

Electrical engineering and electronics.

A powerful engine for Thuringia's industry.



Areas of expertise:

- › Actuators, drives and nano-positioning systems
- › Firmware and software technology
- › Information and communications technology
- › Manufacturing and production
- › Microelectronics
- › Optoelectronics
- › Polytronics
- › Sensors and instrumentation
- › Switching technology and power electronics

Applications/target industries:

- › Aerospace
- › Automotive
- › Building automation
- › Energy
- › Measurement and control engineering
- › Medical devices and bioinstruments
- › Telecommunications
- › Optical industry
- › Personal computers

Thuringia has produced a host of sophisticated electrical innovations – from laser large-screen projection and MP3 compression of audio signals to groundbreaking research on improving the efficiency of high-performance LEDs. Global players such as Bosch, Jenoptik and Siemens research tomorrow's solutions here.

The industry at a glance:

- › 220 companies
- › Approx. 25,000 employees
- › Revenue exceeds € 4.38 billion
- › Around 12,800 students of engineering sciences
- › Attractive customers, suppliers and research institutions located nearby (in optics, IT, medical devices, etc.)
- › Central location is ideal for providing a wide range of on-site services

Seize the opportunities that our

region offers. Benefit from a world-class research infrastructure, highly skilled workers and a prime location in Europe's heartland.

We provide full-service support for any investment project – from site search to project implementation and future expansions.

Please contact us.



Internationally renowned top-flight research.

Thuringia's research institutes are world leaders in developing intelligent electrical engineering applications. As new research findings emerge, they are quickly shared with companies through close ties between the local scientific and business communities.



Selected research institutes:

- › CiS Research Institute for Microsensors, Erfurt
- › Fraunhofer Institute for Applied Optics and Precision Engineering (IOF), Jena
- › Fraunhofer Institute for Ceramic Technologies and Systems (IKTS), Hermsdorf
- › Advanced System Technology (AST) Branch of Fraunhofer IOSB (Institute of Optronics, System Technologies and Image Exploitation), Ilmenau
- › Günter Köhler Institute of Joining Technology and Materials Testing (ifw), Jena
- › Institute for Microelectronic and Mechatronic Systems gGmbH (IMMS), Ilmenau
- › Leibniz Institute of Photonic Technology (IPHT), Jena

Growth through cooperation

ELMUG (standing for “Thuringia Electronic Measurement and Plant Equipment”) is an industrial cluster that pools the technological capabilities of research institutions, developers, suppliers and service providers in the measurement and plant equipment industry.

The cluster is an ideal platform, especially for small and medium-sized industry players looking to gain a foothold in Thuringia. It puts them directly in touch with attractive business partners for joint research, procurement or distribution projects. At the same time, members can share experiences in order to effectively map out the risks and opportunities of future ventures, such as entering foreign markets.

ELMUG expert groups:

- › Micro-nano integration
- › EMC and device security
- › Building automation
- › Power electronics, power supply technology and drive engineering
- › Sensors

www.elmug.de

i Innovation driver for German industry: TU Ilmenau

The Ilmenau University of Technology (TU Ilmenau) is more than a popular institution of higher learning; it is also a world leader in top-flight electrical and IT research. In 2013, the excellent quality of its research was attested by the Council of Science and Humanities, the main scientific advisory body for the German federal and state governments.

The university actively supports transfers of knowledge, technology and personnel to companies. Scientific research is consistently tailored to clients' needs. A dedicated technology scout and transfer center enable effective project management from initial ideas to marketable products.

www.tu-ilmenau.de/en/research



Motivated and highly skilled workers.

Thuringia owes its status as an electrical engineering powerhouse not only to the wide range of degree programs at local universities, but also to its highly trained workforce – from mechatronics technicians to precision opticians.

University education:

Thuringian technical universities carry on the region's long engineering tradition with considerable success. They are among Germany's best educational institutions. In the latest CHE university ranking, for example, TU Ilmenau came in 1st for mechatronics and 3rd for information technology. However, other universities also offer world-class training in fields such as:

- › **Electrical engineering, information technology, automation:** Ernst Abbe University of Applied Sciences Jena, University of Applied Sciences Schmalkalden, Ilmenau University of Technology
- › **Micro and nanotechnologies, mechatronics:** Ernst Abbe University of Applied Sciences Jena, Ilmenau University of Technology
- › **Building and energy technology, renewable energy, electrical power and control engineering:** University of Applied Sciences Erfurt, University of Applied Sciences Nordhausen, Ilmenau University of Technology
- › **Space electronics:** Ernst Abbe University of Applied Sciences Jena
- › **Laser and opto technologies, photovoltaics and semiconductors, photonics, optronics:** Ernst Abbe University of Applied Sciences Jena, Friedrich Schiller University of Jena, Ilmenau University of Technology

All these universities also offer degree programs in applied information technology, technical information technology, engineering information technology and other fields.

Basic and further training

In Thuringia, tomorrow's specialists complete a rigorous course of theoretical and practical training. These and many other programs cover the entire electrical and electronic value chain:

- › **Electronics technician**
Specializations: Energy and building systems, Automation systems, Machines and drives, etc.
- › **IT electronics technician**
- › **Mechatronics technician**
- › **Microtechnologist**
- › **Physics laboratory assistant**
- › **Precision optician/engineer**

Training associations raise the quality of education even more. The Jena Training Center, for example – a joint venture of Schott, Carl Zeiss and Jenoptik – produces highly trained specialists for many industry players.

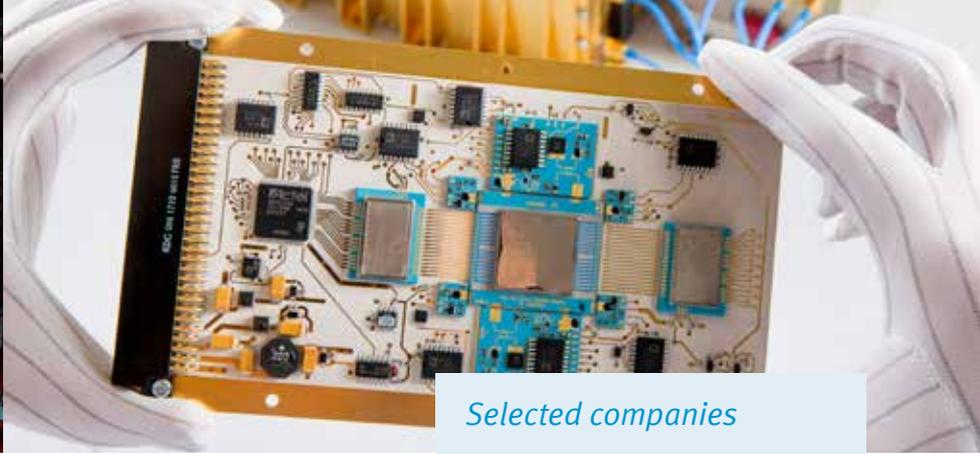
TU Ilmenau offers special continuing education programs such as power grid engineering and light application.



“Thuringia has unique capabilities in optics and optoelectronics. Traditions and regional ties, combined with our employees’ unparalleled expertise, enable us to excel not only in Germany, but worldwide as well.”

Dietmar Ratzsch, Managing Director of Jena-Optronik GmbH

Source: University Ranking by the Center for Higher Education (CHE), published in the May 7, 2013 university guide of DIE ZEIT, a weekly newspaper



Selected companies

ADVA Optical Networking SE, Meiningen
Analytik Jena AG, Jena
Antennentechnik Bad Blankenburg GmbH, Bad Blankenburg
Carl Zeiss Microscopy GmbH, Jena
EPSa Elektronik & Präzisionsbau Saalfeld GmbH, Saalfeld
Fujitsu Technology Solutions GmbH, Sömmerda
Funkwerk AG, Kölleda
Gaia Akkumulatorenwerke GmbH, Nordhausen
HASEC-Elektronik GmbH, Wutha-Farnroda
INA - Drives & Mechatronics GmbH & Co. KG, Suhl
Jena-Optronik GmbH, Jena
JENOPTIK AG, Jena
MAZeT GmbH, Jena
Melexis GmbH, Erfurt
Micro-Hybrid Electronic GmbH, Hermsdorf
Micro-Sensys GmbH, Erfurt
MTM Power Messtechnik Mellenbach GmbH, Mellenbach
paragon AG, Suhl
Qundis GmbH, Erfurt
Robert Bosch Battery Solutions GmbH, Eisenach
Thales Transportation Systems GmbH, Arnstadt
UST Umweltsensortechnik GmbH, Geschwenda
Vision & Control GmbH, Suhl
Vistec Electron Beam GmbH, Jena
WAGO Kontakttechnik GmbH & Co. KG, Sondershausen

Success made in Thuringia.

Thuringia offers outstanding growth opportunities for companies seeking to make a splash in the market with new electrical applications or cutting-edge electronics. Major market and technology leaders have been doing business in Thuringia for many years.

X-FAB Semiconductor Foundries AG

The X-FAB Group is an Erfurt-based multinational semiconductor foundry that produces silicon wafers. Since 1992, the chip manufacturer has invested a nine-digit sum in new equipment and state-of-the-art infrastructure at its Erfurt location, where it now employs around 700 people. It plans to make more investments in the coming years to build a production facility for micro-electromechanical systems (MEMS).

Siemens AG, Fossil Power Generation

Siemens's Erfurt generator plant is a center of competence for the development and production of generators rated up to 300 megawatts. Over 900 generators from Erfurt are in operation worldwide, representing a total capacity of nearly 80,000 MVA. All told, these generators can supply power to nearly 65 million people, or roughly the population of France. More than 700 people work at the site.

SIOS Messtechnik GmbH

Established in 1991, SIOS Messtechnik GmbH is an innovative developer and manufacturer of high-precision, high-quality laser interferometry instruments. The products it makes at its Ilmenau headquarters include the NMM-1 – the world's most accurate and powerful nano-positioning and nano-measurement machine.

GÖPEL electronic GmbH

Jena-based GÖPEL electronic is a leading provider of electrical and optical testing and inspection systems. Founded in 1991, the company currently has over 200 employees in addition to the approx. 300 more specialists in its worldwide distribution and service network. GÖPEL was named one of Germany's 100 best medium-sized enterprises as part of the TOP JOB Program. Its products have won several coveted awards in recent years.

Your LEG-Service

Our consulting services are free. Simply set an appointment with our friendly investor service team.

State Development Corporation of Thuringia (LEG Thüringen)

Dept. Investment, International Business and Cluster Promotion
Mainzerhofstrasse 12
99084 Erfurt/Germany

Picture Credit: LEG Thüringen, Jena-Optronik, JENOPTIK, IOSONO, Siemens, TU Ilmenau

Phone +49 361 5603-450
Fax +49 361 5603-328
invest@leg-thuringen.de
www.invest-in-thuringia.de/en