DATAPATH

EXCELLENCE BY DESIGN

ImageDP4+

User Guide

Contents

FCC Compliance ImageDP4+

Federal Communications Commission Statement

This device complies with FCC Rules Part 15. Operation is subject to the following two conditions:

This device may not cause harmful interference, and

This device 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 B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a commercial, industrial or business environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the manufacturers instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or tele¬vision reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures.

- **Re-orient or relocate the receiving antenna**

- **Increase the separation between the equipment and the receiver**

- **Connect the equipment to an outlet on a circuit different from that to which the receiver is connected**

- **Consult the dealer or an experienced radio/TV technician for help**

Warning! Any changes or modifications to this product not expressly approved by the manufacturer could void any assurances of safety or performance and could result in violation of Part 15 of the FCC Rules.

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tration, US Government Printing Office.

DECLARATION OF CONFORMITY

Per FCC Part 2 Section 2. 1077(a)

Responsible Party Name:	Datapath Limited
Address:	Bemrose Park, Wayzgoose Drive, Derby
Phone:	+441332-294441
Hereby declares the product:	
Product Name:	Four Head PCIe Graphics Card
Model Number:	ImageDP4+ (DGC170C3P)
Conforms to the following specifications:	
FCC Part 15 Subpart b	Class A Digital Device
Supplementary Information:	

This device has been shown to be in compliance with and was tested in accordance with the measurement procedures specified in the Standards & Specifications listed above and as indicated in the measurement report number:
TRA-013599GUS1

Representative Persons Name: Tony Jones, Operations Director

Introduction

The ImageDP4+ is based upon a single, powerful graphics processor that is complemented by faster memory and higher pixel transfer bandwidth over its 16-lane second generation PCIexpress interface. Up to 16 ImageDP4+ cards can be supported by the Datapath XDDM display driver and up to 12 ImageDP4+ cards can be supported by the Datapath WDDM display driver, providing flexible system configurations up to 64 screens.

• DisplayPort connectors allow full-size, locking cables capable of driving next generation displays

• DVI support using Datapath DP*adapt* modules (powered via graphics card)

• Up to 40m cable support using Datapath *DPextend* modules (powered by graphics card).

Specifications:

Card format	Gen 2, x16 lane PCI express
Card size	110mm x 177mm (incl heat sync)
Max output resolution	4 x 2560 x 1600 @ 60Hz (Max 359 Mpixels/s) or 2 x 3840 x 2160 @ 30Hz
Max number of cards per system	16 (64 display channels) using the XDDM Driver on Windows 7 and 12 (48 display channels) using the WDDM Driver on Windows 7 and Windows 10
Graphic card memory	2GB total
Max current at +3.3V	0.25A (+1.8A when powering four channels of DP*extend* + DP*adapt*)
Max current at +12V	1.2A
Max Power	15 watts
Operating temperature	0 to 35 deg C / 32 to 96 deg F
Storage temperature	-20 to 70 deg C / -4 to 158 deg F
Relative humidity	5% to 90% non-condensing
MTBF	180,000 hrs
Warranty	3 years

ImageDP4+

The ImageDP4+ PCI Express graphics card supports the display of digital video capture windows. It is ideal for high end video/data walls, signage or display wall applications.

- Gen 2, x16 lane PCI express graphics card

- Digital outputs 4 x 2560 x 1600 x 32bits/pixel @ 60Hz or 2 x 3840 x 2160 @ 30Hz

- Low power

- High Performance 2D and 3D graphics

- High performance DMA image load (upto 2GB/s)

- Support for Windows® 10 and Windows® 7

- RGB, SD and HD video window support by adding the Datapath Vision range of capture cards.

- HDCP is supported with Datapath capture cards

- Up to 16 cards (64 display channels) per system using the XDDM Driver on Windows 7 and up to 12 cards (48 display channels) using the WDDM Driver on Windows 7 and Windows 10

Installation

This section deals with installing ImageDP4+ cards and spreading the Windows desktop across all the screens. If you are intending to use the ImageDP4+ cards with other Datapath products, you should follow this section to get the Windows desktop working correctly first.

System Requirements

- A Pentium PCI Express bus computer with sufficient free PCIe slots.

- At least 2GB of RAM, up to 8Gb for multiple cards

- Support for Windows® 10 or Windows 7®

Unpacking

Your packing box should contain the following items:

- The ImageDP4+ PCIe plug-in card.

- 4 x DVI Adapters (ImageDP4+/DVI only)

- 4 x HDMI Adapters (ImageDP4+/HDMI only)

- Driver Installation Media

It is recommended that all ImageDP4+ cards and any Vision cards are installed in the system prior to installing the drivers. Otherwise as cards are installed the drivers may need to be reinstalled as the card's PCI bus numbers change.

Note:

All plug-in cards are static sensitive and packed in antistatic materials. 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 ImageDP4+ card, and it is fully installed and working correctly. We also recommend that you make note of the serial number of the card in a prominent place before you plug the card 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 and the box label.

- 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 reconnection. Remove the PC cover.

- Locate a vacant PCIe slot for the ImageDP4+ on the motherboard and remove the backing plate (retain all screws).

- Remove the card from its packaging and secure it firmly into the empty PCIe slot. Extreme care should be taken when securing the card into the slot as some motherboards may have components that impede the siting of the card.

Screw the card bracket to the back panel of the PC and replace the cover.

Connect screens to all the outputs from the card. If there are other graphics devices in the system, connect screens to them (even if you don't intend to use all the outputs in your final configuration).

Switch all the screens on then switch the machine on. You should see the boot messages on one of the screens. The screen on which the system will boot is dependent on how the system is configured and the motherboard BIOS. It is not possible to control which of the ImageDP4+ outputs the system will boot on.

Installing the Display Drivers

Once the ImageDP4+ card has been installed and the boot messages are appearing on the correct monitor, you can start Windows.

The Found New Hardware Wizard will announce that new hardware has been found. Do not use the Found New Hardware Wizard to install the ImageDP4+ drivers. Install the XDDM or the WDDM display drivers from the Software Installation Media supplied with the ImageDP4+ card.

If your final configuration has less than four screens select the number of screens required, otherwise select four screens.

Restart the machine.

When Windows starts up, the desktop should be spread over all the screens connected to the ImageDP4+.

Note:

The ImageDP4+ requires the Datapath Display Driver Install V4.1.1 or later.

Multi Screen Drivers

XDDM

The XDDM Display Driver places the Windows desktop across all the screens connected to ImageDP4+ cards in the system. XDDM is the legacy driver architecture used by graphics drivers from Windows 2000 through to Windows 7 and Windows Server 2008 R2. It is not supported by Windows 10 or Windows Server 2012. The Datapath XDDM drivers provide a robust, multi screen platform with advanced video capture and display capabilities.

The XDDM driver currently supports up to 16 ImageDP4+ cards (64 display outputs) in a single system.

WDDM

The WDDM Display Driver places the Windows desktop across the screens connected to the ImageDP4+ cards. WDDM is the driver architecture used by modern Windows Operating Systems such as Windows 10. It aims to provide improved graphics performance, additional functionality and operating system stability improvements.

The Datapath WDDM driver currently provides support for up to 12 ImageDP4+ cards (48 display outputs) in a single system.

Installing the Additional ImageDP4+ Cards

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

Please consult Datapath support if you have any problems installing multiple cards.

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 16-screen system of ImageDP4+ cards is calculated as follows:

Current

+3.3V 4 x 0.25A = 1.0A
+12V   4 x 1.2A = 4.8A

Power

(3.3V x 1.0A) + (12V x 4.8A) = 60.9W

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

Connecting up to 64 Screens

To connect up to 64 screens (XDDM Display Driver on Windows 7) or 48 screens (WDDM Display Driver on Windows 7 or Windows 10) to ImageDP4+ cards, configure the links as shown in the diagram below:

Card Ordering
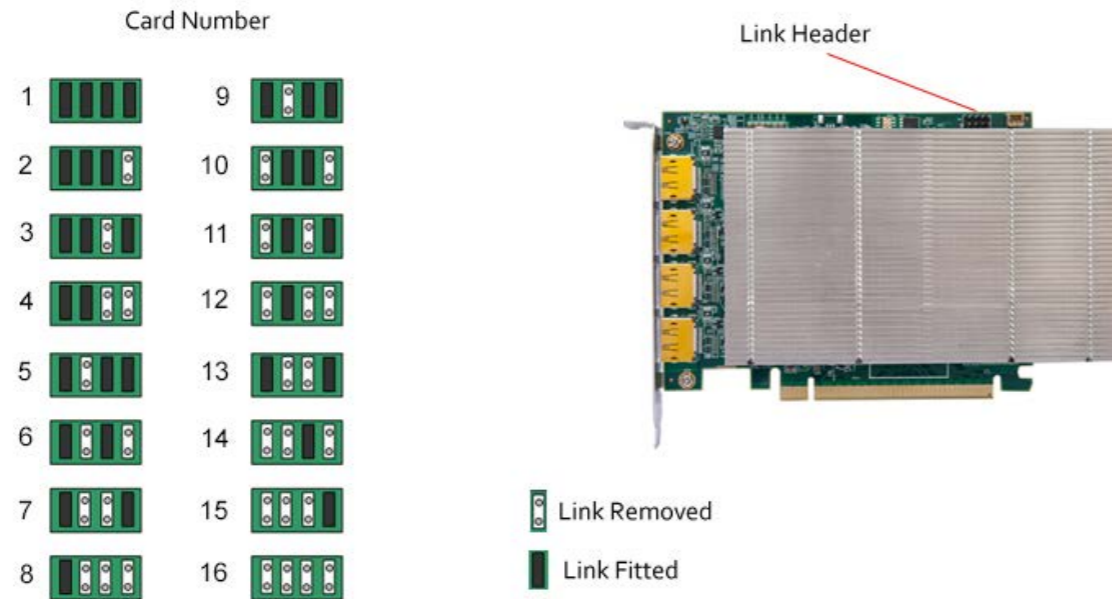
The links control the order in which the display driver uses the ImageDP4+ cards. Knowing the order in which the ImageDP4+ cards are used is useful when connecting the screens and the outputs from video switches.

Note that if you have not configured your system to boot-up on on-board VGA graphics device or another plug-in VGA card the system will boot-up on the master head of one of the ImageDP4+ cards but it is not possible to control which output will be used, this is motherboard BIOS dependent.

If the WDDM driver is selected on installation then an on board or third party graphics adaptor must be configured as the boot up display.

Insert the ImageDP4+ cards into the PCIe slots.

Connect the screens to the cards. The first card should be connected to the first group of four screens; the second should be connected to the second group of four screens and so on.

Switch the screens on then switch the machine on.

Log on as a user with administrative access rights.

The Found New Hardware Wizard will announce that new hardware has been found. This will happen once for each slave ImageDP4+ card you have added to the system. Do not use the Found New Hardware Wizard to install the ImageDP4+ drivers.

DisplayPort Outputs

The Datapath ImageDP4+ has four DisplayPort connectors which allow full size, locking cables capable of driving next generations displays. When used in conjunction with the Datapath DP*extend* modules (powered via the ImageDP4+) cable lengths of up to 40m can be achieved.

The ImageDP4+ outputs are numbered as follows:
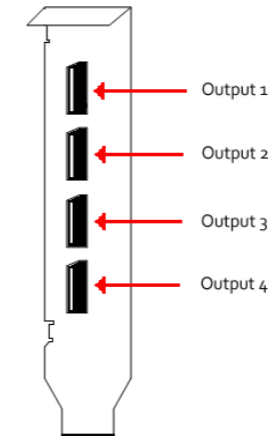
Display Driver Configuration Tool (DDCT)

The DDCT Is a configuration tool designed to guide you through the design and creation of your video wall. The DDCT is installed automatically as part of the driver install.

To access the DDCT, right click on your desktop, select Display Driver Configuration Tool then select the Set Up Wizard. Alternatively select:

Start | Programs | Datapath Drivers | Display Driver Configuration Wizard

(1)

(2)
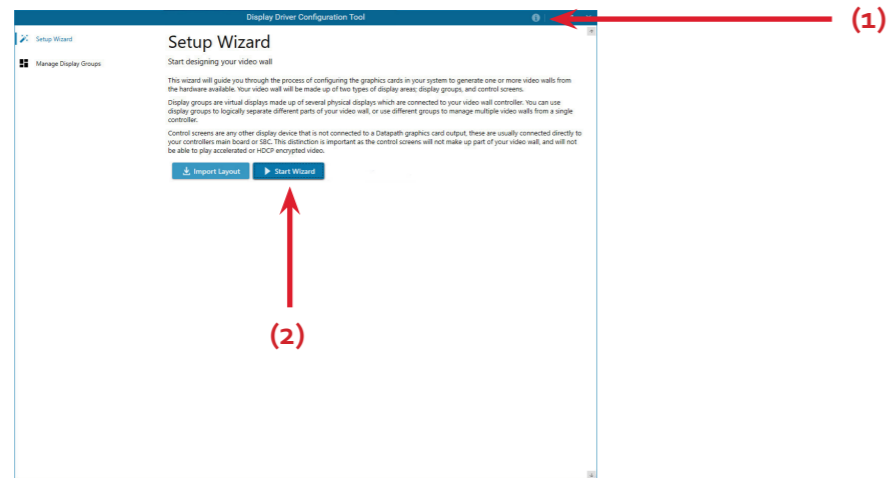
It is recommended that you read the information on each page carefully.

Click on the "Information Icon" **(1)** to open a sliding window which gives version details and copyright information. The latest version of the DDCT is available to download from the Datapath website.

To commence your wall configuration, click on "Start Wizard" **(2)**. "Import Layout" is covered later.

(3)

(4)

(5)
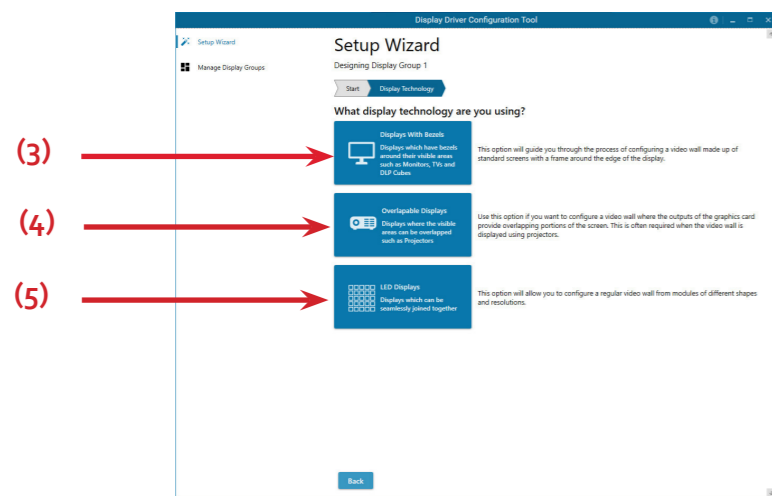
Display Technology

Select the type of displays being used on your wall:

*   Displays With Bezels – Monitors, TV's and DLP Cubes. **(3)**

*   Overlapable Displays – Projectors **(4)**

*   LED Displays. **(5)**

Click on "Continue".

The tool will then display a configuration page for the type of display you selected:

Displays with Bezels
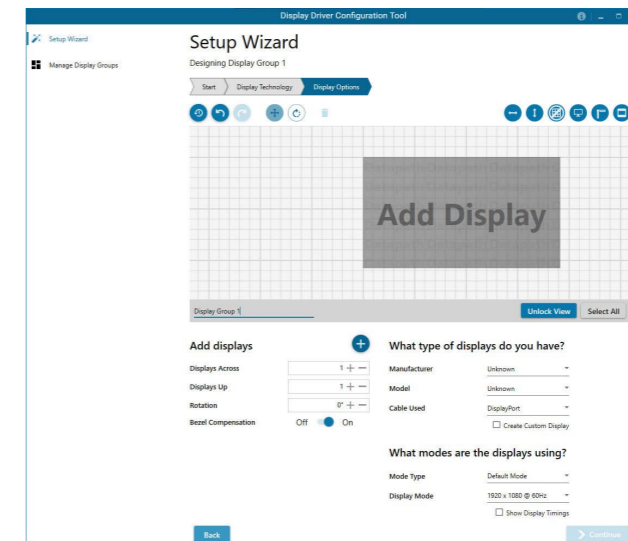
Overlapable Displays

LED Displays

(6)

(7)
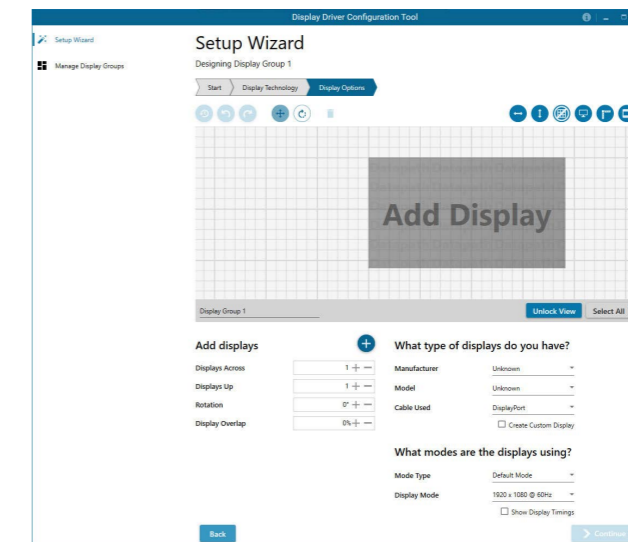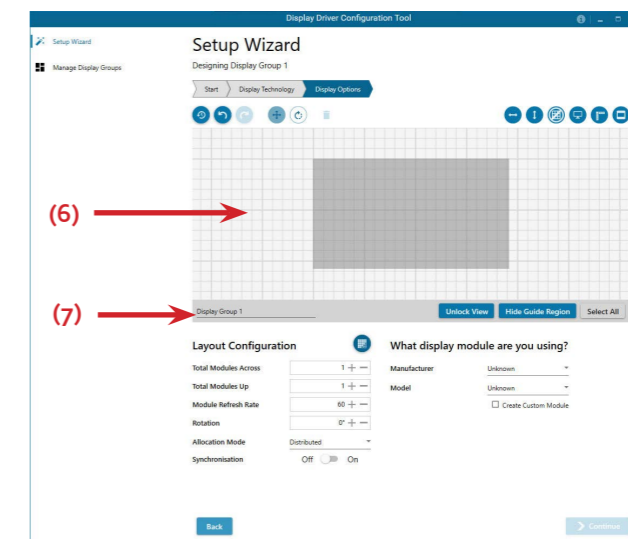
Application Tools

The application tools enable the user to manipulate the design of the wall. The table below describes the tool functionalities

⟲	Undo All – Undo all commands made on this page.
↺	Undo – Undo the last command.
↻	Redo – Redo the last command.
✛	Move displays – When selected, move the displays by clicking on and dragging the displays around the representation.
↻	Rotate displays – When selected click on a display and drag the cursor up or down, left or right to rotate the display. The display can be rotated 90, 180 or 270 degrees.
🗑	Delete displays/Display Groups – Select the displays you wish to remove from the layout then click on the delete button to delete all those selected.
↔	Enable X Axis – Enables the display to be moved from left to right, and right to left.
↕	Enable Y Axis – Enables the display to be moved up and down
⊞	Snap to Grid – When selected, if a display is dragged and released it will snap and position itself to the nearest grid line.
🖥	Snap to displays – When selected, if a display is dragged close to another display and released, it will snap and position itself to the display.
⌐	Snap to Guides – When selected, if the display is dragged and released near to the axis of another display it will position itself on the same axis.
▭	Show Display Bezels – Select to show or hide the bezels on all the displays in the representation.
⟳	Configure Outputs - Available in the Manage Display Group dialogue. Select an output and configure its properties.
⊕	Add Button- Used to add displays to your group or to create a new group.
▦	Layout Configuration - Used to add LED modules to your group or to create a new group.
✎	Edit - Used to edit a selected Display Group
♛	Primary Display - Indicates which display within the display group is the primary display/boot screen. If more than one group is available, the Primary Display can be assigned to either group.

Representation

The representation grid **(6)** displays the physical arrangement of the wall as it is being created. Displays can be arranged as required by clicking and dragging them to their required positions using the application tools.

Wall Naming

Click on the edit box **(7)** to allocate a name to your wall (optional but recommended). This will be used if you choose to export your layout in the future.

Unlock View

When unlocked, the wall representation can be dragged to a preferred position using the mouse. Use the mouse wheel to zoom in and out of the representation.

Select All

Choosing "Select All" enables the user to select all the displays on the representation to apply common attributes to all displays.

Add Displays

Add displays is available for displays with bezels or overlapable displays. It enables you to configure the layout of your wall or display group. Use the "Displays Across" and the "Displays Up" to create a plan of your layout. Once your layout has been created you can then configure the displays using "What Type of Displays Do You Have?" When using overlapable displays "Display Overlap" becomes available enabling you to select a percentage of overlap between displays.

What Type of Displays Do You Have?

### Displays with Bezels and Overlapable Displays

The first step to creating your wall is to select the type of displays you have. Use the "Manufacturer" and "Model" dropdown lists to select each display you are using on your wall. The DDCT has an extensive database of displays, however if your display is not contained in the list, you can input its details manually by selecting "Create Custom Display".

Non Standard Device Reporting - XDDM Driver

The Device Manager will report all but one of the ImageDP4+ cards as non standard, displaying a warning next to each card and an error code 43 in the device properties dialogue:
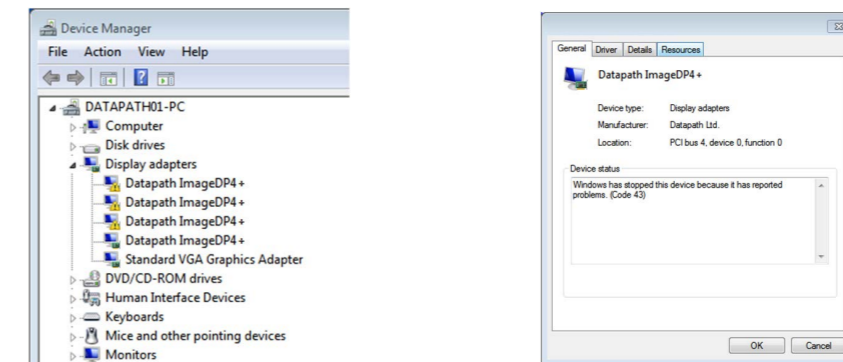
All the cards in your system are driven together to display a single, virtual desktop across multiple screens. Users should be aware that although error code 43 is reported, this is in fact normal operation and there are no faults with the ImageDP4+ cards installed in your system.

If the WDDM driver is installed no error is reported and all devices will be displayed as running correctly.

Datapath Limited

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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