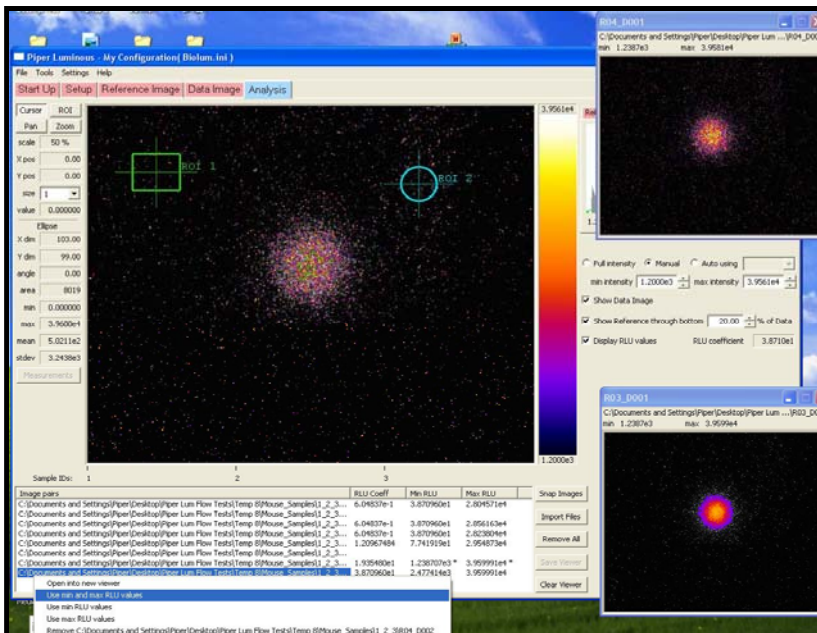# LATEST DEVELOPMENTS IN SOFTWARE SUPPORT

NEW SOFTWARE PLATFORMS, SYSTEMS AND UPGRADES FOR STANFORD PHOTONICS LOW LIGHT IMAGING TECHNOLOGIES

For the past several years, SPI has been developing advanced image capture, control and streaming software designed with the intent of fully leveraging the unmatched sensitivity and speed of the **Mega-10**^{TM}, **Turbo**^{TM}, and **–Z**^{TM} families of low light imaging products. This year, we have reached a number of milestones in our efforts to provide software that allows researchers to go well beyond the performance boundaries that burden much of the legacy products in the market; many are hindered by layers of add-on code which have been patched onto last century's core construction and operating systems.

SPI has recently released new application packages: **Piper Luminous**^{TM} (optimized for luciferase, BRET and other luminescence studies) and **Piper LT**^{TM} (laptop-based). These application packages add significantly to our ongoing improvements to **Piper Control**^{TM} which now provides higher level device management (microscopes, scanning stages, AOTFs etc.) and flexible, configurable time lapse acquisition for our users. To receive test and release versions of these software solutions, contact our Sales Department, and we will provide a link to our FTP site for downloads.

A few of the highlighted features of **Piper-C**, -**Lum** and -**LT**:

- **"State Machine" architecture: build multiple Configuration Tabs that contain all viewing, recording, device and time lapse control, including sequencing though and within Tabs for full automation of experiments. Programmable I/O event triggers frame synchronous to 1000 Hz**.

- **Full frame rate visual and image processing tools include**:
    - Real time (incoming frame) cosmic ray and ion feedback (spot noise) filters
    - Real time thresholding and windowing of incoming data
    - On-chip integration control, RAM integration (summation to 16 bits) and averaging
    - Real time ROI measurements and math; Pan and zoom with high mag interpolation
    - Real time image fusion/blending between image Tabs
    - Single Photon Calibration/Photon Counting
    - Automatic image intensity scaling (full field or ROI based)
    - Automatic exposure mode for single photon/low light accumulation
    - Saturation detection tools
    - Independent Ring Buffer/RAID recording/Viewing pipelines: record and view independently
    - All recording uncompressed 16 bit TIF files (universal export) at full speed/no lost frames; 1ms to 24/7 recording
    - Flexible record and playback of image sequences within viewer window
    - Piper Luminous: Analysis Tab for ROI measurements; image browser for image recall and comparisons with optional scalability to single photon calibrations

⇐ Piper Luminous^{TM} Analysis Tab with pop-up Viewer windows for comparing multiple images in pixel or RLU intensity scale with auto or manual scaling – ROIs in main Viewer with full measurements & math and options to attach ROIs to autoscaling tools.

⇓ Sample overlay image (blended reference & data images) of luminescence strip.
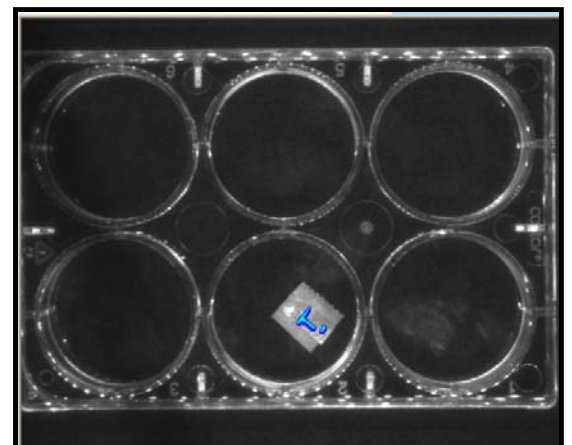
In order to make our technology more accessible to other users via third party software providers, we can now offer an **SDK** that allows straightforward integration of all our camera products, ranging from the high resolution, single photon capable **Mega-10Z**™ to the 1000 fps **Turbo**™ and **Turbo –Z**™.*****

### 3I (Intelligent Imaging Inc.) has recently added SPI ICCD products to its popular Slidebook:

"Intelligent Imaging Innovations, Inc. (3i) is pleased to announce that its market-leading SlideBook software is now compatible with Stanford Photonics cameras. The Stanford Photonics driver is available as an add-on module for SlideBook. SlideBook is specifically designed for microscopy applications including ratiometric imaging, deconvolution, confocal imaging, FRET, 3D and 4D imaging and stereology. Please contact 3i or an authorized SlideBook reseller for pricing and additional information." Posted 11/1/07

Goto http://www.intelligent-imaging.com and http://www.intelligent-imaging.com/slidebook/brochure.pdf

---

And, not to forget our friends in the Vale lab at UCSF: many thanks for all the encouragement and support in getting **SPI ICCDs and real time processing and viewer modules integrated into MicroManager**. Goto http://micro-manager.org.

µ**Manager**
open, powerful and free

µManager is Open Source Microscopy software for automated imaging and device control on multiple platforms (Windows, Mac and Linux). Tightly integrated with ImageJ, µManager provides a comprehensive imaging solution – comparable to commercially available ones. µManager software, including device drivers, is free.
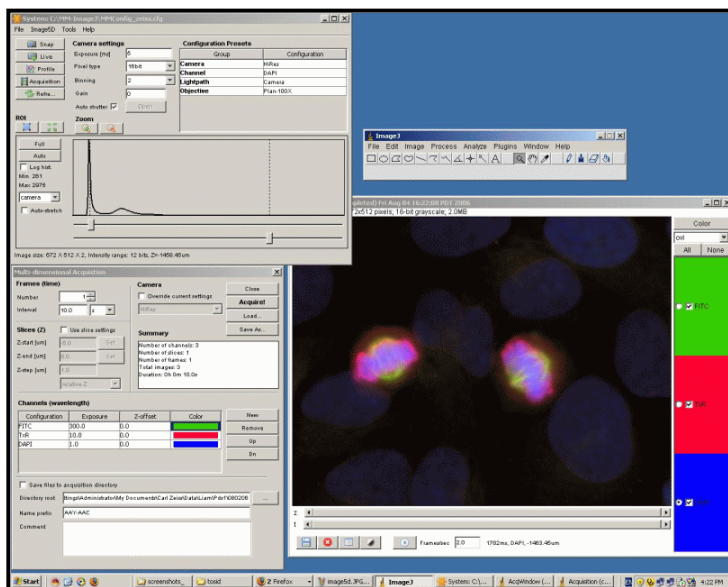
Supported hardware

Automated microscopes:
- Zeiss Axiovert 200M and AxioPlan 2
- Nikon TE2000

Cameras:
- Hamamatsu: many DCAM compatible devices
- Roper/Photometrics: CoolSnap, Cascade, etc.
- Andor: iXon
- Qimaging (most)
- PCO Cooke Sensicam
- **Stanford Photonics**
- Scion, DVC

Serial devices:
- Prior: shutters, filter-wheels and stages
- Sutter: Lambda-10 shutters and filter wheels and DG4 filter changer
- ASI: shutters, filter wheels and stages
- Ludl: Mac 2000/5000 controller (shutters, filter wheels and stages)
- Maerzhauser: Tango controller
- Yokogawa: CSU22
- Vincent: shutter controllers

---

*Media Cybernetics has also provided high level software support for all Stanford Photonics legacy ICCD products for well over five years. Most of the published data and images that have been presented in our booths at the scientific conferences have been derived from Media Cybernetics installations. Goto www.mediacy.com.
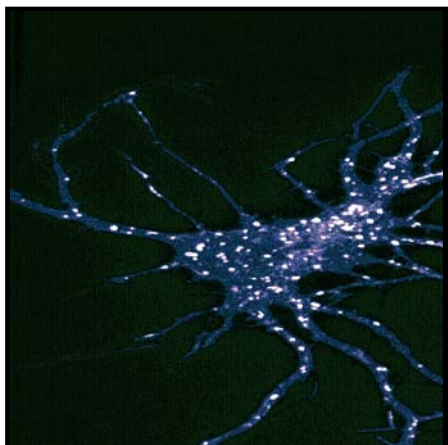
⇐ Axonal traffic in cultured nerve cells, GFP, Stanford Photonics' XR/MEGA-10EX™ Camera. Courtesy of Solamere Technology Group.

Confocal microscope image captured with confocal system and Stanford Photonics XR/MEGA-10EX™ **camera using Media Cybernetics software – systems installed by our partner, Solamere Technology Group.**

Solamere Technology Group
1427 Perry Avenue
Salt Lake City, UT 84103
801-322-2645
info@solameretech.com