



DRS's Lightning® RDT<sup>Plus</sup>™ (Research, Design and Test) camera combines high-speed digital video, intuitive camera control software and powerful analytical functions with the capabilities of a standard PC to provide an integrated, high-speed imaging system with sufficient performance and flexibility to address all motion analysis requirements.

Consisting of a small camera head, detachable cable and custom frame grabber board, the Lightning® RDT<sup>Plus</sup>™ captures 512 x 512 resolution images at 5,000 full frames per second (fps). A blazing 100,000 fps can be achieved at reduced resolution for recording extremely rapid events.

The Lightning® RDT<sup>Plus</sup>™ features extended recording times to capture long duration events such as vehicle rollovers and missile flights. More than 13 seconds of full resolution recording at 5,000 fps are available without compression. Greater than one minute of record time can be achieved by reducing the frame rate to 1,000 fps. The ability to daisy chain multiple frame grabber boards further extends the record time.

A digital interface on the Lightning® RDT<sup>Plus</sup>™ custom frame grabber board allows the output of a continuous, real-time stream of digital image data. The digital interface is capable of streaming image data at up to 1.25 gigabytes per second—the maximum performance of the Lightning® RDT<sup>Plus</sup>™ camera.

The Lightning® RDT<sup>Plus</sup>™ is supplied with MiDAS software from Xcitex, allowing operators to perform vital motion analysis, to control up to four cameras simultaneously, and to save digital video data in different file formats including AVI, BMP, JPEG and TIFF. Optional MiDAS modules provide the synchronization of high-speed video with instrumentation data from a variety of sensors, gauges, tachometers, IRIG encoders and other devices.

The Lightning® RDT<sup>Plus</sup>™ is available with several distinct camera head configurations: monochrome, color and low-light (for light challenged environments). A single system can be purchased with multiple, interchangeable camera heads, providing the flexibility to record high-speed events in different situations.

DRS DATA & IMAGING SYSTEMS, INC.

## Features

- 512 x 512 pixels at 5,000 full fps. To 100,000 fps at reduced resolutions
- Real-time digital interface
- Frame grabber daisy chaining for ultra long record times
- Integrated with complete line of MiDAS modules from Xcitex
- Interchangeable monochrome, color and low-light camera heads
- To 16 GB memory for storage of 65,520 full-resolution images

## Typical Applications

- Airbag deployment testing
- Bio-mechanical research
- Combustion analysis
- Explosives detonation
- Drop, shock and vibration testing
- Impact analysis
- Particle image velocimetry (PIV)

## Imaging Performance

Sensor . . . . . 10-bit CMOS sensor, 512 x 512 pixel resolution @ 5,000 full fps  
Image resolution . . . . . 512 x 512 full frame, with operator-selectable reduced resolutions  
Pixel bit depth . . . . . 8-bit mono and 24-bit color  
Global electronic shutter . . . . . Global with exposure times from 4 microseconds to 1/frame rate

## Triggering and Synchronization

Trigger . . . . . TTL (high, low, positive, or negative), switch closure or software  
Camera synchronization . . . . . Multiple cameras can be synchronized within 2 microseconds  
Exposure out signal . . . . . Available for synchronizing camera to a strobe or other device

## Mechanical Specifications

Camera dimensions . . . . . 3.6 H x 4.2 W x 1.7 L inches (105 x 91 x 52 mm)  
Lens mount . . . . . C-mount  
Custom frame grabber . . . . . Full-size 32-bit PCI 2.2 board  
Camera cable length . . . . . 5 meters standard, 10 meters optional, detachable at both frame grabber and camera head

## Frame Storage per Frame Grabber

Base memory (standard) . . . . . 4 GB; 16,380 full frames  
Medium memory #1 . . . . . 8 GB; 32,760 full frames  
Medium memory #2 . . . . . 12 GB; 49,140 full frames  
Maximum memory . . . . . 16 GB; 65,520 full frames  
Multiple frame grabber boards can be daisy-chained together to further expand frame storage.

## Control/Analysis Software

Up to 4 cameras can be controlled simultaneously; number of cameras depends upon performance characteristics of associated PC. Analysis functions provide angular, linear, velocity and rotational measurements. Auto-tracking is available with optional Xcitex, Inc. MiDAS 2.0 add-on modules.

## Data Acquisition/IRIG

Optional Xcitex, Inc. MiDAS 2.0 modules provide data acquisition and IRIG/GPS functionality that allow images to be recorded in synchronization with instrumentation data.

## Image Display/Playback and File Formats

Live image display during camera setup and recording. User-selectable playback rates. AVI, BMP, JPEG, TIFF image file formats.

## Minimum PC Recommendation

1 GHz Pentium®2 with 1,024 x 768 resolution display; 256 MB RAM, 20 GB hard drive; 64 MB video RAM; CD/DVD-RW drive; one vacant PCI full-length slot; Windows®NT, Window®2000 or Windows®XP.



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