

AUTOMOTIVE



# Production Solutions for the Automotive Industry

**Pioneering, intelligent and future-oriented**



## Manz AG – PIONEER FOR INNOVATIONS

Manz has been an internationally demanded automation specialist for more than 30 years. With "passion for efficiency", we drive key technologies in growth markets. We combine our extensive expertise and experience in technology fields such as automation,

assembly, lasers and metrology to create pioneering production solutions for the automotive industry. We continuously develop and refine these solutions – making a significant contribution to our customers' success.

### Manz AG

Established 1987  
Headquarters in Reutlingen, Germany  
Additional branches in  
Slovakia, Hungary, Italy, China, Taiwan,  
the United States and India

### Core technologies

- Automation
- Assembly
- Lasers
- Inspection Systems

### Employees

approx. 1,400 employees worldwide,  
including around 500 engineers



**NEW: functional printing**  
Industrial high-end inkjet solutions  
with outstanding print quality  
for the automotive industry

## Our portfolio for the automotive industry: solutions that drive the market

WITH INCREASING DIGITIZATION AND RAPID FURTHER DEVELOPMENT IN THE DIRECTION OF E-MOBILITY, THE AUTOMOTIVE INDUSTRY IS FACING MAJOR CHALLENGES. OUR AIM IS TO ACTIVELY CONTRIBUTE TO THIS PROGRESS AS A DEVELOPMENT PARTNER AND PIONEER IN THIS FIELD. WE FOCUS PARTICULARLY ON INTELLIGENT AND INTEGRATED PRODUCTION SOLUTIONS FOR VARIOUS COMPONENTS IN THE SEGMENTS OF AUTOMOTIVE ELECTRONICS AS WELL AS ELECTRIC POWERTRAIN.

As competent technology and process experts for the automotive industry, we bundle competencies from all areas – such as inspection systems, assembly solutions, and laser applications – **into tailor-made and customer-specific production solutions for:**

- Li-Ion Battery cells and battery modules
- Cell-contacting systems
- Battery management systems and inverters
- Displays
- Electronic components and controllers
- Sensors and cameras for assistance systems

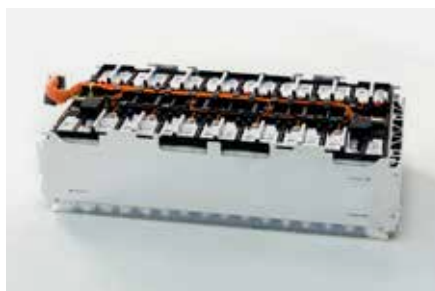
In our modular production lines, we integrate and combine a wide range of technologies: from assembly, ultrasonic welding, bonding and soldering to laser welding and automated function tests.

In this way, we support OEMs and their suppliers in optimizing their production processes and making them more efficient using our machines and equipment.

We are taking targeted steps to expand our process and technology portfolios, offering our customers new opportunities to realize components even more quickly, easily and more cost-effectively.



World's leading production systems for manufacturing lithium-ion battery cells and modules, as well as (super) capacitors and components for the electric powertrain.



Fully automated production systems for cell-contacting and battery management systems are another focus for the e-drive sector.



Our automotive portfolio also includes production systems for displays, electronic components and controllers, as well as sensors and cameras for assistance systems.

## Manufacturing solutions for the mobility of the future

WITH INCREASINGLY EFFICIENT PRODUCTION SYSTEMS FOR CENTRAL COMPONENTS OF THE ELECTRIC POWERTRAIN, MANZ SUPPORTS THE AUTOMOTIVE INDUSTRY IN ITS TRANSFORMATION TOWARD E-MOBILITY.



### OUR AUTOMATION SOLUTIONS ENSURE

- Improved process and resource efficiency
- Reduced production and per piece costs
- Optimized process precision
- Investment security
- Shorter time to market
- Increased performance parameters for the final product

E-mobility plays a key role in the development of new mobility concepts and in achieving climate targets. The sales figures for electric cars are rising steadily. Overall, however, the market is not yet showing the expected growth momentum. This is due to the comparatively high price of electric cars and the fact that their range is still not entirely satisfactory in the eyes of customers.

Using creative and innovative engineering, we are working hard on production solutions that improve performance parameters and reduce costs for e-batteries.

**Automation, digitization, integration and scalability of production processes play a key role.** This is our area of focus, as we work systematically to make our production equipment even more high-performing, improving the efficiency of our customers' manufacturing processes.

# Systematically increase performance parameters in battery production

MANZ AG IS ONE OF THE LEADING SUPPLIERS OF PRODUCTION EQUIPMENT FOR LI-ION BATTERY CELLS, MODULES AND PACKS AS WELL AS CAPACITORS. WE HAVE BEEN SETTING GLOBAL STANDARDS IN THIS FIELD FOR MANY YEARS.

With our technology portfolio for the production of a wide range of different battery cells – from wound button cells to stacked pouch cells – we play a major role in the continued development of lithium-ion battery technology.

Thanks to our efficient production processes for stacked and wound battery cells, we are creating cell structures that are increasingly more stable and precise. The effects on the battery's performance parameters are correspondingly positive. In addition to high process precision, our modern automation systems for increasing throughput have also significantly reduced production costs.

## OUR PRODUCTION PORTFOLIO

- Production solutions for cylindrical, prismatic or pouch battery cells
- Machines and systems for manufacturing wound or stacked battery cells
- Production solutions for battery electric vehicles (BEV), plug-in hybrid electric vehicles (PHEV), and hybrid electric vehicles (HEV)



Highly efficient systems for battery cell and module production.

		SLITTING/ NOTCHING		CUTTING			STACKING						
		Laser	Mechanical	Drying	Laser	Mechanical	Single Sheet Stacking	Flat Winding & Winding	Lamination	Tab Welding	Packaging	Filling	Pre-formatting
E-Mobility	Pouch and Prismatic	Manz	Manz	Manz	Manz	Manz	Manz	Irrelevant in the process	Manz	Manz	Manz	Manz	Manz
	Cylindrical	Manz	Manz	Manz	Manz	Manz	Manz	Irrelevant in the process	Manz	Manz	Manz	Manz	Manz

■ Manz  
■ Irrelevant in the process



# Our modular assembly platform *LightAssembly* – made just for you

ESPECIFICALLY FOR THE NEEDS OF THE AUTOMOTIVE INDUSTRY, WE HAVE DEVELOPED HIGH-PERFORMANCE PRODUCTION SOLUTIONS BASED ON OUR MODULAR *LightAssembly* PLATFORM THAT ENABLE THE GREATEST POSSIBLE FLEXIBILITY, RELIABILITY AND COST-EFFICIENCY.



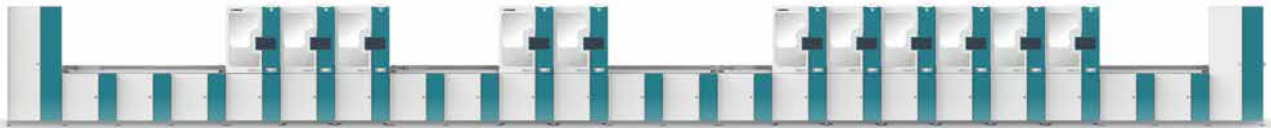
THE STAND-ALONE VERSION  
Manz *LightAssembly* FOR ASSEMBLY

Process modules for manual loading and unloading



THE BASIC MODEL  
Manz *LightAssembly* FOR ASSEMBLY

Loading and unloading unit, transport conveyor, two lifts and one process station



ONE EXPANSION OPTION – Manz *LightAssembly* FOR TESTING AND ASSEMBLY:  
Loading and unloading unit, transport conveyor, two lifts, multiple process stations and stations for parts matching, inspection, labeling and quality assurance. Adaptable to the needs of the specific customer.

The *LightAssembly* platform accelerates and simplifies complex assembly and process steps thanks to intelligent end-to-end automation of work steps. **Its strengths come to bear particularly in manufacturing of components for the electric powertrain.**

In the production of batteries or cell-contacting systems, for example, *LightAssembly* links very different and highly demanding processes into a single, perfectly orchestrated process chain, from goods receiving to processes like ultrasonic welding, screwing, laser welding and final quality control.

*LightAssembly* can be individually configured based on a modular principle, and

scaled almost limitlessly for outstanding productivity, flexibility, and economic efficiency.

It covers all requirements: from single machines for laboratory production to systems for pilot, small and large-scale production, complete assembly lines and turnkey solutions for mass production.

## OUR SYSTEM PORTFOLIO INCLUDES:

- Prototypes/laboratory systems
- Individual systems
- Integrated production lines for pilot, small and large-scale series
- Turnkey solutions

## LightAssembly: Your advantages at a glance

*LightAssembly* COMBINES A VARIETY OF KEY ADVANTAGES: MAXIMUM FLEXIBILITY, OUTSTANDING PROCESS TECHNOLOGY AND EXCELLENT AVAILABILITY.



Produce cell-contacting systems  
highly efficiently and flexibly.

Read our insert "Production  
solutions for cell contacting systems.  
Innovative and forward-thinking."

### **FLEXIBILITY & SCALABILITY**

The modular concept allows users to freely configure production solutions to match their specific requirements: from laboratory machines to mass production, from manual work stations to fully automated assembly, and from single systems to fully-integrated production lines.

### **AVAILABILITY & RELIABILITY**

Tested technologies proven through use in countless customer projects, and the use of standard modules ensure fast delivery and commissioning as well as high availability.

### **SPEED & CONVERTIBILITY**

The modular design, software-controlled set-up and excellent integration capabili-

ty of the *LightAssembly* platform make it easy to adjust production to new requirements while saving time and money.

### **PROCESS RELIABILITY & QUALITY**

All of our applications are characterized by excellent process reliability. Seamlessly integrated, digitally controlled and monitored in real time, they ensure smooth production and outstanding quality.

### **DATA-BASED & NETWORKED PRODUCTION**

Data-based controls and evaluations increase throughput and profitability. The intelligent use of machine and operating data makes it possible to control process parameters even during production, in order to systematically improve machine capacity and performance parameters.

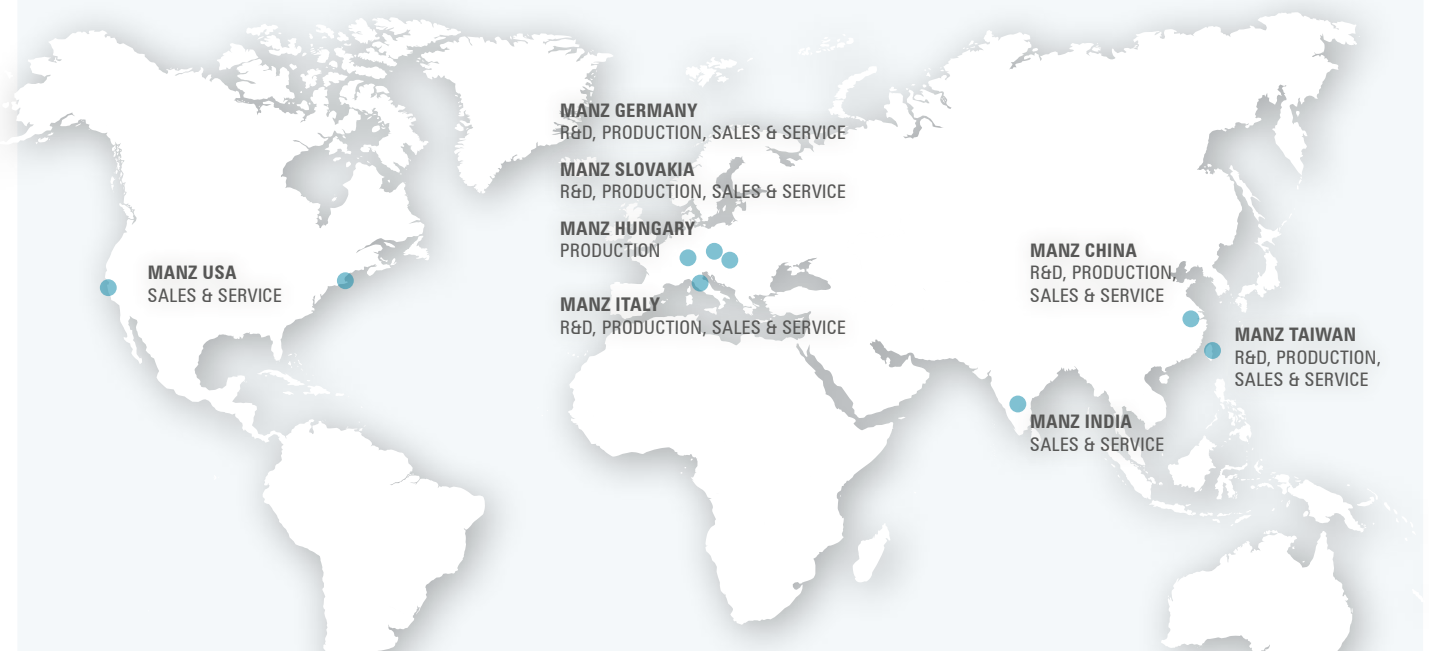
### **EVERYTHING FROM A SINGLE SOURCE**

Thanks to our extensive process expertise, we support you from the initial idea to the finished product, and are available to meet your needs during planning, project management, construction and installation. Set-up and commissioning of the system, user training, remote maintenance and after-sales service – with us, you get the entire range of services from a single source.

Founded in 1987, Manz AG is a global high-tech equipment manufacturing company.

In addition to the turnkey production line *CIGSfab* in the Solar segment, the company is paying special attention to the automotive industry in the Electronics and Energy Storage segments.

The corporate group, publicly listed in Germany since 2006, develops and produces its products in eight countries with roughly 1,400 employees.



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