ProCapture

Xcitex Professional Motion System

Capture Analyze Share

Complete High-Speed Motion Capture System

Life Sciences – Engineering – Manufacturing – Automotive

Up to 5 hours of continuous recording

30 – 500 fps high resolution cameras

Synchronize multiple cameras with up to 32 channels of data collection

2-D and 3-D video-based motion analysis

Introduction

The complete motion capture system for 2-D/3-D motion analysis – connect up to 8 high-speed cameras, record up to 5 hours

Xcitex, the inventor of MiDAS and award winning ProAnalyst® software for video engineering, introduces a new low-cost, high-performance motion capture system designed to record live video and data synchronously. The ProCapture motion capture system is ideal for researchers and engineers who study motion in a variety of industries such as aerospace, applied science, automotive, ballistics, biomechanics and sports, research and development, life sciences, process control and engineering. The foundation of the ProCapture system is the 500 fps Xcitex high resolution camera controlled by the feature-rich ProCapture software. In addition, ProAnalyst motion analysis software is included with each ProCapture system so that motion can be captured, downloaded and analyzed in minutes.

The ProCapture system can be configured with as many as eight Xcitex high-speed cameras and up to 32 channels of data collection for either 2-D or 3-D motion capture and analysis. Video and data sources are automatically synchronized, ensuring a multi-perspective capture of every significant event.

Key Components of the ProCapture System

Xcitex High-Speed Cameras

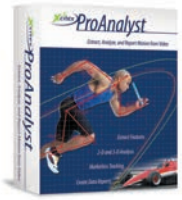
- Resolution up to 1240 x 1080
- 30 - 500 fps color or monochrome

ProCapture Motion Capture Software

- Easy-to-use touchscreen graphical interface
- Automatically creates ProAnalyst projects for 2-D and 3-D analysis

Video Processing Unit and Data Collection Hardware

- Up to 5 hours of continuous recording
- Synchronize multiple cameras with 32 channels of data/sensor collection



ProAnalyst Motion Analysis Software

- Markerless auto-tracking in 1-D, 2-D and 3-D
- 3-D stick figure analysis

Frame rates, resolutions and record times

The maximum duration of a ProCapture recording is determined by the frame rate and resolution the user selects when configuring a recording. Frame Rate, or frames per second (fps), is the number of frames in each second of recorded video. Resolution is the number of pixels (width x height) contained in a digital image. A higher resolution creates a sharper and more detailed image.

The ProCapture system can record for up to 5 hours. The chart illustrates the relationship between ProCapture's frame rates, resolutions, and the length of recording time for a standard system. Special ProCapture configurations may have different recording times.

Frame Rate	Resolution	Record Time Minutes
30 frames/sec	1240 x 1080	203
	1240 x 900	240
	1240 x 720	300
	1150 x 960	251
	1050 x 1000	255
100 frames/sec	1240 x 1080	61
	1240 x 900	72
	1150 x 960	75
	1050 x 1000	79
150 frames/sec	1240 x 1080	41
	1150 x 1080	44
	1050 x 960	54
	960 x 1080	53
300 frames/sec	1240 x 600	37
	1150 x 640	37
	1050 x 700	37
	960 x 770	37
500 frames/sec	960 x 450	38
	860 x 500	38
	760 x 560	38

Xcitex High-Speed Cameras

- 1240 x 1080 pixel resolution (native)
- Up to 150 fps @ full resolution
- Up to 500 fps @ reduced resolution
- CMOS image sensor
- Enhanced Near Infrared (NIR) Response
- Dynamic range up to 120 db
- Global shutter
- Monochrome
- Compact size: 60 x 60 x 45 mm

Lens sold separately

The ideal 30-500 fps camera for motion capture in life sciences, robotics and industrial automation

The XC-1M camera has been designed to give users the flexibility to create a recording environment which meets their particular application needs. Users can choose frame rates beginning at 30 fps up to a maximum of 500 fps with multiple resolution choices up to 1240 x 1080.

Using CMOS image sensor technology, the XC-1M camera delivers the perfect balance of light sensitivity, high recording speed, fast shuttering, and high resolution. Excellent image quality is achieved with a state-of-the-art 1.3 megapixel resolution sensor based on 8 µm square pixels and 60% quantum efficiency. The extended spectral range makes the XC-1M camera ideal for biology and life science applications.

Along with outstanding image quality, the XC-1M offers remarkably good Near Infrared (NIR) responsivity, a dynamic range up to 120 db, and global shutter technology to capture crisp images without blur or distortion. In addition, each individual pixel has a very high saturation capacity, resulting in an excellent signal/noise ratio for extremely sharp, high–contrast images. The compact size of the camera makes it easy to install on walls, tripods, production lines, or into tight spaces.

XC-1M Specifications

Image Sensor	
Technology	CMOS active pixel (APS)
Resolution (total)	1248 x 1082 pixels (maximum)
Pixel size	8 µm x 8 µm
Active Optical area	9.98 mm x 8.64 mm (maximum)
Spectral range	350 to 1000 nm (at 10% of peak responsivity)
Shutter mode	Global shutter

Camera	
Grayscale resolution	8 bit
Fixed patter noise (FPN)	< DN @ 8 bit / correction ON
Operating temperature	0°C to +50°C
Power	+12 V DC (±10%)
Power consumption	< 5.2 W
Dynamic Range	120 db
Conformity	CE / RoHS / WEEE
Optical format	1" c-mount, 2/3" c-mount (5% vignet @ full resolution)
Lens Mount	C-mount, adjustable backfocus
Accessories included	Power supply and 7-meter cable

Dimensions	
Dimensions	60 x 60 x 45 mm (w/o lens)
Weight	265 g / 9.5 oz.

Control Software

Multi-camera and data control software for ProCapture system

ProCapture, Xcitex's motion capture control software, records live video and data synchronously with multiple Xcitex high-speed cameras. ProCapture is extremely powerful, yet easy to configure with settings based on the user's unique recording requirements. With a touch of a button, ProCapture allows the user to focus the cameras, record, trigger, save, and download discrete events. Project files are created for analysis with ProAnalyst® motion analysis software. Add data collection to ProCapture for synchronized data and video capture.

ProCapture software is designed for researchers, engineers, physicians, or scientists studying a variety of applications. Biomechanics, sports performance, product engineering, applied science, and crash testing are just a few areas where ProCapture can provide the ideal solution.

The ProCapture control panel allows users to configure settings and switch between Live, Record, Event Trigger, or Save at the touch of a button. Overlay information displays the settings instantly.

- **Simple setup – all cameras automatically initialize after software launch**
- **Touchscreen ready, easy to use control panel**
- **User-controlled configurations**
- **Create discrete, manageable events from long video streams**
- **Timeline indicates event types and locations**
- **No "blind time" when downloading captured events**
- **Variety of event triggering methods**
- **Video and data automatically synchronized**
- **Automatically creates ProAnalyst projects for analysis**
- **Live view of up to 8 cameras simultaneously, spanning multiple monitors**

Example of Event Triggering

ProCapture software allows researchers to capture meaningful events with the touch of a button or external device. In the example at right, the user captured the kangaroo bouncing on the force plate and saved this video sequence as an event for analysis.

Video Processing Unit and Data Collection Hardware

- **Portable and sturdy for use in lab or field**
- **Automatic data level triggering**
- **The power and precision of National Instruments hardware**
- **Video rates up to 500 fps and data rates up to 1.2 MSamples/sec allow you to collect data along with video**
- **Nanosecond timing accuracy and 16-bit resolution**
- **"Active phase lock" technology continuously synchronizes high-speed cameras to data**

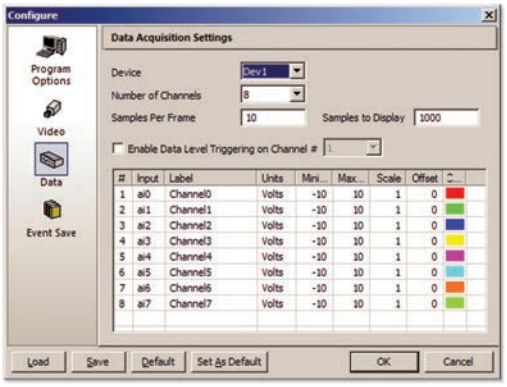
Data Collection and Automatic Event Capture

The ProCapture system is designed to incorporate and automatically synchronize 8, 16, or 32 channels of data collection from sensors, force plates, EMG, gauges and accelerometers. Optional data acquisition hardware collects the data, allowing for quantitative measurement of motion or force. Xcitex is a strategic partner with National Instruments™, the world's largest supplier of data acquisition hardware and accessories.

Xcitex offers three optional add-on solutions for ProCapture synchronized data collection, providing 8, 16, or 32 data channels for PCI and PCI Express platforms. Our pre-packaged data acquisition kits contain fully warranted hardware from National Instruments – the world's largest supplier of DAQ hardware. For recommendations on which type of data acquisition to add to your ProCapture system, please contact Xcitex directly.

Data Acquisition Settings

Converting input volts to a meaningful number in engineering units can be achieved within the Data Acquisition Settings window. Users can adjust the maximum and minimum limits and apply scale and offset factors for each data channel recording.

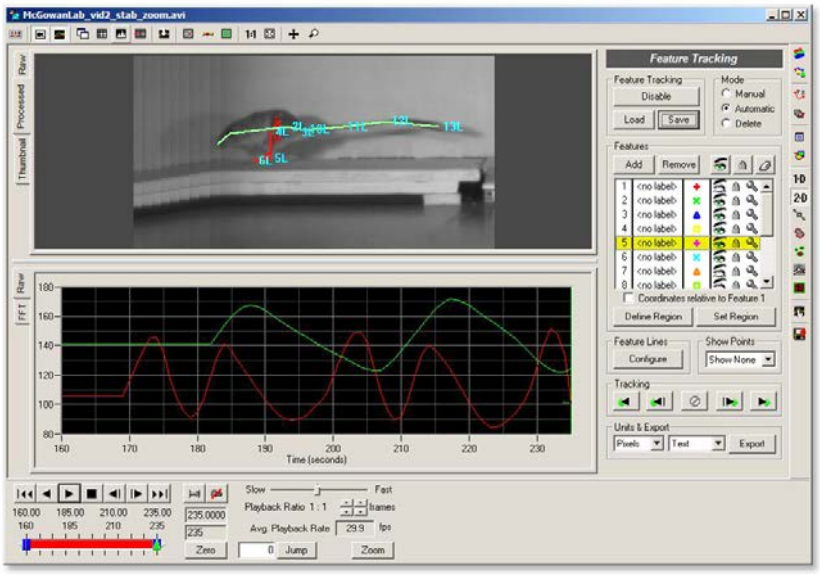


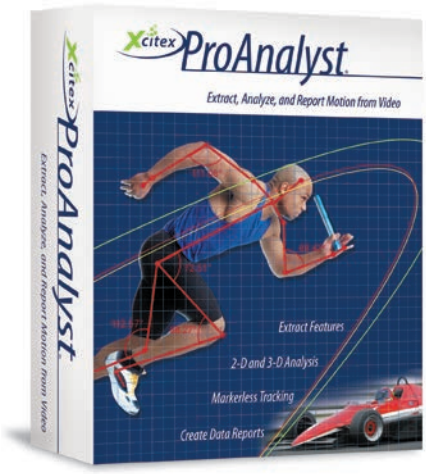
Motion Analysis Software

ProAnalyst

ProCapture is part of the "*Xcitex Professional Motion System*" and has been designed to work seamlessly with Xcitex's ProAnalyst and ProViewer software packages for motion analysis, remote viewing and file exchange. ProCapture events are automatically saved as ProAnalyst project files. Simply double-click on the project file to launch ProAnalyst for motion analysis.

ProAnalyst® is the world's leading software package for tracking, analyzing, and presenting motion from pre-recorded video. Using your ProCapture videos or project files, ProAnalyst allows users to measure and track velocity, position, size, acceleration, location and more. Markerless tracking can be performed automatically in 2-D and 3-D – no special markers needed. State of the art image processing and filters have been included to correct or enhance videos for the automatic tracking algorithms. Create 2- and 3-axis graphs, stick figures and feature lines for angle and distance measurements.

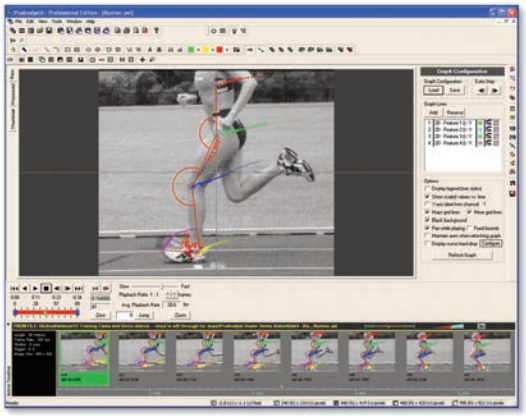




- **Markerless Auto-Tracking of any object in 1-D, 2-D and 3-D**
- **Measure velocity, position, size, acceleration, location, movement and more**
- **Multi-dimensional scene calibration**
- **Extensive image controls and filters to correct or enhance your video**
- **Particle Counting, Sizing, and Flow**
- **Instantly graph and export data to a variety of formats, including 2-axis and 3-axis graphing**

ProViewer

Xcitex's ProViewer is the perfect slow-motion viewer for opening and playing video images and ProAnalyst files. It allows users to easily share their ProAnalyst analyzed data or videos with colleagues. A copy of ProViewer is included in the ProCapture system and can be freely shared by downloading from the Xcitex website.



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