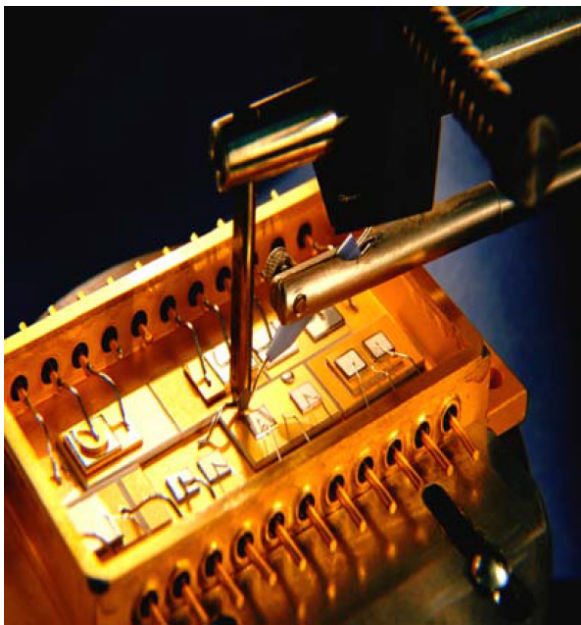


## Technical Bulletin

PCB manufacturing and board loading equipment is often pushed to or past designed operational speeds in an effort to meet production goals.

### *Problem*

Wire bonding, PCB manufacturing and board loading engineers are often faced with high-speed machines that are malfunctioning or not running at required speeds. Such problems can create lengthy downtime, damage expensive parts and materials, contribute to excessive waste, and not achieve productivity targets, all at great expense to their company. In an effort to see what causes the malfunctions, most engineers typically slow the high-speed line down to observe manufacturing processes that are too fast for the eye to see. This changes the mechanical phenomenon (bounce, vibration, alignment, indexing, dwell time, material variability induced by velocity changes, etc.) and the problem goes away. When the line is returned to the required high-speed run rate the problems return. Engineers and operators can spend a great deal of time and money trying to solve the unseen problems.



### *Solution*

High-speed digital cameras provide an easy method for observing high speed mechanical processes under real test and operational situations. The high-speed pictures can be instantly played back in slow motion or on a frame-by-frame basis to allow the engineer to see, measure, and understand the fast mechanical motions that are causing the prototype testing failures and manufacturing problems. Available record rate exceeding 1,000 frames per second – that's greater 33 times faster than standard video.

### *Benefit*

With the camera in the record mode, a trigger signal is received by the camera and the high-speed recording process is stopped, saving the last several seconds in digital memory.

Images of the random event are ready for playback and analysis, providing engineers with vital instant feedback on what went wrong. Typically, high-speed cameras generate very rapid returns on investments. They help engineers and technicians reduce production down time and waste, speed up changeovers and improve yields and product quality. Companies using high-speed imaging benefit from lower manufacturing costs and improved product quality, which leads to increased profits.