DEOS AG Case Study

Saving heating costs at the Eduard-Orth primary school in Germersheim – thanks to the DEOS TEO wireless radiator thermostat

The Eduard-Orth primary school in the town of Germersheim.

With just over 20,000 inhabitants, the district town of Germersheim (Rhineland-Palatinate) is close to Baden and Alsace. In order to find a quick and cost-effective solution for reducing heating costs in the school building, a manufacturer-neutral comparative calculation was carried out. This showed that the one-off investment in wireless radiator thermostats is 13% cheaper than the comparable wired KNX/DDC room solution.

In addition, the ROI (return on investment) of the wireless variant in this individual project calculation and with a conservative assumption of 'only' 20% energy savings is 4.2 years. This is almost twice as fast as the comparable wired solution.

The town of Germersheim therefore looked for a wireless solution such as DEOS TEO in order to fulfil the statutory GEG requirements (Building Energy Act).

High heating costs are also putting a strain on public buildings in the town of Germersheim. According to the results of the upstream investigation, those responsible clearly favoured a wireless solution with radiator thermostats. The DEOS solution stood out in the research: **battery-free** (saves ongoing service costs), **LoRaWAN wireless protocol** (for the best reception in all parts of the building) and **quick installation** (during ongoing building operation).

"The entire radio installation, including the 130 thermostats, was installed in just three days while the school was in operation."

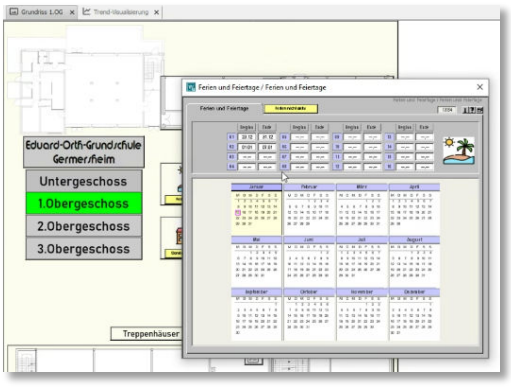
After the Germersheim city council commissioned the company Jürgen Tapper GmbH (local DEOS system partner), the project was quickly implemented. After a short planning and preparation period, the time had come: in three days, the Tapper team replaced the previous manual thermostats with 130 new battery-free DE-OS TEO wireless radiator thermostats, installed 70 wireless wall sensors, set up 9 wireless gateways and connected them to the DEOS OPEN.WRX Controller (DDC) via Modbus/IP - without drilling, without dirt and without noise. The installation took just 5 to 8 minutes per room.

The mayor, Mr Marcus Schaile, is delighted: "*This DEOS TEO solution is quick to install, easy to operate and significantly reduces our heating costs. This is how I imagine a modern energy-saving solution.*"

Automatically controlled: needs-based flow temperature

The existing Siemens heating control system only had manual setting options in the basement. Now the hot water in the pre-control circuit continues to be controlled by the existing Siemens system, but is integrated into the new TEO overall solution via BACnet, with two major advantages: The flow temperature is now set automatically according to demand, which saves heating costs. Furthermore, graphical operation is carried out via the administration workstation using a PC or tablet, so that teaching staff and caretakers can make role-based settings.

The demand-led control of the heating circuit raises the GA efficiency class from C to A in accordance with DIN EN 15232 / DIN V 18599. Room automation also improves from class D to A.



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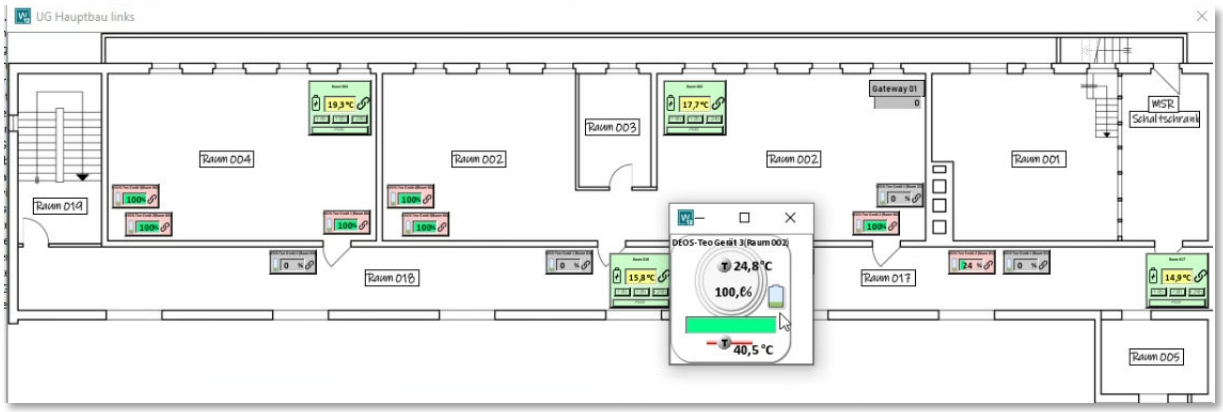
Version July 2024
DEOS Marketing

Smart heating system that thinks for itself!

As required, the SET heating temperatures are set automatically and centrally room by room with DEOS TEO. The ACTUAL temperatures are recorded by the internal TEO sensors and the 70 LoRaWAN wireless wall sensors. In the past, people often forgot to turn down the radiators at night and during holiday periods. Today, the integrated time and calendar programme takes over this task and automatically reduces all heating temperatures at night and at weekends. Holiday mode is now also set automatically. There is also an 'extension button' to extend the heating, e.g. for upcoming parent-teacher conferences and meetings.



Modern operating concept

Different operating levels and rights have been assigned to the user groups (teachers/janitors) so that the level of graphical detail adapts to the roles. The DEOS IoT/cloud solution can be used to set the target temperatures for each room 24/7 via mobile phone/tablet, regardless of location.

Malfunctions of the existing heating installation also detected

The general problems with the old fixed radiator valves, which often made the room temperature too cold or too warm, were also recognisable here. With the new TEO solution, everything is operable again and the room climate has been noticeably improved.

The hydraulics (hot water circuit) and the associated energy loss have also been optimised: The flow temperature in the heating circuit was too low and 13% of this flow heat (energy) was lost along the entire route. Result: The last radiators along the pipework did not receive enough hot water and were therefore not optimally heated.

The outlook: Energy meter connection and monitoring

The energy meter data is currently being recorded in the system and displayed via the BMS. According to current analyses, the energy saving is around 30 %. Exact representations and analyses are still pending, so expansion with DEOS energy monitoring is planned. This project and the planned expansions are a step towards fulfilling the Building Energy Act for non-residential buildings: the property value increases and CO_2 emissions are reduced.

Technology overview

- **Wireless radiator thermostats**
  130x battery-free DEOS TEO and 9x LoRaWAN gateways with Modbus/IP connection
- **LoRaWAN room sensors**
  70x wireless wall sensors for temperature monitoring
- **IoT/cloud plattform**
  For 24/7 operation and visualisation
- **Further**
  DEOS BACnet/SC controller OPEN.WRX

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