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A smart scheme for monitoring and protection of power transformers at smart grid

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Power quality, reliability and availability of electrical energy at the consumer's end has been a top priority of the electrical power supply companies. The smart grid desires to have environmentally friendly and an efficient distributed generation. The priority for a smart grid is not only the combination of smart sensors and automated operation of different sections at the grid but the better performance of electrical power system. This can be achieved through continuous monitoring and control of transformers which is a very important part of an electrical power system. This paper proposes an Arduino with GSM modem for remote monitoring, protection, and control of the transformer. The software-based hardware provides an easy and effective way of implementation of protection system for the distribution transformer from over current, over voltage, humidity, oil temperature and winding temperature, separately. If any of the specified parameters exceed the pre-set value, then it takes corresponding protective action and also sends the information to the provided mobile number. Furthermore, the message can also be sent from the cell phone to the related control sections for further actions regarding the control and the status of different parameters at the transformer at the yard. The software-based hardware is easy and friendly for the user and can be portable to either location. The automated action of the proposed circuit is helpful particularly in autotransformer at power grid, and it is a progressive forward step towards the smart grid and distributed generation.

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