

► Extremely powerful systems for archiving video sequences

Recording extremely long video sequences for subsequent archiving, transport or buffering, has been a common task in industrial image processing (and in other markets involving image sources) for many years. With ever faster industrial processes and new technical innovations happening all the time, special recording systems are increasingly in demand. In many situations - particularly where extremely fast processes are involved - recorded images need to be archived. This is because processing them as rapidly as they are recorded is simply not possible. In this situation, the video sequences are first archived and then processed offline, at a later date.

The comprehensive range of components offered by the STEMMER IMAGING Group, combined with the many years of expertise in building image processing systems, forms an ideal basis for making extremely powerful systems that are specifically designed for archiving video sequences. These systems are built to meet each customer's application requirements, and offer maximum flexibility - using the proven imaging and processing strength of Common Vision Blox.



► Examples of possible applications

The examples below show just what these imaging systems are capable of. There are uses in many extremely diverse markets and for the widest possible range of applications.

- In **automobile manufacture**, the recording and subsequent analysis of **crash test** data is probably the best known application for this type of system. The same systems can also be used to examine, record and evaluate the extreme accelerations that are sometimes encountered on vehicle chassis.
- **Manufacturing** plants often record and archive video sequences. High-speed processes often need to be recorded so that manufacturing faults - often too fast to be observed with the naked eye - can be detected, using subsequent slow-motion playback.
- In **paper manufacturing** and **printing**, video systems can be used to record and analyze the vertical oscillation of paper webs.
- Many potential applications for imaging systems can also be found in the field of **Medical technology**, such as examining vocal cords, recording and evaluating diagnostic images and sequences, recording the distribution of contrast media in blood or analyzing the movements of patients in sleep laboratories to correlate these movements with the recorded brain activity.
- **Sport** provides a rich source of potential image recording and archival applications, such as analyzing and recording the movements of sprinters. At various sporting events, imaging systems can supply special large-scale images of either the players or the ball, for example. Such systems are also suitable for recording game statistics in sports like football, hockey or tennis; enabling trainers to precisely determine how fast their players can run, or to improve tactical analysis using recorded footage.
- The **film industry** provides yet another source of possible applications. These systems can be used to capture fight scenes or action sequences, in which time appears to 'stand-still', while the actors' movements are 'frozen' in mid-air.

A complete list of applications would be considerably longer, and would include examples from research (e.g. analyzing cell growth), traffic monitoring and many other fields.



► Standard models available now

Many different versions of the incredibly versatile STEMMER ImageStation RS are available. Inputs may come from many different camera technologies (monochrome or colour, area or line-scan cameras and simple or high-speed cameras) and each system can handle almost any number of camera inputs. A variety of trigger mechanisms can be implemented to suit your needs. In terms of data storage, the archiving facilities of the ImageStation provide everything that modern PC technology has to offer. The same applies to transfer speeds and recording times. Refresh rates of thousands of frames per second and continuous transfer rates of 500MB/s are not unusual and transfer rates of 700MB/s have already been achieved under laboratory conditions. An accumulated capacity of several terabytes worth of data can be archived securely and distributed over a number of hard disks.



Application example film industry: REALVIZ Movimento, video based recording software, Copyright REALVIZ

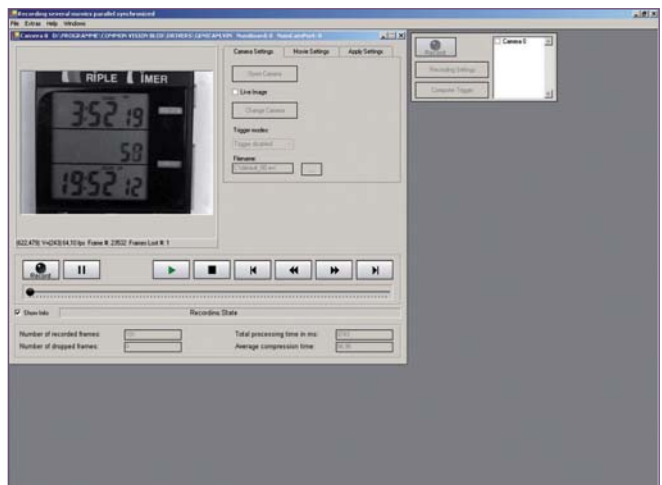
► Possible functions

The following standard recording functions are present in all the systems:

- Start, Stop, Pause, Play, Record, Forwards, Backwards
- Select camera
- Select recording time and the number of frames
- Start recording by pressing a button or with an external trigger
- Select compression method
- Record different image formats (e.g. bmp, tiff, jpg)
- Video recording format (avi)
- Use of an easy-to-operate graphical user interface or a comprehensive software development kit

The following optional functions can also be provided for an additional charge:

- Special synchronization methods
- Timestamps
- Special triggers (using hardware such as photo sensors or in response to software events, such as recognizing an individual or an object)
- Special camera settings (e.g. shutter, gain control, automatic white balance)
- Additional images before or after a trigger event
- Control of any desired I/O signals
- Can be used in combination with any image processing algorithms





The following product combinations are examples of possible recording systems. In addition to these, STEMMER IMAGING will also construct customer-specific systems that fulfil individual customers' requirements.

► CVS ImageStation RS LITE / RS SMALL / RS FULL

The standard systems CVS ImageStation RS LITE / RS SMALL and RS FULL differ essentially only in their form of housing and the amount of storage provided.

The ImageStation RS LITE comes with two 150 GB hard disks plus a DVD archive burner installed in a 19" industrial housing; the ImageStation RS SMALL offers the identical functionality in a tower housing.

The maximum configuration ImageStation RS FULL incorporates 150 GB hard disks in removable frames in a 19" industrial housing.



► CVS ImageStation RS - OEM systems

- Transfer rates of 500 MB/s (700 MB/s under laboratory conditions)
- Refresh rates of several thousand frames per second
- Large number of attachable cameras
- Secure archiving of the accumulated data up to several terabytes, distributed over a number of hard disks
- Special housings and hardware available (e.g. vibration proof, waterproof or dustproof)
- Laptop applications
- System fully customized to suit the specific customer's requirements



► Examples of some cameras (recording times with the CVS ImageStation RS FULL)

High-speed monochrome camera

- 1/3" IT Progressive Scan CCD
- Pixel size 7.4 µm x 7.4 µm
- 640 (H) x 480 (V), 200 frames/sec (recording time approx. 10 h)
- 224 (H) x 160 (V), 1250 frames/sec (for a period of approx. 15 s, then reducing to 200 frames/sec)
- 228 (H) x 80 (V), 2315 frames/sec (for a period of approx. 15 s, then reducing to 200 frames/sec)
- Shutter adjustable from 1/250 to 1/64.000 s
- Dimensions 50.8 x 50.8 x 81.8 (W x H x D in mm)
- Weight 152 g
- 5 m cable

Color camera:

- 1/3" IT Progressive Scan color CCD
- 1034 (H) x 779 (V), 24 frames/sec (recording time approx. 3 h)
- Shutter adjustable up to 1/10,000 s
- Dimensions 50 x 40 x 90 (W x H x D in mm)
- 5 m cable

Up to three synchronous cameras, monochrome with VGA resolution:

- Three 1/3" IT Progressive Scan CCDs
- All three cameras are recorded synchronously

For three cameras:

- 659 (H) x 464 (V), 30 frames/sec (recording time approx. 9 h)
- 659 (H) x 272 (V), 58 frames/sec (recording time approx. 9 h)
- 659 (H) x 127 (V), 124 frames/sec (recording time approx. 9 h)
- 1392 (H) x 1040 (V), 16 frames/sec (recording time approx. 5 h)
- 1392 (H) x 520 (V), 32 frames/sec (recording time approx. 5 h)
- Shutter adjustable up to 1/10,000 s or 1/200,000 s
- Dimensions 44 x 29 x 66 (W x H x D in mm)
- Weight 150 g
- 5 m cable

Other possible camera configurations:

- Resolutions up to 4k x 4k or line cameras
- Almost unlimited number of cameras (independent or synchronous)
- Refresh rate of several 10,000 frames/sec
- Recording times up to 40 h (VGA at 30 frames per second)

