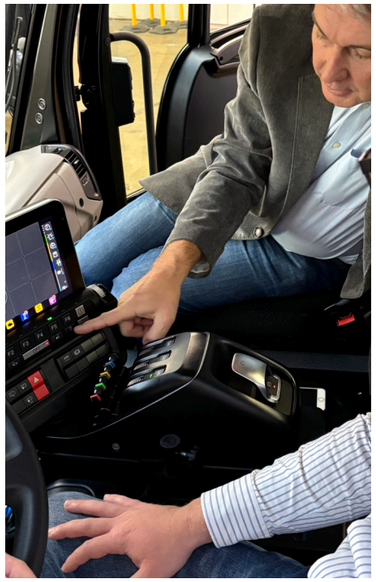
THE CENTERPIECE OF THE VEHICLE

The world's largest truck factory can be found in Germany's Wörth am Rhein, where more than 100,000 vehicles roll off the production line every year. Since 2002, the UNIMOG has been another standout vehicle produced alongside the "big" Mercedes-Benz trucks of the A series, the Econic and the Zetros.

Teamwork at eye level (from left to right): Felix Schmid, Lutz Heidrich, Wulf Aurich and Ladun Bakar worked together on the UNIMOG operating concept of the future.



The UNI-TOUCH system at a glance: The center console features a touchscreen along with additional analog pushbuttons, various toggle switches, and the RAFI LINEAR JOYSCAPE.

For the latest UNI-TOUCH vehicle generation, which was launched this year and features the installation of 700 new parts, a globally unique centre console and joystick were developed in collaboration with RAFI. This is all reason enough to take a glance behind the scenes and delve deeper into the subject matter.

„I've been trying to get the UNIMOG airborne – but haven't yet managed to do it," says Lutz Heidrich, Head of Team for the UNIMOG equipment carrier overall vehicle since 2008 and also with the Daimler Group since 1997. Heidrich makes this statement with a smile on his face as he describes the demands of his job. In his private life, the ambitious RC model builder actually does makes things fly, and it is obvious that the aerospace engineering graduate is passionate about his work, which is a true labor of love. This was also the case in 2018, when the project that was rolled out as UNI-TOUCH was launched. "We wanted to have a unique selling point in the vehicle interior that does not yet exist in this form while also taking vehicle operation, attachment functionality, and future development possibilities into consideration."

To the top of the Austrian Alps and back again

No sooner said than done. Heidrich and his team launched a concept contest, drafted a requirement specification, and received proposals from a variety of suppliers. RAFI persuaded the decision-makers with its expertise and advice and was granted the contract. Together with the Berg-based HMI specialist, the vehicle manufacturers entered the concept phase, during which preliminary investigations were carried out. So-called "product clinics," in which the requirements of the market are identified and tested in collaboration with key users, were also used. In this case, the initial prototype was put to the test in the Alps.

"We tested our snow blower and snow plough concept on the Austrian summit of Grossglockner in the Alps, only to discover that it was not working as intended. Why not? It wasn't variable enough. We decided to break off the trial right then and there," Lutz Heidrich says, looking back. However, he has no regrets about returning to the drawing board at that point. After all, at the end of the day, what is the point of a vehicle and attachment control system if it is not well received by users in a wide variety of applications? It's even worse if it fails to get the job done because it is simply unsuitable for the task at hand. And if there's one thing the UNIMOG community – a dedicated fanbase that has existed since its founding in 1948 – is known for, it's staying in contact with one another. Now more than ever.

„We wanted to have a unique selling point in the vehicle interior"

An iterative development process as the norm

So the project went back to where it began. This is a completely normal way of doing things for UNIMOG, the "universal motorized machine" known for its versatility. A UNIMOG, with all its attachments, is unlike any other vehicle – yet it needs to be easy to understand and intuitive to operate. The users, who are familiar with the normal driver's environment, including the steering wheel, dashboard instrumentation, and gearstick from other vehicles, anticipate a comparable setup. They also would prefer to operate the vehicle without having to think long and hard about which buttons to press and which levers to use.

"Whether using a mower or a spreader, the vehicle operator should feel like a DJ at their mixing console. We ensure that the limited driver's space is used in an ergonomic and efficient manner," says Wulf Aurich, Product Manager at UNIMOG. It is essential to consider both current and future use cases. "The challenge lies in anticipating potential adaptations. No standard, cookie-cutter solutions, but rather iterative steps in the evolution of the operating concept are the norm."

From analog to fully digital operating systems

While the UNIMOG's predecessor model was operated exclusively by joystick and buttons, the UNI-TOUCH system features a touchscreen along with additional analog function buttons, a center console equipped with several toggle switches ("fingertips/linear joysticks"), and a detachable joystick that includes capacitive hand recognition and activation capabilities from the RAFI JOYSCAPE platform. At first glance, the complexity of the UNIMOG appears to have increased, yet the overall count of operational components has significantly decreased. Flexibility is paramount – even for seemingly trivial functions like a rotating beacon. Several different input paths exist for the same function, including the display and any defined function/memory pushbuttons. Transfer to the joystick is also possible. All of this also means that users will need to become more thoroughly acquainted with the system.

The touchscreen features a RAFI touch sensor and a fully bonded HD display, offering not just a user interface but also submenus that can be expanded as required according to functionality. Predefined workflows can also be created as sequences that can be called up depending on their intended use. "The message to the user is: Add button X to your favorites, and leave function Y out. On this basis, we aim to reduce training time and enable the driver to work productively without issues," Wulf Aurich asserts.

Ladun Bakar, Head of Team Sales for Commercial Vehicles & Agriculture and the primary UNI-TOUCH manager at RAFI, adds: "We have managed to interactively visualize the mechanical systems with the software. The user selects the desired function, which is then shown on the display. The process is only executed after active confirmation by the user." At UNIMOG, this is known as

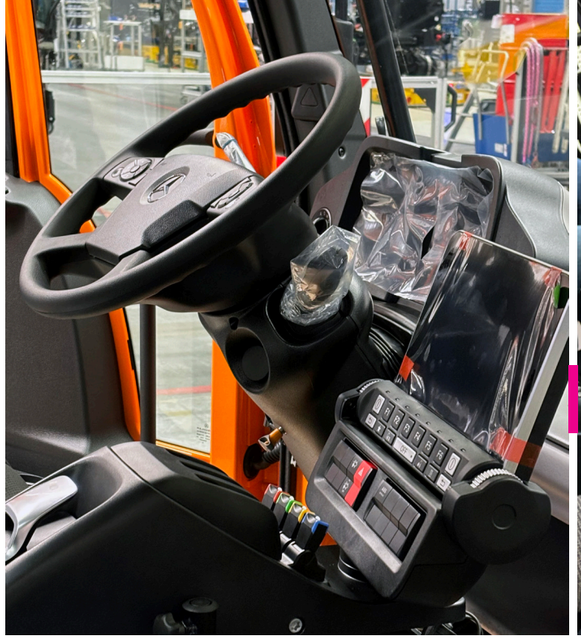
> *„The vehicle operator should feel like a DJ at their mixing console"*

"Show & Go". All components on the armrest are linked to the software through capacitive technology. Commands selected by the user are visualized on the display and then activated by touch. This prevents operating errors and makes a crucial contribution to safety.

Data exchange for service and maintenance

The electrical and electronic (E/E) architectures have been adapted for the latest generation of UNI-TOUCH vehicles. The goal was to streamline complex structures and reduce costs, not just in design and production but also for service and maintenance. "We have interfaces for data exchange with the outside world and can provide digital services, for example," explains Wulf Aurich. That said, we're still far from the end of the road. Ideas are being explored for a portal to receive and evaluate data – something like 365FarmNet in agriculture. Within the Daimler Group, similar solutions like Fleedboard or Uptime are already available for commercial trucks.

A slight difference indicates the generational change: while the previous model had three lights on each side, the new version now has a single light that indicates "I am a UNI-TOUCH vehicle."



Maximum driving freedom: Installed as standard on the left-hand driver's side, the steering wheel can be shifted to the right using a sliding mechanism.

Working together as equals

For the UNI-TOUCH project, RAFI assumed full responsibility for the development of both control units, including the electronics, mechanical systems, and software.

> *„We understood, trusted, and accepted each other as equals"*

They also managed the entire production process, which included PCB assembly, the manufacturing of the touch sensor with display bonding, and the assembly of the complete module. "We deliberately chose RAFI as our system partner due to the company's extensive expertise in automation of the human-machine interface. After all, we're talking about the centerpiece of the entire vehicle here," says Lutz Heidrich, looking back. The collaboration was also a good fit on a personal level. "We understood, trusted, and accepted each other as equals. That was ultimately the key to our success." Naturally, there were also difficult phases and stressful moments involving not just technical problems but also organizational and commercial challenges. Heidrich stated that these were resolved in a manner that was collegial or "amicable, you could almost say." Other ingredients for success include a sympathetic ear at all times and a willingness to actively tackle any hurdles that arise. Giving up was never an option. Ladun Bakar encapsulates the shared ambition in a single sentence: "Our common objective has always been to deliver to the market a compelling product that provides the end customer with a distinct sense of added value."

Soaring into the future in your mind

Looking ahead to the years to come, work at and with UNIMOG will not diminish, despite predictions of global warming. Less snow does not necessarily mean a reduction in winter services. The key factor is the frequency of temperature fluctuations around the freezing point. "The UNIMOG can also be used to clear and trench sand in Abu Dhabi," says Wulf Aurich, highlighting the vehicle's versatility for use globally in any region and at any time. The key phrase is year-round use. Increasing demands and changing framework conditions are being anticipated in the conceptual planning. There is a consensus among everyone at the table that the UNIMOG will be an essential tool in the decades to come.

When asked how people wind down after work in Wörth, Wulf Aurich dryly answers: "By driving UNIMOGs and MB-Tracs." A native of Lower Saxony and passionate about self-sufficiency, he also has a private interest in agricultural machinery and frequently uses a chainsaw. As mentioned at the beginning, Lutz Heidrich likes to let his model airplanes take off on the weekend but also aims to give the UNIMOG wings, even if only in a symbolic sense. "Soaring into the future in your mind is simply a fun thing to do. I extend an invitation to anyone who wants to come along."

Author and photos: Fred Nemitz