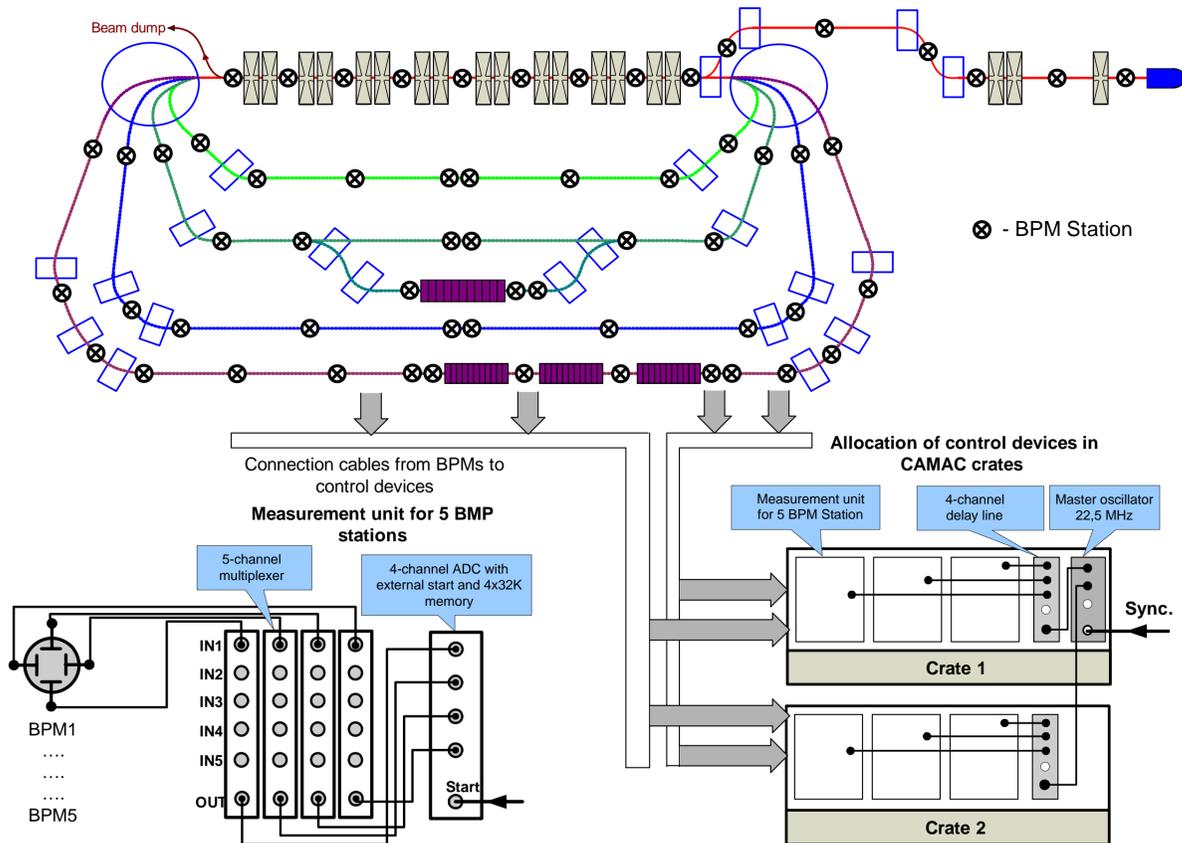


SOFTWARE AND CAPABILITIES OF THE BEAM POSITION MEASUREMENT SYSTEM FOR NOVOSIBIRSK FREE ELECTRON LASER

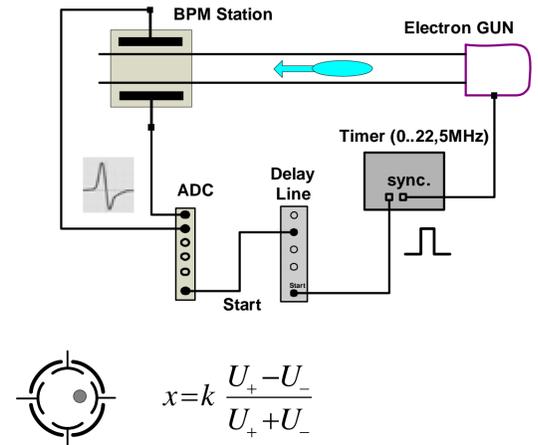
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SYSTEM LAYOUT



PRINCIPLE OF THE MEASUREMENT

The beam position is determined via simultaneous measurement of the amplitudes of signals induced on the buttons by the beam field. The moment of measurement is determined by an external "Start" signal, which is control the electron gun and following with the beam propagation frequency. This signal is passed through the adjustable delay line, allowing to tune precisely the moment of measurement. This allow to separately measure different beams (accelerated and decelerated), passing the same BPM station

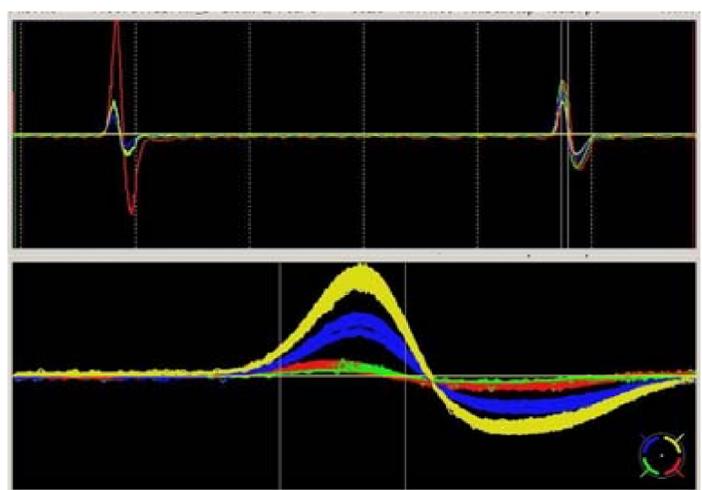
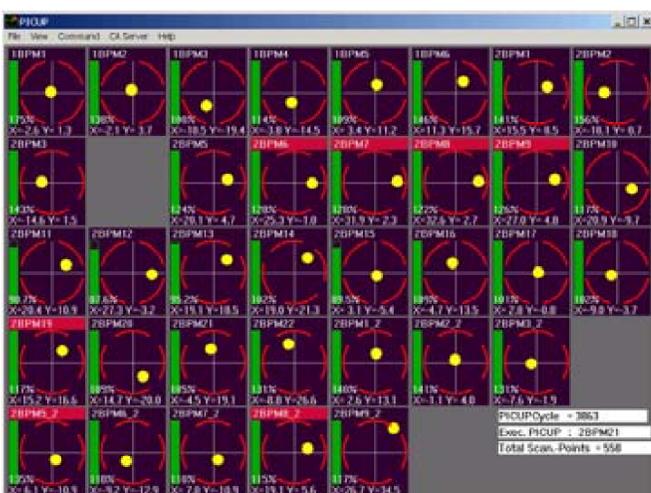


$$x = k \frac{U_+ - U_-}{U_+ + U_-}$$

The algorithm of measurement of four values from all BPM plates with constant delay time value is requires ~15 CAMAC NAF-instructions and ~ 1 millisecond.

SOFTWARE CAPABILITIES

I. Cyclic serial poll of all the BPM stations for the purpose of determination of the transverse coordinates of the beam. Every BPM station is scanned in narrow range of time delay near the maximum of pulse, generated by beam field. The scanning range on average is 10-15 steps of delay line, which is takes up 10-15 milliseconds of time.



III. Poll of the waveform of the selected point of beam pulse on selected BPM station with constant time delay value. The measurements are executed with the frequency of beam propagation and stored in ADC memory. The result is a waveform of the selected point of beam generated pulse, which shows any instabilities of beam pulse, their form and frequency.

