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# APPLICATION NOTE

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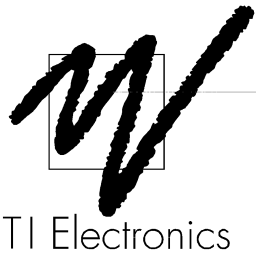


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## Comparing PMX and DIGI-X

When comparing PMX and DIGI-X, certain differences may occur in the kVp measurements.This document points out the differences between the two units that can be expected.

RTI Electronics does not take any responsibility for the result when this application note is used.

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## The comparison

When comparing the PMX and the DIGI-X one must be aware of several factors.

- The PMX is equipped with thinner filters covering the detectors for improved sensitivity. The drawback is that the tube filtration dependence will increase compared with the DIGI-X. The first thing to do is to make sure that the filtration dependence is compensated for. See the manual for each unit and use the correction graphs.

- Another difference is the possibility to check that the detector is properly positioned within the field when using the DIGI-X. The PMX has no such ability and the user must trust the light field which of course can be way out of hand. It is therefore important to know that the light field and the radiation field coincides.

- The detector of the DIGI-X is extremely well-collimated which means that very nearly only the primary beam will be registered. This will make the DIGI-X detector less susceptible to scattered radiation. However, the drawback is that any primary beam that is not striking the detectors in a perpendicular angle will be cut off. This can be the case in mammography. (See appl. note on this). The PMX is less sensitive to this due to its shallow collimation. No cut-off phenomena will occur.

- The PMX needs about 30 ms to adjust its internal gain, make filterchoices etc. The DIGI-X, on the other hand, will start the measurements from the very beginning of the exposure. In order to make the two units "looking" at identical parts of the exposure, the "delay" must be set accordingly on the DIGI-X.

- The DIGI-X and the PMX has different algortihms when measuring kVp. This can show up when dealing with messy signals having a slowly rising kVp-curve. The PMX looks for the maximum peak in the exposure in the signal domain, (i.e the signal value is still in Volts.) When the peak is found, the PMX will deduct 5 % of the value before an 85 % signal discriminating level is applied on the remains. All peak signals reaching above this level (85 % of the modified maximum) will be included for the final calculatiion of the average. This averaged value will then be converted into kVp.

  The DIGI-X on the other hand will track the exposure and when detecting a local maxima or peak it will store that value for calculations of the average peak value later. (A "local" peak means a small change in the gradient of the signal). When the averaging process of all peak values is complete, the corresponding kVp-value is fetched from a table stored in the memory of the DIGI-X.

  Under normal circumstances these algorithm differences will not show up. However, one should always look at the waveform to make sure that the generator is well-adjusted and without any strange-looking, slowly rising (or decreasing) kVp-curves.

• End •