

Centrally controlled domestic appliances

Heating, light and entertainment devices are linked via the power supply system

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Berlin/Zürich - The dream of networked household and electronic appliances has become reality. Computers communicate cable-free with mouse and keyboard, send documents to the printer at the same time exchanging data with the World Wide Web. Hi-fi systems transmit music to wireless headphones and cordless phone send acoustic signals to the stations; our electrical devices have become chatty. To date, however the different networks do not understand each other; a different language is used for each application.

Just imagine if the cell phone could be used as a computer input device or one were able to surf on the Internet using the TV, have one's e-mails read to you via headphones and the remote control could be used not just to operate the TV, but also to dim the light or adjust the heating. And another important factor is that with intelligent controls a lot of electricity could be saved.

To put this vision to the test scientists of the TU Berlin have launched the "SerCHO" project. "The point is to link the devices in such a way that they afford the users maximum convenience", states Professor Sahin Albayrak, leader of the project. The user will not have to spend hours leafing through user manuals: "The networks function according to the plug 'n' play principle and are as easy to install as it is to connect a USB device to the computer" Albayrak comments.

The House of the Future can already be viewed: The TU Berlin has equipped and furnished a demonstration apartment to test out the technology. There is at least one display screen in each room. Via cameras the network automatically identifies where one is and adapts the lighting and temperature to the user. But it can do a great deal more: For example, simplify domestic chores as a cooking assistant. It knows the user's preferences and seeks out recipes for dishes that can be cooked from ingredients that are still to be found in the refrigerator, or automatically prints out a shopping list. Thereafter it starts interactive cooking instructions, regulates the cooker to the optimal temperature and reports when the cooking time is over.

The data are transmitted by means of a so-called bus system, which is familiar from computer technology, i.e. via cable or "wireless". "We are testing a variety of systems for their practicability", Albayrak explains. The different transmission paths nevertheless also have their disadvantages: Cables have to be laid for a bus system and, in the case of wireless connections, electromagnetic pollution arises. Furthermore the devices for transmitting the signals are expensive and consume considerable quantities of energy even in stand-by. Therefore, this simple manner of controlling devices and lighting is not worthwhile because receiving and sending signals consumes more energy than the intelligent control system saves.

Hence the scientists of the TU Berlin are now cooperating with "digitalSTROM". The non-profit organisation and technology of the same name were born at the Swiss Federal

Institute of Technology in Zurich (ETH). In this case normal power lines are used for transmitting data. Semiconductor chips fed directly from the power grid switch the devices on and off, dim lamps and regulate the consumption of energy. "This is the first system that is conceivable for normal consumers and not just for techies" says Professor Ludger Hovestadt who played a major role in its development. The costs and power consumption of the chips are almost negligible. "They require less than one tenth of the electricity wasted by a conventional charger for cell phones in no-load operation. If at some stage the chips are built into household appliances and apartments as a standard feature, it will not have an impact on the price", says Hovestadt. The chip can also be built into plugs or power strips for retrofitting older devices.

Hovestadt claims: "Next year the technology will be ready to go into production". It not only facilitates convenient controls, it can also save a large amount of energy. For example, when leaving the house, all devices not required can be switched off at once; no lamps are forgotten and no devices remain in standby.

The potential savings are high: According to information from the Federal Environment Office, the electricity used nationwide in standby would be sufficient to supply the whole of Berlin and Hamburg. The approximately four billion Euros, which the consumers pay for that energy each year, should make the technology an interesting proposition from the financial point of view. Furthermore, with the chips it is possible to measure the power consumption of the devices and have it displayed via the Internet. Then it is possible to calculate exactly how much operating the devices costs and whether, for example, it would be worthwhile replacing the old TV with a new one that consumes less electricity.