

User Guide



+ Contents

Safety Instructions.....	1
Introduction.....	2
Hardware Overview.....	4
Software Overview.....	5
Installing the Capture Card.....	6
Installing Multiple Cards.....	9
Specification.....	12
Datapath Limited	14
Index.....	15

+ Safety Instructions

Safety Instructions (UK)

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.

Power Supply

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

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.

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.

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.

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.

Smoke/Unusual Smells

Should you notice smoke or unusual smells being emitted from your computer, 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.

Maintenance

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.

Disposal

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

Consignes de sécurité (Fr)

Afin de ne pas endommager votre produit Datapath et d'éviter tout risque de blessure du personnel exploitant le matériel, veuillez lire les consignes de sécurité suivantes avant toute utilisation. Ces instructions doivent être mises à disposition de toute personne souhaitant utiliser et exploiter les produits Datapath.

Alimentation électrique

Tous les produits Datapath requièrent une alimentation électrique principale. Cette alimentation électrique doit être interrompue en cas de mise à jour ou de relocalisation du matériel.

Câbles

Ne pas exposer les câbles à un liquide quelconque car cela pourrait provoquer un court-circuit susceptible d'endommager le matériel.

Ne pas placer d'objets lourds sur les câbles car cela pourrait causer des dommages et conduire éventuellement à des fils électriques dénudés.

Ventilation

Tout matériel informatique doit être disposé dans un endroit bien ventilé. Veiller à ne jamais obstruer les orifices de ventilation du boîtier de l'ordinateur ; sinon, il y a un risque de surchauffe du système et votre matériel peut être endommagé.

Environnement de travail

Le matériel doit être placé sur une surface de travail stable et solide, dans un environnement exempt de poussière et d'humidité et non exposé à des variations extrêmes de températures. Ne pas placer de liquides (boissons chaudes/froides, etc.) près du matériel, car un déversement accidentel pourrait causer de graves dommages.

Gas/Liquides inflammables

Le matériel électronique ne doit jamais être utilisé en présence de gaz ou de liquide inflammable ; cela pourrait entraîner une explosion ou un grave incendie.

Fumée/odeurs inhabituelles

Si vous constatez la présence de fumée ou d'odeurs inhabituelles émanant de votre ordinateur, éteignez-le et débranchez le système de l'alimentation secteur. Dans ce cas, le système devra être confié à un technicien qualifié pour inspection. Une poursuite de son utilisation risquerait de provoquer des blessures corporelles et des dommages matériels.

Entretien

L'entretien doit impérativement être effectué par des techniciens compétents, toute carte enfichable Datapath physiquement endommagée est à retourner à Datapath pour réparation via la procédure Datapath RMA.

Élimination

En fin de vie, tous les produits Datapath seront éliminés conformément aux législations et réglementations locales. Au Royaume-Uni, veuillez contacter Datapath pour organiser l'élimination. Notre numéro d'enregistrement de Déchets d'équipements électriques et électroniques : WEEE/AA0005ZR.

Instrucciones de seguridad (Esp)

Rogamos leer las siguientes instrucciones de seguridad antes de poner en funcionamiento el equipo, a fin de evitar daños en su producto de Datapath o lesiones al personal encargado de su manejo. Poner estas instrucciones a disposición de todos aquellos que vayan a utilizar y/o manejar los productos de Datapath.

Alimentación eléctrica

Todos los productos de Datapath requieren una fuente de alimentación eléctrica. Esta fuente de alimentación eléctrica debe ser desconectada durante las tareas de renovación o traslado.

Cables

No exponer los cables a líquidos, ya que ello puede causar un cortocircuito y, por consiguiente, daños en el equipo. No colocar objetos pesados sobre los cables, ya que esto puede ocasionar daños y poner al descubierto los cables vivos.

Ventilación

Todos los equipos informáticos deben estar situados en un área bien ventilada. Mantener todos los orificios de ventilación de la carcasa del ordenador siempre libres de obstrucciones de cualquier tipo. En caso contrario, podría producirse un sobrecalentamiento del sistema y daños en el equipo.

Entorno de trabajo

El equipo debe estar emplazado en un ambiente sin polvo, humedad ni cambios bruscos de temperatura y debe ser situado sobre una superficie estable y sólida. No colocar líquidos (bebidas calientes/frías, etc.) cerca del equipo, ya que un derrame podría causar graves daños.

Gas/líquidos inflamables

El equipo electrónico nunca debe ser usado en presencia de gas o líquido inflamable, ya que esto podría causar una explosión o un incendio grave.

Humo/olores inusuales

En caso de percibir humo u olores inusuales provenientes de su ordenador, apagar y desenchufar el equipo de la red eléctrica. El sistema debe ser confiado entonces a un técnico cualificado para su

inspección. Si el equipo continuara funcionando, esto podría ocasionar lesiones personales y daños materiales.

Mantenimiento

El mantenimiento solo debe ser ejecutado por técnicos capacitados. Las tarjetas insertables (plug-in) de Datapath que estén físicamente dañadas deben ser devueltas a Datapath para su reparación según los procedimientos RMA (Return Merchandise Agreement) de Datapath.

Eliminación

Al final de su vida útil, todos los productos de Datapath deben ser eliminados de acuerdo con las leyes y normativas locales. En el Reino Unido, contactar a Datapath para organizar la eliminación. Nuestro número de registro WEE (Waste Electrical and Electronic Equipment) es WEEE/AA0005ZR.

Sicherheitsanweisungen (D)

Die folgenden Sicherheitsanweisungen dienen der Vermeidung von Schäden an Ihrem Datapath-Produkt und Verletzungen der Nutzer. Bitte lesen Sie sie sorgfältig durch, bevor Sie Ihr Produkt in Betrieb nehmen. Diese Anweisungen sollten allen Personen zugänglich gemacht werden, die mit der Nutzung und der Bedienung von Datapath-Produkten betraut sind.

Stromversorgung

Alle Datapath-Produkte müssen an die Hauptstromversorgung angeschlossen werden. Die Stromversorgung muss unterbrochen werden, wenn Geräte ausgetauscht oder an einer anderen Stelle platziert werden sollen.

Kabel

Kabel dürfen nicht mit Flüssigkeiten in Berührung kommen, da dadurch ein Kurzschluss und somit ein Schaden an dem Gerät ausgelöst werden könnte. Stellen Sie außerdem keine schweren Objekte auf die Kabel, um Schäden und offen liegende stromführende Leitungen zu vermeiden.

Lüftung

Computerausrüstung sollte in einem gut gelüfteten Bereich aufgestellt werden. Die Lüftungslöcher am Computergehäuse müssen stets freigehalten werden, um eine Überhitzung und somit einen Geräteschaden zu vermeiden.

Arbeitsumgebung

Die Geräte sollten in einer staubfreien und trockenen Umgebung, in der keine extremen Temperaturänderungen zu erwarten sind, auf einer stabilen Arbeitsfläche aufgestellt werden. In der Nähe der Geräte sollten keine Flüssigkeiten (heiße/kalte Getränke etc.) platziert werden, die verschüttet werden und schwerwiegende Schäden anrichten könnten.

Gas/brennbare Flüssigkeiten

Elektronische Geräte sind nicht in Umgebungen zu verwenden, in denen Gas oder brennbare Flüssigkeiten vorhanden ist/sind und somit Brand- und Explosionsgefahr besteht.

Rauch/ungewöhnliche Gerüche

Schalten Sie das System aus und trennen Sie es von der Hauptversorgung, wenn von Ihrem Computer Rauch ausgeht oder dieser ungewöhnliche Gerüche abgibt. Lassen Sie das System anschließend von einem qualifizierten Techniker prüfen. Bei fortgeführtem Betrieb besteht die Gefahr von Verletzungen und Sachschäden.

Wartung

Wartungsarbeiten sollten nur von qualifizierten Technikern durchgeführt werden. Physisch beschädigte Plug-in-Karten von Datapath sollten zur Reparatur unter Einsatz der RMA-Verfahren von Datapath an Datapath übergeben werden.

Entsorgung

Am Ende ihrer Nutzungsdauer sollten Datapath-Produkte gemäß den lokalen Gesetzen und Bestimmungen entsorgt werden. Für Nutzer in Großbritannien: Bitte kontaktieren Sie Datapath, um Vorkehrungen zur Entsorgung von Datapath-Produkten zu treffen. Unsere WEE-Registrierungsnummer lautet WEEE/AA0005ZR.

+ Introduction

The VisionHD2-SQX has three independent video capture channels – two supporting HD capture and decoding Standard Definition composite video. All channels can be captured simultaneously. The VisionHD2-SQX also adds HDMI audio capture, which can be perfectly synchronised with either HD video capture channel. Analogue audio is available using the optional Datapath Audio Module (AM2).

Datapath's SQX encoding technology uses the global H.264 standard for video compression and streaming. Multiple streams of captured video can be simultaneously encoded and streamed to different locations. The VisionHD2-SQX can capture two 1920x1200 channels, the encoding engine can be configured to encode one channel at 60 fps or both at 30 fps. Video input frames are encoded to an elementary H.264 byte stream. The RGBEasy SDK provides sample applications to stream the elementary H.264 video to multiple network and disk end points.

- A single card solution for distance learning, lecture capture and web casting
- Viewing analog or DVI sources from a wide range of PCs, MACs, Industrial/Medical equipment, cameras and other video equipment
- Videoconferencing

Kernel Streaming for Windows applications supporting encode, record and network streaming including:

- Microsoft Media Encoder®
- Telestream® Wirecast
- VLC
- vMix

Any application compatible with Windows® DirectShow or Media Foundation technologies can interface with the VisionHD2-SQX.

Key Features

SQX Technology

- Capturing and encoding raw video into H.264 for distribution over a network or save to disk

LiveStream Technology

- Low latency video and audio capture minimizes the delay prior to post processing

MultiStream

- Open and independently control multiple instances of the same capture from a single input source

Powerful hardware scaler

- Adjust the incoming video size to your requirements

Text and bitmap overlay

- Overlay text and images onto the capture buffer

Automatic video signal detection

- Accurate signal detection for all signal sources including analogue 3/4/5 wire, DVI, HDMI, component, composite SDI, Dual Link and S-Video

Unpacking

Your packing box should contain the following items:

	VisionHD2-SQX
2 x DVI/VGA Adapter	√
2 x DVI/Component Adapter	√
2 x DVI/HDMI Adapter	√
Installation CD	√

Note:

All plug-in cards are static sensitive and are packed in anti-static material. Please keep the card in its packaging until you are ready to install.

It is recommended that you do not discard the packing box until you are completely satisfied with the VisionHD2-SQX capture card and it is fully installed and working correctly. We also recommend that you make a note of the serial number of the card in a prominent place before the card is plugged into the computer. This should hasten any query should you need to contact our Technical Support Department. The serial number is displayed on the card itself and the box label.

+ Hardware Overview

Dual Channel Video

Channel 1: HDMI / DVI / RGB / YPbPr / H.264 Video capture

Channel 2: SD/Composite capture channel

Channel 3: HDMI / DVI / RGB / YPbPr / H.264 Video capture

Flexible Audio Capture

Balanced (XLR) and Unbalanced (RCA) from optional audio module

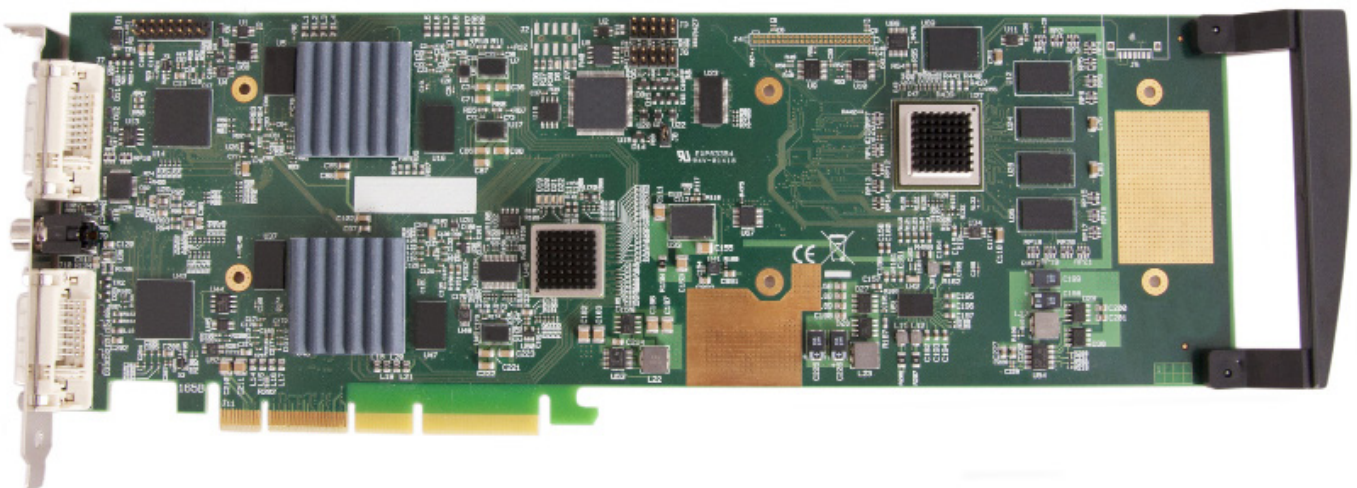
HDMI audio through HD Video Channel

When the VisionHD2-SQX is used with a Datapath graphics card, data can be transferred directly between the devices increasing performance and allowing both sources to be viewed at full frame rate.

When the video data is displayed on a non-Datapath graphics card, the VisionHD2-SQX may still be able to DMA directly to a Graphics Card's physical off-screen memory; for example AMD DirectGMA and Nvidia GPUDirect. This is dependent upon the graphics card driver software capabilities and SDKs are available in order to assist in development.

Models

VisionHD2-SQX



Software Overview

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

Video Streaming

See Quick Start Guide for further details.

+ Installing the Capture Card

You are likely to need a flat blade and /or a cross head screwdriver for the installation of the VisionHD2-SQX 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, noting the positions for accurate re-connection
- Remove the PC cover
- Locate a vacant PCI Express slot (x4 or higher) on the motherboard and remove the blanking plate (retain all screws)

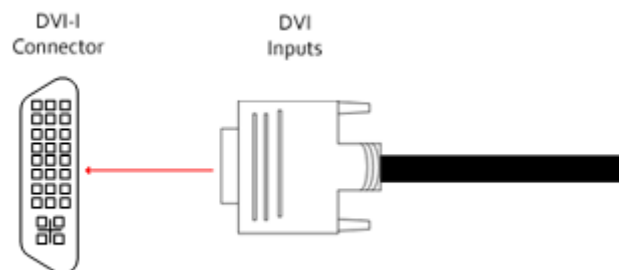
If you are in doubt consult your motherboard documentation to correctly identify a PCI Express slot. If the card is forced into a 32 or 64 bit PCI or PCI-X slot it will be irreparably damaged when the system is powered up and the warranty will be void.

- Reconnect all cables to the PC then connect DVI cables (not supplied) distributing the DVI source signal to the connectors on the VisionHD2-SQX capture card
- A Standard Definition signal can be connected to the RCA connector on the VisionHD2-SQX
- Power up the PC and commence the software installation

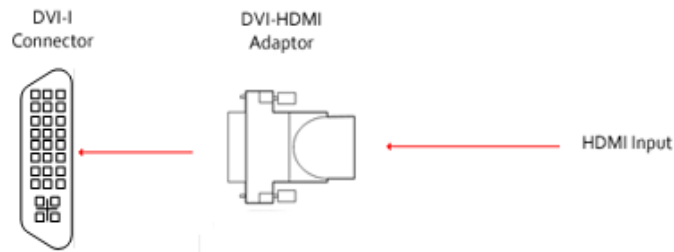
How to Connect Input Sources

The VisionHD2-SQX card has two DVI-I and one RCA (female) connectors, The DVI-I connectors support DVI, HDMI, Component and RGB (VGA) inputs using the appropriate adapters where required.

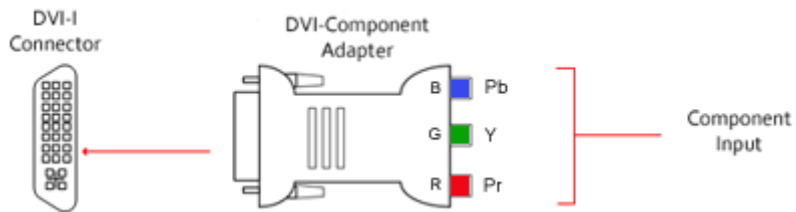
A DVI input is connected directly into the DVI-I connector which accepts DVI-D (digital) or DVI-A (analogue) inputs:



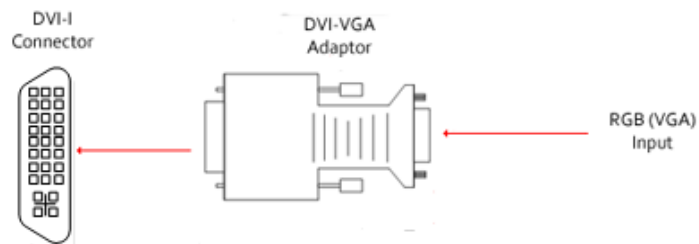
An HDMI input is connected to the DVI-I connector using a DVI-HDMI Adapter:



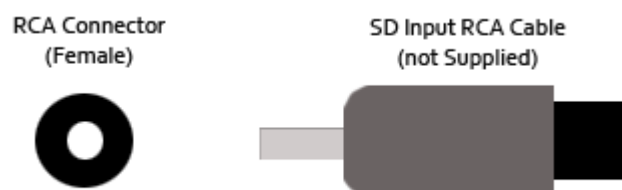
A Component input is connected to the DVI-I connector using a DVI-Component Adaptor:



An RGB (VGA) input is connected to the DVI-I connector using a DVI-VGA Adaptor:

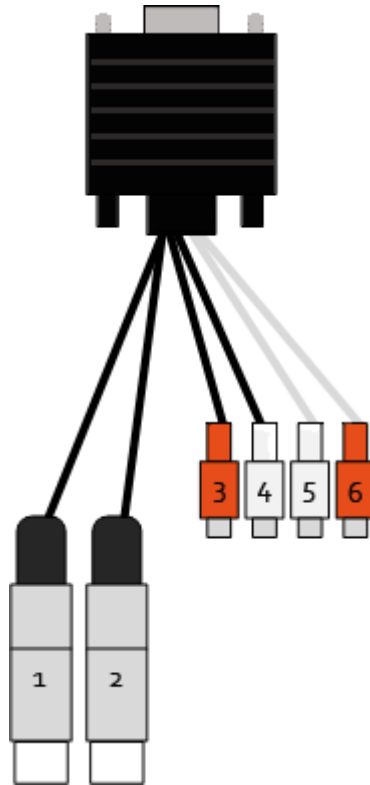


A Standard Definition input is connected directly into the RCA (female) connector on the VisionHD2-SQX card:



Using the Optional Audio Module (AM2)

Audio is connected to the AM2 using the Audio Break Out cable provided with the AM2:

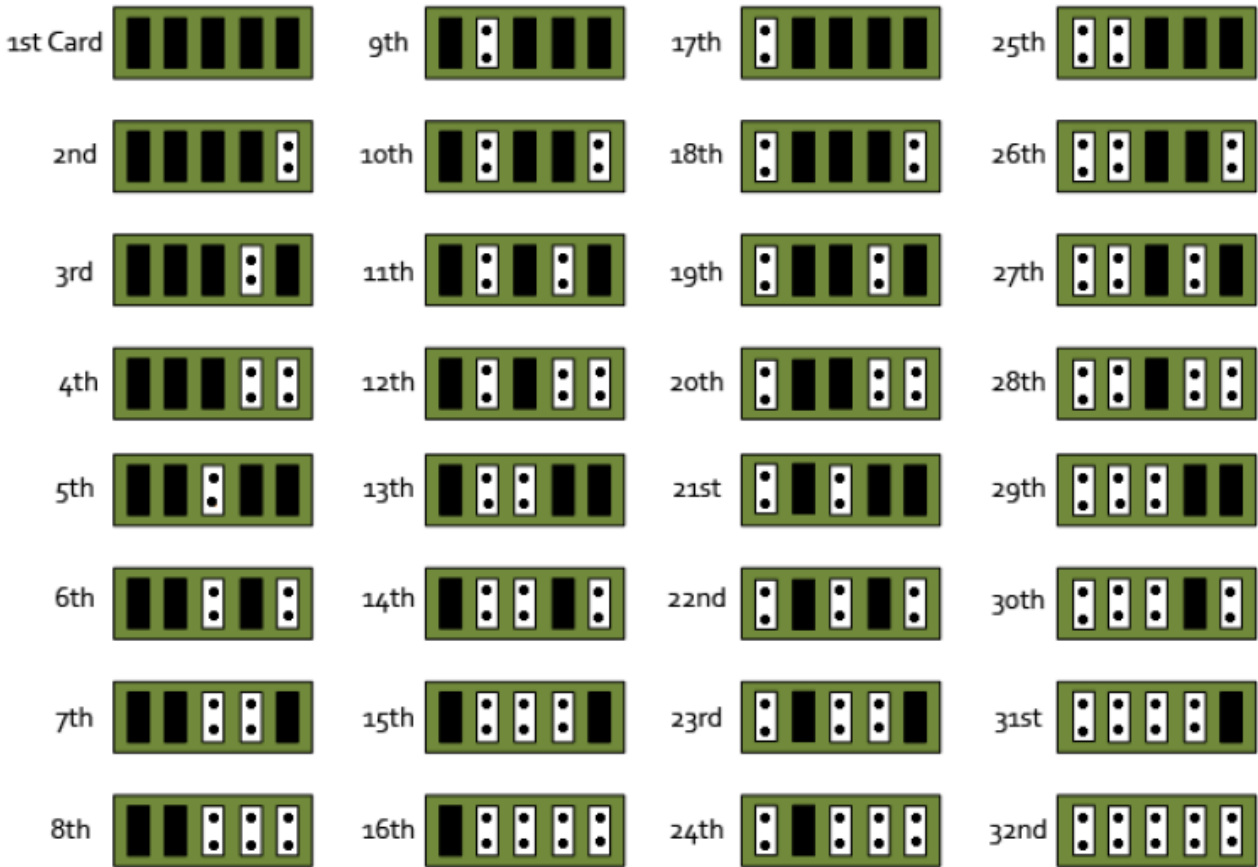


1	Balanced (XLR) Input Left
2	Balanced (XLR) Input Right
3	Unbalanced Input Left
4	Unbalanced Input Right
5	Audio Out Left
6	Audio Out Right

+ Installing Multiple Cards

Multiple cards can be installed in a system providing a large number capture channels. Combinations of Vision capture cards in the same machine are supported by the Vision driver.

In order to control the order in which the driver uses the cards, it is recommended when installing multiple cards that the **J6** links on the VisionHD2-SQX are configured. The example below shows the jumper link settings for up to 32 cards in a single system. When two cards share the same link settings, their order is determined by the PCIe bus.



Link Ordering

If you change the link ordering after installation you must run **dplinks.exe**. This program will update the existing input names used by the windows DirectShow interface.

To run the dplinks program open the **Run** by clicking on **Start/Run** and type dplinks and then press Enter.

The program will run, however no notifications are displayed.

Firmware Upgrades

The VisionHD2-SQX cards allow firmware upgrades to be completed on site rather than returning the card to Datapath. Whenever a firmware upgrade is performed, the **J8 Link MUST BE FITTED** on the VisionHD2-SQX.

To perform the upgrade, follow the step-by-step instructions provided by the upgrade application.

In the unlikely event that something goes wrong during the upgrade process (e.g. System power outage) it is possible to revert to the factory settings by powering down the system, temporarily removing the **J8** link then powering up the system with the link removed. Once the system has rebooted, replace the **J8** link (whilst the system is powered up) and restart the firmware upgrade process.

It should be noted that the latest driver installation program includes an automatic firmware update, if required. Therefore, prior to installing the application and driver, ensure that J8 link is fitted.

Software Installation

The Vision software (driver and application) is installed by inserting the CD that was shipped with your card into your CD ROM drive. The installation process should start automatically.

Should the CD fail to autorun use **Explorer** to browse the CD, locate then double click on **install.exe** file e.g. **d:/install.exe** and click on **Install Software...** and follow the installation wizard instructions as prompted.

Regular software updates are available from our website: www.datapath.co.uk

Also available on the Datapath CD:

- The Release Notes - The release notes contain the latest information on the VisionHD2-SQX
- Installation instructions.
- Release history
- Known problems
- Troubleshooting
- The application Help File - Instructions on how to use the application. The help file is in d:/software/vision.chm. The help file must be located on the local machine to view its content.

Using the card with other Datapath products

The VisionHD2-SQX captures data and stores it in an on-board video buffer. This data is then copied using DMA to the host system for display, storage or streaming.

When a Datapath graphics card is used, VisionHD2-SQX transfers the data directly to the graphics card thereby increasing performance. The VisionHD2-SQX sends the relevant portions of each captured image to each display channel and instructs each channel to use its graphics engine to render the data. This fully utilises the hardware and dramatically increases performance.

When a Direct3D compatible graphics card is used the data can be transferred direct to the graphics card in a similar manner to the Datapath graphics card with the same benefit of non-tearing captures.

When the data is displayed on a non Datapath graphics card, the VisionHD2-SQX sends the data to system memory or direct to the graphics card, dependant on the software used for display.

+ Specification

Board Format	PCI Express x8 3/4 length, full height PCIe card
Connectors (main board)	2 x DVI-I , 1 x RCA (female)
HDMI Capture	<ul style="list-style-type: none"> Supports HDMI 1.3 to 225MHz (including deep colour modes). HDMI audio can be selected as source for audio streaming. Incorporates TMDS equalizer to support up to 20m cables.
DVI Capture	<ul style="list-style-type: none"> Supports DVI 1.0 RGB 24bit capture to 165MHz. Incorporates TMDS equalizer to support up to 20m cables
VGA /YPbPr Capture	Triple ADCs sampling up to 170MSPs. Full 4:4:4 sampling, 8 bits per colour. 5-wire, 4-wire or sync-on-green signal formats.
Composite Video Capture	CCIR601 sampling. PAL, NTSC, SECAM formats automatically detected.
Audio Capture	<p>Stereo Line-In / Stereo balanced inputs with programmable gain (+/-12dB) 16 bit sampling at 44.1/48/96kHz.</p> <p>Analogue stereo line-out for direct pass-through of selected input at up to 64kHz sampling, sourced from Analogue input or HDMI channel</p>
Video Capture Memory	<p>512MB high bandwidth frame buffer supports triple buffering of HD and SD video.</p> <p>Local storage of complex scatter-gather tables for DMA engine (eliminates read overhead)</p>
Video Processing	<p>Polyphase FIR scaling engine (3x3) for hardware downscaling and upscaling</p> <p>Colour space conversion allows captured data to be transferred in any format:</p> <ul style="list-style-type: none"> RGB 16 bit (5-5-5, 5-6-5), 24 bit (8-8-8) or 32 bit (8-8-8-alpha) YUV 16 bit (4:2:2), NV12 (4:2:0) Mono: 8bit
SOX Encoder	<ul style="list-style-type: none"> H.264, MPEG4 (part 10) Single channel compression, 1080p/60fps Dual channel compression, 1080p/30fps
H.264 Profiles	Baseline Profile (BP) / Main Profile (MP) / High Profile (HiP)
H.264 Levels	Level 4.1 / Level 4.2
Max Video Coding Bit Rate	BP/MP 50,000kbps / HiP 62,500kbps
DMA Engine	Direct DMA to physical or virtual memory buffers with full scatter-gather support. DMA bandwidth : up to 800MB/s, 16 independent DMA streams per HD channel including any mix of HD and SD sources, colour space, cropping and scaling parameters.
Operating System Support	Windows Vista / 7 / 8 / 8.1, Windows Server 2003, 2008, 2012, and Linux support
Power Requirements	<p>Max current at 12V – 1A</p> <p>Max current at 3.3V – 1A</p> <p>Thermal dissipation – 15W</p>

Cont'd

Operating Temperature	0 to 35 °C (32 to 96°F)
Storage Temperature	-20 to 70 °C (-4 to 158°F)
Relative Humidity	5% to 90% non-condensing
Warranty	3 years

We are continuously developing the technology used within our product ranges delivering outstanding innovative solutions, therefore the specifications may change from time to time.

Datapath has a long and very successful history in the computer graphics industry. Datapath has been designing and supplying high performance, high quality graphics display systems to the world's largest and most demanding companies and institutions since 1982. Datapath was one of the founding companies of multi-screen Windows acceleration using single and multi board solutions. Now using the very latest display technology Datapath offers some of the world's leading multi screen graphics accelerators for the most demanding applications.

As new technology advances, so we at Datapath improve the performance and functionality of both our hardware and software to give our customers more. Following a continuous development program, we pride ourselves on our support and responsive nature towards all our customers and their changing needs. As more sophisticated equipment and techniques become readily available, so we are there to exploit the power and potential that this technology presents.

Technical Support

Registered Users can access our technical support line using, email, and the Support page on the Datapath Web Site, usually with a response within 24 hours (excluding weekends).

Via Email

Send an email to support@datapath.co.uk with as much information about your system as possible. To enable a swift response we 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 - and please be as specific as possible.

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

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- A
 - Audio Break Out cable 8
 - Audio Out 8
- B
 - Balanced XLR 4
 - Balanced (XLR) Input 8
- C
 - Component input 7
 - Connect Input Sources 6
 - Copyright Statement 14
- D
 - Datapath CD 10
 - Datapath Limited 14
 - Direct3D 11
 - DirectShow 10
 - DirectShow interface 10
 - dplinks program 10
 - DVI input 6
- F
 - Firmware Upgrades 10
- H
 - H.264 2
 - HDMI 6
 - HDMI input 7
 - Help File 10
- I
 - Input Sources 6
 - Installing the Capture Card 6
- J
 - J6 links 9
 - J8 Link 10
- K
 - Key Features 2
- M
 - Maintenance 1
 - Multiple cards 9
 - Multiple Cards 9
- P
 - Packing Box 3
 - Power Supply 1
- R
 - RGB (VGA) input 7
- S
 - Safety Instructions 1
 - Software 10
 - Standard Definition input 7
- T
 - Technical Support 14
- U
 - Unbalanced Input 8
 - Unbalanced RCA 4

Unpacking 6

V

Video Buffer 11

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