

# HG-TX Imager, Model 2000

Designed specifically for use in severe environmental conditions, the HG-TX Imager, Model 2000 features high frame rates, excellent resolution and a small, tethered camera head. Rated to 100 g in any axis, the HG-TX Imager is the ideal system for hard-to-reach places commonly found in vehicle impact testing applications, such as engine compartments, wheel wells and under dashboards. The system is equally useful in harsh range, aerospace and ballistics test environments.

## EXTENSIVE FEATURE SET

The HG-TX Imager offers recording rates from 25 to 2000 frames per second, continuous recording with variable pre/post trigger, and both live and playback video as color RS-170 output. Rear panel buttons provide easy access to commonly used features such as exposure, frame rate and playback controls. A rear panel lockout feature prevents accidental button operation in severe environments.

Digital images may be stored during download in a compact (Bayer) or 24-bit color TIFF format onto a PCMCIA hard drive or solid state memory card for future detailed analysis using a notebook or desktop computer. The HG-TX Imager's one-button record with auto exposure feature reduces the imaging, playback and recording process to a single TTL signal or contact closure.

An adjustable reticle with X/Y coordinate display, in addition to record, playback and download functions, makes analysis and permanent storage of images a simple task. By attaching a video recorder to the rear of the camera, an operator can capture and store images to S-VHS tape.

## NETWORKING AND COMMUNICATIONS

100Mbps Ethernet communication is a standard HG-TX Imager feature, providing remote control communication and fast image transfer for multiple HG-TX Imagers using a personal computer.

PC-based control software for the HG-TX Imager supports both 100BASE-T Ethernet and RS-485 communications for simultaneous management of multiple imagers.

A Dynamic Link Library is available for sophisticated users who intend to develop their own control software. The RS-232 interface allows the HG-TX Imager to be computer controlled through an extensive built-in ASCII command set that permits easy terminal control and development of basic software routines to automate the imaging process.

## COMPATIBILITY WITH OTHER IMAGERS

The HG-TX Imager is fully compatible with the following Roper Scientific high-speed digital imaging systems: HG Imager, CR Imager and RO Imager (RO Imager compatibility is accomplished through the HG Adapter Box). Therefore, the HG-TX can utilize the same cabling and communications infrastructure.

Additionally, a single version of control panel software can be used to control a homogenous network of HG-TX imagers, or a mixed network comprised of HG-TX Imagers, HG Imagers, CR Imagers and RO Imagers.

## Rugged Design

Built to withstand severe environments up to 100 g in any axis.

## Small Camera Head

Unique design provides maximum flexibility in hard-to-reach places.

## High-Resolution Color Recording

State-of-the-art Roper Scientific sensor technology provides resolution at 512 x 384 pixels in 24-bit color.

## Large Square Pixels

Pixels are 16 $\mu$ m x 16 $\mu$ m making the camera ideal for computer image analysis applications.

## Unique Anti-Blooming Control

The camera can look directly into flood lamps and still capture the surrounding scene.

## Built-in Electronic Shutter

The camera's reliable electronic shutter provides sharp images and is essential in eliminating motion blur.

## Variable Exposure

From 23 through 983  $\mu$ sec at 1000 full frames per second, in 5  $\mu$ sec increments.



# Specifications

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<b>Resolution:</b>	512 (H) x 384 (V) photo-sensitive pixels
<b>Image:</b>	24-bit color
<b>Blooming Protection:</b>	> 100x at 1 millisecond exposure and 1000 frames per second (fps)
<b>Exposure Rates:</b>	Electronic shutter variable from 23 through 983 $\mu$ sec at 1000 full fps, in 5 $\mu$ sec increments
<b>Dynamic Range:</b>	48 dB at 25°C ambient temperature
<b>Record Rate:</b>	PAL=2000 partial fps; 1000, 500, 250, 125, 50, 25 full fps and external
<b>Trigger Mode:</b>	Variable from start to maximum available image capacity
<b>Trigger method:</b>	TTL; closed contact; software-selected one-button record mode
<b>Playback Rates:</b>	PAL=1, 2, 3, 6, 12 and 25 fps
<b>Recording Times:</b>	Up to 13.65 seconds storage at 1000 full fps; Up to 18.2 seconds storage at 2000 fps; Proportionally longer record times at slower frame rates
<b>Rear Panel Controls:</b>	Download; live-normal/play forward; live-low light/play reverse; frame rate (up/down); exposure time (up/down); ready; record; delete recording; RS-485 termination on/off switch
<b>X-Y Reticle:</b>	Built in electronic crosshair for data reduction and calibrated measurements
<b>Border Data:</b>	Date/Time; Imager ID number; IP address; exposure rate; frame number; trigger status; temperature; reticle position; system status; session ID number; frame rate; baud rate
<b>LED Indicators:</b>	Standby; Ready; Data Secure; Fault
<b>Hardwired Controls:</b>	<b>Ready:</b> (input) changes imager mode from Standby to Ready to be Triggered. <b>Trigger:</b> (input) defines frame zero in the recording <b>Ready Status:</b> (output) indicates the imager is in the Ready to Record mode, waiting for trigger <b>Fault:</b> (output) indicates trigger fault, PCMCIA fault, overtemperature
<b>Computer Interfaces:</b>	<b>RS-485:</b> used for control and configuration of one or more imagers over serial line <b>RS-232:</b> used for control and configuration of single imager over serial line <b>Dedicated Ethernet:</b> 100 Base-T physical link using UDP/IP protocol used for HG-TX Imager control and configuration and for downloading images from one or more HG-TX Imagers. It is recommended that only HG-TX Imagers, HG Imagers, CR Imagers and RO Imagers be connected to the dedicated Ethernet network.
<b>Image Capacity:</b>	<b>Standard:</b> 1365 full frames at 1000 fps; 3641 frames at 2000 fps <b>Optional:</b> Up to 13653 full frames at 1000 fps, 36409 frames at 2000 fps. <b>Memory module:</b> PCMCIA type III interface for archiving digital images onto removable storage media. <b>IRIG:</b> Optional PC-based IRIG-B time capture for annotation of image tag data with IRIG time.
<b>Software:</b>	Control panel software for remote control of one or more imagers via Ethernet or RS-485: for use with personal computer using Windows NT 4.0™
<b>Processor dimensions:</b>	10.9 cm width; 14.97 cm height; 30.5 cm length; 4.4 kg weight
<b>Processor connectors:</b>	<b>Main Interface:</b> (Mil-C-38999)-conduit for all supported communication lines and power (except RS-232). <b>RS-232:</b> DB9 provides serial communications for control via ASCII commands
<b>Video out:</b>	BNC provides NTSC or PAL, RS-170 video output
<b>Mounting:</b>	Five ¼" – 20 UNC-thread bolt mounts on bottom of processor Five ¼" – 20 UNC-thread bolt mounts on face of camera
<b>Lens mount:</b>	C-mount or Box Mount
<b>Camera dimensions:</b>	9.7 cm width; 9.7 cm height; 5.6 cm length; 1.5 kg weight (including cable)
<b>Cable length:</b>	5 meter
<b>Camera head connector:</b>	Single Mil-C- 38999 connector
<b>Distribution box connectors:</b>	<b>RS-485-</b> DB9 supports multiple imager control on a single communication line <b>RS-232-</b> DB9 provides serial communications for control via built-in ASCII commands <b>BNC Connection:</b> Ready, Exposure out, Sync In, Fault Status, NTSC or PAL Video, Trigger, and Ready Status <b>RJ45:</b> LAN- Supports direct connection from an Imager to an Ethernet HUB PC- Supports direct connection from an Imager to a PC NIC
<b>Power:</b>	+22 to 42 VDC at 50W
<b>Operating Case Temp:</b>	-10°C to + 50°C
<b>Storage Case Temp:</b>	-25°C to +65°C
<b>Shock:</b>	100 g @ 10 milliseconds any axis; 1000 cycles 50 g @ 100 milliseconds any axis; 1000 cycles
<b>Emission/Safety Standards:</b>	Meets all applicable international standards



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Note: Specifications are typical and subject to change  
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