

Electronics²

Kontron sets new standards
Development | Prototyping | Production | Assembly

Discover the advantages – Get to know us



kontron
The Power of IoT

Electronics²

»Where ideas take shape,
electronics emerge that move markets
– developed and manufactured within
a strong global network.«

Manfred Hois
Vice President Sales Electronics²



Electronics²

One partner. One network. From idea to solution.

Electronics is key to reliable products, efficiently controlled processes, and secure data flows. Whether in industry, mobility, communications, energy, medical technology, defense, or other demanding markets, electronics is a central factor for competitiveness and future viability. Good ideas therefore need a partner who can turn technical concepts into market-ready products and scalable series production.

That is what Electronics² stands for: an integrated service offering from a single source and a partnership based on equality. The service brand brings together the expertise of Kontron, KATEK, Ennoconn and beflex, A Brand of Kontron, in development, industrialization, and manufacturing. This creates an integrated offering for you that supports electronics projects from the initial concept through series production and beyond.

Our locations in Europe, Americas and Asia, provide a strong foundation. You benefit from proximity to markets, shorter routes, more resilient supply chains, and production where it makes the most sense strategically, economically, and sustainably.

Electronics² combines ODM, EMS, and an in-house product portfolio. We develop and industrialize electronic assemblies and systems on behalf of customers and efficiently transfer them to series production. In this way, engineering know-how and process technology expertise work together seamlessly.

Rapid prototyping is an important building block in this process: initial functional samples and near-series prototypes are created quickly and precisely, enabling ideas to be tested, improved, and reliably industrialized. The subsequent manufacturing process is considered from the outset and scaled appropriately, from low-volume/high-mix production to high-volume series with more than one million units per year.

Modern placement lines and processes, automated inspection and test concepts, a high level of vertical integration, and end-to-end traceability ensure reproducible quality. Depending on product requirements, assembly, system integration, and suitable conformal coating complement the manufacturing process.

We consider security from the very beginning. Connected products require robust processes, secure infrastructures, and a clear understanding of requirements such as NIS2, the Cyber Resilience Act, and ISO/IEC 27001. This enables us to combine manufacturing expertise with future-proof security.

I invite you to think ahead with Electronics² on your electronics projects - with a focus on reliable implementation, scalable solutions, and long-term competitiveness.

Manfred Hois
Vice President Sales Electronics²



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Electronics² – Creating synergies for your projects

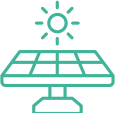
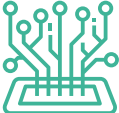
By combining our strengths and acting as one,
we create significant value for our customers.
We leverage synergies, develop innovative
solutions faster and produce volume products
more cost-effectively.





Electronics² – A strong network for development, production and innovative solutions

- Hardware development of electronic components and devices
- Software development for automation, communication and visualization
- Mechanical design with state-of-the-art development tools
- Product industrialization from prototype to series production
- Highest quality manufacturing services
- Stringent quality and functional testing
- Final assembly of complex assemblies and devices

 IoT/Industry 4.0	 Mechanical Engineering	 Medical Technology	 Building Services Technology	 Automotive	 Aerospace
 Telecommunication	 Environmental Technology	 Office Technology	 Electronics	 Laboratory Technology	 Home Appliance Technology
 Consumer Electronics	 Defense	 Space	 Railroad		

Certificates and mandatory norms

We maintain the highest quality standards through consistent quality management and extensive certifications.

Quality is our calling card, and we operate on the basis of a well-internalized, continually audited quality management system. Our **ISO 9001:2015 Certification** demonstrates our commitment to transparent business operations and thoroughly documented processes across all business segments. We pledge to live up to these values, continually review and develop them, and comply with statutory and administrative obligations at all times.

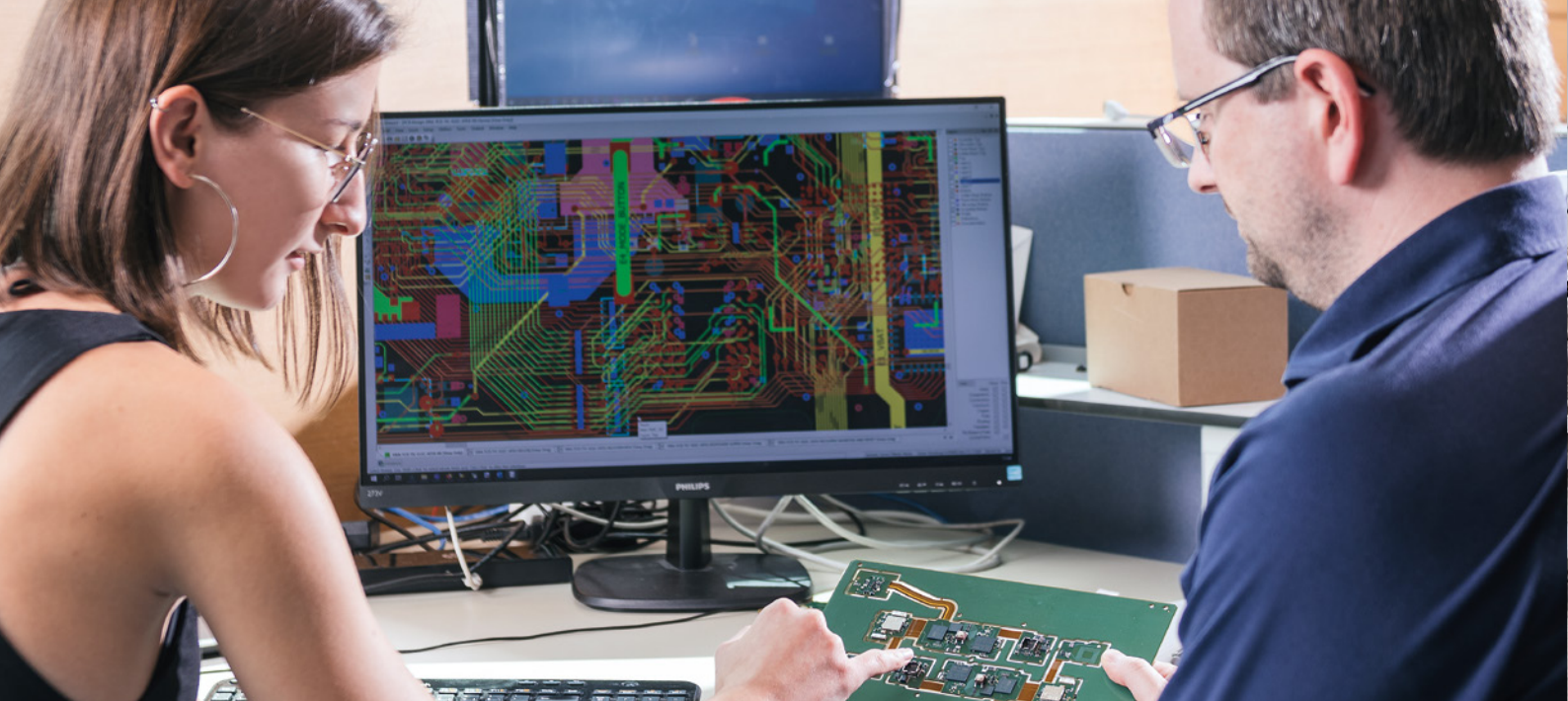
By virtue of our commitment to the environmental management norm **DIN EN ISO 14001**, we assume responsibility for ecological conservation. We define targets for sustainable and resource-saving projects and processes.

The **EN ISO 13485** standard complements our quality management system with the specific requirements of the medical technology sector. It covers quality-related processes in the development and manufacture of customized components and products and supports the consistent implementation of applicable regulatory requirements.

IATF 16949, a globally recognized standard for quality management systems in the automotive industry, expands our certification portfolio. It covers all aspects of quality management, including product development, manufacturing and customer service.



- All facilities are ISO 9001 certified
- **ISO 14001, ISO 13485, UL, Apple MFI**
Kontron Electronics GmbH, Germany, Hungary
 - **ISO 13485, ATEX-DIRECTIVE 2014/34/EU, UL, Apple MFI**
Kontron Austria GmbH, Austria
 - **ISO 14001, ISO/IEC 27001, AS/EN 9100**
Kontron d.o.o., Slovenia
 - **ISO 14001, IATF 16949, ISO 13485, ISO 50001**
Kontron Europe GmbH, Germany, Bulgaria
 - **Avionics Maintenance and Repair Organisation, Augsburg Reference: DE.145.0092**
Kontron Europe GmbH, Augsburg, Germany
 - **ISO 13485, ATEX, ISO 14001, IATF 16949, ISO 50001, ISO 45001**
KATEK GmbH, Germany, Hungary and Czech Republic
 - **ISO 14001, IATF 16949, ISO 50001**
Kontron Automotive GmbH, Düsseldorf, Germany
 - **ISO 14001, IATF 16949, ISO 50001, ISO/IEC 27001, TISAX**
Kontron eSystems GmbH, Leipzig, Germany
 - **ISO 13485, AS9100D, ITAR Registered**
Nextek, Inc., USA
 - **ISO 13485, ISO 14001**
Kontron Canada Systems Inc., Canada



Product development

We turn your ideas into reality

Our many years of development experience, combined with our expertise in the latest components and processes, are a guarantee of your success. Based on your product specification, we develop and optimize your product and transfer it into series production. When designing assemblies, we focus on the proactive selection of components with long-term availability and on a modular, flexible circuit concept that makes it easier to replace discontinued components throughout the product life cycle.

We are there to support you when you need construction advice, help with generating CAD layouts or defining specifications for components and design. In addition to a wide array of testing methodologies, we develop and manufacture test equipment for electronic validation of your components. Our EMC lab ensures full compliance with the relevant guidelines and regulations throughout the development process.

Our focus lies on these key industry sectors: Mechanical engineering, automation, transport, home appliance technology, building services engineering, environmental engineering, electric mobility, gateways, IoT devices and medical technology.

Hardware

- › Product specification
- › Circuit design
- › Layout design
- › Commissioning

Software

- › Real-time software
- › Linux BSPs
- › Applications programming
- › Web technology

Mechanics

- › Industrial design
- › 2D/3D construction
- › Plastic/metal
- › Tool procurement

Product industrialization

- › Prototype construction
- › EMC lab
- › Conformity measurement
- › In-house test equipment manufacturing

Electronics Prototyping

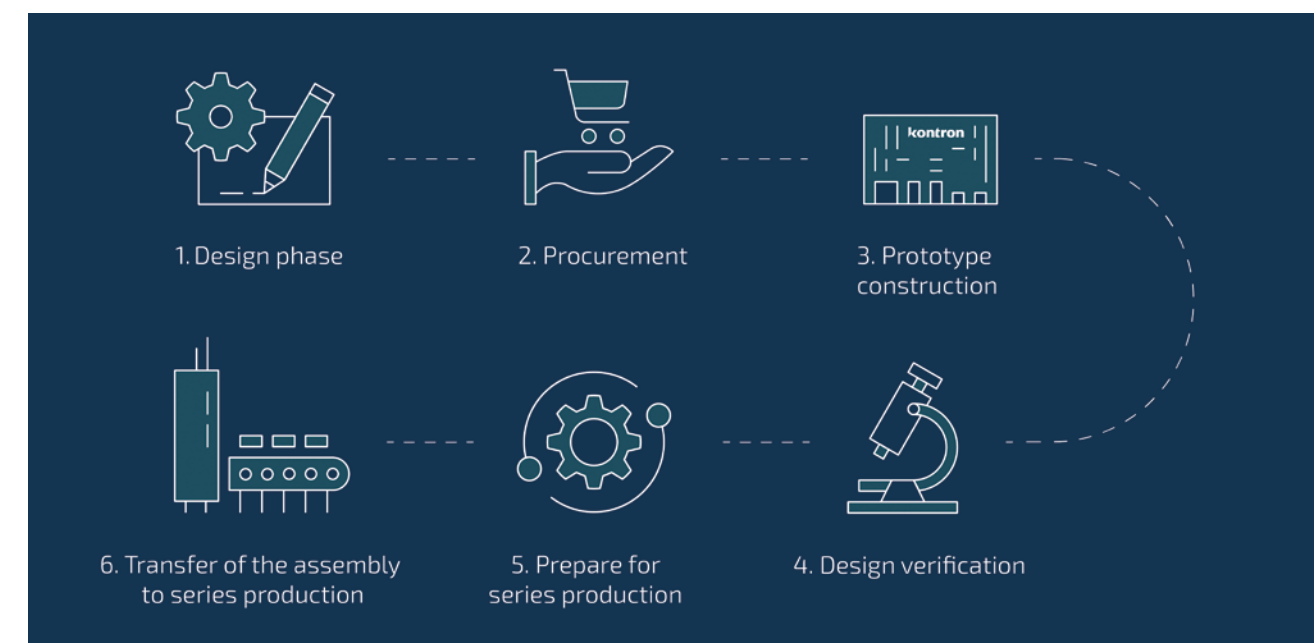
The direct route to a market-ready solution

Prototyping is a key component of developing innovative electronics. It allows new ideas and concepts to be tested and refined under real-world conditions at an early stage. This approach reduces development time and costs while ensuring the quality of the final product from the outset.

Take advantage of personal technical consulting and our comprehensive services to shorten development times and minimize project risks. Bring your products to market faster and more securely.

Our service portfolio

- › Rapid Prototyping & Prototyping
- › Samples starting at 1 piece
- › Layout design
- › Obsolescence management
- › New product introduction
- › Inline test procedures
- › Test equipment construction and development
- › Production network





Electronics manufacturing and final assembly

Quality and precision at every stage of production

As an experienced provider of electronics services, we deliver maximum competence in a wide range of manufacturing procedures. We offer a broad scope of services for your entire component assembly, from circuit board mounting to various soldering processes, application of protective coatings and final assembly. We are pleased to support you with our technology expertise, develop ideas and solutions for your prototypes and assist you in bringing your product to series maturity. We are the trusted partner at your side.

Assembly technologies

- › SMT technologies
- › THT assembly

Soldering processes

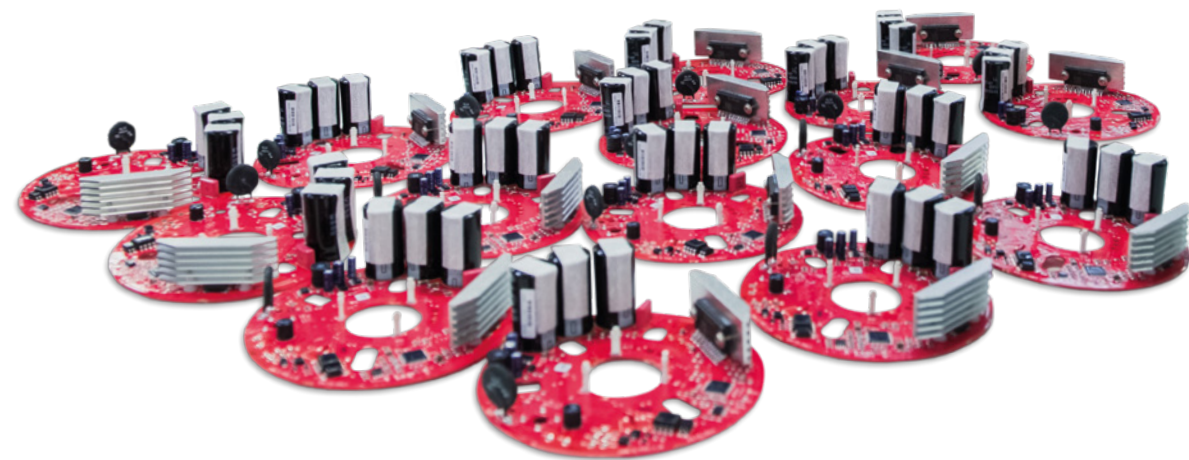
- › Reflow soldering
- › Wave soldering
- › Selective soldering

Surface protection

- › Coating
- › Nano coating
- › Potting

Final assembly

- › Electromechanical assemblies
- › System integration
- › Box build



Small-series production

Using modern technology and our experience, we manufacture small batch sizes efficiently and with precision, ideal for innovative projects, pre-series and custom-made products.

- › **Maximum flexibility:** Product adjustments can be made at short notice
- › **Fast market entry:** Rapid implementation and series production launch
- › **Lower risk:** Low capital commitment, quantity-based procurement
- › **Cost-effective implementation:** Customized solutions for small batch sizes

Medium-volume production

For medium-volume production, we combine efficiency with a high degree of flexibility, which is ideal if you are looking for the right production method between small and large series.

- › **Optimal cost-benefit ratio:** Attractive cost structure thanks to scaled processes
- › **Reliable quality:** Proven processes and continuous quality control
- › **Agile production management:** Rapid response to changing market demand
- › **Global purchasing network:** Security of supply and competitive prices

Large-scale production

Our automated production lines and strict quality standards ensure cost-effectiveness and reliability, guaranteeing you sustained market success.

- › **Automated production lines:** Maximize cost efficiency with state-of-the-art process automation
- › **Integrated quality management:** Consistently high quality in every batch
- › **Optimized logistics processes:** Short lead times and reliable delivery capability
- › **Global production:** Flexible manufacturing options through Kontron's locations in Europe and North America and Ennoconn's production capabilities in Asia.



Testing and programming

Modern technology and maximum quality

All electronics components, modules and systems produced by Kontron are subjected to strict functional and quality testing. For us, secure recognition of potential errors is an absolute prerequisite for optimal production quality.

Thanks to our many years of experience in developing and building test equipment and based on our own custom testing infrastructure, we ensure that components are validated in strict compliance with customer specifications.



Inline inspection procedures

- › SPI solder paste inspection
- › 3D AOI automated optical inspection

End-of-line testing processes

- › ICT in-circuit test
- › FPT flying probe test
- › FKT function test
- › BST boundary scan test
- › High-voltage test
- › X-ray

Test equipment development and construction

- › Testing according to customer specification
- › Own test infrastructure
- › Test software development
- › Hard- and software development

Traceability

- › Traceability on component and process level
- › Process data monitoring and archiving

Special services

- › Prototyping
- › Cleanroom production
- › Pressfit
- › Cable assembly



Maintenance and services

We are optimally equipped

Benefit as a customer from our global supplier network and the advantages of large procurement volumes within the Kontron Group. We are ideally positioned to handle the immense range of requirements, components and production technologies that our customers bring to us.

Our service scope encompasses a wide range of tasks along the entire product lifecycle. Each and every day, we do our best to fulfill your expectations.

»Our SCM and global sourcing teams connect with our suppliers in the closest possible way. Our customer focus and clearly defined delivery channels ensure efficient supply, especially in times of shortage and crisis.«



Thomas Ebner
CPO

Material management

- › Kontron global sourcing, worldwide demand consolidation and direct price negotiations with manufacturers
- › Direct support of all leading semiconductor manufacturers
- › Global network of suppliers
- › On-site staff in the most important procurement markets

Product lifecycle management

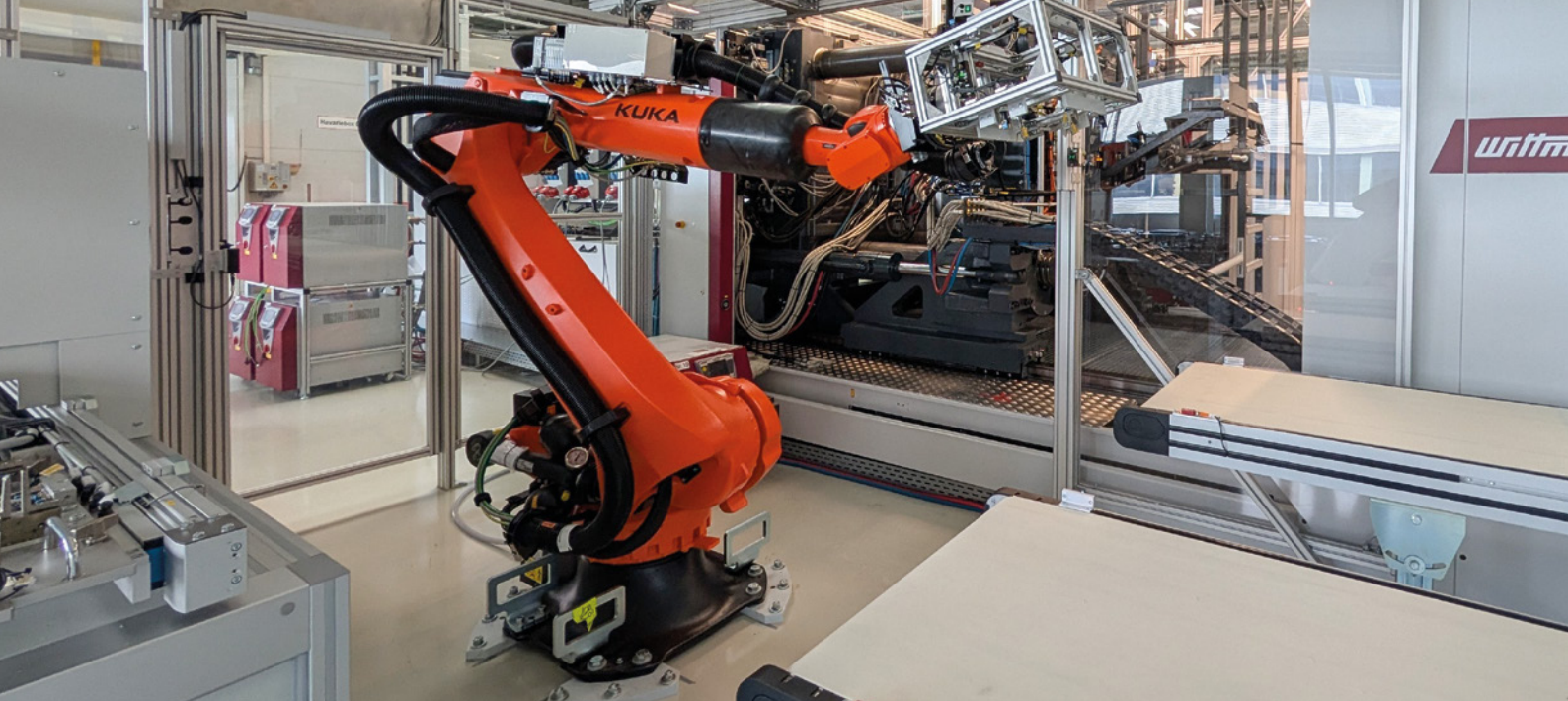
- › PCN process, EOL monitoring, sourcing, and stocking of discontinued parts
- › Search for and testing of alternative components
- › Connection to silicon experts
- › Long-term storage of components with nitrogen

Logistic concepts

- › Consignment stock for a flexible and needs-based supply
- › Kanban
- › Rolling forecast
- › Security stocks

Repair service

- › Repair in cases of warranty and services
- › Technical support



Plastics processing

Injection molding enables the cost-effective production of technical plastic components in consistently high quality, from functional and housing parts to visible components. Precise mold design, automated processes, and complementary methods such as ultrasonic welding or heat staking provide the basis for complex assemblies from a single source.

Your benefits at a glance

- › Manufacturing of technically demanding plastic components
- › Cost-effective production from small to large series
- › High flexibility in component size, geometry, and surface design

Cable assembly

Cable assembly is suitable for applications with custom design requirements, short lead times, and high functional reliability, even in demanding environments. Flexible manufacturing capacities, comprehensive testing processes, and coordinated workflows help reduce supply chain complexity and ensure consistently high product quality - from concept to delivery.

Your benefits at a glance

- › Custom cable assemblies according to customer specifications
- › Flexible manufacturing for short response times
- › Tested quality for reliable connections

Ultrasonic welding

Ultrasonic welding is ideal for applications with high production volumes, short cycle times, and reproducible joining results. Since no additives are required and thermal stress on the component remains low, the process supports efficient, resource-saving series production. Precise parameterization, process monitoring, and tool coding enable reliable documentation and validation of joining results.

Your benefits at a glance

- › Fast, reproducible joints
- › Low thermal stress
- › No additives required



Metal systems

Our manufacturing capabilities cover modern machining and processing technologies for sheet metal, enclosure, and system solutions - from CNC punching, combined punch-laser processing, CNC bending, welding, CNC milling, and aluminium profile processing to the assembly of complete systems.

Your benefits at a glance

- › Manual and automated welding processes for precise joints
- › Processing of aluminium profiles, including sawing, punching, and milling
- › Digital printing and screen printing directly on metal surfaces



Electronics²

– Development, Prototyping,
Production, Assembly

	Kontron Europe GmbH, Germany, Bulgaria	Kontron Electronics GmbH, Germany, Hungary	Kontron Electronics GmbH, beflex – Rapid Prototyping, Germany		KATEK GmbH, Germany, Hungary, Czech Republic	Kontron eSystems GmbH, Germany	Kontron Automotive GmbH, Germany	Kontron Austria GmbH, Austria	Kontron d.o.o., Slovenia	Nextek Inc., USA	Kontron Canada Systems Inc.	
Development services												
Hardware	✓	✓			✓	✓		✓	✓		✓	
Layout	✓	✓	✓		✓	✓		✓	✓		✓	
Software	✓	✓			✓	✓		✓	✓			
Mechanics	✓	✓			✓	✓		✓	✓		✓	
Development and construction of test equipment	✓	✓	✓		✓	✓	✓	✓	✓	✓		
Production services												
SMT assembly	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	
Number of SMT assembly lines	12	5	1		11	10	6	5	4	4	5	
Number of Prototype lines			4			1		1		3	1	
Wave soldering	✓	✓			✓	✓	✓	✓	✓	✓	✓	
Selective soldering	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	
Pressfit	✓	✓			✓	✓	✓	✓	✓	✓	✓	
Plastics processing						✓						
Cable assembly	✓								✓		✓	
PCB cleaning	✓	✓	✓		✓	✓	✓	✓	✓	✓		
Inline inspection procedures												
SPI solder paste inspection	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	
3D AOI automated optical inspection	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	
Testing process												
ICT in-circuit test	✓	✓	✓		✓	✓	✓	✓	✓		✓	
FPT flying probe test	✓		✓		✓	✓	✓	✓		✓	✓	
FKT function test	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	
BST boundary scan test	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	
High-voltage test	✓	✓	✓		✓	✓		✓	✓		✓	
Test and quality												
Traceability	✓	✓			✓	✓	✓	✓	✓	✓	✓	
Cleanroom			class 8									
X-ray	✓				✓	✓	✓	✓	✓	✓	✓	
Surface protection												
Coating	✓	✓			✓	✓	✓	✓	✓	✓	✓	
Thick-film coating	✓	✓			✓	✓	✓	✓	✓		✓	
Nano coating	✓				✓	✓		✓	✓			
Potting	✓	✓			✓	✓		✓	✓	✓		
Assembly												
System assembly for complex devices and systems	✓	✓	✓		✓	✓		✓	✓	✓	✓	
Box Build	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	
Production volume												
Large-scale production					✓	✓	✓				✓	
Medium series	✓	✓			✓	✓	✓	✓	✓	✓	✓	
Small series	✓	✓	✓			✓		✓	✓	✓	✓	
Prototyping	✓	✓	✓		✓	✓		✓	✓	✓	✓	
Rapid Prototyping			✓							✓	✓	

	Ennoconn, Kunshan, China	Ennoconn, Shenzhen, China	Ennoconn, Penang, Malaysia	Ennoconn, Binh Duong, Vietnam	
Development services					
Hardware	✓				
Layout	✓				
Software	✓				
Mechanics	✓				
Development and construction of test equipment	✓				
Production services					
SMT assembly	✓	✓	✓		
Number of SMT assembly lines	5	4	10		
THT production line	4	2	3		
Final assembly lines	9	8	10	6	
Prototype lines	✓	✓	✓		
Wave soldering	✓	✓	✓		
Selective soldering	✓		✓		
Pressfit	✓		✓		
Plastics processing	✓		✓		
Cable assembly	✓		✓		
PCB cleaning	✓	✓	✓		
Inline inspection procedures					
SPI solder paste inspection	✓	✓	✓		
3D AOI automated optical inspection	✓		✓		
Testing process					
ICT in-circuit test	✓	✓	✓		
FPT flying probe test	✓	✓	✓		
FKT function test	✓	✓	✓		
BST boundary scan test	✓	✓	✓		
High-voltage test	✓	✓	✓		
Test and quality					
Traceability	✓	✓	✓		
Cleanroom	class 8		✓		
X-ray	✓	✓	✓		
Surface protection					
Coating	✓	✓	✓		
Thick-film coating	✓	✓	✓		
Nano coating	✓		✓		
Potting	✓		✓		
Assembly					
System assembly for complex devices and systems	✓	✓	✓	✓	
Box Build	✓	✓	✓	✓	
Production volume					
Large-scale production	✓	✓	✓	✓	
Medium series	✓	✓	✓	✓	
Small series	✓	✓	✓	✓	
Prototyping	✓	✓	✓		
Rapid Prototyping	✓	✓	✓		



Electronics²

– Global network, regional strength in Asia

Asian development and manufacturing capabilities for global customer projects.

Ennoconn strategically expands the Electronics² portfolio with additional development and manufacturing capacities in Asia. This gives customers who are already active in the region, seeking to enter new markets or aiming to internationalize their manufacturing strategy, a broader range of options. They benefit from access to established regional supplier networks, extensive technical expertise and high-performance production structures.

At the same time, proximity to suppliers, manufacturing facilities and target markets enables closer coordination, shortens lead times and makes it easier to respond to requirements and market changes at an early stage. When

products are manufactured for the Asian market, shorter regional routes can also reduce logistics requirements and delivery times. Depending on the product, volume and target market, projects can therefore be implemented in line with specific needs across the international network.

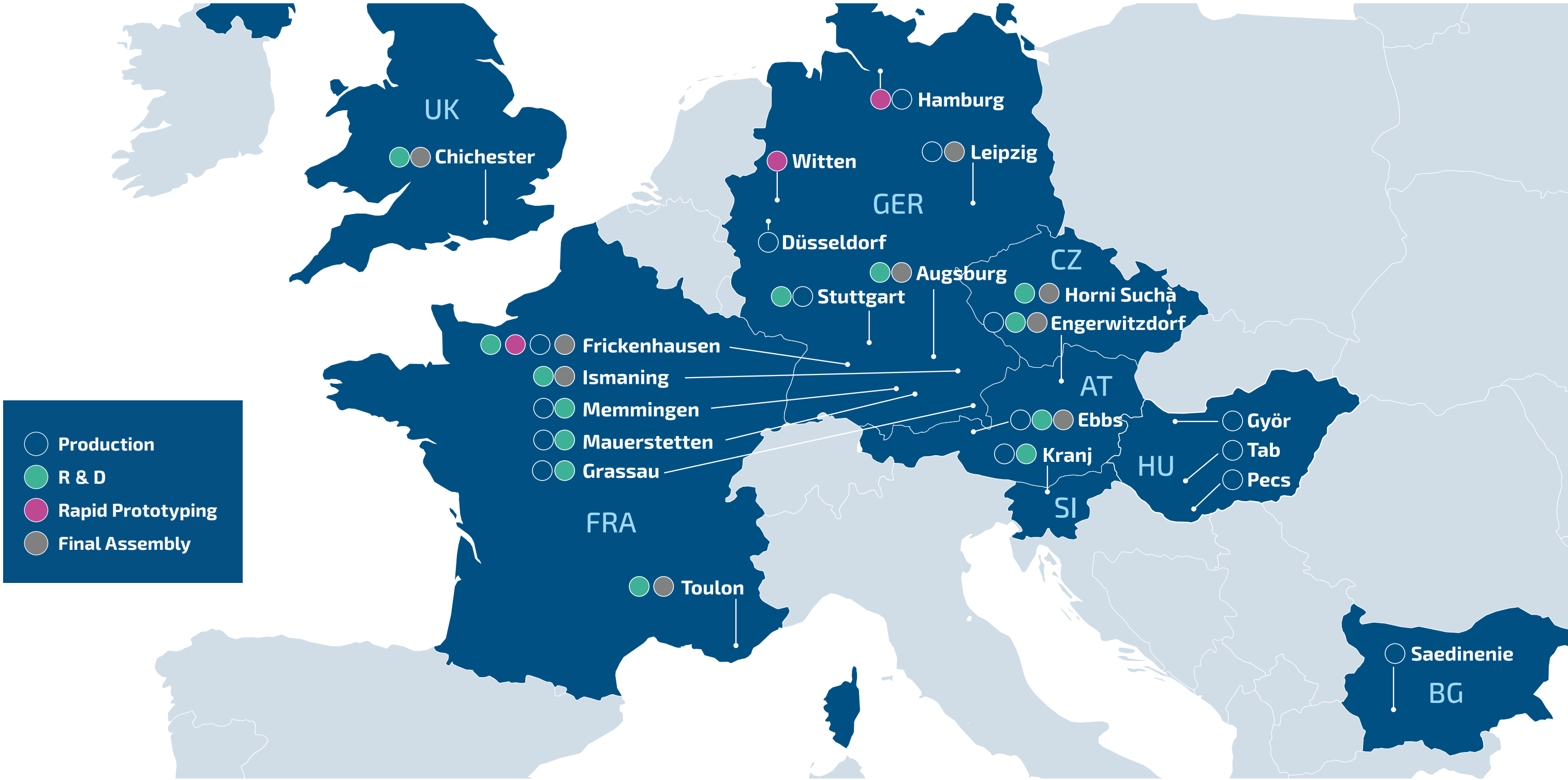
Customers benefit from a local presence and aligned structures. The combined expertise of the locations provides the foundation for flexibly addressing a wide range of project requirements.

Electronics²

– Development, Prototyping,
Production, Assembly

A strong global network: Electronics² connects specialized locations worldwide, technical expertise, and industrial manufacturing capabilities – delivering comprehensive end-to-end solutions across the entire product lifecycle.

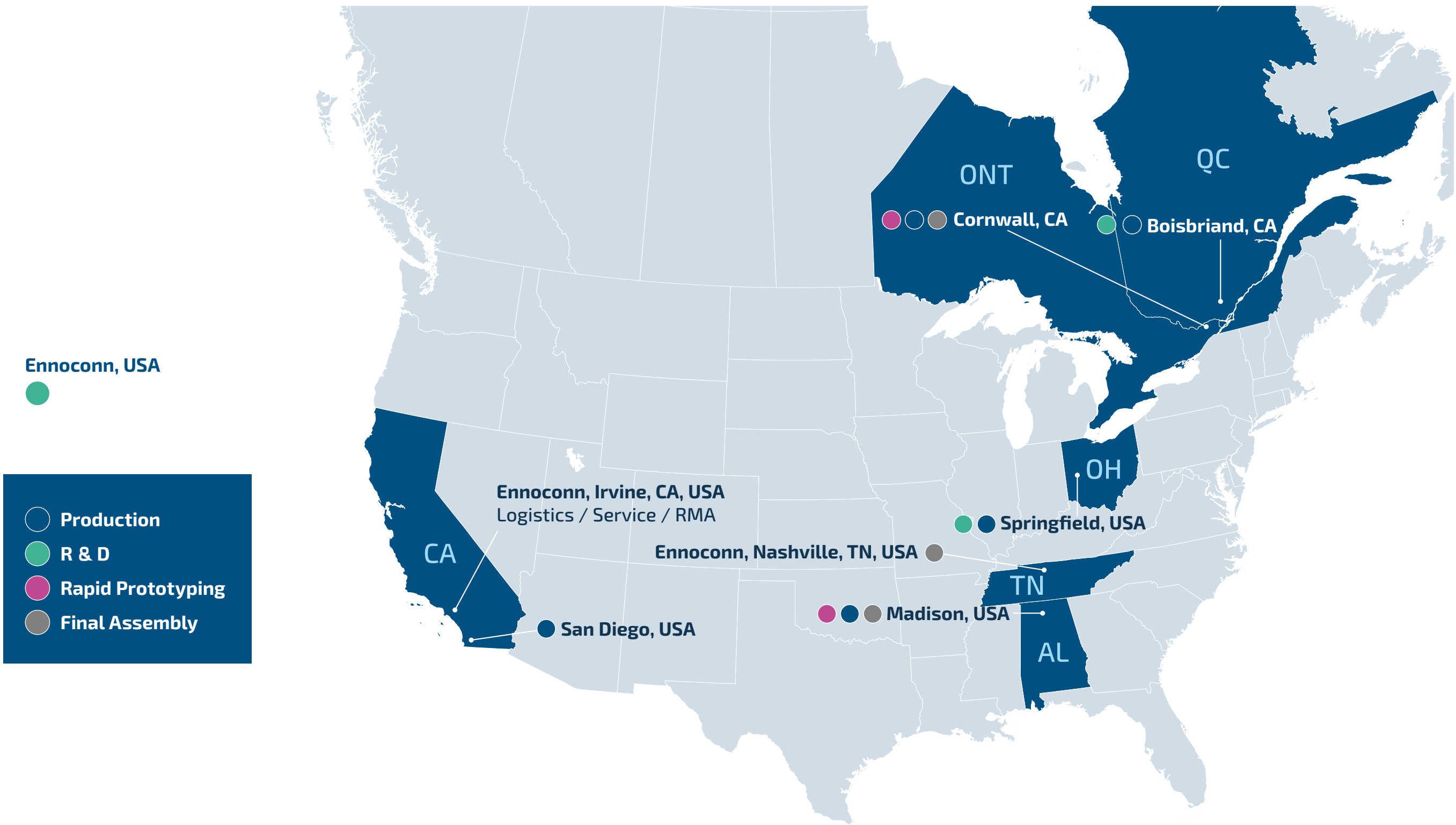
The map illustrates the global presence of our network and shows where we reliably support customer projects around the world.



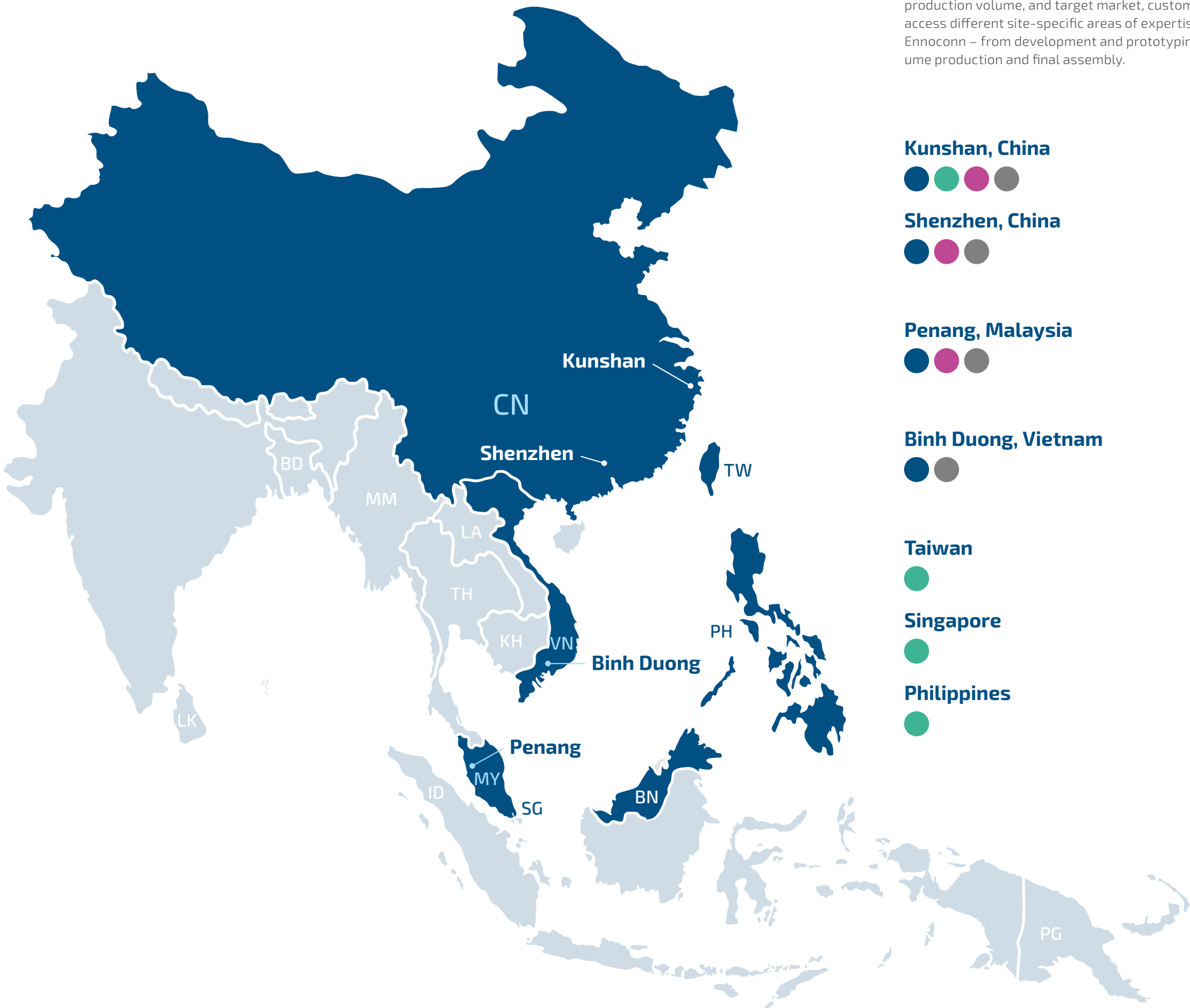
Electronics²
– Development, Prototyping,
Production, Assembly

Electronics² also has a strong presence across the Americas with high-performance locations. In combination with our European network, this creates short lines of communication, pooled expertise, and flexible structures for international customer projects.

In this way, we combine regional proximity with global strength - supporting our customers across markets, time zones, and continents.



Electronics²
– Development, Prototyping,
Production, Assembly



In Asia, Ennoconn strengthens the global Electronics² network through development and manufacturing sites. Depending on product requirements, technology, production volume, and target market, customers can access different site-specific areas of expertise within Ennoconn – from development and prototyping to volume production and final assembly.

This allows projects to be implemented strategically where the right economic, logistical, and regional conditions are in place. Customers benefit from a flexible, scalable network that combines regional proximity, industrial capabilities, and international implementation expertise.

Kunshan, China



Shenzhen, China



Penang, Malaysia



Binh Duong, Vietnam



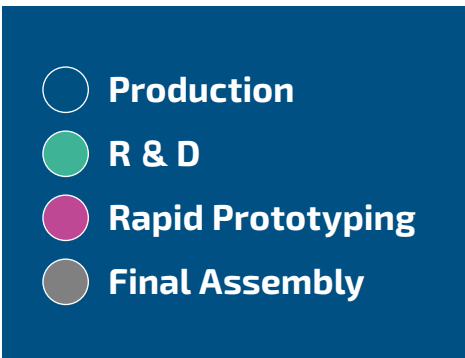
Taiwan



Singapore



Philippines





Electronics² – Your advantages at a glance

- › **Low volume/high mix to very high volume/low mix**
As a leading electronics service provider, we cover the entire spectrum – from prototypes to small and medium series through to high-volume series production.

› **Network of electronics service providers**
With locations in Europe, Americas and Asia, we are ideally positioned to meet the needs of our customers locally.

› **Active site selection**
We will advise you on which location best meets your requirements.

› **Internal second source**
We offer maximum supply security in the event of production downtime. Thanks to site-independent redundancy, we are able to ensure resilient production.

› **Lifecycle analysis and management**
We use SiliconExpert forecast data to help you determine the optimum time for your new design or redesign.

› **Product and cost analysis**
Our experts offer solution-oriented advice on how to reduce costs when selecting components and manufacturing processes in order to achieve the best result for you.
- › **Logistics concepts**
Our solutions include consignment stock, Kanban, rolling forecast and safety stock to ensure your continuous supply.

› **Secure supply chains**
Take advantage of our global purchasing network. We avoid supply bottlenecks through forward-looking planning and strategic partnerships.

› **Consistent quality management and comprehensive certifications**
We ensure that the highest quality standards are maintained and that your requirements are always met.

› **One-Stop-Shop for comprehensive solutions**
Comprehensive development and manufacturing services as well as standard products, from modules to complete systems. Software from secure operating systems to complex applications. Industry-specific solutions for future markets such as solar energy, eMobility, 5G communication and transportation.

Through targeted investments in our production landscape and the integration of KATEK and beflex – Rapid Prototyping, we have consistently built-up Electronics².

With Ennoconn's international manufacturing capabilities, we are now significantly expanding our portfolio and creating a globally scalable network with even greater reach.

This enables projects to be implemented strategically wherever the right economic, logistical, and regional conditions are in place. Our customers benefit from the combination of local presence, industrial capabilities, and international execution strength.

With Electronics², the Kontron Group and Ennoconn are combining their expertise to create a powerful offering in the international ODM/EMS market - with a clear focus on quality, innovation, and reliability.

I invite you to discover Electronics² as a strong partner for the successful implementation of your projects worldwide - today and in the future.

Hannes Niederhauser
CEO Kontron AG

Your Powerhouse for Electronics Solutions.

»Development and manufacturing are matters of trust. That's what we stand for with our name and reputation – now and in the future.«

Your direct contact for Electronics² ODM/EMS project inquiries
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