An urgent call comes in at the fire department: «We’ve got a warehouse fire. Multiple people are trapped inside and it’s filling with smoke. Warehouse contents unknown.» There’s no time to lose and no room for errors. Every movement must be performed with absolute precision – while wearing a full set of heavy and cumbersome protective gear. Firefighters train for these conditions over and over. In the field they are supported by fire fighting vehicles that serve as mobile operating bases. These vehicles not only transport them quickly and safely to the scene of the fire, they also carry a full range of equipment and supplies, including truck-mounted pumps and foam proportioning systems, field lighting units, various tools and operating controls.

146 years of fire fighting excellence
The world’s leading producer of fire fighting vehicles is Rosenbauer, whose headquarters are located in Leonding, outside of Linz, Austria. Founded in 1866 as a trading house for fire fighting supplies, Rosenbauer began producing fire pumps soon after the turn of the century, followed by its first fire fighting vehicles in 1919. Today, Rosenbauer is represented by a sales and customer service network in more than one hundred countries worldwide, supplying both professional and volunteer fire departments, as well as industrial and airport fire departments.

The most well-known Rosenbauer product is the spectacular airport fire truck known as the »Panther«. First introduced in 1991, more than a thousand Panthers have since rolled off Rosenbauer’s production lines, the largest of which bearing an enormous 19,000 liter extinguisher tank. Despite their lightweight construction, these vehicles weigh in at 52 tons – yet they still manage to accelerate from 0 to 80 km/h in 25 seconds and reach speeds of 135 km/h. Even at top speed, a joystick in the cab can be used to control the optional extendable turret and aim extinguishing foam at targets ranging from one to sixteen meters high while ground-sweep and under-truck nozzles protect the truck from ground fires.
Fire fighting vehicles are as complex as they are rugged, and the conditions under which they must operate are as diverse and demanding as the emergencies to which they respond. They must perform reliably in harsh environments and take turbulent movements in stride. This places extreme demands on the technology involved. As a global leader in fire fighting equipment, Rosenbauer relies on B&R’s expertise.
B&R offers a unique combination of general automation expertise and experience in the area of mobile applications. Developments for special-purpose vehicles and mobile equipment will continue to build upon this foundation, promising even more innovative vehicle automation solutions yet to come.

Saving lives with ergonomics
The Rosenbauer Group’s technological leadership is built on its years of dedication to fire fighting systems and vehicles. All the processes involved in developing and producing fire fighting technology, vehicle construction and overall system control are united under one roof. To allow emergency response teams to concentrate fully on the task at hand, ergonomic controls and automatic processes are extremely important. This fact is deeply ingrained in the minds of all Rosenbauer developers.

With a twenty-man team at the headquarters, software development is one of the company’s core specialties. Leonding is also home to electrical engineering, prototype construction and pre-series production. For its control electronics, Rosenbauer relies on long-term partnerships with specialist companies and collaborates closely in the development of customer-specific projects to ensure protection of intellectual property. After all, as the industry leader, Rosenbauer has encountered more than its fair share of competitors eager to copy key innovations.

»Providing all the functions of a universal emergency response vehicle with ergonomic control design can eliminate a large portion of operator errors,« says Olivier Hrazdera, Rosenbauer’s head of electrical and electronic development and design. »This is primarily the responsibility of the vehicle’s electronics, which, in addition to providing intuitive operation, must also adhere to a range of standards and regulations while operating reliably for an average of twenty years in all sorts of extreme field conditions and climates.«

From the arctic circle to the equator, the automation technology must withstand hostile temperatures as well as shock and vibration. Electronic components must be fully shielded from dirt, sand, water and extinguishing foam. To further complicate matters, there is increasing demand for modular construction. On the one hand, this allows equipment to be adjusted to accommodate varying needs and provide optimal comfort and flexible functionality. On the other, it simplifies the process of replacing components.

Growing partnership
Since the early 1990’s, Mondial Electronic has been developing and producing electronic components for operating and controlling special-purpose vehicles and mobile commercial equipment. Developed according to custom specifications and produced exclusively in Austria, Mondial devices meet the most demanding requirements for availability. They also ensure quick startup even under extreme mechanical stress — including shock, vibration, heat, cold and moisture.

Rosenbauer values long-term partnerships, so they began by testing Mondial’s performance on smaller projects, including the replacement of previous developments. »Early in this initial
phase, Mondial displayed an impressive mastery of the unique challenges involved in vehicle automation, «remembers Hrazdera. «Over the years, our relationship with Mondial grew into a structural partnership.» Fruits of this partnership have included a control solution for the electric motors of the DIGIMATIC injection foam proportioning system, with high-performance electronic components up to 80A, as well as a three-phase controller for mobile floodlight masts with integrated diagnostics.

**Generational leap with new operating concept**

In 2010, at the Interschutz event – an international exhibition for rescue, fire prevention, disaster relief, safety and security held every five years – Rosenbauer presented the third generation of its successful AT series of municipal vehicles. Mondial had been one of nearly ten companies invited to bid on the contract to develop the new electronic components, including new operator controls.

«Mondial had already proven their expertise in the field and their ability to produce extremely robust hardware, yet pump control presented a new range of demands,» explains Hrazdera. «To develop an optimal operating design, one needs a partner able to contribute knowledge and ideas in an iterative process that continues until the resulting HMI devices offer the customer the best possible support.» Clearly it was also beneficial for Rosenbauer to find a partner located practically next door and able to communicate freely without any language barriers.

The Mondial pump control devices have since become a standard feature of all Rosenbauer fire fighting vehicles. The series includes a modular selection of easily readable displays and indicators, as well as control panels and keypads that can be operated confidently in extreme temperatures while wearing gloves. It also includes a mobile operator terminal.

The latest product to come out of the partnership is a driver warning device for airport fire fighting vehicles. US regulations require that these vehicles be equipped with a system that alerts the driver to any potentially dangerous operations, such as when steering sharply at high speed might threaten to roll the vehicle.

Data from acceleration and vertical direction sensors is used to provide the driver with a dynamic visualization of the vehicle’s orientation in relation to a virtual horizon on a display in the cab, along with corresponding warnings when danger is imminent.

**The best of both worlds**

For a globally active company like Rosenbauer, international presence and delivery capacity are important criteria when selecting a partner. Mondial’s integration into B&R in 2010 secured the company’s economic future and strengthened its position worldwide. B&R has a worldwide network of 175 offices providing its customers with application development, sales, support and training services.

This global presence harmonizes well with that of Rosenbauer and will provide an even stronger foundation on which to build the future of the cooperation. B&R offers a unique combination of general automation expertise and experience in the area of mobile applications. They will continue to develop automation solutions for special-purpose vehicles and mobile commercial equipment and produce complex and innovative solutions for vehicle automation. And they do it with this in mind: to protect and support fire fighters around the world as they literally walk through fire to save lives and protect property.