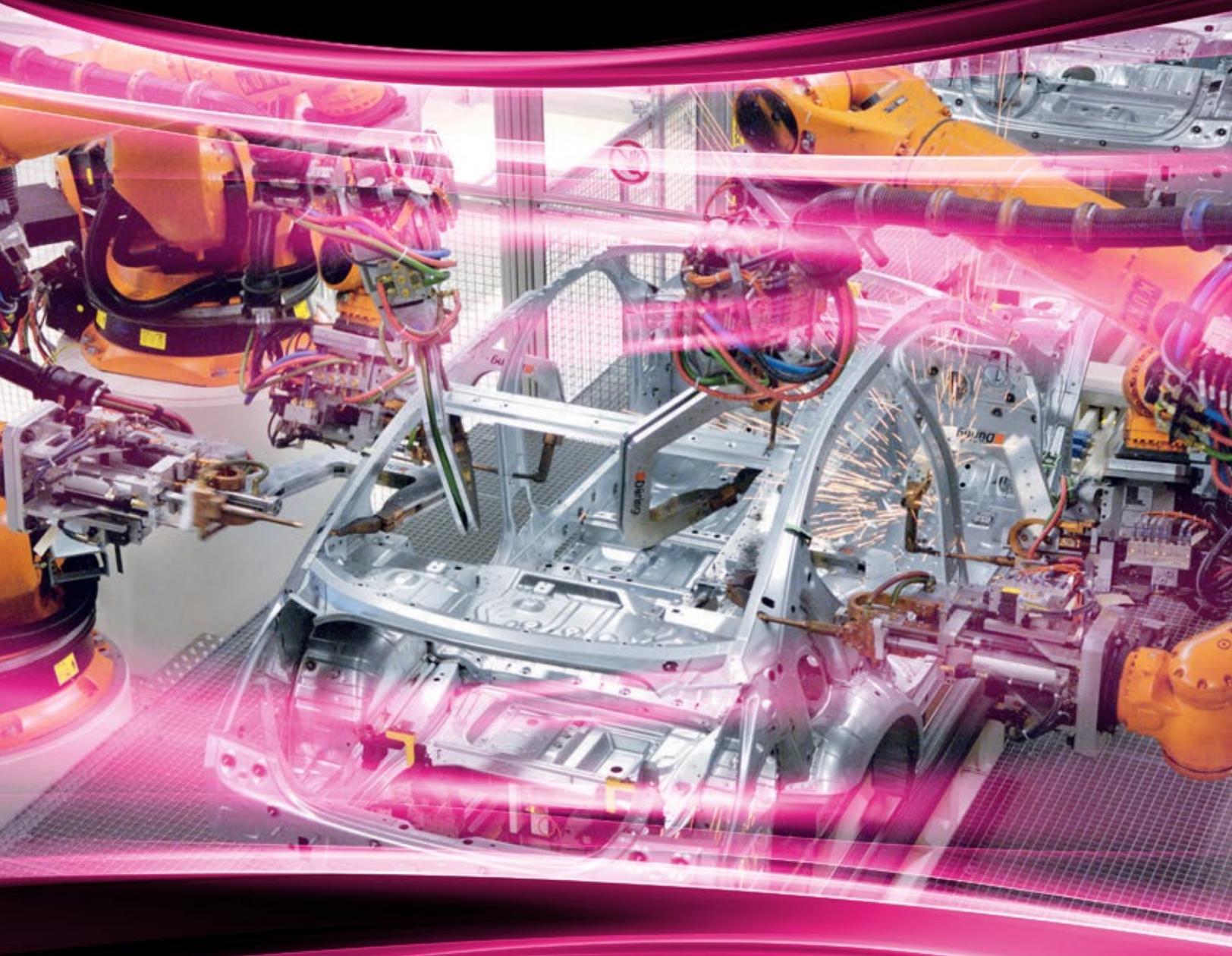


Rittal – The System.

Faster – better – everywhere.

SOLUTIONS SUITE

AUTOMOTIVE



ENCLOSURES

POWER DISTRIBUTION

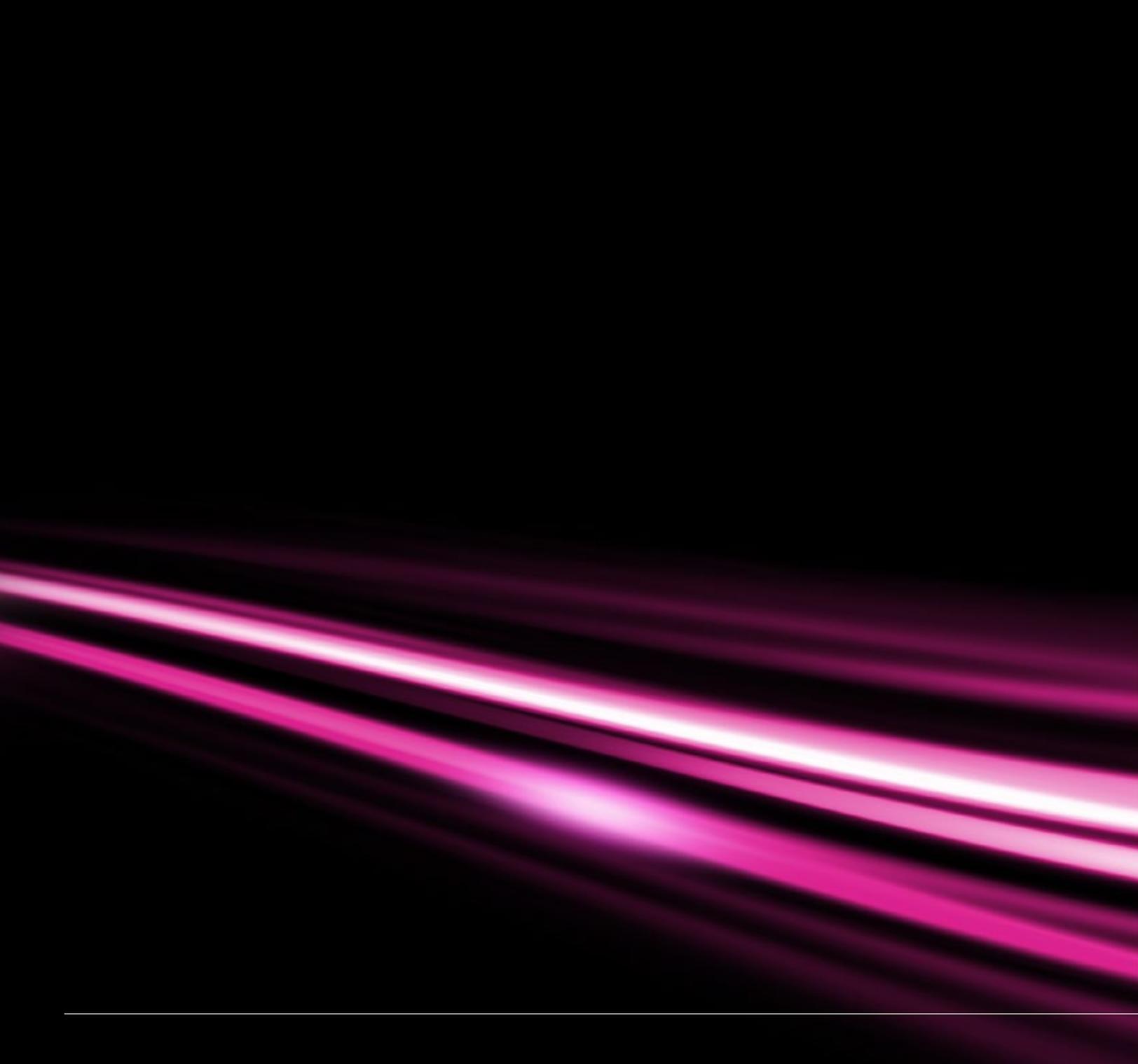
CLIMATE CONTROL

IT INFRASTRUCTURE

SOFTWARE & SERVICES



FRIEDHELM LOH GROUP





SOLUTIONS SUITE

AUTOMOTIVE

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THE ROAD AHEAD IN AUTOMOTIVE

Tomorrow's outcomes depend on today's decisions. But with variant-rich production streams, supply chain uncertainties, compliance concerns, and shifting consumer demands, the choices manufacturers make today may very well be different from those they must make tomorrow.

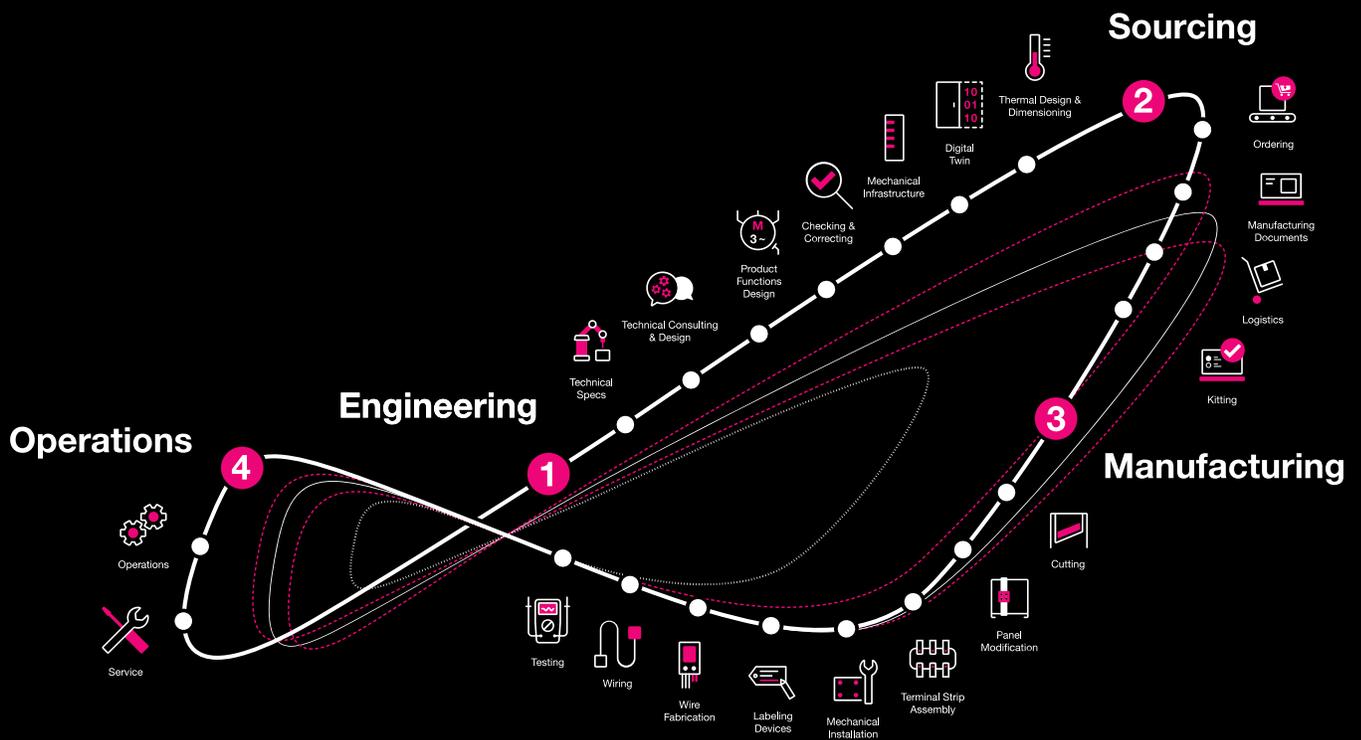
Rittal's Automotive Solutions Suite of enclosures, climate control systems, IT network/server cabinets, busbar power distribution, and industrial automation solutions help automotive manufacturers embrace opportunities for simplified production practices and address challenges, such as:

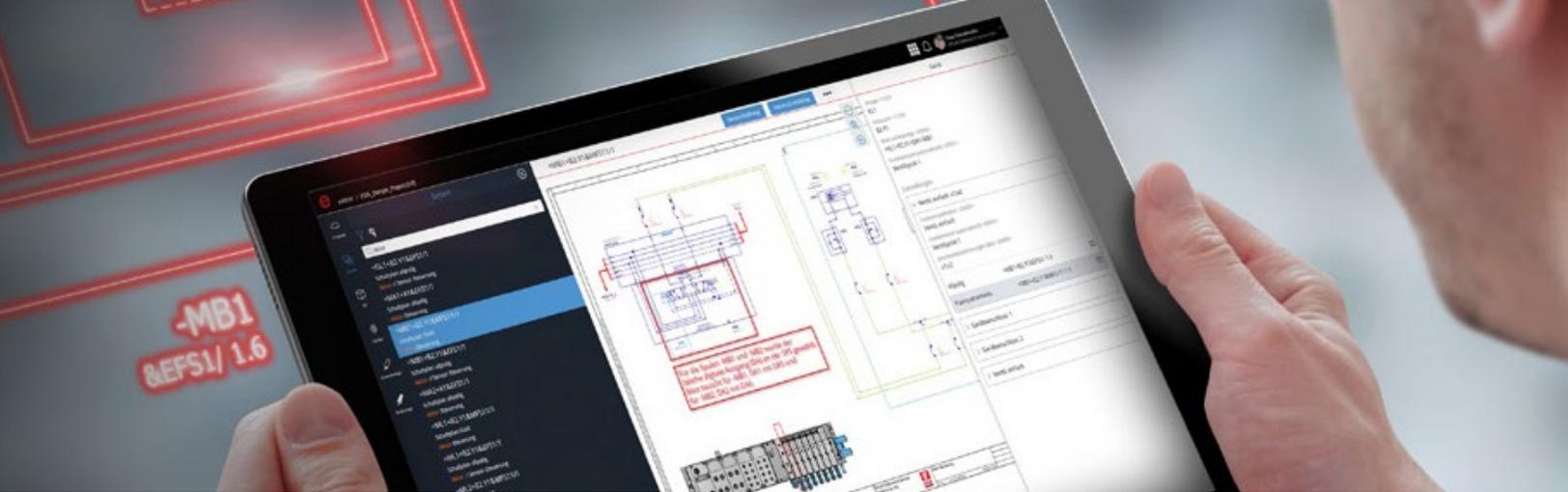
- **Automation:** The integrated planning, production, modification, and deployment of critical plant infrastructure such as enclosures for both industrial control systems and IT deployments, climate control, and busbar power distribution creates a more visible production cycle to identify redundancies, streamline workflows, and reduce enclosure space, energy consumption, and production costs.
- **Industry 4.0:** IoT-enabled devices create a smart production facility where decisions and plans are made in a proactive as opposed to a reactive manner for greater degrees of flexibility and agility, readying companies for shifts in demand or production variables.
- **Energy efficiency:** Increased automation means more electrical components, which need to be kept at stable temperatures for optimal performance. Securing energy-efficient climate control solutions helps facilities lower their carbon footprint — and their costs.
- **Electric vehicles:** A global shift toward electric vehicles is forcing automotive manufacturers to reconfigure their production lines to account for differences in the design and engineering of electric cars.
- **Plant regulations:** Whether by country or region, the geographic diversification of automotive manufacturing presents compliance challenges in a range of areas, from manufacturing conditions and equipment specifications to energy consumption and safety protocols.
- **Supply chain management:** Sourcing the necessary components to keep global manufacturing centers operating at peak efficiency without downtime is critical to ensuring the stability and viability of the value chain.
- **Global competition:** As new markets emerge and develop, new consumers are demanding more of the automotive industry's attention, so competition in the automotive manufacturing space includes new and motivated producers from around the world.

THE AUTOMATED PRODUCTION SEQUENCE

Rittal and EPLAN provide an industrial automation system that not only reduces the complexity of multi-stream production programs but also provides manufacturers with enhanced insight into their existing workflows to identify redundancies and optimize processes.

Rittal's optimized industrial automation production sequence allows manufacturers to seamlessly pass the proverbial baton between each stage of production in the relay race that is today's automotive industry. Each movement is coordinated with the next, leveraging Industry 4.0, IoT, modular thinking, and a data-driven philosophy to achieve true end-to-end efficiency.





THE PLANNING STAGE



EPLAN

The traditional panel-building and switchgear production process involves manual interventions and tasks that automotive plant engineers and integrators simply do not have the time or bandwidth to address. EPLAN's powerful line of computer-aided engineering (CAE) software offers holistic automation for panel building and switchgear manufacturing at each stage of the process, from design and material sourcing to engineering and modification.

- **EPLAN Electric P8:** CAE platform for electrical controls design — digitized project data forms the foundation for the automated creation of machine and plant documentation
- **EPLAN Pro Panel:** Design and build control cabinets, switchgear systems, and power distribution systems for energy supply, all in 3D
- **EPLAN Data Portal:** Integrated, web-based data portal with up-to-date device data from leading component manufacturers
- **EPLAN ePULSE:** Secure cloud solution connects data, projects, disciplines, and engineers worldwide in a collaborative environment
- **EPLAN Engineering Configuration (EEC):** Tool for designing and applying configuration interfaces and for automatically generating documentation
- **EPLAN Preplanning:** CAE software that enables you to capture engineering data from the start of the pre-planning phase, for example, the actuators and sensors for a plant, machine, or building
- **EPLAN Fluid:** Engineering tool for designing and automatically documenting the schematics for fluid-power systems with hydraulics, pneumatics, cooling, and lubrication requirements

EPLAN's powerful software makes it easier than ever before to create, store, share, and modify panel and switchgear schematics. This software leverages a component article database and digital twins to ensure that designs exist in a single place.



QUICK & EASY MODIFICATION

Rittal's network of rapid modification centers provide fast, precise, and custom modifications on a nationwide scale. Our modification centers work seamlessly in EPLAN's design suite to offer maximum visibility into the entire process from design to deployment in order to save both time and money. We use our own Rittal Automation Systems machines and tools to streamline the entire enclosure assembly process and ensure accuracy and quality, every time.

With modification centers and warehouses in Sparks, Nevada; Houston, Texas; and Urbana, Ohio, automotive manufacturers from coast to coast have access to Rittal Automation Systems Perforex machines for precise and cost-effective cuts, holes, drilling, and other panel modifications, as well as our large distribution network for quick delivery, regardless of your location.

5X Modification Program

Available to customers within 400 miles of our Houston Modification Center, our 5X Modification Program includes stainless and carbon steel wallmount and junction box modifications such as holes, tapped holes, and cutouts of up to 5 enclosures with a shipping time of less than 5 days.

primeXPRESS Program

With a turnaround time of just 15 days, the primeXPRESS Program offers holes, cutouts, and installation of accessories for a variety of enclosures and junction boxes including our popular wallmount enclosures like the AX and our freestanding enclosures such as the TS 8 in both stainless and carbon steel.

Rittal Automation Systems

Designed to streamline the entire enclosure assembly process, Rittal Automation Systems' tools and machines increase the accuracy and repeatability of such manual tasks as machining and wire processing to improve the quality of enclosure assembly and help ensure enclosed electronics operate at optimal levels.

PRODUCTS DESIGNED FOR **INDUSTRIAL AUTOMATION**

WALLMOUNT ENCLOSURES

Stainless and carbon steel WM/JB construction provide the maximum durability and protection for the electronic components inside the enclosure. The brand new AX/KX line of industrial enclosures is designed with Industry 4.0 and IoT principles in mind to provide end-to-end efficiency for deployment in sophisticated industrial automation systems. This innovative design is available in both steel- and fiberglass-reinforced polyester offering increased cable density and a new packaging concept saving time and cost. NEMA and IP ratings are ensured through a secure locking system and foamed-in-place gasket. These enclosures come with mounting panel included and are made with best in industry optimum surface finish.



PRODUCTS DESIGNED FOR INDUSTRIAL AUTOMATION

FREE-STANDING AND MODULAR ENCLOSURE SYSTEMS

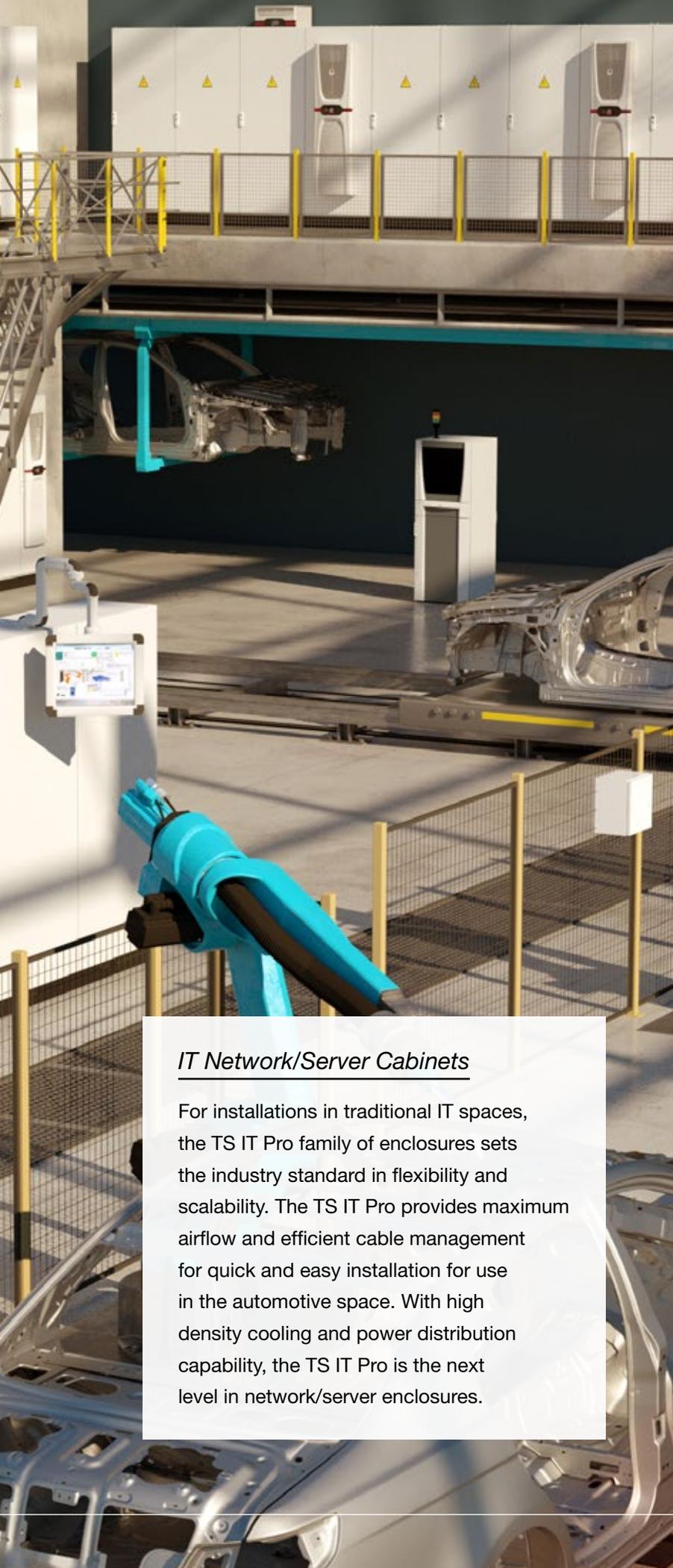
As production programs continue to diversify relative to consumer demands of the automotive market, manufacturers need to protect and secure more sophisticated wiring and electronic components to help power more varied production. Rittal's line of free-standing and modular enclosures provide more flexibility compared to unibody designs. UL 508A Certified flange mount disconnect enclosures, such as the TS 8, help to ensure arc flash safety and security with one simple switch as doors cannot be opened while the system is energized.

TS 8 Modular Enclosure System

The industry standard in modular enclosures, the TS 8 is available in both stainless and carbon steel material for use in harsh environmental conditions as well as in indoor/outdoor applications. With a maximum weight capacity of 3,000 pounds, 4X NEMA, and IP 66 rating, the TS 8 is a workhorse. Plus, buying options on all sides due to a robust 16-fold tubular frame system allow for easy integration, endless configuration, and ultimate scalability.

VX SE Freestanding Enclosure

When space is limited but a compact enclosure is too small, the VX SE non-disconnect enclosure provides the best of both worlds. With widths up to 1,800 mm and space-saving depths starting at 300 mm, the VX SE is available in both carbon and stainless steel and comes with a protection category up to NEMA 4/4X and IP 66.



IT Network/Server Cabinets

For installations in traditional IT spaces, the TS IT Pro family of enclosures sets the industry standard in flexibility and scalability. The TS IT Pro provides maximum airflow and efficient cable management for quick and easy installation for use in the automotive space. With high density cooling and power distribution capability, the TS IT Pro is the next level in network/server enclosures.

ENCLOSURE ACCESSORIES

To supplement the modularity and flexibility of Rittal enclosure systems, accessories such as enclosure walls and panels, door locks, interior fittings, task lighting, and cable routing help you customize the enclosure that is perfect for your application.

HMI (*Human Machine Interface*)

NEMA-rated carbon steel and stainless steel HMI consoles allow for process automation and the implementation of Industry 4.0 principles while providing durability and contamination prevention. NEMA 4/4X and IP 55 rated, Rittal carbon steel and stainless steel pushbutton boxes are engineered to protect equipment from dirt, dust, sprayed water, oil, and coolants.

BUSBAR POWER DISTRIBUTION

When it comes to future-oriented solutions for modern low voltage power distribution used in automotive applications, you are on the right track with Rittal busbar systems. RiLine is a flexible 60 mm system, assembly-friendly, time-saving, individual, and modular. Automotive production facilities will benefit from RiLine busbar technology as it is versatile for a wide range of applications, has individual modularity that can reduce overall enclosure size, and is tested for safe operation.

Rittal also offers RiLine Compact system for low amperage applications that is based on a board with integral circuit board conductors and a contact pitch pattern throughout. The board and all components are easily top-mounted; no tools required. Securing the components simultaneously helps ensure a secure electrical connection to the all-round shock-hazard-protected board. The contact pitch pattern of the RiLine Compact system allows the assemblies to be positioned wherever they are required.

CLIMATE CONTROL SYSTEMS

With an emphasis on automation, network connectivity, analytics, and actionable data, Rittal's climate control solutions offer automotive manufacturers more power and control over one of the most critical elements of their production facilities: maintaining efficient, consistent cooling for enclosures and electronics.

Air-to-water Heat Exchangers

Engineered for adaptive mounting capabilities such as those common in automotive production facilities, Rittal's air-to-water heat exchangers feature resistant and joint-free seals, water connection flexibility, and smooth external surfaces to reduce dirt and foreign contaminant build-up while allowing for maximum system productivity.

Cooling Unit Accessories

Rittal's complete line of climate control and cooling unit accessories, including filter fans, air routing, water cooling, climate mounting, spare parts, and communication integrations, provide the critical supplements necessary to deploy a fully-automated, energy-efficient cooling solution that curbs energy consumption and reduces cost.

Blue e+ Cooling Units (with IoT interface)

With carbon footprint reduction being top of mind in the automotive industry, Rittal's Blue e+ cooling units represent a quantum leap in terms of cost-effectiveness and energy conservation. Blue e+ reduces energy costs by an average of 75% due to hybrid technology that leverages both active and passive cooling. With remote monitoring and systems alert capability via the IoT interface, Blue e+ is the most energy-efficient climate control system on the market today.

Blue e+ Chiller Units

Blue e+ chillers are efficient, flexible, and compact. Up to 70% energy savings stems from speed-regulated components and inverter technology. UL 60335-2-40 Certified, international approvals, and multi-voltage capability make Blue e+ chiller units ideal for worldwide use. Intuitive operation using touch display and intelligent communication interfaces help ensure convenient operation and analysis.

TopTherm Fan Cooling

Engineered for tool-free mounting on surfaces, Rittal's TopTherm fan cooling units feature an ambient temperature range of -30 degrees to +55 degrees C along with air throughput from 20 - 900 m³/h. Standard IP 54 rating provides the necessary protection for deployment in the automotive space through the removal of dust and other airborne contaminants.

Air-to-air Heat Exchangers

Designed and engineered for wallmount deployment and ideal for use in the automotive space, Rittal's air-to-air heat exchangers are fully wired with controller and digital temperature control and display for precision in both cooling output and overall performance within a climate system.

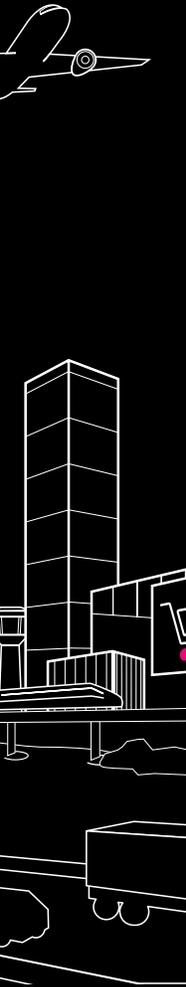


LIVING AT THE EDGE

The automotive manufacturing space can be an uncontrolled environment for IT equipment, especially if not protected against dust, fire, water, intrusions, or other ingress, all while constantly maintaining a properly cooled installation. In order to effectively ensure uptime and manage costs, embracing Edge Computing is the next logical step. Edge Computing provides manufacturers the ability to store and retrieve data with real-time processing, keeping critical data as close to the source as possible.

Edge Computing solutions benefit automotive manufacturers by reducing latency to help ensure uptime, as well as reducing energy consumption to minimize their carbon footprint and operational costs. The Edge deployment itself is a complete system built around sensors and optimizing data analysis to allow manufacturers to make informed, real-time decisions.





Edge Standalone Platforms

To support Edge computing and Industry 4.0, Rittal's Edge Standalone Platforms are pre-engineered solutions for deployment in every space that is not a data center. Using TS 8 enclosures, these systems include climate control (Blue e+ or LCP DX), UPS and PDUs, CMCIII monitoring and control, and DET AC fire suppression subsystems. Packaged within enclosures for higher levels of environmental protection against dust, dirt, water, and other contaminants. Edge Standalone solutions are designed to be deployed in the harshest installation environments.

Liquid Cooling Package

Whether the need be single or multi-rack deployment, organizations are turning to liquid cooling solutions to eliminate the risk of IT failure with high density deployments at the Edge. Liquid cooling is one of the most efficient and cost-effective ways to remove heat. Rittal's direct expansion in row liquid cooling package (LCP DX) removes heat directly from one or two adjacent IT network/server cabinets. The LCP DX uses sealed cabinets to help ensure cold air is not wasted in spaces where it is not needed and all hot air is captured and removed.

Blue e+ Air Conditioners

When managing large production facilities with complex infrastructure, energy-efficiency delivered by the Blue e+ air conditioners contributes significantly to the bottom line. When used in combination with the IoT module, Blue e+ technology allows facility managers to centralize their monitoring and controls, as well as provide predictive insight into the system performance and future requirements.

CMC III/ Security & Monitoring

Edge installations are often in remote, secluded locations without the multi-layer physical security found in traditional data centers. Rittal's Computer Multi Control (CMC) provides remote web-based monitoring on intrusion, environmental conditions, and access control that seamlessly integrates with building management and industrial controls.

Power Distribution Systems (PDU)

Rittal's wide range of power distribution systems (PDU) allows manufacturers to select the appropriate product from basic to managed power distribution units with tool-less installations in the zero-U-space.

EXPLORE SOLUTIONS



Whether you're upgrading your enclosures, evaluating your climate control options, or opening a new automated plant, leverage Rittal's industrial automation expertise to outfit your facilities with industrial automation solutions engineered for automotive.

Explore our solutions at [RITTAL.COM](https://www.rittal.com)

Rittal – The System.

Faster – better – everywhere.

- Enclosures
- Power Distribution
- Climate Control
- IT Infrastructure
- Software & Services



Rittal North America LLC

Woodfield Corporate Center
425 North Martingale Road, Suite 400 • Schaumburg, Illinois 60173 • USA
Phone: 937-399-0500 • Toll-free: 800-477-4000
Email: rittal@rittal.us • Online: www.rittal.com

Rittal Systems Ltd.

6485 Ordan Drive • Mississauga, Ontario L5T 1X2 • Canada
Phone: 905-795-0777 • Toll-free: 800-399-0748
E-Mail: marketing@rittal.ca • Online: www.rittal.ca

Rittal Mexico

Dr. Roberto Gayol 1219-1B • Col. Del Valle Sur, 03100 • Mexico, D.F.
Phone: (+52) (55) 5559-5369 • Toll-free: 01 800 8 Rittal (748.825)
E-Mail: info@rittal.com.mx • Website: www.rittal.com.mx

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