An electronic portal imaging device (EPID) of the scanning liquid ionization chamber (SLIC) type is a new therapy imaging device which may also be employed for dosimetric measurements. Although useful in a wide variety of applications, the SLIC EPID is ideally suited to planar dose measurements in phantom. In this capacity, it surpasses the ionization chamber in terms of spatial resolution, and film in terms of dose precision and dynamic range. Furthermore, the SLIC EPID's response is independent of photon energy, its pixel calibration curve is stable, and the digital images it produces are easily processed and analyzed.

In the step-and-shoot approach to intensity-modulated beam delivery, the beam is temporarily shut off as the leaves move from one pre-determined MLC configuration to the next. Thus the dose for a particular field is delivered in a series of MLC-defined subfields, or segments, each with its own associated MU setting.

To use the SLIC EPID for the verification of an intensity-modulated field delivered in the step-and-shoot mode, an EPID image is acquired for each of the MLC-defined subfields of the leaf-sequence. After being calibrated, each image is weighted by its associated MU setting. Summation of the weighted images yields a dose rate distribution at the measurement depth, which may be varied by suspending sheets of phantom material above the imager surface. Results are in excellent agreement with beam profiler measurements and the predictions of our commercial treatment planning system.