



## MCSYS: Myocyte Contractility Recording System

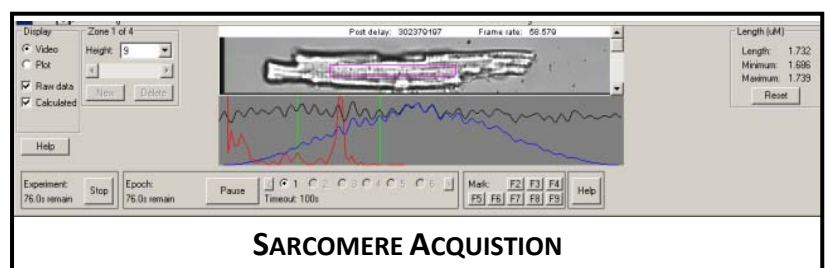
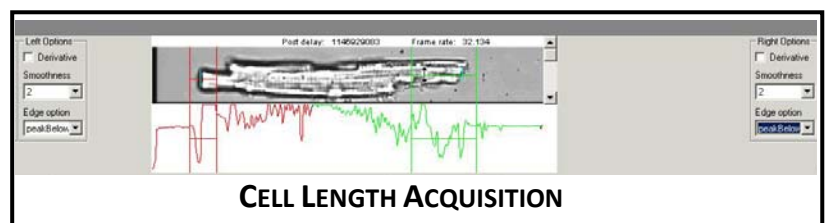
IonOptix has developed its **Myocyte Contractility Recording System** over many years of collaboration with top cardiovascular researchers. We take pride in a line of precision products that are application driven and built to meet the needs of a demanding research environment. Since its inception in 1990 IonOptix has installed hundreds of high performance, turn-key systems in research laboratories worldwide.

Interest in the physiology and pathology of the heart has led to a substantial increase in the number of laboratories studying the myocardium at the cellular level using isolated cardiac muscle cells or myocytes. Although excitation-contraction (EC) coupling, the process by which electrical stimuli induce a mechanical response in myocytes, has been an area of intense investigation for over half a century, elucidation of the fundamental molecular and biophysical mechanisms remains at the forefront of cardiovascular research. Impairment to the regulatory machinery governing EC coupling correlates strongly with the onset and progression of many myopathies. Cellular dimensioning and intracellular calcium recordings offer an important measure of EC coupling in isolated myocytes and myofibers while also providing key insight into the processes that affect cardiovascular health.

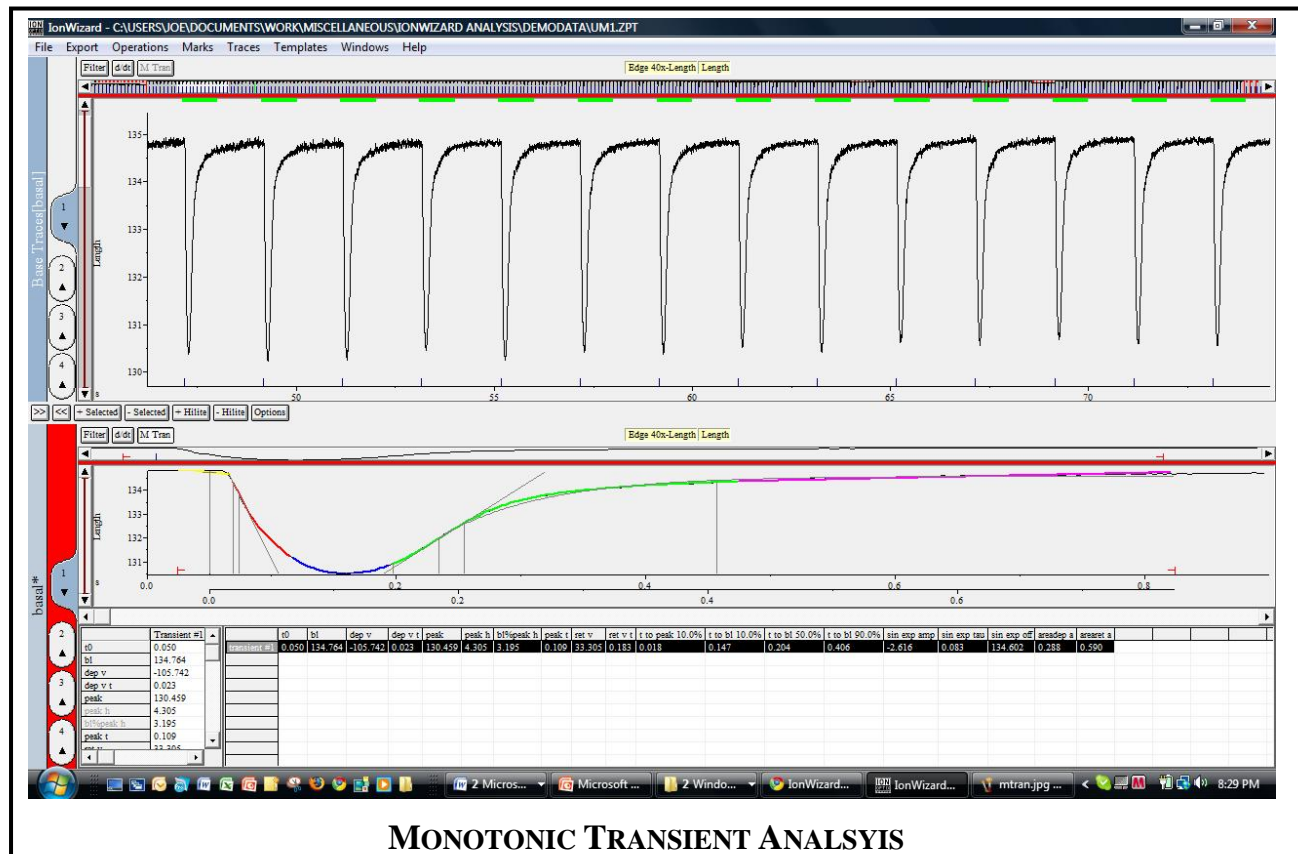
The list of components comprising a complete, integrated myocyte contractility workstation is extensive. IonOptix has built its recording systems from components designed to work seamlessly with one another, providing completely synchronous and accurate data acquisition. Our systems begin with the [IonWizard](#) core software. IonWizard's central functions can be expanded through the [SoftEdge](#) and [SarLen](#) acquisition modules to record cell and sarcomere length. IonWizard communicates directly with two root devices, the video acquisition camera and our data system interface. Our newest camera, the [MyoCam-S](#), offers 500Hz acquisition for fast recording of cellular dimensions. It also offers USB connectivity for greater flexibility. The digital system interface ([DSI](#)) provides a communication hub for all peripheral hardware devices through a suite of analog and digital connections. The DSI's digital input enables synchronization with the gate out TTL from our [MyoPacer](#) or [MyoPacer-EP](#) digital field stimulators for simple event averaging during transient analysis.



The SoftEdge acquisition module collects cell length at rates up to 250Hz. The simple user interface enables the precise placement of thresholds for marking cell edges. The output of calibrated length allows real-time cell length collection. Similarly, our Sarcomere acquisition module collects real-time sarcomere length at 250Hz. Line intensity information within a simple region of interest is averaged to generate a well resolved striation pattern. A fast Fourier transform calculation immediately outputs sarcomere spacing. Along with our fast acquisition MyoCam-S digital acquisition camera, our systems offer precise, real-time calcium and contractility measurements.



IonWizard's analysis functions are tailored to monotonic transients making them ideal for contractility studies. IonWizard functions include ensemble averaging, mathematical filtering and many important transient parameters, including baseline, peak height, shortening and re-lengthening velocities, as well as single exponential fit and tau.



## MONOTONIC TRANSIENT ANALYSIS

For myocyte studies, we include our acute field stimulator, the [MyoPacer](#), to electrically pace cellular contractions. The MyoPacer offers full control of stimulation pulse duration, frequency, and voltage. When coupled to an IonOptix system interface, stimulation marks are recorded and interpreted by IonWizard for event averaging and [analysis](#). We also offer the [FHD Microscope Chamber System](#), a stimulation and superfusion cell chamber system that uses 25mm coverglass. The FHD chamber is equipped with a thermistor to monitor chamber temperature when coupled to the [TempC2](#), a temperature controller and in-line heater package.

No system would be complete without a microscope. We can equip your microscope with all the necessary couplings to attach your IonOptix hardware or we can supply the microscope as part of your system. We offer a high quality [Motic inverted microscope](#) configured to our specifications. Our microscope package offers upscale features such as uniform Koehler illumination and high contrast, infinity corrected optics at a very reasonable price. Our microscope package guarantees you'll have everything you need for precise calcium and contractility measurements.

# ION OPTIX

Equipped with the latest computers, we assemble and test all components at our facility before shipping. Every system includes a visit to your lab for installation and training. When we install our complete systems we use your preparations to help get you started as quickly as possible. And when you need assistance we offer unlimited phone and email support for the lifetime of your system.



**COMPLETE MYOCYTE CONTRACTILITY RECORDING SYSTEM**



*Standard Components:*

**Software**

[IonWizard-Core and Analysis](#)

[SoftEdge™ Myocyte Cell Length Acquisition Module](#)

[SarLen Sarcomere Length Acquisition Module](#)

**Cameras**

[MyoCam-S Digital CCD Video Camera](#)

**Interfaces**

[Data System Interface](#)

**Stimulators**

[MyoPacer Cell Stimulator](#)

**Cell Chambers and Temperature Control**

[FHD Microscope Chamber System](#)

[Cell MicroControls mTCII Temperature Controller & Heater](#)

**Microscope**

[IonOptix/ Motic Microscope Package](#)

*Optional Components:*

**Stimulators**

[MyoPacer EP Cell Stimulator](#) (replaces MyoPacer for additional functionality)

**Cell Chambers**

[C-Stim CMC Microscope Chamber System](#) (replaces FHD Microscope Chamber System)

Please visit us at [www.ionoptix.com](http://www.ionoptix.com) for more information.

Email your IonOptix representative at [info@ionoptix.com](mailto:info@ionoptix.com) for a system tailored specifically to your application.