

Datapath Product Guide




DATAPATH


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Multi-screen graphics and video technology solutions

Datapath is a UK manufacturer of PC based computer graphics and video capture hardware. Established in 1982 the company has specialised in this technology for over 20 years. Our extensive product range provides solutions for many wide and varied applications – including:



- Display wall controller hardware and software.
- Multi-screen desktop applications.
- Multiple video overlay windowing applications.
- RGB/VGA capture hardware.
- RGB Streaming.
- Video Matrix switch hardware.

What is a video or data wall?

We have all seen, at some time, a video wall constructed of TV monitors showing video, spread across all screens, to produce a large video image that can be viewed from long distances by many people. This is a traditional video wall and has been around for many years, being used mainly in entertainment applications, for displaying movie or TV pictures.

Over recent years, there has been an increase in demand for more complex video walls that, not only display standard video pictures but also show computer generated information and display other non-standard video formats.

The main advance in this technology is that the wall controller hardware is PC based and so the wall content can be controlled interactively and any standard Windows application program can be run and displayed. Datapath specialises in this technology, offering an extensive range of PC based PCI plug-in cards that enable you to build anything from a simple 4 screen display controller, using a single PCI card and desktop PC, to a highly complex data wall using multiple PCI cards and a high-end industrial PC.



The main components of any video or data wall consist of:

1. A number of displays arranged in single or multiple clusters.
2. A wall controller used to generate the display image.
3. Software to control the video wall display content.

Datapath provides a complete solution for your wall controller hardware and software

Wall Controller Applications OVERVIEW



Datapath offers a wide range of products for video and data wall display controllers. Many configurations are possible, to address the needs of today's display wall applications. This guide shows some of the possibilities and outlines the available product range.

A wall controller is required to provide the video signal outputs to the display wall. The display wall is typically made of DLP rear projection cubes, projectors, plasma displays, High Definition TV, LCD displays or standard CRT monitors. When specifying your wall controller the first thing to determine is the number of display channels required and the configuration of the wall (number of displays horizontally and vertically).

Datapath wall controllers operate using Windows XP Professional spreading the Windows desktop across the display wall. The desktop is seamless and the Windows operating system views the wall as one large display area. Any standard Windows application can be run and displayed anywhere on the wall. The wall behaves the same as a standard single screen PC running MS Windows. This is the simplest configuration for installations that are required to display Windows applications. Datapath wall controllers support up to 64 display channels.

Many wall controller applications also need to display other types of information, for example:

- Live video from standard video devices such as cameras, DVD players, TV tuners etc.
- VGA video sources from other PC's or RGB data from non-standard equipment.
- MPEG video files from either the wall controller's hard drive/CD drive or streaming video via a network connection.

Datapath offers solutions for all these requirements

Datapath also provides its Wall Control software, which gives the ability to layout and configure a display wall. Wall Control allows you to position and size standard Windows applications, live video windows and RGB/VGA windows. Layouts can be saved, recalled, and accessed remotely via a network connection from any other PC.

Datapath wall controller products allow you to build a wall controller using your own PC for small systems or to use one of our industrial PC controllers for larger configurations. The components required are as follows:

- Select one of the Vantage4 or iH4 range of PCI graphics cards to drive your display wall. Each Vantage4/iH4 will drive up to 4 displays and you can have a maximum of 16 Vantage4 cards or 10 iH4 cards in one PC. Decide how many displays are required for the wall and select the appropriate number of Vantage4/iH4 cards.
- Decide if you need to display live video and if so how many inputs are required and how many live video windows are needed on the wall.
- Determine if you need to display RGB/VGA video from other PC's or equipment, again, decide how many inputs are required.
- Once you have determined how many PCI cards are needed to provide the functionality required then select a suitable PC platform. For small systems requiring up to 5 PCI cards then normally a standard desktop PC will be suitable. Make sure the chosen PC has good cooling with a dedicated cooling fan for PCI cards. For larger controllers or, if you would like to purchase a preconfigured PC with cards and software pre installed, select one of Datapath's IPC industrial PC chassis.

Wall Control Software

Datapath also provides a Windows application program enabling easy configuration and set-up of your data/video wall controller.

Wall Control features:

Wall Control enables the visualisation of the video wall. Wall Control displays the entire wall layout in its local application window. The position and size of each window on the video wall is displayed in the application window. The user can interactively move and size the application windows.

- Control of Video Overlay, Mosaic and RGB window properties.
- Control of VisionSwitch cards in stand alone mode.
- Control of standard Windows application programs including Real VNC.
- Wall Control can be operated remotely on any PC via a network connection.
- Screen ordering utility.
- Save and re-call layout templates.
- Supports Crestron and AMX Controllers via RS232 using the Datapath COMport utility.
- Command line interface for custom applications.
- Available in French and Spanish.



Wall Control is available in three versions:

Wall Control – Free version.

Wall Control PRO-SK - Licensed version with a software key code.

Wall Control PRO-HK - Licensed version with a USB Key (Dongle).

Wall Controller PCI Card Selection Guide

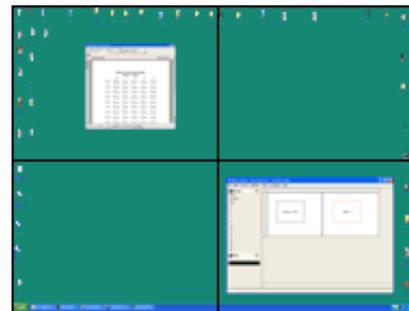
Step 1 - Select the right display card

You will need to choose the right PCI display card and accessories for your application. There are 4 display card options as follows:

Option 1:

iH4 or Vantage4 display card.

These cards operate under Windows XP Professional and spread the Windows desktop across the display wall. Any standard Windows application can be positioned and sized on the wall. If you only need to display Windows applications, then select the number of cards required to connect to your display wall. Each card supports up to 4 displays. The Vantage4 range supports higher resolution displays and provides higher quality video windows than the iH4.



Option 2:

iH4-PRO or Vantage4-PRO display card.

The PRO version of these cards provide the same features as the standard cards but also support 1 video overlay per display channel. The video windows can be positioned and sized anywhere on the wall. The cards also require a video input card, there are 4 options available depending on how many video inputs you need:

1. **VIM** – This card provides 4 composite video inputs or 2 S-Video inputs. The VIM supports up to 10 x iH4-PRO or 16 x Vantage4-PRO.
2. **VIM16** – This card provides 16 inputs for the Vantage4-PRO (Maximum of 16 Vantage4-PRO cards).
3. **VisionSwitch-H** - This card provides 16 composite video inputs or 8 S-Video inputs. VisionSwitch-H supports 4 x iH4-PRO.
4. **VisionSwitch32-H** - This card provides 32 composite or 16 S-Video inputs. VisionSwitch32-H supports up to 8 x Vantage4-PRO/iH4-PRO.

Graphics Card	Input Option	Max No of Video Inputs	Max No of Cards	Max No of Screens
Vantage4-PRO	Video Input Module (VIM)	4	16	64
Vantage4-PRO	VIM16	16	16	64
Vantage4-PRO	VisionSwitch32	32	8	32
iH4-PRO	Video Input Module (VIM)	4	10	40
iH4-PRO	VisionSwitch	16	4	16
iH4-PRO	VisionSwitch32	32	8	32



Option 3

IH4-DIG and Mosaic

This version of the iH4 contains a high speed 1Gb/s digital video bus that connects to the Datapath Mosaic card. This configuration is needed for applications that require more than one video window to be positioned on the same screen or where video windows overlap.

There are many configurations possible using the iH4-DIG and Mosaic cards. To determine how many cards are needed for your application, first decide how many video windows are required. Each Mosaic card supports up to 9 video windows. You can have a maximum of 4 Mosaic cards connected to an iH4-DIG card providing a maximum of 36 windows. Each window can be positioned and sized anywhere on the wall. The restrictions are a maximum of 9 windows on one screen and windows from different Mosaic cards cannot be positioned on the same screen. The Mosaic card can be connected to a maximum of 4 iH4-DIG cards. This can be increased to 8 when using the Mosaic Buffer Module

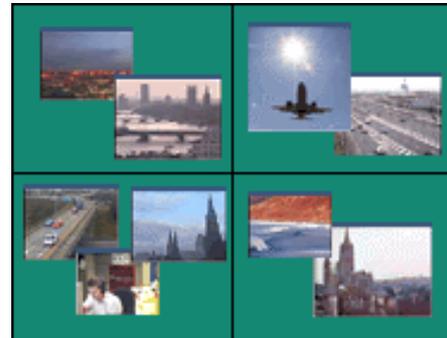
If you require more than 36 windows then this is possible by partitioning the wall into groups of 4 screens (2 x 2's). Each iH4-DIG in the system can have up to 4 Mosaic cards connected to it.

Further Mosaic Options

When using Mosaic each window can display 1 of 2 possible video inputs. These 2 inputs are dedicated to a single Mosaic window (Mosaic has a total of 18 inputs, 2 per window). If your requirements are that each Mosaic window can display any of the available inputs then this can be achieved by using the VisionSwitch-SA products with the Mosaic:

- **VisionSwitch-SA** - provides 16 video inputs and supports up to 16 Mosaic video windows.
- **VisionSwitch32-SA** - provides 32 video inputs and supports up to 32 Mosaic video windows.

For larger configurations, please contact Datapath Sales





Option 4:

Vantage4-SIP\iH4-SIP and Mosaic-SQ16

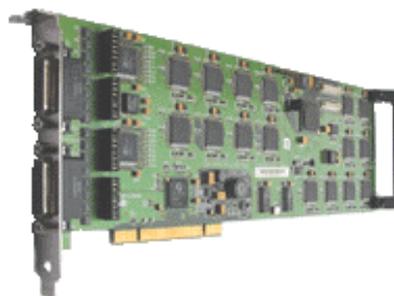
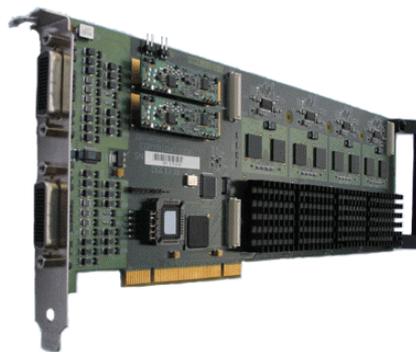
The Vantage4-SIP and iH4-SIP cards provide all the features of the DIG range plus four high performance SIP video overlay processors, each with 64Mb frame buffers.

These versions of the cards contain a high speed 5Gb/s SIP digital input port that connects to the Datapath Mosaic-SQ16 card.

By combining the Vantage4-SIP\iH4-SIP with the Mosaic-SQ16 you can have almost unrestricted video overlay capabilities. The Mosaic-SQ16 can capture up to 16 video channels which can be positioned and sized anywhere on the multi-screen desktop.

Restrictions:

- Maximum of 16 video windows on one screen.
- Maximum of 8 Mosaic-SQ16 cards per Vantage4-SIP\iH4-SIP card.
- Max of 64 video windows per graphics adapter.
- Max of 128 video windows per system.



Step 2 - RGB/VGA Capture

Do you require RGB/VGA display capture windows?

If you need to display RGB/VGA video from other PC's or other equipment on the display wall, firstly determine how many RGB/VGA channels are required and then select the number of VisionRGB-PRO cards.

The VisionRGB-PRO is available in both single and dual channel versions and up to 64 channels of RGB/VGA capture are supported. There are no restrictions on size or position of the RGB video windows. RGB windows are not necessarily real-time but update rates of up to 50 frames a second are possible.

If you are displaying multiple RGB windows then the update rate is shared between the number of channels (eg 2 channels would give 25 frames/sec and so on). The actual update rate achieved also depends on the scale factor and capture resolution of each RGB window.

If the windows are scaled down then the update rate will improve because there's less data to be transferred over the PCI bus. If RGB windows are up scaled there is no impact on the update rate. Update rates specified assume either 1:1 scaling or up scaled.

Typical update rates for a single channel:

Capture Resolution	Scale Factor	Update Rate
1024 x 768	1:1	50 frames/sec
1280 x 1024	1:1	35 frames/sec

VisionRGB-PRO1 – single channel RGB/VGA capture card.

VisionRGB-PRO2 – dual channel RGB/VGA capture card.



Step 3 - Select your PC

Now you have determined how many cards are required for your wall controller you will need to select a suitable PC in which to install the cards. Datapath offers a range of industrial PC's that provide from 2 PCI slots up to 26 slots:

- **IPC1**

An industrial PC with 7 PCI slots. Pentium 4 CPU.

- **IPC-X13**

Expansion chassis for the IPC1 providing a further 13 slots (total 19 slots, 1 slot in the IPC1 is used for an expansion card).

- **IPC1-PRO**

An industrial PC with 2 PCI slots. Dual Xeon CPU. Redundant PSU. Use the IPC-X13 to expand the number of PCI slots.

1off IPC-X13 provides a total of 14 slots.

2off IPC-X13 provides a total of 26 slots.

- **IPC-X13S**

The IPC-X13S provides the same expansion features as the IPC-X13 but with increased airflow for cooling and a larger Redundant PSU (1350 watt).



The following table shows the maximum recommended number of graphics cards for the IPC1, IPC-X13 and IPC-X13S chassis, allowing for power and cooling requirements:

	IPC1	IPC-X13	IPC-X13S
Vantage4	5	6	12
Vantage4-PRO	5	6	12
*Vantage4-SIP	3	3	7
iH4	6	13	13
iH4-PRO	6	13	13
*iH4-SIP	4	7	12

* = Also includes 1 x Mosaic-SQ16

Step 4

Now you have selected all the hardware components required for your wall controller, install the PCI cards into the PC and load the software supplied with the cards. Connect your wall to the display cards and use Wall Control to configure your wall format and to launch video and RGB overlay windows.

RGB/VGA Capture Applications



There is a growing demand for applications to capture RGB/VGA video sources.

Typical applications include:

- Capture and pre-view VGA video sources or any other RGB source. The VisionRGB-PRO will accept virtually any VGA or RGB video source. For example: PC, Mac, SUN, Linux machine or any non-standard equipment with an RGB video output.
- Capture RGB/VGA source and save the captured data to disk.
- Capture RGB/VGA and stream the captured video to other PC's.
- Record RGB data at high frame rates and save to your hard drive using VisionRecorder, which has adjustable compression for increased storage. Playback the recording using VisionPlayer.

The Datapath VisionRGB-PRO PCI card offers a solution for these applications.

There are both single and dual channel versions of the VisionRGB-PRO card. Multiple cards can be used if you have more than two RGB sources (Maximum 64 channels/32 cards).

For streaming or save to disk applications the VisionRGB-PRO is used with Windows Media Encoder® to compress and stream/save captured video. To replay use Windows Media Player®.

For preview applications, use the Datapath VisionRGB application program. This will allow the highest update rate and allow up to 64 channels of RGB preview. This application is also built into the Datapath Wall Control software for video wall systems. VisionRGB-PRO is optimised for operation with the Vantage4 and iH4 range of graphics cards for maximum update rates when previewing RGB sources.

RGB Pre-View



RGB Streaming



4-Port PCI Graphics Cards and Video Overlay Options



Vantage4 – PCI graphics card

- Multi-screen desktop applications.
- Video/data wall applications.
- Use up to 16 cards for a maximum of 64 displays.
- Spreads the Windows XP desktop across all screens.
- Analog VGA and DVI outputs.
- Resolutions up to 4 x 2048 x 1536 analog and 4 x 1600 x 1200 DVI.



Vantage4-PRO – PCI graphics card

- Multi-screen desktop applications.
- Video/data wall applications.
- Use up to 16 cards for a maximum of 64 displays.
- Spreads the Windows XP desktop across all screens.
- Analog VGA and DVI outputs.
- Resolutions up to 4 x 2048 x 1536 analog and 4 x 1600 x 1200 DVI.
- 4 super high quality video overlays, 1 per screen.
- PAL/NTSC/SECAM video decoders.
- Use with VIM-16 or VisionSwitch32 for video input options (16 inputs or 32 inputs).



Vantage4-SIP – PCI graphics card

- Multi-screen desktop applications.
- Use up to 16 cards for a maximum of 64 displays.
- Spreads the Windows XP desktop across all screens.
- Analog VGA and DVI outputs.
- 5Gb/s SIP digital input port for the Mosaic-SQ16, supporting 128 video channels per system.
- Up to 64 video windows when combined with the Mosaic-SQ16.
- Resolutions up to 4 x 2048 x 1536 analog and 1600 x 1200 DVI



iH4 – PCI graphics card

- Multi-screen desktop applications.
 - Video/data wall applications.
 - Use up to 10 cards for a maximum of 40 displays.
 - Spreads the Windows® desktop across all the screens.
 - Analog and DVI outputs.
 - Resolutions up to 4 x 1600 x 1200 analog and 4 x 1280 x 1024 DVI.
-



iH4-PRO - PCI graphics card

- Multi-screen desktop applications.
- Video/data wall applications.
- Use up to 10 cards for a maximum of 40 displays.
- Spreads the Windows® desktop across all the screens.
- Analog and DVI outputs.
- Resolutions up to 4 x 1600 x 1200 analog and 4 x 1280 x 1024 DVI.
- 4 High quality video overlays, one overlay per screen.
- PAL/NTSC/SECAM video decoders.

Use with VIM, VisionSwitch or VisionSwitch32 for video input options (4 inputs, 16 inputs and 32 inputs).



iH4-DIG – PCI graphics card

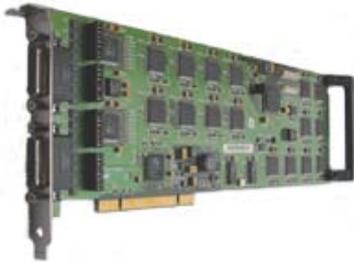
- Multi-screen desktop applications.
 - 1Gb/s digital video bus interface to the Mosaic card.
 - Up to 36 video windows when combined with the Mosaic card.
 - Use up to 10 cards for a maximum of 40 displays.
 - Spreads the Windows® desktop across all the screens.
 - Analog and DVI outputs.
 - Resolutions up to 4 x 1600 x 1200 analog and 4 x 1280 x 1024 DVI.
-



iH4-SIP – PCI graphics card

- Multi-screen desktop applications.
- Use up to 10 cards for a maximum of 40 displays.
- Spreads the Windows XP desktop across all screens.
- Analog VGA and DVI outputs.
- 5Gb/s SIP digital input port for the Mosaic-SQ16, supporting 128 video channels per system.
- Up to 64 video windows when combined with the Mosaic-SQ16.
- Resolutions up to 4 x 1600 x 1200 analog and 1280 x 1024 DVI.

Video Input Devices



Mosaic-SQ16 – Multiple video window add-on card for the iH4-SIP and Vantage4-SIP.

- 16 video inputs, PAL, NTSC, SECAM, S-Video.
- Virtually unrestricted video capture capabilities.
- Up to 8 Mosaic-SQ16 cards per iH4-SIP and Vantage4-SIP.
- 16 high quality video decoders and video down scalers.
- On board 32x16 video matrix switch.



Mosaic – Multiple video window add-on card for the iH4-DIG.

- 9 video inputs, PAL, NTSC, SECAM, S-Video.
- Video windows can be positioned anywhere across the multi-screen display.
- Up to 4 Mosaic cards per iH4-DIG providing 36 video overlays.
- Real time video windows in true colour.
- Video up and down scaling to any size.
- Up to 16 Mosaic cards supporting 144 video windows per system.



VIM – Video Input Module for the iH4-PRO.

- Provides 4 composite video inputs or 2 S-Video inputs.
- A range of versions are available depending on the number of iH4 cards you wish to connect to the VIM:

VIM-1 connects to 1 iH4-PRO card
VIM-4 connects to 4 iH4-PRO cards
VIM-6 connects to 6 iH4-PRO cards
VIM-9 connects to 9 iH4-PRO cards

- 2 types of input connectors are available, either BNC or RCA. When ordering please specify which type you require, e.g. VIM-4 BNC.

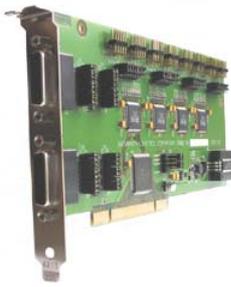


VIM16 – Video Input Module for the Vantage4-PRO

- Provides 16 analog video inputs to each set of Vantage4-PRO cards.
- Connects to 2 sets of 8 or 1 set of 16 Vantage4-PRO cards (total of 16 cards per VIM16).
- A range of versions are available depending on the number of Vantage4 cards you wish to connect to the VIM:

VIM16-1 connects to 1 Vantage4-PRO card
VIM16-16 connects to 16 Vantage4-PRO cards

- Panel-16 or panel-16A can be provided as a replacement for the BNC16-Cable.



VisionSwitch32-H – Add-on video switch card for the iH4-PRO.

- Provides 32 video inputs.



VisionSwitch32-SA - General purpose 32 x 32 video matrix switch.

- Use with the Mosaic to allow each Mosaic window to display any of the 32 available inputs.



VisionSwitch-H – Add-on video switch card for the iH4-PRO.

- Provides 16 video inputs.



VisionSwitch-SA - General purpose 16 x 16 video matrix switch.

- Use with the Mosaic to allow each Mosaic video window to display any of the 16 available video inputs.



Panel16A - Accessory for Mosaic or VisionSwitch

- The Panel16A contains 16 BNC sockets mounted on a 1U 19" panel and is supported with a cable that connects to the Mosaic or VisionSwitch allowing easier access to both input and output BNC connectors.
- 1 Panel16A will provide either 16 inputs or 16 outputs.

RGB/VGA Devices



VisionRGB-PRO1 - Single channel RGB/VGA capture card.

- Captures any RGB/VGA resolution up to 1600 x 1200.
- Supports multiple cards.
- 32 RGB capture channels (32 cards).
- Full integration with Datapath multi-screen video walls.
- Windows streaming video drivers available for Windows Media Encoder® and Windows Media Player®.
- Use VisionRecorder to record captured frames to disk for subsequent playback using VisionPlayer.



VisionRGB-PRO2 - Dual channel RGB/VGA capture card.

- Captures any RGB/VGA resolution up to 1600 x 1200.
- Supports multiple cards.
- 64 RGB capture channels (32 cards).
- Full integration with Datapath multi-screen video walls.
- Windows streaming video drivers available for Windows Media Encoder® and Windows Media Player®.
- Use VisionRecorder to record captured frames to disk for subsequent playback using VisionPlayer.



Video Wall Controller PC's



IPC1 - 4U 19" metal industrial PC

- 3.0Ghz Pentium 4 CPU.
- 1Gb memory (upgradeable).
- 160Gb Hard Drive Fast IDE.
- DVDRW drive.
- Ethernet, USB, Serial, Parallel ports.
- Dual Redundant PSU 350W + 350W.



IPC1-PRO - 4U 19" metal industrial PC

- Dual Intel® Xeon CPU 3Ghz, 800 Mhz FSB.
- 1 GB memory (upgradeable).
- Dual mirrored removable 160Gb Hard Drive.
- DVDRW drive, floppy drive.
- Ethernet, USB, Serial, Parallel ports.
- Dual Redundant PSU 350W + 350W.



IPC-X13 – 4U 19" PCI expansion chassis

- Expands the PCI bus from the IPC1 or IPC1-PRO.
- 13 free 32bit 33Mhz PCI slots.
- 2 dedicated cooling fans for plug-in cards.
- 1M expansion cable.
- Use two IPC-X13 chassis to provided 26 PCI slots.
- Compatible with all Datapath cards.
- Dual Redundant PSU 350W + 350W.



IPC-X13S – 6U 19" PCI expansion chassis

- Expands the PCI bus from the IPC1 or IPC1-PRO.
- 13 free 32bit 33Mhz PCI slots.
- 1M expansion cable.
- 1350 watt Redundant PSU.
- 3 x High flow rate cooling fans.
- Separate cooling for PSU.

IPC Components

Datapath are also able to provide a range of IPC components:



DFI Motherboard

Specially designed Datapath BIOS.
Compatible with all Datapath PCI Cards.
7 x PCI slots.



IPC1 – Chassis only



PRT PRA 350MV RPSU

350 + 350W Redundant PSU.



Magma 13 slot PCI Expansion backplane



IPC-X13S chassis only



1350W Redundant PSU

Stand Alone Video Wall Controllers

The Datapath VQS01 is a display wall controller, which connects to the VGA output of any PC and displays the image across 4 displays. Each display shows 1/4 of the VGA image in a 2 x 2 format.



VQS01 - Stand alone wall controller

- Accepts any VGA or DVI input.
- Splits the incoming VGA picture into 4 (2 x 2).
- 4 VGA or DVI outputs each displaying a quarter of the input image. Maximum input resolution is 2048 x 1536.
- Maximum output resolution is 4 x 1024x768.



Datapath Accessories



DVI-S Cable

Vantage4 and IH4 two way DVI splitter cable.



RGB-S Cable



HDTV-S-Cable

Vantage4 analog TV splitter cable for High Definition TV.

Supports:

- 4 x Composite
- 4 x S-Video
- 4 x YprPb for HDTV



VIM

For feeding composite video or S-Video to the iH4 and Vantage4 graphics adapters.

DVI-VGA Adapter

Used to convert a VGA connector to DVI or DVI to VGA.



BNC16 Cable

16 way BNC splitter cable for use with the Mosaic and VisionSwitch range.



SDVI-D-5M Cable

High quality 5 metre DVI-D cable.



VSRC-Set

Ribbon cable set for VisionSwitch comprising of:



Used to connect 2 BNC's i.e. to connect an output from VisionSwitch to a Mosaic input.

Cable-16

Used to connect the panel 16A to a Mosaic or VisionSwitch card.



MBM-H2 Set

Mosaic Buffer Module with ribbon cables to connect the Mosaic to 5 or 6 iH4-DIG cards.



MBM-H4 Set

Mosaic Buffer Module with ribbon cables to connect the Mosaic to 7 or 8 iH4-DIG cards.



SIP-Cable

Used to connect the Vantage4/iH4-SIP cards to the Mosaic-SQ16.

Connects up to 10 iH4-SIP cards.

Connect up to 16 Vantage4-SIP cards.



Panel-16A

4U Panel with 16 BNC sockets and PCB with connection for Cable-16.

For all your multi-screen graphics and video technology solutions contact Datapath at sales@datapath.co.uk or telephone +44 1332 294441

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