

Data Acquisition System for Synchronous Generator Transient Performance

PREW Generation



Agenda

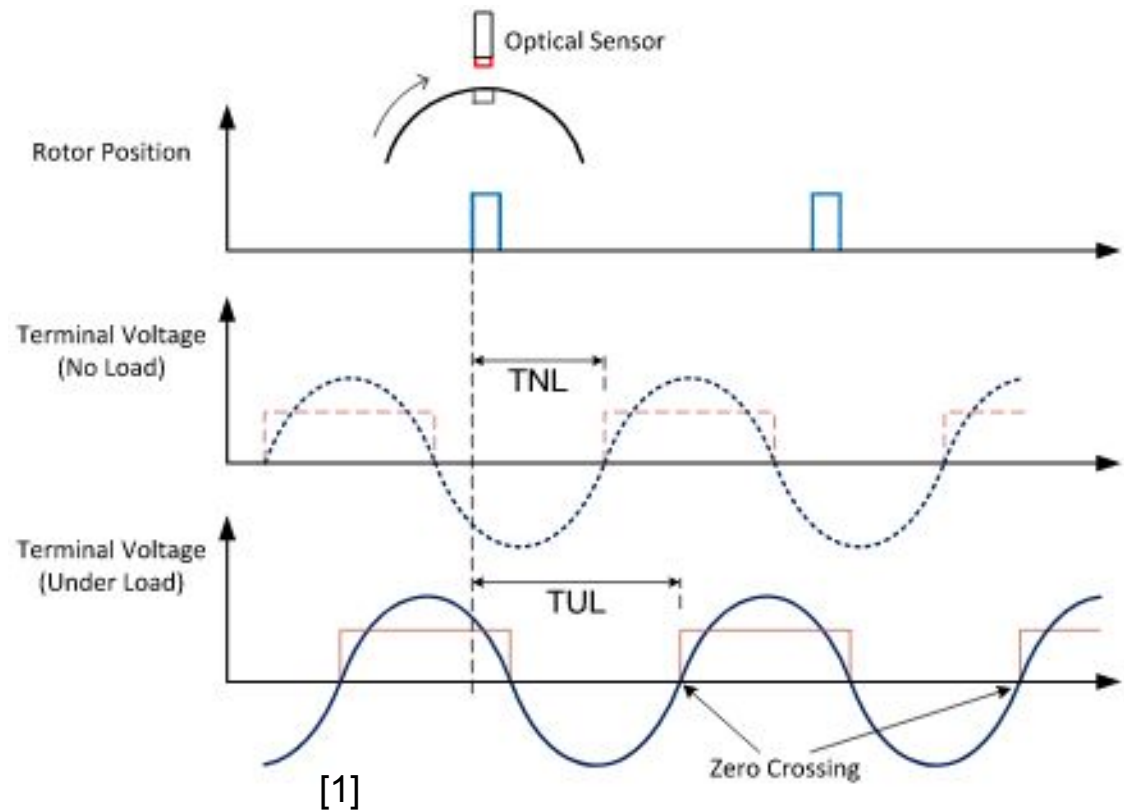
- Project Status.
 - Measuring the Load Angle.
 - LEM Box.
 - Reverse engineering the current design.
- Next Step.
 - LEM Box.
 - Design a LEM Box for DC measurement.
 - Printing the circuit.
 - Testing PXI 6251 data acquisition



Measuring the Load Angle

TNL: Time in No-Load condition.

TUL: Time in under-Load condition.



Measuring the Load Angle

1. We measure the angle under no-load once and stored it.

$$\theta_{UL} = \frac{T_{UL}}{T} \times 360$$

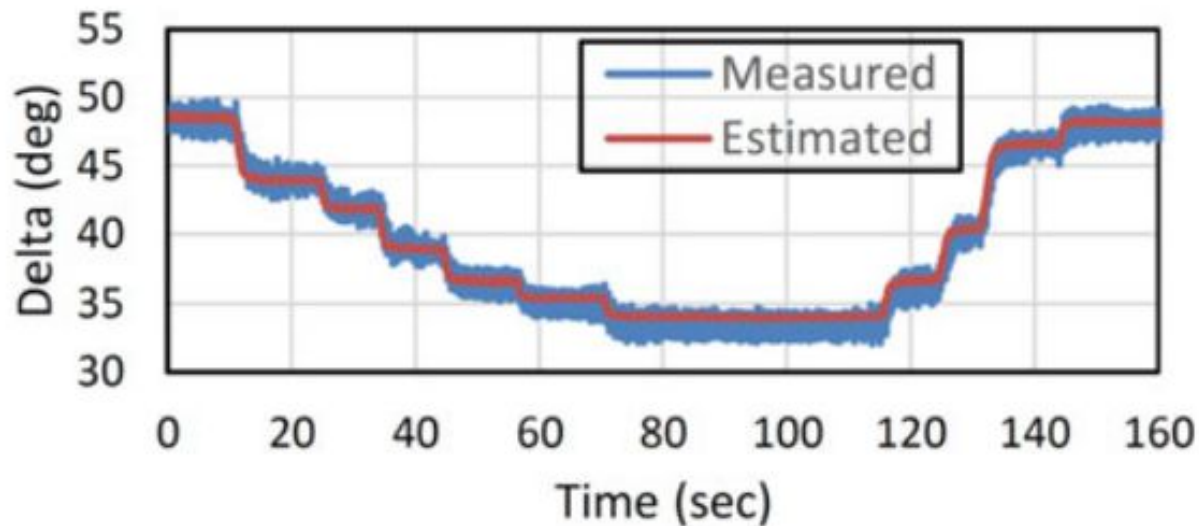
2. When, we add a load.

$$\delta = \left(\frac{T_{UL}}{T} \times 360 \right) - \theta_{NL}.$$



Implementation

IEEE TRANSACTIONS ON INDUSTRIAL ELECTRONIC



[1]

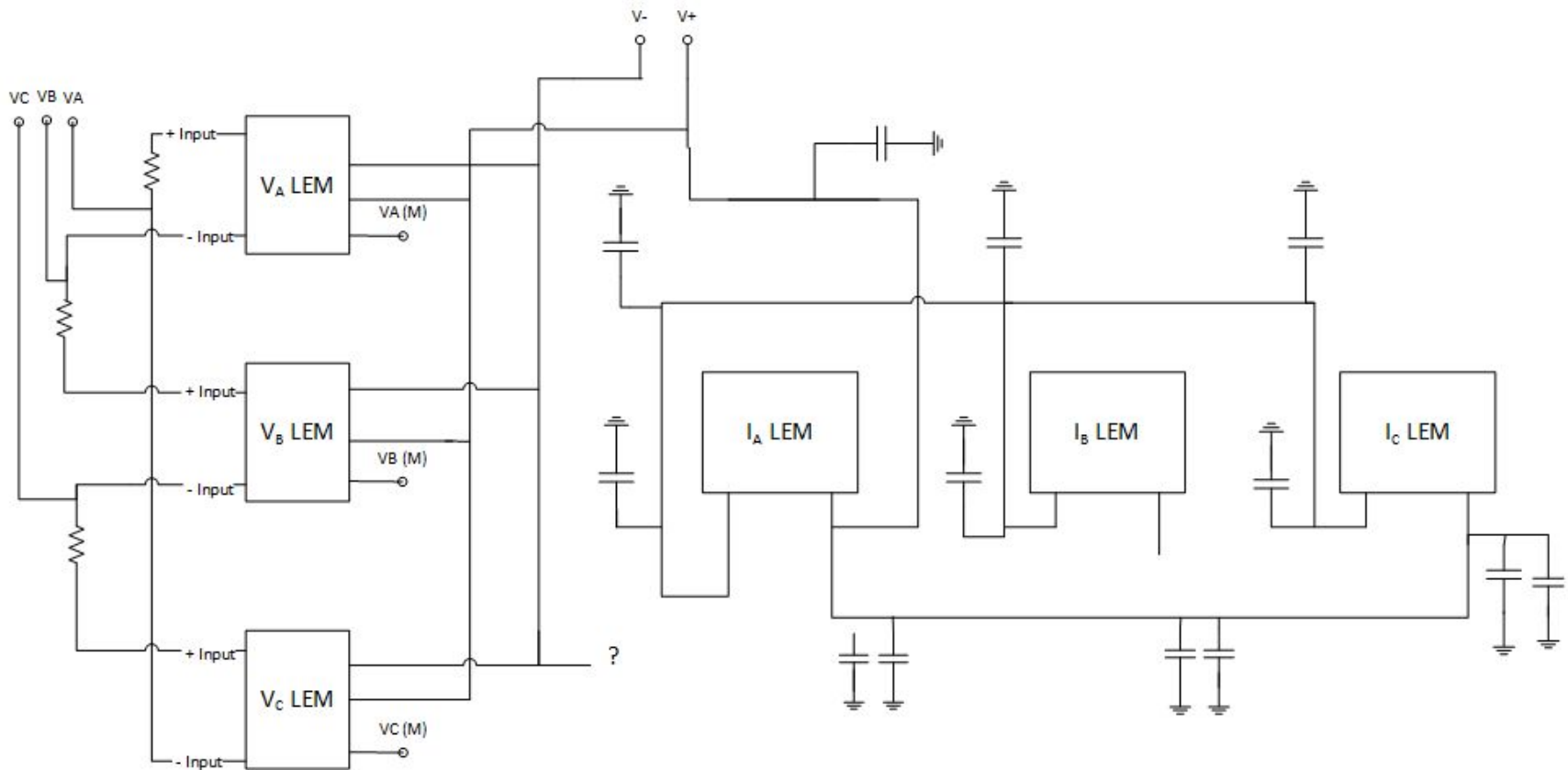


Problem/Solution

- Third Harmonic
 - Filter (software/ Hardware)
 - Half-wave rectification?

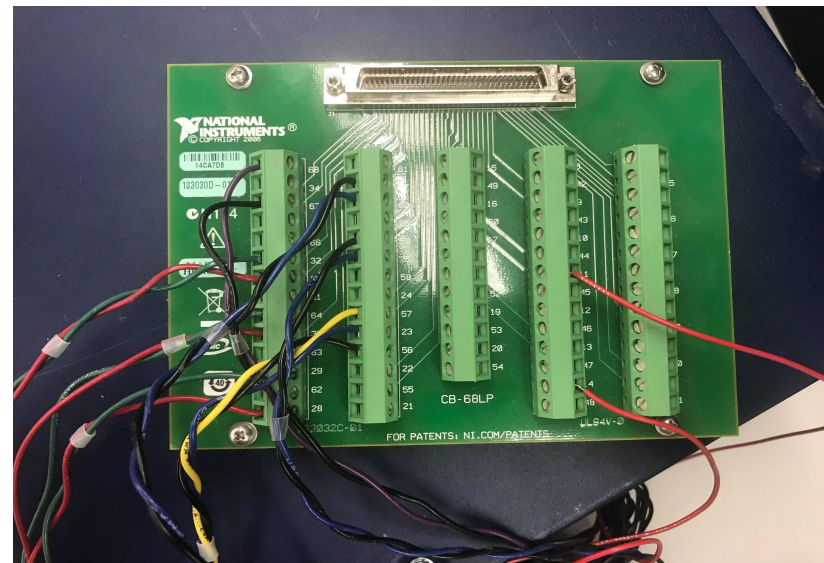


First draft of LEM box



Next Step

Testing PXI 6251



Reference

- [1] Inclusive Design and Implementation of Online Load Angle Measurement for Real-Time Transient Stability Improvement of a Synchronous Generator in a Smart Grid



Thank you

Any Feedback?

