EESTI METROLOOGIA KESKASUTUS

METROSERT

Setup for Electrical Power Measurements at Metrosert, Estonia

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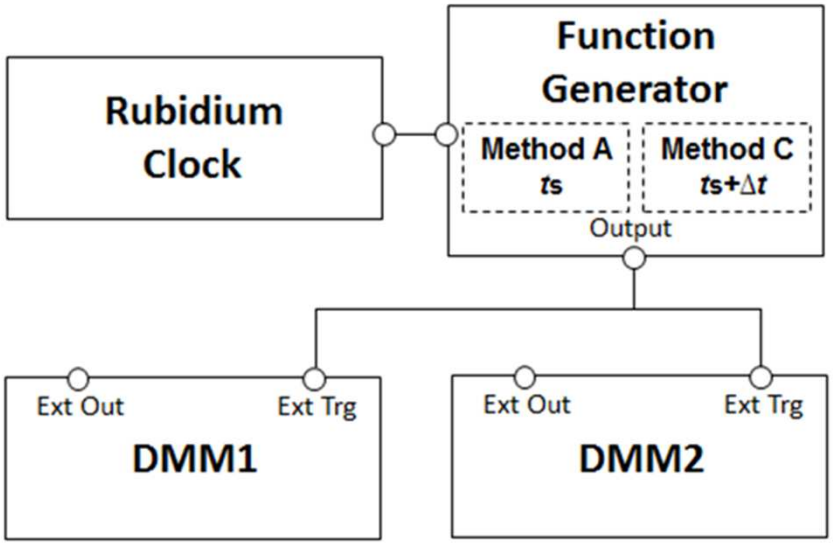
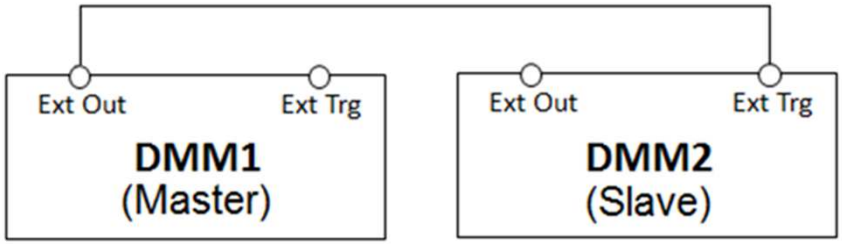
Measurement Setup

- Multiharmonic least-squares fitting algorithm



Method A and C



Method B

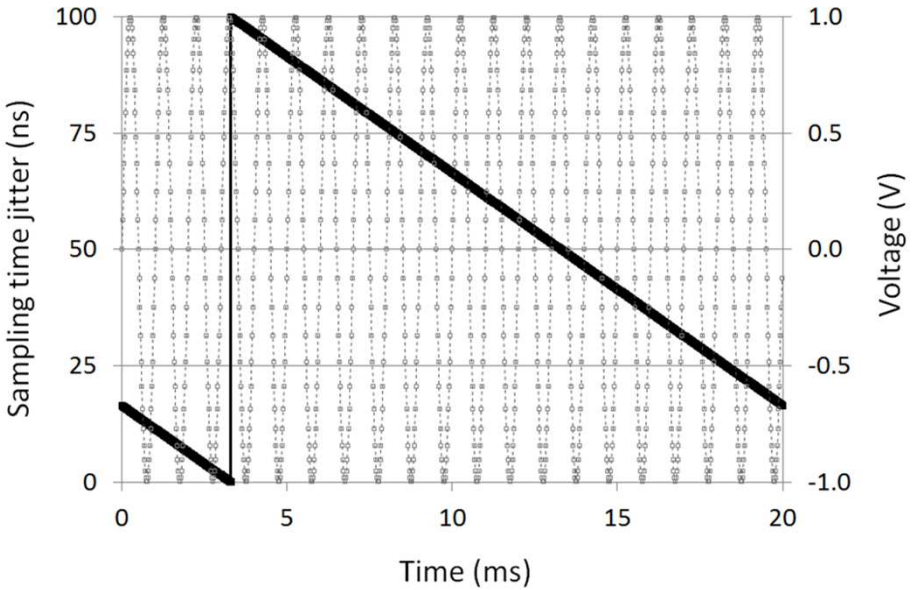
Method C

External sampling interval t_{sel} is applied to both DMMs:

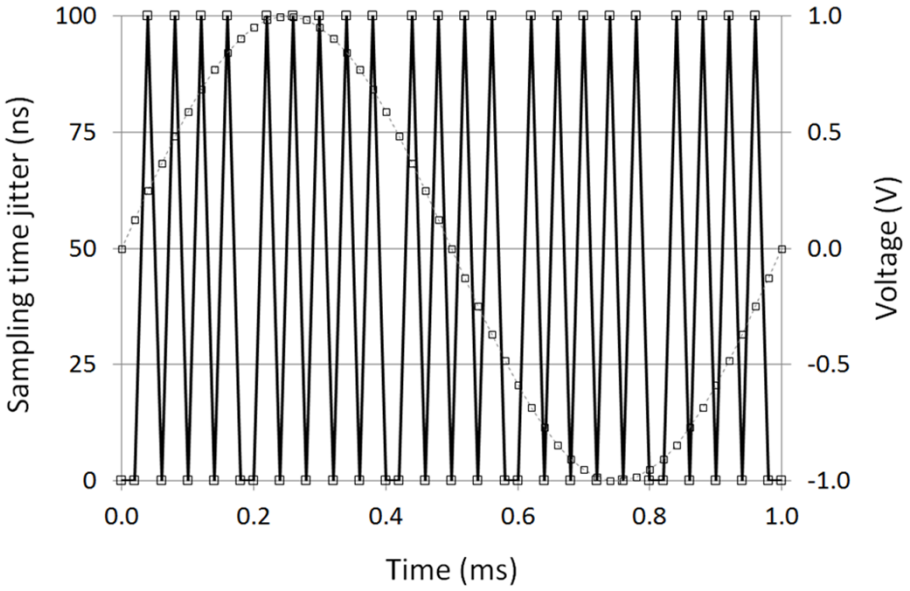
$$\boldsymbol{t_{sel} = t_s + \Delta t}, \text{ where}$$

t_s - internal sampling interval in μs,

Δt - time shift less than one half of the internal clock resolution. Δt = 45 ns.



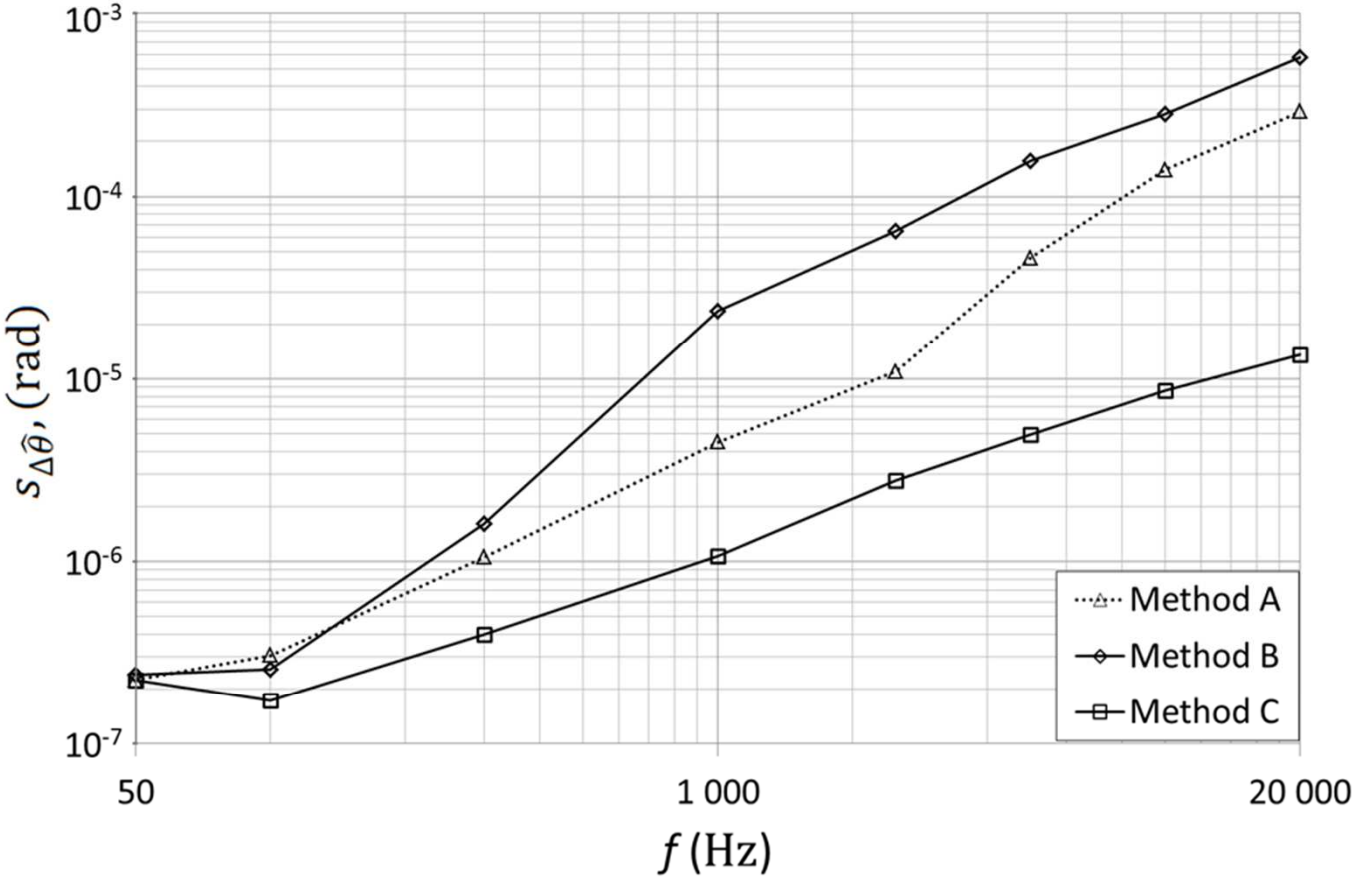
Sampling time jitter (solid line) on the left vertical axis.



Repeating jitter pattern with Δt = 45 ns on the left vertical axis.

Standard Deviation of Phase difference Estimate

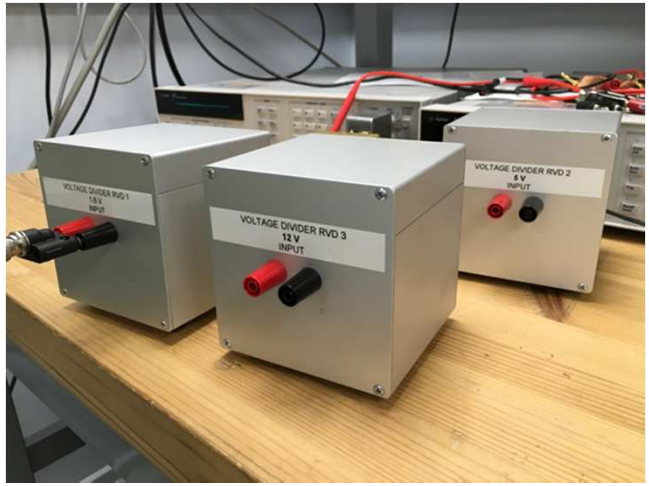
- 50 measurements of 1000 samples, f_{in} = 50 Hz to 20 kHz

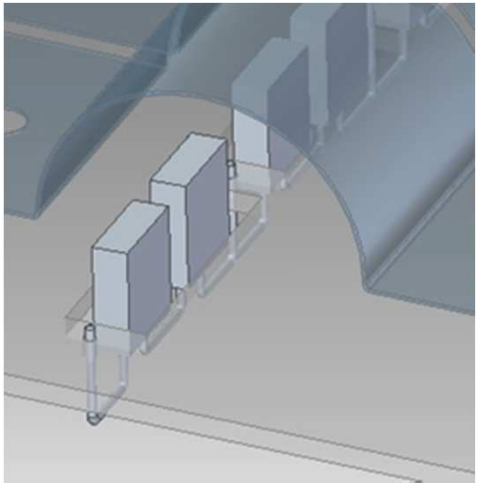


Standard deviation $s_{\Delta\hat{\theta}}$ of the phase difference estimate $\Delta\hat{\theta}$ for three synchronization modes as a function of frequency f.

Voltage and Current Transducers

- Resistive voltage dividers up to 240 V; <100 urad at 20 kHz

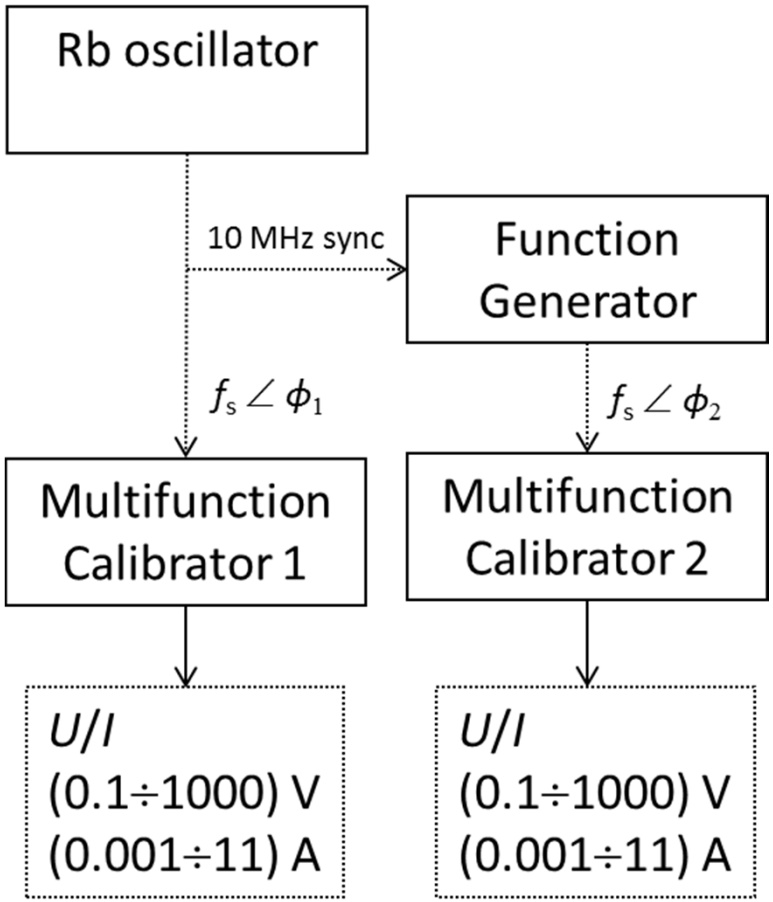




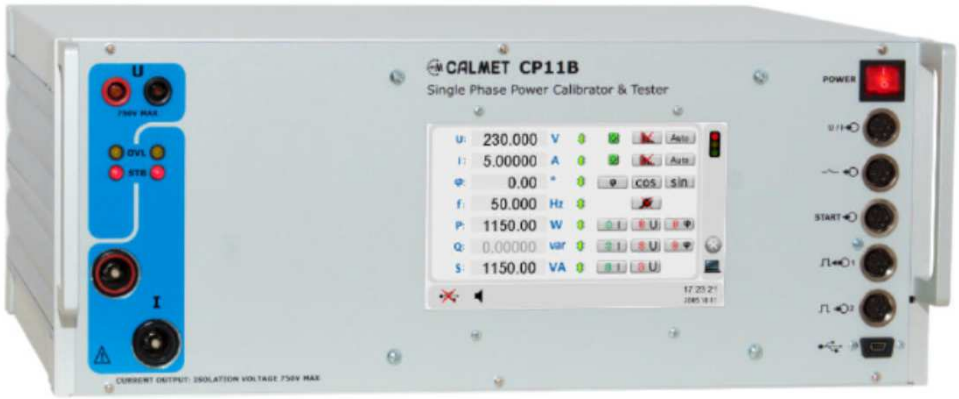
- Current shunts Fluke A40A up to 20 A <40 urad at 5 kHz for 20 A shunt

Phantom Power Sources

(1) Modular setup



(2) CALMET CP11B (class 0.02)



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