The LEONI Group
Intelligent solutions for energy and data management

LEONI is a global provider of products, solutions and services for energy and data management in the automotive sector and other industries. The group of companies, listed on the German MDAX index, has more than 86,000 employees in 31 countries and generated consolidated sales of EUR 4.9 billion in 2017.

LEONI’s largest customer group comprises the global car, commercial vehicle and component supply industry. LEONI furthermore supplies products and services to these markets: data communication & networks, healthcare, process industry, transportation, energy & infrastructure, factory automation, machinery & sensors as well as marine. An integrated network for research & development, production as well as distribution and service gives customers the assurance of tailor-made support at more than 90 locations around the globe. LEONI operates as a solutions provider with pronounced development and systems expertise.

Innovative solutions based on development and systems partnership
Especially in the automotive industry, LEONI offers substantial added value to motor vehicle manufacturers in both technological and commercial terms by being an innovation partner based on profound understanding of the overall system and by being involved in the early stages of development. In addition to standard and special cables as well as custom-developed wiring systems and related components, the Company’s offering also includes software solutions and such services as architecture design and simulation. LEONI concentrates its automotive research and development work on the sector’s major trends such as electromobility, autonomous driving and connectivity – enhanced by lightweight construction solutions, multi-voltage and function integration, but also by logistics and engineering expertise.

Digital transformation thanks to intelligent products and smart services
LEONI pursues the aim of becoming a leading solutions provider of intelligent systems for the megatrends of energy transmission and data management. To achieve this, the Company’s offering will in the future also include intelligent cables, cable systems and components – which is gaining importance particularly in the wake of digitalization and the development of fail-safe systems with a high level of connectivity. The Company is consequently enhancing its know-how in such fields as electronics, sensor technology and big data, and provides such customised smart services as predictive maintenance and error analyses.

The digital transformation within LEONI manifests itself in digital processes and software expertise, which is used, for instance, to implement more automated production. Together with international customer networks and strategic partnerships, this is creating new, digital business models – individually tailored to customers’ requirements.

For further information, please visit www.leoni.com
LEONI Engineering Products & Services, (LEONI EPS), part of LEONI AG, is the Americas’ leading provider of automated industrial solutions. Our unique position as a leader in automation specialized in robotic cable management solutions, machine vision integration, automation systems training, and more means LEONI EPS is uniquely positioned to help our customers reach operating efficiency and production of quality products needed for achieving world-class manufacturing.

Whether it’s defining an original specification; designing, installing, and servicing the automated solution; or empowering operators and technicians to achieve new levels of quality and productivity, LEONI EPS is your solution provider.

Robotic solutions
More than just manufacturing award-winning robotic technology such as the TCP robotic tool calibration system, LEONI EPS assists manufacturers to improve throughput and uptime with our best-in-class dress pack (LSH 3) and cable management systems. When combined with on-site programming and unparalleled training solutions, LEONI EPS helps your robotic solutions reach new heights of productivity.

Machine vision
The science of machine vision can help reduce assembly costs while boosting yields and quality, among other critical KPIs. LEONI EPS was the first Certified Systems Integrator (CSI) in the Americas and has more Advanced-Level Certified Vision Professionals than any other machine vision integrator. Let LEONI EPS develop your next machine vision solution, or leverage our engineers at your facility to develop your next in-house quality assurance solution.

Services, experts, maintenance, and more
Like any complex solution, robot workcells, machine vision solutions, and PLCs all need regular check-ups to guarantee optimal performance. LEONI EPS provides automation contract services to serve the needs of manufacturers and line builders worldwide. Have an emergency? Our service experts are on call around the clock. Need to fill a programming or machine vision engineer gap? LEONI will make sure you have the expert staff on the line every day to guarantee productivity, over the short term or long term. At LEONI, customer service never stops.

Automation systems training
As leaders in automation, LEONI EPS understands that the best automated solutions do not carry just one company’s brand. Robots from this OEM need to speak with PLCs from a different vendor, across multiple industrial network protocols. That’s why LEONI EPS is the only automation training supplier that takes a system-level approach that goes far beyond an OEM’s training manual.

Our systems-level approach empowers trainers, engineers, technicians, and maintenance personnel to make sure that your lines operate at peak productivity, while our pre-class employee skill audits allow us to leverage your employees’ existing knowledge to assess training needs and minimize costs. Our proven results are part of the reason why LEONI EPS is a certified learning institution in the state of Michigan.
Robotic Solutions
Expertise in robotic cable management systems and integration-ready robots

Industrial robots are designed to work 24/7/365, but they need a controller running the correct software to guide them; the proper hoses, tubes, and dress packs to feed them, sensors to calibrate them and knowledgeable programmers and maintenance personnel to keep them running.

That is where LEONI EPS’ robotic solutions expertise can help your robot to realize its full potential. Leverage our experience optimizing, installing, and maintaining robots in virtually every industrial segment to make sure your next robot project is a success.

Robot cables, hoses and tubes
As the world’s largest manufacturer of specialty hoses and cables, LEONI’s robot solutions use only the best components. From LEONI’s tube-fit PUR-line of general-purpose robot hoses to specialty hoses such as our FR-line of flame retardant tubes for welding applications, and profile-line tubes for robot dispensing, LEONI not only manufactures the finest robotic cables, hoses, and tubes, we also use them in our industry-leading LSH 3 dresspack and cable management solutions.

LSH 3 robot dress pack minimizes downtown
LEONI’s LSH 3 dress pack is the toughest, smartest and most compact guided robotic dresspack for routing robot cabling and tooling lines available in the industry today. Don’t be fooled by imitators, LEONI’s LSH 3 uses only the most durable materials, manufactured to highest quality requirements, and tested for optimized performance.

LEONI recently developed a cable management system for an automotive manufacturing dispensing application. Life-Cycle testing has exceeded 500,000 cycles without any failures – and that’s for one of the “dirtiest” jobs in the automotive sector.
**Function packages: Integration-Ready Robots**

With LEONI’s leading global position as a supplier of robot solutions and services, it is no surprise that some of the world’s largest OEMs trust LEONI to prepare their robots for the plant floor.

Our Function Package service begins with your basic robot. We install the dress package, end-of-arm tooling, weld controller, dense pack, electrical junction box, and other ancillary systems required by your specific application. We optimize the dress pack to maximize your uptime, configure the controller, set up, and test the end of arm tooling (EOAT) software, and calibrate the system for operation or install optional Tool Center Point (TCP) automated calibration solutions as requested. When we’re done, your Integration-Ready Robot is ready to go to work at maximum efficiency.

We have the capability to provide you with complete Function Packages – e.g., for spot and laser welding, inert gas welding, vision-guided robotics, measuring, and handling, among many other robot applications. And with our cross-discipline team of automation engineers and expert technicians, we’ll make sure your Integration-Ready Robot is ready to work with existing equipment on your line.

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**Without LEONI**

1. Robot
2. Robot controller

**With LEONI**

Integration-Ready Robots = LEONI Function Packages

1. Robot
2. Robot controller
3. Robot dress pack
4. Robot end of arm tooling
5. Power and media supply
6. Programming service
7. Installation and setup service
8. PLC/HMI controller
9. Media panel
Machine Vision

Turnkey custom solutions provided by advanced-level Certified Vision Professionals

In any automated environment, the quality of a product is the determining factor for a company’s success. At LEONI EPS, we believe machine vision is the solution to bridging the gap in automation between the quality that is expected and the quality that is actually achieved.

As an industry-leading machine vision integrator, we develop machine vision solutions across industries such as automotive, aerospace, food and beverage, consumer packaged goods (CPG), and general manufacturing markets.

LEONI’s machine vision team regularly solves the most challenging machine vision inspection, assembly verification, robot guidance, and other applications; while maintaining a user-friendly interface for future updates by the customer.

How do we do it?
LEONI’s machine vision solutions engineers start with in-depth front-end analysis and an engineering feasibility study to build a well-informed foundation for the vision solution design. Then we design, commission, document, and train your operators on your custom solution using the best machine vision hardware and software for your application – not our partner’s software or a preferred hardware provider.

Why LEONI?
- First Certified Systems Integrator named by AIA.
- More advanced-level Certified Vision Professionals (CVP) on staff than any other machine vision integrator.
- Machine vision is a science, not an art. LEONI uses engineering and simulation to ensure your application and system will succeed.
- Certified school of learning and training by the state of Michigan.
- Agnostic approach to machine vision software and hardware means you get the tools that are best for your application, not a “one-size-fits-all” solution.

Application types
Our knowledgeable staff of Certified Vision Professionals (CVP) specializes in turn-key solutions for the following application types:

- **Robot guidance:** Positioning of the robot using a vision-based solution – Reduction of hard tooling and labor costs
- **Defect detection:** Inspection of the quality of an object (i.e. cracks, porosity, voids, etc.) – Improvement of quality and reduction of scrap
- **Assembly verification:** Verification of manual or machine assembly of objects
- **Part identification:** Identifying the correct part is present and tracking the item through the assembly process (e.g. Optical Character Recognition (OCR), Datamatrix, 1D Barcode, etc.) – Full scale traceability of manufacturing / assembly process
In addition to developing custom machine vision solutions, LEONI also offers packaged solutions such as the Wheel & Tire Validation System. This system prevents mismatched wheel/tire combinations, simplifies changeover and new-model training, and provides 3D and 2D surface analysis for key features. The system can perform multiple inspection tasks for both wheel and tire, including wheel style, diameter, color, and center cap placement, as well as tire tread pattern (2D or 3D), sidewall, diameter, tire width/height, D.O.T., and text checks – just to name a few. The system can store more than 100 wheel models and combinations, is compatible with industrial Ethernet, and comes with full documentation and training.

**Wheel & Tire Validation System**

**Wheel identification features**
- Style
- Diameter
- Color
- Center cap

**Tire identification features**
- Tread pattern (2D identification and 3D analysis)
- Tire dimensions: tread width, sidewall height, overall height, inner diameter, etc.
- D.O.T. code – record and/or validate
- sidewall text validation

**System overall validation results**
- Balance ID mark alignment
- Wheel/tire/TPMS/logo/feature orientation
- Center cap (color/style/orientation)
- Gloss finish identification (high/medium/low-gloss finish)

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**advintec TCP – robot tool calibration and protection system**

Designed for rotation-symmetric tools, such as weld heads inarc, spot, and stud welding applications, the TCP measures the tool’s position electronically across in three dimensions, including rotation around each axis. This automated tool position-detection system prevents customers from having rejects or being forced to rework due to tool wear, inadvertent contact with nearby objects and tool changeover, thereby ensuring 100 percent production quality and reducing costs.

**Advantages at a glance**
- No manual adjustments to programs or associated downtime
- Hassle-free production-line integration
- High process reliability
- No additional PCs required
- Automatic logging of calibration-data
- Data evaluation possible at any time
Automation Systems Training
System-level training customized to meet your needs

As a manufacturer, your most valuable resources are your employees and their ability to recover from errors and downtime. LEONI automation systems training's approach to training is designed to make sure your employees get the knowledge they need in the least amount of time to keep productivity high.

We train systems, not products
LEONI automation systems training takes an unbiased systems approach to give your employees the knowledge they need to be successful.

LEONI’s custom approach to automation systems training realizes that one training program does not fit the need of every student. Before we begin, LEONI instructors research your organization’s needs, including:

- Student demographics (engineers, electricians, operators, maintenance technicians, skilled-trades)
- Existing and proposed automation equipment (PLCs, robots, presses, variable frequency drives (VFD), machine controls, HMIs and safety systems)
- Existing applications and processes (robotic welding, sealing material handling, press operation, material handling, etc.)
- The specific needs of your industry and application (automotive packaging, casting, forging, heavy equipment, aerospace, wastewater treatment, general manufacturing, etc.)
- Ways to measure success, including hands-on lab exercises, testing, and task verification.

Example of LEONI’s systems training overview with our total systems approach.
Custom curriculum, mobile workcells, at your place, or ours
After developing the curriculum you need, LEONI works with its clients to find the right compromise between training time and uptime. To reduce the time away from the plant, LEONI can perform training at the client’s location or in our professional classrooms. We will construct mobile workcells if necessary so that production can continue while new technicians are trained. Whether LEONI trains your employees or just your trainers, you can be confident that your program is best-in-class thanks to LEONI’s certifications as an official learning institution by the state of Michigan.

Applications
- Material handling
- Spot and arc welding
- Advanced material joining technologies (flow-drill screw, riveting, clinching)
- Dispense
- Waterjet cutting
- Laser applications
- Thermal plasma spray coating
- Drilling
- Polishing
- Grinding
- Machine vision
- Stamping and press systems

Industries served
- Automotive
- Aerospace
- Metal and plastic processing, stamping, forging, fabrication, molding
- Municipal water systems (water and wastewater); CEC certified and accredited in Michigan and Wisconsin
- Paper processing
- Food, beverage, and packaging industry
- General and heavy manufacturing

Training facility at LEONI Engineering Products & Services, Inc. in Lake Orion, MI.

Our customers’ needs come first, which is why we only develop custom training programs, delivered at your site or at our training facility.
Service, Repair and Maintenance
Experience on-call, gap coverage, over-the-shoulder or anywhere in between

Regular maintenance for your automation systems translates to maximum uptime for your robot, machine vision, and PLCs. Let LEONI’s experienced engineers, programmers, and technicians keep your systems in tip-top shape. We can monitor your existing work cells, provide preventive maintenance checkups, identify problems before they happen and offer service and support in the event of a fault.

Service runner for robots, machine vision
LEONI’s Service Runner program was developed as an enhancement to our project-based service response teams. Under LEONI’s Service Runner program, our technicians will support you at your plant on an ongoing basis based on your needs, providing system checks, preventive maintenance, programming optimization and other services on an as-needed basis.

Our Service runners support your own maintenance work, while helping to expand their expertise on automation systems with additional service pointers, training, and insight on critical equipment and processes.

Over-the-shoulder program: expert advice on demand
Starting up a new line or installing a new machine vision system or robot workcell? Let LEONI engineers take the worry out of commissioning and start-up by working hand-in-hand with your technical staff to make sure everything goes smoothly. In need of on-the-spot training or long-term skill acquisition? Our Over-the-Shoulder experts don’t just fix the problem, they teach your staff how to troubleshoot the problem and develop the best solution.

Programming services for robotics, controls, engineering, and production support
As part of an integration-ready robot or as a separate service, our experienced technicians can provide the robot and PLC programming you need for any work cell installation from assembly to welding. As a trusted outfitter and dress pack supplier for all the major robot lines, including KUKA, FANUC, ABB, Motoman, Kawasaki, and Reis, our technicians can optimize your cycle times. And our pay-for-performance contracts take the risk out of outsourcing your robot programming.

LEONI Robotic Solutions is the right partner for your robot programming as well as optimization needs. We are very well versed in the programming of common robot types. The following applications belong to our areas of expertise:

- Assembly
- Deburring
- Gluing
- Handling

- Integration of measuring and inspection systems
- MIG/MAG
- Riveting/clinching
- Spot welding
When it comes to state-of-the-art automation equipment, your plant network and cabling infrastructure needs to be ready for increasingly complex bus systems that have to enable communication from the supervisory control system down to the actuator/sensor level. As more channels are added to accommodate all this data transmission, cables are getting more sophisticated too.

LEONI’s factory automation and drive specialists realize that data and communication complexity must go hand-in-hand with assurance and reliability of production and safety equipment. And at the most basic level, this means performance and reliability of the cable carrying all these electrical and optical signals.

Automation & drives cables
- Industrial Ethernet/PROFINET cables
- PROFIBUS cables
- DeviceNet cables
- CAN bus cables
- USB/FireWire
- Feedback cables
- Power cables

Specialized properties
- Flame retardant
- Weld splatter resistant
- Highly flexible
- Permanent installation
- Halogen free
- Silicon free
- Sunlight resistant
- Oil resistant
- Cold resistant
- Chemical resistant
- Trailing cable up with up to 10 million bending cycles
- RoHS compliant