

Image acquisition and processing with MicroTCA.4

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Development of high-performance digital cameras in recent years has made them promising tools for observing transient

and fast events in large-scale scientific experiments. The modern digital cameras allows grabbing images with a megapixel resolution and thousands frames per second. A digital camera working with a high resolution and a high frame rate produces a large stream of data reaching dozens of gigabytes per second. A precise nanosecond synchronization is also required to record a dynamic processes in physics applications.

A flexible and powerful hardware platform is required for image acquisition and image processing in real time. The MicroTCA.4 standard, originally developed for the High Energy Physics community, provides all required interfaces to design a powerful and scalable image acquisition system. The MicroTCA.4 chassis accommodates a few frame grabber modules, synchronization card and provides high-throughput interfaces and trigger signals on its backplane.

The presentation shows the requirements and architecture of image acquisition systems designed with MicroTCA.4 standard. The image acquisition system is composed of frame grabber module with Camera Link interface, precision timing module and CPU. The developed software framework currently supports cameras from three vendors: Microtron, PCO and Andor.

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