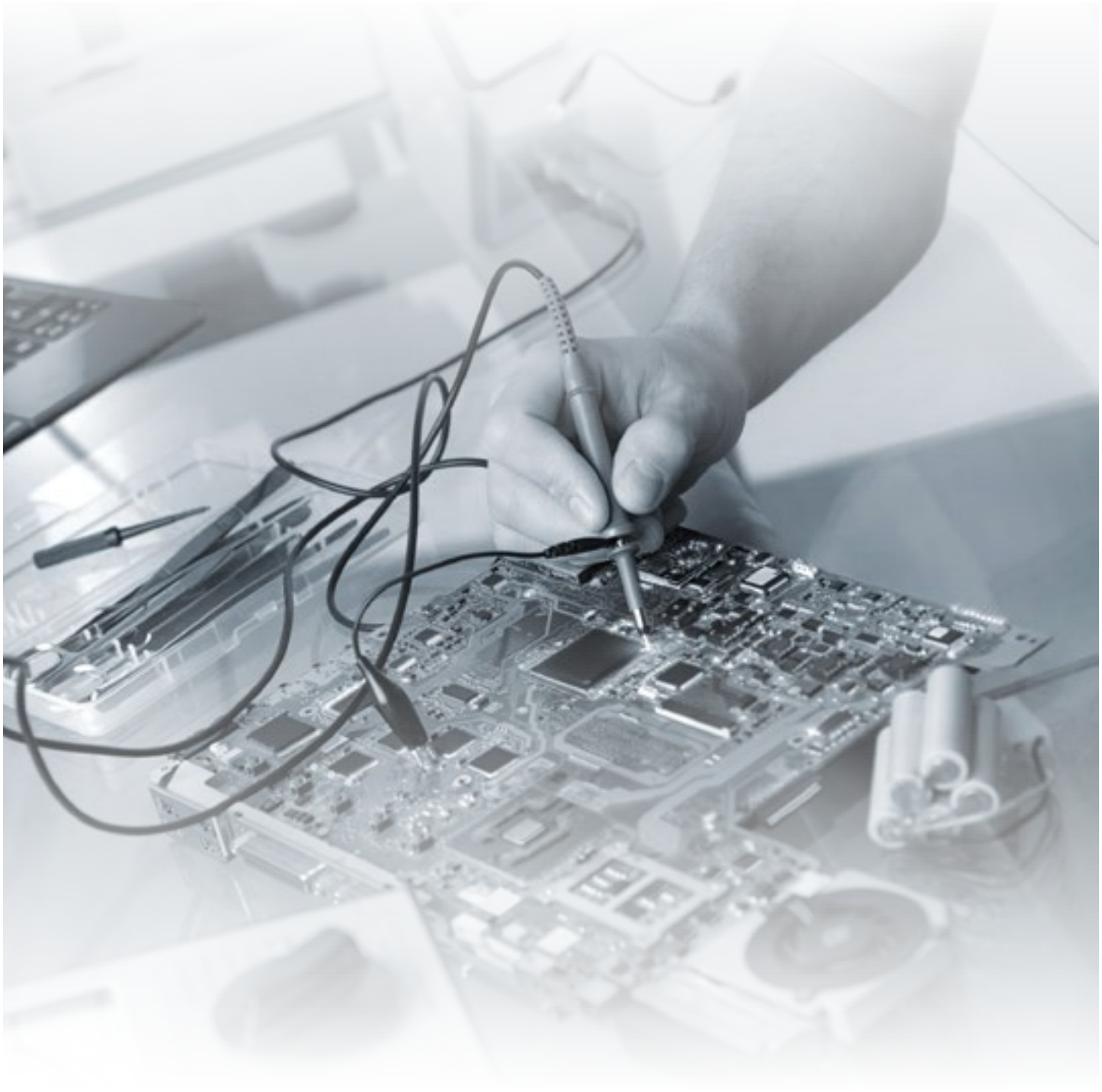
Czech Republic
The Country For The Future

ELECTRONICS

CzechTrade



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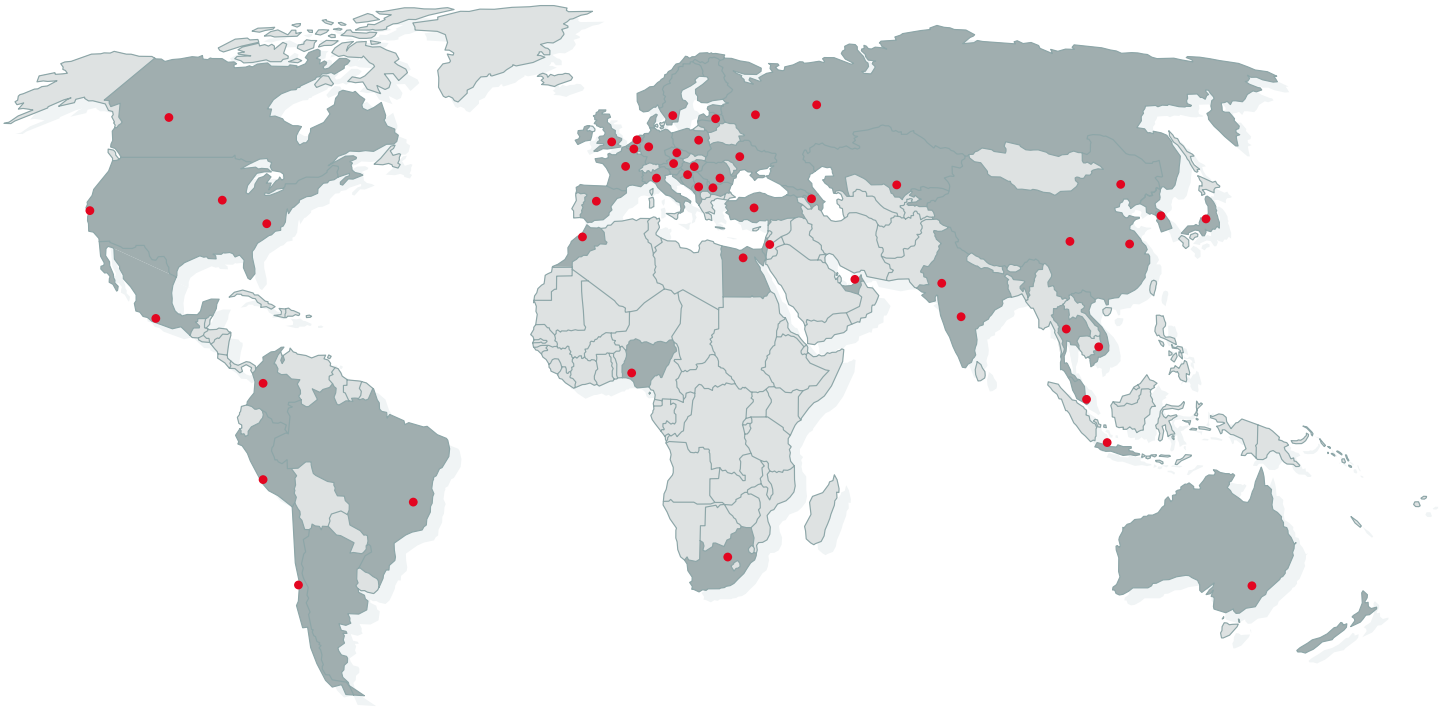
CzechTrade is proud to present the Czech electronics industry sector guide.

If you are looking for a supplier in the Czech Republic, CzechTrade will be delighted to assist you in order to find new manufacturing/service partners, professional organisations and interest groups.



CzechTrade operates in almost 60 countries worldwide.

CzechTrade is a government trade promotion agency of the Czech Republic focusing on developing international trade and cooperation between Czech and foreign businesses. CzechTrade works with Czech companies to facilitate their success on international markets.

The goal of this brochure is to inform interested foreign entities about the electronics industry in the Czech Republic. Take the companies listed in this brochure as a sample listing, which will help you to formulate a better picture of the specific field.
If you are interested in more information, please contact:
supplier@czechtrade.cz

CzechTrade

YOUR BUSINESS PARTNER IN THE CZECH REPUBLIC

Foreign companies contact CzechTrade when looking for new reliable partners in the Czech Republic. CzechTrade foreign office network together with its sourcing team will identify potential suppliers based on your requirements:

- initial consultation by phone/email/in person
- provision of a basic overview of a special sector
- compilation of a contact list of companies interested in cooperation
- eventual facilitation of meetings with Czech companies, so-called Sourcing Days

Other services:

- access to verified Czech suppliers
- assistance with language support
- presentation of Czech companies at foreign trade shows
- preparation of business missions to the Czech Republic
- providing the online database Czech Exporters Directory **http://exporters.czechtrade.cz**

CzechTrade

Information and contacts for individual foreign offices can be found at www.czechtradeoffices.com

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128 01 Prague 2
Czech Republic
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DID YOU KNOW?

CzechTrade has an extensive network of foreign offices in almost 60 countries on 5 continents. With their scope of activities, the foreign offices network covers Europe from Scandinavia to the Balkans, Eastern Europe and the CIS, Africa from Sub-Saharan Africa to South Africa, major Asian regions, the American continents from Canada to Latin America, and Australia.

THE ELECTRICAL AND ELECTRONIC ASSOCIATION

The Electrical and Electronic Association of the Czech Republic (EIA) was established in January 1992 as an economically and legally independent employer and entrepreneurs' association. The association associates both legal entities and natural persons of the electric engineering and electronic industries as well as entities with the same interests as the electronic industry. The association promotes the interests of employers on the principles of entrepreneurial democracy. In addition to the collective negotiations with the trade unions, which is a basis of social dialogue, it further communicates with the respective state administration bodies (Ministry of Industry and Trade, Ministry of Labour and Social Affairs, Ministry of Education, Youth and Sports, Ministry of the Environment etc.) and of course with the umbrella employer organisation, the Union of Industry and Transportation of the Czech Republic. It enables its members to participate in the creation of new legislation standards, at work in expert groups and other activities.

Other activities of the association:

- supporting pro-export activities of member companies
- promoting its members
- organising conferences
- organising general meetings
- buying energy centrally for its members
- cooperating on operating programs and EU projects
- launched the first industrial blockchain

The world-unique project from the Czech Republic serves to industry

The E1A blockchain is a world-unique blockchain project, which is being built together by a community of companies and state institutions for their needs as a trusted platform for industry and commerce and as a public authority for digital property registration.

We are pleased that, in addition to companies, state administration institutions have also shown interest in joining the project. The Ministry of Industry and Trade, for example, has already set up its node. The Confederation of Industry also installed its node, even in the top ten participants.

Last year, the Czech Chamber of Commerce or the certification company TÜV SÜD also launched its node. It is a signal to us that the professional public considers blockchain to be an essential technology associated with the digital future of industry and services in the Czech Republic. In January 2021, the E1A blockchain network already has almost thirty nodes, which ranks it among the largest commercial blockchain networks in the world (except the cryptocurrency network).

The E1A blockchain is equipped with adequate monitoring, billing and other services; we are continually updating the defence against cyber-attacks. Last year, we also managed the first breakthrough abroad. The E1A Blockchain is integrated into the WISE-SaaS industrial platform of Advantech Co., one of Taiwan's leading technology companies. In addition to the Blockchain Notarius® service (in Chinese), we offer the use of a blockchain to provide IoT communication or communication via industrial buses.

There is also interest in applications of detecting counterfeit Covid vaccines or verifying data in telemedicine.

These are all cases of applications that will become more common with the development of Industry 4.0. Even more so than today, data will be money, and blockchain will ensure that you are not deceived. However, the E1A blockchain was created mainly for companies in the Czech Republic. We launched several pilot projects last year, and interest is still growing. The E1A blockchain is not just a blockchain behind the Blockchain Notarius® application. Several other independent blockchain solutions can run on the platform. Besides, each of them can have specific properties suitable for your application. It is an opportunity for you who want to use this technology of the future in your commercial projects.

Another unique feature of this platform is creating a blockchain representing an independent public authority for digital ownership verification. Every node owner of our network can become a verifier and a part of this authority. For example, this authority will ensure that no one falsifies certificates, invoices, declarations, or other documents issued by you.

The platform is developed and managed by ELA Blockchain Services a.s. which was founded in June 2019 by the Electrical and Electronic Association of the Czech Republic and is wholly owned by it. Provide you with the necessary information, support, and development environment for your application.

It has a so-called sandbox a test blockchain with one node, on which development can begin. It will also lend a non-public test blockchain network for further development.

Blockchain is the future of industry and services. Representatives of the Electrical and Electronic Association of the Czech Republic, and ELA Blockchain Services a.s. are proud to have been able to offer this technology to members of the Electrical and Electronic Association and other interested parties. Take advantage of this offer and do not miss the opportunity to be among the first to use blockchain. It will soon be a substantial competitive advantage.

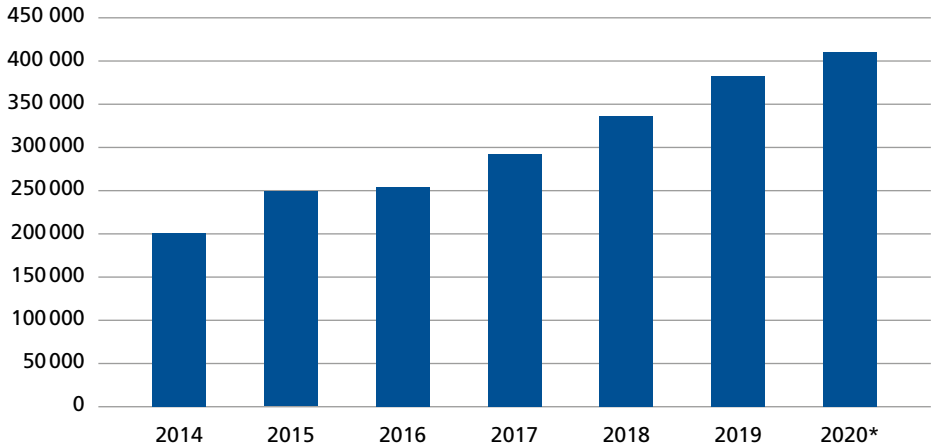
ELA Blockchain Services a.s.

www.elachain.cz

1 ELECTRONICS IN NUMBERS

Electronics is a pillar of the Czech economy and the second most important industrial sector of the Czech economy.

EXPORT OF ELECTRONIC AND TELECOMMUNICATION PRODUCTS FROM THE CZECH REPUBLIC (IN MIL. CZK)



Source: The Czech Statistical Office, Cross-border movements of goods, Export of high-tech goods,
*preliminary data
Average exchange rates (2020): 1EUR: 26,444 CZK ; 1USD: 23,196 CZK

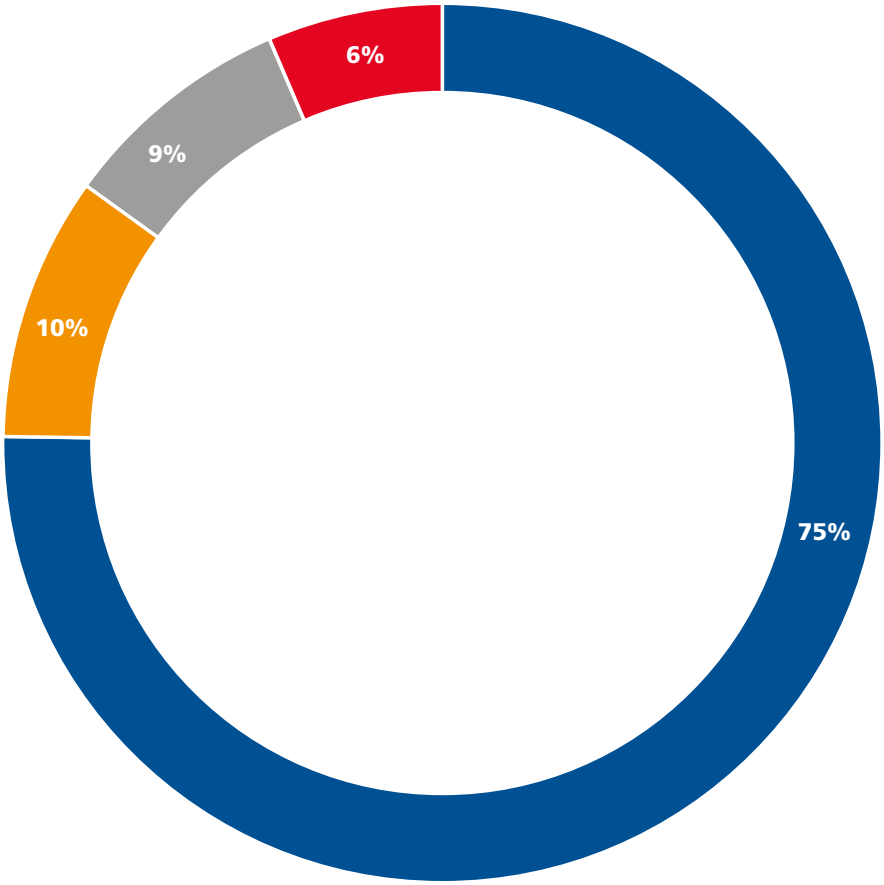
Competitive advantages of the Czech Republic: advantageous position, infrastructure and mainly the available and sufficiently qualified labour.

The own technological potential of the Czech Republic is really strong and it is a guarantee of the competitiveness in the foreign markets.

Electronics is one of the key industrial sectors, due to the high added value of products classified in the category of high and medium sophisticated technology.

The industry requires lots of investments in science and research, and this is also the reason why the further development has been supported by direct foreign investments where foreign companies provided for the transfer of technologies and the production basis.

EXPORT OF ELECTRONIC AND TELECOMMUNICATION PRODUCTS FROM THE CZECH REPUBLIC IN 2020



Source: The Czech Statistical Office, Cross-border movements of goods, Export of high-tech goods, preliminary data

- Telecommunication devices
- Semi-conductors
- Electronic devices
- Devices for recording

THE ELECTRONICS INDUSTRY IN NUMBERS

The second major industry of the Czech economy

13,763

Enterprises

141,012

Employees

780,400

million CZK

Net turnover

Source: Ministry of Industry and Trade, 2019
1EUR: 25,672 CZK ; 1USD: 22,934 CZK

2 CZECH REPUBLIC: CRADLE OF ELECTRONICS

The electronics industry is now one of the most important industries in the Czech Republic with a long and rich history.

COMMUNICATION AND SIGNALLING EQUIPMENT HAS BEEN PRODUCED IN THE CZECH REPUBLIC SINCE THE 19th CENTURY

Approximately from the middle of the 19th century, electrical engineering became a fully fledged independent industry and a common part of the life of the society, and the first production plants producing telegraph devices and signalling equipment were established in the territory of what now is the Czech Republic. Shortly after the telegraph expansion, the telephone also appeared in the territory of the current Czech Republic, which was related to further development of electrical and electronics plants. In addition to telegraphs and telephones, work on the development of electric lighting were carried out during the whole 19th century. František Křižík (1847–1941) played a crucial role in this development. It was his patent, according to which lighting was installed in a lot of industrial enterprises, buildings, public and exhibition premises, mainly in the second half of the 19th century.

FRANTIŠEK KŘIŽÍK as the Czech Edison

František Křižík contributed to the development with his first invention in 1878 – the automatically controlled semaphore for increasing the safety of rail traffic. Three years later he presented one of his most important inventions – the improved arc lamp. He was awarded the gold medal for this achievement in the international exhibition of electric engineering and electronics in Paris. Subsequently, he had founded an electrical engineering plant in Prague, which soon had hundreds of employees. In 1891, he presented the light fountain in the Anniversary provincial exhibition. At the same time, he also established the first tram track in Praha – Letná. Křižík's other achievements also include the first electrified track in the Austrian-Hungarian empire, which was put into operation between the Czech towns of Tábor and Bechyně. He built more than one hundred municipal power plants, thus electrifying several Czech towns and municipalities.

THE CZECH INDUSTRY ALREADY HAD TO FACE FOREIGN COMPETITION IN THE 19th CENTURY

In what is today the Czech Republic, lighting was mainly installed by foreign companies (Siemens and Halske from Germany, Ganz and Co. from Budapest, Glücher from Galicia etc.) and less by Czech ones (F. Křižík, Waldek and Vágner, etc.). Electrical goods were delivered by several foreign companies to our territory, and it was not easy for our entrepreneurs to establish themselves in trade. Thus, they were forced to proceed in such a way that their production did not directly compete with these foreign companies. The first electromechanical workshops dealing in electro-forming and the production of electrical devices in our country were established in the 1860s. A typical electrical engineering plant dealt with the production and installation of less sophisticated products such as buttons, bells, electric clocks, battery devices etc. Sophisticated devices were only assembled here using parts imported from abroad. Most electrical engineering plants were established in Prague.

SOON AFTER 1900, THE CZECH COMPANIES BEGAN MERGING WITH THE FOREIGN CAPITAL

In the last two decades of the 19th century, several new electrical engineering companies were established there, which later became the main drivers of this industry during the existence of independent Czechoslovakia. The most important ones included namely companies by František Křižík (founded in 1882), Emil Kolben (1896), Josef Donát and Robert Bartelmus, Alois Duda (1895) or Waldek and Wagner (1884). Originally, most of these companies were Czech-owned; later they merged with the foreign capital.

ESTABLISHMENT OF ELECTRICAL ENGINEERING BUSINESS GROUPS IN THE 20th CENTURY

In the period between the two wars, the Czech electrical engineering industry produced a relatively wide portfolio of products. In the 1920s, the electrical and electronic production started to concentrate into bigger companies. An increased focus on the heavy-current electrical engineering was characteristic of this period. Before World War II, the electrical engineering industry in Czechoslovakia employed about 200,000 people working in 60 plants. A part of the electrical and electrical engineering industry developed under the influence of foreign licences from renowned companies such as Siemens, Osram, Philips, Blaupunkt, AEG, Ericsson etc.

EMIL KOLBEN – a giant of the electrical engineering industry

In 1896, Prague born Emil Kolben founded Kolben a spol. dealing with electrical machines and devices, with its headquarters in Vysočany, Prague. In 1900, the company produced its first steam engine and was awarded gold medal for its thousandth alternator in Paris International Exhibition. In 1921, the company merged with Českomoravská strojírna, and six years later Českomoravská-Kolben-Daněk was founded through another merger. Mr Kolben – in the position of Managing Director – brought this machinery group to the position of a world renowned manufacturer of electrical machines, transformers and engines. ČKD manufactured a wide range of products, including aircrafts or combat tanks. It established the first trolleybus track in Prague, which was operated in the ČKD corporate area. It exported water and steam power plants worldwide.

START OF THE DYNAMIC GROWTH AFTER 1990

In spite of the fact that some domestic electrical engineering products achieved a global level and in spite of the long tradition of this industry in our country, the Czech electronics and electrical engineering industry generally lagged behind global development from the 1970s. In the 1990s the electronics and electrical engineering industry reached its transformation's low level with a production drop as low as below 50% of the original volume. Since these times, this industry has been characterised by dynamic growth in production, labour productivity and the quality of products. The main factor that initiated this dynamic development was the arrival of several major foreign investors. Currently, the main features of our electronics and electrical engineering industry include the assembly nature of the production, the significant share of the multi-national capital both with new and existing investments, the utilisation of high technologies, the wide range of technological processes, the high extent of the utilisation of science and research in the production and the need for highly qualified employees in research, development and production.

Invention of the electron microscope

The beginning of the current success of DELONG INSTRUMENTS dates back to times of the Institute of Instrument Technology founded in 1953. In 1955 the commercial repeated production of electron microscopes was started here, and in 1962 Professor Armin Delong was appointed the director of the institute. Prof. Ing. Armin Delong, DrSc was a Czech scientist, the world-renowned physicist and the founder of the electron microscopy in Czechoslovakia. He worked on the production of electron microscopes from the 1950s. In 1958, he was awarded the gold medal for his prototype of the desk electron microscope BS242 in the Brussels EXPO International Exhibition. Therefore, Professor Delong stands behind the development of the LVEM5 (Low Voltage Transmission Electron Microscope) with the 2-nm resolution, which is 100 times bigger resolution compared to the high-quality light optical microscope. Currently, the company is a world leader in the production of electron microscopes. DELONG INSTRUMENTS, **www.dicomps.com**

THE WORLD TOP LEVEL OF CZECH COMPANIES DRIVEN BY THE TRADITION AND KNOW-HOW

In this biggest detail the Czech Republic is the world's leader

The Czech Republic, in particular the city of Brno, is the proud leader of the world's electron microscopy. Currently, several companies produce over 30% of the global production of electron microscopes. Brno has the highest concentration of companies and scientific and research institutes in this industry in Europe. However, DELONG INSTRUMENTS is not the only company in the Czech Republic specialising in the production of electron microscopes. Tescan and Thermo Fisher Scientific Brno, also have their registered offices in Brno.

Czech sewing machines are operated around the world

MINERVA realises a turnover of over CZK 1 billion, and sewing machines produced by MINERVA are used by renowned brands (Baťa, Adidas, RIEKER, GABOR, RICOSTA, MEINDL, Högl, ARA, LLOYD,…) for the production of their products. Nevertheless, the company history dates back to 1883.
MINERVA BOSKOVICE,
www.minerva-boskovice.com

ATAS elektromotory Náchod a. s.

ATAS elektromotory Náchod is a company with a longterm tradition. In 1928, Antonín Taichman founded the ATAS electrical engineering plant in Náchod. From its establishment, the company focused on the production of small electric motors and ventilators and its development. ATAS manufactures electric motors for the general use and "custom" motors designed according to the required application.
ATAS elektromotory Náchod a. s.,
www.atas.cz

The world is broadcasting on Czech waves

TESLA is a successor of the one of the first electrical engineering companies in the territory of former Czechoslovakia, which was founded in 1921 under the name of Elektra exclusively with Czech capital. From 1932 to 1945, it was owned by Philips. Its production range included bulbs, vacuum tubes, radio receivers and military technology as well as radio and TV transmitters. By the end of the 20th century, over 1,500 television transmitters were installed in the territory of the former Soviet Union alone, providing for over 60% of the radio and TV broadcasting there. A number of radio transmitters were sold to Egypt, Algeria, Yemen and Syria despite the competition from other world producers. Currently, TESLA is also a renowned manufacturer in the field of military technology. It is one of the leading suppliers in the field of special radiocommunications and the connecting technology for the military stationary and mobile tactical networks. The main commodities of the company include the production of radio relay equipment for the creation of microwave communications, maintenance of security equipment and systems, weak-current systems, structured networks and the setting up of circuit boards. It also ensures complete services for all supplied technologies.
TESLA,
www.tesla.cz

KOPOS has been beating its competitors worldwide for almost one hundred years.

The history of the KOPOS KOLÍN a.s. plant has been related to the development of electrical engineering dating back to the beginning of the 20th century. In 1926, the production of shell type and armoured wiring conduits including mounting boxes and other accessories was started.

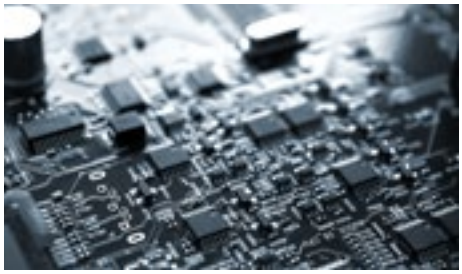
KOPOS is still a Czech owned company. Currently, produces more than 5,000 items – wiring boxes, trunkings, parapet trunkings, pipes, double wall protector conduits (business mark KOPOFLEX® and KOPODUR® system) divided cable duct KOPOHALF® and cable management systems. The company also produces environment-friendly products, e.g. plastic products from halogen-free and lead-free materials. Respecting the increasing demand for building safety, we developed the systems with maintained functionality in fire. The first fire resistance test was conducted in 2009. The company also uses the technology for the production of shading blocks NEUTROSTOP, the product able to protect the environment from neutron radiation.

KOPOS has a production and technical background which enables it to respond quickly to the market requirements and the continuous extending of the offer of new products. The company has its own development and design basis, its own workshop and prototype shop for the development, preparation and verification of new products.

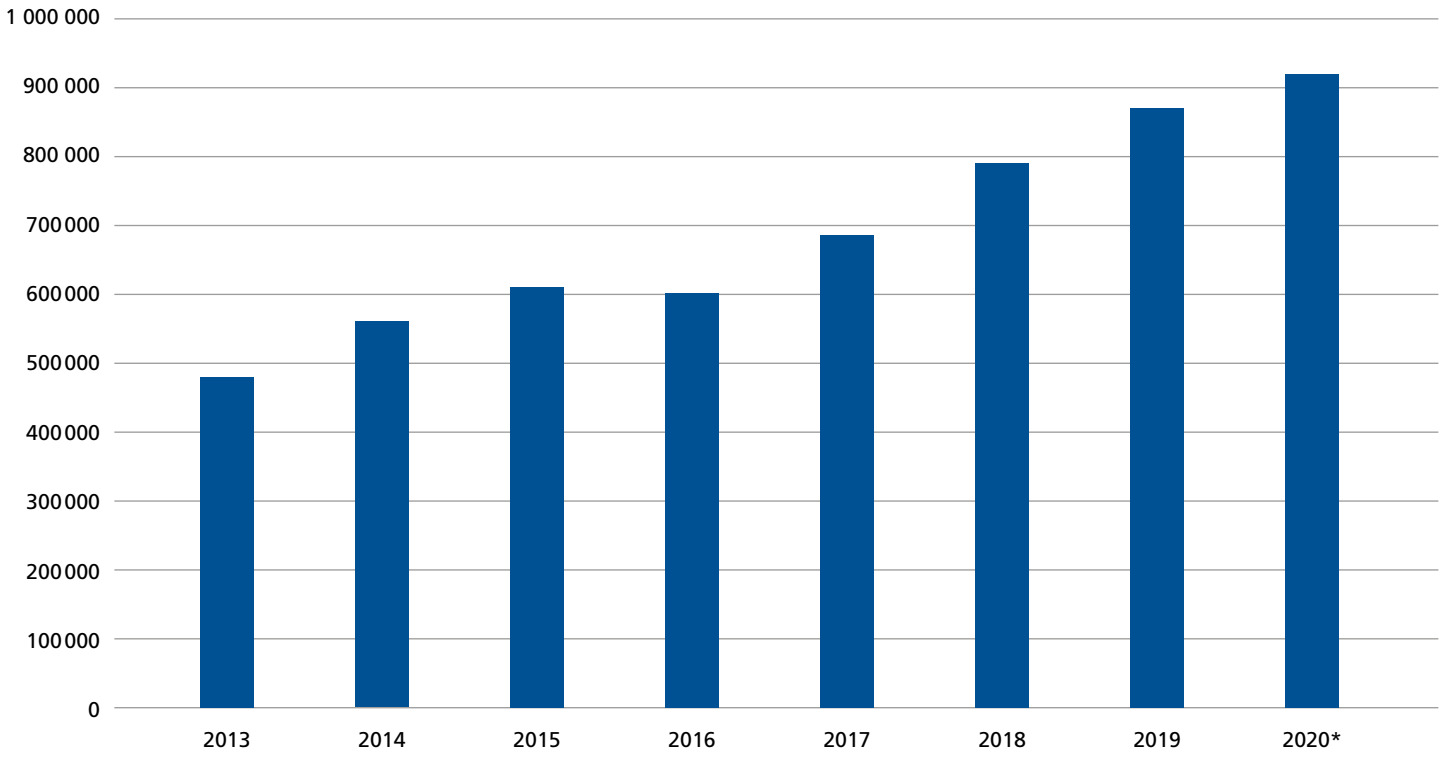
Recently, a new PVC mixing plant was put into operation, allowing for the preparation of high-quality materials both in terms of the mechanical properties and the permanence of colours.

KOPOS KOLÍN a.s.
www.kopos.com

3 CZECH ELECTRONICS: TOP TECHNOLOGY

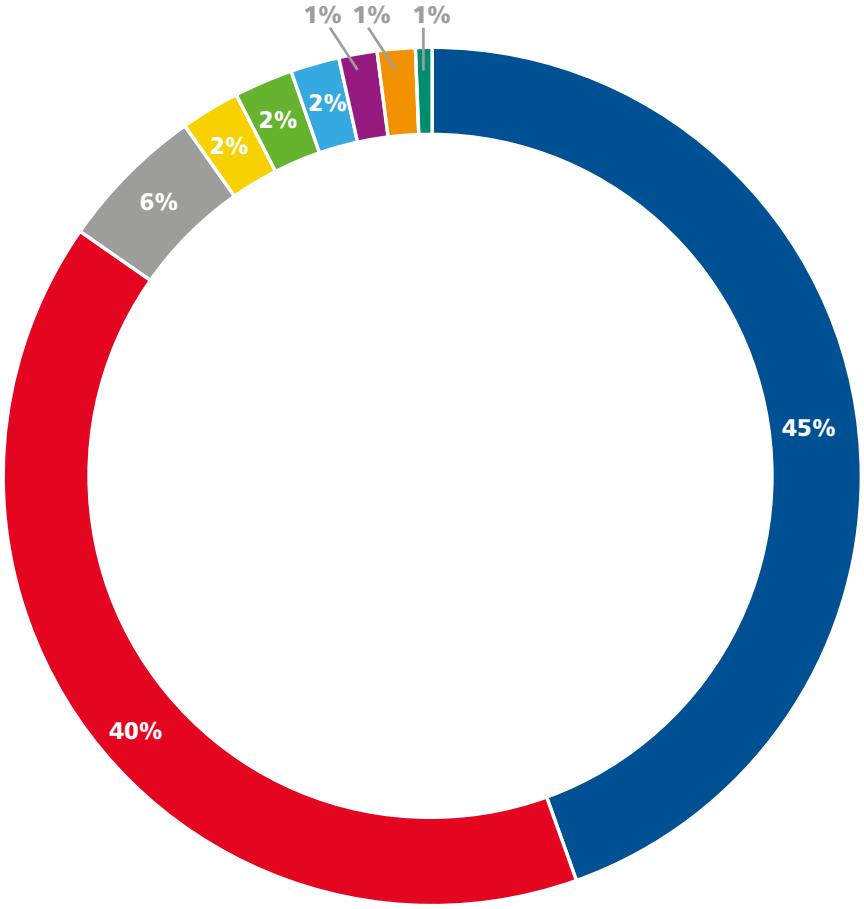


EXPORT OF HIGH-TECH GOODS FROM THE CZECH REPUBLIC (IN MIL. CZK)



Source: The Czech Statistical Office, Cross-border movements of goods, Export of high-tech goods, *preliminary data
Average exchange rates (2020): 1EUR: 26,444 CZK ; 1USD: 23,196 CZK

EXPORT OF HIGH TECH GOODS FROM THE CZECH REPUBLIC IN 2020*



Source: The Czech Statistical Office, Cross-border movements of goods, Export of high-tech goods, *preliminary data

- Electronics and telecommunications
- Computer technology
- Scientific apparatus
- Electrotechnics
- Pharmacy
- Non-electric machines
- Other high-tech
- Aerial technics
- Chemistry

HIGH QUALITY OF EDUCATION AND GROWING INVESTMENTS IN SCIENCE AND RESEARCH

Twenty-four percent of the Czech population has attained university education, and 37% of the country's residents have secondary-school education with leaving exam; wages reach the level of 40%–60% compare to western countries with the same degree of technical advancement among workers, which is one of the competitive advantages when it comes to attracting foreign investors. At the same time, this fact also supports the economic and technology development in electrical engineering. The current trend is the intense cooperation with the private sector making the research, more pro-market oriented with emphasis being placed on experimental research, thus ensuring added value in technological innovations. Currently, research and development are mostly financed from private business sources (share over 60%). Support for science and research is of key importance for the Czech Republic. R&D expenditure in the Czech Republic stood at 1.94% of GDP in 2019 (in the EU stood at 2.19% of GDP in 2019). Therefore, highly specialised scientific and development centres and scientific-technical parks, have been established in our country.

The cooperation of successful companies and universities provide the Czech electronics sector with a competitive advantage

TESLA designs and produces aerials, antenna arrays and antenna fields up to the 40 GHz frequency. Currently, it also focuses on SIW aerial structures. It cooperates with the electromagnetic field department of CTU Prague and BUT Brno on the aerial system with the switchable bundle width.
TESLA, **www.tesla.cz**
Czech Technical University in Prague, **www.cvut.cz**
Brno University of Technology, **www.vutbrno.cz**

DID YOU KNOW?

Czech scientists have worked on the appliance for the Solar Orbiter. Czech scientists from the Academy of Sciences of the Czech Republic have completed the development of a device that will measure electromagnetic waves in space. It is to be part of the RPW (Radio and Plasma Waves) on the Solar Orbiter interplanetary European probe, which will orbit between the Sun and Earth. The completed probe should be dispatched in orbit in 2018. Own production by qualified technological processes was carried out by the company G. L. Electronics, which owns the necessary certification required by the European Space Agency.

Centre of scientific excellence in the field of sciences on animated nature and advanced materials and technologies: CEITEC

The first scientific centre in the Czech Republic, which integrates research and development in this extent. The research in the fields of electronics and electrical engineering is focused, for example, on intelligent sensors using new materials, advanced control technologies, mobile robotic systems, computing and built-in systems. It results in unique inventions: Autonomous tele-presentation robotic system – ATEROS, intended for the autonomous or supervised research of areas non-accessible or dangerous for people represented by professor Luděk Žalud. CEITEC, **www.ceitec.cz**

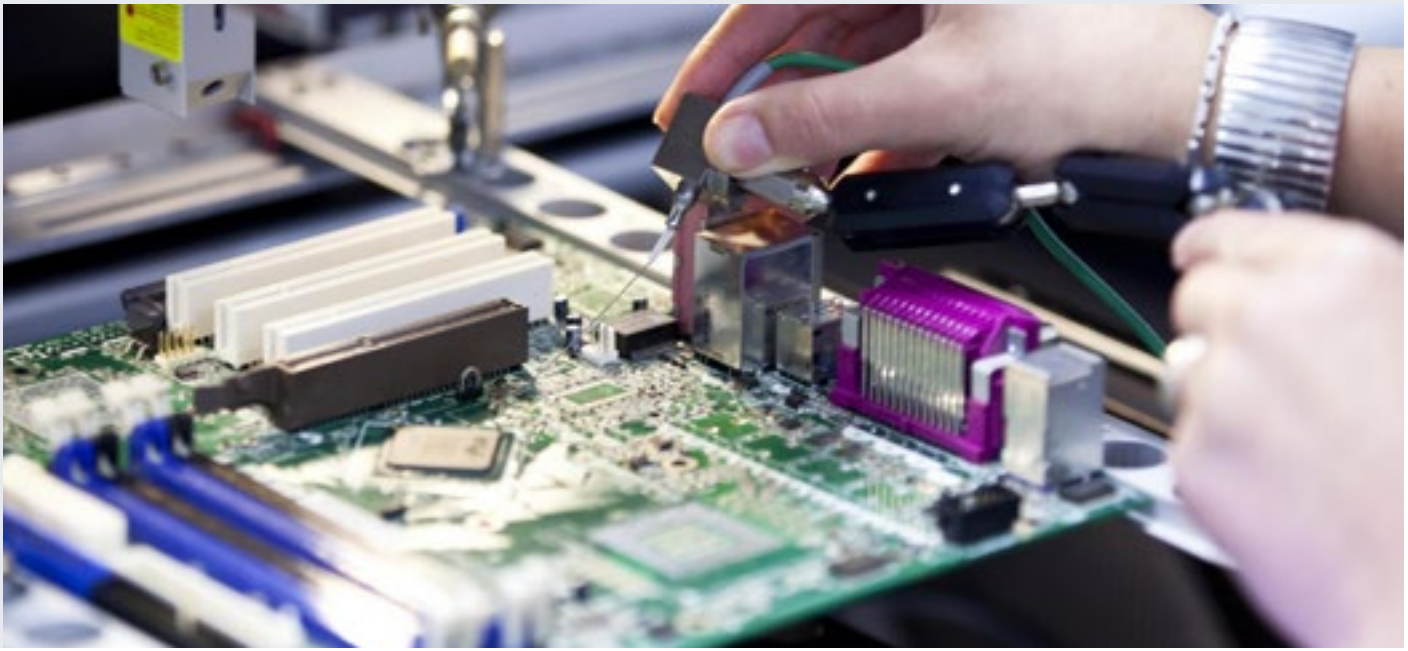
The world level universities

Czech Technical University in Prague, Faculty of Electrical Engineering

The Faculty of Electrical Engineering provides for research development works in the following areas: measuring systems, acoustic sensors (transducers), advanced radio systems, intelligent decision making support and control systems, CIM robotics, real-time management, modelling and management of the dynamic systems, biomedicine engineering, sensors and micro-systems, designing, modelling, simulation and diagnostics of the microelectronic and optoelectronic structures, analysis and synthesis of circuits in the A/D systems, microwave technologies, technologies of millimeter waves, lighting systems, energetic systems, control of drives, etc. In 2019, the faculty acquired eight utility models, nine Czech patents and 10 international patents. A total of 30 new research outcomes were submitted for patent protection. Projects whose worth totalled

CZK 101 million included 160 contracts worth up to CZK 1 million and 81 contracts worth over CZK 1 million. Many development projects are secret, but we can, for example, mention the AERIAL Cognitive Integrated Multi-Task Robotic System with Extended Operation Range and Safety or a simulator that was developed by experts of the Faculty that changes the way of training of operators at the 155 emergency number – the system emulates the development of emergency situations operators at emergency call centres have to deal with; the Prague Rescue Service uses this new solution.

Participation in the NASA space research activities: Doc. R. Hudec has solved the joint Czech-U.S. project aimed at the cooperation with NASA and the development of the innovation technologies on a basis of active X-ray optics for the envisaged US mission called Generation X (2008–2012). This project has now continued through another Czech-American project in the field of space technologies with the objective of studying and developing the wide-angle optics for the space-satellite experiments. The Czechs helped create the artificial intelligence with intuition. It is not like a common computer anymore and offers a revolution across industries. The DeepStack artificial intelligence bluffs and is able to cheat humans. It has a sort of intuition, and thanks to this, it managed to beat the world's leading poker players. The information of this breakthrough development, which, according to some experts, was not supposed to ever have been managed by artificial intelligence, has attracted lots of attention in the world. Authors of the DeepStack program include students from the Applied Mathematics Department at the Mathematics & Physics Faculty at Charles University and the Artificial Intelligence Center, Faculty at Electrical Engineering at the Czech Technical University in Prague. Czech Technical University,
Faculty of Electrical Engineering,
www.fel.cvut.cz



First-rate global level customised development

MOOG Brno is a development centre founded back in 1947. Currently, it operates in the market as a development production company. It focuses on customised non-standard designs of electrical machines – rotational according to customers requirements. It has its own development basis and in addition has been cooperating with VUT Brno experts for a long time.
As an example, we can mention a joint project called the Research Centre for Special Rotary Machines, where in addition to the mentioned MOOG Brno and VUT companies, the consortium also includes another 9 companies, both industrial and those from the research area. This project has been implemented under the support of the Technology Agency of the Czech Republic. The output of the mutual cooperation between VUES Brno and VUT Brno within the project will be functional samples of high-revolution machines with the output parameters from 6 kW to 200 kW and rotational ranges from 20,000/min to 120,000/min.
MOOG Brno,
www.moogbrno.cz/vues-home-en/
Brno University of Technology (BUT),
www.vutbr.cz
Technology Agency of the Czech Republic (TA ČR),
www.tacr.cz

DID YOU KNOW?

The Czech Republic has achieved success in the field of innovation. In the Global Innovation Index (GII), it ranked 24th out of 131 world economies (GII 2020). R&D expenditure in the Czech Republic stood at 1.94% of GDP in 2019 (in the EU stood at 2.19% of GDP in 2019).

INNOVATIVE AND DESIGN SOLUTIONS

Focusing on the most successful Czech companies, even here the importance of technologies and innovations become obvious. Take ELCOM as an example. Currently, this is a world-renowned supplier of advanced solutions, especially in the field of automated measuring and testing systems, systems of monitoring the electricity quality, industrial testers and camera systems. It has achieved its position due to the unique level of research and application of innovations. ELKO LP is another example; this company has been exporting electrical wiring to 70 countries in the world thanks to its own development and innovations. It has succeeded in the foreign markets also due to its quick and perfect maintenance service. Currently, it is the innovations that characterise the most successful global players. These include the Czech company ZPA Smart Energy, which made it to the finale of the AT Kearney best innovator prestigious world chart. With these high added value commodities, we observe a generally positive trend of export diversification, which is not only focused on EU countries but has also been successful in prospective emerging markets and in Asian countries. Czech companies are successful on foreign markets through the high quality of processing, innovative technology solutions as well as due to the emphasis placed on the design, speed and reliability.

SALTEK, the leading Czech company dealing with the development and production of surge protections was awarded the prestigious international 2014 Red Dot award for product design

The product range of surge protections by the Czech company SALTEK, which was awarded in the Red Dot Award competition in the Product Design category, features a unique coloured coding system, which distinguishes individual models of the surge protection according to the installation area. This coloured distinguishing significantly facilitates the selection of a suitable type of equipment, thus eliminating any installation errors and allowing for an easy orientation with later revisions and maintenance. However, SALTEK also lays emphasis on its own development, which is essential for the continuous and dynamic development. The experienced development team works in a technologically advanced testing laboratory with unique devices and technologies, which support a fast and high-quality development process. The flexibility and speed are also other added values. The flexible approach to the implementation of special custom-made ODM/OEM solutions and products worldwide.
SALTEK, **www.saltek.eu**

ZPA Smart Energy

The portfolio of ZPA Smart Energy products targets electricity measuring and control. The company has been active in this field for more than 60 years and its products stand for high quality, reliability and innovation, arising from the robust in-house development capacity. Many decades ago, ripple control receivers enabled controlling of consumption and, via PLC (Power Line Communication) received signals from energy centres, to govern appliance consumption. This functionality has now been incorporated in modern Smart Grid systems, which, in particular, are based on precise and reliable measuring. ZPA Smart Energy is a leading European producer of intelligent electricity meters and systems for remote data collection and control of the Smart Grid distribution system. It also develops and installs systems for multinational power generating companies.
ZPA Smart Energy,
www.zpa.cz

Intense collaboration with universities

ELCOM has had long-term cooperation with the Faculty of Electrical Engineering and Computer Science at VŠB – Technical University of Ostrava. They supported the cooperation with universities also by constructing the building in the area of the Science-technology Park in Ostrava and by building the technological centre. ELCOM, in cooperation with National Instruments supplied the measuring system for the measuring of the temperature of plasma in Tokamak COMPASS in the Institute of Plasma Physics of the CAS (The Czech Academy of Sciences). This year the solution as a system has been presented at two expert symposiums of physics in Rome and Austin. In the field of the development of SW applications based on the LabVIEW system, ELCOM has been cooperating with the Czech Academy of Sciences. Thanks to business relationships with the world's leading manufacturers of measuring technology, camera systems and optical systems, it has been mainly participating in the development of software with new products in these areas. The power electronics experts cooperate on the MOET (More Open Electrical Technologies) project, which is a task aimed at establishing a new industrial standard of the design of electric systems for commercial aircrafts. This project is about to increase the competitiveness of the European aerospace industry and contribute to the reduction of air transport emissions and improvement of the operational capacity of aircrafts. ELCOM Virtual Instrumentation Division: Within its lifetime, it has developed solutions of system integration projects to such an extent that by now it has become a renowned supplier of hi-tech solutions, especially in the field of authorised measuring and testing systems. Since 2003, ELCOM has been – as the only Czech company – a member of the worldwide National Instruments Alliance Program – a network including more than 600 partner companies dealing with the technical support, system integration and sale of National Instruments products. The aim of this membership is to provide highly sophisticated services in the field of virtual instrumentation to customers worldwide – currently,

ELCOM has achieved the certification of the second highest level within this program. ELCOM Applied Electronics division: The research, development and manufacture of special power electronic devices, especially special power supply sources for railways, testing and means for the improvement of electricity quality. ELCOM,
www.elcom.cz

TRADITION & INNOVATION

ELKO EP

ELKO EP is a leading Czech company developing and manufacturing modular electronic devices and smart electro-installation products since 1994. Thanks to its long-term experience, strong in-house research and development, quality-oriented production and a service-oriented approach, ELKO EP has become the market leader in the field of relays and Smart Building products. The company operates 15 branches or franchises worldwide, and its products are exported to 70 countries worldwide.

The company has been awarded the Czech Business Superbrands certificate with repeated verification for the years 2019, 2020 and 2021. ELKO EP is constantly growing in terms of production and the number of employees. However, it is still a family owned, stable company, and has been for the last 27 years.
ELKO EP, s.r.o.,
www.elkoep.com

TES Vsetín

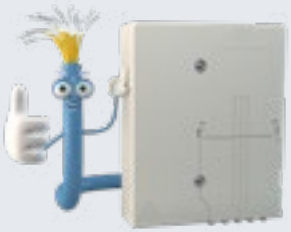
It is a manufacturer with a unique position on the global market, especially in the field of the development of synchronous generators, which are the heart of power plants worldwide. The company was founded in 1919 and within just one year after its establishment lodged over 200 Czech and world patent applications. Since 2000, it has been expanding into other continents and has become the European leader in the field of water power plant generators.
TES Vsetín, **www.tes.cz**

MICOS TELCOM

The Micos Telcom company has developed and produced passive components for fibre optic networks since 1990.The range of products is used extensively in the many FTTx scenarios – externally /internally and for business or residential scenarios. The range includes, e.g., fibre access terminal boxes, fibre optic boxes, fibre distribution hubs, fibre optic closures, fibre optic patch panels and data cabinets. Since 2019, it has become a part of the Preformed Line Products company. Since 2020, it has developed and implemented a longstanding Centre of Excellence for telecommunications and FTTx optical networks.

MICOS TELCOM

www.micostelcom.com



ETD TRANSFORMÁTORY

It is a leader in its category. In the beginning, in 1924, the company started to produce machines of its own design. Only thanks to the intensive R&D and the work of educated and committed people, the ETD transformers have become successful both on the Czech and foreign markets. Every territory as well as every investment project has its specifics, and the company is able to solve such challenges. Thanks to this, it has become the leader even in such a competitive environment as the transformer market. Therefore, it invests high amounts in upgrading and in new technology and production procedures. The company pays lots of attention to the high quality of the technology service provided to its products. This especially applies to transformer measuring before their putting into operation, within the production diagnostics and regular transformer inspections throughout their operation.

ETD TRANSFORMÁTORY,

www.etd-bez.cz

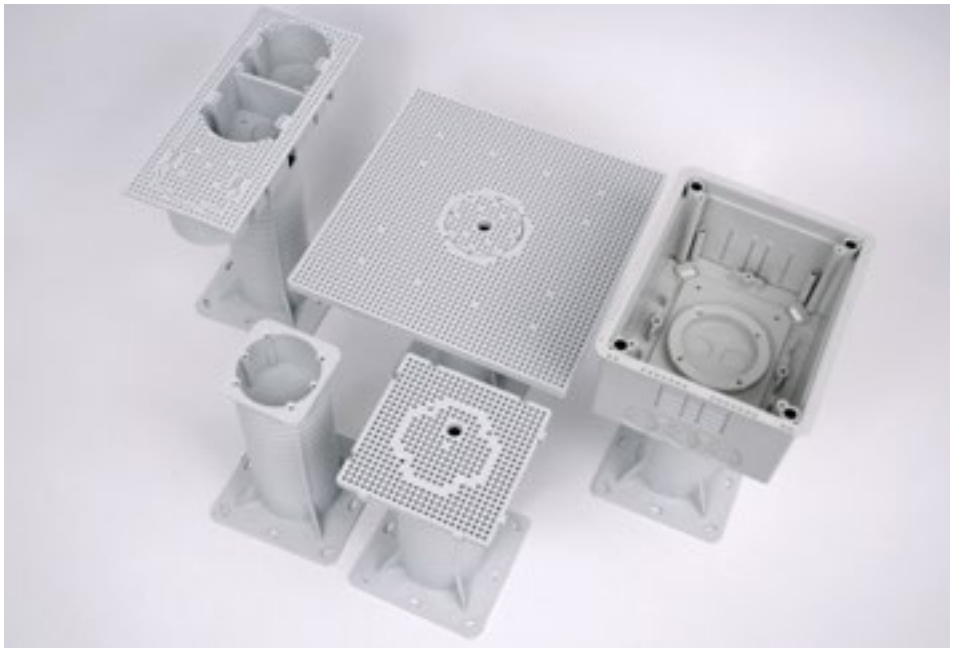
KOPOS KOLÍN

It is a traditional Czech electrical engineering company, which has been active on the Czech market for decades. The wiring material is the main field of business of the company. Nevertheless, it has also been active for a number of years in the field of research and development in the area of radiation shielding in nuclear plants, using the product marketed under the name NEUTROSTOP.
KOPOS KOLÍN,
www.kopos.cz

THE COMPETITIVE ADVANTAGE OF CZECH MANUFACTURERS IS CUSTOM-MADE INNOVATIVE SOLUTION

RCD Radiokomunikace

They supply radio and communication systems both for external and internal covering buildings and underground premises. They also specialise in tailor-made solutions in the most difficult conditions. In addition, they specialise in solutions in the field of the Internet of things.
RCD Radiokomunikace,
www.rcd.cz



4 TECHNOLOGY TRANSFER: FOREIGN DIRECT INVESTMENT

The Czech Republic offers a unique combination of the rich history of the electrical engineering industry and the scientific research, creating a great basis for further development, and that is why ever since the 1990s the Czech Republic has been a favourite destination of foreign investors.
The main benefits of foreign owned companies in the Czech Republic are the high productivity, growth rate, sales and generation of new jobs. The Czech TOP 100 chart classifying the most successful companies in terms of sales leading positions in the field of electronics and electrical engineering has long been occupied by such companies as Foxconn CZ s.r.o., Siemens s.r.o., ABB s.r.o. and Witte Nejdek s.r.o.

FOREIGN COMPANIES FINANCE THE RESEARCH AND PROVIDE FOR THE TECHNOLOGY TRANSFER

As the structure of research and development financing indicates, the foreign direct investments are the driving force as companies controlled by foreign owners are the main operators of the science and research in the Czech Republic. The benefit of these enterprises is enormous, especially in the field of the electrical engineering and electronics industries, which is more than 60% owned by foreign companies (the majority of foreign capital). Most of the foreign trade in the industry is implemented thanks to these relationships – foreign contracts constitute more than 70% of the total amount of contracts and contribute significantly to the employment in the regions of the Czech Republic.
The research and development is also a priority area for the Siemens group. Siemens has been investing in the research and development heavily and opened a new Development and Design Centre at its Prague residence, which belongs amongst the technologically most advanced in the world. It is going to invest another CZK 7 billion over the next several years (the plan for investing started in 2016/2017) in technology upgrades and the new electric motor development centre. The development driven by the development of electric motors and the Industry 4.0 may turn the Czech Republic into a leader in the fields of digitalisation. The links to foreign companies also have a positive impact in terms of the guaranteed sales of goods; on the other hand, there is a danger of investment efflux or drop in demand in Europe in case of the economic crisis – whereas Europe is the major export market for them. This trend is also clearly observable in terms of the amount of new contracts with a 70% foreign market share but a decreasing trend.

Panasonic AVC Networks Czech (PAVCCZ)

It is a subsidiary company of Panasonic Corporation – manufacturer of Panasonic branded products. This company, which uses hi-tech production technology, is a part of the Panasonic concern manufacturing PDP and LCD TV sets in Europe.
Panasonic AVC Networks Czech, **www.panasonic.cz**

SYSGO s.r.o

The position of the Prague office of Sysgo is exceptional among branches of this company by being responsible for the independent development of a product – namely the ELinOS system. The Sysgo team has developed a purely software solution, which is currently implemented to the Power PC group of processors but basically it is transferable to any other processor. This contributes to significant cost savings appreciated by such customers as Airbus or Boeing, with which Sysgo cooperates. SYSGO provides operating system technology, middleware and software services for the real-time, safety and security critical embedded markets. A differentiating capability of SYSGO is the Safe and Secure Virtualisation platform PikeOS, a paravirtualisation operating system which is built upon a small, fast and safe microkernel. It supports the coexistence of independent operating system personalities on a single platform, including ELinOS, SYSGO's embedded Linux distribution. PikeOS has been designed for use in safety critical applications and has gone through a comprehensive validation according to safety standards like DO-178B, EN 50128, IEC 62304, IEC 61508, ISO 26262 and IEC 61513 of either the avionics, automotive, railway, medical, industrial automation or nuclear power plants. SYSGO supports international customers with services for embedded Linux, realtime capabilities and certification for safety-critical applications. Markets include aerospace & defence, industrial automation, automotive, transportation and network infrastructure. SYSGO has facilities in Europe and North America, and offers a global distribution and support network, including a strong presence in the Pacific Rim. In 2012, the group was acquired by the French group Thales. SYSGO represents one of the R&D centres of SYSGO group.
SYSGO,
www.sysgo.com

The Czech Republic is not an assembly shop anymore. It is the brain and centre of research and development. Foreign investors tend to confirm this exceptional position by often only establishing research and development centres here instead of production plants.

5 ELECTRONIC COMPONENTS

Since the 1990s, Czech manufacturers have specialised in the production of various electronic components and electronics. Czech production is characterised by modern technologies and technical innovations, with emphasis placed on the quality and maximum adaptation to the needs of customers, which have been appreciated by Czech and especially by foreign partners.

SMART GRIDS AND SMART METERING

The global installed basis of smart electric meters is expected to reach as many as one billion units by 2020 with growth being supported mainly by Asian demand (China). Nevertheless, the European market is also very important. The European Union has adopted plans to replace 80% of electric meters with smart electric meters by 2020. The target was following: almost 72% of European consumers are expected to have a smart electric meter, which means investments of up to EUR 45 billion and 200 million electric meters. Czech companies are leaders in the smart meter market both in the Czech Republic and in the world.

LOGAREX Smart Metering

The LOGAREX Smart Metering company is a Czech firm established in 2011. As a development, production and supplying firm, it specialises in meeting the demands of the energy branch, focusing on the measurement, processing and transfering data. The company focuses on the complex solution of customers' demands. All technical activities of the firm continue the knowledge and long experience of development and marketing specialists. These experiences are bound to the further development of new technologies and products, which will fulfill the demands of both Czech and foreign customers, and to the further expanding of its field of action, preferably on foreign markets.
LOGAREX Smart Metering,
www.logarex.cz

ZPA Smart Energy

It is a leading Czech manufacturer of electricity meters, ripple control receivers and modern measuring systems. It relies on its long-term experience, having been established as early as in 1958 and applies advanced know-how, stemming from almost a quarter of its full time employees working in the R&D department. It is a leader on the Czech market. In addition to its domestic market it has also managed to hit success in the emerging CEE and Balkan markets (e.g. Poland, Slovakia, Lithuania, Kosovo, Bulgaria and Macedonia) as well as in Western Europe (Germany, Switzerland, the Netherlands, etc.) The portfolio of ZPA Smart Energy focuses on electricity measuring and control. Digital electricity meters enable precise measuring and data transfer to control headquarters. Thanks to bi-directional communication, smart meters are even able to control consumption.
ZPA Smart Energy,
www.zpa.cz

TRENDS IN INDUSTRIAL AUTOMATION IN THE AREA OF INDUSTRY 4.0

The industrial automation industry has been rapidly evolving with a number of partial trends. The field of the Internet of things (IoT) is important. The new high level of the communication and computing technologies with end devices opens up possibilities for holistic and adaptive automation with a clear objective of increasing efficiency. This is a logical development step in the direction toward the trend of more sensitive and efficient production. The objective of the Internet of things is to provide I/O (inputs/outputs) interactions, including sensors, action elements, analysers, drives, machine vision and robotics, in order to achieve higher production output and flexible production. This revolution will manage the intelligence of equipment with the ultimate goal of all industrial devices to support IP including I/O.

Data collection and their efficient use is another trend. The high-volume data, which can be collected directly from the production with the use of new technologies, are further used for analyses and the optimisation of automatic processes for the purpose of increasing productivity and efficiency. Interconnecting in-house information systems will also play an important role in the future. The integration of systems in the production with other business software logically seems to be the next step in the industrial production evolution. The rapid robotics development can be due to the price availability of robots compared to the PC development. According to World Robotics Report 2020, 2.7 million industrial robots operating in factories around the world, which means an increase of 12%. The Czech Republic belongs to top 15 countries in annual installations of industrial robots (15th place).

The major risk for companies in this regard consists in a failure of adopting these new principles and the consequent necessity of catching up with competitors, who have not been afraid to risk. Lots of Czech companies responded to this challenge in the very beginning, thus becoming leaders in the field of industrial automation.

SOPHISTICATED ENGINEERING, ELECTRO & INDUSTRIAL AUTOMATION

Blumenbecker Prag

Whether we look at elaborating the whole automation projects, the design and/or assembly of low voltage distributors, putting into operation or a guarantee or after-guarantee service, the application of powerful robotic workplaces or the implementation of camera systems into the existing production capacity – this is where Blumenbecker Prag is the market leader.

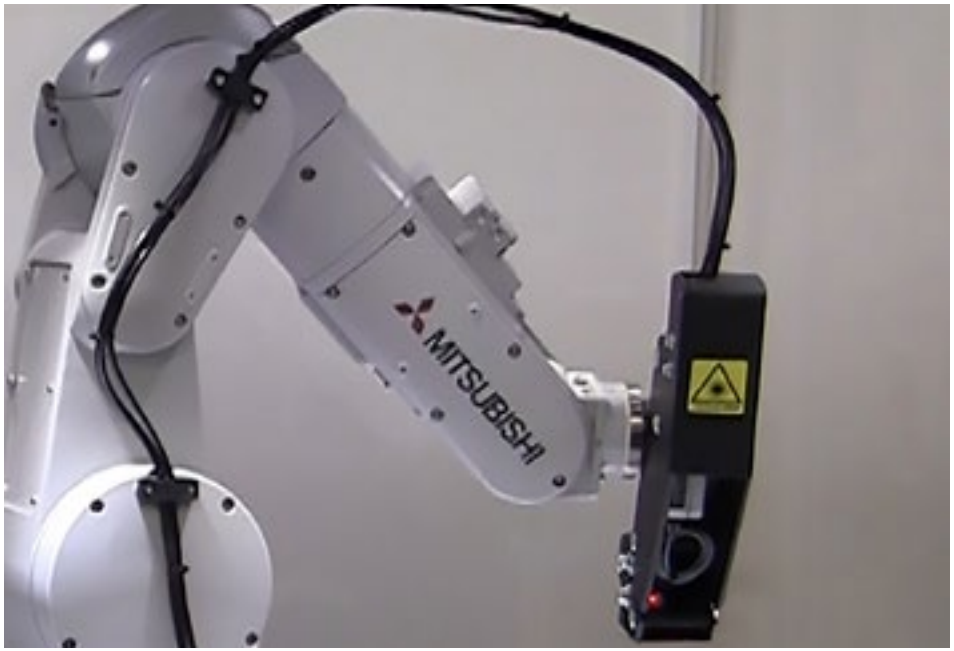
Blumenbecker Prag, which cooperates with the SKLAD association, won the Industry 4.0 Award for the e-Robot project at the end of last year. The award was given by the Confederation of Industry and Transport of the Czech Republic. The digital twin of the production line with industrial robots speeds up work on the project by several weeks. Blumenbecker Prag, **www.blumenbecker.cz**

B:TECH, a.s.

A Czech engineering company with extensive know-how in system integration (complete delivery of industrial automation in the area of process and production technologies) and robotics. Their services include: project documentation, design of control systems including machine and functional safety, programming of control systems and creation of operator interfaces. In turnkey projects, they take care of complete material supplies, including their assembly and electrical installation at the end-user customer. Having had 20 years of worldwide references across industries, they realise 240 projects annually in 40 countries.
B:TECH, a.s.
www.btech.cz/en

FCC průmyslové systémy

FCC průmyslové systémy is a technology-oriented trading company, representing important manufacturers of industrial automation and communications equipment. The portfolio of industrial process control systems and components includes sensor systems, industrial buses, industrial communication devices, industrial process control and telecommunications computer systems based on specialised PCs. An important area of company focus covers machine vision systems applied in factory automation and quality control. FCC průmyslové systémy customers and partners are engineering companies and system integrators working in the field of control systems, industrial data communications and telecommunications. FCC průmyslové systémy are a representative of companies such as ADVANTECH, AAEON and AXUS (industrial computers, data storage systems), DataLogic (machine vision) and Westermo Teleindustri and HMS Industrial Networks (industrial communication).
FCC průmyslové systémy,
www.fccps.cz



6 ICT & SPECIALISED INFORMATION SYSTEMS

Czech companies have achieved an important position on foreign markets in the field of IT and communications thanks to their unique and innovative solutions, with which they have always been a step ahead of their competitors. Therefore, the efficiency of the Czech technology industry has been growing, which has been evidenced by the 9.3% year to year sales increase of the one hundred most successful Czech ICT companies.

Investments in the digital transformation and improving the IT and business interconnectedness are expected. More dynamic transfer to the so-called third platform of technological innovations and growth, consisting of on four pillars: mobility, cloud services, analysis of big data, and social technologies including technology solutions based on them. This has been reflected in the growing expenses in cloud services exceeding the amount of USD 433 million in 2019, which corresponds to almost the 27.1% year-on-year increase. Czech manufacturers and researchers have been responding to these trends and also foreign corporations have noted their qualities. As a result, the technology hub of Novartis moved to the Czech Republic; its IT experts thus provide services to other Novartis branches in the world. The Czech Republic has therefore become a leader in the field of artificial intelligence, as is registered by Angee, an innovative household security product, or Neuron soundware, which is able to recognize failures according to sound and has already been used by such companies as Deutsche Bahn or Siemens. IoT, Internet of Things, is another new trend, which has been developing very quickly in Europe. It brings essential technology innovations, allow for innovating enterprise processes and shift the digital transformation further than has been possible up to now. The estimation of average market growth till 2024 is 11.3% per year (IDC). According to IDC, companies invested over USD $700 billion in the Internet of Things (IoT) in 2019.

DID YOU KNOW?

The Czech producer of the anti-virus software, Avast, started to develop its first anti-virus software already in 1988. Avast has been so successful that in 2016 it took over another, originally also Czech anti-virus producer – AVG, which had been its major competitor by that time. Together they obtained over 400 million users.

The production of the communication and sensor modules for all important wireless networks

The production of the communication and sensor modules for all important wireless networks is the domain of RCD Radiokomunikace. The wireless (radio) communication systems currently belong to the most important technical means – not just because they increase our comfort and mobility but especially because they are a part of the absolute majority of security and safeguarding devices. In addition, with the advent of IoT, Smart City, Industry 4.0. or indoor localisation phenomena, their importance seems to continue its sharp increase. This is also the reason why it is important that in every stage of a new building or its remodeling the availability of radio services and their errorfree operation is considered. And this is the domain of the RCD Radiokomunikace, thanks to which the radio signal is available for example, in a number of big tunnels and subways in Europe.

RCD Radiokomunikace

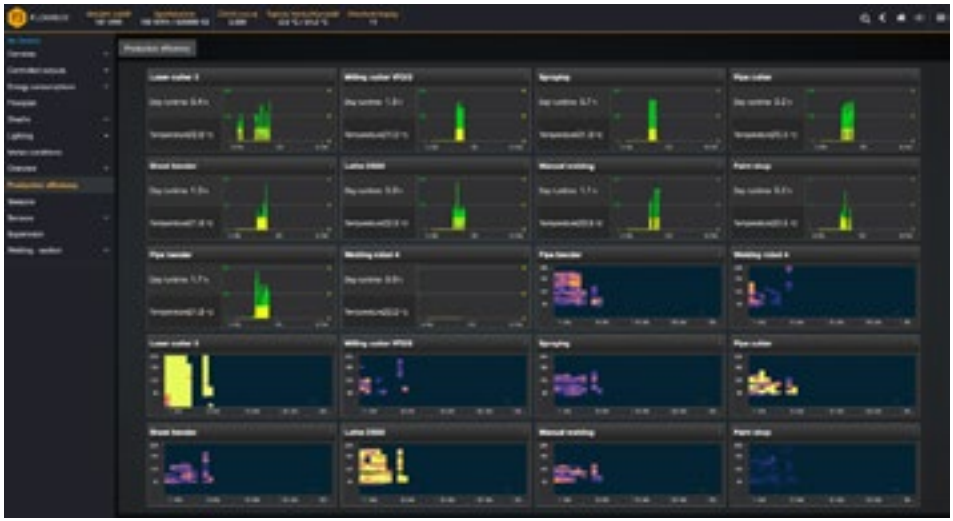
The research, development and production of radio communication equipment in the 40 MHz – 8 GHz range. Radio networks design, assembly and maintenance. Integration of security and radio systems for the critical infrastructure protection.
RCD Radiokomunikace,
www.rcd.cz

The radio communication technology not only for the army

The security systems and equipment, printed circuits, radio stations and other components ... this is only a fraction of the wide portfolio of products supplied by TESLA. This company is one of the manufacturers of military radio-communication technology with a long term tradition. The beginnings of the development and later also the production date back to the 1960's. The development and production team has always responded to current needs flexibly. Furthermore, Tesla produces and supplies aerial systems, radio-relay connections, mobile water treatment plants and automatic PET bottle fillers and blowers. In addition, it offers TV and radio transmitters, solar technologies, solar power plants, external assemblies of electronic and security devices. Production of military electronics; tendering procedures both in the Czech Republic and abroad.
TESLA,
www.tesla.cz

FLOWBOX

FLOWBOX offers solutions for digitalisation of industry, buildings, and cities. The product packages covers manufacturing, buildings & property management, smart cities & government, telecom & data centres, utilities & energy carriers, renewables & microgrids, e-mobility, mining, oil & gas, retail & food and health & research. Flowbox focuses on management of energy flows and integration of stand-alone technology systems to work in optimised ecosystem. Companies can benefit from energy savings, increased grid/microgrid flexibility and improved quality of indoor environment.
FLOWBOX,
www.flowbox.com



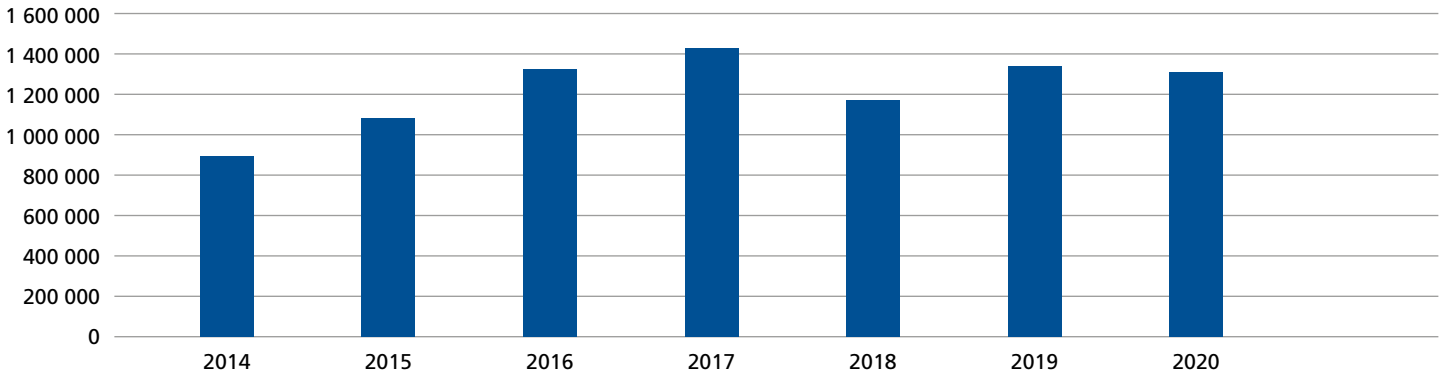
IMA s.r.o.

IMA s.r.o. is a leading Czech manufacturer and supplier of innovative identification solutions, locating and record-keeping systems for both public and private sector.
They open tens of thousands of doors each day for our clients like Skoda Auto, Czech Technical University in Prague, mBank Poland or in new residential districts in Stockholm.
Their aim is to constantly improve user convenience by leveraging our IMAporter MobileAccess platform with cloud-based management and distribution of mobile credentials.
IMA s.r.o.,
www.ima.cz

7 CONSUMER ELECTRONICS AND HOUSEHOLD APPLIANCES

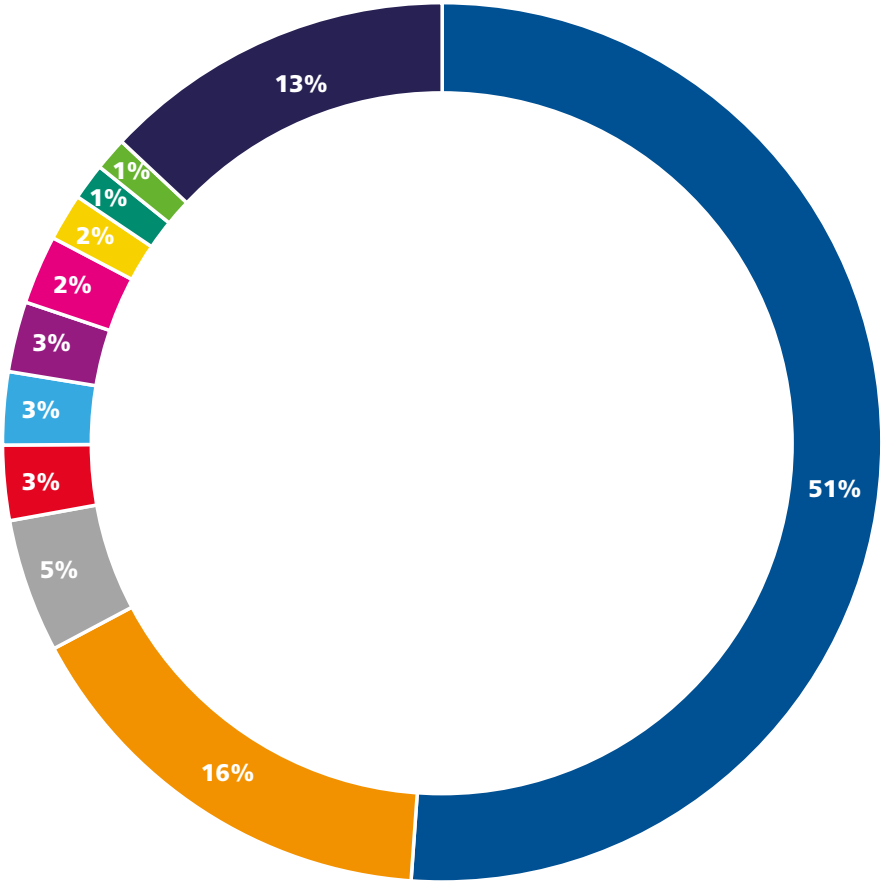
The Czech Republic has already become a favourite destination for foreign investments in the field of consumer electronics, due to its great geographic location, logistics and open business environment with a number of incentives, as well as thanks to the highly qualified labour force and the excellent level of technical education and the connection with research and development. Panasonic AVC Networks Czech from Japan is one of the companies, which are active in the field of consumer electronics in the Czech Republic. It is one of the key production plants of Panasonic Corporation, based in Japan and it focuses on meeting the requirements of the European TV set markets. Foxconn based in Taiwan is another example of a successful foreign company, which continues to extend its production plants. Also the producer of the luxury electronics, Bang & Olufsen, had its first production plant outside the domestic Denmark, including the research and development department in the Czech Republic. Lots of electronics companies are important suppliers to other industry sectors, especially to the automotive industry and machinery. These are such companies as Siemens, Bosch, Daikin, Tyco Electronics Czech and Kostal. In the Czech Republic, headlights are produced by Hella Autotechnik, Varroc Lightning Systems, Marelli Automotive Lighting Jihlava, etc.

EXPORT OF HOUSEHOLD APPLIANCES FROM THE CZECH REPUBLIC (IN THOUSANDS EUR)



Source: The Czech Statistical Office; SITC 3; 775 – Household type, electrical and non-electrical equipment, Cross-border movements of goods

EXPORT OF HOUSEHOLD APPLIANCES FROM THE CZECH REPUBLIC IN 2020 – TOP COUNTRIES



Source: The Czech Statistical Office; SITC 3; 775 – Household type, electrical and non-electrical equipment, Cross-border movements of goods

- Germany
- Slovakia
- Poland
- Italy
- Hungary
- Austria
- France
- Netherlands
- United States
- United Kingdom
- Others

Panasonic AVC Networks Czech

Panasonic AVC Networks Czech was founded in 1996 in Plzeň as a manufacturer of hi-tech TV sets. Currently, it has become one of the biggest and respected industrial plants in the Czech Republic. Since the start of the production in 1997, employees of Panasonic have been producing TV sets with high added value for customers from more than 30 European countries. In 2004, the company started the transition from the production of classical TV sets to modern flat-screen TV sets.
Panasonic AVC Networks Czech, **www.panasonic.cz**

Almeto

A supplier of electronic components – radio interference filters, ferrite cores, choking coils, transformers, CuSn wires. Furthermore, it offers cable assemblies, condensers, RC elements, PWM controllers, high-voltage lighters, variable-resistance resistors,compensation condensers, coils.
Almeto, **www.almeto.cz**

8 MEASURING AND NAVIGATION INSTRUMENTS

The Czech Republic is the world leader in the production of electron microscopes with three leading microscope manufacturers having their registered offices here; those with the longest tradition include DELONG INSTRUMENTS, Tescan Orsay and Thermo Fisher Scientific Brno. Recently, perhaps the biggest microscope manufacturing plant in the world was built here. The cluster of smaller suppliers and collaborating scientific institutions has been created around these dominant players and a generation of highly educated microscopy experts has been growing here. The perfect intersection of science and business has been achieved here. Most products are exported to countries of the whole world.

DID YOU KNOW?

1/3 of the global electron microscope production is produced in the Czech Republic.

The oldest producer of electron microscopes with unique know-how is from the Czech Republic

DELONG INSTRUMENTS is a company mainly engaged in electron optics, microscopy and vacuum technology. Its activity covers research, development, manufacturing, assembling and the testing of various physical instruments, including vacuum chambers and components, ion pumps and power supplies, motion systems, and respective control electronics and software. DELONG INSTRUMENTS offers its own products of electron sources and low voltage electron microscopes, and also serves as a contract developer of unique custom-made devices. DELONG INSTRUMENTS collaborates with world renowned companies and has long-term experience with joint projects.
DELONG INSTRUMENTS, **www.dicomps.com**

RTG are used more and more often in the industry in situations when checking the internal components of products all the way to their covering is required. Due to new manufacturing trends, an ever-increasing number of companies need these X-rays. X-ray instruments are relatively expensive, but the Czech manufacturer MICo Vision, for example, offers RTG, the SCIOX instrument for approximately half price compared to its competitors. MICo Vision X-ray instruments are especially designed for checking the quality of electronics components assembly both in the development and manufacture.

The world's leading supplier of metering instruments is from the Czech Republic

The diversity of components, the great extent of accuracy requirements as well as growing measuring productivity demands have forced special measuring instruments manufacturers to use an ever wider range of measuring methods. Currently, contact measuring methods have began to be replaced with contactless optical methods, from simple workshop measuring gauges to measuring and control stations. MESING, which is a company dealing with production of custom-made measuring instruments, has been successful in the field of custom made measuring technology. It has recently been awarded a number of awards for its products, which in many cases have literally been ahead of their time. However, the success is also based on technical parameters, price, short delivery terms and the perfect maintenance service. The majority of measuring gauges developed and produced by MESING are delivered to automotive subcontractors. A big part of the production is supplied to the bearing industry. In terms of territorial distribution, more than half of the production is realised outside the territory of the Czech Republic – namely in Slovakia, Switzerland, Lichtenstein, England, Germany, Poland, India, Turkey etc.

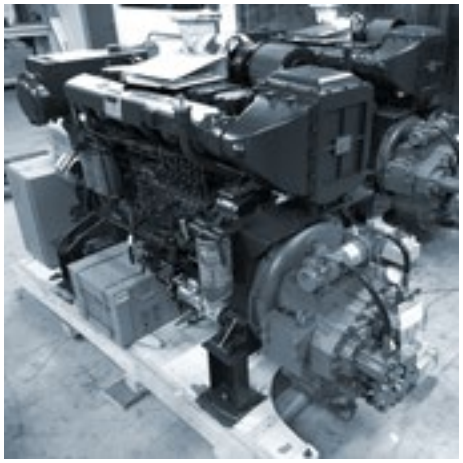
MESING

The custom-made measuring instruments for measuring lengths according to specific requirements of customers such as workshop and laboratory gauges and instruments, checking stations and sorting automatic machines and assembly automatic machines for the electronics industry. SPC based systems, possibly with the feedback to the machine tool, are an important part of the portfolio. MESING is a leading supplier of calibration gauges and a monopoly producer of induction length sensors in the Czech Republic. MESING also performs the modernising of various older gauges and instruments.
MESING, **www.mesing.cz**

KPB INTRA

Design, manufacture and supply of current and voltage instrument transformers. Manufacture of epoxide components.
KPB INTRA,
www.kpbintra.cz

9 ENGINES, GENERATORS AND TRANSFORMERS



HIGHLY SOPHISTICATED AND CUSTOM-MADE PRODUCTION IS THE DOMAIN OF CZECH MANUFACTURERS

Czech manufacturers have also been growing due to the production of products with a high technical added value. This is an example of ATAS elektromotory Náchod, which keeps investing in new technologies – especially in the field of engines with electronic commutation and location sensors. This is one of the reasons why products are so highly demanded and the company exports 80% of its production to over 50 countries of the whole world, especially Germany.

Special custom-made solutions and innovative technologies are also characteristic of ELCOM. It mostly deals with special products competitors either find too difficult from the technical point of view or on the other hand the multinational electronics groups, which mainly deliver catalogue products, find uninteresting. Nevertheless, the success requires high-quality experts and engineers and bringing new technical solutions all the time. A big part of deliveries and solutions is a result of the corporate research and development. Therefore, most products bear the ELCOM Intelligence Inside trade mark, which exactly grasps the originality of the solution. We can therefore find unique ELCOM solutions all over the world. For example, special compensation high voltage distributors are mostly exported to the Middle East region whereas special high performance electric engines are exported to reconstructed or new plants in Russia. Furthermore, ELCOM deals with the development of SW libraries and toolkits for the field of power duality and measuring of synchro-phasors enabling building analysers for Smart Grids on modern HW platforms. The developed algorithms are used in the new measuring device – synchro-phasor measurer (PMU), the testing of which is now going on in cooperation with National Instruments in the laboratories of Bonneville Power Administration in the US. We could further name a number of other successful projects abroad. Currently, the company also has foreign branches in Abu Dhabi, Hongkong and Changshu.

ATAS elektromotory Náchod

ATAS elektromotory Náchod was founded in 1928. It manufactures induction motors up to 1 kW, DC motors up to 1.5 kW, gear motors, EC motors, resolvers, axial and radial ventilator, stamping tools, moulds for pressure moulding of plastics and Al alloys. ATAS elektromotory Náchod a. s. **www.atas.cz**

ELCOM

ELCOM conducts business in the field of power electrical engineering, virtual instrumentation and it is divided into the five divisions. The division of Applied Electronics has been working on research, development and production of special power electronic devices for railway, testing and means for the improvement of the quality of electricity. The Drives and Motors Division is a specialised workplace for the delivering of electromotors and whole regulated drives, mainly in an explosion-proof design. The Realisation and Design Division specialises in compensations and substations for low and high voltage levels. The Manufacturing Division serves as a production and materiallogistic unit for all other division. The Virtual Instrumentation Division was founded in the Science and Technological Park in Ostrava. It provides services in the system integration, designing and delivering of measuring and testing workstations that are based on virtual instrumentation.
ELCOM, **www.elcom.cz**

ETD TRANSFORMÁTORY

ETD TRANSFORMÁTORY is a designer and manufacturer of both serially produced and special power transformers, chokes, and reactors with its own know-how, complex technologies and special testing equipment in Central Europe. Transformers have 90 years experience in production mostly under the ŠKODA brand and satisfied customers all over the world. Production programme: phase regulating oil transformers, power output range 10–350 MVA, nominal voltage up to 420 kV; three-phase non-regulating transformers, power output up to 410 MVA, nominal voltage up to 420 kV; single-phase non-regulating oil transformers with the total power output of the three-phase composition up to 1200 MVA and voltage up to 420 kV; regulating and non-regulating transformers of special manufacturing; autotransformers of power up to 400 MVA, nominal voltage up to 420 kV; locomotive transformers; furnace transformers; traction chokes; reactors. service activities: modernisation; repair works; high voltage testing laboratory; accredited electrotechnical testing laboratory.
ETD TRANSFORMÁTORY, **www.etd-bez.cz**

TES Vsetín

TES Vsetín, another Czech company, has also succeeded through the application of exceptionally sophisticated technology. For example, it has developed the thermo-crimping machine, which is able to weld wires very quickly and position them into a joint or jumper. Compared to manual welding, this is done within shorter time, which is a clear benefit of this technology. Thanks to this, the insulation of cable outlets is not thermally affected and damaged. The machine is also exceptional by its ability to rotate its head. Thanks to this, no big and heavy stator handling is required as the machine is able to get to them comfortably, to weld required wires and locate them to the joint. TES VSETÍN,
www.tes.cz

KPB Intra

Another Czech company – KPB Intra – boasts of its remarkable success abroad exporting seventy per cent of its production. Although the European Union is its major market, it also exports to more distant countries such as Russia, Pakistan, Algeria, Morocco and Iran. It also has customers in the U.S. It mainly deals with the development, manufacture and sales of instrument power and voltage transformers. Its major long-term customers include ABB, ČEZ, DRIBO, EATON, E-ON, EVN, KPB INTRA Polska, OHL-ŽS, Ormazabal, PRE, SIEMENS, SCHNEIDER ELECTRIC and many others.
KPB INTRA,
www.kpbintra.cz

THE NARROW SPECIALISATION AND UNIQUE TECHNOLOGIES ARE THE ADDED VALUES OF CZECH PRODUCTION

SOPO

SOPO was founded in 1993. It focuses on the production of winding parts of electric motors. Due to its narrow specialisation, top ranking technologies and huge know-how, SOPO can cover the entire portfolio of winding parts for smaller and middle-sized electric motors. One of the most important strategic targets of the company is to become a European leader in winding. SOPO has top-ranking technological equipment at its disposal and combines the machines of reputable world-famous producers with its own technologies, machines and tools. The amount of investments only into new technologies and technological solutions in 2013–2015 exceeded one million Euros. SOPO,
www.sopo.cz

MOOG Brno

Design and production of tailor-made AC rotating electric machines, electric drives and loading test stands with dynamometers, according to the customer specifications. Custom-built AC electric machines and drives. Permanent magnet synchronous servomotors and motors with high dynamics and accuracy. Synchronous and induction linear motors. Electric dynamometers and test stands. Low-speed and high-speed electric motors. Synchronous and induction generators built to demand. Electric traction motors and generators. Aircraft technology board generators and electric starters. Power supply sets and rotating power sources. Tests with international validity. MOOG Brno, **www.moogbrno.cz/vues-home-en/**

THE DYNAMIC DEVELOPMENT OF CZECH COMPANIES

KOPOS KOLÍN

It is a traditional Czech company involved in the production of electroinstallation materials and has operated on the Czech market for many decades. The KOPOS brand has become synonymous with products used in electroinstallations. Even though electroinstallation materials are the company's primary focus, for many years the company has worked in the area of the research and development of radiation shielding in nuclear devices using the product called NEUTROSTOP.
KOPOS KOLÍN, **www.kopos.cz**

ELKO EP

ELKO EP is a traditional developer and manufacturer of modular electronics devices. Its production covers up to 200 models, including timers, protection, monitoring and many other relays and comprehensive wireless or bus based solutions for automated homes named iNELS. In the field of advanced technologies, ELKO's production also overlaps with IoT production focused on Smart City projects.
ELKO's headquarters, research and development and production are based in Czech Republic, but its activities are international thanks to a network of branches. Exports make up 65% of the company's total production.
ELKO EP, s.r.o., **www.elkoep.com**

HAGER ELECTRO

Hager is a leading provider of solutions and services for electrical installations in residential, commercial and industrial buildings.
The company was founded in 1955 by brothers Hermann Hager and Dr Oswald Hager together with their father Peter. Until today, it remains an independent business, owned and run by members of Hager family, with its headquarters in Blieskastel – Germany.
Hager product portfolio ranges from energy distribution through cable management and wiring accessories to building automation and security systems. This allows to combine all the skills necessary for the development of innovative products, systems and services required for building automation, smart home technologies and e-mobility. The local team of the Hager Electro subsidiary has been taking care of Czech and Slovak customers since 1995.
Hager Electro s.r.o.
www.hager.cz

SALTEK

SALTEK is a leading Czech company specialised in the development and production of surge protection devices (SPD). The company offers a broad range of lightning current arresters and surge protection type 1–3 according to EN 61643-11 and surge protection for information technology, measurement and control and telecommunications and photovoltaic applications. SALTEK products provide protection against the lightning and technological overvoltage and thereby increase the safety and troublefree operation of the technologies and machinery in the industry, telecommunications, data centres, office buildings even in ordinary homes. The principle of dynamic company expansion consists in its own product development. A team of experienced development engineers work in the test development laboratory with unique devices and technologies. The sophisticated materials, design processes, technologies and measurement methods are used for the development of SALTEK products. Production is equipped with automatic and robotised assembly lines. SALTEK places emphasis on quality, but also ton the design of products. The line of surge protection devices with unique colour coding has been awarded the 2014 Red Dot® design prize.
SALTEK,
www.saltek.eu

ALPS Electric Czech

The company is OEM manufacturing company. ALPS can assemble any electrical parts or products including the suppliying of all components (incl. plastics), if required. The goal is to supply customers with top quality products or services at very competitive prices. ALPS can offer large flexibility on the level of production. ALPS way is to find the cheapest location for production, where a high quality of production can be reached.
ALPS Electric Czech,
www.alps.cz

OEZ

For seven decades the company OEZ has evolved from a producer of circuit breakers and fuses to become an integrated supplier of products and services for protecting electrical circuits and low-voltage devices. Since 2007, OEZ has been a member of the group Siemens. OEZ's products have been in use in power engineering, industry, infrastructure as well as in housing development. The company's delivery programme focuses on: Minia devices, Modeion moulded case circuit breakers, Arion moulded air circuit breakers up to 6300A, Varius fuse systems, Distri enclosures and Conteo devices for switching and control.
OEZ, **www.oez.cz**

ABB

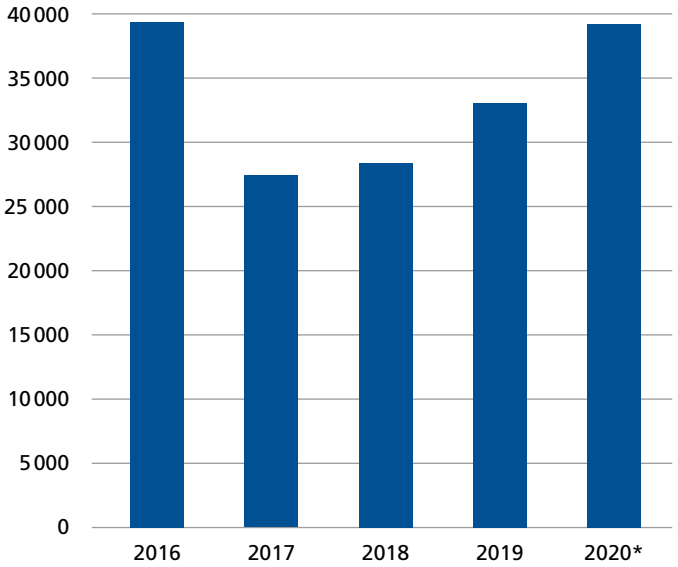
ABB is a leader in power and automation technologies that enable utility, industry, transport and infrastructure customers to improve their performance while lowering the environmental impact. The ABB Group of companies operates in roughly 100 countries and employs about 140,000 people. The company has been present in the Czech Republic since 1970 and today employs more than 3,400 people. ABB operates in 8 locations. The Czech ABB can use the international know-how and the latest results of the research and development achieved by the global company. It offers its customers added value in the form of a strong base of its own engineering and service centres and long-standing experience of traditional Czech producers. Nowadays, ABB has five divisions: Power Products, Power Systems, Discrete Automation and Motion, Low Voltage Products and Process Automation.
ABB,
www.abb.cz

10 CABLES, WIRES AND WIRING SYSTEMS

Export of semiconductors from the Czech Republic amounted to 39 bil. CZK in 2020, and this amount means year-on-year growth almost 19%.

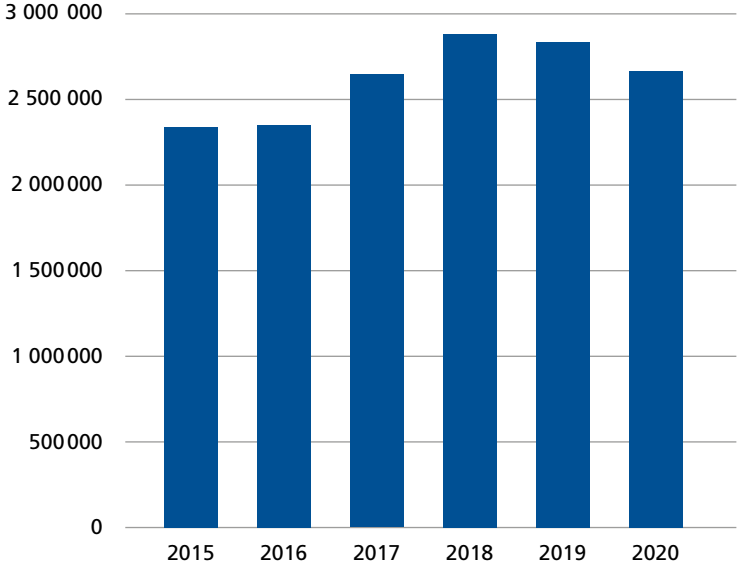
Since 2017, the export of semi-conductors from the Czech Republic has been growing every year.

EXPORT OF SEMI-CONDUCTORS FROM THE CZECH REPUBLIC (IN MIL. CZK)



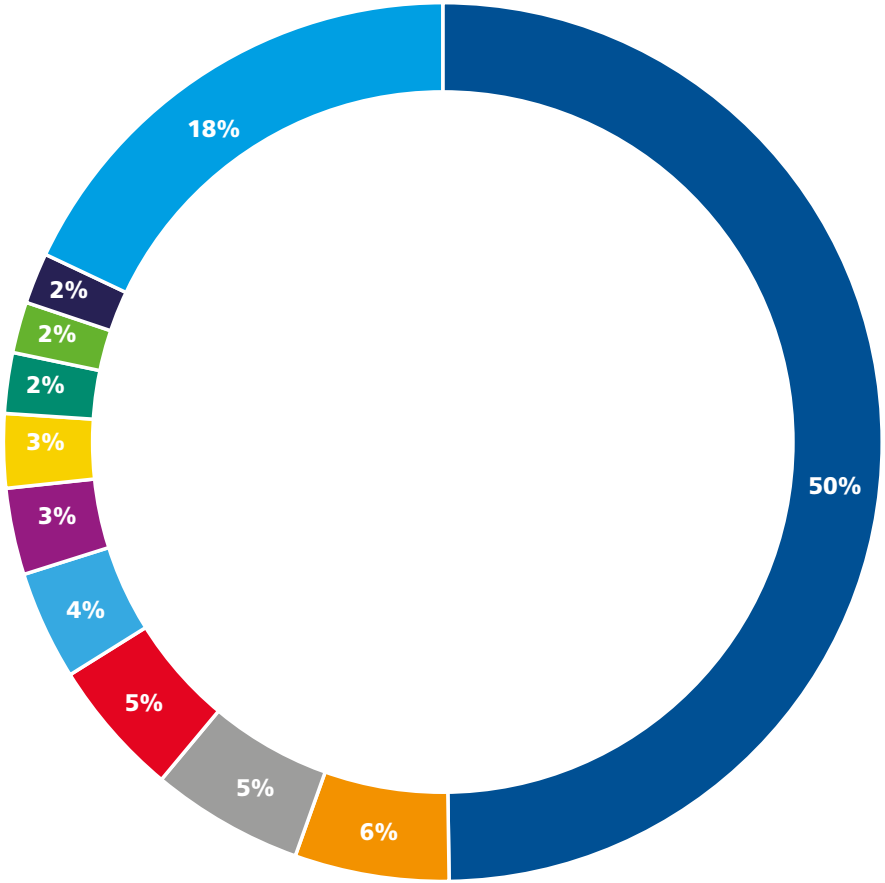
The Czech Statistical Office, Cross-border movements of goods, Export of high-tech goods, *preliminary data
Average exchange rates (2020): 1EUR: 26,444 CZK ; 1USD: 23,196 CZK

EXPORT OF WIRES, CABLES, AND CONDUCTORS FROM THE CZECH REPUBLIC (IN THOUSANDS EUR)



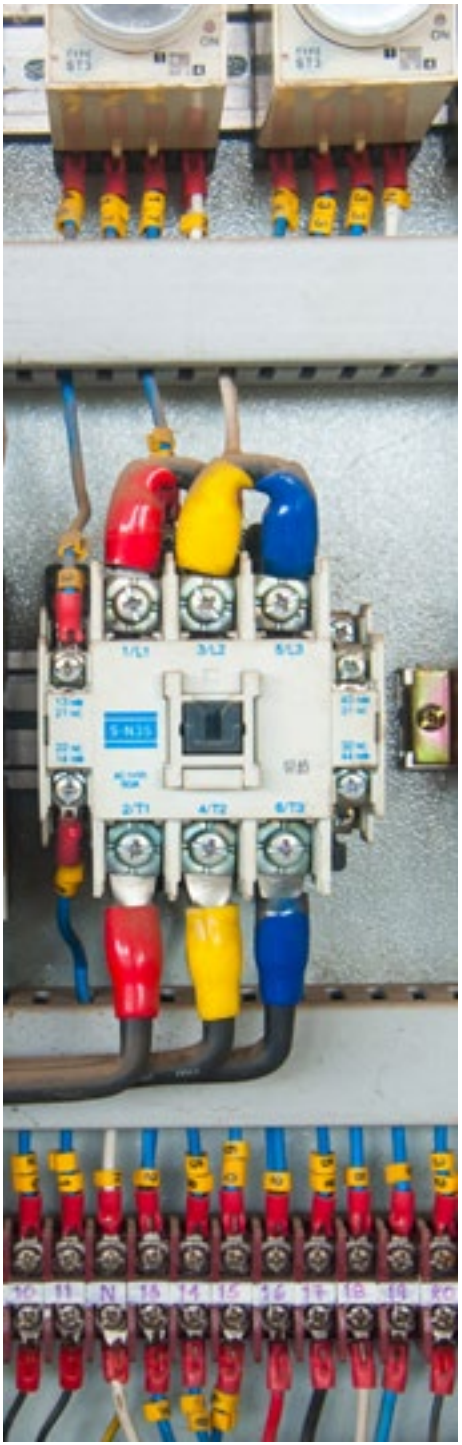
Source: The Czech Statistical Office; HS4: 8544 – Insulated wire (incl. "enameled or anodised"), cable (incl. coaxial cable), Cross-border movements of goods

EXPORT OF WIRES, CABLES AND CONDUCTORS FROM THE CZECH REPUBLIC IN 2020 – TOP COUNTRIES



Source: The Czech Statistical Office; HS4: 8544 – Insulated "incl. Enameled or anodised" wire, cable"incl. Coaxial cable,Cross-border movements of goods

- Germany
- Poland
- Austria
- Slovakia
- Hungary
- Romania
- Ukraine
- France
- Spain
- Tunisia
- Others



ONE OF THE MOST INNOVATIVE CZECH COMPANIES HAS BEEN SUCCESSFUL WORLDWIDE

ZPA Smart Energy is a leading Czech manufacturer of electricity meters, ripple control receivers and modern measuring systems. It is the leader on the Czech and Slovak markets. With a 70% market share in the field of electricity meters and almost a 100% share in the field of ripple control receivers, it is the most important supplier of these products to ČEZ, E.ON and PRE. However, the export range of ZPA Smart Energy is significantly broader. It has been delivering its products both to EU countries and Belarus as well as former Yugoslavian regions. It delivers its most sophisticated products such as electricity meters for remote data collection to several pilot projects of ČEZ and PRE as well as to Lebanon, Poland, Hungary and Montenegro. It closely cooperates with local companies on foreign markets. In its African expansion, the Egyptian owner plays a dominant role in its market strategy. Although ZPA Smart Energy was among the leading domestic electrical engineering and electronics companies (in 1970–1975 the first generation of ADT computers was manufactured here), its product portfolio changed significantly after 1990, veering in the direction of highly sophisticated products with electronic components. Former technologists and mechanical engineers have been replaced by development engineers in the field of electricity meter hardware, i.e. kind of "small computers" common in all households. Graduates from new fields also participate in software and firmware development and in equipment operation and maintenance of the state of the art manufacturing operations. Programmers from Trutnov and Prague pay a lot of attention to the development of the software data management system for the smart measuring field. The system allows for collection and processing of data from smart electricity meters as well as from other meters such as water meters, gas meters, calorimeters etc. It is also able to analyse the data collected and to use these in energy consumption control. Simultaneously, it is able to prepare billing invoices for individual tenants of a building, as per the collected data. This product has been developed both for large distribution operators as well as administrators of shopping and business centres, industrial zones and commercial areas.

ZPA Smart Energy

ZPA Smart Energy is the largest and most important Czech manufacturer of electricity meters, smart systems, ripple control receivers and AMR/AMM solutions. Its expertise is based on decades long experience going back as far as 1958, as well as cutting edge technology – almost a quarter of total manpower works in R&D. The company HQ and production plant are located in East Bohemian Trutnov, the heart of the Czech electrotechnical industry, where industry icons like ABB, TE and Siemens reside also. ZPA Smart Energy subsidiaries are stationed in Prague, Berlin and Sofia. Territory-wise, ZPA Smart Energy has traditionally held a leading position on the Czech market and has successfully penetrated foreign markets too – be they the emerging ones in Central, Eastern and South Eastern Europe or highly developed ones, such as Germany, Switzerland and Netherlands, to mention just a few. The product portfolio of ZPA Smart Energy specifically targets electrical energy measurement and management. ZPA Smart Energy offers integrated system solutions for the measurement and management of electrical energy via communication modules and concentrators to communication servers and database client applications.
ZPA Smart Energy, **www.zpa.cz**

Pilz Czech

With 2,000 staff members worldwide, Pilz operates internationally as a technology leader in automation technology. In this area, Pilz is consistently developing a role as a total solutions supplier for safety and control technology. In addition to the head office in Germany, Pilz is represented by 32 subsidiaries and branches on all continents. Products include sensor technology, electronic monitoring relays, automation solutions with motion control, safety relays, programmable control systems and an operating and monitoring range. Safe bus systems, Ethernet systems and industrial wireless systems are also available for industrial networking. Pilz solutions can be used in all areas of mechanical engineering, including the packaging and automotive sector, plus the wind energy, transport and press industries. These solutions guarantee that baggage handling systems run safely at airports, that theatre scenery moves smoothly and funiculars or roller coasters travel safely. Pilz also provides a comprehensive range of services with an extensive selection of training courses. With safety advice and engineering, a comprehensive and competent service is available.
Pilz Czech, **www.pilz.cz**

Helukabel CZ

HELUKABEL is a leading international manufacturer and supplier of wires & cables, custom cables, cable accessories, data, network & bus technology and media technology, as well as pre-assembled cable protection systems for robotics and handling systems.
Helukabel CZ,
www.helukabel.cz

11 CONTACTS

Electrical and Electronic Association of the Czech Republic, **www.electroindustry.cz**
EIA is a free union of entrepreneurs, employers, associates, the most significant domestic producers and the suppliers of electrical and electronic industries as well as of information technology. Its members include both domestic branches of large international corporations as well as medium and small enterprises in the ownership of domestic capital. The proportion of members in the Electrical and Electronic Association of the Czech Republic within all electrical production in the Czech Republic has been approximately 70% for a long period of time.

ABB s.r.o., **www.abb.cz**
ABB is a leading company in the area of power and automation technologies. Its products enable utility, industry, transport and infrastructure customers to improve their performance while lowering their environmental impact.

Almeto s.r.o., **www.almeto.cz**
Almeto supplies a variety of components of electrical engineering such as transformers, coils and condensers.

ALPS Electric Czech, **www.alps.cz**
It is an OEM manufacturing company which can assemble any electrical parts or products including the supplying of all components.

ATAS elektromotory Náchod a. s., **www.atas.cz**
This traditional Czech company produces a great variety of motors, resolvers, axial and radial fans, stamping tools and dies for the die casting of plastic and aluminium alloys.

Blumenbecker Prag s.r.o., **www.blumenbecker.cz**
This firm's activities include the engineering of projects for automation systems of technological processes, regulated drives, robotic cells, structured industrial networks and many more. It also offers a broad range of welding equipment and related know-how.

Brno University of Technology, **www.vutbr.cz**
BUT in Brno conducts its own research and development. It is focused on non-specified research as well as on clearly defined research projects. Applied research is directly initiated by both Czech and international companies.

B:TECH, a.s., **www.btech.cz/en**
Czech engineering company with extensive know-how in system integration (complete delivery of industrial automation in the area of process and production technologies) and robotics with 20 years of worldwide references across many industries.

Central European Institute of Technology (CEITEC), **www.ceitec.cz**
Central European Institute of Technology is a joint project of the Brno University of Technology, Masaryk University and five other partner institutions in Brno. Its aim is to build a modern, high-quality scientific research infrastructure.

Czech Technical University in Prague, Faculty of Electrical Engineering, **www.fel.cvut.cz**
Faculty of Electrical Engineering CTU in Prague offers study programmes in Electrical Engineering and Informatics, Software Technologies and Management and many more. Besides this, it carries out its own research and development in a broad variety of fields such as robotics and biomedical engineering. In addition to that, this university provides programmes and courses supporting further training and education.

DELONG INSTRUMENTS a.s., **www.dicomps.com**
This company produces electron optics and microscopy, and vacuum technology. Besides these activities, Delong Instruments offers its own products of electron sources and low voltage electron microscopes, and serves as a contract developer of unique custom-made devices.

ELCOM a.s., **www.elcom.cz**
This company's activities focus on the field of power electrical engineering, energy engineering and virtual instrumentation. It is divided into several divisions that are oriented, e.g. on the research, development and production of special power electronic railway devices, explosion-proof drives or system-integration-services.

ELEDUS s.r.o., **www.eledus.cz**
A firm whose core activity is the development and production of X-ray inspection equipment for industrial non-destructive testing, control and inspection. This company's products can be used, e.g. in machine design and the quality control of product casting.

ELKO EP, s.r.o., **www.elkoep.com**
ELKO EP is a developer and manufacturer of modular electronics devices, especially relays, and smart electro-installation products focused on Smart Buildings projects. ELKO's production also overlaps with IoT production related to Smart City. The company has been awarded the Czech Business Superbrands.

ETD TRANSFORMÁTORY a.s., **www.etd-bez.cz**
A company designing and producing transformers, chokes, and reactors. Taking advantage of its own know-how and 90 years of experience in this field, the company offers not only serial production but also tailor-made solutions.

FCC průmyslové systémy s.r.o., **www.fccps.cz**
FCC is a technology-oriented trading company representing the important manufacturers of industrial automation and communications equipment. It provides a variety of process control systems and components such as sensor systems, industrial buses, industrial communication devices and many more.

FLOWBOX, **www.flowbox.com**
FLOWBOX offers solutions for digitalisation of industry, buildings, and cities. The product packages covers manufacturing, buildings & property management, smart cities & government, telecom & data centres, utilities & energy carriers, renewables & microgrids, e-mobility, mining, oil & gas, retail & food and health & research.

Hager Electro s.r.o., **www.hager.cz**
Hager is a leading provider of solutions and services for electrical installations in residential, commercial and industrial buildings. Hager's product portfolio ranges from energy distribution through cable management and wiring accessories to building automation and security systems. This allows us to combine all the skills necessary for the development of innovative products, systems and services

required for building automation, smart home technologies and e-mobility.

Helukabel CZ s.r.o., **www.helukabel.cz**
Helukabel is a leading international manufacturer and supplier of wires and cables, cable accessories, data, network and bus technology as well as media technology. It also produces cable protection systems for robotics and handling systems.

IMA s.r.o., **www.ima.cz**
IMA s.r.o. is a leading Czech manufacturer and supplier of innovative identification solutions, locating and recordkeeping systems for both public and private sector. Their aim is to constantly improve user convenience by leveraging their IMAporter MobileAccess platform with cloud-based management and distribution of mobile credentials.

KOPOS KOLÍN a.s., **www.kopos.cz**
Kopos is a traditional Czech company producing electric installation materials. Besides production, this company focuses on its own research and development of radiation shielding in nuclear devices.

KPB INTRA s.r.o., **www.kpbintra.cz**
KPB INTRA manufactures and supplies current, voltage transformers instruments and epoxide components.

LOGAREX Smart Metering, s.r.o., **www.logarex.cz**
A Czech firm specialising in the area of measurement, processing and data transfer. Combining the experiences of development and marketing specialists, meets this company the demand of the Czech as well as foreign customers.

MESING, spol. s r.o., **www.mesing.cz**
MESING is one of the major suppliers of calibration gauges. It is the only producer of inductive length transducers in the Czech Republic.

MICOS TELCOM, **www.micostelcom.com**
The Micos Telcom company has developed and produced passive components for fibre optic networks since 1990. The range of products is used extensively in the many FTTx scenarios – externally/internally and for business or residential scenarios.

MINERVA BOSKOVICE, a.s., **www.minerva-boskovice.com**
The core activity of this company is the development, production and sale of industrial sewing machines such as post bed, flat bed zigzag and many more. This company offers a wide range of single or twin needle lockstitch suitable for shoes, leather goods and textiles.

OEZ s.r.o., **www.oez.cz**
A Czech firm specialising in the area of measurement, processing and data transfer. Combining the experiences of development and marketing specialists, this company meets the demand of Czech as well as foreign customers.

Panasonic AVC Networks Czech, s.r.o., **www.panasonic.cz**
It is the manufacturer of high quality PDP and LCD TV sets in Europe. The Czech subsidiary of this company produces colour TV sets of this brand.

Pilz Czech s.r.o., **www.pilz.cz**
Pilz is a technology leader in automation technology. It supplies total solutions for safety and control technologies which can be used in all areas of mechanical engineering, including the packaging and automotive sector, plus the wind energy, transport and press industries.

RCD Radiokomunikace spol. s r.o., **www.rcd.cz**
This company focuses on the research, development and production of radio communication equipment. It designs and installs radio networks and integrates radio and safety systems for critical infrastructure protection.

SALTEK s.r.o., **www.saltek.eu**
Saltek is a leading company in the production of lightning and technological overvoltage protection. This company's products help to increase the safety and troublefree operation not only of industrial technologies, machinery, telecommunications, data centres, and office buildings but also of family houses.

SOPO s.r.o., **www.sopo.cz**
A company focusing on the production of winding parts of electric motors. Taking advantage of the narrow specialisation, top-ranking technologies and huge know-how, SOPO covers the entire portfolio of winding parts for smaller and middle-sized electric motors.

SYSGO s.r.o., **www.sysgo.com**
This company provides operating system technology, middleware, and software services for the real-time and safety and security critical embedded markets. SYSGO offers its own paravirtualisation operating system known as the Safe and Secure Virtualisation platform PikeOS.

Technology Agency of the Czech Republic, **www.tacr.cz**
It is an organisational unit of the state aiming to support research, experimental development and innovation. This organisation is considered to be one of the cornerstones of the fundamental reforms in research and development in the Czech Republic.

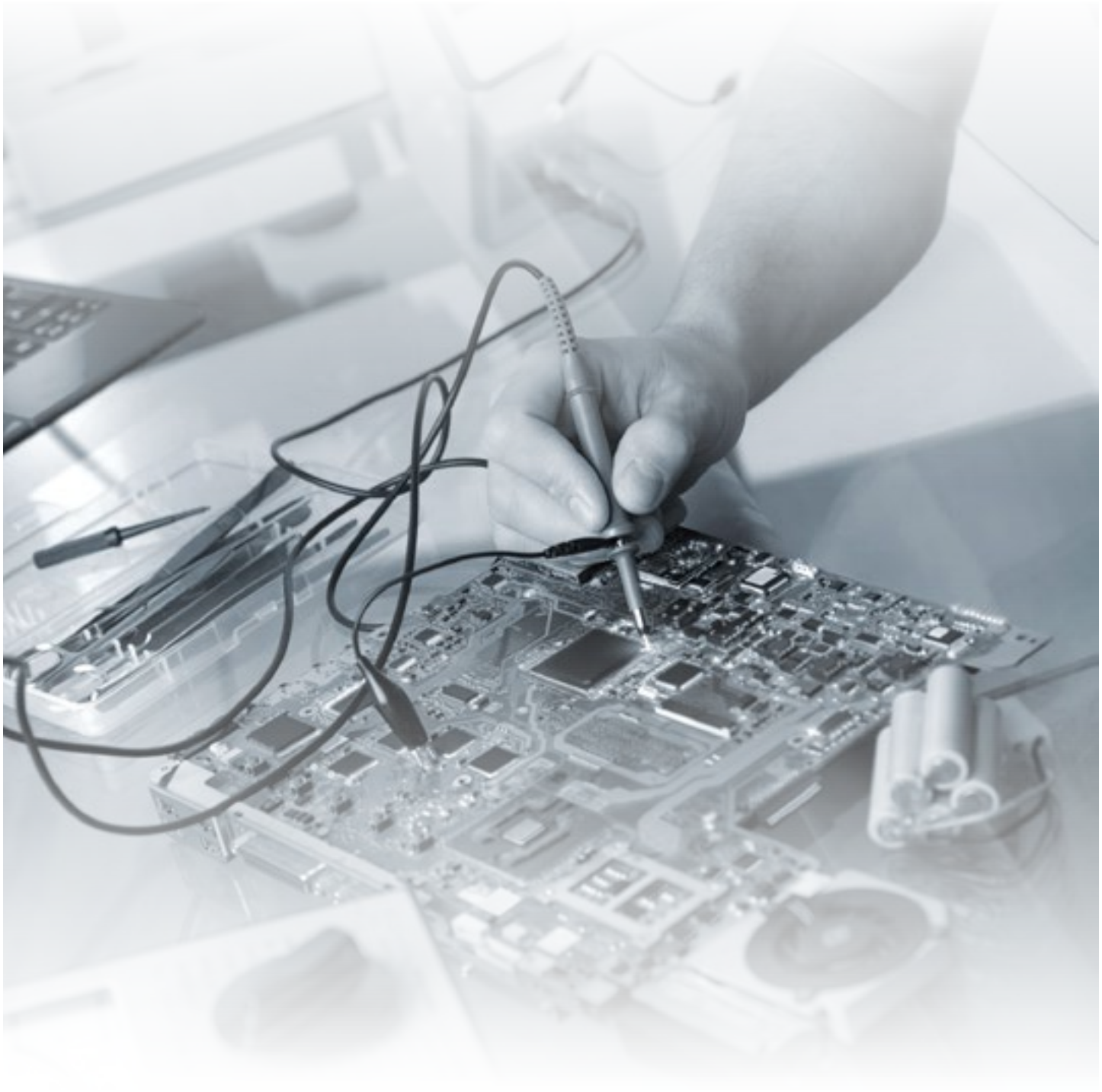
TES VSETÍN s.r.o., **www.tes.cz**
This company offers serial and unit production solutions in the area of electric motors and drives, generators, and parts of electric machines in the field of power engineering.

TESLA a.s., **www.tesla.cz**
Tesla produces and supplies high quality and certified TV and broadcast transmitters, antenna systems, radio relay equipment, a wide range of solar technologies and electronic military equipment.

VUES Brno s.r.o., **www.vues.cz**
VUES Brno is a designer and producer of tailor-made AC rotating electric machines, electric drives and loading test stands with dynamometers, various motors, aircraft technology board generators, electric starters, etc. Besides this activity, VUES Brno provides design and verification consulting and has an accredited test field.

ZPA Smart Energy a.s., **www.zpa.cz**
ZPA Smart Energy is the largest and most important Czech manufacturer of electricity meters, smart systems, ripple control receivers and AMR/AMM solutions. It produces integrated system solutions for the measurement and management of electrical energy.

The catalogue of electronics in the Czech Republic was created as collaboration between the Agency CzechTrade and the Electrical and Electronic Association of the Czech Republic.



CONTACT

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128 01 Prague 2
Czech Republic
info@czechtrade.cz
www.czechtrade.eu

CzechTrade