

YOUR RELIABLE
PARTNER FOR
DEVELOPMENT AND
MANUFACTURING

- | Electronic Components
- | Interior Lighting Systems
- | Customized Connectors
- | Wire Harnesses



25 Years
since 1993

www.alacsystems.de



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”Do not spend any more time looking for the right product,
but the right partner for development and production.

Kay Naber
CEO, ALAC GmbH

CUSTOMER-ORIENTED PERSONAL AND SPECIALIZED

Our Team Members

Our mid-sized company has a flat hierarchy, ensuring an open environment for the exchange of ideas as well as flexibility and the ability to respond quickly to changing conditions.
Get in touch with our team members today and let us work together toward success!

We are proud Member of:



FROM **CONCEPT** TO **SERIES** **PRODUCTION**

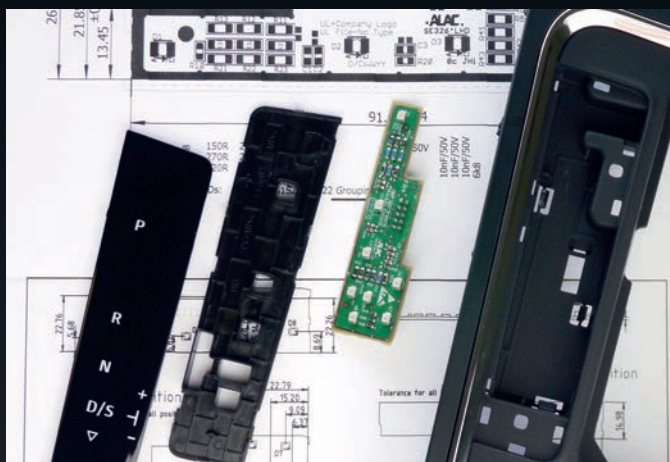
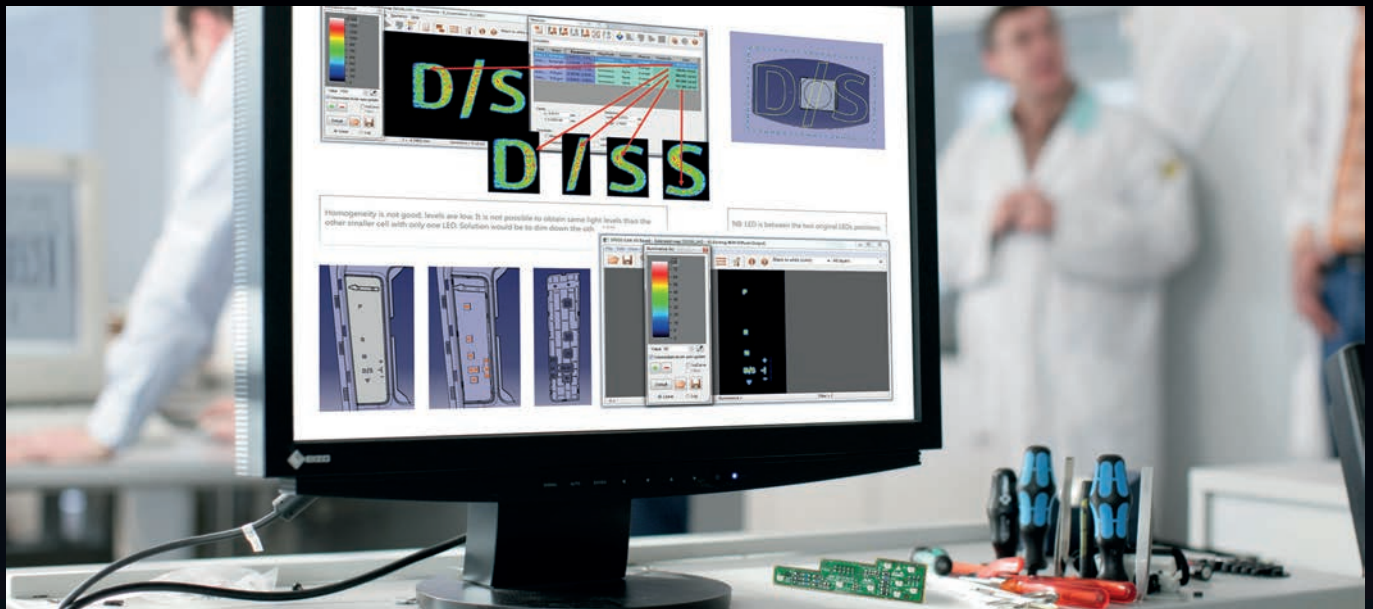
From a single source

ALACsystems is a specialist in the field of electronic components and tailored connectivity solutions in automobiles for more than 25 years.

The comprehensive expertise from development and production as well as the experience from intense and long-term cooperation with Tier 1 and Tier 2 suppliers of the automotive industry make ALACsystems the ideal partner for your projects.

Automotive Applications

- | Multimedia and Infotainment
- | E-Call and Telematics
- | E-Mobility
- | Smartphone integration
- | Microphones
- | Sensor modules
- | Lightning modules
- | Interior
- | Seat heating



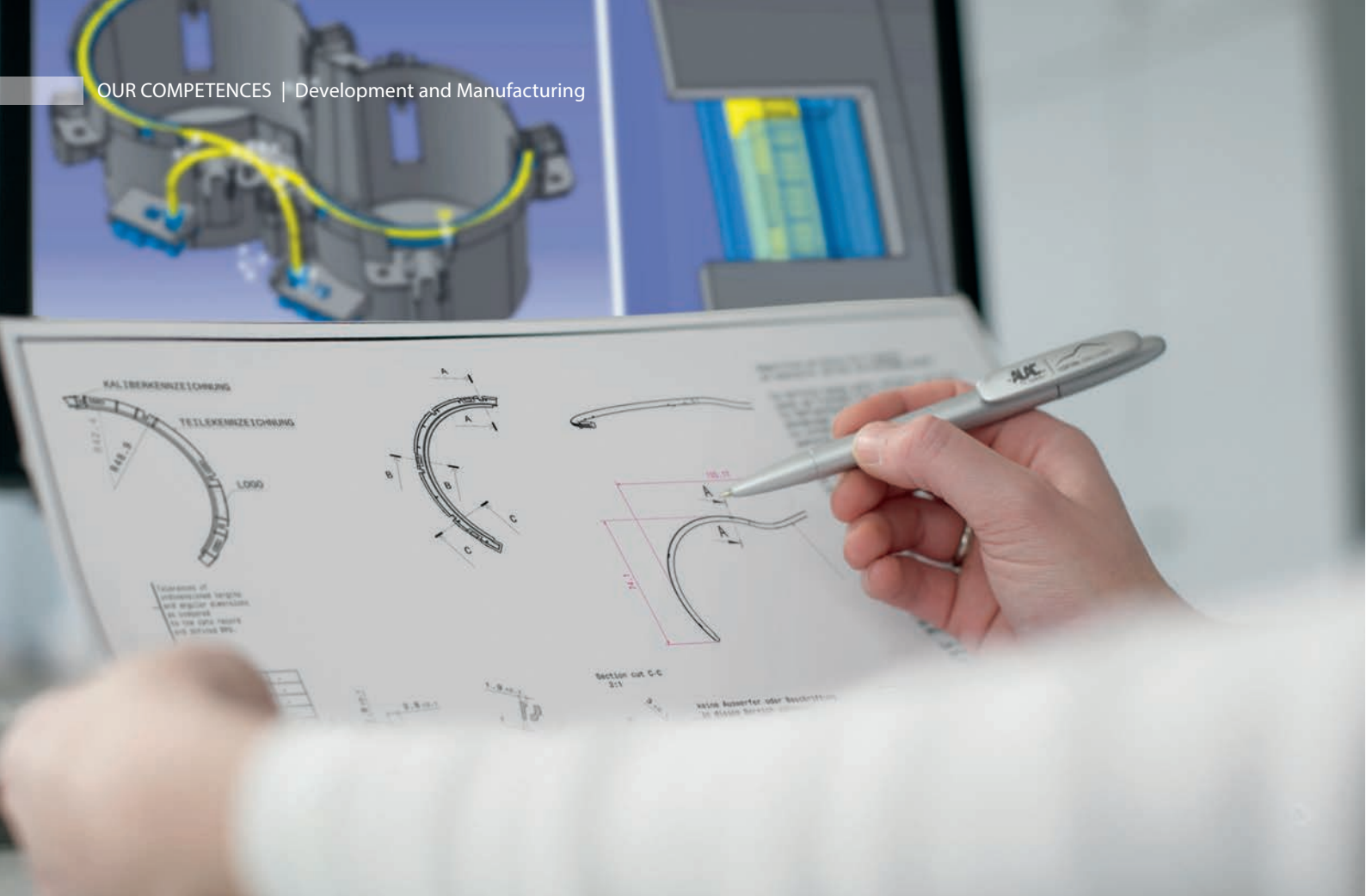
Our wide range of services covers all processes from analysis and development to project management and series production.

- | Ensuring high product availability
- | Material control (IMDS/RoHS/Conflict minerals)
- | Global sourcing for purchased parts
- | Manufacturing according to IATF16949
- | Process monitoring and control
- | Quality monitoring and optimization
- | Process and product optimization
- | Logistics, warehousing and customs
- | Complaint processing

Product-specific Competences

The products and solutions offered by ALAC require a wide range of services. To get a detailed impression of our competencies please find more information on all relevant processes under the particular product group sections on following pages.

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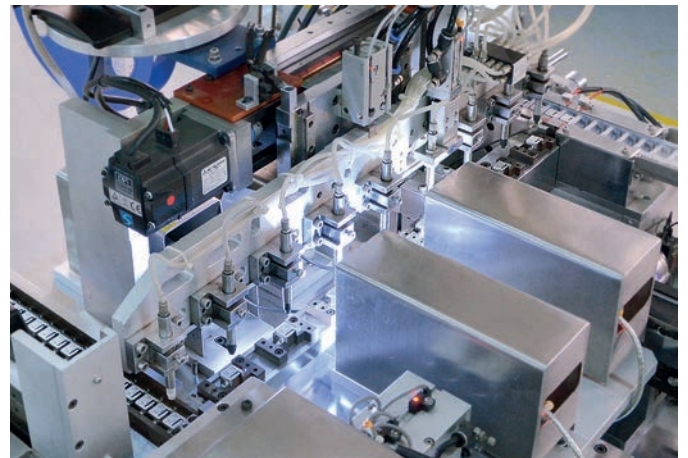
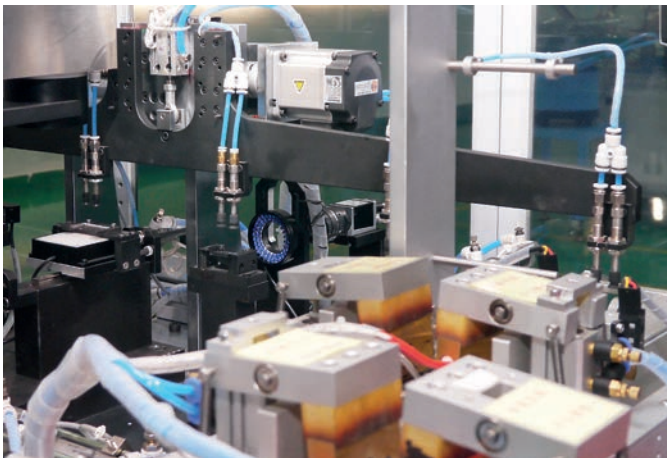
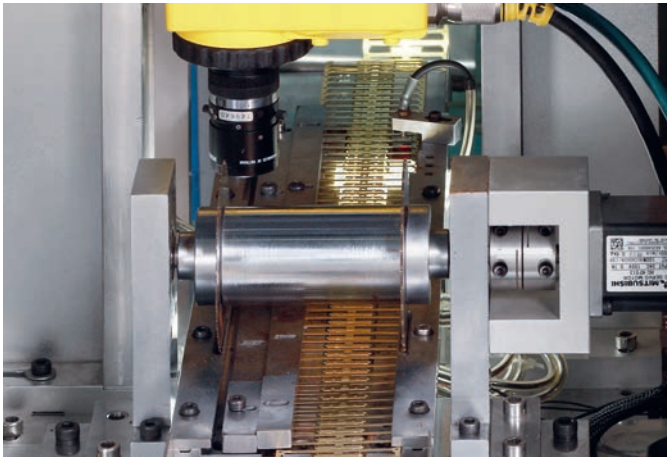
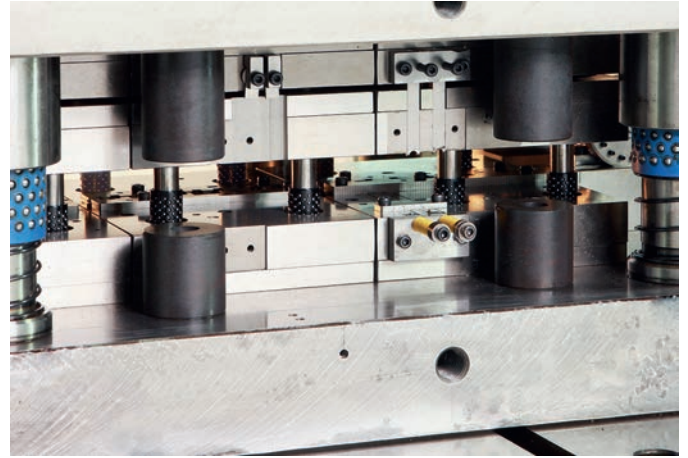


DEVELOPMENT AND MANUFACTURING

Efficient and state-of-the-art technologies –
of course with certification

Our R&D department develops connectors, wire harnesses and electronic components like Lighting- and Wireless-Charging modules in close cooperation with the customer.

All drafts are realised using state-of-the-art tools such as 2D/3D CAD software and prototyping processes. The tools and machine designs needed for manufacture are also made in our in-house tool and machine construction workshop. To be able to offer optimal solutions we are not only specialised in manual production but most of all in fully automated assembly. Especially for large quantities our self-designed production lines ensure the great advantage of reproducible quality.



Our Production Network

- | Internal tool design and manufacturing
- | Wire eroding and die sinking
- | High-speed progressive stamping processes
- | Automated Injection Moulding
- | Insert- and over-moulding technology
- | PCB assembly (SMD/THT)
- | Development and manufacturing of high-performance production lines
- | Automated and manual cable assembly



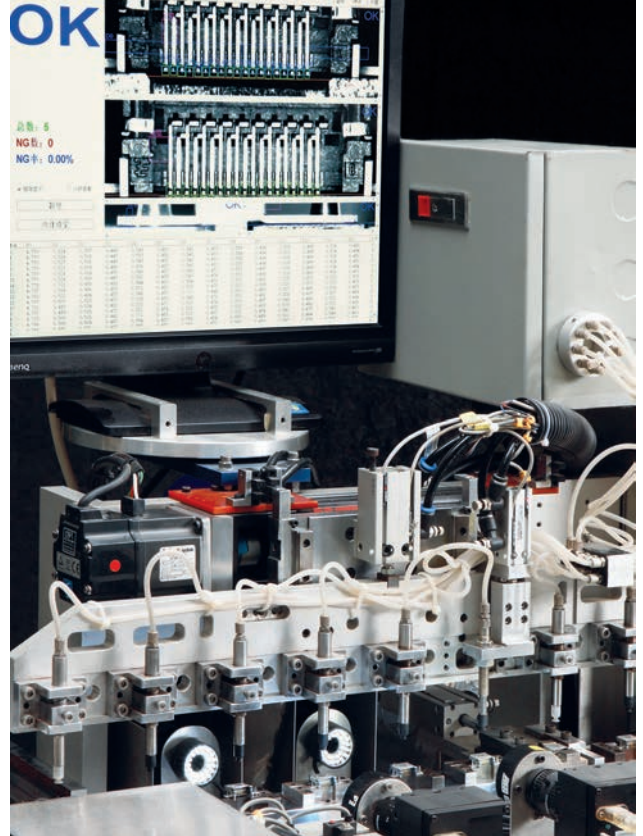
QUALITY FROM THE VERY BEGINNING

The key for success

Our quality management system is oriented on the one hand on national and international standards as well as on the highest demands of the automotive industry.

Possible causes for defects in the later production stage will be almost excluded already during the development of tools and production lines. The entire process monitoring is based on Advanced Product Quality Planning (APQP), including the documentations DFMEA, PFMEA, SPC, MSA and PPAP.

For us however, quality management also means to organise operational sequences, continuous optimisation and thus the ability to offer high-quality finished products.



- | Zero-defect philosophy
- | Continuously updated certifications
- | Consistent commitment to quality by all employees
- | Incoming goods inspection
- | Verification and validation
- | 100% automated process monitoring
- | 100% end-of-line tests
- | Traceability of all components

ALAC Elektrik-Mechanik-Vertrieb GmbH
is certified:



ISO9001:2015
valid until 23.09.2019



AEO-DE AEOF 118110
valid from 10.07.2013



RELIABLE - EFFICIENT

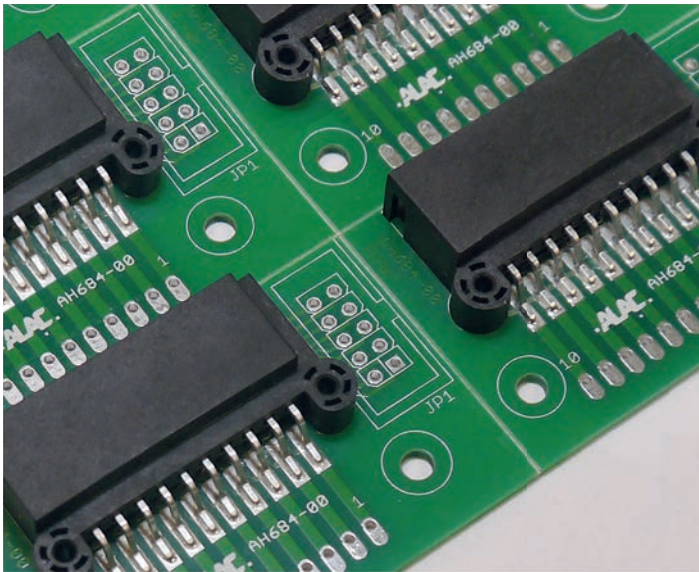
SUPPLY CHAIN MANAGEMENT

Individual concepts for
the entire supply chain

Our purchase volume and optimal bundling of material requirements ensures low unit costs. We demonstrate highest flexibility in order processing and offer customized concepts for material procurement and logistics. Take advantage of our know-how from our long-term cooperation with the automotive industry.

- | Weekly air and sea freight deliveries in the European market
- | Optimized material and procurement management
- | We offer the optimal solution – from framework agreement, buffer storage location to consignment warehousing
- | Just in time and zero-defect delivery





PLASTIC MEETS METAL

| Plastic-Metal-Hybrid Parts

| Solderless electrical Connections (Press-Fit)



*For more information please
ask for our special brochure or
write an e-mail to:
hybridparts@alacsystems.de*

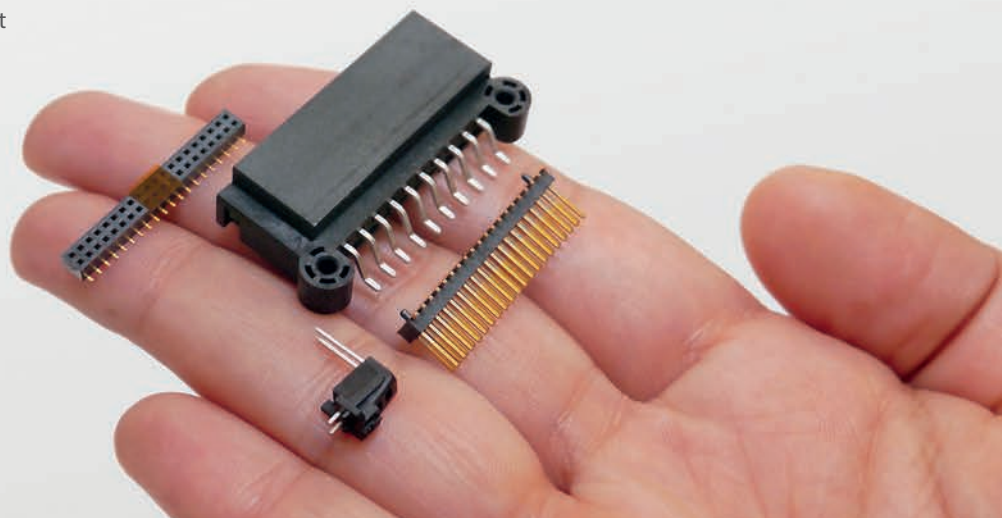
CUSTOMIZED CONNECTORS

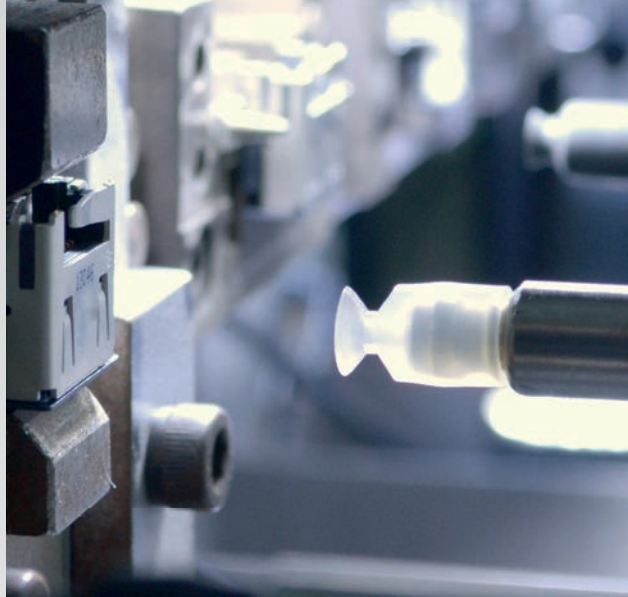
Smart, powerful and safe solutions
for reliable connections

Today's high technical requirements call for special and individually optimised connectors.

Smaller, lighter, more functions and faster data transmission – these are the objectives to enable new technologies at our customer applications. ALACsystems faces such requirements and is particularly specialised in:

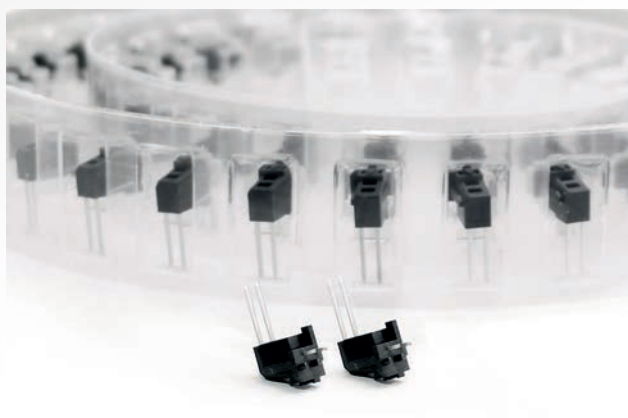
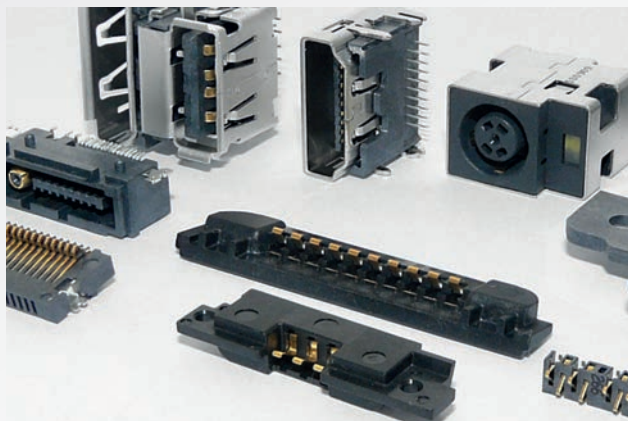
- | New development of customized connectors
- | Board-2-board connectors
- | Wire-2-board connectors
- | Modification, functional extension and improvement of standard connectors, e.g. miniaturisation
- | Combination of multiple technologies and functions in one connector with simultaneous compliance of the standard requirements, e.g. integrated LED technology
- | Development of shielded connectors to meet automotive standards





Product-Specific Competences

ALAC realises reliable connectors for application-specific requirements of our customers from development to prototyping, qualification to series production. Innovative ways of development and manufacturing according to IATF 16949 / APQP and in-house production of the necessary tool and machine designs ensure efficient order processing.



Development

- Preparation of requirements and performance specifications
- Development of connector systems
- Definition of electrical contacting
- Form, material and surface definition for contacts and housings
- Handling and functional reliability
- Development of progressive punching tools for contacts and shielings
- Determination of contact surfaces
- Development of injection moulding dies for housings and overmouldings
- Development of assembly processes and the associated semi/fully automatic production machines
- Preparation of the production drawings in 2D/3D
- Development of test devices
- Prototyping
- Shrinkage and distortion simulation
- Mould-flow analysis



Tool and special machine construction

- Construction of gauges and production fixtures
- Manufacturing of injection moulding dies and overmoulding tools
- Manufacturing of progressive punching tools
- Manufacturing of semi/fully automatic production machines for connector systems
- Wire eroding and die sinking, CNC milling and grinding
- Manufacturing of copper electrodes
- Manufacture of test devices



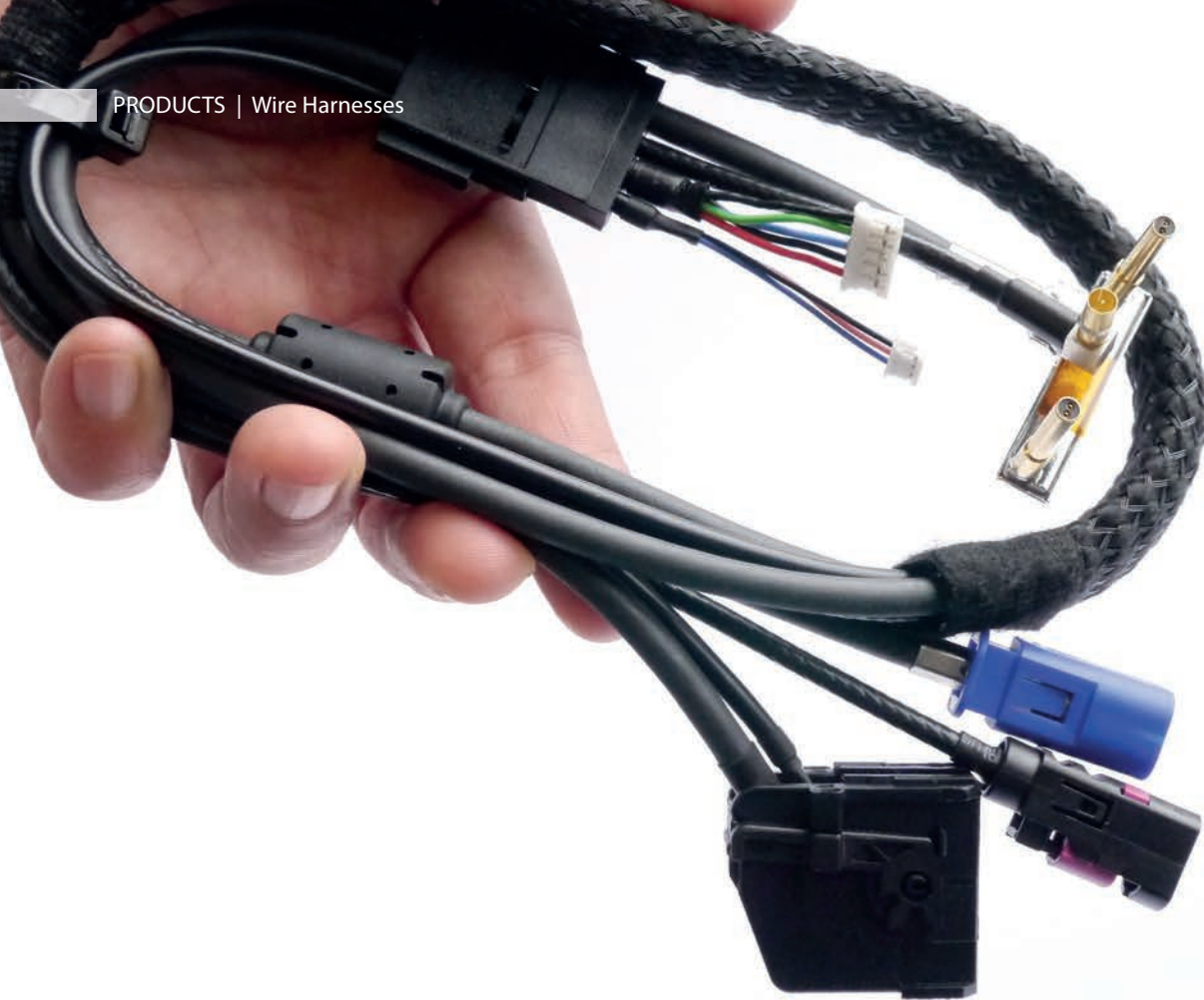
Manufacturing technologies

- Stamping department
- Injection moulding department
- Assembly production for connectors - different degrees of automation
- Integration of electronics into connector systems
- In-line test cells



Qualification

- Microsection laboratory to analyse crimp connections, splices and other component groups
- X-ray system to analyse crimp connections, connector systems and electronics components
- Pull force measuring devices
- Vibration and shock test
- Climate chambers for environment and lifecycle testing
- Contact durability test devices
- Bending cycle test devices
- Complete validation according to OEM/customer specifications



TAILOR-MADE WIRE HARNESSSES

High-performance and reliable transmission solutions
to the automobile periphery

In cooperation with our customers we develop solutions for wire harness applications using standard components which are available on the market, but also with integrated specific components like special cables and connectors developed and manufactured by ALAC.

Our current portfolio:

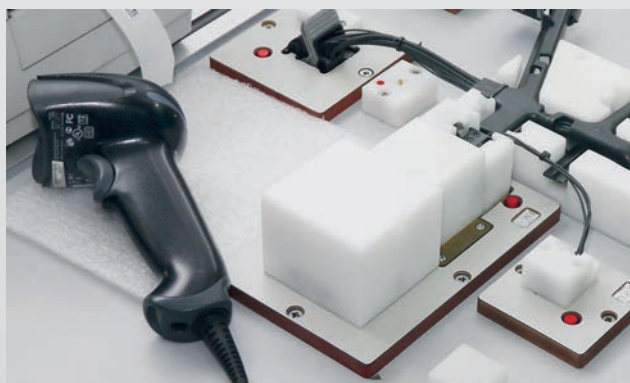
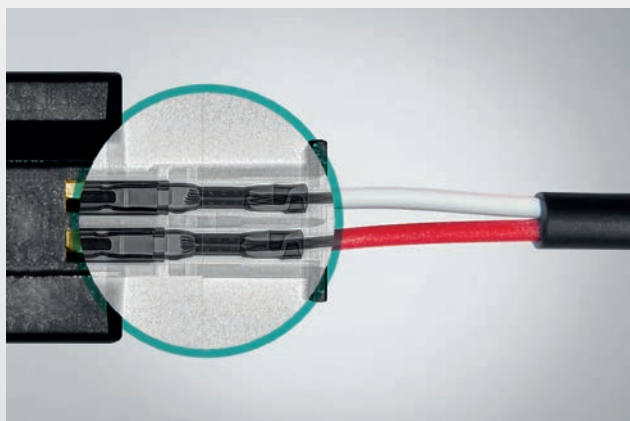
- | Cable assembly for in-car infotainment systems
- | Wire harnesses for interior vehicle lighting
- | Coaxial cable assemblies
- | Cable connections for in-car microphone systems
- | Antenna connections
- | Wire harnesses with overmoulded components
- | Wire harnesses with special and standard connectors
- | FPC wiring harnesses



Product-Specific Competences

ALACsystems reliably implements wire harnesses for application-specific requirements of our customers – from conception and prototyping to qualification and serial production. Modern high-capacity wire processing machines with in-line test systems and a high vertical range of manufacturing technologies for all market-relevant connection techniques ensure a high degree of automation, functional security and price competitiveness.

Especially our high experience to develop own connector systems qualifies ALACsystems to better understand the customer requirements for wire harnesses.



Development

- Preparation of requirements and performance specifications
- Feasibility studies
- Preparation of electric system circuit diagrams according to customer requirements
- Concepts for current distribution and fuses
- Dimensioning of cable cross-sections
- Development and design of cable connections (connectors, terminal blocks and soldered connections)
- Definition of the cable fastening (clamping connection and screw joints)
- Integration of electronic components and assemblies into the cable harness (light, sensor systems, etc...)
- Process conceptions and implementation of new processes into production as well as their validation
- Semi and fully automatic machines for production
- Development of injection moulding dies for overmouldings
- Development of the production drawings in 2D/3D
- Development of series test devices
- Definition of test and inspection processes
- Prototyping
- Product validation according to customer requirements



Tool and special machine construction

- Construction of gauges and production fixtures
- Manufacturing of injection moulding dies and overmoulding tools
- Manufacturing of progressive punching tools
- Manufacturing of semi/fully automatic production machines for connector systems
- Wire eroding and die sinking, CNC milling and grinding
- Manufacturing of copper electrodes
- Manufacturing of test devices (EOL)



Manufacturing technologies

- Machines for automatic cable processing for stripping, crimping, sealing, tinning and twisting processes (crimp force monitoring)
- Injection moulding department (plastic parts, insert moulding, strain relief and overmoulding of electronic modules)
- Dispensers for dosed application of soldering paste
- Induction soldering, laser soldering and manual soldering
- Special machines for component assembly (in-house developments)
- Printing systems



Qualification

- Microsection laboratory to analyse crimp connections, splices and other component groups
- X-ray system to analyse crimp connections, connector systems and electronics components
- Pull force measuring devices
- Vibration and shock test
- Climate chambers for environment and lifecycle testing
- Contact durability test devices
- Bending cycle test devices
- Complete validation according to OEM/customer specifications

INTERIOR LIGHTING CONCEPTS AND SYSTEMS

Perfect lighting creates perfect mood

In the past there was only a reading lamp in the vehicle. Today, innovative lighting concepts, especially LED light sources, are the trend in the vehicle interior. Along with functional interior lighting, ALACsystems also analyses, develops and manufactures decorative interior lighting with our partner *The Lighting Consultants*.

These systems do not only serve to highlight special design elements but help the driver to get a better perception of the surroundings and improve orientation.

”*We are not just another lighting analyst.
We realise your projects from the concept to series production –
this gives you security for each process step.*

Kay Naber
CEO, ALACsystems

WE BRING LIGHT TO LIFE

Comfort and function in an
intelligent combination



This product range offers the automotive supply industry and vehicle manufacturers various options for vehicle-specific interior design and at the same time to increase driving safety. Our wide range of services covers all processes from analysis and development to project management and series production.

Selection of the various lighting types we cover and some of their applications:

Ambient

- | Door trims
- | Centre console / IP
- | Foot well
- | Roof lining
- | Stowage bins
- | Glove compartment

Contour

- | Door trims
- | Speaker trims
- | Cup holders
- | Ventilation elements

Function

- | Stowage bins
 - | OHC (Overhead consoles)
 - | Reading lights
 - | Spot lights
 - | Luggage illumination
 - | PRNDL Indicator
-

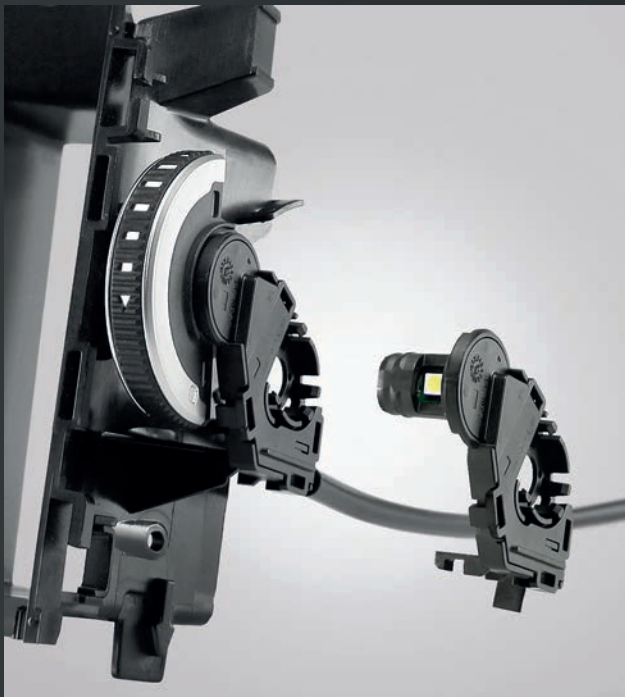
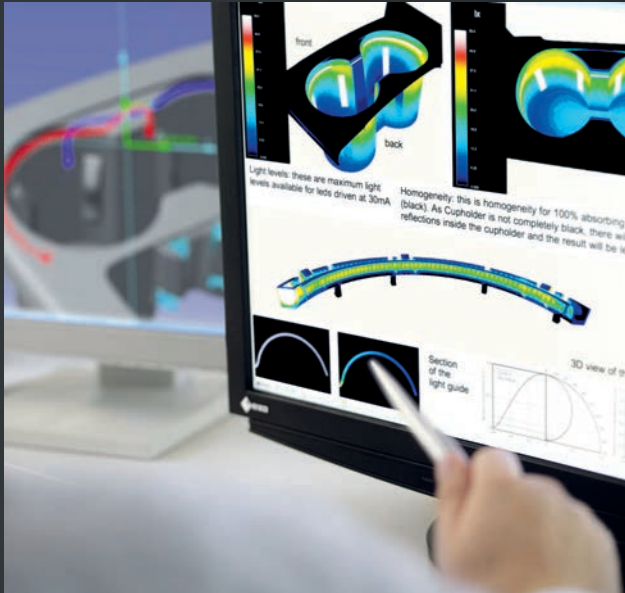


FROM
CONCEPT
TO **REALITY**

Efficient state-of-the-art technologies

Our efficient teams in analysis, development, manufacturing and quality are there to ensure successful realisation of customised product and process solutions of our lighting modules.

We thrive on finding innovative design solutions even within the tightest of package spaces.



Product-Specific Competences



Feasibility Analysis

- Evaluation/verification of the lighting design
- Design space examination
- Light simulation
- Design strategy
- Evaluation of the design for manufacturability (DFM)
- Realisation in due time and with regard to legal requirements



Development

- Visual design (colour, light, symbols, ergonomic)
- Light technical Analysis
- Electronic system
- Mechanics
- Material selection (LED selection, design of optical fibres)
- Prototyping
- Simulation (beam tracking, colour matching, brightness distribution, homogeneity)
- Validation
- Manufacturing of test devices (EOL) and calibration



Manufacturing

- Assembly of printed circuit board
- Construction of tools and jigmaking (automatic cutting presses, injection moulding machines and assembly machines)
- Injection moulding (light guides, panels, enclosures, connectors, coating)
- Potting/grouting
- Cable assembly
- Electric implementation (EMS)
- Mounting the assembly
- Series tests
- Provision of samples



Qualification

- X-ray system for analysis of crimp connections, connector systems and electronic components
- Measuring instruments for pull-off force
- Vibration and shock tests
- Climate chambers for environment and lifecycle testing
- Contact durability test devices
- Light measurements
- Complete validation according to OEM/customer specifications



ELECTROMAGNETIC COILS WIRELESS CHARGING

Wireless technologies - smartly combined

The compact module combines inductive charging in accordance with the Qi standard, a wireless antenna coupling for better mobile reception in the vehicle and enhanced shielding against interference.

With our customised solutions for transferring wireless technology and optional extensibility, we are able to integrate the features required for the respective application into the designing and production of the modules.

- | Temperature sensors, customised connectors and other auxiliary components
- | Individual components or the complete module, optimised for size and shape

”*With the development and production of the wireless charging modules, we have reached another milestone in our company.*

Dr. Alfons Naber | Managing Director, ALAC GmbH



ELECTROMAGNETIC COILS INDUCTORS ^{AND} TRANSFORMERS

Assemblies for e-mobility applications

As with all applications that require extremely careful power control, choosing the right electromagnetic component is essential. Often, a very individual product is needed. A product that can be easily integrated into the project and that meets very high quality standards.

- | Conversion of alternating current (AC) to direct current (DC)
- | Adjustment of direct current to the requirements of the battery
- | Galvanic isolation/decoupling
- | Power Factor Correction (PFC)





25 Years
since 1993

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