Smart power cable monitoring

Power cable condition monitoring with broadband over power line communication signals

Invention

What is the status of the power cables at the distribution grid level? This information is generally not gathered, since conventional methods such as dissipation factor measurement involve a great deal of effort – and then there are the high costs and power disruption for connected customers. But an invention by the University of Wuppertal changes all that: It can continuously monitor power cables for low- and medium-voltage grids, determine the ageing process for electric cables, and generate a service life forecast. It also detects the technical condition of the power cables with broadband over power line (BPL) modems that already transfer smart meter data in many power grids.

Cable distributor
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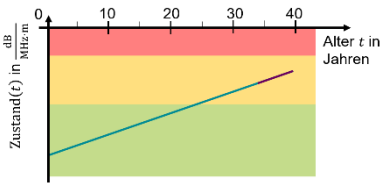
The system requires at least two BPL modems that can determine and forward the signal-to-noise ratio (SNR) on a broad frequency range (2 to 28 MHz). It also requires a database for storing and analyzing the measured SNR data. The power line signals provide information about power cable quality. Software modules allow the BPL infrastructure to be used for both communication and cable condition assessment.



Condition line for cable quality assessment

Commercial Opportunities

The increased installation of heat pumps, charging stations for e-vehicles, and private solar systems increases requirements for distribution networks and the associated power cables. Heavily fluctuating loads on our low- and medium-voltage grids demand information about whether the power cable in question can provide sufficient power transmission quality or whether it needs to be replaced, which can be expensive. The new process can be used to continuously monitor the technical condition of a power cable without interruption of the power supply.

Current Status

Initial long-term measurements have been made on a laboratory sample, demonstrating the utility and advantages of this invention. It has been registered with the German Patent and Trade Mark Office. It can be registered in other countries in the priority year or upon later PCT registration. We are offering interested companies the opportunity to license and refine the technology in collaboration with the inventors and the University of Wuppertal.

An invention by the University of Wuppertal.

Competitive Advantages

- Continuous power cable monitoring
- Condition monitoring in operation
- Service life prediction
- Software-based solution
- Broadband powerline communication

Technology Readiness Level

123456789

Laboratory sample and long-term test series available

Industries

- Electrical engineering
- Energy technology

Ref. No.

6495

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