

# On-Premises Considerations & Pre-Requisites

RVL1083

# DEMS360

Version 6

# On-Premises Considerations & Pre-Requisites

<b>Description</b>	The intention of this document is to provide information regarding the IT requirements for DEMS 360 V5.2 onwards.	
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## Document History

Version	Date	Change Notes	Author
1.0	7 May 19	First Issue for release of DEMS 360 V5.2	O. Gibbs
1.1	10 Oct 19	Addition of note about USB power management	O. Gibbs
1.2	31 Oct 19	Addition of note about standalone machine name	O. Gibbs
1.3	10 Jan 20	Added customer form and reworked info pages	L. Papworth
1.4	26 Nov 20	Added Calla Cameras & Multi Tennant option including firewall rules	L. Papworth
1.5	16 Nov 21	Updated to reflect DEMS 360 V6.2's independence from Windows driver letters and the resulting ability to support up-to 80 cameras from one PC, providing there are sufficient USB end points available.	L. Papworth

## Approval History

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# Introduction

## What is DEMS 360?

DEMS 360 is the industry leading digital evidence management platform built on Reveal technology that has been used for over a decade by police forces, local authorities, security services and prisons in 35+ countries worldwide.

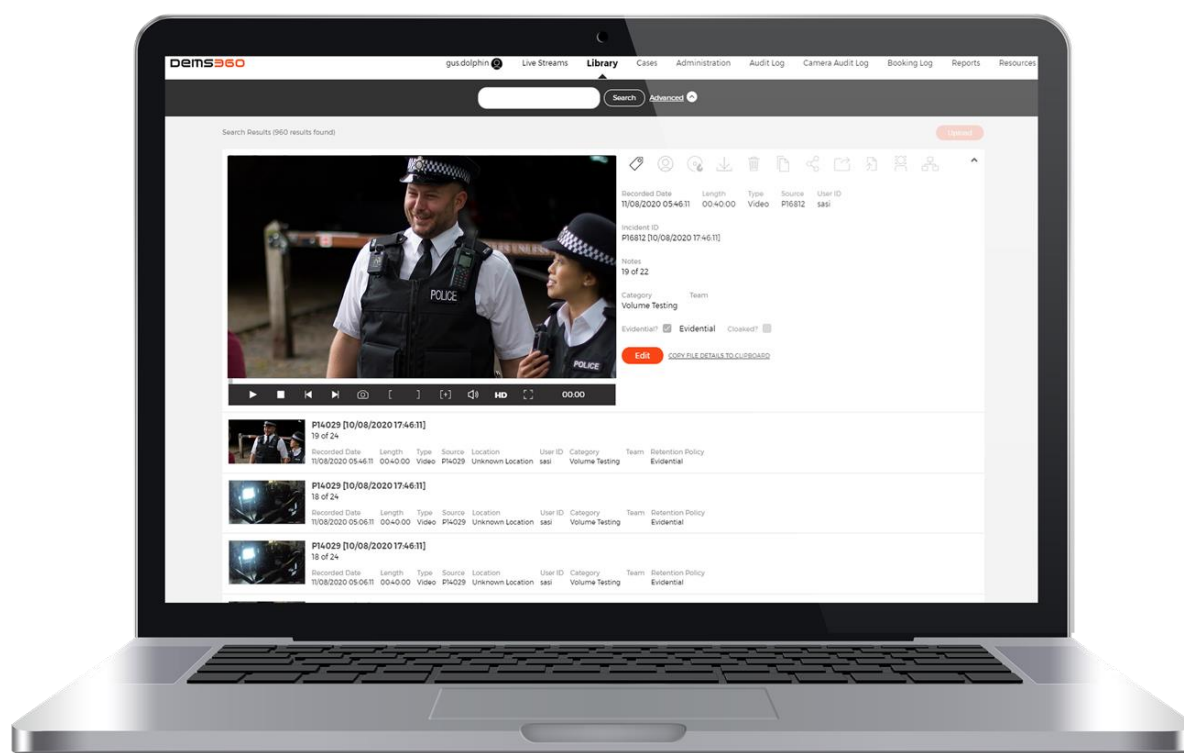
DEMS 360 is powerful enough to securely store, manage and export any amount of digital evidence, large or small, whilst always remaining incredibly simple and easy to use.

## Why use DEMS 360?

DEMS 360 allows you to:

- ✓ Access media from any device on any platform.
- ✓ Password control access to content and features for active directory support.
- ✓ Securely store all media with a unique digital fingerprint.
- ✓ Keep track of any action performed in the system with an extensive audit trail attached to all digital evidence.
- ✓ Securely export digital evidence and deliver it quickly where and how you need it.
- ✓ Create ISO files for evidential media that can be burnt to a DVD or CD.

DEMS is easy to set up, incredibly simple to use and easy to manage; automated processes allow users to simply plug in a camera and let DEMS 360 do the rest. This design philosophy allows all the benefits of body worn cameras to be realised without placing a burden on your organisation.



# On-Prem Deployment Options

DEMS 360 can be deployed in different ways to reflect the infrastructure of your operation. This document outlines how DEMS 360 can be deployed On-Prem.



## standalone

Stand Alone is the most basic deployment with DEMS 360 running on a single computer.

Cameras upload directly to the standalone instance with the media files stored either on the computer or on an external storage device. This means that the files cannot be viewed from any other computer, but DVD copies can easily be made for the purpose of sharing.

A dedicated computer should be allocated to running DEMS 360 and should not be utilised to perform other tasks as this may affect performance of operations such as file transfer and decryption.

## workgroup

Workgroup is a larger scale version of Standalone, with DEMS 360 running on 2 or 3 computers connected via a mini network with one acting as the server and the others as clients. This scenario is suitable for relatively small deployments on a network (normally within the same building).

The uploaded media files can be stored either on the computer acting as the server or on an external device. This means that the files cannot be viewed from any other computer, but DVD copies can easily be made.

## enterprise

Enterprise is a more complex deployment with DEMS 360 running on a central server over a wide area network. The database is installed on the central server or on a dedicated database server. Multiple client machines can be used for video upload, so there is no practical limit to the number of Cameras that can be used.

Media files will be transferred over the corporate network, so sufficient bandwidth must be available. The uploaded media files can be stored either on the central server or on an external storage device. This means that the files can be viewed on any machine connected to the network.

Note: Cloud storage can be utilised for the storage of media files but is limited to Microsoft Azure Blob Storage.



# DEMS 360 Components

DEMS 360 comprises of several Windows Services, Applications and Storage folders.

## Windows Services

Service	Description
<b>DEMS 360 Uploader Service</b>	<p><b>Standalone:</b> Moves media files:</p> <ol style="list-style-type: none"><li>1. From their camera to the media folders (Root and SecRoot).</li></ol> <p><b>Enterprise:</b> Moves media files:</p> <ol style="list-style-type: none"><li>1. From the camera to the local cache.</li><li>2. From the local cache to the media folders (Root and SecRoot).</li></ol> <p>The service also verifies video integrity and sends settings, firmware and book out details to the camera.</p>
<b>DEMS XCoder Service</b>	Transcodes videos to low resolution. Used in Enterprise instances to reduce network bandwidth utilisation.
<b>DEMS 360 Webservices Host</b>	(Stand Alone only) Interface between DEMS 360 UI and DB or storage and decrypts files upon arrive in the media folders (Root and SecRoot).

## Applications

Application	Description
<b>DEMS 360 Uploader</b>	Displays camera upload status and allows Cameras to be booked out
<b>DEMS Web Service</b>	(Enterprise only) Interface between DEMS 360 UI and DB or storage and decrypts files upon arrive in the media folders (Root and SecRoot).
<b>DEMS Web</b>	Main evidence management application includes Library, Administration, Cases etc.
<b>DEMS Web API</b>	Interface between different applications and DEMS Database or storage.
<b>Reveal Redactor</b>	Performs Redaction of Media files.

## DEMS 360 Storage

Folder	Description
<b>Root</b>	Non-Evidential media files.
<b>Secroot</b>	Media files classified as evidence (evidential).
<b>LowRes</b>	Videos (evidential or non-evidential) with lower resolution to review on restricted low bandwidth. Used in Enterprise installations.

## Web Browser Screen Size

Full DEMS 360 web application functionality requires a device of minimum 7 inches screen size. The LIBRARY, CASES and ANNOTATION features support smaller screen sizes as they are web responsive by design.



# Limitations and Considerations

## Active Directory User Configuration

In an Enterprise deployment all DEMS 360 users, including those to whom cameras will be Booked Out, must exist in Active Directory and be in a relevant DEMS 360 AD group.

## USB Endpoints

Each connected camera uses three of the client machine's USB endpoints. Most machines should be able to support up to 18 cameras, depending on other system resources, such as keyboard and mouse, using USB endpoints. Endpoint can be increased by adding a USB host plugin card.

In DEMS 360 V6.2 onwards, the uploader service has been re-engineered to remove the dependency on Windows driver letters. This enhancement increases the maximum number of cameras that can be connected to a single uploader machine at any one time and a single uploader PC can support up-to 84 cameras, providing there are sufficient USB endpoints available. Further details are provided below in the Pre-Requisites/ Uploader/Kiosk Hardware Requirements

## Media Cache

Client Machines of an Enterprise deployment need to have adequate storage to cache media files during the upload from camera to the media folders (Root and SecRoot).

The amount of storage is dependent on:

- A) The model of camera
- B) The number of cameras
- C) The amount of media stored on each camera

The table below gives some examples on the unlikely scenario where every camera's memory is completely full.

Maximum Storage Capacity per Camera	Camera Model	Cameras uploading concurrently	Hard Disk Minimum Storage for Cache
8GB	Calla	6	128GB
		18	250GB
		84	1TB
16GB	Calla 16GB	6	250GB
		18	500GB
		84	2TB
32GB	D3	6	500GB
		18	1TB
		84	4TB
64GB	D5, D6, D7 K6 & K7	6	1TB
		18	3TB
		84	12TB



## Bandwidth

For Enterprise and Workgroup deployments, the bandwidth between the client computer and the DEMS 360 database and server will influence the user experience in terms of responsiveness. Hardware speed requirements are proportional to the number of users accessing the system simultaneously.

There are many factors to consider but you can never really have too much of a good thing when it comes to memory and processor speed. When managing a handful of cameras, our clients have run DEMS 360 on modern laptops quite happily

The information below shows the minimum bandwidth required on the client computers to have a pleasant user experience in using DEMS 360:

- 1 Mbps to use DEMS 360 interface
- 10 Mbps to use DEMS 360 to playback original quality (high resolution) videos
- 2 Mbps to playback transcoded videos  
(100 Mbps or higher for best performance)

## Media Storage

The table below gives three deployment examples and a calculation of the amount of storage required for a two-year period.

Parameter	Example 1	Example 2	Example 3
Number of Cameras Deployed	10	30	80
Recording Resolution	720 High	1080 Standard	720 Standard
Average Recording per Camera Per Day	60 Minutes	30 Minutes	20 Minutes
Percentage of Video that is Evidential	15%	20%	30%
Retention Policy for Evidential Files	90 Days	60 Days	365 Days
Retention Policy for Non-Evidential Files	30 Days	30 Days	30 Days
Estimated Storage Required	1 TB	2 TB	13 TB

A Storage Calculator is available allowing different parameters to be entered to model alternative deployments.





## ISO Files and Disc Burning

When recording for long periods, Reveal Cameras create a new file every 40 minutes. When contiguous files are then uploaded to DEMS 360, they are “linked” together. The files remain 40 minutes (or less), but they are linked in the database and share common metadata (Incident ID and Retention Policy).

Depending on the Camera setting (resolutions, frame rate and quality) the approximately file size of a 40-minute video will be as shown in the table below.

It is not possible to create an ISO with a single video that is greater than 2GB in size. The table below shows the approximate file size of a 40-minute video for each combination of Resolution and Quality. As shown in the table, a 40-minute video recorded at 1080p resolution and at High quality will be too large to create an ISO file.

**Note:** Reveal cameras use a variable bit rate encoder. Storage capacity is calculated based the target bit rate and the memory size. Actual performance will vary depending on light conditions, movement of subject and movement of camera.

Resolution	Quality	Frame Rate	Approximate Bit Rate	File Size of 40 Min Video
480p	Standard	30 FPS	1.0	300 MB
480p	High	30 FPS	2.5	750 MB
720p	Standard	30 FPS	3.0	900 MB
720p	High	30 FPS	6.5	1,950 MB
1080p	Standard	30 FPS	5.0	1,500 MB
1080p	High	30 FPS	8.5	2,550 MB



## Back-ups

DEMS 360 is robust. Providing back-ups are made of both the Media Files and Database the Reveal Support team should be able to recover any system failure from the back-ups.

It is essential that your organisation's policies and procedures are adhered to when handling such material and we highly recommend that your information security and IT staff are involved in establishing appropriate data protection and backup procedures.

It is advisable to make a risk assessment regarding how resilient your hardware and backup/restore facilities should be.

It is essential they the Encryption PIN and Passwords set by DEMS 360 are backed-up.

Things to consider:

Operating Considerations	Operating Recommendations / Description
<b>DRP / BCP</b>	How long you can afford to have the system inoperable owing to system failure or disaster.
<b>Disc Failure</b>	<p>This can be mitigated by using a ** Raid array for the operating system, database and storage. Raid 5 is a popular choice and many raid controllers allow the failed disc to be replaced ("hot-swapped") without the system being powered down.</p> <p>Note that the disc array is vulnerable whilst a disc being replaced, and the raid array rebuilt. Most of our clients consider this to be a minimum protection level and the hardware quoted above has this facility.</p>
<b>Data Backups</b>	Most customers have well thought out policies regarding the backup of critical material which can include regular backups of the media and database using dedicated backup facilities that are not in the same vicinity. This provides significant protection in the case of local fire or flood etc. Some customers regard the fact that evidence is burned to disc promptly as being sufficient. Backup to an external hard drive regularly will provide a certain level of protection if this cannot be brought under normal IT procedures for some reason. Such discs can be bought from a variety of vendors including Buffalo and Netgear etc.
<b>Other Hardware Failure</b>	There are many things that can go wrong with a computer but in most cases the data remains intact and the system can be up and running again once the fault has been rectified either by the supplier or internal staff.
<b>Support</b>	You should stipulate a support arrangement with the vendor that provides the cover that you require. A "return to base" contract may be inappropriate owing to the sensitivity of the material likely to be on the system.



# APPENDIX

## 1) DEMS 360 Transcoding facility (Enterprise only)

The Transcoding facility can be switched on to enable transcoding of high-resolution videos to low resolution ones. This is done in order to save network bandwidth during playback or to create a browser playable MP4 from an otherwise unplayable format.

Uploaded videos are transcoded once they arrive to the server storage (enterprise). Transcoded videos are stored in the default media storage location which means that the storage size of media will increase.

By default, videos are transcoded to 640x360 resolution with 1Mbps bitrate, however this is configurable if needed. The original video will remain in DEMS 360 and will not be altered, and DEMS 360 can be configured to playback the high resolution instead of the low resolution if needed.

Transcoding takes time to complete and requires computing resources. Therefore, the following questions should be considered.

- What is the capability of the servers performing the transcoding (see table later)?
  - What CPU load can be dedicated to transcoding on each server? (more on transcoding means less CPU available to other computational activities)
  - How many servers can be dedicated to transcoding?
- What is the acceptable time for transcoded material to be available (peaks in uploading will create longer transcoding queues therefore what does peak use look like)?
- What volume of material will be transcoded?
  - How many cameras will be used each day per shift?
  - How many shifts will there be?
  - How many minutes of video will be recorded per shift?
- Does all material need to be transcoded or just evidential material?
  - What proportion of recorded material is evidential?
- What resolution is being used for recording?

There is a great deal of difference in time taken to transcode on the server based on its particular CPU and memory etc. The example below is the performance measured on a virtual server with Intel Xeon 2.6 GHz CPU and 8GB RAM memory on Windows 2012 Server R2 for testing the transcode of 10 minutes video in 1280x720 resolution.

Number of Server Cores	Transcoding Threads	CPU Usage	Time taken to Transcode
8 cores	Auto	70% to 80%	2 mins secs
4 cores	1	25% to 30%	10 mins 42 secs
	2	55% to 60%	6 mins 40 secs
	3	65% to 70%	5 mins 53 secs
	4	90% to 95%	4 mins 8 secs

Real world testing of the intended configuration would be required to establish an accurate figure and the example above is for illustration purposes only.



## 2) DEMS 360 Streaming

Supported camera models: D5, D6, D7, K6 and K7

IT Areas	Spec
<b>Hardware</b>	i5 or better, 8GB RAM or better 128GB Hard drive or better 1Gb Ethernet port (should support several thousand streams)
<b>Connection</b>	Public facing IP address Single port connection into the DEMS server
<b>Ports</b>	443 (RTMPS)
<b>Security</b>	A signed certificate from a Certificate authority
<b>Viewing Device</b>	OS: Windows or Android Browser: Microsoft Edge or Chrome

## 3) Reveal Media App

The Reveal Media App runs on the Android platform and requires Android Version 5.01 or higher.



# DEMS 360 On-Prem Pre-Requisites

This form outlines the prerequisite requirements for DEMS 360, including servers, uploader PC's, Client PC's and networking.

Please complete, sign and return this form so that the installation of DEMS 360 can be carried out.

## Installation type

Standalone	Enterprise single server	Enterprise multi server	Enterprise multi server with load balancer	Hybrid (Not Currently Supported)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## Usage

Please describe how you plan to use DEMS 360; this information will aid in supporting users after roll out.

Testing has been conducted to simulate 1000 users per hour with 20 concurrent users per minute

Final Storage Requirements Evaluation			
Estimated Concurrent users	0-50 <input type="checkbox"/>	51-500 <input type="checkbox"/>	501+ <input type="checkbox"/>
Estimated daily DVD creations	0-50 <input type="checkbox"/>	51-100 <input type="checkbox"/>	101+ <input type="checkbox"/>
Estimated Number of Uploaders	0-100 <input type="checkbox"/>	101-500 <input type="checkbox"/>	501+ <input type="checkbox"/>
Estimates daily clippings/snapshots	0-50 <input type="checkbox"/>	51-100 <input type="checkbox"/>	101+ <input type="checkbox"/>
Estimates daily Redactions	0-50 <input type="checkbox"/>	51-500 <input type="checkbox"/>	501+ <input type="checkbox"/>
Estimated recordings per camera per day (minutes)	0-30 <input type="checkbox"/>	31-60 <input type="checkbox"/>	60+ <input type="checkbox"/>
Estimated average concurrent cameras uploading from each location	0-50 <input type="checkbox"/>	51-100 <input type="checkbox"/>	101+ <input checked="" type="checkbox"/>



Remote Access

For support purposes Reveal requires remote access to DEMS servers. Please provide your preferred method to provide access to the Dems System

Remote access		
Software	Version	Unattended access (Y/N)
Credentials		
Username:		
Password:		
Remote Access rules and procedures		
Please describe the rules and procedures to follow when using remote access to connect to the DEMS 360 server		



## Server Requirements (Enterprise)

Server Hardware and Software (Enterprise)			
Requirement	Test	Live	Details
Intel/AMD CPU 3.3 GHz Quad Core (minimum, may require extra cores dependant on number of cameras and users)	<input type="checkbox"/>	<input type="checkbox"/>	
12GB RAM (minimum, may require extra RAM dependant on number of cameras and users)	<input type="checkbox"/>	<input type="checkbox"/>	
Windows 2012 R2 Server SE or above	<input type="checkbox"/>	<input type="checkbox"/>	
Disk Space – 1-1.2GB for SQL Server, Visual C Runtimes, Roles and Features	<input type="checkbox"/>	<input type="checkbox"/>	
Disk Space 1GB for DEMS 360	<input type="checkbox"/>	<input type="checkbox"/>	
Microsoft .NET Framework 4.7.2 or above	<input type="checkbox"/>	<input type="checkbox"/>	
Visual C++ redistributable 2010, 2013 & 2015 x86 (32 Bit)	<input type="checkbox"/>	<input type="checkbox"/>	
Microsoft SQL Server 2012 (or above)	<input type="checkbox"/>	<input type="checkbox"/>	
Microsoft SQL Management Studio	<input type="checkbox"/>	<input type="checkbox"/>	
Web Server Management Tools IIS 6 Management Compatibility	<input type="checkbox"/>	<input type="checkbox"/>	
.Net Framework Features WCF Services HTTP Activation	<input type="checkbox"/>	<input type="checkbox"/>	
URL Rewrite Module 2 to access DEMS 360 Web over https connection	<input type="checkbox"/>	<input type="checkbox"/>	
Integrated Microsoft Active Directory Authentication 2000 or above (Enterprise only)	<input type="checkbox"/>	<input type="checkbox"/>	



## Final Storage Requirements

The tables below give three deployment examples and a calculation of the amount of storage required for a two-year period.

Parameter	Example 1	Example 2	Example 3
Number of Cameras Deployed	10	30	80
Recording Resolution	720 High	1080 Standard	720 Standard
Average Recording per Camera Per Day	60 Minutes	30 Minutes	20 Minutes
Percentage of Video that is Evidential	15%	20%	30%
Retention Policy for Evidential Files	90 Days	60 Days	365 Days
Retention Policy for Non-Evidential Files	30 Days	30 Days	30 Days
Estimated Storage Required	1 TB	2 TB	13 TB

## Uploader/Kiosk Storage Requirements

Client Machines of an Enterprise deployment need to have adequate storage to cache media files during the upload from camera to the media folders (Root and SecRoot).

The amount of storage is dependent on:

- A) The model of camera
- B) The number of cameras
- C) The amount of media stored on each camera

The table below gives some examples on the unlikely scenario where every camera's memory is completely full.

Capacity Per Camera	Capacity Per Camera	Cameras uploading concurrently	Hard Disk Minimum Storage for Cache
8GB	Calla	6	128GB
		18	250GB
		84	1TB
16GB	Calla 16GB	6	250GB
		18	500GB
		84	2TB
32GB	D3	6	500GB
		18	1TB
		84	4TB
64GB	D5, D6, D7 K6 & K7	6	1TB
		18	3TB
		84	12TB





## Media Storage

Please confirm your storage availability meets the table figures above

Media Storage			
Requirement	Test	Live	Details
Final Storage disk Space <small>note: not meeting the required storage could cause footage not to upload</small>	<input type="checkbox"/>	<input type="checkbox"/>	
Uploader/Kiosk disk Space <small>note: not meeting the required storage could cause footage not to upload</small>	<input type="checkbox"/>	<input type="checkbox"/>	

## Client PC (For accessing DEMS) Requirements

Client PC Hardware and Software (for accessing DEMS 360, playback and video management)			
Requirement	Test	Live	Details
Windows 10	<input type="checkbox"/>	<input type="checkbox"/>	
Intel i5 processor or above	<input type="checkbox"/>	<input type="checkbox"/>	
4GB RAM <small>(minimum for best experience use 8GB or above)</small>	<input type="checkbox"/>	<input type="checkbox"/>	

## Network, Browser & Mobile Device Requirements

Network/Ports and Internet Browsers			
Requirement	Test	Live	Details
15 Mbps Minimum Bandwidth requirement for the Client PC's to have a positive user experience <ul style="list-style-type: none"><li>1 Mbps to use DEMS 360 interface</li><li>10 Mbps to use DEMS 360 to playback original quality (high resolution) videos</li><li>2 Mbps to playback transcoded videos</li></ul>	<input type="checkbox"/>	<input type="checkbox"/>	
Open ports HTTP 80 and 443	<input type="checkbox"/>	<input type="checkbox"/>	
DEMS 360 uploaders use HTTPS for file transfer to the server you can limit the max bandwidth used to upload by DEMS to stop it using all available bandwidth, is this required? <small>(please note that leaving this unlimited could cause other applications to run slower)</small>	<input type="checkbox"/>	<input type="checkbox"/>	
Desktop PC Internet browsers: Microsoft Edge or Google Chrome	<input type="checkbox"/>	<input type="checkbox"/>	
Mobile Internet Browsers (minimum screen size 7inches for full DEMS 360 functionality) Safari or Chrome on Apple OS Chrome on Android	<input type="checkbox"/>	<input type="checkbox"/>	



## Uploader (Kiosk) Hardware Requirements – Up to 18 cameras per PC

Uploader Hardware and Software			
Requirement	Test	Live	Details
i5 Processor minimum	<input type="checkbox"/>	<input type="checkbox"/>	
4GB RAM	<input type="checkbox"/>	<input type="checkbox"/>	
Disk Space – Minimum as per the recommendations below	<input type="checkbox"/>	<input type="checkbox"/>	
DVD±RW (for DVD burning)	<input type="checkbox"/>	<input type="checkbox"/>	
3 x USB2 ports (for uploading up to 18 cameras using docking stations)	<input type="checkbox"/>	<input type="checkbox"/>	
USB Ports whitelisted for cameras (if USB blocking is in place)	<input type="checkbox"/>	<input type="checkbox"/>	
USB End points – Sufficient to run up to 18 cameras plus any other connected USB devices such as mouse or keyboard.	<input type="checkbox"/>	<input type="checkbox"/>	
USB Power setting – Turn off USB sleep settings	<input type="checkbox"/>	<input type="checkbox"/>	
HD capable Video Card	<input type="checkbox"/>	<input type="checkbox"/>	
Microsoft SQL Express Server 2012 or above (Standalone mode only)	<input type="checkbox"/>	<input type="checkbox"/>	
Microsoft .NET Framework 4.7.2 or above	<input type="checkbox"/>	<input type="checkbox"/>	
Visual C++ redistributable 2010, 2013 & 2015 x86 (32 Bit)	<input type="checkbox"/>	<input type="checkbox"/>	

## Uploader (Kiosk) Hardware Recommendation – Up to 84 cameras per PC

The following hardware has been tested and verified to work with 84 cameras and is recommended by Reveal. If alternative hardware is chosen then Reveal cannot guarantee it will support more than 18 cameras.

Media Storage			
Requirement	Test	Live	Details
Dell OptiPlex 5090	<input type="checkbox"/>	<input type="checkbox"/>	
SEND A PCI Express USB 3.1 Gen 1 (5Gbps) Port adapter with low profile bracket (Required to expand the quantity of available USB endpoints to allow more cameras to be connected)	<input type="checkbox"/>	<input type="checkbox"/>	



## Sign Off:

Please sign and return to Reveal Media, Signing this document confirms you have read and understood the Pre-Requisite requirements for DEMS 360, if the Pre-Requisites are not met the DEMS 360 system may not perform as expected.

Name:		Date:	
Job Title			
Signature			

## Support

For Support with the DEMS 360 system please contact Reveal.

Type	Contact	Support Hours
Software	Online: <a href="http://www.revealmedia.co.uk/fault-report/software">www.revealmedia.co.uk/fault-report/software</a>	24/7
	Phone: +44 (0) 20 3890 2000	Monday – Friday 09:00am - 5:30pm UK
Hardware	Online: <a href="http://www.revealmedia.com/fault-report">www.revealmedia.com/fault-report</a>	24/7
	Phone: +44 (0) 20 3890 2000	Monday – Friday 09:00am - 5:30pm UK

