



## Considerations when purchasing CARMA

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### 1. CARMA Standalone and Network edition features comparison.

CARMA is available in two editions:

The first is **CARMA Standalone** edition which allows management of multiple cameras on a single workstation.

The second is **CARMA Network** edition which allows management of multiple cameras on multiple workstations. The Network edition is a Server based web application requiring the web clients to have XP Pro, Internet Explorer 6 or above, Windows Media Player and .Net 2 framework. The web clients will need any relevant video codecs as required to replay vendor specific material.

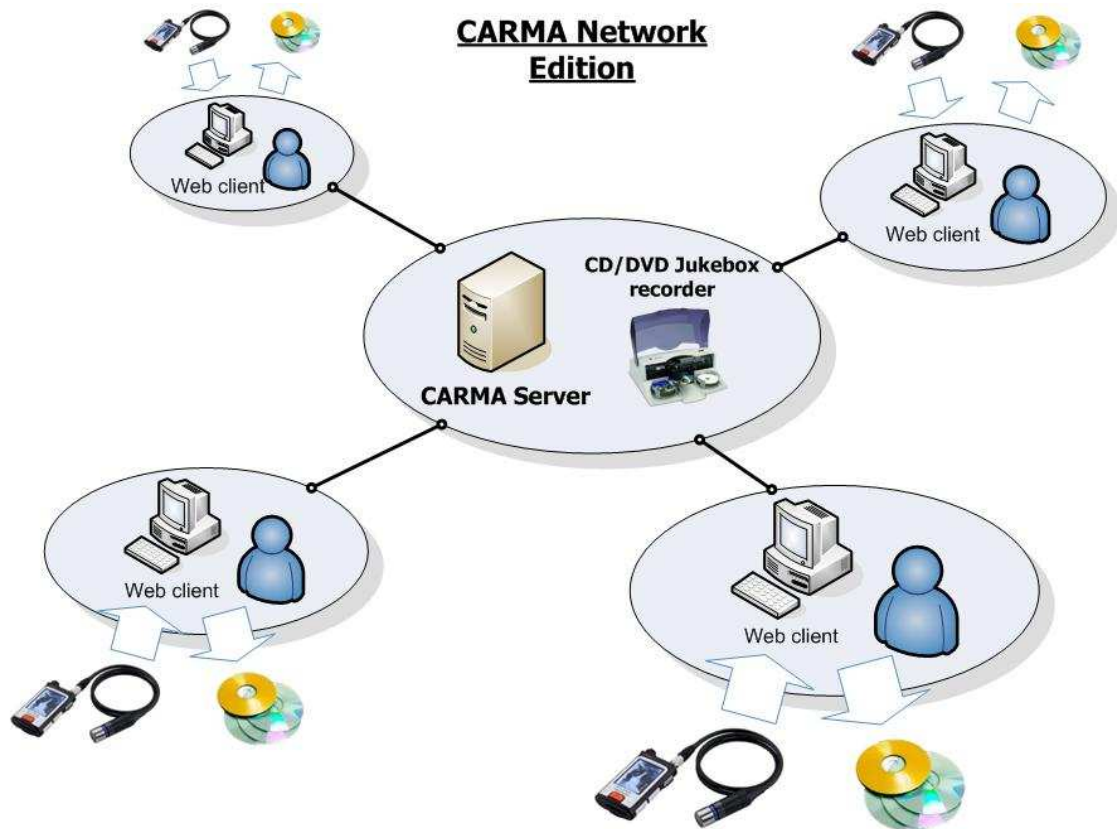
CARMA Network edition is designed to scale from single room, station level, BCU and force-wide.

| Feature                                      | CARMA Edition       |                     |
|--|---------------------|---------------------|
|  | Standalone          | Network             |
| A. Remote synchronisation                    | x                   | ✓                   |
| B. Remote to local manual burn               | x                   | ✓                   |
| C. CD/DVD automated jukebox enabled          | ✓*                  | ✓                   |
| D. Local synchronisation                     | ✓                   | ✓                   |
| E. Delete files for DPA compliance           | ✓                   | ✓                   |
| F. Report creation with free text entry      | ✓                   | ✓                   |
| G. Search and retrieve all reports and files | ✓                   | ✓                   |
| H. Add delete user and camera                | ✓                   | ✓                   |
| I. Automatic audit creation                  | ✓                   | ✓                   |
| J. Automatic moving of evidential material   | ✓                   | ✓                   |
| K. Local manual CD/DVD burn                  | ✓                   | ✓                   |
| <b>Operating system support</b>              |                     |                     |
| Windows XP Pro SP2                           | ✓                   | x                   |
| Windows Vista Business                       | ✓                   | x                   |
| 2003 SBS                                     | ✓ (not recommended) | ✓                   |
| 2003 Standard Edition                        | ✓ (not recommended) | ✓                   |
| <b>Database support</b>                      |                     |                     |
| SQL Server 2005 Express                      | ✓                   | ✓ (not recommended) |
| SQL Server 2005 Workgroup Edition            | ✓                   | ✓                   |
| SQL Server 2005 standard edition             | x                   | ✓                   |

Explanation of features not common to both editions:

- A. Remote Synchronisation:** This allows video material to be downloaded onto a remote CARMA server from any web client on the network. A user wishing to download material from a recorder simply logs into the CARMA Web interface and opens the CARMA Synchroniser tool which allows the user to send the video data over the network to the CARMA server.

*\*\*The data is sent over the network using a protocol known as BITS (Background Intelligent Transfer Service) BITS will only transfer data whenever there is bandwidth which is not being used by other applications, for example, when applications use 80% of the available bandwidth, BITS will use only the remaining 20%. BITS constantly monitors network traffic for any increase or decrease in network traffic and accordingly throttles its own transfers to ensure that other foreground applications get the bandwidth they need. All data is encrypted during transfer and as it uses HTTPS, no special firewall provisions need to be made.*



- B. Remote to local manual burn:** This feature allows a user to burn video material onto CD and DVD from CARMA over the network. The user selects any material that they want to burn and the files are sent from CARMA to their local machine. Once the files have been delivered (time depending on network bandwidth available and amount of data) the user simple puts a blank CD/DVD into their burner and clicks the CARMA burn interface.

**C. CD/DVD automated jukebox enabled:** CARMA is able to automatically create a list of all material that is marked as evidential which goes into what is called the Burn Cue. Using one of the supported DVD/CD jukebox recorders, the user can easily burn all discs in the cue. A master and any number of working copies are created. The labels are printed onto the CD/DVD automatically and include a unique reference number as well as date, time and user information. Incidents can be linked and sent to the same evidence disc by a simple process using CARMA web. The discs that are created will load automatically on any PC (security settings allowing) and any files can be played by a single click of the mouse.

*\*\*This feature requires an additional license fee when using CARMA Standalone. This feature requires third party software and hardware: please enquire about prices if you are interested.*

## 2. CARMA Storage calculations.

There are many factors to consider when sizing your CARMA hardware:

- Recording bit rate used in the Camera system
- Number of Cameras
- The average number of minutes recorded during each shift
- Number of shifts that the cameras are used per day
- Percentage of evidential to non evidential material
- Period that material is kept on CARMA
- Average time that cameras are not available due to repair etc (\*not in calculator)

Below is a sample calculation using our "Storage calculator for CARMA.xls" spreadsheet that is available on request.

*This storage calculator is designed to help size an appropriate amount of storage for your CARMA system. There are many variables therefore this cannot be 100% accurate - please treat it as a guide only.*

|   |     |
|---|-----|
| <b>Number of cameras to be used</b>   | 5   |
| <b>bitrate of recordings (Mbs)</b><br><i>2.5 is an average figure for something like an Archos AV500</i>  | 2.5 |
| <b>Average number of minutes recorded during each shift.</b><br><i>The Home Office report suggests a little over 20 Minutes.</i>  | 20  |
| <b>Number of shifts camera is used per day</b>  | 1.5 |
| <b>Percentage of Evidential material</b><br><i>The Home Office report suggests a little under 30%</i>   | 30  |
| <b>Number of days to keep non-evidential material.</b><br><i>The Home Office report suggests 31 days in accordance with the data protection act</i>   | 31  |
| <b>Number of days to keep evidential material.</b><br><i>The Home Office report suggests material can be removed once a worm disk has been created but material can be reviewed much quicker if left on CARMA</i> | 180 |

**Total storage required (GB) 209.5276**

*A very course calculation is that each hour of recorded material requires just over 1 Gigabyte (assuming the recording is made at 2.5Mbs).*

### **3. Hardware and software:**

CARMA consists of a Database and Web server and the hardware speed requirements are proportional to the number of users accessing the system simultaneously. Again 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 CARMA on modern laptops quite happily. Given the experience that the Devon and Cornwall headcam team have had managing 50 cameras and an automated CD burning jukebox, they are going to be using a system similar to the one below which we recently recommended.

Example hardware for CARMA

- HP ProLiant ML150 G3 with 1 x Dual-Core Xeon 5130 / 2 GHz
- Memory - 4 GB ( 2 x 2 GB ) - FB-DIMM - DDR II - 667 MHz / PC2-5300 - Fully Buffered
- DVD±RW (+R double layer) - 16x/8x - IDE - internal - 5.25"
- 2 x Hard drive - 160 GB - hot-swap - 3.5" - SATA-150 - 7200 rpm in RAID 1 configuration for operating system
- 4x Hard drive - 500 GB - hot-swap - 3.5" - SATA-150 - 7200 rpm in RAID 5 configuration providing 1.5TB storage for media files
- HP Smart Array E200/128 BBWC Controller - Storage controller (RAID)
- Microsoft 2003 SBS Server with 5 CALS -STANDARD
- Multicard Reader

Cost approximately **£2,415**

For Automated CD recording jukebox

- HP Compaq Business Desktop dx2300 - Micro tower - 1 x Pentium Dual Core E2160 / 1.8 GHz - RAM 1 GB - HD 1 x 160 GB - DVD±RW (±R DL) - Win XP Pro

Cost approximately **£361**

\*The hardware above is for illustration purposes only and we highly recommend that you seek advice from the relevant parties within your force.

Whilst we do not offer the PC hardware and support, we are happy to discuss your sizing requirements and recommend a reputable supplier of HP equipment that a number of our clients are purchasing from.

## **Operating systems.**

**CARMA Standalone** edition requires Windows XP Pro Service pack 2 with IIS 5.1 installed and enabled.

**CARMA Network** edition requires Microsoft 2003 Small business server or standard edition with IIS6 installed and enabled.

Client Access Licenses (CALs) for Microsoft 2003 Small business server and standard edition.

Many forces have enterprise licenses for Microsoft Software so it is well worth verifying what the most cost effective way to purchase licenses is. CARMA network edition requires 2003 Small Business Server or above. In most cases it is cheaper to buy "device" CALs as opposed to "user" CALs. In this case a "device" is any single computer that accesses CARMA (in other words, every computer that accesses CARMA must have a Device client access license regardless of how often that device is used)

Microsoft's definition:

*"A user CAL permits one user (using any device) to access the server software. A device CAL permits one device (used by any user) to access the server software. Both types are offered to allow customers cost-effective licensing options. For example, per-user CALs are most effective when an employee uses several devices to access the server, such as a work computer and a home computer. Per-device CALs are most effective when several employees use the same device to access the server, such as rotating shifts in a call center."*

Microsoft Small Business server costs around £250 when bought with hardware and includes 5 CALs. CALs can be bought in packs from many vendors and a further 20 costs around £600.

## **Database.**

**CARMA Standalone** edition requires Microsoft SQL Server 2005 Express.

SQL Server 2005 Express is free but has certain key licensing limitations:

Max CPUs = 1

Max Ram for database = 1GB

Max Database size = 4GB

Whilst CARMA standalone will perform adequately using only 1GB Ram for the database, it is not recommended for CARMA network.

**CARMA Network:** it is recommended that this edition uses Microsoft SQL Server 2005 Workgroup Edition or SQL Server 2005 Standard Edition: again this is best to purchase on a "device" CAL basis (in the same numbers as the Small Business Server discussed above). This version also has licensing limitations:

Max CPUs = 2

Max RAM for database = 3GB

(No max database size)

\*Please note that .NET Framework 2 is required on all web client PCs running CARMA synchronisation and manual burn facilities.

#### 4. **Operating recommendations:**

It is essential that your force 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.

Things to consider:

- How long you can afford to have the system inoperable owing to system failure or disaster.
- Disc failure: 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. 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.
- Back-ups: most forces 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 forces 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.
- Other hardware failure: 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.
- Support: 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.

#### 5. **CARMA Compatibility list**

- Cylon
- David Horn Communications
- Double Vision
- Ocutek/Tactical Electronics
- Robocam
- Video Vest

\*Suppliers change their models from time to time. We will endeavor to update CARMA to be compatible with all major recorder units when appropriate.



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