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Intelligent Distribution System

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The goal of this paper is to present development of the Intelligent Distribution System (IDS), which connects a number of devices to a three-phase network and balance loading of this network. The main challenge in the IDS project was to meet the requirements for strictly limited dimensions of the device and simultaneously to provide all necessary functionalities, e.g. remote control. The prototype version of the IDS will ensure powering the 12 devices of total power consumption at the level of 17,25 kW. In order to ensure symmetric loading of the network the automatic measurements of the individual power consumption are performed. A dedicated relay system has been designed and it allows to connect each powered device to each phase. The control system is based on the NI CRio and performs the optimization of phase loading, detect short circuits, automatically switch-on and switch-off power of the devices. Moreover, system can register parameters of connected devices, events during system operation and the power consumption history.

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