

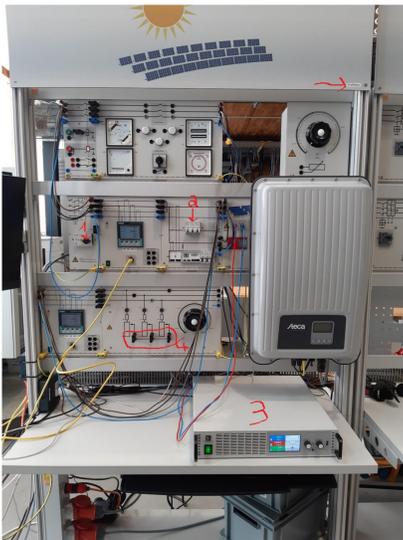
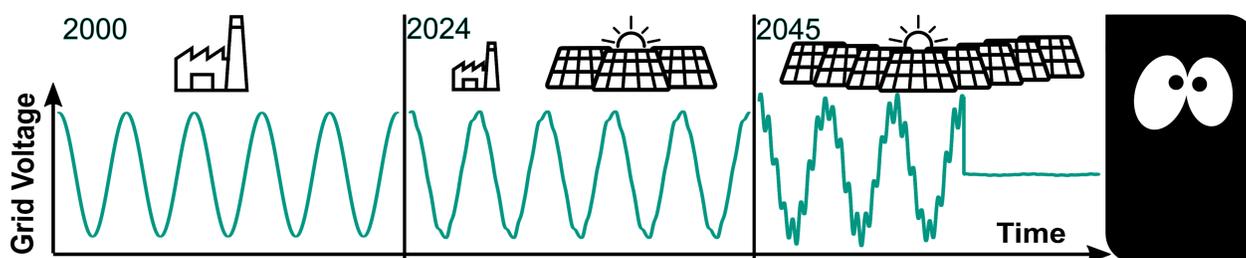


Master Thesis / Bachelor Thesis

# Inverter Interrogation – The Truth Between Harmonics

Scientific Title: Inverter Current Depending on Harmonic and Interharmonic Grid Disturbances

Our electrical power grid faces major changes in order to realize the energy transition towards renewable generation. For example, large central power plants are replaced by many widespread generators such as photovoltaics and wind turbines. This can cause issues with power quality and security of supply [1, 2].



**This thesis aims to put an inverter to the test. You will be using a test stand allowing to supply an inverter with pre-defined grid conditions. We are especially interested in subjecting the inverter to disturbances at frequencies that are non-integer multiples (interharmonics) of the grid frequency (50 Hz) [3]. You will compare your measurements to behavior under harmonic disturbances.**

This sounds exciting? Then get in touch!

The proposed thesis consists of the following parts:

- Familiarization: Measurement device, data, and inverter hardware setup.
- Test Cases: Selection of disturbance frequencies.
- Measurement: Measure inverter current for different test cases.
- Extension for Master thesis: Explain different inverter behaviors.

We are happy to answer any questions you might have. Feel free to ask for an appointment or just give us a call!

Die Arbeit darf natürlich auch in deutscher Sprache geschrieben werden.

## References

- [1] DIN EN 50160:2020-11 „Merkmale der Spannung in öffentlichen Elektrizitätsversorgungsnetzen; Deutsche Fassung EN 50160:2010 + Cor.:2010 + A1:2015 + A2:2019 + A3:2019“
- [2] Li, C. “Unstable Operation of Photovoltaic Inverter From Field Experiences,” *IEEE Transactions on Power Delivery*, 2018, 33(2), 1013–1015. <https://doi.org/10.1109/TPWRD.2017.2656020>
- [3] Marz, M. (2016). “Interharmonics: What They Are , Where They Come From and What They”. <https://ccaps.umn.edu/documents/CPE-Conferences/MIPSYCON-Papers/2016/Interharmonics.pdf>

## Advisor:

Ellen Förstner, M. Sc.  
Sophie Xing An, M. Sc.

## Programming language:

Matlab

## System, Framework(s):

Windows, Matlab

## Required skills (Wish list):

- Student of computer science or mechanical engineering
- First experiences with measurement technologies (e.g. lecture, Hiwi)

## Language(s):

German, English

## Starting date:

As soon as possible

For more information, please contact:

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