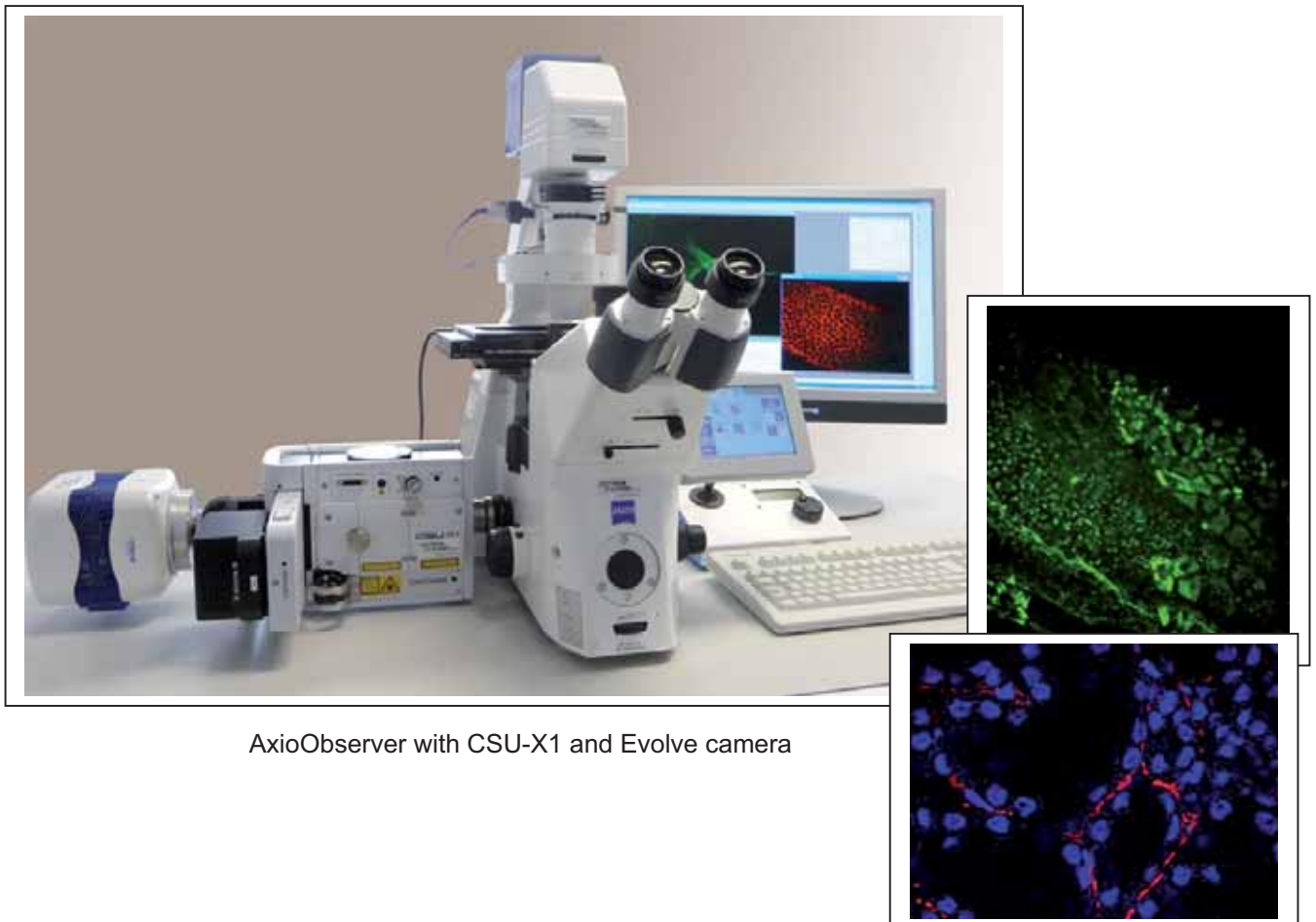


Realtime Confocal Imaging System

CSU-X1 Real-Time Confocal System

based on Dual-Disc Micro-lens Technology

The CSU-X1 is the advanced model of our CSU-series, which are widely recognized as the most powerful tools for live cell imaging. A Nipkow spinning disk containing about 20,000 pinholes and a second spinning disk containing the same number of microlens to focus excitation laser light into each corresponding pinhole are mechanically fixed with a motor, and very rapidly raster scan the field of view with about 1,000 laser beams when rotated. The pinhole and microlens pattern are arranged in our proprietary design to optimize raster scan. Multi-beam scanning with the CSU-X1 not only increases scanning speed, but also results in significantly lower photobleaching and phototoxicity, because multi-point excitation needs only a low level of laser power at the specimen to fully excite fluorescence.



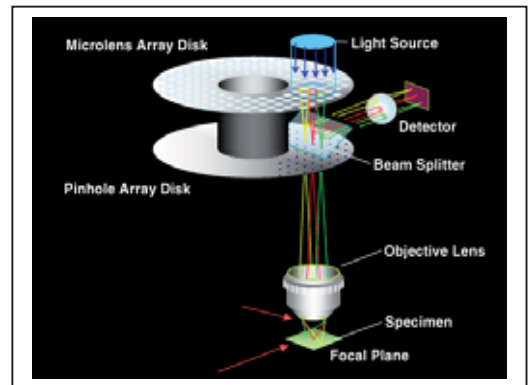
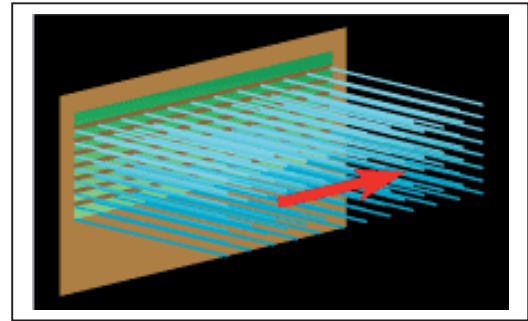
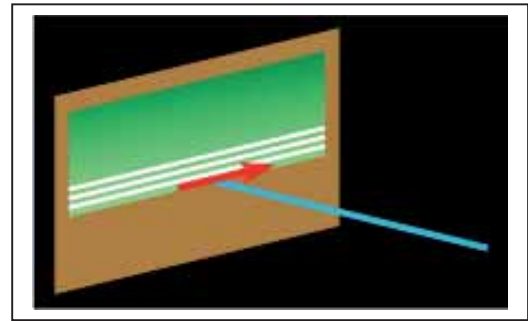
AxioObserver with CSU-X1 and Evolve camera

Principles of the Microlens-enhanced Nipkow Disk Scanning Technology

The most common conventional confocal microscopes use a single laser beam to scan a specimen, while the CSU scans the field of view with approximately 1,000 laser beams, by using microlens-enhanced Nipkow-disk scanning: In short words, CSU can scan 1,000 times faster.

The microlens array disk and the Nipkow disk are physically fixed to each other and are rotated to scan the entire field of view at high speeds, thus, making it possible to view confocal fluorescent images in real-time through the eyepiece of the CSU head.

As compared to conventional single point scanning, multi beam scanning by the CSU requires a significantly low level of light intensity per unit area, which results in significantly reduced photo bleaching and photo toxicity in live cells.



Configuration of CSU-X1

Two confocal models are available:

- manual M1
- motorized A1

Additional options for each series are bright field, second camera port, high speed option, filter wheel.



Specification comparison of the CSU confocal series:



Model	CSU-X1		CSU22	CSU10	
	High-end	Basic			
Imaging Speed (Max. fps)	2,000	360	1,000	360	
Scanner Motor Rotation Speed (rpm)	1,500-10,000 (Variable)	1,800 (Fixed) ^{*1}	1,500-5,000 (Variable)	1,800 (Fixed)	
Recommended camera exposure time	0.5msec <	33msec <	1msec <	33msec <	
Rotation position trigger signal	External signal output possible	None ^{*1}	External signal output possible	None	
Filters	EX	Option	Option	Supplied up to 3 filters	Supplied 1 filter
	DM	Option (up to 3 filters)	Option (1 filter)	Supplied up to 3 filters	Supplied 1 filter
	EM	Option (up to 6 filters with filter wheel)	Option (1 filter)	Supplied up to 3 filters	Supplied 1 filter
Addition or exchange of filters	At user site : DM block and filters (EX, EM.) At Yokogawa factory : DM		At Yokogawa factory	At user site	

