

LTN SERVOTECHNIK



**LTN Servotechnik GmbH**

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*Innovative, value-oriented, a partner you can trust. Get to know LTN Servotechnik GmbH – a recognised excellent company.*

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## ABOUT US

LTN Servotechnik GmbH is a mid-sized engineering company located in the south of Munich. We are specialised in the development, design and series manufacture of accessories for apparatus, machinery and plant engineering customers worldwide.

At least, that's the official description.

We also define ourselves as a 250-strong team of men and women united by a genuine passion for technology. Together we strive to create, design and implement many things better, more effectively and more sustainably.

We believe that precision begins with a precise understanding of a problem, a vision or a technical challenge – in short, with the needs of our customers.

We also believe that an idea is only as good as the enthusiastic and committed employees who accompany it on the way to series manufacturing. Incidentally, we are proud to have been officially recognised as an excellent company with a business award from our local region in 2015.

We believe in technology. And in the people who use it.

Welcome to LTN.

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## SUSTAINABILITY

*Durable products from LTN not only cut your costs; they also help you save resources. The quality of our work reflects our sense of responsibility for the environment. This also includes an appreciative attitude towards our employees and all partners. We respect applicable laws throughout the world and engage in fair competition.*

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WHAT DRIVES US

Ever since we were founded in 1979, our work and our successes have been based on listening to our customers and understanding their problems.

Only in this way can innovation flourish. From prototype through custom-made product to series manufactured, every component that leaves our premises is the outcome of a partnership.

Wherever something needs to be turned or transmitted, we can and would like to – indeed we should and must – be your partner. No matter how high up or how deep down and regardless of the wind or weather.

We look forward to your ideas.

LTN STANDS FOR QUALITY

No matter whether there are five or 50,000 of them, all our components are manufactured according to the highest standards.

In order for our customers to become our partners, we need to understand them and be capable of brainstorming together, thinking ahead and providing answers to burning questions.

That's why we maintain not only our systems but also a think tank – our Engineering department – which allows us to explore new avenues in technology, sustainability and profitability together with our customers through research, development and design.

HISTORY

*Since its founding in 1979, the company has developed continuously. Over a period of more than 35 years LTN has grown from a supplier of components to a system partner of modern key technologies. By constantly increasing our scope of application know how, we are constantly addressing new industries.*

THE VERY BEGINNING

Foundation of the company in Munich. Manufacture and assembly of rotary encoders, potentiometers and slip rings.

A FUTURE WITHOUT BRISTLES

Start of brushless resolver production.

SHINING INNOVATION

Development of slip rings for medical lamps.

THREESOME

Entry into the production of resolvers, slip rings and encoders.

NEW 4400 SQUARE METRE SITE

Expansion and relocation to Otterfing in Upper Bavaria, south of Munich.

MOTION PICTURES BY LTN

Development of slip ring transmitters for video signals.

THE WIND POWER ERA

First slip rings shipped for wind turbines.



*Technology begins with the people it supports.  
That's our creed.*

#### SITE ENLARGED TO 6500 SQUARE METRES

Construction of a new  
production shop and  
warehouse in Otterfing.

2010

#### SOUND BARRIER

For the first time, our  
annual turnover is a  
record-breaking ...  
(you shouldn't talk  
about money).

2011

#### HIGH DEFINITION

More innovations in  
HD transmission of  
moving images.

2013

#### INTRODUCTION OF SAP

Better and faster  
order entry and  
processing proce-  
dures.

2014

#### RECOGNISED EXCELLENCE!

LTN is selected as  
the local region's  
business enterprise  
of the year.

2015

#### NEW WEBSITE

Welcome to LTN!  
We look forward  
to hearing what  
you think...

2017

2018

## EXPERTISE

As an experienced supplier of electromechanical components for industrial control and drive technology, our portfolio extends from innovative development in-house to advanced manufacturing of metal and plastic products directly on the premises – all with a high level of vertical integration.

LTN develops patented core technologies and designs electromechanical assemblies and components. From the construction of complex one-off systems right through to large-scale series manufacturing, we trust in the expertise of our technicians, engineers and highly qualified specialists.

We regularly have the quality of our products inspected at a state-of-the-art test laboratory according to standardised guidelines. The numerous certifications we have received as a result of this are objective proof of our performance. Many of our developments are patented and form the basis for new, customer-specific concepts, leading to successful, made-to-measure solutions.

Changing customer's requirements can be taken into account at short notice thanks to our lean and flexible production principles. Our after-sales service ensures that the availability of our customers' machines is maintained throughout their entire lifetime.



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*Our products and services are closely aligned to our customers' requirements. They are characterised by top-rate quality and a high level of vertical integration.*

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## SERVICE PORTFOLIO

Our engineers, technicians and highly qualified specialists provide a broad portfolio of services tailored to each customer's individual needs:

- One-off manufacturing of prototypes and sample series
- Toolmaking for own production facilities
- Cable assembly: cutting, stripping, harness preparation, crimping, welding, soldering
- Plastics injection moulding
- Manufacture of resolver windings on highly specialised machines
- Installation of complex assemblies with qualified procedures in areas such as joining, gluing, screwing, coating, casting
- Design and development of fine mechanical, electrical and electronic assemblies
- Efficient repair and spare parts service
- Series manufacture of electromechanical components



*Unconventional path to reach our goals. Our portfolio extends from innovative development to advanced manufacturing of metal and plastic products. Where necessary, we are not afraid to adopt an unconventional approach in order to satisfy your needs.*



## HOW WE WORK

Only when we have understood our customers' visions, recognised the challenges and established a common objective do we embark on a creative process free of dogmatism and set to work on the engineering. Persistent, passionate and always in dialogue with the customer.



## EVERYTHING IN-HOUSE. EVERYTHING TOGETHER.

Understanding requirements, mastering technical challenges, questioning the status quo, structuring ideas, making things better: at LTN, we do all of this as a team. Engineers, specialists and production staff – we all work together as equals and are only satisfied when we have achieved the best possible solution for our customers. We are grateful and proud that we have the infrastructure, the freedom and the capacity at our disposal to provide an end-to-end service – from consulting to series manufacturing – in-house under one roof.

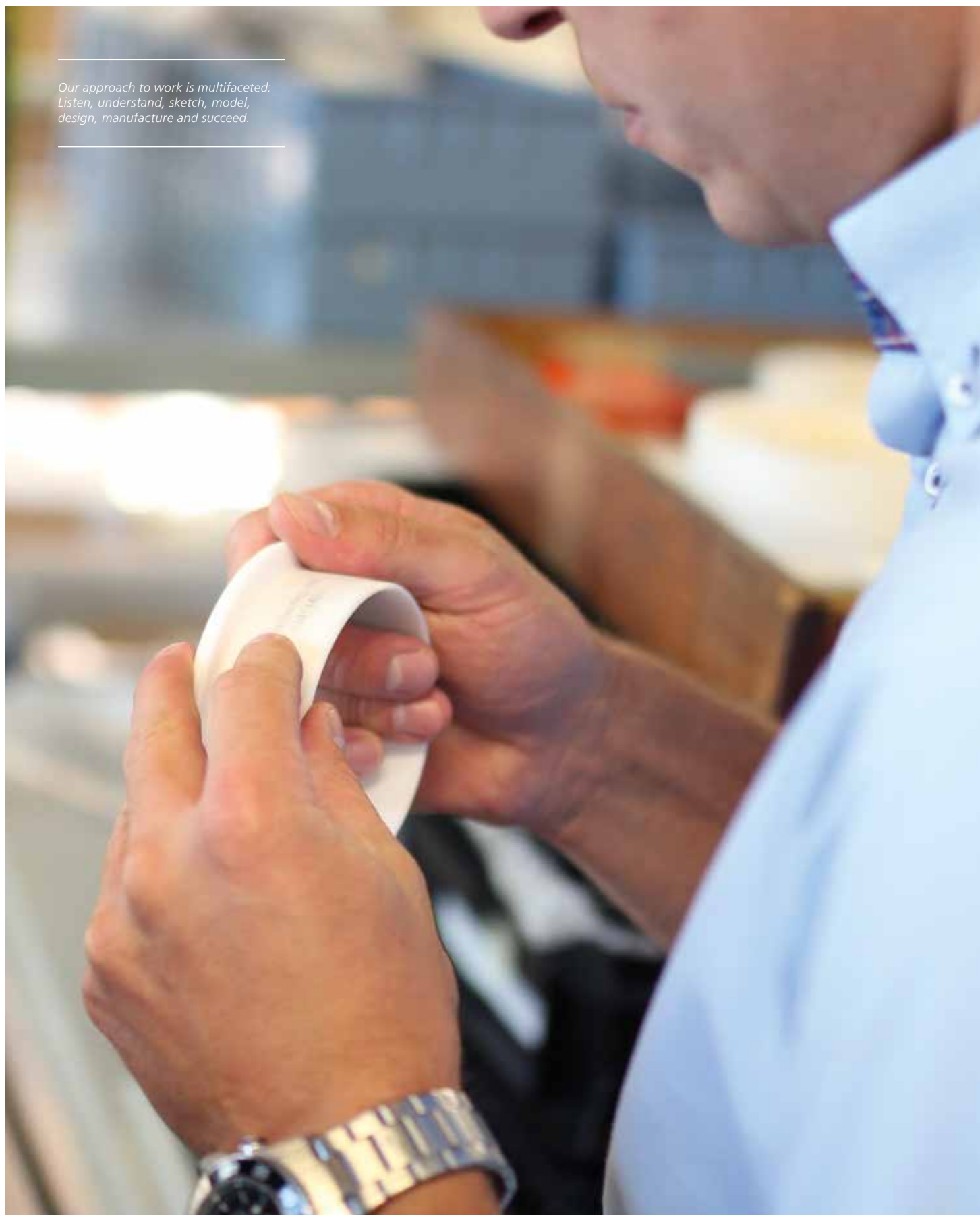
## PROVEN PROCESSES FOR NEW IDEAS

- |   |  |   |
|---|--|---|
| - Individual creation of customer requirement profiles    | - Advanced manufacturing processes for manual and automated assembly | - Short start-up and implementation times in series manufacturing |
| - Client-specific process expertise in many industries    | - High level of mechanical and electronics manufacturing expertise   | - Automated inspection processes for all series products          |
| - Qualification of prototypes together with our customers | - Experience of one-off and small-batch production                   | - Quality controls in all production areas                        |
| - Quality management throughout the entire process        | - Knowledge of all logistical processes                              | - One hundred percent functional testing of all products          |

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*Our approach to work is multifaceted:  
Listen, understand, sketch, model,  
design, manufacture and succeed.*

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## INDUSTRIES: PRACTICALLY EVERYWHERE

If you're looking for clear signals, LTN is the answer.

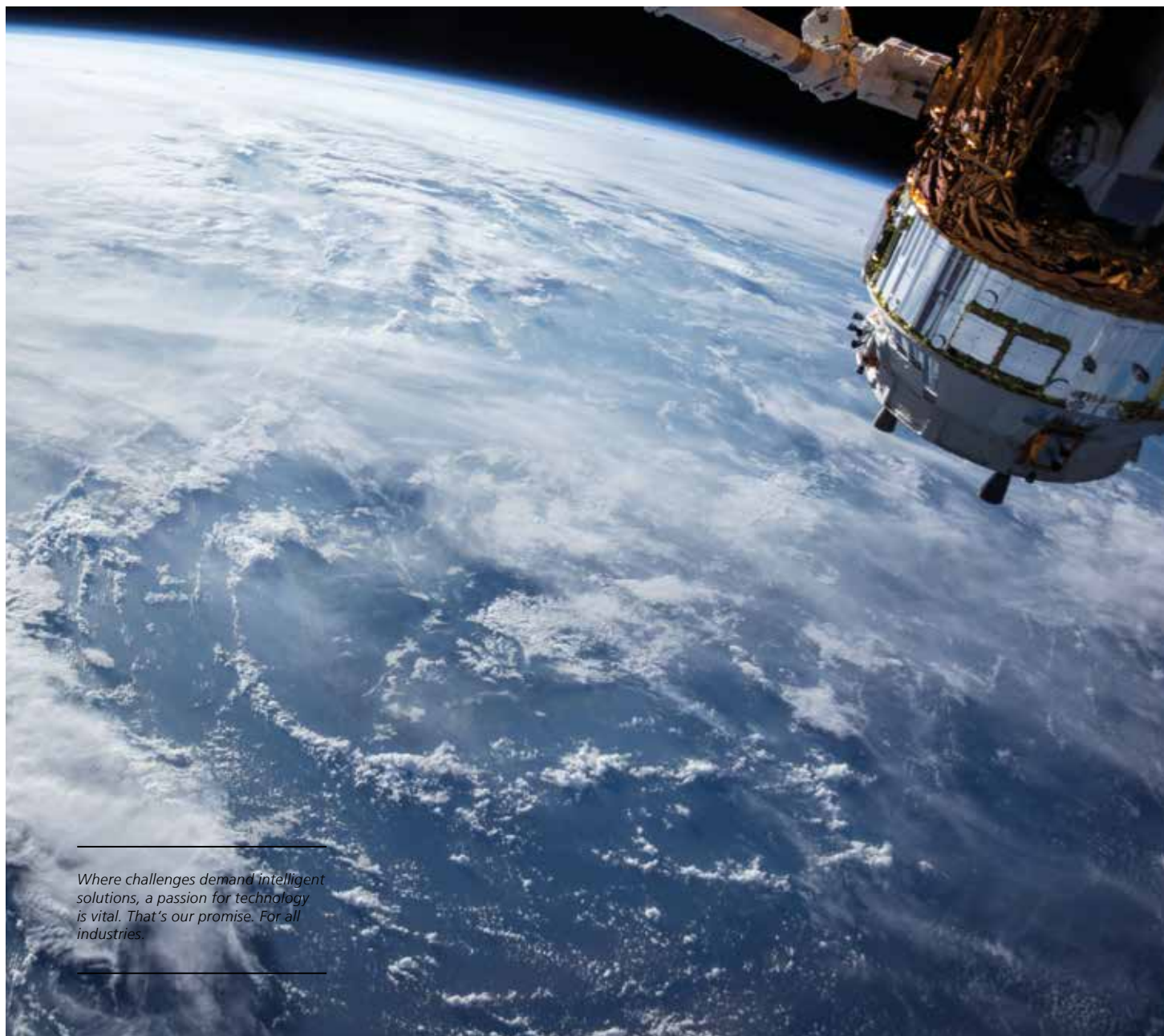
Whether manufactured on a large scale or custom-made, our slip rings, resolvers and rotary encoders are found wherever innovative, efficient and sustainable technical solutions are called for.

The many different industries we operate in are mirrored by the wide spectrum of applications for our products.

## APPLICATIONS

Resolvers and slip rings from LTN can be found in many different applications. Let our challenges and solutions inspire you:

4K video transmission, heavy duty, milling machine, landing flap control, packaging machine, control system, rotary actuator, radar antenna, resolving door, rotary table, satellite antenna, aircraft seat, servomotor, robot controller, support arm lamp, surveillance camera, swivelling solar panel, generator, pitch system and many more...



*Where challenges demand intelligent solutions, a passion for technology is vital. That's our promise. For all industries.*

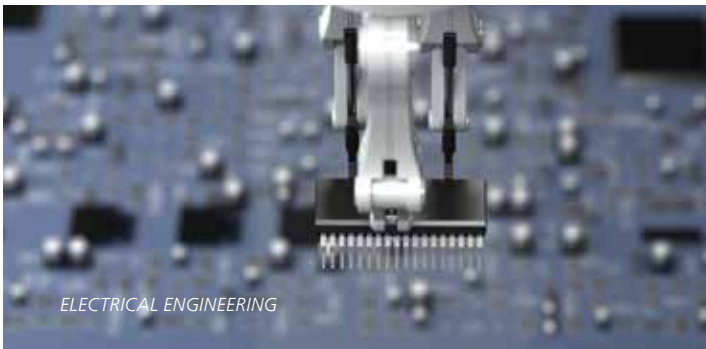




AUTOMATION



WIND POWER & RENEWABLE ENERGY



ELECTRICAL ENGINEERING



AVIATION



DATA TRANSMISSION



MECHANICAL ENGINEERING



MEDICAL TECHNOLOGY



DRIVE TECHNOLOGY



ACCESS SYSTEMS



OTHER INDUSTRIES

## QUALITY COMBINED WITH HIGH VERTICAL INTEGRATION

Our product range includes slip rings for power, signal and data, resolvers for open & closed-loop control tasks and rotary joints for fibre-optic information systems. Our product portfolio are characterised by extraordinary diversity.



*Our portfolio of slip rings, resolvers and encoders for the drives and automation industry is based entirely on individual customer requirements.*





## SLIP RINGS

Slip rings are electromechanical components which allow electrical power signal and data transmission between stationary and rotating systems. Our slip ring systems withstand harsh environmental influences such as corrosive, salty air or severe vibration. LTN slip ring systems ensure the reliable functionality of entire machine systems. Slip ring systems are found in many electrical machines. The spectrum ranges from just a few mV or mA to 300 A and 1500 V

LTN slip rings meet all the requirements for error-free transmission of real-time fieldbus systems. Of course, all our Fast, Gigabit and 10 Gigabit Ethernet slip rings are certified according to TIA-568 and EN 50173.

Our components conform to the highest standards of durability, sensitivity and reaction time and are therefore an important part of automation, robotics and all other highly dynamic applications.

In addition, we offer contactless fibre-optic rotary joints for contactless transmission at high data rates.



## RESOLVERS

Resolvers convert the angular position of a rotor to two voltages. The absolute position can be represented clearly in this way. Modern resolvers are usually brushless and the information is transmitted through induction. Resolvers provide an absolute signal within a single revolution and therefore do not have to be calibrated after switching on. Resolvers are used for open and closed-loop control tasks such as electric servo drives, positioning drives and machines with interdependent motors. The robustness and availability of the systems are of central importance. Our brushless resolvers operate without wear and are fail-safe – even in the harshest environmental conditions (e.g. extreme temperatures).

In addition, we offer electrical circuits for evaluating the resolver's analogue output signals. Rotary encoder output signals can be emulated, for example. Using our downstream electronics, the analogue signal can also be digitized.



## FROM PROBLEM TO PRACTICE

In the classical sense, a problem is no reason for despair and certainly not the end of all things and ideas. A problem is simply a task, and in our Engineering department we apply this interpretation with pleasure and passion.


As our customers know, LTN is founded on common ideas and challenges on which the pillars of our Engineering department rest. When designing prototypes, we devote careful attention to your specific task until we come up with practical and robust answers.

It's a promise that we can deliver to nearly any industry – if necessary, under tight pressure of deadlines.

In addition to addressing the specific neuralgic “problem parts” of your product, we are always pleased to assist our customers with technical advice when it comes to creative sparring, technical optimisation, further development or series manufacturing.

From the development of equipment or tools to a critical assessment of your production planning, LTN's experienced development and design team is there to support you with anything from one-off solutions to complete, integrated development processes.

Let our effective Engineering department get straight to work for you. We'll turn your problem into a smoothly functioning solution – all from a single supplier.

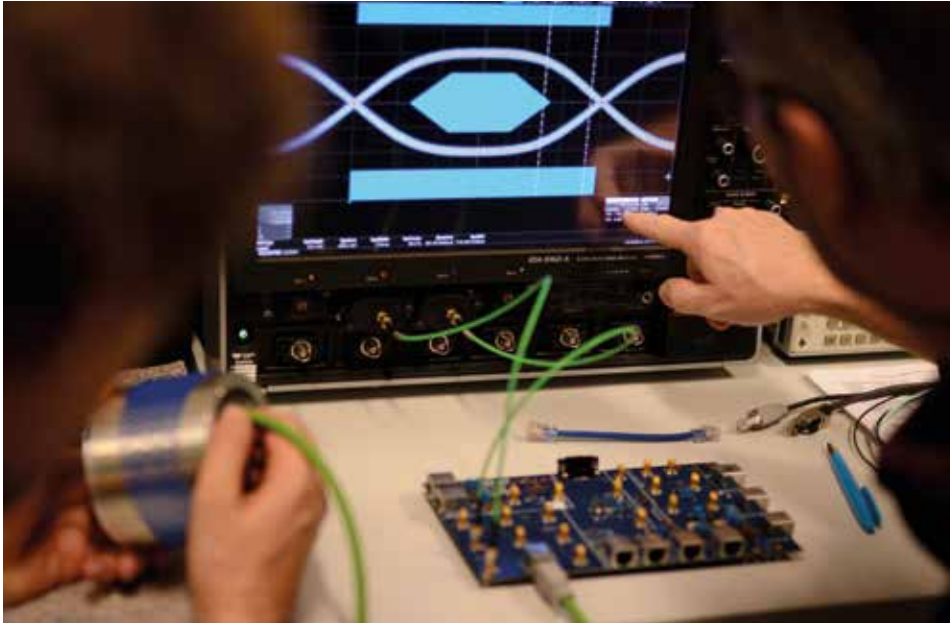


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*Engineering is the ability to develop technical solutions which are ready to be used for specific requirements – and possibly even for large-scale series manufacturing.*

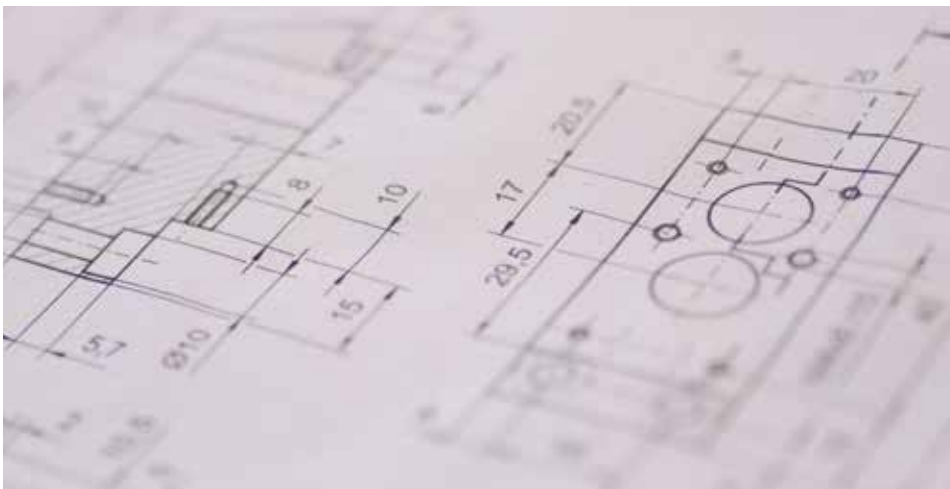
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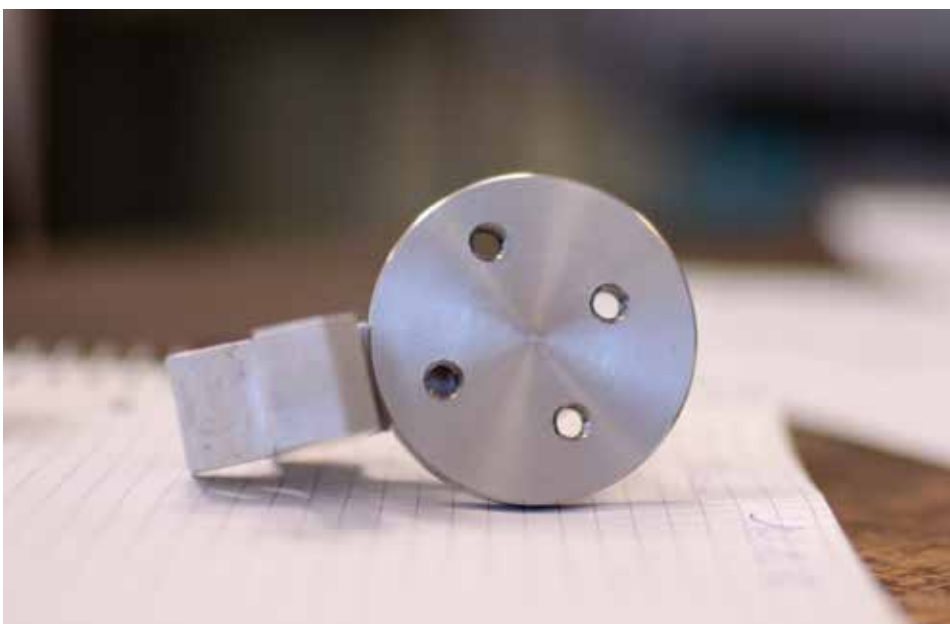
## RESEARCH

Knowledge as a foundation: Basic research and technology development.



## DEVELOPMENT

For the best of the best answers: Product development, design and consulting.



## DESIGN

Insistent on success: Prototypes and pre-production series development.

## SOLUTIONS TO SATISFY YOU

Long-term support for our customers is our creed. At LTN, service begins with the very first customer contact and continues throughout the entire product lifecycle. For us, sustainable profitability takes centre stage. Maintenance and repairs are a central element here. LTN's different product categories require different service concepts in order to meet the high demands of all our customers.

LTN products are durable and, especially when it comes to wearing contact technologies, easy to service and maintain. Thanks to our high level of vertical integration, LTN can supply spare parts for all equipment for a long time after delivery. Highly qualified services for complex technologies are particularly vital if ever any problems arise. LTN is a competent and reliable service partner: we provide a comprehensive range of timely and unbureaucratic services.



*LTN provides comprehensive services and support throughout the lifecycle of your product or application.*

## TECHNICAL ADVICE

We offer you step-by-step advice to help you find the product that best matches your availability, cost efficiency and technology requirements.

Our consulting services cover the entire project lifecycle – from the initial customer contact and prototyping through product development and environmental testing to the pre-production series and subsequent optimisation.

## SPARE PARTS

Production documents exist for every design. Even products that were built more than 30 years ago can be remade at any time.

These new products can be purchased from us through the usual distribution channels. Depending on the design, subcomponents can also be manufactured and supplied as one-offs.

## REPAIRS

There are many reasons why repair work could become necessary. We consider your needs and, based on the product which is returned to us, provide you with a quote that takes into account the time for the repair and also whether or not repair is actually economical.

If you choose not to accept this quote, we will simply charge a handling fee for diagnosing the problem.

## COMPLAINTS

In the unlikely event of a defective delivery, we promise to rectify it immediately – either by reworking the product or by replacing it with a new one.

We charge a handling fee for unjustified complaints and returns.

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