



Symposium

## SUPRAHARMONICS 2026

Lecture Center of Poznań University of Technology

Poznań, September 21, 2026

Poznań, 18.05.2026 r.

## Supraharmonics – what are they?

Supraharmonics are voltage and current components with frequencies from 2 kHz to 150 kHz (or higher, e.g., up to 500 kHz) and are classified as conducted disturbances. They arise from the operation of PLC (power line communication) data transmission and power electronics systems. They can be distinguished as supraharmonics with frequencies:

- that are very high integer multiples of the fundamental harmonic  $f_c = 50$  Hz;
- that are integer multiples of the  $f_{\text{switch}}$  switching frequency of power electronic valves, e.g.,  $f_{\text{switch}} = 20$  kHz and higher harmonics: 60 kHz, 100 kHz, etc.;
- that create complex amplitude characteristics caused by the operation of PLC systems or loads with advanced control.

Measuring supraharmonics requires specialized equipment and advanced DSP algorithms and correct interpretation of such results requires specialized knowledge and appropriate experience. Supraharmonics measurement results constitute a large dataset, and their comprehensive visualization is difficult. For example, considering frequencies from 2 kHz to 150 kHz with a resolution of 200 Hz, 741 supraharmonics are obtained. Analyzing the propagation of supraharmonics in electrical circuits is complex and requires knowledge of the properties of individual circuit components. This analysis is often complicated by a lack of knowledge of the electrical properties of circuit components at supraharmonics frequencies.

The occurrence and propagation of supraharmonic voltages and currents in power grids are poorly understood. The impact of supraharmonics on various types of electrical systems also requires further investigation. The increasing share of power electronics systems among loads implies an increase in supraharmonics in power supply.