In order to control domes using the mouse or remotely control domes via ethernet, a connection is required on the back of the DVR between the green terminal block and the D-type connector marked "Control" as follows:

Terminal Block	CONTROL port
T+	Pin 1
T-	Pin 2
R+	Pin 3
R-	Pin 4

Domes should be connected to the DOMES connector using the Vi-X18 breakout module as above.

3.10.4 RS485 Local Control using DVR Protocols

A Vi-K2, Vi-K2A or Vi-K2000 joystick keyboard can be used to control PTZ domes connected to the Vi-R4000. Connect the keyboard to a KBD port on the DVR and set up the keyboard menu such that control is “via” DVR”.

Program the DVR for PTZ control as follows:

Before issuing the commands, issue an un-lock command as follows:

Press and hold LIVE key, enter 9001, release LIVE key

3.10.4.1 Enable RS485 Control on outputs 1 & 2

To configure a camera for PTZ control on RS485 outputs 1 & 2, enter this command:

Press and hold LIVE key, enter 42XX, release LIVE key

Where XX is the camera number 01 to 16, or 00 for all cameras..

3.10.4.2 Enable RS485 Control on outputs 3 & 4

To configure a camera for PTZ control on RS485 outputs 3 & 4 , enter this command:

Press and hold LIVE key, enter 43XX, release LIVE key

Where XX is the camera number 01 to 16, or 00 for all cameras.

3.10.4.3 Set RS485 Protocol for Outputs 1 & 2

To set the PTZ protocol for RS485 outputs 1 & 2 , enter this command:

Press and hold LIVE key, enter 45XX, release LIVE key

Where XX is the protocol number (see section 3.3).

3.10.4.4 Set RS485 Protocol for Outputs 3 & 4

To set the PTZ protocol for RS485 outputs 1 & 2 , enter this command:

Press and hold LIVE key, enter 46XX, release LIVE key

Where XX is the protocol number (see section 3.3)

Note: Interface commands are summarised in section 3.2.3

3.10.5 RS485 Local Control using Keyboard Protocols

The protocols built into a Vi-K2A joystick keyboard can be used to control PTZ domes connected to the Vi-R4000. Connect the keyboard to the KBD1 port on the DVR and set up the keyboard menu such that each PTZ camera is assigned to Domes-1 or Domes-2 output and that each of these outputs is assigned the required RS485 protocol. Set the Dome o/p to “DVR” to tell the keyboard that the domes are to be connected to the DVR (rather than the keyboard). Note that Domes-1 output on the keyboard relates to RS485 outputs 1 & 2 on the DVR and Domes-2 output on the keyboard relates to RS485 outputs 3 & 4 on the DVR.

3.10.6 RS485 Dome Control via Menu

If you want to control PTZ domes using mouse control:

Protocol and baud rate is set in the menu to suit the dome(s).

Menu>Camera>PTZ

Select PTZ mode either using pressing the PTZ key or right-clicking the mouse on a live camera image and pressing the PTZ icon. The dome may now be controlled by the mouse.

3.10.7 RS485 Dome Control via Ethernet

If you want to control PTZ domes via a network, whether locally or via broadband, this is achieved using mouse control as above except from the remote viewing software.

4 User

4.1 Live Viewing

4.1.1 Full screen

To select full screen camera images:

- Enter the camera number using the number keys: **1,2,3,4,5,6,7,8,9,0**
- Pressing the **←** and **→** keys to step through cameras
- Right click on mouse and select Main or Aux monitor and required camera.

4.1.2 Multi-Screen

To select multi-screen camera images:

- Press the **SCREEN** key to get the format you require. Use **←** and **→** for different camera groups in multi-screens.
- Right click on mouse and select Main or Aux monitor and required screen format

4.1.3 Auto-Switching

If a dwell time has been set in the **Configuration>Live View** menu, pressing **SEL** will start camera switching on the main monitor.

To stop switching:

Left click on mouse and select Stop Auto-Switch

4.1.4 Auto-Sequencing

If auto-sequencing has been set by interface commands, to start sequencing:

Press and hold ESC key then press PAUSE key

To stop auto-sequeuncing

Select a camera by entering a number on the keyboard.

4.1.5 Main or Aux Monitor Selection

Press the **MAIN/AUX** key then **SELECT** to switch between main and aux monitors so that camera can be selected.

Note: Take care if the other monitor isn't attached or visible to you, as you will lose sight of your cursor. If this happens, just press **MAIN/AUX** key then **SELECT** again and control will return to your monitor.

4.1.6 Screen Warning Symbols

The following symbols may appear on the screen for each camera.



To find what has caused the alert:

- Press **HELP** key to go to menu path: **Menu>Maintenance->System Info**

- Look at **Camera, Record, Alarm, Network** and **HDD** tabs and check for errors
- Select **Log Information**

Click on **Search** (change date and **Major Type** and **Minor Type** to narrow down the events as required)

4.1.6.1 Yellow Triangle

The yellow triangle is an alert cause by either:

- An alarm such as movement detection or external alarm input
- An exception such as a hard drive failure.

4.1.6.2 Red Cross

A red cross indicates that recording has stopped on that camera. This may be due to a variety of reasons, including:

- Time is outside programmed schedule
- Recording has been manually stopped
- Camera is faulty
- Hard drive is faulty
- Network problem (if IP camera)

4.1.7 Quick setting Toolbar

If you right-click on the mouse (or mouse emulator) in Live mode, you will see this toolbar.



This provides these functions (in order):

Enable manual record	If schedule is inactive, record may be manually enabled or disabled
Instant playback	Instant Playback only shows the last five minutes recorded
Mute audio	Mute/Enable audio
Capture an image	Take a snapshot of the current image
PTZ control	Control dome via keyboard
Digital Zoom	Left-click and draw to select the area for zooming
Image settings	Adjust image appearance
Close toolbar	Close this toolbar

4.2 Spot Monitors

4.2.1 Using Vi-K1 remote keyboard

If you plug a Vi-K1(A) keyboard into **KBD2** it will control monitor 2. If you plug a Vi-K1(A) keyboard into **KBD3** it will control monitor 3. If you plug a Vi-K1(A) keyboard into **KBD4** it will control monitor 4.

- Enter **numbers** to select cameras.
- Press **OK** to start auto-sequencing (cameras and dwell time can be specified by interface commands).
- Press **LIVE** or select a camera to stop auto-sequencing

4.2.2 Using Vi-K1 to control other monitors

A Vi-K1 keyboard plugged into any of the four KBD ports can be made to behave as if it is plugged into any of the other KBD ports as follows.

Control DVR as if plugged into KBD1 port (i.e. monitor 1)

Press and hold ESC key, press 1

Control DVR as if plugged into KBD2 port (i.e. monitor 2)

Press and hold ESC key, press 2

Control DVR as if plugged into KBD2 port (i.e. monitor 2)

Press and hold ESC key, press 3

Control DVR as if plugged into KBD2 port (i.e. monitor 4)

Press and hold ESC key, press 4

To make the keyboard revert to it's normal control port:

Press and hold ESC key, press 0

4.2.3 Using Vi-K2(A) remote keyboard

A Vi-K2(A) keyboard is capable of controlling any monitor when plugged into any keyboard port by selecting the display monitor 1 to 4 on the keyboard, then entering the camera number (use may be restricted in the keyboard if required).

You can also route cameras 1-16 to the various monitors from the DVR's front panel keypad as follows:

- BNC Monitor 1 - enter 1 to 16
- BNC Monitor 2 - enter 101 to 116
- BNC Monitor 3 - enter 201 to 216
- BNC Monitor 4 - enter 301 to 316

4.3 Play

To enter playback mode	Press the FIND key, or Right click mouse and select All Day Playback , or select Play in the main menu (V2.3.3_130717 or later).
To select cameras	Make sure playback is paused. Move mouse pointer to right of screen and select which cameras you want to playback.
To select day	Move mouse pointer to right of screen and use calendar to select which day you wish to view.
To select time of day	Move slider bar across bottom of screen
To play or pause	Click on PLAY or PAUSE icon

4.4 Video Clip Export

One or more vVideo clips may be exported to a USB stick or to CDs or DVDs using the the built-in DVD drive. These clips may be for one or more cameras.

Follow these steps to export one or more video clips:

1. Press the **FIND** key to enter playback mode
2. Select cameras, day and time as above, section 4.3
3. Pause playback at start of clip you wish to export
4. Press **CLIP** key or click on the scissor icon near the bottom left of screen.
5. Move slider to the end of the video section to be exported.
6. Press **CLIP** key again or click on the scissor icon to mark end of clip to be exported
7. Repeat steps 3 to 6 if there are other clips you require.
8. Press **ESC** and if clip size is ok to fit on your backup media, click on **YES**.
9. Put in CD, DVD or USB memory stick and refresh.
10. When ready, press **START** to export. Wait until completed. Create duplicate copies as required.

Note

Keep clips as small as possible and only include cameras that are required so that exported data fits onto the backup media.

4.5 Remote Viewing

4.5.1 Browser

Connect to a Videoswitch R-series Net Recorder with a browser for remote viewing and management. You will need to allow the browser to install some add-ons.

4.5.2 Vi-Viewer4000 Camera Management System

Install Vi-Viewer4000 on PC running Windows (XP, Vista, Windows 7) to remotely monitor and manage up to 256 Videoswitch Net Recorders.

5 Reference

5.1 Menu

5.1.1 Playback

5.1.2 Recording Configuration

5.1.2.1 Quick Schedule

5.1.2.2 Advanced Schedule Configuration

5.1.2.3 Record Quality Settings

5.1.2.4 Motion Detection Settings

5.1.2.5 Trigger Settings

5.1.3 Cameras Setup

5.1.3.1 Privacy Zones

5.1.3.2 Video Tampering Detection

5.1.3.3 Video Loss Detection

5.1.3.4 OSD Configuration

5.1.4 Status

5.1.4.1 Drive Information

5.1.4.2 Chan Status

5.1.4.3 Record Status

5.1.4.4 Alarm Status

5.1.4.5 Network Status

5.1.4.6 HD Status

5.1.5 System Configuration

5.1.5.1 Time/Date

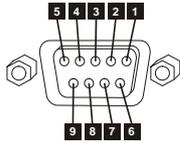
5.1.5.2 Network

- 5.1.5.3 PTZ
- 5.1.5.4 Serial Settings
- 5.1.5.5 On Camera Settings
- 5.1.5.6 Exception
- 5.1.5.7 Display
- 5.1.5.8 Disk Management
- 5.1.5.9 Email
- 5.1.6 File Management
- 5.1.7 Maintenance
 - 5.1.7.1 Firmware Upgrade
 - 5.1.7.2 Factory Default
 - 5.1.7.3 Shutdown
 - 5.1.7.4 Configuration Export/Import
 - 5.1.7.5 System Logs

5.2 Connector Pin-outs

5.2.1 Domes

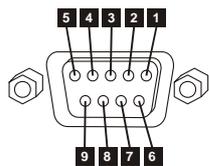
Connector Type: 9-way D-type Female



Pin	Function
1	Dome Output 1 RS485 TX+
2	Dome Output 1 RS485 TX-
3	Dome Output 2 RS485 TX+
4	Dome Output 2 RS485 TX-
5	GND
6	Dome Output 3 RS485 TX+
7	Dome Output 3 RS485 TX-
8	Dome Output 4 RS485 TX+
9	Dome Output 4 RS485 TX-

5.2.2 Control

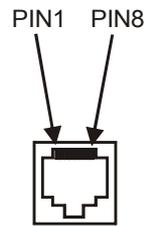
Connector Type: 9-way D-type Female



Pin	Function
1	RS485 RX+
2	RS485 RX-
3	RS485 TX+
4	RS485 TX-
5	GND
6	N/C
7	N/C
8	N/C
9	N/C

5.2.3 Keyboards

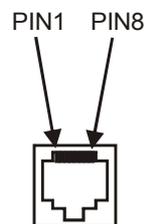
Connector Type: RJ45 Female



Pin	Function
1	RS485 RX+
2	RS485 RX-
3	RS485 TX+ (KBD1 only)
4	9V
5	GND
6	RS485 TX-+ (KBD1 only)
7	Twisted Pair Video+
8	Twisted Pair Video-

5.2.4 Cascade

Connector Type: RJ45 Female



Pin	Function
1	RS485 TX+
2	RS485 TX-
3	RS485 RX+ (CASC1 only)
4	n/c
5	GND
6	RS485 RX-+ (CASC1 only)
7	Twisted Pair Video+
8	Twisted Pair Video-

5.2.5

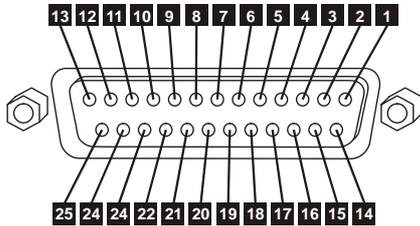
5.2.6 VGA

Connector Type: 15-way High Density D-type Female

Pin	Function
1	RED
2	GREEN
3	BLUE
4	N/C
5	GND
6	GND
7	GND
8	GND
9	N/C
10	GND
11	N/C
12	N/C
13	HSYNC
14	VSYNC
15	N/C

5.2.7 Audio

Connector Type: 25-way D-type Female



Pin	Function
1	AUDIO INPUT 1
2	AUDIO INPUT 2
3	AUDIO INPUT 3
4	AUDIO INPUT 4
5	AUDIO INPUT 5
6	AUDIO INPUT 6
7	AUDIO INPUT 7
8	AUDIO INPUT 8
9	AUDIO INPUT 9
10	AUDIO INPUT 10
11	AUDIO INPUT 11
12	AUDIO INPUT 12
13	AUDIO INPUT 13
14	AUDIO INPUT 14
15	AUDIO INPUT 15
16	AUDIO INPUT 16
17	N/C
18	N/C
19	N/C
20	N/C
21	N/C
22	AUDIO LINE IN
23	AUDIO OUT (BNC)
24	AUDIO OUT (VGA)
25	GND

5.3 Specifications

5.3.1 Video

- Video Compression H.264
- Video Input 16-ch, BNC, 1.0 Vp-p
- Termination 75Ω switchable
- Video format PAL/NTSC
- BNC outputs 4-ch, 704×576 (PAL)
- VGA/HDMI Outputs 1920×1080P/60Hz, 1600×1200/60Hz, 1280×1024/60Hz, 1280×720/60Hz, 1024×768/60Hz
- Screen formats Full screen, 2x2, 1+6, 1+7, 3x3, 4x4

5.3.2 Audio

- Audio Inputs 16-ch, 2.0 Vp-p, 1 kΩ
- Audio output 2-ch, 600Ω
- Two-way Audio 2.0Vp-p, 1kΩ
- Audio Compression OggVorbis
- Audio Bit Rate 16kbps

5.3.3 Recording

- Recording formats 4CIF(D1), 2CIF, CIF, QCIF
- Frame rate per camera 1/16 to 25 fps
- Video Bit Rate 32K to 8M bits per second
- Sub-stream CIF, QCIF up to 25 fps
- Pre and post alarm 5s default, programmable
- Time-lapse recording 1, 2, 3, 4, 5 seconds
- Scheduling timers Yes
- Activity detection Yes
-

5.3.4 Playback

- Multi-channel playback 16-ch
- Playback rate Single step, variable speed, forward/reverse
- Search Date/time, alarms, activity, retrospective activity

5.3.5 Storage

- Removable hard discs x2, up to 4Tbytes each, SATA

- Hard disc expansion eSATA
- DVD/CD backup Built-in write (also plays back)

5.3.6 Network

- Network Interface RJ45 10M/100M/1000M Ethernet
- Remote access Web browser, Vi-Viewer4000, iPod, Android

5.3.7 Interface

- Keyboards x4, RS485 (can control multiple DVRs)
- Video via CAT5 Each keyboard has BNC video output
- Alarm Inputs 16-ch
- Alarm Outputs 4-ch relays
- Mouse USB (can control multiple DVRs)
- Backup USB 2.0
- RS485 dome control 4-ch, Pelco-D, Pelco-P and other protocols from Vi-K2A
- Coax dome control BBV
- GUI Graphical user interface can be controlled by Internal or external keyboard, mouse or mouse emulator

5.3.8 Power

- Power input IEC, 100~240VAC, 2A, 50~60Hz
- Power consumption 100W max

5.3.9 Environmental

- Temperature 0 to 35deg C operating, -10 to 40deg C storage
- Humidity 10 to 90% non-condensing

5.3.10 Dimensions & Weight

- Dimension 355mm x 105mm x 400mm (W x H x D)
- Weight 6kg

