The wide-radiation field calibration technique has been theoretically shown to be very useful for the calibration of an array of detectors. This theory is experimentally validated by examining the sensitivity change of the diode in an array with field size, off-axis distance, source–diode distance (SDD), and depth. Absolute sensitivity at each data point is defined as the ratio of collected charge by the diode per unit dose measured with a 0.6 cc Farmer-type chamber at the same point. The data collected on a Varian 2100CD 8MV photon beam showed that individual diodes in Sun Nuclear's Profiler exhibit 0.5% decrease in sensitivity for field sizes ranging from 6x6 cm^2 to 25x25 cm^2; increase of 1-2% at 15 cm off-axis distance; a decrease of 2% with change in SDD from 80 cm – 120 cm, and decrease of 2% for depths that range from 5 cm to 20 cm. The changes in sensitivity are due to changes in the irradiation conditions, i.e., scatter, angle, and energy. The wide field calibration measures the detector sensitivity in the irradiation conditions where it will be used, and compensates for these changes. Off-axis corrections were then applied to profile sections of a 30-cm beam, measured in locations off axis from the wide field calibration, and concatenated into a profile which agreed with ion chamber profile. All other sensitivity changes have no influence on relative measurements. This study demonstrates that the wide field calibration technique is simple and accurate for any type of linear detector array.