

# Raptor-4 Digital RealTime System



Motion Analysis Corporation recently announced the introduction of the Raptor-4 high-performance mocap camera. The Raptor-4 features massive on-board throughput processing power for real-time processing of up to 5,000 markers at 600,000 markers per second in full grey scale images, making it the industry's most powerful motion capture camera. The Raptor-4 automatically measures focus and adjusts brightness for optimal performance. As with other MAC digital cameras, the Raptor-4 is field upgradeable via email, compatible with other MAC digital cameras and supported with the new generation Cortex software.

The limitation of most mocap cameras is their limited bandwidth and throughput capacity. At four mega-pixel resolution, the Raptor-4 processes in real-time full greyscale images, image analysis and centroid calculations for 5,000 markers.

The Raptor-4 Digital RealTime System consists of Raptor-4 Digital Cameras and Cortex software, which captures complex motion with extreme accuracy. Real-time capabilities allow our customers to see capture results at the same instant as the subject is performing a specific task. The Raptor-4 can be mixed with other Motion Analysis digital cameras to optimize your capabilities.

## Raptor-4 Digital Camera

The Raptor-4 uses the Micron Corporation MI-MV40 sensor and operates up to 200 fps at a full resolution of 2352 x 1728 pixels, and up to 10,000 fps at reduced resolutions. The Raptor-4 Digital



Cameras provide today's motion capture technicians with a tool that assures reliable and accurate data. With digital technology there is no degradation of the signal over distance, less noise, and no resampling of data on another piece of electronics.

With today's motion capture facilities demanding multiple person capture within increasing volumes, the stability of the signal becomes critical. The Raptor-4 Digital Camera signal goes directly to the tracking computer via an Ethernet connection. The signal processing is embedded in the camera. This streamlined system of motion capture from camera to computer means less hardware and less potential for equipment problems. The FPGA (field programmable field array) built into the Raptor-4 is software and firmware upgradeable via the Internet - you don't even have to take the cameras down! Motion Analysis was the first company to manufacture digital cameras for motion tracking - the Eagle Digital Camera was introduced at SIGGRAPH 2001. Thousands of our digital cameras are currently in service.

The Raptor-4 Digital Camera has a larger sensor area than standard video cameras. The corresponding use of a high quality 35mm lens allows for the sweet spot of the lens to map over this larger image sensor area, resulting in greater lens and system accuracy.

## Features

- 1-200 Hz selectable frame rates at full resolution
- Up to 10,000 Hz at partial resolution
- Portable - up to 8 cameras in two suitcases
- Built-in zoom provides more visual options for ease of set-up
- Separate zoom, iris and focus settings independent of ringlight
- Available with visible red, near red, or infrared ringlights
- LED display panel for camera identification and status
- 237 LED's for brighter and better light uniformity
- Strobed ringlight with camera body heat sink
- Four body mount points on camera for variable positioning
- Software controlled adjustable light output



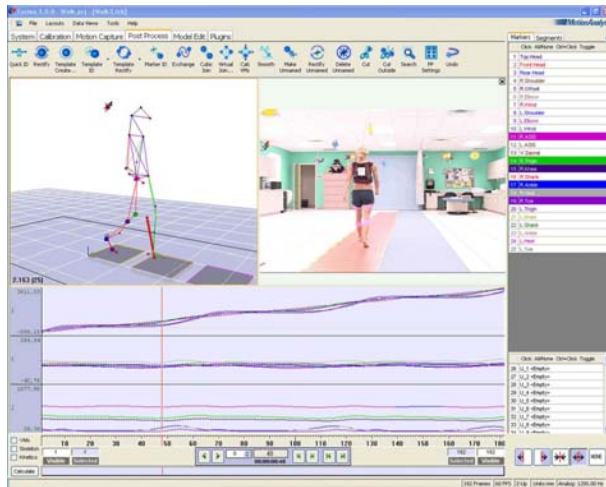
## Calibration: The Key to Real Time

Motion Analysis uses a dynamic linearization technique which is the only technique currently available capable of producing precise and accurate calibration. First, a small four-point calibration device is used for defining the XYZ axes. A 500mm wand (for large capture volumes) or a 150mm wand (for small capture volumes) is then used for establishing camera linearization parameters. If the camera lenses are changed, recalibration takes mere moments as compared to the cumbersome, time consuming grid technique used by other motion capture systems.

## Cortex

Cortex provides a user with a simple and powerful interface. Under a single software environment you can set up, calibrate, capture motion in real-time, capture motion for post processing, edit and save data in the format of your choice.

A dual monitor option provides the motion capture technician with a full view of the active capture display and graphic panels on one monitor while viewing application forms and panels on another monitor.



## Simultaneous Display of Panels

The Raptor-4 Digital RealTime System provides simultaneous viewing of up to four different panels:

- 3D Display - different views and angles are possible
- 2D Display - digital greyscale and threshold images
- Color Video Display (avi)
- XYZ Graphs
- Analog Graphs
- HTR Graphs

## Simple and Customizable Interface

- Post processing provides one stroke hot keys for power users
- "Hot keys" are customizable - define your own system for processing actions
- Preferences for features such as initial monitor display, init poses, etc., can be named to an .ini file so that multiple system users are always assured of their customized configurations at login

## PowerHub

The Power Hub provides power for up to eight cameras. A single Ethernet Cat 5e cable is used for all signals and power between the cameras and the Power Hub.

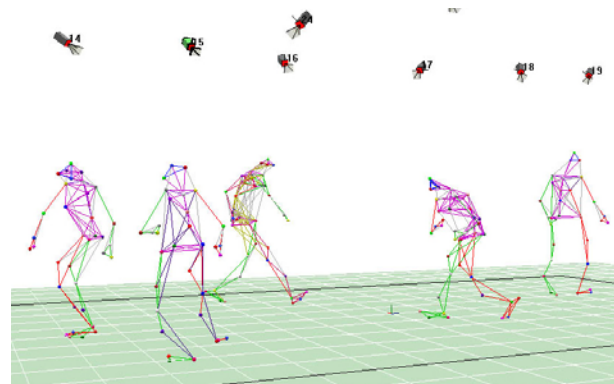


## Integration

- Fully compatible with Cortex or EVaRT software
- Standard TCP/IP Protocol
- 128 channels of synchronized 16-bit analog data acquisition (forceplate and EMG data)
- Exportable to all major animation packages

## Additional Components

- Camera tripods or wall mounts
- Camera carrying cases
- Ethernet switch
- Calibration "L" frame and wand set
- Test cable and wireless controller
- Marker kit



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