

WALL CONTROLLER USER GUIDE

VSN900 and VSN1100
Series Controllers

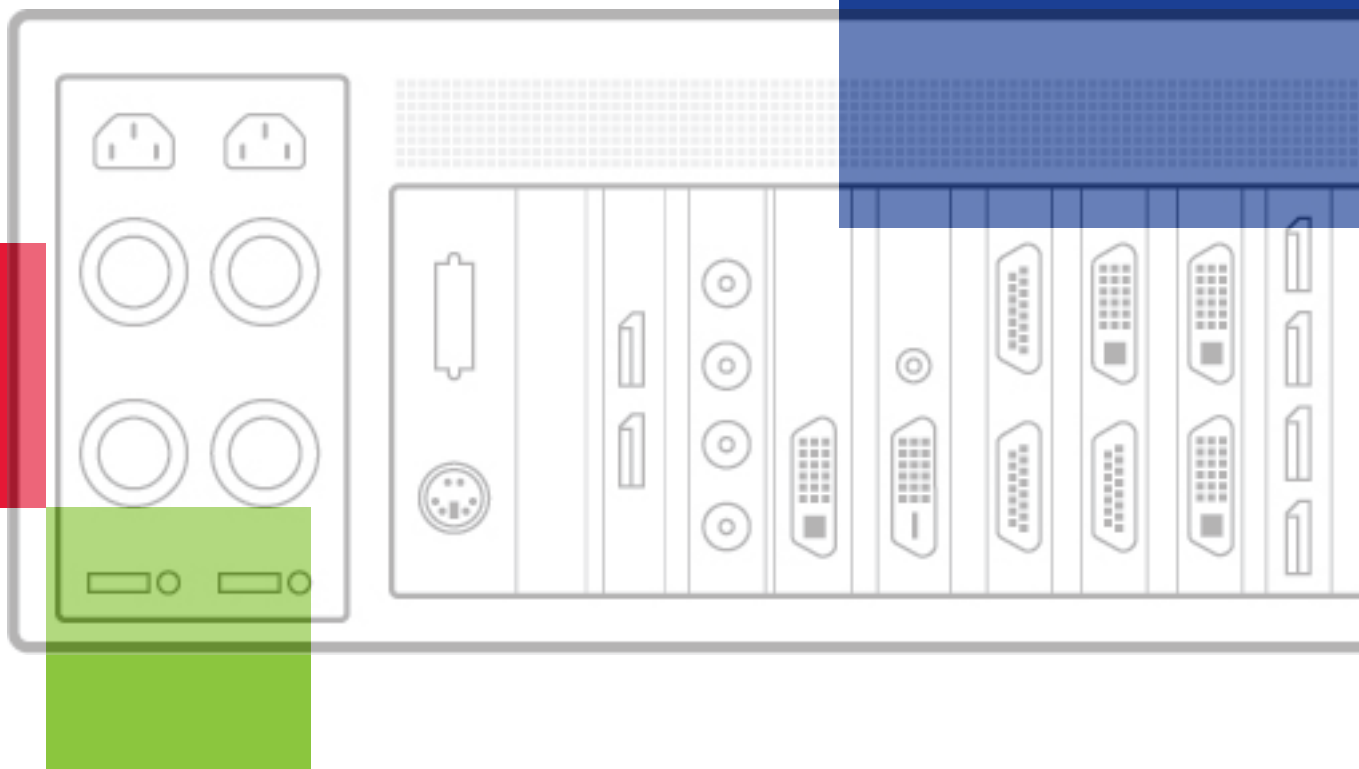


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Quick Start Guide

A version of the Quick Start Guide is included below for your convenience.

Contents

Main System

- VSN Main chassis
- Mouse/Keyboard
- Recovery Media
- Cables/Adapters
- Accessories Pack
 - Chassis Key
 - MAC Address Labels

Expansion Unit

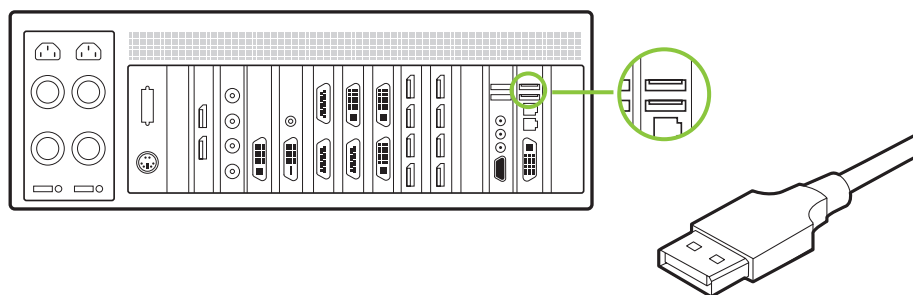
- VSN Expansion chassis
- ExCable/HLink card
- Accessories Pack
 - Chassis Key
 - HLink-G3 Card
 - SLink-G3 Card
 - Ex-Cable-G3

Note: VSN Expansion units may have been purchased as part of a large system or ordered separately.

Each Datapath system is custom built therefore the number and type of input and output cards will differ from system to system.

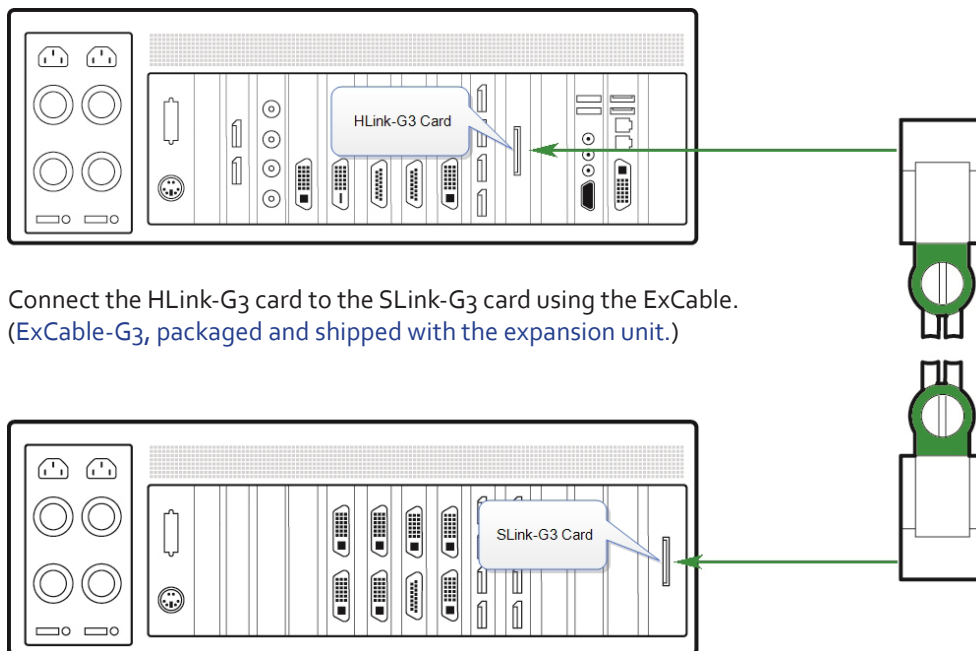
Accompanying this Quick Start Guide are PCIe card product leaflets which give details on how the cards are installed and any accessories supplied with them.

Step 1 - Keyboard and Mouse

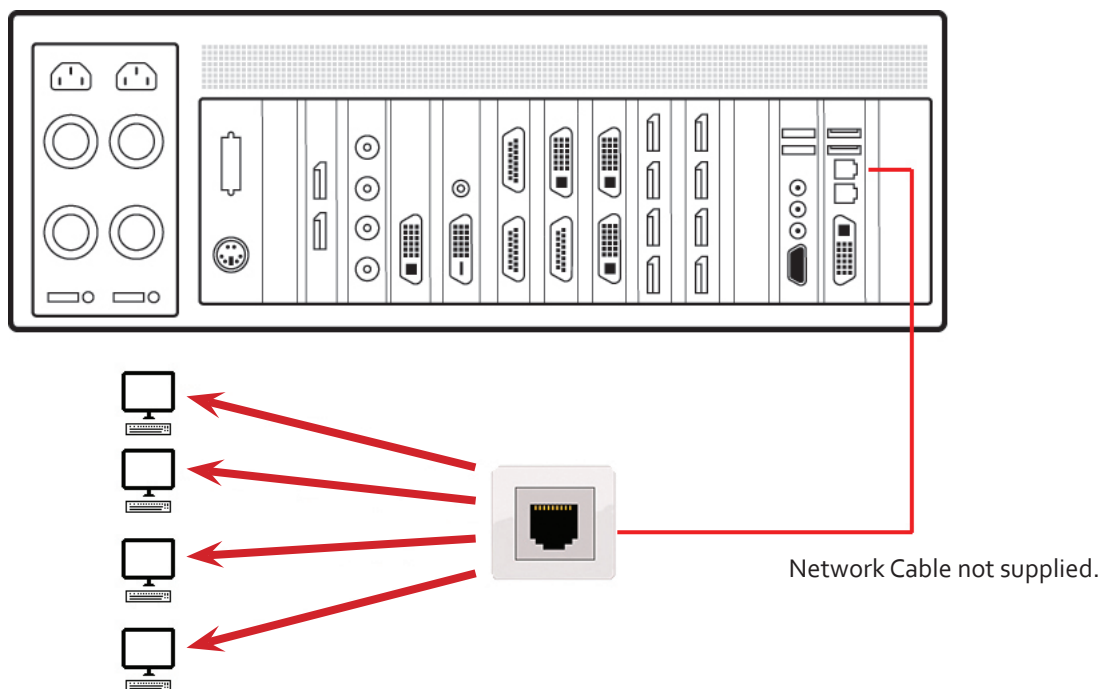


Connect Keyboard and Mouse to USB Ports.

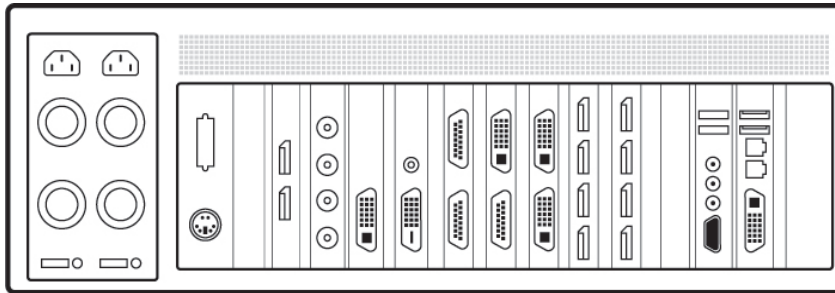
Step 2 - Connect Expansion Chassis (Optional)



Step 3 - Connect to a Network (Optional)



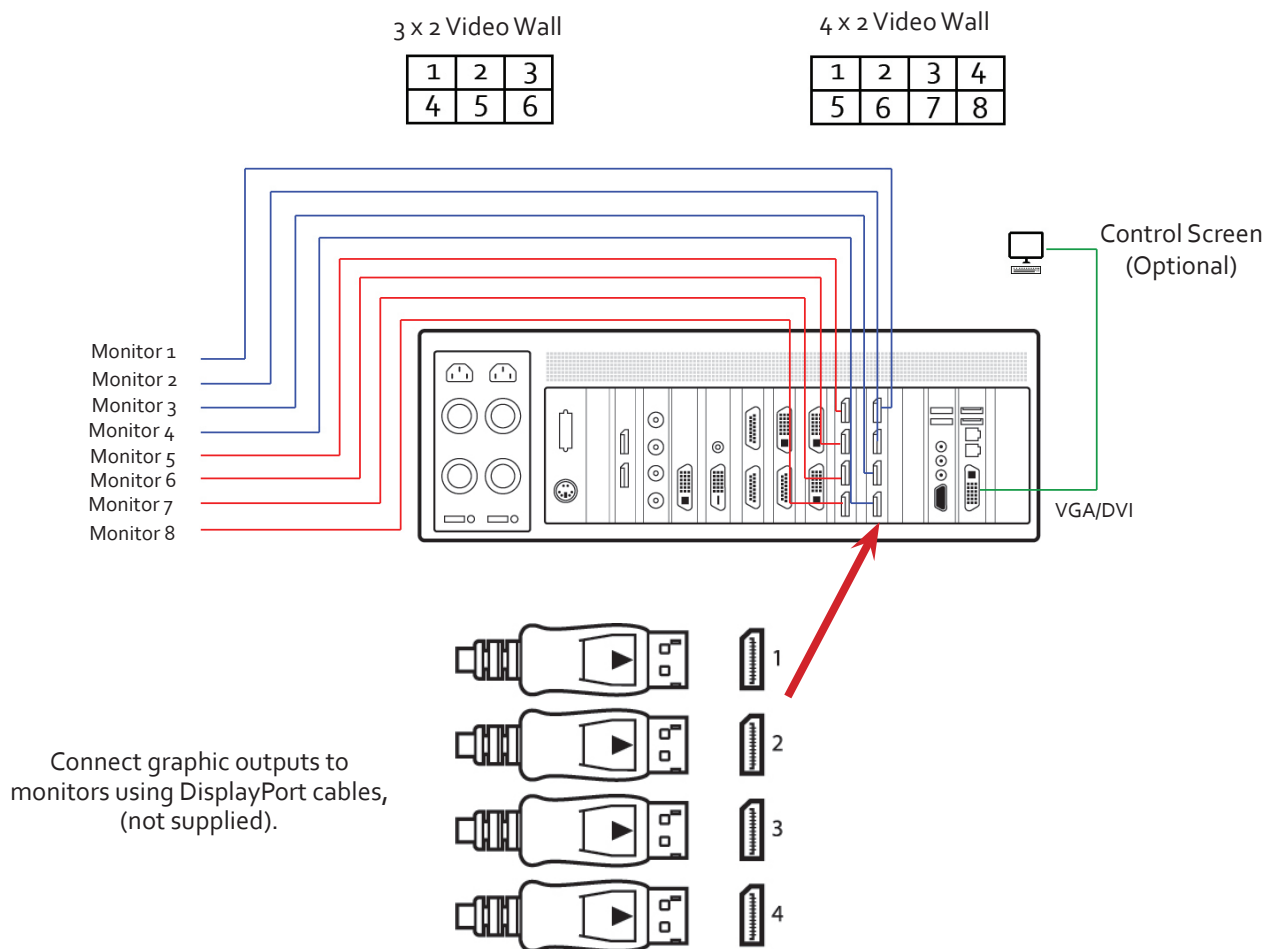
Step 4 - Connect Input Source



Each Datapath system is custom built. The number and type of inputs will differ from system to system.

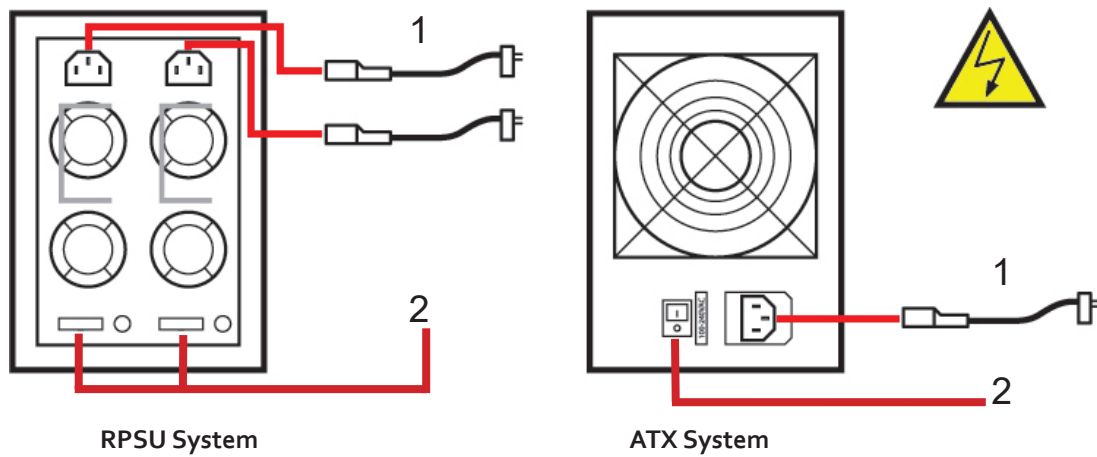
Contained within the documentation pack are PCIe card product leaflets which give details on how the cards are connected.

Step 5 - Connect Control Screen (Optional) and Monitors

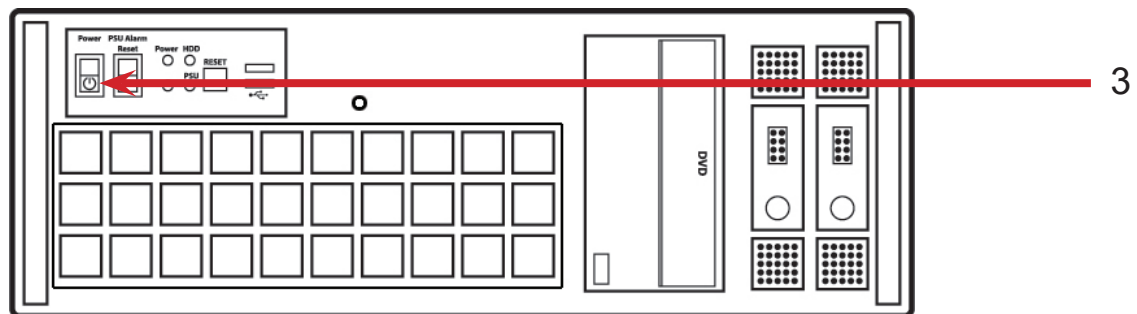


Many of our wall controllers are configured to use a control screen prior to leaving the factory. If required, connect the control screen to the SBC as shown above. If a control screen is not required, the BIOS settings may require changing. See User Guide for detailed instructions.

Step 6 - Powering up the System



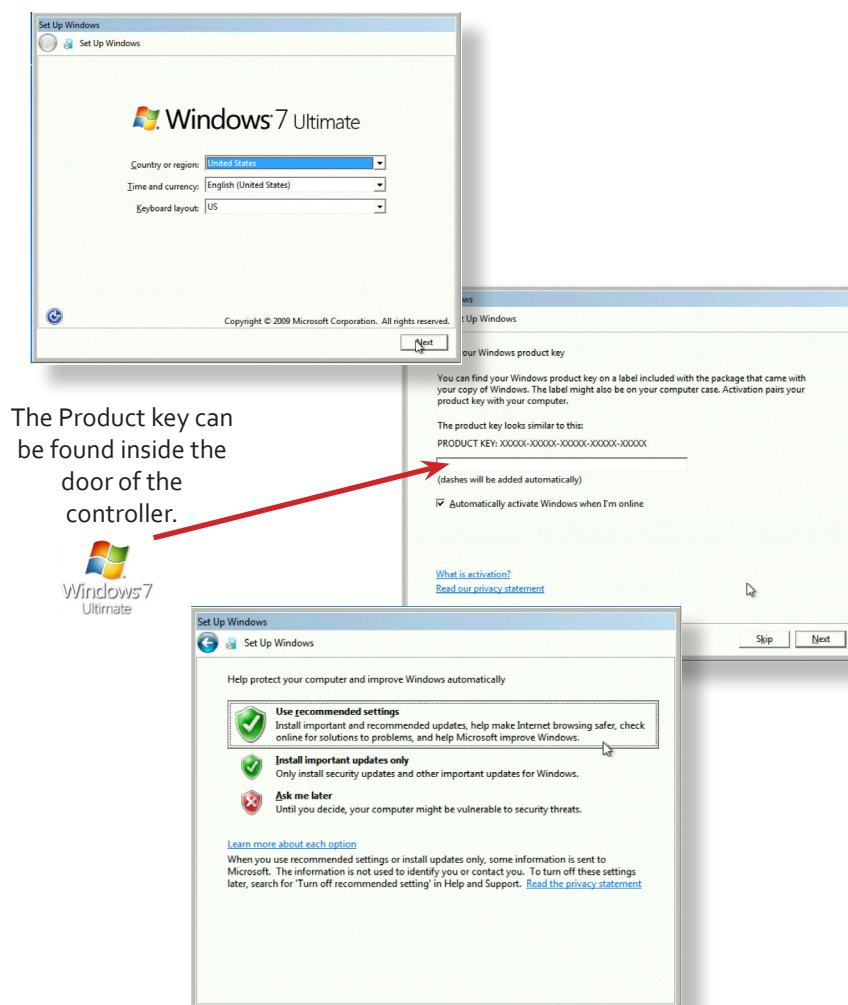
- 1 Connect power cables then plug into a mains supply.
- 2 Switch on the power supply units.



- 3 Switch on the system.

If you have a VSN Expansion Chassis connected to the main unit the power supply units on the expansion chassis should be switched on prior to the main unit. There is no requirement to switch on the system (3) on an expansion chassis.

Step 7 - Windows®7 Setup



Computer Name:

It is recommended that only Internet-standard characters are used in the computer name. The standard characters are the numbers 0 through to 9, upper and lower-case letters from A through to Z and the hyphen character. Computer names cannot consist entirely of numbers, contain spaces or use special characters such as: < > ; : " ? * + = \ | ? , .

Step 8 - Activate Windows®7



Start | Computer | Properties | Activate Windows now.

Select the appropriate method available.

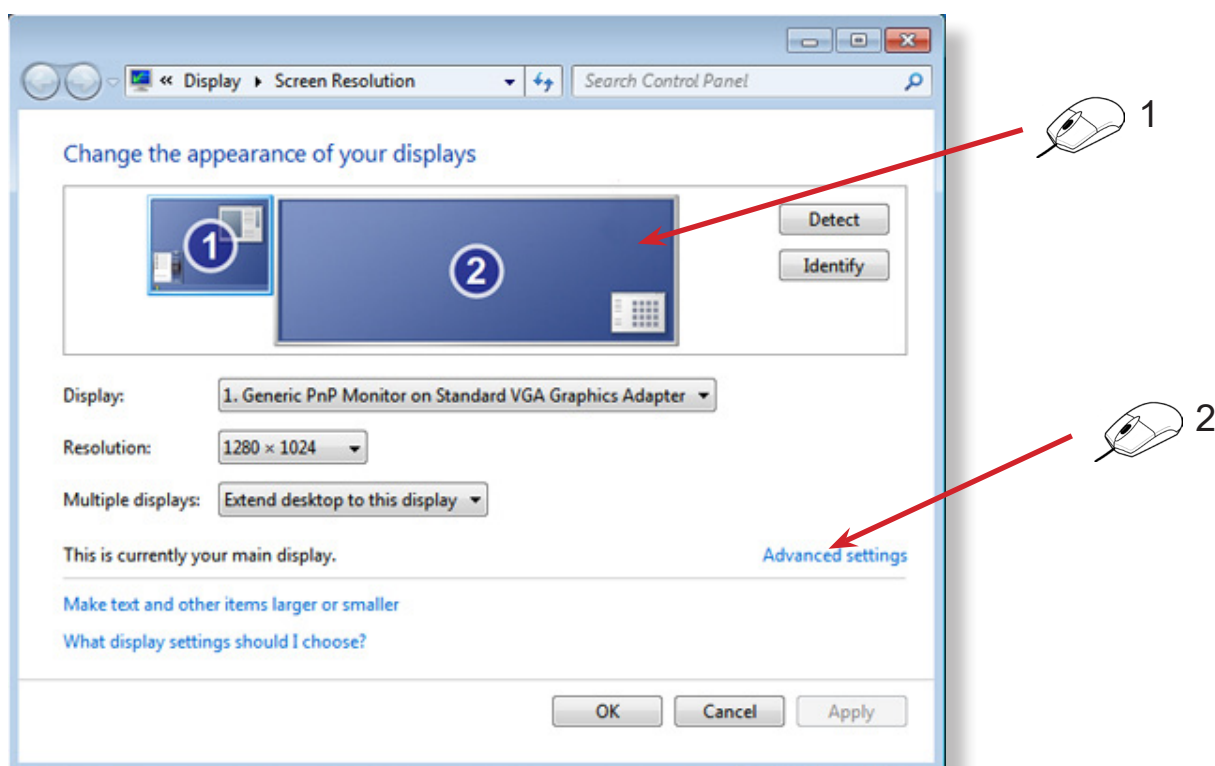
To view the Product Key, open the front door panel. The Product Key label is displayed on the front panel of the system.

Step 9 - Display Setup

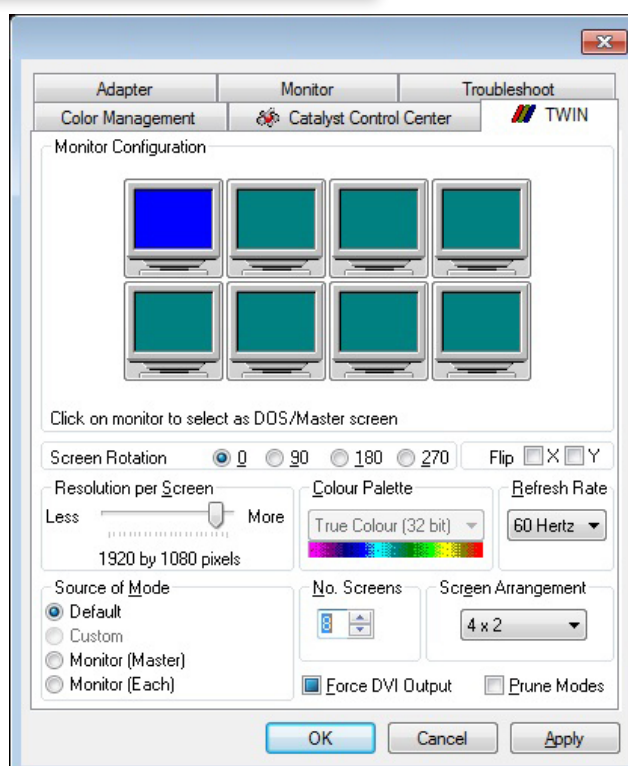
All Datapath wall controllers have pre-configured settings for the wall layout and screen resolution. Change settings using the TWIN tab:



Start | Control Panel | Appearance and Personalization | Adjust screen resolution.



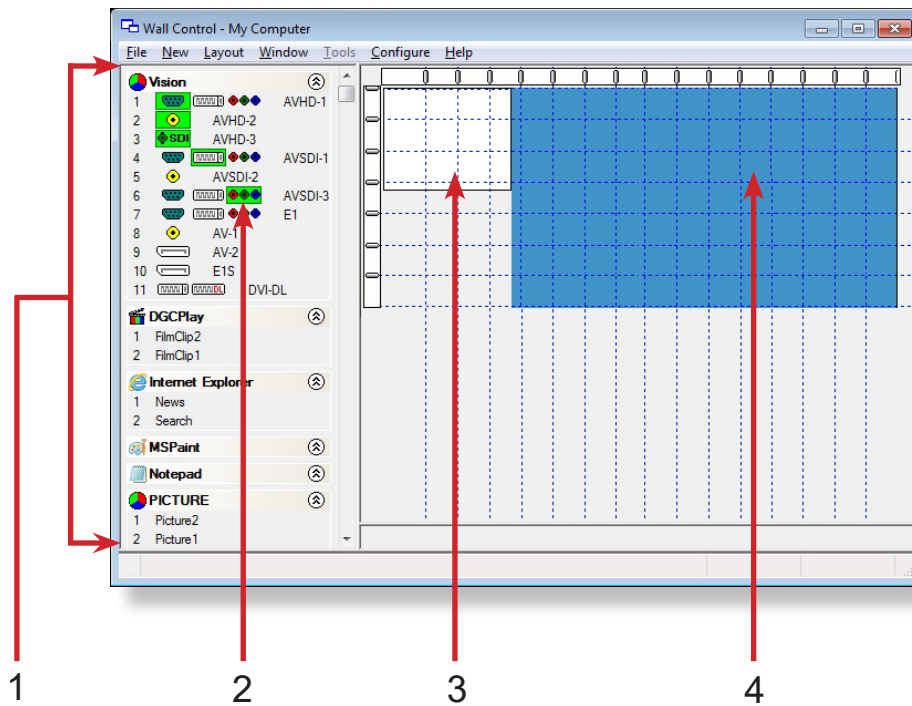
3 →



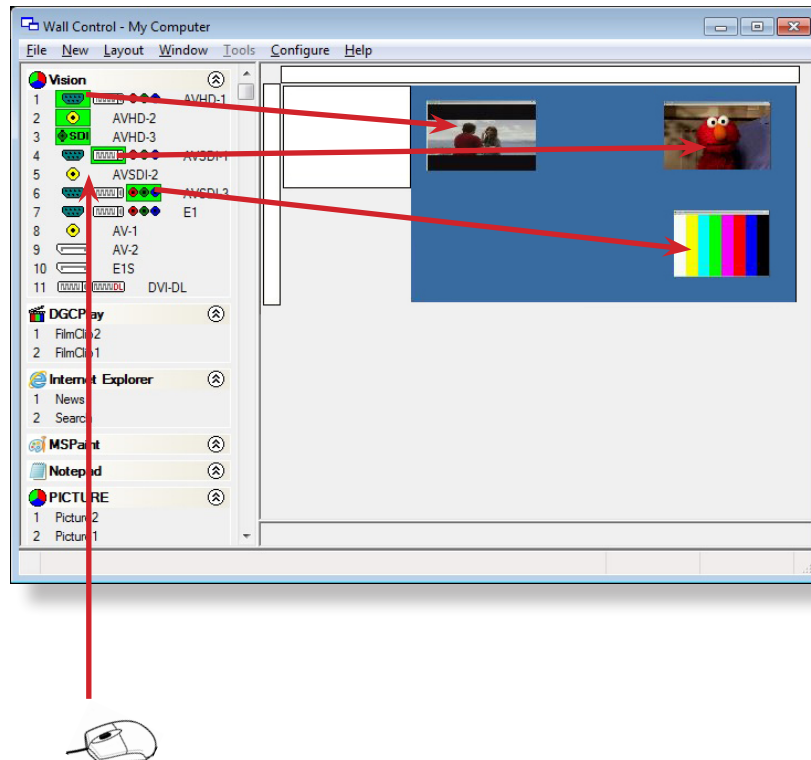
Step 10 - Wall Control (Optional)



Start | All Programs | Wall Control | Wall Control-My Computer



1	The Icons displayed in the application toolbar identify which type of source is available to each input
2	Icons highlighted green indicate an active capture for that particular input.
3	Representation of the control screen if one is being used.
4	Representation of the video wall desktop.



To open a video window click and drag an active capture into the Wall Control application.

Use the Help Menu for a comprehensive guide on the features of the Wall Control application.

Chapter 1 - Introduction

1.1 Introduction

Congratulations on your purchase of the Datapath Wall Controller system. The wall controller has been manufactured and tested to the highest standards offering unparalleled quality and reliability. The aim of this user guide is to assist you through the installation of the system safely and effectively and act as a reference guide for future use. Do not switch on the system until all the relevant cables have been connected.

1.2 Systems

The systems covered by this user guide are the VSNg00 and the VSN1100 video wall controllers and expansion chassis ranges.

1.3 How the User Guide is Organised

The user guide is broken down into chapters and each chapter into sections. Chapters, sections and pages are numbered individually. Pages are numbered in Arabic numerals with the exception of the cover page (no numbering).

1.4 Fonts and Symbols

1.4.1 Fonts

The font used throughout the user guide is Corbel however the following font styles mean:

Bold = Used to describe menu titles, buttons in software or elements that you must type exactly as shown in the Command Line Interface

Ellipsis (...) - Parameter that can be repeated several times in a command line.

Between brackets ([]) - Optional items.

Between braces ({}) - Set of choices (separated by |) from which you must choose only one.





Italic = Information that must be supplied by the user

`Courier` = Indicates code or program output.

[Blue Underlined](#) = Indicates a hyper-link. Some hyper-links may be linked to live websites.

1.4.2 Symbols

Symbols are used throughout this user guide to assist the user in quickly identifying important safety information and notes.

	Yellow triangle indicates that failure to observe the instructions could result in injury and/or damage to the system.
	Lifting precautions should be considered.
	White arrow in a blue box indicates a useful tip.
	White exclamation mark in a blue box indicates important information.

1.5 Terminology and Definitions

1.5.1 Backplane

Datapath manufactures types of backplanes; the Express9 Gen 3 (9 slots) and the Express11 Gen 3 (11 slots). The Express 9 Gen 3 is used in the VSN970/990 and the VSN900X expansion chassis and the Express 11 Gen 3 is used in the VSN1170/1190 and the VSN1100X expansion chassis.

The backplanes use advanced PCI Express switches to create a high bandwidth fabric that connects up to 9 or 11 PCI Express plug in cards in a single system. This system can be expanded to create more PCI Express slots using the VSN900x/1100X expansion units.

1.5.2 BIOS

Basic Input/Output System: Used during system boot up to initialise and test system hardware and load the operating system. Each BIOS is specifically designed to work with a particular motherboard.

1.5.3 Command Line Interface

Preferred means by advanced users of issuing commands and controlling an application or operating system. Programs with a Command Line Interface are generally considered easier to automate via scripting.

1.5.4 Control Screen

Some systems are shipped with the BIOS configured to boot the system off the onboard graphics device. This output can then be used as the Control Screen for a typical video wall. The content of the control screen is not displayed on the video wall desktop and can be used to host the Wall Control application window.

1.5.5 SBC

A Single Board Computer built on a single circuit board. SBC's in the VSN970/990/1170/1190 are plugged into the PICMG1.3 slot on the Express9 and Express 11 backplanes

1.5.6 SDK

Software Development Kit: A set of software development tools which allows the creation of certain applications

1.5.7 Wall Control (Optional)

An optional software application for controlling and managing Vision, IP-Camera and third party application windows on a Datapath Wall Controller. Providing a graphical representation of the video wall and a toolbar through which to manipulate all available input sources and applications. Can also be used offline.

1.5.8 Wall Monitor

A software application that enables the user to monitor the temperatures and voltages of system components.

1.5.9 Screen Order

The order in which the screens appear on the display wall.

1.5.10 SQX

SQX is Datapath's collective name for its video streaming and compression technologies.

Chapter 2 - Safety



2.1 Safety Precautions

To prevent damage to your Datapath product or injury to personnel operating the equipment, please read the following safety precautions prior to operation. These instructions should be made available to all those who will use and operate Datapath products.

2.1.1 Power Supply

All Datapath products require a mains power supply. This power supply must be disconnected when equipment is being upgraded or relocated.

2.1.2 Cables

Do not expose cables to any liquids; doing so may cause a short circuit which could damage the equipment. Do not place heavy objects on top of any cables as this can cause damage and possibly lead to exposed live wires.

2.1.3 Ventilation

All computer equipment should be located in a well ventilated area. All ventilation holes on the computer casing must be kept clear of any obstruction at all times. Failure to do so will result in the system over heating and damaging your equipment.

2.1.4 Working Environment

The equipment should be located in an environment free from dust, moisture and extreme changes in temperature and should be placed on a stable and solid work surface. Liquids (hot/cold drinks etc) should not be placed near the equipment as spillage could cause serious damage.

2.1.5 Gas/Flammable Liquids

Electronic equipment should never be used in the presence of gas or any flammable liquid, doing so could result in an explosion or serious fire.

2.1.6 Smoke/Unusual Smells

Should you notice smoke or unusual smells being emitted from your system, turn off and unplug the system from the mains supply. The system should then be passed to a qualified technician for inspection. Continued operation could result in personal injury and damage to property.

2.1.7 Maintenance

Apart from what is detailed in this user guide, maintenance should only be carried out by competent technicians, any Datapath plug-in cards that are physically damaged should be returned to Datapath for repair using Datapath RMA procedures.

2.1.8 Replaceable Batteries

Caution: Risk of explosion if batteries are replaced by an incorrect type. Dispose of used batteries according to the local laws / regulations and manufacturer's instructions.

2.2 Rack Mount Safety Instructions

2.2.1 Temperature

If VSN900/1100 systems are to be installed in a closed or multi-unit rack assembly, the installation should be such that the amount of air flow required for safe operation of the equipment is not compromised. The operating ambient temperature of the rack environment should be maintained below 35 degrees centigrade under all conditions. Appropriate cooling arrangements should be built into the cabinet to ensure that this specification is maintained.

2.2.2 Mechanical Loading

Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.

2.2.3 Circuit Overloading

Consideration should be given to the connection of the equipment to the mains supply circuit and the effect that overloading of the supply might have on any over-current protection or supply wiring. Appropriate consideration of equipment nameplate ratings should be used.

2.2.4 Reliable Earthing

Reliable earthing of all rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g. use of power strips).

2.3 Unpacking and Initial Inspection

2.3.1 Unpacking



The system is heavy; lifting precautions should be considered.

To unpack the system follow the instructions provided on the outside of the packaging. All packaging materials should be retained for future transit.

2.3.2 Initial Inspection

All systems are carefully prepared for shipment and every effort is made to ensure you receive the product in pristine condition. On receipt, you should carefully inspect the outer packaging for any transit damage i.e. any signs that the system may have been dropped etc.

Use the packing list enclosed to establish that all the items are present. Should any items from the packing list be missing, contact Datapath for further instructions.

Check the chassis for damage that could have an adverse affect on the operation of the system or could cause injury to the operator. Should there be any physical damage to the power supply unit, for example damaged power sockets or exposed wiring do not connect to a power source, contact Datapath for further instructions.

Chapter 3 - General

3.1 Overview

Datapath's VSN900 and VSN1100 systems are powerful video wall controllers, capable of delivering Ultra High Definition video across large, multi-screen display installations. For use in a host of environments, from CCTV security suites to sports stadia, and from military installations to utility management centres. Fully compatible with Datapath's world leading portfolio of PCI Express video capture and graphics cards that offer Ultra High Definition video for storage and display, including the ability to capture HDCP sources without any display restrictions.

Each system has been designed for use in demanding control room environments. Each component has been subjected to rigorous testing to ensure the highest levels of performance and reliability.

In summary:

- High performance and reliability in demanding conditions
- Suited for 24/7 applications
- Can be operated via a network
- PCIe switched fabrics enables systems to be expanded using additional expansion chassis
- Wall Control software (optional) - Display video on the desktop in real time using an array of features
- Wall Monitor software (optional) - Provides monitoring of the temperature and voltage sensors on system components

3.2 Systems in the VSN900 and VSN1100 Range

	Features							
Systems	Express 9 Backplane	Express 11 Backplane	SBC 3	SBC 4	Intel® Core i7	Dual Intel® Core Xeon	RPSU	ATX
VSN970*	x			x	x		x	x
VSN990	x		x			x	x	
VSN1170		x		x	x		x	
VSN1190		x	x			x	x	
VSN900X*	x						x	x
VSN1100X		x					x	

* Available with either and RPSU or ATX power supply.

3.3 Associated Output/Input Cards and Related Products

The following table lists the range of Datapath products associated with the VSN900/1100 range of video wall controllers:

Product	Description
ImageDP4	Quad output DisplayPort graphics card.
ActiveSQX	Dedicated IP Streaming decoding card.
VisionSC-DP2	Dual channel, 4K UHD DisplayPort capture card.
VisionSC-SDI4	Four channel 3G-SDI video capture card.
VisionSC-HD4+	Quad HDMI video capture card.
VisionAV-HD	Four lane PCI Express capture card with 2 x HD DVI-I and 1 SD channels.
VisionAV-SDI	Four lane PCI Express capture card with 1 x HD DVI-I, SD, SDI channels.
VisionHD4	Eight lane PCI Express capture card with four independent DVI-I HD channels.

VisionRGB-E1s	Single channel HD video capture card.
VisionAV	Single Channel HD and single channel SD video capture card.
VisionRGB-E2s	Dual channel HD video capture card.
VisionDVI-DL	Single channel Dual-Link video capture card.
VisionSD4+1s	Video capture card with four channels of SD and one of HD.
VisionSDI2	Dual channel HD-SDI video capture card.
VisionSD8	Eight channel SD video capture card.
HLink-G3	Host link card for Gen.3 expansion systems.
SLink-G3	Slave link card for Gen.3 expansion systems.
ExCable-G3	Copper cable Gen.3 for expansion systems.
HLink-Optical	Host link card for optical linked expansion system.
SLink-Optical	Slave link card for optical linked expansion system.
ExCable-Optical	Locking optical cable available in 50m and 100m lengths.

We are constantly updating our product portfolio, for the latest details on our full product range please visit our website:
www.datapath.co.uk

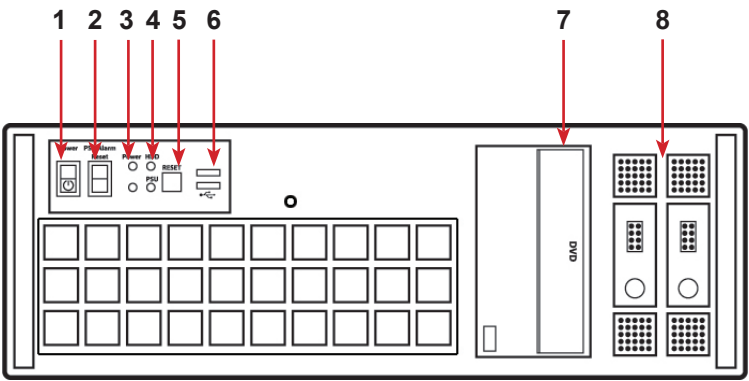
3.4 Product Datasheets

Product datasheets are available to download from www.datapath.co.uk

Chapter 4 - Hardware

4.1 VSN970 / VSN1170 Chassis

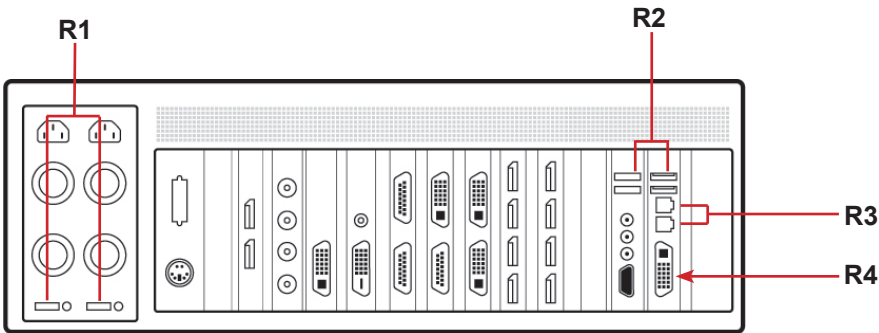
4.1.1 Front



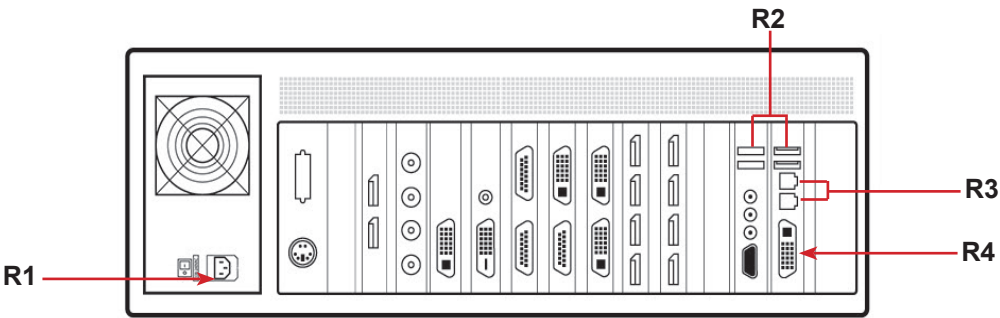
Front Panel

1 = Power, on-off	5= Reset Button
2= PSU Alarm Reset	6= USB Ports
3= Power LED	7= DVD +RW
4= HDD LED	8= Removable Hard Drives

4.1.2 Rear



Rear Panel - RPSU

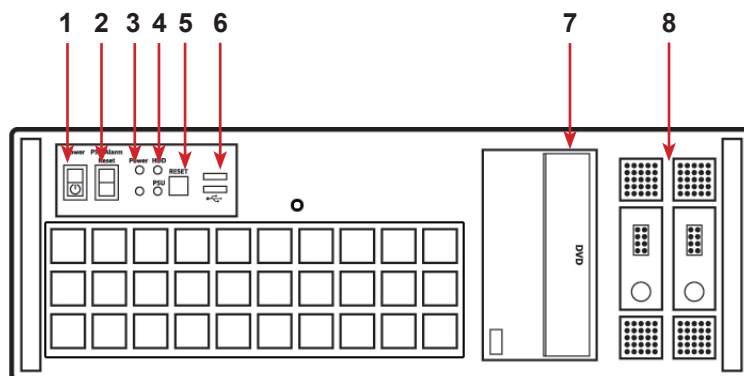


Rear Panel - ATX

R1= Power Switch	R3= Ethernet Ports
R2= USB Ports	R4= DVI-I Output

4.2 VSN990 / VSN1190 Chassis

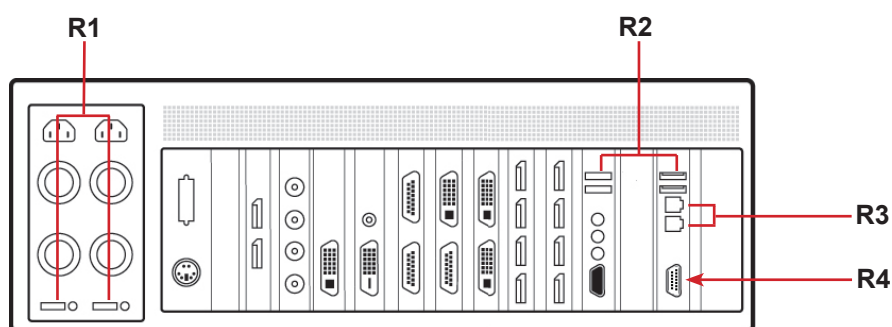
4.2.1 Front



Front Panel

1 = Power, on-off	5= Reset Button
2= PSU Alarm Reset	6= USB Ports
3= Power LED	7= DVD +RW
4= HDD LED	8= Removable Hard Drives

4.2.2 Rear



Rear Panel

R1= Power Switch	R3= Ethernet Ports
R2= USB Ports	R4= VGA Output

4.3 SBC's

Datapath have developed, tested and qualified two SBC's for use in the VSN900/1100 range of video wall controllers providing improvements to the BIOS and a higher performance for Windows based software applications.

4.3.1 SBC₃

The Portwell ROBO 8120VG2R:

- An Intel® Xeon® processor based on PICMG 1.3 SHB with DDR3 ECC SDRAM.
- Used in the VSN990 and the VSN1190.

4.3.2 SBC₄

The Portwell ROBO-8112 Q87:

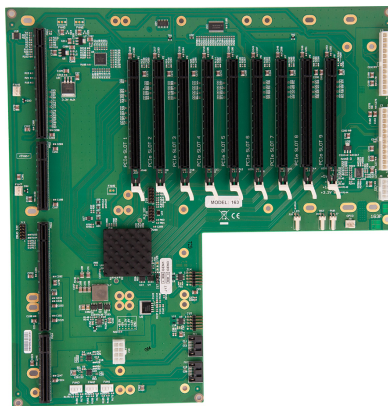
- An Intel® Core i7 processor based on PICMG 1.3 SHB with DDR3 SDRAM.
- Used in the VSN970 and the VSN1170.

4.4 Backplanes

The Datapath backplanes use advanced PCI Express switches to create a high bandwidth fabric for connecting multiple PCI Express into a system.

4.4.1 Express9-G3

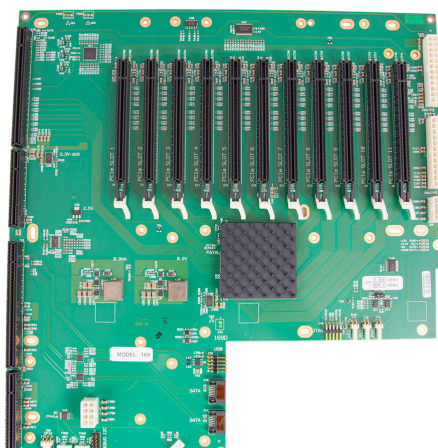
- Nine slot PCI Express backplane - 8 x 4 lane slots, 1 x 8 lane slot and 1 x PICMG 1.3 slot.
- Used in the VSN970, VSN990 and the VSN900X.



Express9-G3

4.4.2 Express11-G3

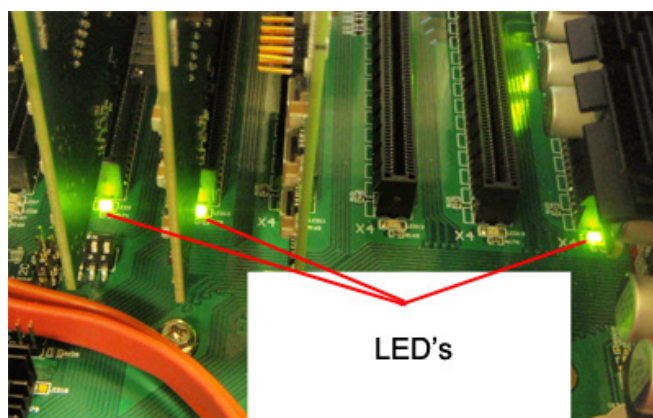
- Eleven slot PCI Express backplane - 11 x 8 lane PCI Express slot and one PICMG 1.3 slot.
- Used in the VSN1170, VSN1190 and VSN1100X.



Express11-G3

4.5 Backplane LED's

Both the Express9-G3 and the Express11-G3 backplanes have a LED's fitted for each PCI Express slot and the PICMG1.3 slot. The LED's indicate the following:



4.5.1 Express9-G3

LED1	ON = +5V standby voltage present
LED2	ON = +5V supply present
LED3	ON = +12V supply present
LED4	ON = +3.3V supply present
LED5	ON = PICMG link speed = Gen3, FLASH-FAST = Gen2, FLASH-SLOW = Gen1
LED7	ON = PCIe Slot 1 link speed = Gen3, FLASH-FAST = Gen2, FLASH-SLOW = Gen1
LED9	ON = PCIe Slot 2 link speed = Gen3, FLASH-FAST = Gen2, FLASH-SLOW = Gen1
LED10	ON = PCIe Slot 3 link speed = Gen3, FLASH-FAST = Gen2, FLASH-SLOW = Gen1
LED11	ON = PCIe Slot 4 link speed = Gen3, FLASH-FAST = Gen2, FLASH-SLOW = Gen1
LED12	ON = PCIe Slot 5 link speed = Gen3, FLASH-FAST = Gen2, FLASH-SLOW = Gen1
LED13	ON = PCIe Slot 6 link speed = Gen3, FLASH-FAST = Gen2, FLASH-SLOW = Gen1
LED14	ON = PCIe Slot 7 link speed = Gen3, FLASH-FAST = Gen2, FLASH-SLOW = Gen1
LED15	ON = PCIe Slot 8 link speed = Gen3, FLASH-FAST = Gen2, FLASH-SLOW = Gen1
LED16	Not Used

4.5.2 Express11-G3

D1	ON = +12V supply present
D2	ON = +3.3V supply present
D3	ON = +5V supply present
D4	ON = +5V Standby supply present
D5	ON = PICMG link speed = G3, FLASH-FAST = G2, FLASH-SLOW = G1
D6	ON = PCIe Slot 1 link speed = G3, FLASH-FAST = G2, FLASH-SLOW = G1
D7	ON = PCIe Slot 2 link speed = G3, FLASH-FAST = G2, FLASH-SLOW = G1
D8	ON = PCIe Slot 3 link speed = G3, FLASH-FAST = G2, FLASH-SLOW = G1
D9	ON = PCIe Slot 4 link speed = G3, FLASH-FAST = G2, FLASH-SLOW = G1
D10	ON = PCIe Slot 5 link speed = G3, FLASH-FAST = G2, FLASH-SLOW = G1
D11	ON = PCIe Slot 6 link speed = G3, FLASH-FAST = G2, FLASH-SLOW = G1
D12	ON = PCIe Slot 7 link speed = G3, FLASH-FAST = G2, FLASH-SLOW = G1
D13	ON = PCIe Slot 8 link speed = G3, FLASH-FAST = G2, FLASH-SLOW = G1
D14	ON = PCIe Slot 9 link speed = G3, FLASH-FAST = G2, FLASH-SLOW = G1
D15	ON = PCIe Slot 10 link speed = G3, FLASH-FAST = G2, FLASH-SLOW = G1
D16	ON = PCIe Slot 11 link speed = G3, FLASH-FAST = G2, FLASH-SLOW = G1
D17	ON= PLX Fatal Error
D24	ON = PSU FAULT

No LED's flashing indicates that lane width has not been established. The LED's will not flash on slots where no cards are installed.

Chapter 5 - Cabling

This Chapter will cover:

- Connecting keyboard and mouse
- Connecting an expansion chassis
- Connecting to a network
- Connecting input sources
- Connecting a control screen
- Connecting monitors
- Connecting power cables

5.1 Connecting the Keyboard and Mouse

The keyboard and mouse supplied with your system both have a USB interface. Identify vacant USB ports on the chassis and plug them in.



The location of the USB ports are identified [here](#)

5.2 Connecting an Expansion Chassis

The Datapath range of expansion chassis are solutions that allow system builders and integrators the flexibility to extend a PCIe based PC or motherboard enabling a larger, distributed system architecture. The optical expansion chassis can be used to create systems with distances of up to 100m between the host PC and the expansion chassis.

The expansion link is created using a combination of Host Link (HLink) and Slave Link (SLink) cards connected together using a cable or a series of cables (copper or optical). These combined provide a high bandwidth PCI Express link from an upstream host to a distributed expansion unit.

Expansion Chassis Model	Backplane	Number of available PCIe slots
VSN900X	Express9-G3 (SLink-G3 pre installed)	9
VSN1100X	Express11-G3 (SLink-G3 pre installed)	11
VSN900X-Optical	Express9-G3 (SLink-Optical pre installed)	9
VSN1100X-Optical	Express11-G3 (SLink-Optical pre installed)	11

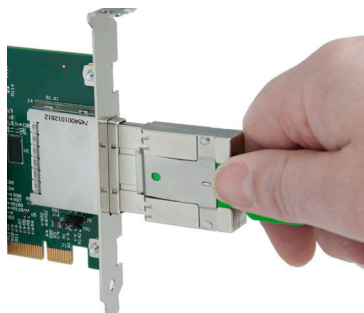
5.2.1 Connecting the VSN900X and VSN1100X

If your expansion chassis is supplied as part of a wall controller system the HLink-G3 card will be pre-installed in the host machine which contains the SBC. If the expansion chassis has been supplied separate to a host machine the HLink-G3 card provided needs to be installed in the host PC.

You are likely to need a flat blade and/or a cross head screwdriver for the installation of the HLink-G3 card; it would be useful to have these to hand before you begin. Power down the PC (including peripherals), switch off at the mains and disconnect all the cables connected to the computer and expansion chassis. Remove the PC cover. Locate a vacant PCIe slot (x8 on the motherboard and remove the backing plate (retain all screws) .

Remove the HLink-G3 card from its packaging and secure it firmly into the empty PCIe slot. Screw the bracket to the back panel of the PC and replace the cover.

Connect the HLink-G3 and SLink-G3 using the ExCable-G3 provided.



The correct way to insert the cable is to have the release tab facing away from the card. The rectangular connector needs to be fully inserted into the card until a definite click can be heard. This locks the cable in place. Failure to lock the connector in place can result in the ExCable-G3 becoming separated from the card and the link between chassis being lost.

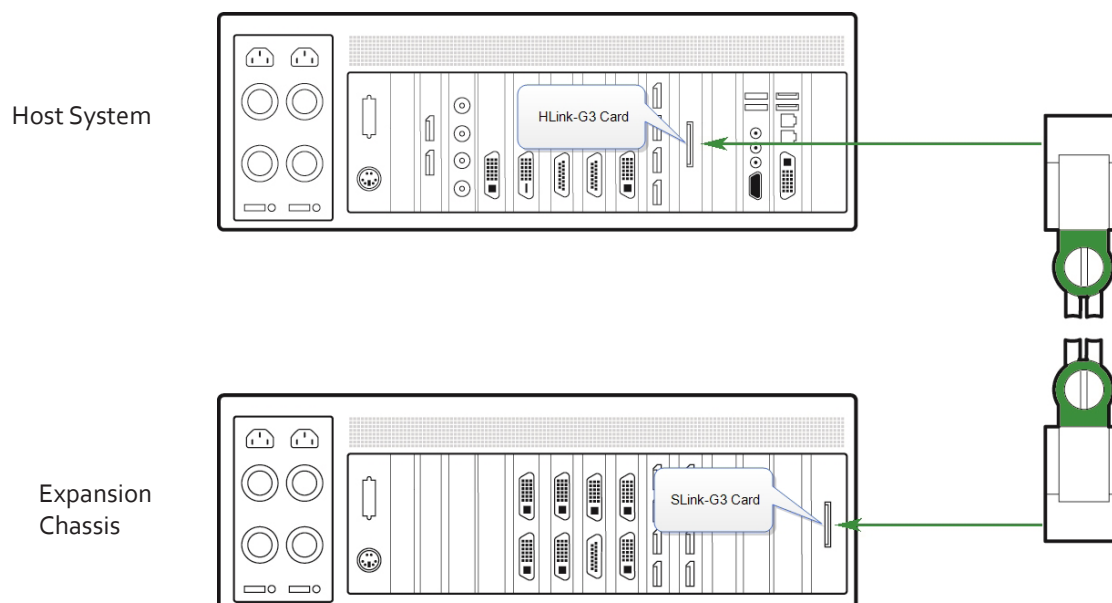


To remove the connector gently pull the ring pull tab to unlock the connector from the card then slide the connector out fully.

Normal copper cable handling precautions should be observed to avoid tight loops or kinks in the ExCable-G3.



If more than one expansion chassis is supplied, ensure the cards are paired correctly by connecting the cards labelled "Link1" together, the pair labelled "link2" together and so on. In the event that this is not possible i.e. the expansion chassis are shipped separately and the cards are not labelled, connect the cards using the ExCables-G3 provided and re-install the Datapath Driver Install package to reset the pairings.



The example above shows the connection of a VSN1190 - VSN1100X. For detailed instructions/information on connecting multiple expansion chassis, refer to the Datapath Expansion Chassis User Guide supplied with your expansion chassis.

5.2.1 Connecting the VSN900X-Optical and the VSN1100X-Optical

The Datapath optical solution allows expansion chassis to be located up to 100m away from the main controller. The Optical solution can support up to PCIe Gen 3 x8 bandwidths between an HLink-Optical, located in the host machine and an SLink-Optical, located in the expansion chassis. Full bandwidth is achieved by using two ExCable-Optical cables between each HLink and SLink-Optical card.

Alternatively, PCIe Gen3 x4 bandwidth can be achieved using only one ExCable-Optical between each HLink-Optical and SLink-Optical. This will reduce the total amount of video signal that can be transferred between the chassis. If x4 bandwidth is acceptable, one HLink-Optical can be connected to two SLink-Optical cards, providing that the HLink-Optical is located in a x8 slot.

See creating a PCIe [x4](#) lane and [x8](#) lane link



If your optical expansion chassis is supplied as part of a complete wall controller system the HLink-Optical card will be pre-installed in the host machine which contains the SBC. If the expansion chassis has been supplied separate to a host machine, the HLink-Optical card provided needs to be installed in the host PC.

You are likely to need a flat blade and/or a cross head screwdriver for the installation of the HLink-Optical card. Power down the PC (including peripherals), switch off at the mains and disconnect all the cables connected to the computer and expansion chassis. Remove the PC cover. Locate a vacant PCIe slot (x8) on the motherboard and remove the backing plate (retain all screws).

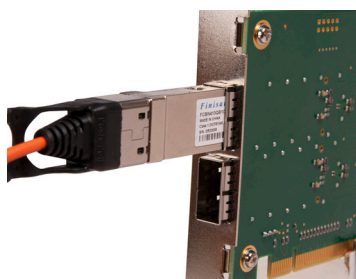
Remove the HLink-Optical card from its packaging and secure it firmly into the empty PCIe slot. Screw the bracket to the back panel of the PC and replace the cover.

If more than one expansion chassis is supplied, ensure the cards are paired correctly by connecting the cards labelled "Link1" together, the pair labelled "link2" are connected together and so on. In the event that this is not possible i.e. the expansion chassis are shipped separately and the cards are not labelled, connect the cards using the ExCables-Optical provided and re-install the Datapath Driver Install package to reset the pairings.

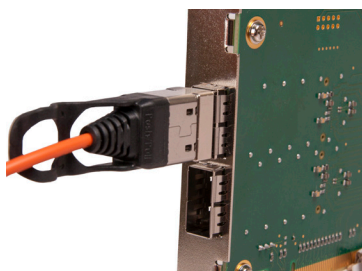
5.2.1.1 Connecting to a VSN1170 and VSN1190

If the VSN1100X-Optical is being connected to a VSN1170 or VSN1190 the full bandwidth (x8) is available in all PCIe slots. When using the Datapath VSN1170 as a host machine it is recommended to connect multiple expansion chassis in a "Star" configuration (i.e place all HLink-Optical cards in the VSN1170 host machine). This is because each slot of the VSN1170 is capable of supporting the full x8 Gen.3 connection to the HLink-Optical card. Other host machines that support multiple x8 or greater slots should also be configured this way. For detailed instructions/information on connecting multiple expansion chassis, refer to the Datapath Expansion Chassis User Guide supplied with your expansion chassis.

The ExCables-Optical should be inserted firmly into the connector on the HLink and SLink-Optical cards.

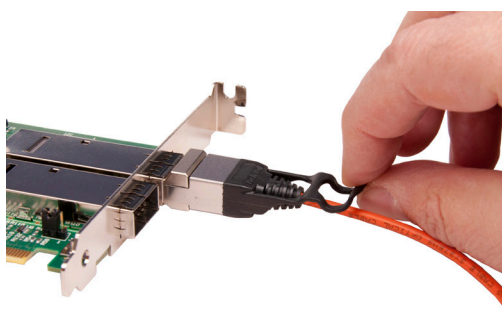


The correct way to insert the cable is to have the manufacturers label facing the card as shown above.



The rectangular connector needs to be fully inserted into the card until a definite click can be felt. This locks the cable in place. Failure to lock the connector in place can result in the ExCable-Optical becoming separated from the card and the link between chassis being lost.

Normal fibre handling precautions should be observed to avoid tight loops or kinks in the ExCable-Optical. Bend radii below 75mm are not recommended and may result in fibre breakage.



To remove the connector gently pull the ring pull tab to unlock the connector from the card then slide the connector out fully.

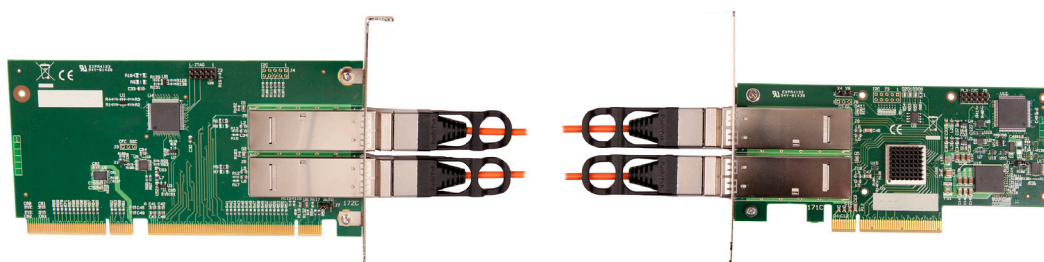
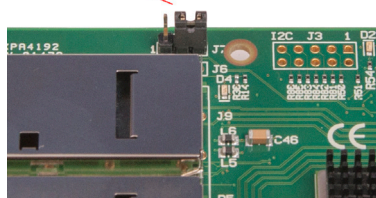
5.2.2 Creating the PCIe Link - x8 (Optical)

For maximum bandwidth, the HLink \SLink -Optical cards should be connected using two optical cables to form an eight-lane ("x8") link, capable of 64G-transfers/sec (approx 6.4GB/s effective data rate in each direction).

In "x8" mode the Jumper Link "J7" on the HLink-Optical card must be set to position 2-3 as shown below.

When creating the "x8" link, the ExCable-Optical connected into the top connector on the HLink-Optical card must also be connected to the top connector on the SLink-Optical card. Similarly the second ExCable-Optical must connect between the lower card connectors.

Jumper Link "J7"



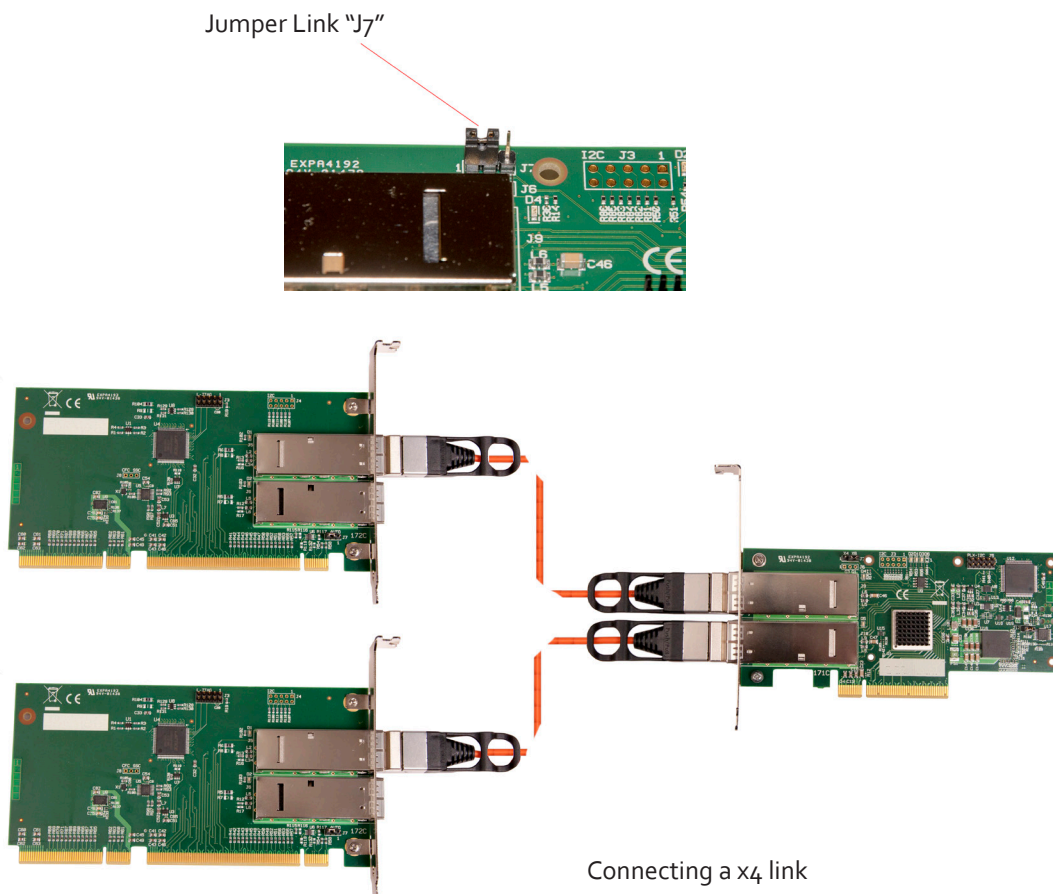
Connecting a x8 link

5.2.3 Creating the PCIe Link - x4 (Optical)

For a reduced bandwidth connection or where a single HLink-Optical is used to connect to two separate SLink-Optical cards (i.e. "Star" connection of two expansion chassis). In this configuration, for a single ExCable-Optical link the PCIe connection is "x4" and the bandwidth is reduced to 3.2GB/s.

In "x4" mode the Jumper Link "J7" on the HLink-Optical card must be set to position 1-2 as shown below.

Either (or both) connectors on the HLink-Optical card can be used, but only the top connector of the SLink-Optical card.



5.2.4 Frame Locking

When using the Datapath Optical Expansion Link it is not possible to maintain display frame locking. It is assumed that displays controlled from the expansion chassis would be sufficiently far away from the host machine that this will not be a problem. It should be noted that all displays within an expansion chassis (or cluster of chassis) connected using a standard HLink-G3 and ExCable-G3 will remain frame-locked to each other.

5.3 Slots and Bandwidths - Optical Systems

The optical solutions offer a variety of configurations and bandwidths depending on customer requirements. Each HLink-Optical is capable of transferring up to PCIe Gen.3 x8 bandwidths across distances up to 100m. To achieve this the HLink-Optical must be installed in a x8 PCIe slot on the host backplane and connected to the corresponding SLink-Optical card pre-installed in the PICMG 1.3 slot in the expansion chassis using two ExCable-Optical cables.

A x4 bandwidth can also be achieved by connecting the HLink-Optical (installed in a x8 PCIe slot) to two separate SLink-Optical cards. If the HLink-Optical is installed in a PCIe x4 then it can only be connected to one SLink-Optical card.

5.3.1 VSN900 Range - Optical Expansion

HOST							EXPANSION	
PCIe Slot Number	Bandwidth		ExCable-Optical		HLink-Optical		SLink-Optical	
	X8	X4	1 Cable	2 Cables	Top Connector	Bottom Connector	Top Connector	Bottom Connector
1	x			x	x	x	x	x (1)
1		x	x		x		x (2)	
2	N/A	x	x		x		x	
3	N/A	x	x		x		x	
4	N/A	x	x		x		x	
5	N/A	x	x		x		x	
6	N/A	x	x		x		x	
7	N/A	x	x		x		x	
8	N/A	x	x		x		x	
9	N/A	x	x		x		x	

(1) SLink-Optical card is pre-installed in the PICMG 1.3 slot in the expansion chassis.

(2) Two ExCables-Optical connecting to two separate SLink-Optical cards (see section: Creating the Link -x4 optical on page 29)

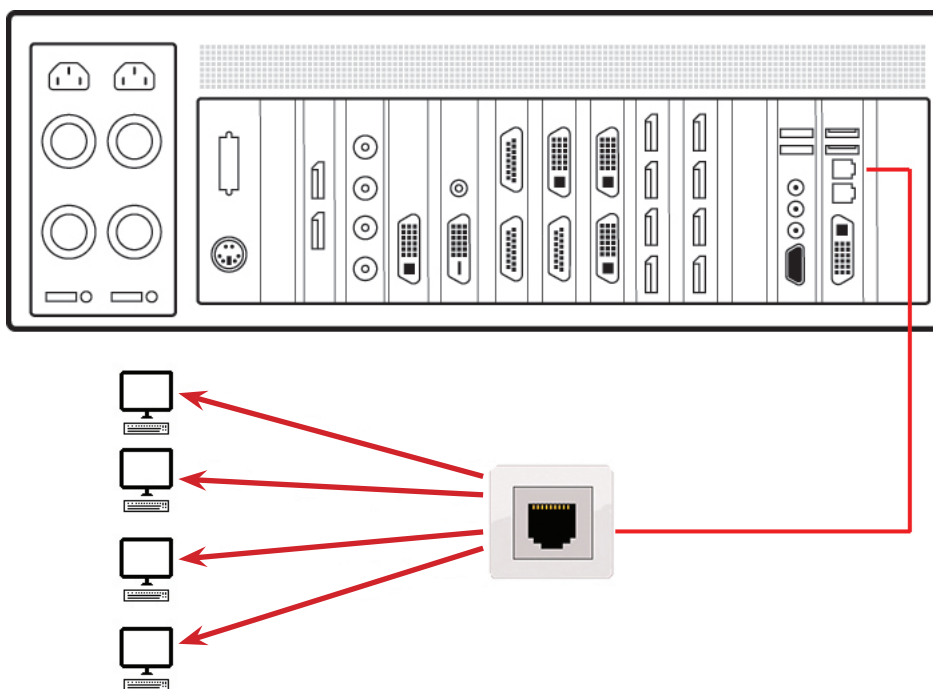
5.3.2 VSN1100 Range - Optical Expansion

HOST						EXPANSION	
PCIe Slot Number	Bandwidth	ExCable-Optical		HLink-Optical		SLink-Optical	
	X8	1 Cable	2 Cables	Top Connector	Bottom Connector	Top Connector	Bottom Connector
1	x	(3)	x	x	x	x	x
2	x		x	x	x	x	x
3	x		x	x	x	x	x
4	x		x	x	x	x	x
5	x		x	x	x	x	x
6	x		x	x	x	x	x
7	x		x	x	x	x	x
8	x		x	x	x	x	x
9	x		x	x	x	x	x
10	x		x	x	x	x	x
11	x		x	x	x	x	x

(3) All 11 slots in the VSN1100X-Optical expansion chassis are PCIe x8 lane therefore two ExCables-Optical are required. If the requirement is for x4, only one ExCable-Optical is required, however this reduces the available bandwidth by 50% and therefore reduces the amount of video signal that can be transferred.

5.4 Connecting to a Network

The optional Wall Control software enables the user to operate and manage the video wall display remotely, via a network. The SBC4 has two LAN ports, plug in your network cable (not supplied) to a LAN port and connect the wall controller to the LAN, as shown below:



5.4.1 Network Security

It should be noted that network ports have a potential vulnerability. If your system is working in a secure environment you probably don't need to worry about unauthorised access to the LAN port. If your system is on a network that is generally accessible, you will probably want to restrict access to the ports. The Wall Control software application enables you to configure access to the ports using a network access dialogue, see the Wall Control help file (located on the Recovery Media) for more detailed information.

5.5 Connecting Input Sources

Each system is custom built and each controller will differ depending on the number and models of input cards installed. The packing list enclosed with your system will enable you to establish which input cards you have installed in your wall controller.

Contained within the product documentation folder are PCIe card product leaflets which give details on how the cards are installed and any accessories which may accompany them. For detailed information on specific cards please consult the relevant User Manual. Each capture card manual can be located on the Datapath Recovery Media supplied with your system.

5.5.1 Cable Handling



Great care must be taken when connecting cables. Ensure the cable connectors are the correct type for the connector on the cards. Push the cable connector on squarely, there is no requirement to force the connector in place. Poor cable handling could result in damaged pins in the cable connector, this in turn could cause serious and irreversible damage to the printed circuit board. Any damage caused this way is not covered under the warranty.

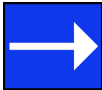
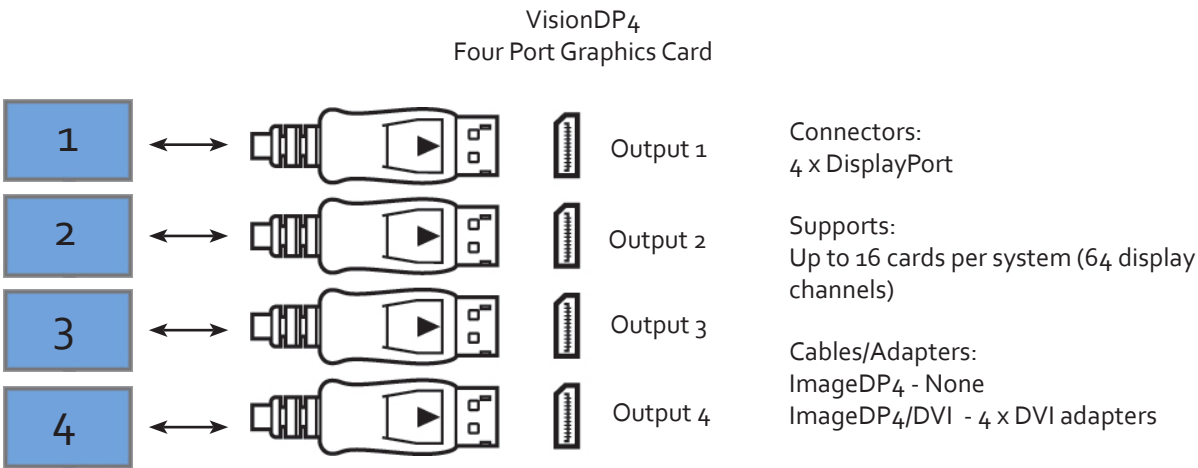
5.6 Connect Monitors and Control Screen (Optional)

Each system could support any number of screens from 4 to 64 depending on hardware, however the following information is a guide based on a 12 screen 4x3 video wall system.

The number of graphics cards in your system determines how many screens will be available on your video wall. The ImageDP4 graphics cards each support a maximum of 4 screens, one output per screen.

5.6.1 Screen Order

The screen order is determined by where the graphics cards are installed in the system. The card installed nearest to the SBC is card 1 which is the first card to be initialised and will generate the desktop for the top left monitor on the video wall plus the 3 adjacent screens. The second card drives the next four screen and so on. Each graphics card has 4 connectors, numbered as follows:

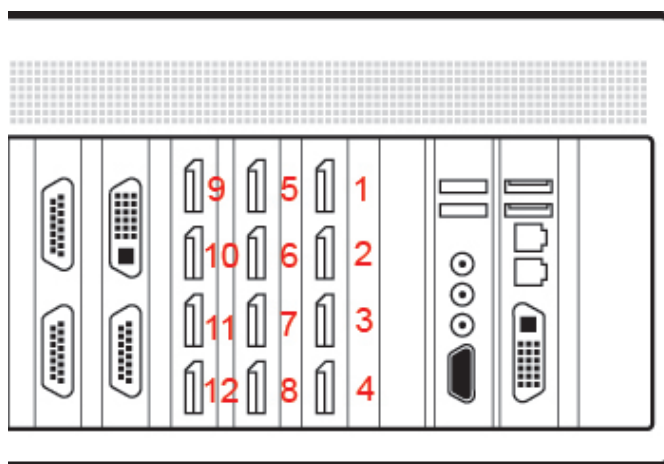
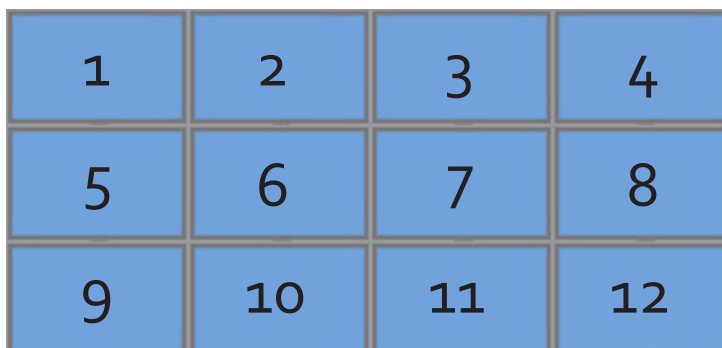


For detailed information on the ImageDP4 graphics card please consult the User Manual which can be located on the Datapath Recovery Media supplied with your system.

The following illustration shows how to connect 12 monitors to 3 x ImageDP4 graphics cards to create a 12 screen video wall.

Connect the graphic outputs to your monitors using DisplayPort cables. (Not supplied)

Twelve Screen Display Wall



Corresponding Graphics Outputs

1-4	Output connectors on card 1 - For screens 1 - 4
5-8	Output connectors on card 2 - For screens 5-8
9-12	Output connectors on card 3 - For screens 9-12

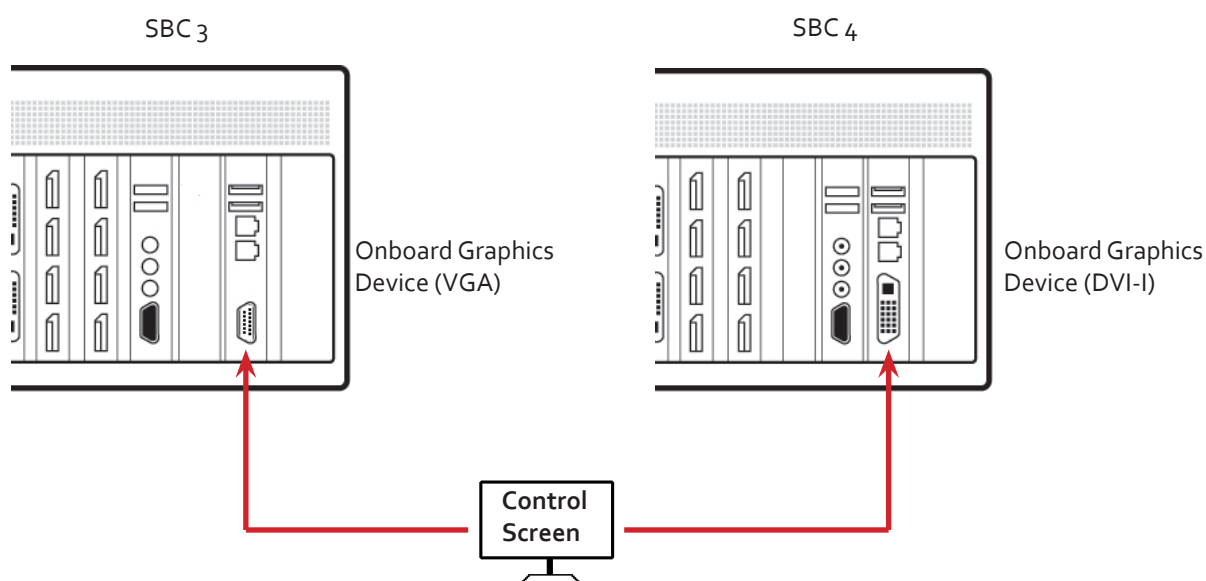
5.6.2 Changing the Order of the Screens

Changing the order in which the screens appear is possible using the Wall Control application. Select **Screen Order** from the Wall Control **Configure Menu** and in the displayed dialogue, click on the screens sequentially to establish the order you require. For detailed information on changing the screen order, click on the **Help** button in the **Configure Screen Order** dialogue.

5.6.3 Connecting the Control Screen (Optional)

Most Datapath systems are configured to boot off the onboard graphics device therefore there may be a requirement to connect a control screen. The control screen is a standalone VGA (VSN990 / VSN1190) or DVI-I (VSN970 / VSN1170) monitor which is separate from the monitors on the display wall. The control screen is configured as the Primary monitor in the Windows® Display Settings and the display wall is configured as the Secondary monitor.

Connect the control screen as follows:

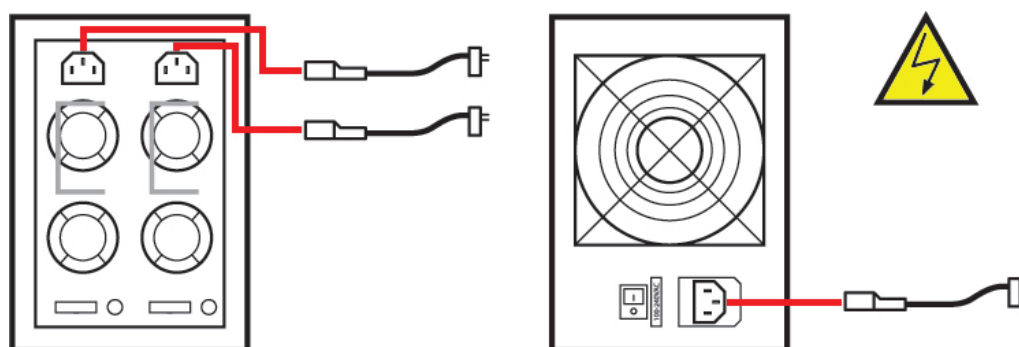


5.6.4 How to disable the Control Screen

If you do not require a control screen then you should disable the integrated graphics in the system BIOS. (See Chapter 13 - Use of the SBC's Onboard Graphics Device).

5.7 Connecting Power Cables

This section applies to both the RPSU and the ATX powered systems and expansion chassis.



Ensure cables are fully inserted into the power supply sockets, failure to do so could result in the cable becoming dislodged and the system inadvertently shutting down.

In systems with an RPSU, both cables must be connected otherwise an audible alarm will be triggered when the system is switched on



Only use the power cables supplied with your system, for advice on replacements please contact Datapath.

Chapter 6 - Operation

This chapter will cover:

- Switching on
- Initial system boot on delivery
- Setting up the operating system
- Opening Wall Control
- Displaying video captures

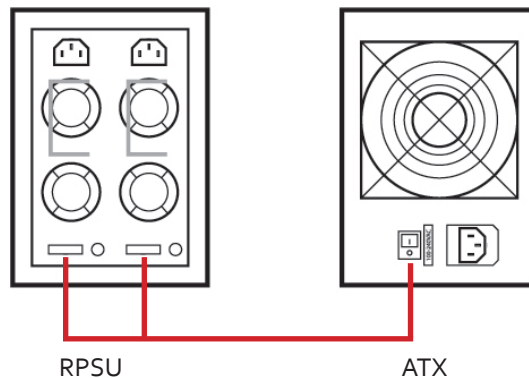
6.1 Switching On

When switching the system on for the first time you will need to complete the initial system boot steps as described in Initial System Boot on Delivery below.

6.1.1 Switching on the Main System

All systems are supplied with either RPSU or ATX power supplies, see [System Features](#) for details.

- Switch on the power supply units ensuring both units on the RPSU are switched on.



- Turn on the main system power switch which is located on the [front panel](#).

The BIOS and boot messages will be displayed on the control screen as the system boots. Once the system boot up is complete, the display wall will open up into a Windows® desktop.

6.1.2 Switching on with an Expansion Chassis

If your system has a VSNg00X or VSN1100X expansion chassis the following procedure should be followed when switching on:

- Switch on all the power supply units ensuring both units on a RPSU system are switched on.
- Turn on the main system power switch on the host system located on the [front panel](#). There is no requirement to turn on the main power switch on the expansion chassis as it will be switched on automatically by the host VSN system.

The BIOS and boot messages will be displayed on the control screen as the system boots. Once the system boot up is complete, the display wall will open up into a Windows® desktop.

6.2 Initial System Boot on Delivery

Once the system has been configured in the factory the operating system is resealed, meaning that when switching on the system for the first time the operating system setup commences.

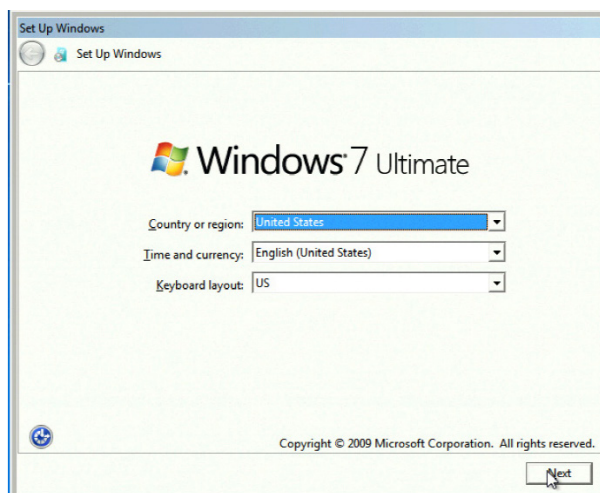
You will be prompted to enter information to set up the controller.

6.2.1 Select Language Pack

You will now be prompted to set up your Windows® 7 operating system starting with selecting the language option you require. Language selection is the responsibility of the customer and is not part of the system pre configuration prior to shipment. Windows® 7 language settings can be changed using **Control Panel/Region and Language** on the **Keyboard and Languages** tab. Language packs are available to download as optional updates through Windows Update. The following languages are pre-installed:

- Simplified Chinese
- English (UK)
- English (USA)
- French
- German
- Italian
- Japanese
- Polish
- Portuguese (Brazilian)
- Russian
- Spanish

6.2.2 Select Country and Region



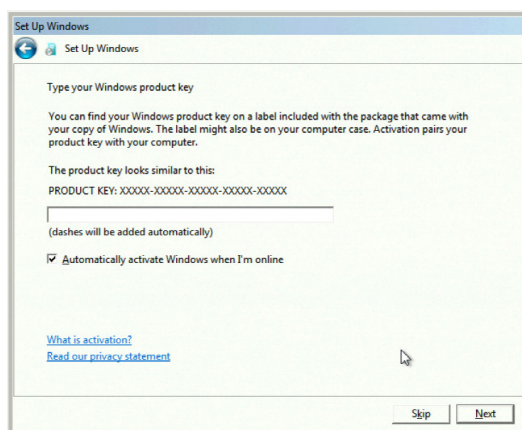
Use the dropdown menus to select the country and region, the time zone and currency and the keyboard layout. These localised settings can be changed if required using the dialogue in **Control Panel/Region and Language**.

6.2.3 Names and Password

Next you will be prompted to personalise your system by entering a user name, a computer name and a password.

It is recommended that only Internet-standard characters are used in the computer name. The standard characters are the numbers 0 through to 9, upper and lower-case letters from A through to Z and the hyphen character. Computer names cannot consist entirely of numbers, contain spaces or use special characters such as: < > ; : " ? * + = \ | ? , .

6.2.4 Enter the Product Key



Enter the Product key in the edit box, the Product Key is attached to the front panel of your system.

Once the Product key has been entered, read and accept the license agreement.

6.2.5 System Backup

It is strongly recommended that you create some form of system recovery media using the **MS Windows Backup and Restore Tool** once your system is up and running. This will enable you to restore to factory settings should serious problems occur.



Start | Control Panel | System and Security | Backup and Restore

6.3 Opening Wall Control (Optional)

Wall Control is an optional video/display wall management software application specifically designed for Datapath Wall Controllers. Wall Control consists of two separate elements that work together to enable you to control the display wall, the Wall Control Application and the Wall Control Server.

6.3.1 Wall Control Application

The Wall Control Application should be installed on the machine that has been identified to control the display wall. This could be any machine on the network including the machine driving the display wall. The application element of Wall Control is used to control the position, size and properties of each window displayed on the Server machine.

6.3.2 Wall Control Server

The Wall Control Server is used to display Vision/IP and application windows. The Server element of Wall Control needs to be installed on the machine from which you wish to create Vision/IP and application windows. To open Wall Control:



Start | All Programs | Wall Control

The Wall Control Start Menu offers two methods of opening the application, Wall Control and Wall Control-My Computer.

6.3.3 Wall Control-My Computer

Wall Control-My Computer refers to your system having both the Wall Control Application and the Wall Control Server installed. Selecting Wall Control-My Computer will open the Wall Control application window having activated both the Server and the Application. The application window will display all inputs available in the system.

6.3.4 Wall Control

Selecting Wall Control will launch the application window but will not connect to a Wall Control Server. For more information regarding connecting to a Wall Control Server, consult the application help file.

6.4 Displaying Video Captures

Once a connection to a Wall Control-red server has been established then windows can be created for display on your video/display wall. Some video formats may not be supported, see Installing video CODECS in the Advanced User Chapter.

Windows can be created using the **New** menu or the application **Toolbar**.

6.4.1 New Menu

Displays options for each window type:

- Preset Window
- Vision Window
- IP-Camera Window
- Run an Application

6.4.2 Toolbar

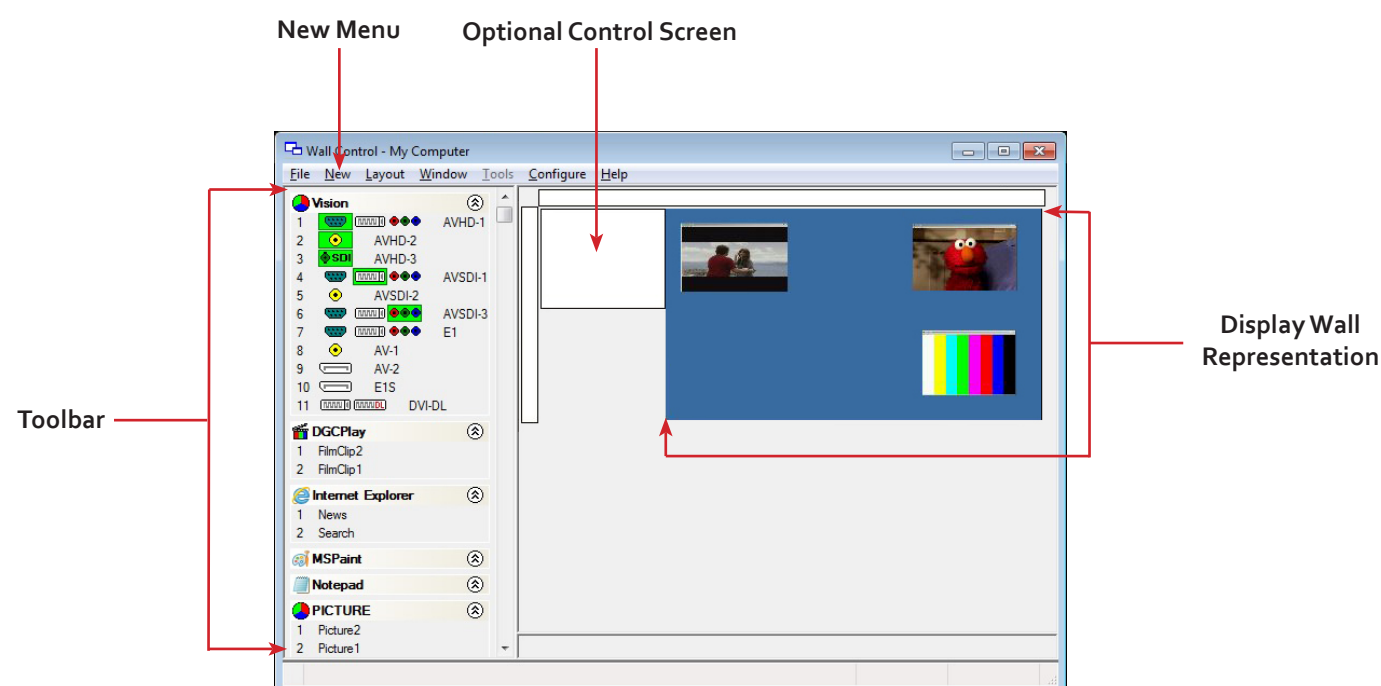
The application Toolbar displays a list of the type of windows that can be opened, depending on the hardware you have installed in your machine.

To open the required inputs:

Select the required input using the cursor and drag to a preferred position on the wall.

Double click on the required input and the window will open, positioned at the top left of the display wall.

Open multiple inputs by pressing the shift key and clicking the required number of inputs with the mouse.



A detailed summary of Wall Control-red features can be found in Chapter 7, alternatively a comprehensive help file system is available within the application, select **Help | Contents**

Chapter 7 - Software

This chapter will cover:

- Wall Control
- Wall Monitor
- Utilities

7.1 Wall Control (Optional)

The optional Wall Control software application (Wall Control-red / Wall Control-SQX depending on your order) is pre-installed and tested prior to shipment of your system therefore no installation of the software is required.

Wall Control displays the desktop of the machine that is being controlled. It allows you to remotely display Vision, IP-Camera (Wall Control-SQX required) and Application windows across a network on another machine or locally on the same machine.











You can use Wall Control to interactively move, size and position application windows and control Vision and IP-Camera windows by using the Windows Properties sheet. Wall Control also has a guide and grid function to aid the positioning of windows on the display wall.

Wall Control allows you to save specific wall layouts as .lay files enabling them to be re-called when required.

There is an area of the application around the desktop where windows can be dragged allowing them to be manipulated without being displayed on the video/display wall.

7.1.1 Icons displayed in the Wall Control Toolbar

The Icons displayed in the application toolbar identify which type of source is available to each input:

	Composite Source.
	S-Video Source.
	Analogue Source.
	Component Source.
	DVI Source.
	Dual-Link DVI Source.
	DisplayPort Source.
	SDI / HD-SDI / 3G Source.
	IP-Camera Source.
	If an Icon is displayed with a green surround, this indicates the type of source currently being captured for that particular input.

7.1.2 Wall Control - Features and Tools

Wall Control has a range of advanced features to enable you to manage your video/display wall either locally or remotely over a network. The following list provides a brief summary of the features and tools contained within the application. However, all the features and tools are documented in depth in the Wall Control-red help file which can be accessed through the **Help** menu or by pressing **F1** when the application is active.

7.1.3 Layout Files

Save and recall specific desktop configurations using layout files. Window properties including the position, size and any On Screen Displays are also saved in layout files.

7.1.4 Offline Configuration

The Wall Control offline layout editor allows layout files to be created and edited without physically displaying any windows on the display wall. Wall Control can be connected offline on either the server machine or a machine without any display wall hardware, for example a laptop.

An offline connection in Wall Control is initiated by opening a configuration file. This file must have been exported from a server machine and will contain a snapshot of the hardware and software configuration on that machine.

7.1.5 Vision and IP Window

Control over presenting captured video and IP camera streams on the display wall. Configure window properties including:

- Position and size of windows
- Aspect ratio enforcement
- Exclude window borders and menu bar
- Create on screen display captions
- Control capture rate

7.1.6 Application Windows

Support for controlling applications such as Internet Explorer, Microsoft Powerpoint. Application can be opened direct from the Wall Control Toolbar, through the Command Line Interface or from previously saved layout files.

7.1.7 On Screen Display (OSD)

Highly configurable OSD function to overlay bitmaps (not on all types of window) and text over Vision and IP-Camera windows. Add descriptions and logos with transparency support and create specific display variables such as frame rates.

7.1.8 Carousel Support

The Carousel function can automatically cycle through configured lists of different inputs for Vision and IP-Camera windows over defined time periods. A double buffering mechanism will automatically start IP-Camera streams prior to the carousel input switch.

7.1.9 Split into Sub- Windows

Divide an active Vision window into sub-windows. Each sub-window will display a cropped portion of the original Vision window.

7.1.10 Audio Support

Control digital and analogue audio content associated with specific Vision windows.

7.1.11 Command Line Interface

Wall Control comes with a powerful Command Line Interface to enable you to automate almost any operation from opening layout files, moving windows around the display wall and changing specific input settings.

7.1.12 Support for Crestron /AMX Controllers

- Remote Command Line Interface for automation via Crestron/AMX Controllers:
- Control the display wall remotely from a Crestron/AMX controller
- Access to the full local Command Line Interface
- Support for RS-232 (via serial cable) and TELNET (via a local network)
- Integrated user interface support to configure and monitor the Remote Command Line

7.2 Wall Monitor (Optional)

The optional Wall Monitor software application enables you to monitor the temperatures and voltages of the following system components:

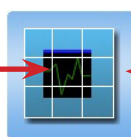
- Backplanes
- Capture Cards
- SQX Cards
- SBC
- CPU Cores
- Graphics Cards

Should any overheating or voltage surge be imminent within the system, the Wall Monitor application will alert the user via a pre-configured alarm.

When running, the Wall Monitor application can display a transparent floating icon which can be placed anywhere on the desktop.

Cursor tooltips are available throughout the application offering information and advice. Hover the cursor over different areas of the application to reveal the tooltips. The application also has a help file to assist you, click on any help button or press F1 on your keyboard to access the help files.

Left click the centre of the icon to open the application or right click to display the application menu.



Wall Monitor Icon

Left click and hold on the border of the icon to move it around the desktop.

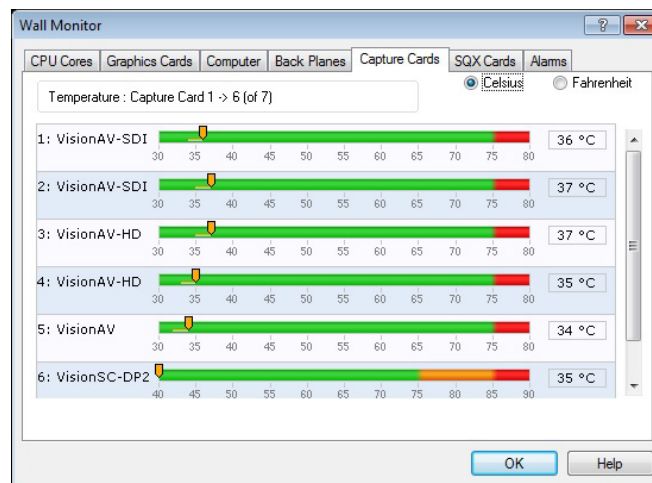
7.2.1 Monitoring System Components

Each of the system components listed above have built in temperature and/or voltage sensors which enables the Wall Monitor application to display any increase or decrease in voltage and temperature. The temperature and voltage ranges are graded as follows:

Green = Normal operating conditions

Amber = An indication that voltages or temperatures are operating outside of normal thresholds and if configured and alarm will activate.

Red = Indicates that the voltages or temperatures have exceeded the acceptable working thresholds and a system shutdown is imminent.



7.2.2 Wall Monitor Application Window

The Wall Monitor application window (above) is displaying the temperature of the capture cards in the system. To view different components, click on the relevant tabs of the application. Temperatures can be displayed in either degrees Fahrenheit or degrees Celsius.

7.2.3 Configuring Alarms

Wall monitor allows you to configure three types of alarm to warn of impending problems:

System Buzzer - The system buzzer can be configured to determine the amount of time the buzzer will be audible up to a maximum of 5 seconds, an audio alarm is activated within the system. On some systems, speakers may have to be connected.

Email - Should you not be in the proximity of your system and email warning can be configured. An email is sent to a nominated email address giving details of impending problems.

On Screen - Text is displayed on screen to warn of impending problems with the system. The Wall Monitor icon adopts an amber border when the alarm is issued.

7.2.4 Current Status

At any time you can check the current status of the monitored components by selecting **Show Current Status in Browser** from the **Application** menu. This will display a browser window, similar to the following:

Summary of the status of all monitored devices

Device Status	Total	Green	Amber	Red
CPU Cores	4	4	0	0
SBC	1	1	0	0
GPUs	1	1	0	0
Capture Card	7	7	0	0
BackPlanes	3	9	0	0

CPU Cores	Minimum	User Min	Current	User Max	Maximum
Core 1	N/A	N/A	42 °C	90 °C	92 °C
Core 2	N/A	N/A	39 °C	90 °C	92 °C

7.3 Vision Application (Optional)

When purchased separately, Vision capture cards are supplied with a powerful software application for configuring the format of input sources and displaying the data.

7.3.1 Video Streaming

DirectShow drivers for WDM Streaming driver supports the following applications, to encode, record and stream video over networks or the Internet:

- Microsoft Media Encoder®
- VLC
- VirtualDub
- Any other DirectShow encoding software

For streaming applications, Vision cards can be used with Windows Media Encoder to compress and stream captured video. To replay the video, use Windows® Media Player.

Any application compatible with Windows® DirectShow technology can use Vision capture cards due to their built-in WDM support.

7.3.2 Vision Software Capabilities

Timestamp support for streaming synchronisation:

- Synchronisation of multiple inputs across multiple cards
- Synchronise systems using network clock synchronisation
- For edge blending and other applications

Flexible and configurable EDID Management:

- Allows programming of custom EDID parameters for capture cards

Low Input to Output Capture Latency.

DMA to third party graphics vendors back and front buffers via Direct3D:

- Compatibility with AMD DirectGMA
- Compatibility with Nvidia GPUDirect

User Mode filter for source selection:

- Enables cropping support in DirectShow on all inputs
- Supports Start and Stop trigger interface on all Vision inputs

Datapath Unified Vision Driver:

- Multiple cards per system, 16 streams per input
- Frame sync and time stamping

- DirectShow interface
- The RGBEasy API for advanced audio and video control
- Fully integrated for use with Datapath Wall Control software for video wall applications

7.3.3 MultiStream

Datapath's MultiStream feature is available on all Datapath capture cards and enables multiple, independently formatted video streams to be set up in parallel.

Each stream can be formatted completely independently and individual selection of resolution, colour space and cropping region can be set for each stream. This maximises bandwidth utilisation of the capture card and PCIe interface, and also simplifies development tasks for application developers who do not need to implement video stream reformatting separately.

7.3.4 Vision Application Overview

The application displays the connected source in a window; it has the following features:

- Scales the data to fit in the window
- Ability to set up sources accurately (settings automatically saved)
- Save a single frame to a file in one of the following formats: BMP, JPEG, GIF, TIFF, PNG
- Print a single frame
- Maintain the aspect ratio of the displayed captured data
- Cropping
- Display text over the data (on-screen display)
- Command line interface
- HDCP supported (not supported in SQX encoding)
- Help file documenting all features

Note:

The supplied drivers and software require you are using :

- Up to and including Windows®10
- DVD ROM Drive

7.4 Software Utilities

Datapath provides a group of software utilities designed to assist you fine tune your system for specific individual system requirements. All the software utilities can be found on the Recovery Media that was shipped with your system, alternatively, you can download the most up-to-date versions from the Datapath website.

7.4.1 Desktop Utility

Used to define a desktop resolution which can compensate for display bezels or projector overlap.

7.4.2 Custom Mode Utility

A utility for defining custom display timings for video modes not available in the display driver or EDID.

7.4.3 Multi Resolution Configuration Tool (MultiResConfig)

Developed to assist in the design and configuration of a video wall that contains a mixture of multi resolution displays.

7.4.4 Diagnostic Tool (diagtool)

A diagnostic tool that gathers information to assist in diagnosing problems with hardware and software configurations. Information is gathered and compressed into a zip file for onward transmission to the Datapath Support Team.

7.4.5 PCICFG Tool

A diagnostic program that prints out the PCI configuration information. Note, this tool must be run from either a USB or MSDOS boot disk, it cannot be run from Windows®.

7.4.6 Sleep Utility

Designed to generate a pause within a script. This can be used when sequencing the loading of files or application windows.

Chapter 8 - Troubleshooting

8.1 Frequently Asked Questions (FAQs)

8.1.1 I can't Save a Layout file?

The server does not have a USB License Dongle installed and so Wall Control is working in limited Demo mode.

8.1.2 Access is denied

This message means that the attempt to connect to the server application failed because the authentication information provided was not acceptable.

One of the following has occurred:

The user name, the password or the machine/domain that you have entered are not correct. Try entering the details again.

If the machine to which you are connecting is running Windows XP Service Pack 2 and you have not entered a password, you will need to change your account so that you have a password.

If the machine you are connecting to is running Windows XP and it is not participating in a domain, you will need to change the Network Authentication settings on the machine.

8.1.3 RPC Server Unavailable

This message means that the attempt to connect to the server failed.

If you are connecting to My Computer:

Is the server application running?

Did an error occur that prevented the server application starting the RPC server?

Are you using the correct port name?

If you are connecting across a network:

Has the Wall Control-red server been activated?

When Wall Control-red is installed on the server, a serial number must be entered to enable the networking features.

If the server is running Windows XP Service Pack 2, is the firewall blocking the port for the server component? See Windows XP Service Pack 2 .

Is the Wall Control-red server configured for network access?

Is the server application running?

Did an error occur that prevented the server application starting the RPC server?

Are you using the correct port?

If a connection is possible with the Wall Control application either remotely or locally, you can use the Server Application Manager dialogue to find out if the server application has been installed, is running and which port and port name it is using and if an error occurred. In the Wall Control application, go to the Configure menu and select Server Applications.

If a connection is not possible with the Wall Control application, you will need to look at the application event viewer on the Wall Control Server.

8.1.4 The endpoint is a duplicate

This error message suggests that an attempt to open a communication port failed because it is already in use.

If the Wall Control server has not been activated or the networking has been disabled in the Wall Control Administrator dialogue or Wall Control has not been activated, the problem is with the port name.

If networking is enabled, the problem could be with either the port number or the port name.

You can find out the port number and the port name that the server application is using through the Server Application Manager dialogue or the application event viewer.

You can find out which port numbers are in use on a machine with the netstat command. There is no way to find out which port names are in use.

Use **Wall Control | Configure Menu | Server Application Manager** to change the port number and/or port name and restart the server application.

8.1.5 The remote procedure call failed and did not execute

This is displayed when trying to contact a server application that has been stopped after it had been connected to successfully. Go to the Server Application Manager dialogue and start the server application again.

8.1.6 Changing Screen Resolution

Prior to making any changes to the resolution, it is recommended that the Vision server be stopped beforehand. This can be done using **Wall Control | Configure Menu | Server Application Manager**.

The servers retain resources on the graphics card which may not be available if the resolution is changed.

8.1.7 How do I connect a remote command controller via RS-232 or IP-Telnet? E.G. Crestron or AMX controllers.

Support for RS-232 and IP remote control of Datapath machines is provided through our Wall Control RED software. This package includes a 'remote command line interface' that can be used to select and configure the required method of control. This can be accessed under the 'Configure->Remote Command Line' menu option while Wall Control is connected to the server. Once configured, the Wall Control program does not need to remain open and the system will process remote commands until the configuration is changed.

In order to use the remote command line you must first select the required method of control via the 'Active Server' drop down list in the 'remote command line' dialogue. This allows you to select between 'Com Port Command Line Interface' (RS-232) and 'Telnet Command Line Interface' (IP network based control). Once a server has been selected, its settings can be configured by pressing the 'Settings' button and it must also be enabled via the 'Enabled' checkbox; the server specific settings include options such as ports and transmission speed. Once the selected server has been activated then the 'Status' on the 'Remote Command Line' dialogue should change to 'Connected'. At this point the software should be ready to receive remote commands and the Wall Control software can then be closed.

RS-232 and Telnet commands can be sent by any suitable remote device, including Crestron Controllers or PCs. Please note that we do not provide any client software or support for the configuration or usage of these remote devices themselves though.

The commands sent to the controller via the remote command line interface should be in the format of Wall Control's local command line interface. The command usage includes the ability to open and close layout files, manipulate individual windows properties and to change capture sources. These commands, which are detailed in the help file topic 'Command Line Interface', can be tested by executing them locally on the server machine via the Windows command prompt 'CMD.EXE'. When using the 'Com Port Command Line', each command will be executed when a carriage return or line feed character is encountered. For Telnet, a carriage return immediately followed by a line feed is used to signify that the command should be executed. When testing usage of the remote command line, the 'Monitor' window in the 'Remote Command Line' dialogue will display all commands as they are received.

Full information on usage of the Remote command line interface can be found in the Wall Control help file by either searching for 'remote command line' or pressing the 'Help' button on the 'Remote Command Line' dialogue itself.

8.1.8 When I recall a Fire Fox or Chrome web browser page, the window is not positioned where I saved it?

Wall Control only supports Internet Explorer. Full functionality is not available using any other web browser.

8.2 Technical Support

Registered users can access our technical support using email and the Support Enquiry Form on our website, usually with a response within 24 hours (excluding weekends).

8.2.1 Email

Send an email to support@datapath.co.uk with as much information about your system as possible. To enable a swift response our support team will need to know the following details:

- Specification of the PC - including processor speed.
- Operating system.
- Application Software.
- Datapath Hardware/Software.
- The exact nature of the problem - please be as specific as possible.

Please quote version and revision numbers of hardware and software wherever possible.

8.2.2 Support Procedures

During the support process you may be asked by one of our support staff to carry out certain tasks and procedures to assist them in solving any problem you may encounter. Details and up to date instructions can be found in the support section of the Datapath website.

Chapter 9 - Maintenance

9.1 Filter Maintenance

The system filter is an integral part of the wall controller and as such it needs to be maintained correctly. Failure to maintain the filter can result in the system overheating and causing it to fail. In normal operating conditions the filter should be removed and cleaned every 3 months. However, this 3 month period is a guide only and it can be increased to every 6 months or decreased to one month depending on the levels of dust in the environment the system is operating in.

It is recommended that the condition of the filter is checked at regular intervals.

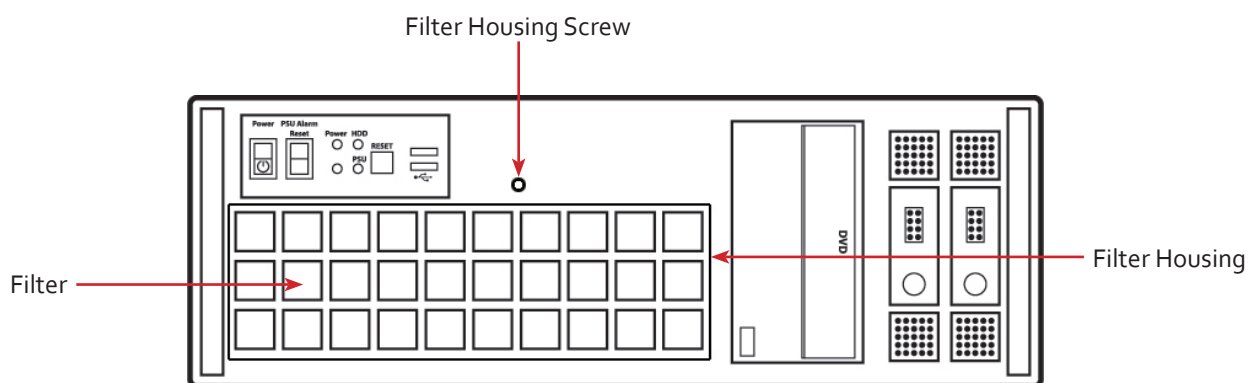
The filter can be removed and cleaned whilst the system is in operation, system shutdown is not necessary.

Note:

Failure to maintain the system filter could result in damage to your system and invalidate the warranty.

9.1.1 Remove the Filter

Open the front panel door and locate the filter housing screw, remove the screw and lift the filter housing away from the front panel.



Remove the filter from the housing and shake it to remove any dust particles, this should not be done in close proximity to the system to avoid dust ingress. Ideally, the filter should be cleaned using a vacuum cleaner.



Note: The filter should never be immersed in water or any other cleaning liquid.

For advice on replacement filters, please contact Datapath Ltd.

Chapter 10 - Environmental

10.1 Certification and Compliances

10.1.1 CE



EU- Class A Declaration of Conformity

Datapath Ltd declares that the Wall Controllers covered in this User Guide comply with the essential requirements and other relevant provisions of Directives 2001/108/EC and 2011/65/EU.

A copy of our Declaration of Conformity is available on request:

Datapath Ltd
Bemrose House
Bemrose Park
Wayzgoose Drive
Derby, DE21 6XQ
United Kingdom

10.1.2 FCC

These devices comply with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) These devices may not cause harmful interference, and (2) these devices must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at their own expense.



Caution. Changes or modifications to the equipment not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment

10.1.3 Disposal

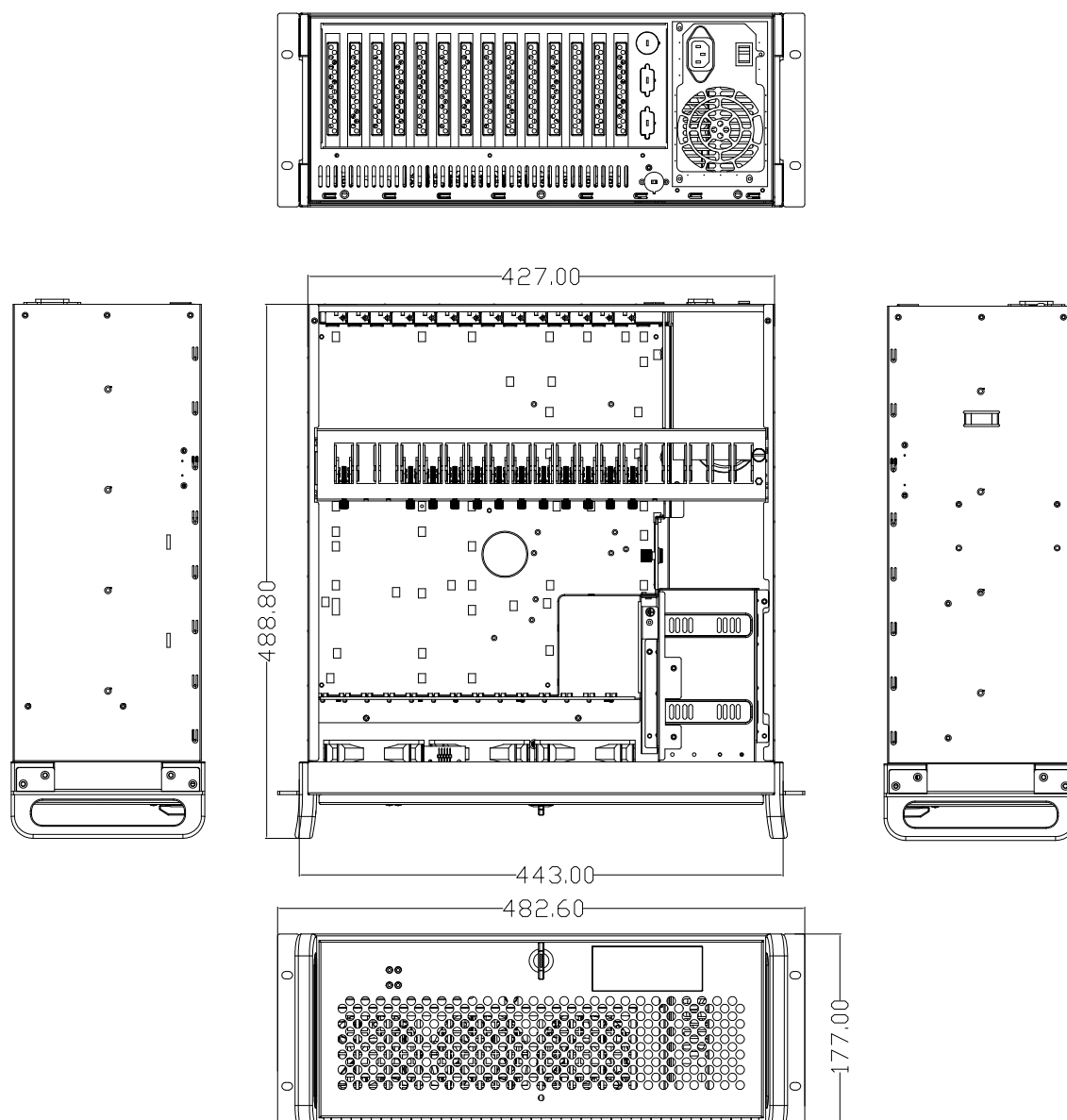
At the end of life all Datapath products should be disposed of as per local laws and regulations dictate. In the UK contact Datapath to arrange disposal. Our WEE registration number is WEEE/AA0005ZR.

Chapter 11 - Specifications

This chapter will cover:

- Technical drawings of the chassis
- Technical specification of the VSNg70
- Technical specification of the VSNg90
- Technical specification of the VSNg00X
- Technical specification of the VSN1170
- Technical specification of the VSN1190
- Technical specification of the VSN1100X
- Technical specification of the Express9-G3 backplane
- Technical specification of the Express11-G3 backplane

11.1 Technical Drawings



11.2 Technical Specification - VSN970

19" 4U Industrial PC chassis
Dimensions (approx) Length 500mm (incl handles, Height 177mm, Width 481mm (incl mounting brackets)
SBC4 - Core i7 4770S CPU 3.1GHz PICMG1.3 SBC with DVI/VGA, High speed dual Gigabit LAN, SATA RAID USB2.0/3.0 and Audio and 16-bit GPIO
8GB DDR2 1600 DDR3 non-EEC registered system memory with an upgrade option of 16GB
Express9-G3 PCIe back plane providing 1 x8 lane slot and 8 x4 lane slots
Two 750GB removable SATA hard drives - Enterprise Grade
One DVD/RW combo drive
Two Gigabit Ethernet ports
DVI-I output enabling connection to DVI/VGA using the cable provided. (Can be used as a control screen)
500 Watt ATX Power supply, or 600 Watt Dual Redundant RPSU
Noise - 48.6dB(A) up to 67.9 db(A); Dependent on system configuration and ambient temperature
Triple cooling fans with removable air filter
Includes keyboard and mouse
Windows 7 64bit operating system
Operating temperature: 0 to 35 Deg C
Weight - 19 to 25Kgs, Shipping Weight - 30 to 35 Kgs

11.3 Technical Specification - VSN990

19" 4U Industrial PC chassis
Dimensions (approx) Length 500mm (incl handles, Height 177mm, Width 481mm (incl mounting brackets)
SBC3- Intel® Dual Quad Core Xeon EC5549 chipset in LGA 1366 Package
16GB DDR3 1333 EEC registered system memory
Express9 PCIe back plane providing 1 x8 lane slot and 8 x4 lane slots
Two 750GB removable SATA hard drives - Enterprise Grade
One DVD/RW combo drive
Two Gigabit Ethernet ports
VGA output enabling connection to VGA using the cable provided. (Used as a control screen)
800 Watt Redundant PSU

Noise - 48.6dB(A) up to 67.9 db(A); Dependent on system configuration and ambient temperature
Triple cooling fans with removable air filter
Includes keyboard and mouse
Windows 7 64bit operating system
Operating temperature: 0 to 35 Deg C

11.4 Technical Specification - VSN990X

Express9-G3 PCIe backplane providing 1 x 8 lane slot and 8 x4 lane slots
600W Redundant PSU or 500W ATX
Dual cooling fans with removable air filter
Noise - 48.6dB(A) upto 67.9dB (A); Dependent on system configuration & ambient temperature
Weight - 19-25kg (shipped 30-33kg)
Operation temperature: 0 to 35 °C

11.5 Technical Specification - VSN1170

19" 4U Industrial PC chassis
Dimensions (approx) Length 500mm (incl handles, Height 177mm, Width 481mm (incl mounting brackets)
SBC4 - Core i7 4770S CPU 3.1GHz PICMG1.3 SBC with DVI/VGA, High speed dual Gigabit LAN, SATA RAID USB2.0/3.0 and Audio and 16-bit GPIO
Fitted with 8GB 1600 DDR3 non-ECC registered system memory. 16GB upgrade option available on request
Express11-G3 PCIe back plane providing 10 x 8 lane slots
Two 750GB removable SATA hard drives - Enterprise grade
One DVD/RW combo drive
Two Gigabit Ethernet ports
DVI-I output enabling connection to DVI/VGA using the cable provided. (Used as a control screen)
800 Watt Dual Redundant RPSU
Noise - 48.6dB(A) up to 67.9 db(A); Dependent on system configuration and ambient temperature
Triple cooling fans with removable air filter
Includes keyboard and mouse
Windows 7 64bit operating system
Operating temperature: 0 to 35 Deg C
Weight - 19 to 25Kgs, Shipping Weight - 30 to 35 Kgs

11.6 Technical Specification - VSN1190

19" 4U Industrial PC chassis
Dimensions (approx) Length 500mm (incl handles, Height 177mm, Width 481mm (incl mounting brackets)
SBC3- Intel® Dual Quad Core Xeon EC5549 chipset in LGA 1366 Package
16GB DDR3 1333 non-EEC registered system memory with an upgrade option of 32GB
Express11-G3 PCIe back plane providing 11 x8 lane slots
Two 750GB removable SATA hard drives - Enterprise Grade
One DVD/RW combo drive
Two Gigabit Ethernet ports
VGA output enabling connection to DVI/VGA using the cable provided. (Used as a control screen)
800 Watt Redundant PSU
Noise - 48.6dB(A) up to 67.9 db(A); Dependent on system configuration and ambient temperature
Triple cooling fans with removable air filter
Includes keyboard and mouse
Windows 7 64bit operating system (VSN1190 only)
Operating temperature: 0 to 35 Deg C

11.7 Technical Specification - VSN1100X

Express11-G3 PCIe backplane providing 11 x 8 lane slots
800W Redundant PSU
Dual cooling fans with removable air filter
Noise - 48.6dB(A) upto 67.9dB (A); Dependent on system configuration & ambient temperature
Weight - 19-25kg (shipped 30-33kg)
Operation temperature: 0 to 35 °C

11.8 Technical Specification - Express9-G3

11.8.1 Pin Connectors

FAN1, FAN2, FAN3	4 pin fan speed control header Pin 1 : GND Pin 2 : +12V Pin 3 : TACH Pin 4 : PWM	J11, J12	SATA 2.0 Pin 1 : 0V Pin 2 : A+ Pin 3 : A- Pin 4 : 0V Pin 5 : B- Pin 6 : B+ Pin 7 : 0V
FAN5, FAN6, FAN7, FAN8	3 pin fan header (non speed control) Pin 1 : GND Pin 2 : +12V Pin 3 : N/C	J13	Debug I2C Pin 1 : SCL Pin 2 : 0V Pin 3 : SDA Pin 4 : N/C Pin 5 : N/C Pin 6 : N/C Pin 7 : N/C Pin 8 : N/C Pin 9 : N/C Pin10 : 0V
FAN9	2 pin fan header (non speed control) Pin 1 : GND Pin 2 : +12V	J14, J15	USB 2.0 Pin 1 : +5V Pin 2 : +5V Pin 3 : USB1N Pin 4 : USB0N Pin 5 : USB1P Pin 6 : USB0P Pin 7 : 0V Pin 8 : 0V Pin 9 : N/C Pin10 : N/C
J1,J2	ATX Power Connector Pin 1 : +3.3V Pin13 : +3.3V Pin 2 : +3.3V Pin14 : -12V Pin 3 : 0V Pin15 : 0V Pin 4 : +5V Pin16 : PS_ON# Pin 5 : 0V Pin17 : 0V Pin 6 : +5V Pin18 : 0V Pin 7 : 0V Pin19 : 0V Pin 8 : PWR_ON Pin20 : N/C Pin 9 : +12V Pin21 : +5V Pin10 : +12V Pin22 : +5V Pin11 : +12V Pin23 : +5V Pin12 : +3.3V Pin24 : 0V	J16	Panel LED Connector Pin 1 : LED Anode Pin 2 : LED Cathode
J7	Panel Power Pushbutton Connector Pin 1 : PWRBUT Pin 2 : 0V	J17	PLX EEPROM Select Pin 1-2 : EEPROM U4 Pin 2-3 : EEPROM U14
J8	Panel Reset Pushbutton Connector Pin 1 : SHB_RST Pin 2 : 0V	J18	AUX Power Connector Pin 1 : 0V Pin 5 : +12V Pin 2 : 0V Pin 6 : +12V Pin 3 : 0V Pin 7 : +12V Pin 4 : 0V Pin 8 : +12V
J6	AUX Power Connector Pin 1 : 0V Pin 5 : +12V Pin 2 : 0V Pin 6 : +12V Pin 3 : 0V Pin 7 : +12V Pin 4 : 0V Pin 8 : +12V	J19	PLX I2C Pin 1 : SCL Pin 2 : 0V Pin 3 : SDA Pin 4 : N/C Pin 5 : N/C Pin 6 : N/C Pin 7 : N/C Pin 8 : N/C Pin 9 : N/C Pin10 : 0V

J6	AUX Power Connector Pin 1 : 0V Pin 5 : +12V Pin 2 : 0V Pin 6 : +12V Pin 3 : 0V Pin 7 : +12V Pin 4 : 0V Pin 8 : +12V	J19	PLX I2C Pin 1 : SCL Pin 2 : 0V Pin 3 : SDA Pin 4 : N/C Pin 5 : N/C Pin 6 : N/C Pin 7 : N/C Pin 8 : N/C Pin 9 : N/C Pin10 : 0V
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11.8.2 PCIe Port Width

PICMG	X8
SLOT 1	X8
SLOT 2	X 4
SLOT 3	X 4
SLOT 4	X 4
SLOT 5	X 4
SLOT 6	X 4
SLOT 7	X 4
SLOT8	X 4
SLOT9	X 4

11.8.3 Power and Environment

Max Power (without SBC)	16W
Power requirements	Max current at +3.3V < 0.5A Max current at +12V < 0.5A Max current at +5V < 1.5A
Form Factor	PICMG1.3 Host SBC interface 1 x PCI Express (x8) expansion slot 8 x PCI Express (x4) expansion slots
ATX PSU	4 x 24 pin power connectors
SATA Ports (2.0)	2 x ports via PICMG1.3 interface
USB Port (2.0)	2 x ports via PICMG1.3 interface
Operating Temperature	0 to 35 deg C/32 to 95 deg F
Storage Temperature	-20 to 70 deg C/-4 to 158 deg F
Relative Humidity	5% to 90% non-condensing

11.9 Technical Specification - Express11-G3

11.9.1 Pin Connectors

FAN1, FAN2, FAN3	4 pin fan speed control header Pin 1 : GND Pin 2 : +12V Pin 3 : TACH Pin 4 : PWM	J30, J31	SATA 2.0 Pin 1 : 0V Pin 2 : A+ Pin 3 : A- Pin 4 : 0V Pin 5 : B- Pin 6 : B+ Pin 7 : 0V
FAN5, FAN6,	3 pin fan header (non speed control) Pin 1 : GND Pin 2 : +12V Pin 3 : N/C	J33	2 pin fan header (non speed control) Pin 1 : GND Pin 2 : +12V
J17	Panel Power Pushbutton Connector Pin 1 : PWRBUT Pin 2 : 0V	J38	USB 2.0 Pin 1 : +5V Pin 2 : +5V Pin 3 : USB1N Pin 4 : USB0N Pin 5 : USB1P Pin 6 : USB0P Pin 7 : 0V Pin 8 : 0V Pin 9 : N/C Pin10 : N/C
J18	Panel Reset Pushbutton Connector Pin 1 : SHB_RST Pin 2 : 0V	J40	JTAG Pin 1 : TCK Pin 2 : 0V Pin 3 : TDO Pin 4 : +3V Pin 5 : TMS Pin 6 : +3V Pin 7 : N/C Pin 8 : TRST Pin 9 : TDI Pin10 : 0V
J19	Panel LED Connector Pin 1 : LED Anode Pin 2 : LED Cathode	J42	Debug + PLX I2C Pin 1 : SCL Pin 2 : 0V Pin 3 : SDA Pin 4 : N/C Pin 5 : N/C Pin 6 : N/C Pin 7 : N/C Pin 8 : N/C Pin 9 : N/C Pin10 : 0V
J23, J24	ATX Power Connector Pin 1 : +3.3V Pin13 : +3.3V Pin 2 : +3.3V Pin14 : -12V Pin 3 : 0V Pin15 : 0V Pin 4 : +5V Pin16 : PS_ON# Pin 5 : 0V Pin17 : 0V Pin 6 : +5V Pin18 : 0V Pin 7 : 0V Pin19 : 0V Pin 8 : PWR_ON Pin20 : N/C Pin 9 : +12V Pin21 : +5V Pin10 : +12V Pin22 : +5V Pin11 : +12V Pin23 : +5V Pin12 : +3.3V Pin24 : 0V	J49	PLX Debug Speed Select Pin 1-2 : All slots Gen 1 Pin 2-3 : All slots Gen 3
J25, J26	AUX Power Connector Pin 1 : 0V Pin 5 : +12V Pin 2 : 0V Pin 6 : +12V Pin 3 : 0V Pin 7 : +12V Pin 4 : 0V Pin 8 : +12V	J50	GPIO Pin 1 : GPI Pin 2 : 0V Pin 3 : GPO

J29	PLX EEPROM Select Pin 1-2 : EEPROM A - U13 Pin 2-3 : EEPROM B - U14		
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11.9.2 PCIe Port Width

PICMG	X8
Slot 1	X8
Slot 2	X8
Slot 3	X8
Slot 4	X8
Slot 5	X8
Slot 6	X8
Slot 7	X8
Slot 8	X8
Slot 9	X8
Slot 10	X8
Slot 11	X8

11.9.3 Power and Environment

Max Power (without SBC)	25W
Power requirements	Max current at +3.3V < 0.5A Max current at +12V < 0.5A Max current at +5V < 4A
Form Factor	PICMG1.3 Host SBC interface (x8 PCIe) 11 x PCI Express (x8) expansion slots
ATX PSU	2 x 24 pin power connectors 2 x 8 pin AUX power connectors
SATA Ports (2.0)	2 x ports via PICMG1.3 interface
USB Port (2.0)	2 x ports via PICMG1.3 interface
Operating Temperature	0 to 35 deg C/32 to 95 deg F
Storage Temperature	-20 to 70 deg C/-4 to 158 deg F
Relative Humidity	5% to 90% non-condensing

Chapter 12 - Warranty

12.1 Warranty Statement

Datapath provides a return to manufacturer warranty on all its products for a standard 36 month period, see the table below for non standard warranty periods. It is important that RMA procedures are followed prior to products being returned as often issues can be resolved quickly without the need for products being returned.

Component	Standard 36 Month Warranty	12 Month Warranty
Image DP4 Graphics Cards	X	
Vision Capture Cards (including ActiveSOX)	X	
Express9-G3 / Express11-G3	X	
HLink / SLink Cards (G3 and Optical)	X	
ExCable (G3 and Optical)	X	
SBC3 and SBC4		X
Power Supply Units		X
Hard Drives, RAM, Fans		X

12.2 RMA Returns Policy

If your Datapath product is not working as you expect, we recommend that you contact Datapath Ltd in the first instance for support, since many issues that may first appear as hardware faults, are actually installation or set-up problems and can normally be resolved without having to ship any hardware back to us. This route is therefore often the quickest, easiest and cheapest way of solving the problems that you are experiencing. Please email support@datapath.co.uk including as much detail regarding the failure as possible (for example: system description, signal types, input or output resolutions and any other relevant background information).

It is essential for you to know the serial number of the product(s) when contacting us.

If it appears that the fault is most likely to be hardware related, please email rma@datapath.co.uk stating the serial number and as much additional information regarding the nature of the failure as possible. Detailed explanation of the fault will help us to better identify the problem and will direct additional focused testing if necessary. We will then issue an "RMA Number" to you.

At the time that the "RMA Number" is issued we will inform you of the warranty status of the product and the cost of the repair, if appropriate - see paragraph (b) below. The product should then be returned, at your cost, too Datapath Ltd following the steps below.

There are 4 possible scenarios when a product is returned to us:

- (a) The product is in warranty and is either found to be genuinely faulty or no fault is found. In these cases, the product will be repaired as necessary, or replaced by a new or previously repaired product, and returned to you at our cost.
- (b) The product is out of warranty and is found to be faulty. The product if possible will be repaired or replaced at fixed cost, as stated in the RMA authorisation email. To cover this payment, you will be required to either provide a Purchase Order or Credit Card details, when the product is returned to us. (However, we will not issue an invoice or charge the credit card until the repair has been completed and is about to be returned to you)
- (c) The product is in warranty but is found to be damaged by mis-use. This will be treated as (b) above.
- (d) The product is out of warranty and is obsolete. In the unlikely situation that the product can be neither repaired nor replaced, because some of it's components are obsolete and we have no swap-out stock left, then the product will either be returned to you, or disposed of at your request, with no charge.

PLEASE NOTE: Datapath will not accept responsibility for the safety, integrity or security of any programmes, data or other content held on hard drives or any other type of rewritable media which is sent to us either separately or as part of any equipment returned to us for repair or for any other purpose. Customers are advised to take back-ups of anything that they deem to be valuable or important before returning the equipment to us and anything which is confidential should be erased from the media before it's returned.

Once the RMA Number has been issued, you need to raise your Purchase Order, or supply your credit card details, and return the product to: Datapath Ltd, Bemrose House, Bemrose Park, Derby DE21 6XQ, United Kingdom - securely packed and with the RMA Number clearly displayed on the outside of the box. To prevent unnecessary carriage and handling please only send back products or accessory items you believe to be faulty.

In the case of paragraph (c) , the fixed charge will be levied after we have seen the product and identified the misuse. In this case we will request you to issue a purchase order or provide credit card details before any repairs are completed.

Our policy is to return the repair (or swap-out) to you within 10 days of receipt.

Chapter 13 - Advanced Users

This chapter is aimed towards advanced users and covers the following:

- Wall Control Command Line Interface
- Software Development Kit (SDK)?
- RAID
- ImageDP4 Video BIOS
- Replacing Cards
- Updating Firmware
- System Recovery

13.1 Command Line Interface

13.1.1 Wall-Control-red

The Wall Control-red command line interface allows you to open layout files.

Example Usage

- Open the Layout file "c:\layouts\layout.lay" and exit without showing the Wall Control-red application window.
`"C:\Program Files (x86)\Wall Control\wallctl.exe" -Layout="c:\layouts\layout.lay" -exit`
- Connect to a computer named VideoWall and close all existing windows.
`"C:\Program Files (x86)\Wall Control\wallctl.exe" -Machine=VideoWall -CloseWindows=Yes`
- Connect to a computer named VideoWall without showing the Wall Control-red application window and save the configuration to a layout file named "c:\layouts\snapshot.lay".
`"C:\Program Files (x86)\Wall Control\wallctl.exe" -Machine=VideoWall -Save="c:\layouts\snapshot.lay" -exit`

Commands

-Layout=*layout file*

- This command line argument specifies the layout file to be loaded.
- If the layout file name or path contains spaces then enclose the path in quotes, for example:
`-layout="C:\Documents and Settings\user\Desktop\file.lay"`
- -layout is not compatible with -machine.

-Exit

- When used with the -layout option, -Exit will cause the Wall Control-red application to load the layout file without the application window being displayed and to terminate once the layout file has been loaded.
- Use this option to open a layout file without displaying the Wall Control-red application.
- When -Exit is specified on the command line, an exit code is returned.

-Quiet

- Used in conjunction with -Exit to suppress user interface dialogue boxes.

-CloseWindows={Yes|No}

- Use -CloseWindows=Yes to close existing windows.
- Use -CloseWindows=No to keep existing windows open.
- When the -layout command line option is specified, the default value for -CloseWindows is Yes.
- When the -machine command line option is specified, the default value for -CloseWindows is No.

-ShowState={Minimised|Restored|Maximised}

- Controls the appearance of the Wall Control-red application window.

-Window=[top],[left],[width],[height]

- This option enables the Wall Control-red application window to be positioned.
- If a number is left out of the list then the value saved when the application was last terminated is used.
- To change the position of the window without changing the size:

```
-window=100,200
```

- To change the size of the window without changing the position:

```
-window=, , 800, 600
```

-AlwaysOnTop={True|False}

- This sets the Always on Top state of the Wall Control-red application window.
- To enable the window to behave normally, the value should be set to false.
- To force the window to be displayed on top of all other normal windows the value should be set to true.
- 1 or on can be substituted for true.
- 0 (zero) or off can be substituted for false.

-Save= *Layout file*

- Allows the saving of a layout file from the command line. It's not compatible with the -layout or -closewindows options but can be used with -exit

Networking Options

To control a machine other than the one you are working on you will need some of the following options:

-Machine=*{machine name|IP address}*

- This option specifies the machine to connect too.
- If the machine name contains spaces then enclose the name in quotes, for example:

`-machine="My Computer"`

- You can also specify an IP address, for example:

`-machine=10.0.0.21`

- `-machine` is not compatible with `-layout`.

If the server requires a User Name and Password the following options should be used:

-UserName=*user name*

Password=*password*

If the machine is not participating in a domain, the account must be on the machine you are connecting to.

If the machine is participating in a domain, you have a choice:

- The account can be on the machine you are connecting to.
- It can be an account on the domain.

If the account is on the domain, the domain name must be specified with the following option:

-Domain=*domain name*

-Port=*port number*

You need specify the port if you are attempting to connect to another machine and Wall Control-red has been configured to listen on a port other than the default port.

A port number is any integer between 1 and 65535.

13.1.2 IP Camera

The command line interface allows you to create, modify or close IP-Camera windows. The command line interface can be accessed in a number of ways:

- From a shortcut specifying IPCAMCMD.EXE as the target followed by the command line options separated by spaces.
- From a command prompt by specifying the full path of IPCAMCMD.COM or by having the folder where the IP-Camera software was installed on the path.
- From a batch file. The same rules as command prompt apply.

-ID=*number*

- When a window is created it can be allocated an ID. To modify or close a window, specify its ID so the correct window is modified or closed.
- An ID is any integer between 1 and 65535. The ID is specific to IP-Camera windows.

-Input=*camera name*

- Specifies the name of a camera. This camera must already have been configured in Wall Control

-Close

- If this command line option is specified with an ID, the window with that ID is closed.

-ShowState=**{Minimised|Restored|Maximised|Show|Hide}**

- Sets the show state of the window.
- To activate a window use Restored.

-AlwaysOnTop=**{On|Off}**

-AspectRatio=**{[On|Off],[width],[height]}**

- Switch the maintain aspect ratio feature on or off and specify the ratio of the width and height of the window.
- All the values are optional but the commas must be used.

-Caption=

- Set the caption of the window. To include spaces, enclose the string in double quotes (").

-ShowFrameRate=**{On|Off}**

- Display or remove the current frame rate in the title bar,

-ShowMenuBar=**{On|Off}**

- Use to specify if the menu bar is to be displayed.

-Window=**[top],[left],[width],[height]**

- Change the position and size of the window.
- All the values are optional but the commas must be used.

-WindowStyle=**{BorderAndTitleBar|BorderOnly|NoBorderOrTitleBar}**

The following command line options allow changes to the appearance of the IP-Camera source. The numbers correspond to the values displayed on the Input Settings sheet.

Networking Options

To control a window on a machine other than the one you are working on you will need some of the following options:

-Machine=*{machine name|IP address}*

- Use this option to specify the machine to connect to.

-Port=*port number*

- You need to specify the port if you are attempting to control a window on another machine and the server has been configured to listen on a port other than the default port 1049.

- A port number is any integer between 1 and 65535.
- If the server requires a User Name and Password, the following options should be used:

-UserName=*user name*

-Password=*password*

If the machine is not participating in a domain, the account must be on the machine you are connecting to.

If the machine is participating in a domain you have a choice:

- The account can be on the machine you are connecting to.
- It can be an account on the domain.

If the account is on the domain, the domain name must be specified with the following option:

-Domain=*domain name*

13.1.3 Vision Windows

The Vision command line interface allows you to create, modify or close Vision windows.

-ID=number

- When a window is created it can be allocated an ID. To modify or close a window, specify its ID so the correct window is modified or closed.
- An ID is any integer between 1 and 65535. The ID is specific to Vision windows.

-Close

- If this command line option is specified with an ID, the window with that ID is closed.

-ShowState={Minimised|Restored|Maximised|Show|Hide}

- Sets the show state of the window.
- To activate a window use Restored.

-AlwaysOnTop={On|Off}

-AspectRatio=[{On|Off|Source}], [width], [height]

- Switch the maintain aspect ratio feature on or off and specify the ratio of the width and height of the window.
- If Source is specified, the width and height of the source are used as the aspect ratio.
- All the values are optional but the commas must be used.

-Caption=

- Set the caption of the window. To include spaces, enclose the string in double quotes ("").

-ShowFrameRate={On|Off}

- Display or remove the current frame rate in the title bar,

-ShowMenuBar={On|Off}

- Use to specify if the menu bar is to be displayed.

-Window=[top], [left], [width], [height]

- Change the position and size of the window.
- All the values are optional but the commas must be used.

-WindowStyle={BorderAndTitleBar|BorderOnly|NoBorderOrTitleBar}

-ExcludeBorders={On|Off}

-DisplayMessageAfter=time in milliseconds

-CaptureFormat={Automatic|5-5-5|5-6-5|8-8-8}

-TransferData={ViaSystemMemory|DirectToGraphicsCard}

-Scaling={Fast|Slow}

-ActiveCaptureRate=percentage

- Select one of the following percentages: 1, 5, 10, 15, 20, 25, 33, 50 or 100. If you use a number that is not in the list, it will be rounded down to the closest number lower in the list.

-InactiveCaptureRate=percentage

- Select one of the following percentages: 1, 5, 10, 15, 20, 25, 33, 50, 100. If you use a number that is not in the list, it will be rounded down to the closest number lower in the list.

-DifferentCaptureRate={On|Off}

-Input=input number

-Reset

- Discards the capture settings for the mode the Vision source is currently generating.

-ShareCaptureSettings={On|Off}

- With ShareCaptureSettings switched on, the changes made to the capture settings controls are shared with other Vision windows. The capture settings are saved automatically so that the next time a Vision window is created, the capture settings can be used.
- With ShareCaptureSettings switched off, the changes made to the capture settings controls are applied to this Vision window only.
- When switching ShareCaptureSettings on, the capture settings for the Vision window will be discarded.
- By default, ShareCaptureSettings is switched on.

-Cropping=[{On|Off}], [top], [left], [width], [height]

-Deinterlace={Weave|Bob|Field0|Field1}

- Select Weave for sources with little or no motion.
- Select Bob for sources displaying motion.
- Select Field for a single field to be displayed.

The following command line options allow changes to the appearance of the Vision source. The numbers correspond to the values displayed on the Input Settings sheet.

-CaptureWidth=number

-CaptureHeight=number

-HorizontalPosition=number

-HorizontalSize=number

-Phase=number

-VerticalPosition=number

-BlackLevel=number

-Brightness=*number*

-Contrast=*number*

-Saturation=*number*

-Hue=*number*

-Rotation=*{0|90|180|270}*

- Sets the orientation for the current input signal.

-Information

- Creates a text file called `information.ini` in the current directory. The file contains details of the minimum and maximum values and supported features that can be used with the command line.
- The `information.ini` file is over written every time the `-information` is used.

-CursorStyle=*Show*

- Always shows the cursor within the client area of the window

-CursorStyle=*Hide*

- Always hide the cursor within the client area of the window

-CursorStyle=*HideWhenActive*

- Only hide the cursor within the client area of the window when the window is the active window on the desktop.

Networking Options

To control a window on a machine other than the one you are working on you will need some of the following options:

-Machine=*{machine name|IP address}*

- Use this option to specify the machine to connect to.

-Port=*port number*

You need specify the port if you are attempting to control a window on another machine and the Vision server has been configured to listen on a port other than the default port 1049.

A port number is any integer between 1 and 65535.

If the server requires a User Name and Password, the following options should be used:

-UserName=*user name*

-Password=*password*

If the machine is not participating in a domain, the account must be on the machine you are connecting to.

If the machine is participating in a domain you have a choice:

- The account can be on the machine you are connecting to.
- It can be an account on the domain.

If the account is on the domain, the domain name must be specified with the following option:

-Domain=*domain name*

13.1.4 Application Windows

The command line interface allows you to create, modify or close Application windows, it can be accessed in a number of ways:

- From a shortcut specifying APPCMD.EXE as the target followed by the command line options separated by spaces.
- From a command prompt by specifying the full path of APPCMD.COM or by having the folder where the software was installed on the path.
- From a batch file. The same rules as command prompt apply.

Non-Configured Applications

The command line interface can be used to control windows for third-party applications that have not been specifically configured in . See Starting Non-Configured Applications below.

Configured Applications

An abbreviated version of the command line is available for starting applications that are already configured in Wall Control. See Starting Configured Applications below. This includes pre-supported applications automatically configured during installation and also custom applications added by the user after installation. See Configuring Applications in Wall Control .

Example Usage – Configured Applications

- Open the Internet Explorer application 'iexplore.exe with the configured input ID 1.
`"C:\Program Files (x86)\Wall Control\appcmd.exe" -AppName="Internet Explorer" -Input="Search" -ID=1`
- Dynamically switch input for an Internet Explorer window with the ID of 1.
`"C:\Program Files (x86)\Wall Control\appcmd.exe" -ID=1 -Input="News"`

Example Usage – Non-Configured Applications

- Open the application 'notepad.exe' to display the file "c:\info.txt".
`"C:\Program Files (x86)\Wall Control\appcmd.exe" -AppName="notepad.exe" -CmdArgs="c:\info.txt"`
- Open the Internet Explorer application 'iexplore.exe' with the URL "http://www.google.com" and assign the ID 1.
`"C:\Program Files (x86)\Wall Control\appcmd.exe" -AppName="C:\Program Files\Internet Explorer\iexplore.exe" -CmdArgs="-nomerge http://www.google.com" -ID=1`

- Dynamically switch inputs for an Internet Explorer window with the ID of 1.

"C:\program files (x86)\Wall Control\appcmd.exe" -ID =1 -CmdArgs="http://www.google.com/news"

- Move the application window with the ID 1 to the origin of the desktop without changing its size.

"C:\Program Files (x86)\Wall Control\appcmd.exe" -ID=1 -Window=0,0,,

- Close the application with the ID 1.

"C:\Program Files (x86)\Wall Control\appcmd.exe" -ID=1 -Close

-ID=number

- When a window is created it can be allocated an ID. To modify or close a window, specify its ID so the correct window is modified or closed.
- An ID is any integer between 1 and 65535. The ID is specific to windows.

-Close

- If this command line option is specified with an ID, the window with that ID is closed.

-ShowState={Minimised|Restored|Maximised|Show|Hide}

- Sets the show state of the window. To activate a window use Restored.

-AlwaysOnTop={On|Off}

-ShowMenuBar={On|Off}

- Use to specify if the menu bar is to be displayed.

-Window=[top],[left],[width],[height]

- Change the position and size of the window.
- All the values are optional but the commas must be used.

-WindowStyle={BorderAndTitleBar|BorderOnly|NoBorderOrTitleBar}

Starting Non-Configured Applications

A non-configured application involves any application that has not been added to Wall Control's list of configured applications: See Configure Applications.

-AppName="application name"

- The full path of the application must be specified (eg. "C:\Program Files\Internet Explorer\iexplore.exe")

-CmdArgs="Command line arguments"

- Specifies optional parameters for the application. Many applications accept the name of a file to be opened. For details of command line arguments, refer to your application documentation.
- -CmdArgs can only be used in conjunction with -AppName for non-configured applications. If -AppName contains the name of a pre-configured or custom application then -Input should be used instead.

-CmdArgs="-File=\"C:\My Pictures\picture.jpg\""

Starting Configured Applications

Configured applications include pre-supported applications automatically added during Wall Control installation and custom applications added by the user after installation: See Configure Applications.

-AppName="application name"

- The name of a pre-configured or custom configured application in Wall Control must be specified (eg. "DGCPlay").

-Input="input name"

- The input name must specify the name of an input that has been configured for the application (eg. "FilmClip1").

Networking Options

To control a window on a machine other than the one you are working on you will need some of the following options:

-Machine={machine name|IP address}

- Use this option to specify the machine to connect to.

-Port="port number"

- You need specify the port if you are attempting to control a window on another machine and the Application server has been configured to listen on a port other than the default port 1049.
- A port number is any integer between 1 and 65535.
- If the server requires a User Name and Password, the following options should be used:

-UserName="user name"

-Password="password"

If the machine is not participating in a domain, the account must be on the machine you are connecting too.

If the machine is participating in a domain you have a choice:

- The account can be on the machine you are connecting to.
- It can be an account on the domain.

If the account is on the domain, the domain name must be specified with the following option:

-Domain="domain name"

Dynamically Switching Inputs for Configured Applications

The -Input command can be used to change the input displayed in a window for a configured application without closing and re-opening either the window or the application. This is an application specific feature that requires the window to be in a visible state and not obstructed by other windows on the desktop.

-Input="input name"

- The input name must specify the name of an input that has been configured for the application that owns the window.
- The -Input switch must be used with the -ID switch to specify the target window.

Example of dynamically switching the input for an Internet Explorer window with the ID of 1.

```
"C:\Program Files (x86)\Wall Control\appcmd.exe" -ID=1 -Input="News"
```

Dynamically Switching Inputs for Non Configured Applications

-CmdArgs can be used to change the open file/URL displayed in a window for a non configured application without closing and re-opening either the window or the application. This is an application specific feature that requires the window to be in a visible state and not obstructed by other windows on the desktop.

-CmdArgs="File pathname or URL"

- The value in -CmdArgs must specify the full pathname or URL.
- -CmdArgs must be used with the -ID command to specify the target window.
- The value in -CmdArgs should only include the pathname/URL and should not include any application specific commands that were used to start the application.

Example of dynamically switching inputs for an Internet Explorer window with the ID of 1.

```
"C:\program files (x86)\Wall Control\appcmd.exe" -ID =1 -CmdArgs="http://www.google.com/news"
```


13.1.5 On Screen Display

-OSDType={Disabled|SimpleText}

- Switches the OSD on or off

-OSDText=

- Specifies the on screen display text.
- If the text includes spaces, the text must be enclosed in double quotes.
- Line breaks are indicated by the characters \n. If you wish to include a \ in the text, it must be preceded by a \.

For example -OSDText="The quick\nbrown fox\njumps over\nthe lazy dog." Gives the on screen display:

The quick

brown fox

jumps over

the lazy dog

-OSDScaling={FixedSize|ScaleWithWindow}

- Allows you to specify how the OSD is scaled. When FixedSize is specified, the OSD is displayed at the same size regardless of the size of the window. When ScaleWithWindow is specified, the OSD is scaled up or down according to the size of the window.

-OSDFontName=font name

- Specifies the name of the font to be used for OSD text. If the font name includes spaces, the name must be enclosed in double quotes.

-OSDFontSize=number

- Specifies the point size of the font to be used for OSD text.

-OSDFontStyle={Regular|Bold }

-OSDFontItalic={On|Off}

-OSDFontStrikeout={On|Off}

-OSDFontUnderline={On|Off}

-OSDFontColour=red,green,blue

- Specifies the colour of the text in red, green and blue components. Each of the components is a number from 0 to 255.

-OSDBackground={Transparent|Opaque}

- When Transparent is specified, the Vision capture in the area behind the text is visible.
- When Opaque is specified the area behind the text is displayed in the colour specified using the OSDBackgroundColour option.

-OSDBackgroundColour=red,green,blue

- When OSDBackground is set to Opaque, this option specifies the colour displayed behind the text in red, green and blue components. Each of the components is a number from 0 to 255.

-OSDMargins=[top],[left],[right],[bottom]

- The margins define the area in which OSD is displayed.
- If ScaleWithWindow is specified, the margins are measured in pixels of the Vision source. If FixedSize is specified, the margins are measured in pixels of the interior of the Vision window.
- Any part of the OSD that falls outside the margins is not displayed.

-OSDTextWrap={On|Off}

- When text wrapping is switched on, if the text does not fit between the left and right margins, spaces between words are replaced with line breaks to produce shorter lines.
- When text wrapping is switched off, the text is displayed with the same spaces and line breaks as it has been entered.

-OSDHorizontalAlignment={Left|Centre|Right}

- If you specify Left, the left edge of the OSD will be positioned against the left margin and each of the individual lines will be left aligned.
- If you specify Centre, the centre of the OSD will be positioned half way between the left and right margins and each of the individual lines will be centred.
- If you specify Right, the right edge of the OSD will be positioned against the right margin and each of the individual lines will be right aligned.

-OSDVerticalAlignment={Top|Centre|Bottom}

- If you specify Top, the top edge of the OSD will be displayed against the top margin.
- If you specify Centre, the centre of the OSD will be positioned half way between the top and bottom margins.
- If you specify Bottom, the bottom edge of the OSD will be displayed against the bottom margin.

13.1.6 Audio

The Audio command line interface controls analogue, digital and line out audio streams.

-AudioEnable={On|Off}

- Enable or disable for the specified window.

-AudioFocusMute={On|Off}

- Use to mute audio for the specified window unless it has focus.

-AudioLineOutMute={On|Off}

- Mute line out in hardware.

-AudioLineOutGain=gain

- Specify the numeric gain value to be applied to the line out.

-AudioLineOutSource={Digital|Analog}

- Set line out source to as digital or analogue line out source .

-AudioDigitalMute={On|Off}

- Mute digital input in hardware.

-AudioDigitalPair={0|1|2|3}

- Select the stereo channel pair sampling for a digital input.

0: 0-1

1: 2-3

2: 4-5

3: 6-7

-AudioUnbalancedMute={On|Off}

- Mute unbalanced input in hardware.

-AudioUnbalancedGain= gain

- Specify the numeric gain to be applied to the unbalanced input.

-AudioBalancedMute={On|Off}

- Mute balanced input in hardware.

-AudioBalancedBoost={On|Off}

- Add a 20dB boost to the balanced input.

-AudioBalancedGain= gain

- Specify the numeric gain to be applied to the balanced input.

-AudioADCMute={On|Off}

- Mute the output mixer in hardware.

-AudioADCGain= gain

- Specify the numeric gain to be applied to the output mixer.

13.2 Verify RAID

To verify the RAID set up on your Wall Controller follow these instructions.

13.2.1 Enter the BIOS Setup

Restart the Wall Controller and press the keyboard delete button when the Boot-Up splash screen is displayed. This will direct you to the BIOS Setup Utility.

Use the keyboard arrows to navigate across to the Advanced Tab:

- Confirm that **Configure SATA#1** is set to RAID.
- Press F10 to save and exit the BIOS Utility.

When the wall controller restarts press CTRL+i at the BIOS splash screen to enter the RAID BIOS utility.

13.2.2 Degraded RAID Array

If a RAID array degrades this does not necessarily mean that the hard drive or any other hardware within the system is faulty. What it does mean is that there is an inconsistency in DATA across the array. This could be caused by many different factors including a BSOD, the system hanging, an application conflict or power outage.

As stated above, the degrade of a RAID array does not necessarily mean hardware failure but should the problem occur on a regular basis then further diagnostics should be performed/undertaken. It is recommended, as with any system, that regular backups are made to safeguard information.

If a RAID array is degraded take note of the physical port number and the drive serial number of the degraded disk. The degraded disk will normally be highlighted with an error in red in the RAID BIOS Utility. Working drives are normally set to green.

Use the keyboard arrow keys and navigate to Reset disks to Non-RAID and press enter.

Use the keyboard arrow keys to select the degraded disk and press the keyboard spacebar to assign it for Reset.



Warning! Ensure the correct disk is selected before continuing.

Once a disk has been reset the BIOS RAID Utility will detect the disk as a new one and a prompt will appear asking if you want to use the selected disk to repair the RAID. Accept and continue.

Both disks should now be displayed as **Member Disk (x)** with the status highlighted in yellow as Rebuild.

Exit the Utility by clicking Esc and RAID will commence the rebuild process once the operating system has loaded.

13.3 ImageDP₄ Video BIOS

13.3.1 Introduction

There are two Video BIOS available for the ImageDP₄. This section of the user guide is intended to describe how to choose which BIOS to use on an ImageDP₄ and why the choice is available. It also describes how to update an ImageDP₄ with the chosen BIOS.

13.3.2 Background Information

The Intel x86 based architecture limits the amount of legacy IO space available in a system to 64KB. Hardware which requires IO access can be mapped into this 64KB area. An ImageDP₄ requests 256 Bytes of legacy IO. Unfortunately any PCIe bridge will align this to a 4KB boundary and so the IO space allocated to each ImageDP₄ is actually 4KB. $64\text{KB} \div 4\text{KB}$ gives an absolute maximum of 16 ImageDP₄ graphics cards. However, other system devices also require legacy IO. Often the Network Devices will request some IO space, and so might the USB devices and on-board graphics. It is not unusual for there to be IO space available for only 8 ImageDP₄ graphics cards when installing them in a complex server class motherboard.

There are a number of different BIOS types in operation as the computer boots. The "System BIOS" is resident on the motherboard and is responsible for starting up all the hardware and mapping in the resources (like the IO) so that they are available to the CPU. The "Video BIOS" is resident on the graphics cards. It is responsible for booting the GPU and for informing the System BIOS which resources will be required for the GPU to operate correctly.

The System BIOS requires an IO enabled ImageDP₄ if it is used as the boot device, i.e. it provides the graphics output that displays the BIOS boot messages. However the Windows driver for the ImageDP₄ has been designed so that it does not require IO. We can therefore use two types of Video BIOS for the ImageDP₄, one which requests IO (and which can be used as a boot device) and one which does not. This allows us to increase the number of ImageDP₄ cards which can be used in a system.

13.3.3 When to Disable IO

Where the onboard graphics is used as a boot screen the ImageDP₄ won't be used by the System BIOS and none of the cards will require IO. However, if someone were then to enter the System BIOS and change the boot display from "IGD" (Integrated Graphics) to "PEG/PCI" (a graphics card in a PCIe slot) then the system will require an IO enabled ImageDP₄ to be available as the boot card. Without this the system will not boot, and the only way to recover it is to install another IO enabled boot card.

We would therefore recommend that the card which would be used as the boot card using "PEG/PCI" is always set to the IO Enabled, regardless of whether an onboard graphics control screen is enabled. This will ensure that it is not possible to break the system by selecting an incompatible BIOS option.

Further to this, in a multi chassis system it is possible that the boot order might change. Someone might remove the Host Interface cable for instance, or they may fail to power up one of the expansion chassis. This would change the ImageDP₄ which would be selected as the boot card. To ensure that in this instance it is always possible to boot the system, we would recommend placing an IO enabled card in each of the chassis which comprise the system. To be of use this card must be positioned in the slot which the System BIOS would select if the chassis were the only one in the system.

13.3.4 SBC₃

The SBC₃ will use the first ImageDP₄ card enumerated by the System BIOS as the boot device. It will run out of IO if used with more than 6 ImageDP₄ cards. We would recommend that each chassis that comprises the system should contain one IO enabled ImageDP₄ card. This should be the first ImageDP₄ that the SBC will enumerate in the chassis. This ensures that no matter which way the chassis are wired, the first card seen by the BIOS will be an IO enabled card.

13.3.5 SBC₄

The SBC₄ will use the last ImageDP₄ card enumerated for the boot device. It will run out of IO if used with more than 10 ImageDP₄ cards. Again we would recommend that each chassis that comprises the system should contain one IO enabled ImageDP₄ card. In this instance however, it should be the last ImageDP₄ the SBC will find in the chassis. This ensures that no matter which way the chassis are wired, the last card seen by the BIOS will be an IO enabled card.

13.3.6 Backplane Slot Ordering

The order which the System BIOS enumerates the cards is dictated by the way the PCI Express slots are mapped onto the PCI Express switch on the backplane. Unfortunately this is dictated by the routing of the tracks from the slot to the switch on the backplane. The track routing is designed to provide the highest signal integrity possible, and this means that there is not necessarily a straight mapping between physical slot number and logical BIOS enumeration.

Physical Slot	Express9 Bus Number	Express9 ¹ G3 Bus Number	Express11 Bus Number
1	1	1	3
2	2	2	2
3	3	3	7
4	4	4	6
5	5	5	11
6	6	9	10
7	7	8	9
8	8	7	8
9	9	6	5
10	--	--	4
11	--	--	1

¹ This order was introduced in Revision F of the Express9 G3 backplane. Prior to this the ordering was as found in the original Express9. The revision can be determined from the backplane serial number, and the Revision F serial number will always start 163F.

It can be seen from the table that the first card enumerated by the BIOS when using either an Express9 or Express 9-G3 is the one in Slot 1. However, on an Express11 the first card enumerated would be the card in Slot 11.

The last card enumerated in an Express11 would be the one in Slot 5. If we were using an SBC₄ with this backplane then an ImageDP₄ card would be programmed with the IO Enabled BIOS. Additional cards could have their IO requirement disabled. If Slot 5 is not populated with an ImageDP₄, the card which would require IO would be the one with the highest bus number.

The last slot enumerated in an Express9 G3 by the SBC₄ would be Slot 6. In the same manner as the Express11 if an ImageDP₄ is placed in this slot it should be the IO enabled card.

It is also worth noting that once booted into Windows the Datapath Drivers will reorder our hardware so that it appears in the order dictated by the jumpers on the card, or by the physical slot if the jumpers are not set. We hide the logical bus order from the user to simplify the wiring of the inputs and outputs.

13.3.9 Other Motherboards and SBC

Selecting which version of Video BIOS to use can be complicated because it requires an understanding of which graphics card the System BIOS will choose as its boot device. The rules change from one motherboard model to the next but normally the System BIOS will either choose the first graphics device it enumerates, or the last. The algorithm used by the System BIOS can be discovered by placing cards in different slots and noting which one it uses to display the boot messages.

Determining which card is used can be complicated further with multiple expansion chassis but it can still be derived through experimentation with a few ImageDP4 cards.

By default we would recommend leaving all ImageDP4 as IO Enabled unless the amount of IO required exceeds that which can be provided in the system.

13.3.10 Programming the ImageDP4

The ImageDP4 must be successfully mapped by the System BIOS before we are able to program it. We cannot therefore install all 16 cards and program them on mass to disable the IO. We must program them in small batches so that they can be allocated IO by the System BIOS.

To program the Video BIOS we use a tool provided by the GPU Manufacturer, AMD. This is called ATIFLASH.EXE. ATIFLASH.EXE can program any AMD based graphics card. Where another AMD based card is installed in the system (for instance as a control screen) extra care must therefore be taken to ensure that only the ImageDP4 is updated.

Replacing the Video BIOS of a different AMD card with the ImageDP4 BIOS will break it and potentially leave it in an unrecoverable state. Do not use another AMD Graphics card in the system used to program the ImageDP4.

ATIFLASH.EXE must be used from an MS-DOS BOOT environment and will not work when run under Windows. Normally this entails creating a USB Boot disk from which the MS-DOS environment can be booted. There are a number of ways of creating a USB Boot Disk. We tend to use an open source package called "Rufus" and further documentation can be found online.

Once the USB Boot disk has been created copy the files included in the ImageDP4 BIOS to the USB stick and then reboot the machine. Enter the System BIOS and ensure that the USB disk is the boot device. Instructions on selecting the USB disk as the boot drive can be found in the motherboard manual.

Once inside the MSDOS environment the command line below can be used to program the bios_file to the ImageDP4 device which is referenced by card_num:

```
ATIFLASH -f -p <card_num> <bios_file>
```

There are currently two ROM files released for the ImageDP4*:

DP4_R110.bin is the ROM file which enables IO on the ImageDP4 so that it can be used as the boot device.

DP4_R120.bin is the ROM file which disables IO on the ImageDP4 so that it can be used to create large systems.

Run in the MS-DOS environment, the following commands will flash the first four ImageDP4 cards with the BIOS file called DP4_R120.BIN. This will disable the IO on these cards:

```
ATIFLASH -f -p 0 DP4_R120.bin
```

```
ATIFLASH -f -p 1 DP4_R120.bin
```

```
ATIFLASH -f -p 2 DP4_R120.bin
```

```
ATIFLASH -f -p 3 DP4_R120.bin
```

These commands can either be entered one at a time, or used to create a batch file to program a number of cards at once.

Conversely, the following command can be used to program the ImageDP₄ card with a BIOS enabled ROM:

```
ATIFLASH -f -p o DP4_R110.bin
```


13. 4 Use of the SBC's Onboard Graphics Adaptor

All Datapath Wall Controllers are shipped configured to boot off the onboard graphics device, this output is then used as a control screen for a typical video / data wall configuration.

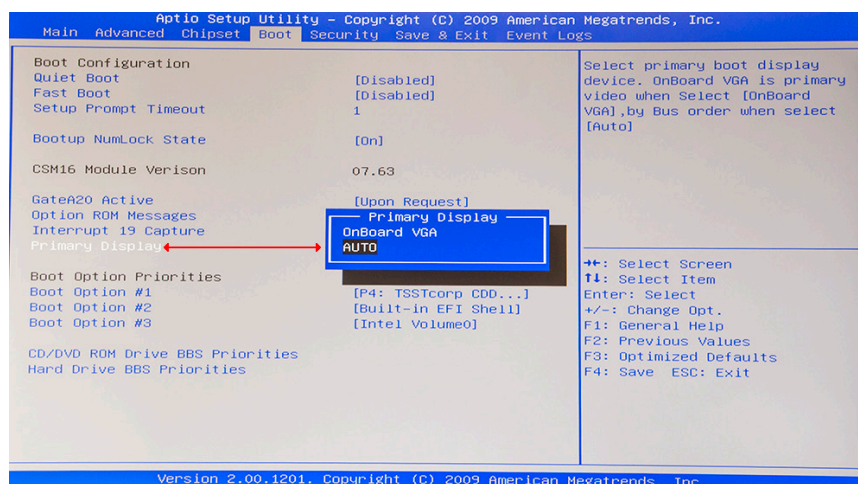
If you do not require a control screen, then you should disable the integrated onboard graphics as described below:

13.4.1 Disable Onboard Graphics - SBC 3

Connect a monitor to the onboard graphics device output and enter Setup from the boot screen by pressing <F2> as prompted.

In the BIOS setup utility select:

Boot>Primary Display>Auto



The system will then boot from the graphics card identified first by the PCI Bus.

13.4.2 Disable Onboard graphics - SBC4

Connect a monitor to the onboard graphics device output and enter Setup from the boot screen by pressing <F2> as prompted.

In the BIOS setup Utility select:

Advanced>Graphics Configuration>Graphics Configuration>primary Display Selection [PEG/PCI]

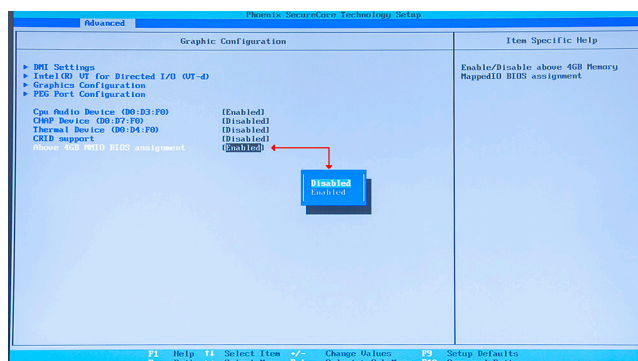
Once the Primary Display selection PEG/PCI has been made, the "Above 4GB MMIO BIOS assignment" has to be disabled:

Navigate to

Advanced>Graphic Configuration>PEG Port Configuration> Above 4GB MMIO BIOS assignment - Disabled



By opting to disable the onboard graphics adapter, this reduces the maximum number of screens available from 64 to 32.



The system will then boot from the graphics card identified first by the PCI Bus.

13.5 Installing Additional ImageDP4 Cards

As the number of required screens increase, the likelihood of reaching a system limitation or encountering problems increases. The system limitations are the amount of address space available and the capacity of the power supply.

13.5.1 Power

The amount of current a power supply can deliver on each voltage rail is limited. Often there is also a limit on the total power.

Each ImageDP4 card requires 0.25A at +3.3V and 1.2A at +12V.

You can calculate the amount of current and the amount of power required for the ImageDP4 cards. For example, the requirements for a 24-screen system of ImageDP4 cards is calculated as follows:

Current

$$+3.3V \ 6 \times 0.25A = 1.5A$$

$$+12V \ 6 \times 1.2A = 7.2A$$

Power

$$(3.3V \times 1.5A) + (12V \times 7.2A) = 91.35W$$

These are the requirements for the ImageDP4 cards; you must take into account the requirements of all the other devices in the system.

13.5.2 ImageDP4 Jumper Links

Multiple ImageDP4 cards may have had jumper links fitted, when fitted the links control the order in which the display driver uses the ImageDP4 therefore any additional cards need to have their jumper links set accordingly. Details on how the jumper links are set can be found in the ImageDP4. If a damaged card is being replaced, the new card must have the same jumper settings as the damaged one coming out of the system.

13.5.3 Installing the Display Drivers

If any graphics cards are added (or removed) from the system the Display Drivers need to be re-installed from the Recovery Media that came with your system or by downloading the latest drivers from the Datapath website.

13.5.4 Screen Order

Any additional graphics cards will change the way the screens on your video wall are ordered. The Wall Control application has a screen order tool which can be used to configure which order the screens appear on the desktop. This allows the screen order to be changed without physically swapping any of the output cables between graphics cards.

13.6 Installing CODEC Packs to Play Video

DGCPay utilises the DirectShow codecs installed on the computer to playback a video file. A standard installation of Windows includes codecs for playing WMV files, plus some AVI and MPG files. Many video files require additional 3rd party codec files.

For many of AVI and MPG formats the open source ffdshow package will contain codecs which will allow playback using DGCPay. ffdshow is available from:

<http://ffdshow-tryout.sourceforge.net>

MOV files are supported through QuickTime. By default QuickTime is not available through DirectShow. With additional software it is possible to make QuickTime video files available however. There are a number of codecs which do this, for instance:

http://www.codecguide.com/download_kl.htm

<http://www.riverpast.com/en/prod/quicktime/>

http://www.medialooks.com/products/directshow_filters/quicktime_filter.html

SWF and FLV files are supported by Flash. In the same manner as QuickTime these are not natively supported by DirectShow, although it is possible to use additional software to enable playback. A suitable codec for this might be:

http://www.medialooks.com/products/directshow_filters/flash_source.html

Datapath do not provide any warranty or assurance that these examples will be suitable for commercial use. We simply list them as an example of those available through 3rd parties. Before deployment we advise that any of the above, and any other codec selected, is thoroughly evaluated to confirm their suitability.

13.7 Firmware Updates

The procedures for updating the firmware of your cards can be found in the relevant user guide which is available on your Datapath Recovery Media. Check the Datapath website for the latest version of the user guides.

13.8 Restoring to Factory Settings

To restore your wall controller to its factory settings you will need the recovery media supplied with your system. If you no longer have your recovery media, contact sales@datapath.co.uk for advice in obtaining a replacement.

Ensure your wall controller is turned off and insert the recovery media (USB Stick) into a USB port.

13.8.1 Selecting a Boot Device

With the USB recovery media inserted, switch on your wall controller and press F8 when the Splash Screen is displayed to enter the **Select Boot Device** screen.

From the list of boot devices, select the **NON UEFI USB media** and click on OK.



At this point, if Windows® fails to start this indicates that the wrong boot device was selected. In this instance, select Esc to exit and start the process again.

The wall controller will reboot with the boot messages appearing on your control screen (if set) or the first screen on your video wall. When prompted, accept the terms and conditions and then follow the instructions to restore your wall controller.

13.8.2 Reactivate Windows®

When the wall controller has been restored the Windows® operating system will need to be re-activated. The software key can be found on the front panel of your wall controller.

13.8.3 Install Display Drivers and Software

Once the Windows® re-activation process is complete the Display Drivers need to be re-installed and if required, the Wall Control application software. The Display Drivers and Wall Control software can be found in the **Driver and Tools** folder on the recovery media.

For the latest drivers and software go to www.datapath.co.uk

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