SELECTRON ON TRACK

TOGETHER FOR THE FUTURE: VISIONS OF TODAY FOR THE MOBILITY OF TOMORROW.

SUSTAINABLE MOBILITY:
Innovation is needed

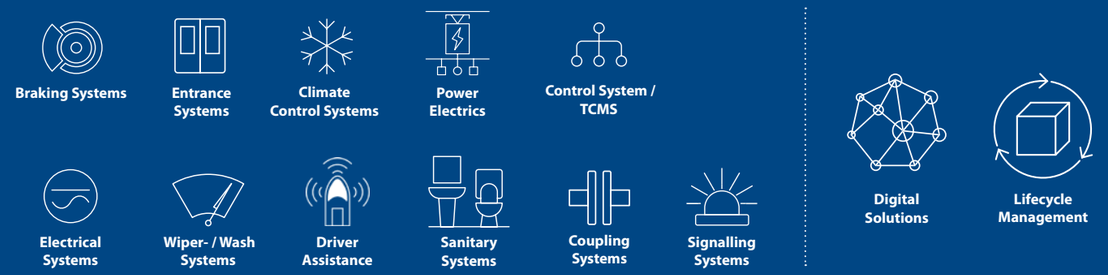
CYBERSECURITY FOR RAILWAYS:
Elementary prerequisite for the digital transformation

THE CUSTOMER IN THE CENTER:
New Customer Service business unit

SELECTRON

Content

KNORR-BREMSE RAIL VEHICLE SYSTEMS:
INNOVATIVE TECHNOLOGIES AND SYSTEMS COMPETENCE FROM A SINGLE SOURCE



DR. THOMAS FISCHER, CEO SELECTRON SYSTEMS (LEFT)
MARCO FANGER, CEO SELECTRON SYSTEMS (RIGHT)

Dear Readers,

Standing still means taking a step back. So, growth is the key to success – but it should be sustainable growth! This is why Selectron Systems AG made this commitment some 15 years ago. The strategic heart of our business has always been to coordinate important development steps with our customers in order to shape our product portfolio in a customer-oriented manner.

In April 2018, we – Thomas Fischer and Marco Fanger – took over the management of Selectron Systems AG. A lot has happened since then: the starting pistol was fired with a successful reorganization. This meant that we reached our goal faster: we were able to shorten the anticipated development time of our new Central Processing Unit by around 12 months. We have also made progress in the area of cybersecurity and have established the Center of Competence for Cybersecurity within the Knorr-Bremse Rail Division.

The year 2020 proved that Selectron is a team and pulls together. The COVID-19 pandemic presented the world with challenges unlike anything we have seen before on this scale. As a result, Selectron also had to adapt its organization and core processes to the new reality in order to ensure the health and safety of our employees, while at the same time safeguarding our operative business. Our overarching goal was to avoid having to announce any redundancies or short-time working. It is with some pride that we can say at this point that we have succeeded.

This makes us optimistic that we will continue to manage the situation well. It is precisely at this time, and despite difficult conditions, that we have decided to make a real push for innovation in order to emerge stronger from this crisis.

Our holistic cybersecurity architecture and the new Threat Detection Solution will make a significant contribution to making rail vehicles more secure in the future. Selectron has also built up its own resources so that rail-specific communication can be mastered on all protocols and technologies in the long term.

Thanks to all these major projects and measures, we can proudly say today: Selectron continues to be one of the leading TCMS specialists and is now also one of the global leaders in the fields of cybersecurity and train communication.

All of this was, is and will only be possible in the future because we can rely on a team that thinks and acts in an entrepreneurial manner, regardless of the size of the company, its past successes or affiliation to the Group. The Selectron spirit that was built up by generations before the current management team means that the relatively small team has an incredibly high potential for innovation. Our global Selectron team has a unique knowledge base that will significantly shape the future of the rail industry.

Learn more about our company, our goals and our visions for the future on the following pages. We hope you enjoy reading it.

DR. THOMAS FISCHER CEO

MARCO FANGER CEO

Vision 2021+ – Within Our Reach

Selectron is one of the world's leading developers of Train Control and Management Systems (TCMS). We are looking to the future in a positive, ambitious and innovative way. We have successfully secured our strong position in the market – through high-quality standards, a wide range of components and innovations. But resting on its laurels has never been an option for Selectron. Find out where the journey should lead.

DR. THOMAS FISCHER
CEO SELECTRON SYSTEMS

MARCO FANGER
CEO SELECTRON SYSTEMS

Innovation – But Done Right

Our innovations are always based on direct benefits for the customer. We are looking for solutions that take into account both current and future pain points in the market and at the same time increase the value of our customers' systems in the long term.

The SCPU 94x controller with a virtual PLC concept is our latest innovation and enables the simultaneous and independent processing of several subsystem tasks – while maintaining freely selectable Safety Integrity Levels (SIL). This allows the number of hardware units to be reduced, resulting in further cost savings and reduced operational complexity.

With Smartio® – our decentralized IO modules – we have succeeded in reducing both cable requirements and cabling complexity by up to 30%. The added value for our customers: minimizing costs, optimizing time to market and reducing space requirements.

Where do we go from here? An intensive market analysis as well as numerous discussions with railway manufacturers and operators led us to take the following decision: based on the current TCMS product range, Selectron will – without changing its business model – make a decisive contribution to solving the following core challenges facing the railway industry.

Management of Cyber Risks

The convergence of TCMS and operational deployment systems as well as the increased demand for comfort systems (multimedia, Wi-Fi, entertainment) is firstly leading to a noticeable increase in the volume of data and secondly to a more intensive data exchange – with the associated security risks. The transition from proprietary protocols to Ethernet-based data exchange increases the risk of cyber attacks. Railway operators are legally obliged to secure their infrastructure against attacks.

With Selectron's comprehensive cybersecurity architecture, we ensure that not only individual components of the TCMS, but also the entire system, are secured against cyberattacks with different security levels (SL).

Furthermore, the same security precautions also apply to Knorr-Bremse's range of services, because Selectron has taken over the governance function for the entire Rail Division with regard to cybersecurity. Selectron is providing the Threat Detection Solution (TDS) for legacy fleets and current peripheral systems – not limited to Knorr-Bremse – using various systems to detect cyber attacks in real-time.

Simplification of Complex Homologation Procedures

Intensive and complex homologation procedures mean that, once the electronic systems of rail vehicles have been approved, they can only be modified at great cost. Security patches, bugfixes, function extensions and general improvements are therefore hardly possible. This has a negative impact on the efficiency, safety, security and value retention of the vehicles.

Based on the new controller, Selectron is working together with vehicle manufacturers, operators and approval authorities on a solution that will significantly simplify upgradeability.

Future TCMS from Selectron will therefore automatically be modifiable – after a one-time approval. A new homologation will only be necessary in individual cases. Integration tests can be carried out while the vehicle is in operation, thanks to the multi-kernel structure of our CPU as well as sophisticated statistical procedures and meticulous test documentation, thus maintaining the operational capability of the vehicle.

Selectron Remains True to Its Own Origins, but Continues to Develop Consistently

Selectron will remain the supplier of the world's leading TCMS system – that is our mission. To support vehicle manufacturers in optimizing their own time to market and significantly reducing implementation costs, we offer innovative services and solutions that are focused on security, safety and efficiency.

Selectron – and it works.

»We give our customers an edge – by quickly identifying our customers' everyday pain points and developing solutions.«

MARCO FANGER
CEO SELECTRON SYSTEMS

»Selectron is purposefully striving to anticipate the needs of customers, to work with them on new, future-oriented concepts to shape the mobility of tomorrow.«

DR. THOMAS FISCHER
CEO SELECTRON SYSTEMS

The Path To Sustainable Mobility – Together With Our Customers

Rethinking mobility

More and more people around the world are traveling by train. Globalization is increasing demand for international, cost-effective and efficient railway transport. In order to make mobility sustainable, the railway industry must break away from its proprietary systems and instead rely on innovative and established solutions.

Passenger transport performance has increased significantly over recent years. At the same time, transport within the EU became more international with the opening of political borders. This not only accelerated globalization, but also increased competition and encouraged innovation. In order to keep up with these developments, the railway industry needs to look for state-of-the-art solutions. After all, a highly developed economy is dependent on free and unrestricted mobility. What is needed now are intelligent transport and regional developments.

Sustainable mobility: Innovation is needed

In order to enable increasing transport performance and internationalization in rail transport over the long term, the railway industry must move away from its old and proprietary systems. Innovative and efficient solutions are called for. Selectron picked up this gauntlet a long time ago. Cybersecurity, reduction of complexity, big data, smart data, time to market, communication and cost optimization are central topics that Selectron is working on intensively.

In order for the railway industry to keep pace with other industries, it needs industrial solutions and innovations that will allow it to reduce its product and system costs over the entire service life. In recent years, railway companies have not only purchased many new vehicles, but have also invested in the maintenance of their rolling stock to an increasing extent. They are faced with the challenge of ensuring timely, cost-effective and, above all, sustainable mobility.

Selectron is supporting railway companies in this process with, among other things, the new and powerful generation of controllers, the integrated cybersecurity range as cornerstones of digitalization and new system concepts to reduce costs, complexity and time to market. Digitalization is fundamentally changing the railway industry: Digital solutions enable efficient engineering, a reduction in lifecycle costs, cost-effective system designs and simplified approval processes in new vehicles and modernization projects.

Intelligent data – intelligent mobility

Due to the ongoing digitalization, individual subscribers are becoming increasingly networked with one another, both within the vehicle (TCMS, PIS, passengers, among others), but above all and increasingly with the outside world (rail vehicles, passengers, Cloud systems). This leads to an enormous increase in bandwidth requirements. It is therefore high time to replace proprietary bus technologies with a standardized network technology that meets today's requirements. With the networking of different participants, trains are no longer closed systems but the central part of a uniform overall system. Although this system change will bring new possibilities to the railway industry in the future, such as Automatic Train Operation (ATO) or Predictive Maintenance, it also places new demands on cybersecurity.

Smart data is indispensable for optimizing traffic. Without this data, it will not be possible to increase transport capacity, improve punctuality or rely on intelligent maintenance. In order for vehicle data to be accessed efficiently and quickly from outside, vehicles and fleets must "open up" so that they can communicate with their environment. It is therefore necessary for data not only to be sent from the vehicle but also to enter the vehicle. This will only be made possible through the intensive use of digital information and telecommunications solutions, which must be secure. For this purpose, Selectron offers not only secure products, but also a comprehensive cybersecurity solution tailored to the railway industry.

THE RAIL INDUSTRY IN THE DIGITAL AGE
Strong and sustainable solutions are needed to meet the challenges of the future.

»Strengthening our customers on the path to sustainable mobility remains our central mission.«

TOMISLAV RADJENOVIC
HEAD OF STRATEGIC MARKETING – CMO
SELECTRON SYSTEMS

We can find strong solutions together

Security is the top priority for digital technologies. Cybersecurity is therefore the cornerstone for open and networked solutions. New architectures of our products allow, among other things, security patches without loss of approval.

In addition to security, a culture of partnership and trust between the parties involved is another important prerequisite for a secure overall system. As with digitalization, a network (chain of trust) is needed to find strong solutions together.

Selectron is offering a complete cybersecurity solution for the future. Combining strengths allows us to achieve more together and reach our goal faster. Selectron is developing its products under this motto. The principle of virtual PLCs on the new generation of controllers enables innovative system configurations to be achieved which reduce complexity, hardware, engineering, costs and time to market. Different applications can be bundled together and run in different Safety Integrity Levels (SILs) on the same hardware without any mutual interaction. The secure, generically certified operating system guarantees that the individual applications are not affected.

Strengthening our customers on the path to sustainable mobility remains our central mission. Make a flying start into the new age of mobility. Selectron supports you in this with innovative overall solutions. We don't just talk about the future – we actively and sustainably put it into effect.

We Design Cybersecurity – For Tomorrow's Railways

Railway systems are becoming increasingly digitalized and networked. This also makes them more vulnerable to cybercrime. Sustainable rail transport involves the implementation of new, smart concepts. Unless cybersecurity is mastered, it will become a potential stumbling block to achieving these goals. This is because the potential for cyber attacks increases with the introduction of each new technology. Cybersecurity is becoming a central task. Selectron offers ground-breaking cybersecurity solutions for secure, digital communication.

Cybersecurity as an elementary prerequisite of digital transformation

The mobility of the future requires new solutions and concepts – railway operators are called upon to drive forward the digital transformation and implement smart transport solutions. The key factor is the implementation of new operational concepts, such as predictive maintenance and automatic train operation. The main drivers for such digital and automated solutions are increasing demands on security and safety, reducing operating costs and, ultimately, increasing the value added. The latter is achieved by increasing line productivity. This means, for example, reducing moving blocks with the objective of increasing the traffic capacities. Real-time localization is essential to ensure optimum moving blocks and braking distances. Demands on the performance of the rail vehicle are increasing accordingly.

A RAPID DEVELOPMENT
The railway of the future will be "smart" and networked. Cybersecurity is critical.

The future is networked: Is this a blessing or curse?

New, digital business models require ubiquitous networking and online connectivity of rail vehicles. In addition, the increased use of standardized commercial off-the-shelf products brings decisive cost advantages. At the same time, however, this also creates security vulnerabilities with potentially serious consequences, these range from significant economic losses to a serious threat to passenger safety. Cybersecurity is an essential factor in risk prevention – because security and safety go hand in hand. Security standards play a decisive role in this. The pressure on operators is increasing – not least because of the numerous new conformity regulations. Solutions with integrated cybersecurity are in demand.

The key to security: Identity and access control

Protecting trains from cyber attacks is a complex task. A defense in depth security concept is fundamental. Security policies recommend implementing multiple security barriers. Identity and access control for devices, software and configuration tools is considered the primary defense measure.

Digital identities can be assigned to a device or its software using security certificates and public key infrastructures (PKIs). Each and every one of us uses a PKI without knowing it – when surfing the Internet for example. When your browser warns you that a website is not trustworthy, this is because a PKI is working in the background and has detected an invalid certificate. The same principle can also be used between communicating train devices.

For example, Knorr-Bremse recently launched a PKI solution under the leadership of Selectron to protect the identity of its devices. As the cybersecurity leader, Selectron is the first company in the Group to use the PKI. Already, selected Selectron software will be digitally signed with security certificates issued by the PKI, thus protecting it from forgery and modification. The new generation of controllers from Selectron will also be able to communicate with the PKI and check the integrity of the digital ID. Combined with a Trusted Platform Module (TPM) integrated in the controller, changes to the hardware and operating system are checked every time the train is started. The combination of PKI and TPM ensures reliable threat detection and prevention of attacks.

» Cybersecurity is an essential factor in risk prevention – because security and safety go hand in hand.«

PAOLO FANULI
HEAD CENTER OF COMPETENCE
OT CYBERSECURITY
SELECTRON SYSTEMS

Threat monitoring: The early warning system for cyber threats

However, what happens if the digital ID cannot be verified, for example because there is no connection, checking is not possible with the PKI service or the certificate is no longer valid? New security vulnerabilities arise. The train must be protected by additional measures; several security levels are essential.

This is where threat monitoring comes in. Network traffic and device behavior are continuously monitored in real-time. If an anomaly occurs, it will be reported. Railway operators are required by law to ensure continuous monitoring of their control system – including during operation.

THE KEY TO SECURITY
Security is complex. This is why Selectron solutions are designed according to a modern defense in depth architecture.

New Selectron Threat Detection Solution

Selectron has recognized the need for threat monitoring in the railway industry. This is why we have made it our mission to develop a specific intrusion detection system for the railway industry – the Selectron TDS (Threat Detection Solution). We are working together with Irdeto and T-Systems, two experienced partners from the areas of IT and automotive security, to derive optimum synergy effects in terms of expertise. The prototype was put into operation and tested in early 2020. The early warning system will be available on the market in two versions – Local and Advanced – from 2021.

Cybersecurity: An additional core competence of Selectron

Selectron has developed a complete cybersecurity concept to protect the train as a whole and its individual components against cyber attacks. This also includes introducing important processes such as Risk Management or the Secure Development Lifecycle process. This is supplemented by employee training on the IEC 62443 standard and secure software development. This competence in governance, risk management and compliance prompted Knorr-Bremse to locate its global competence center for product cybersecurity for all railway companies in Selectron. Cybersecurity is therefore our additional core competence. In addition to a range of secure products, this includes targeted services and strategic partnerships. This makes Selectron the ideal and competent point of contact for cyber-security in TCMS solutions. We are committed to providing our TCMS products and future solutions with integrated cybersecurity. Selectron thus offers a portfolio of cybersecure TCMS solutions that is unique on the market.

Selectron is helping to shape cybersecurity for railways from the ground up and is confirming its leading role in the railway sector.

With their innovations, Selectron and Knorr-Bremse are at the forefront of an exciting development within the railway industry. We support our customers in mastering current and future challenges – for safe mobility in the future.

Everyone is Talking about Customer Centricity – We are Implementing It

Long-term customer satisfaction is no coincidence, but the result of a consistent customer focus. Mutual trust and a strong partnership are important to us.

We are proud to have a strong Selectron team, which our customers can rely on to implement their projects. Our motto: Customer first.

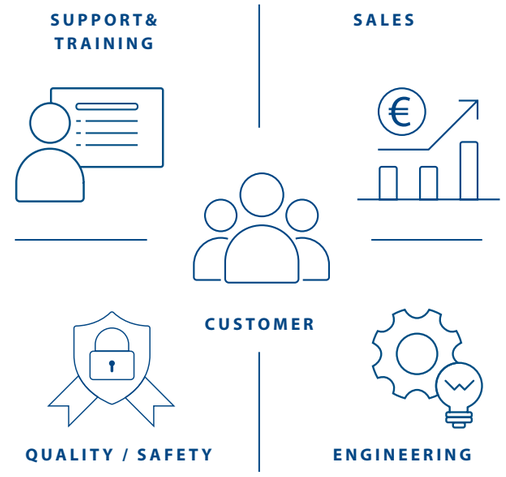
MARCO FANGER
CEO, SELECTRON SYSTEMS

Customer Service – Everything Under One Roof

At Selectron, we place customers and their needs at the center of everything we do. For us, customer centricity means not only offering customer-oriented products and services – but also aligning our organization and processes to the ideal customer experience.

We created the new Customer Service business unit to structurally anchor our customer-centric orientation. All activities that have a direct interface to our customers are combined here. This includes the areas of Sales, Engineering, Quality/Safety and Support & Training.

By bringing all these areas under the auspices of Customer Service, we are able to offer our customers comprehensive, individual and continuous support and consulting: From the concept idea through to after-sales service.

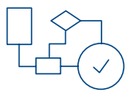


From the Idea to Commissioning

Whether it's a matter of handling a special retrofit project or planning a TCMS for a new fleet – we accompany our customers from the initial idea to commissioning. Customer requirements are always a primary concern. Together with you, we develop solutions that optimize the Total Cost of Ownership. We draw on decades of experience and use the advantages of the latest technologies. Our technical specialists are also available to you after the completion of your project and offer competent support if questions arise.

1.COLLATING CUSTOMER REQUIREMENTS AND PERSONAL CONSULTING

2.OFFER PREPARATION ACCORDING TO CUSTOMER REQUIREMENTS



3.RELIABLE PROJECT IMPLEMENTATION

4.CUSTOMER SUPPORT AFTER SUCCESSFUL PROJECT IMPLEMENTATION

The new organizational unit supports our customers not only in technical matters, but also offers them help to help themselves. Together with our customers, we develop optimum system configurations and test them for their technical feasibility. If necessary, we also take unconventional approaches. By working in this way, we ensure that everything has been thought of already during the planning of a new project and that the project is optimally implemented: Our goals are to ensure a short time to market, sticking to the budget, offering high-quality services and products with the necessary functionality.

In addition, we hold training courses to impart specific knowledge in handling our hardware and software. Our customers can choose from various standardized training blocks or assemble a personalized program in consultation with our support team.

OUR CUSTOMERS PLACE THEIR TRUST IN US
We are not satisfied until our customers are.

Customer Focus is Our Motivation. Our Raison d'Être.

Customer focus is the core of Selectron's corporate culture. We consistently focus on our customers. Today and in the future we want to enable our customers to successfully implement applications on rail vehicles with our leading products and solutions.

Why Not Get In Touch With Us?

We do everything in our power to strengthen mutual trust and build a good, cooperative relationship with our customers. Therefore, we always have an open ear for our customers. Inquiries and feedback are always welcome – just get in touch with us. We are committed to providing our customers with competent advice and targeted support for their projects.

Customer dialogue
We take time for questions and concerns. We advise our customers individually and comprehensively via e-mail, telephone or on site.

info@selectron.ch
+41 32 387 61 61

Website
Our website at **www.selectron.ch** provides information about our company, our products and services as well as giving current news.

LinkedIn
Selectron now has its own LinkedIn page. Follow us, so that you can keep up to date with upcoming trade show participations, news and current developments from Selectron.

Follow us on LinkedIn

Facts & Figures

More than 10,000 vehicles are used successfully with Selectron products all over the world.

We are an international, multilingual team! We have a passion for languages in our company. Our employees can ideally use and develop their language skills in our international environment.

- Swiss-German
- Spanish
- Russian
- Chinese
- German
- Italian
- French
- Tigrinya
- English
- Croatian
- Turkish
- Others

Our Team

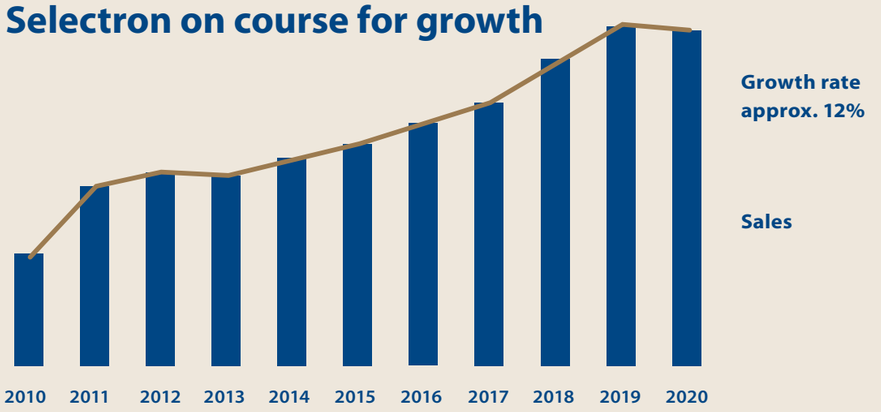
NUMBER OF EMPLOYEES	
145	Switzerland
4	China
12	Italy

OF WHOM

66 % engineers

Global customers

Selectron on course for growth



New products from Selectron – designed to revolutionize the control and security architecture of modern rail vehicles.

TCMS and cybersecurity products that set new standards.
For maximum efficiency, security and availability of rail transport.

CPU 94x

The Next Generation of Vehicle Control Unit

CPU 94X
Powerful. Secure. Flexible.

When designing the new Selectron controller – the CPU 94x (Central Processing Unit) – our focus was directed on optimizing development and maintenance processes, as well as simplifying the homologation procedure, in order to deliver an efficient and innovative answer to the challenges facing the railway sector in the future.

The new controller offers a number of features that are designed to meet the needs of innovative integrators. The underlying virtualization concept makes it possible to operate up to three independent controllers in parallel on one CPU 94x. This allows greater flexibility in the TCMS architecture. With applications running in parallel and without mutual interaction, standard and safety functions can be implemented separately from project-specific adaptations on a second virtual controller. This allows the time and effort involved in homologation to be massively curtailed, since only the changes are considered.

The modular software concept also offers decisive advantages in terms of maintenance costs, especially with regard to cyber-security. Parallel operation of different MOS versions (MAS Operating System) and the possibility of applying security patches without losing approval are essential functions for operating a permanently maintainable system with scope for future expansion.

The modularity also results in a configurable distribution of performance. Thus, in addition to virtual controllers of varying performance (S-M-L), fast cycles or a variant with only one controller – but full performance – are also available.

With the ability to expand to a computer that meets Safety Integrity Level 4 (SIL4), Selectron offers a further option for integrating previously separate systems. This allows TCMS and signaling to be integrated more optimally, especially with regard to automated running – this allows for improved and deeper integration of the various systems.

With the new generation of controllers – the CPU 94x – Selectron is setting new standards in performance, security and flexibility. It enables vehicle manufacturers to achieve an efficient configuration of their applications and delivers benefits in homologation.

Selectron Revolutionizes Wheel Slide Protection with the New WSP3 Solution

WSP3
(WHEEL SLIDE PROTECTION)
Flexible. Adaptable. Robust

The needs of our customers inspire us again and again to continuous development and innovation. The first Selectron wheel slide protection module with certified safety functions was the CDT 731 TG from the MAS-73x family in 2007. The positive market response and the numerous customer requests for a comprehensive solution with UIC approval inspired us to develop a complete solution.

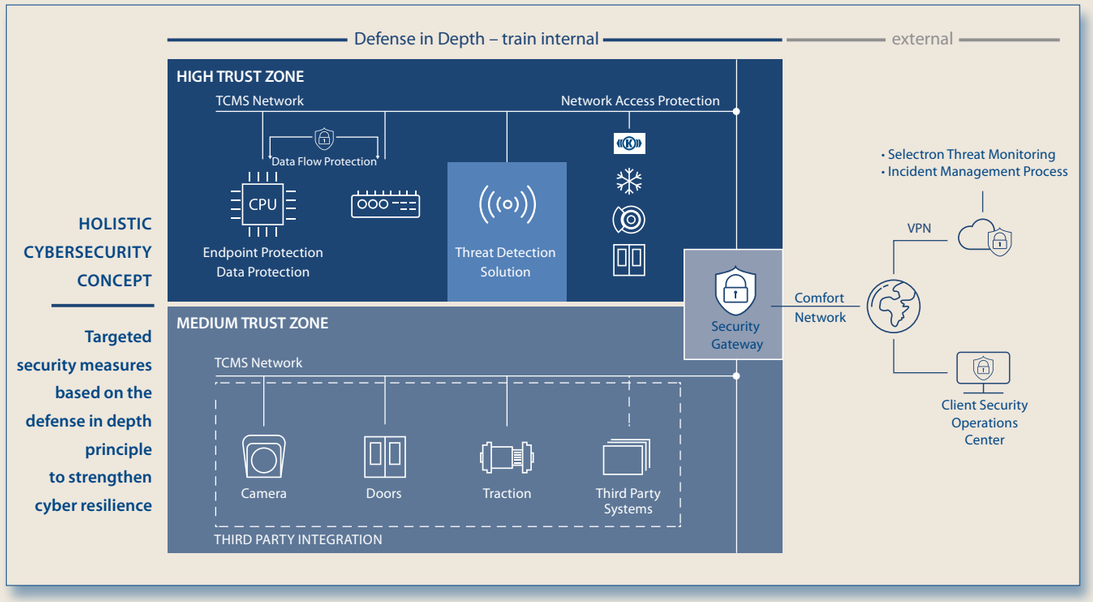
For example, the first SBB Regional Traffic double-decker train from Stadler with a UIC-certified WSP800 wheel slide protection system from Selectron was put into operation in 2012. Due to the demand for greater flexibility in terms of system application as well as changes in the railway policy landscape in Europe, the extended WSP800 V04 solution was certified as a TSI interoperability component and has been available on the market since 2015. The success factors are high flexibility, easy adaptability, robustness and – this should not be forgotten – TSI conformity.

The wheel slide protection solution from Selectron is used by various vehicle manufacturers throughout Europe and thousands of them are now in operation. The vast majority of these are TSI interoperability components. The uniqueness of the system lies in the fact that sensors for wheel speed measurement and actuators for brake cylinder pressure control from various manufacturers are included in the TSI certificate. This gives our customers unique freedom to design their entire braking system.

The WSP3 wheel slide protection system is currently being developed together with the latest generation of control system computers. As the successor to the successful WSP800 wheel slide protection solution, the WSP3 combines the existing solution with the advantages of the Smartio® module. In addition to the increased performance and the space-saving design, the successor solution is particularly impressive due to its even greater flexibility. Of course, the new WSP3 will also support the same sensors and actuators as our customers are used to from the previous WSP800 V04 version.

The wheel slide protection controller now runs directly on the Smartio® function module. Significant savings for the vehicle manufacturer also result from the decentralized system architecture, which significantly reduces the amount of cabling and shielding required. In 2021, the WSP3 wheel slide protection system will also be certified as a TSI interoperability component. The new wheel slide protection family revolutionizes the wheel slide protection function on rail vehicles.

Secure, Digital Communication with Selectron Cybersecurity Products



HOLISTIC CYBERSECURITY CONCEPT

Targeted security measures based on the defense in depth principle to strengthen cyber resilience

Security by Design

The security by design concept comes into play in the development of cybersecurity products. In this context, security is primarily integrated into the development process.

Security influences every step from the definition of security requirements through to the development and certification of products, and maintenance. The dynamic environment, the constantly changing threat situation and newly discovered system weaknesses are challenges that must be mastered.

Accordingly, Selectron has introduced a security framework based on IEC 62443. This puts Selectron in a position to develop products according to standardized security levels in order to guarantee security over the entire lifecycle.

Defense in depth approach

Security only functions within the overall system and therefore influences different products. The security role of a product is therefore defined taking into account the proven Selectron system. Based on the defense in depth approach, security is consistently implemented in the Selectron product roadmap:

Protect: There are classic "security products" such as the Security Gateway (SGW) for network segmentation, "secure products" as secure variants of the classic TCMS components (e.g. Secure CPU) as well as the "security infrastructure", which can be used for secure communication (PKI) among other things.

Detect: The Threat Detection Solution (TDS) provides a cost-optimized solution for detecting anomalies in network traffic, especially for existing fleets. As a standalone measure, it can be used to cover important legislative requirements. In combination with other security measures and/or products, the information provided by the TDS from Selectron can make an essential contribution to trouble-free operation of a vehicle fleet. The solution has a modular structure and is therefore optimized for different application areas.

Respond: Security updates are reliably provided thanks to the adapted processes. The targeted buildup of security expertise also enables us to offer services that complement our security portfolio, from risk assessments to incident management.

Considering this in the context of the overall system leads to the situation that important aspects such as usability need to be considered on a continuous basis despite all security requirements. Consequently, such aspects must be incorporated into the system architecture and thus into the designs of the individual products.

SELECTRON TDS (THREAT DETECTION SOLUTION)
Protection against cyber threats through early threat detection

Do you want to learn more about our new Threat Detection Solution?

Take a look at our product video:

The Future is Ethernet

ETHERNET ROUTER AND MANAGED SWITCHES
Powerful and precise network control

Communication is what counts

Ethernet technology has become a substantial component of modern rail vehicles. Initially used mainly for passenger comfort functions, Ethernet has now also become a standard in the part relevant to train control – the Train Control & Management System (TCMS).

The TCMS contains the control and monitoring functions of the train and is therefore relevant for safety and availability in operation. It also provides relevant data for fleet maintenance and servicing. Passenger comfort relates to multimedia infotainment and safety systems such as video monitoring.
All these areas communicate with one another, exchanging large amounts of data. This requires more and more communication capabilities in terms of both bandwidth and management of such communications. The greater the number of networked devices, the more urgent the question of availability becomes. In view of this aspect, the questions of fail-safety and cybersecurity are becoming more and more important.

All of the above bring about the need of a very precise control of the network. This requires innovative and future-oriented network devices. Selectron responds to the market demands with a new set of devices: Ethernet routers and Ethernet-managed switches.

Future-proof networks with the new Selectron Ethernet Routers and Managed Switches

The Selectron Ethernet routers are fully compliant with railway standards with regard to interoperability and, at the same time, are ready for higher speeds. It is possible to connect them with each other up to 10 Gbit/s. The combination of router and managed switch in one device also offers possibilities for cost-effective Ethernet architectures.

Regarding Ethernet-managed switches, our offering includes a choice of different port speeds (up to 10 Gbit/s) and enhancements guaranteeing increased fail-safe properties; for example, hardware bypasses. The possibility to create different network topologies is also an important aspect, from normal ring topologies right up to the high-end ladder ones that ensure complete redundancy and provide a massive leap forward in terms of overall network performance.
The focus is increasingly on installation and maintenance costs, which usually go far beyond the pure acquisition costs. Efficient configuration possibilities are available during commissioning, which will help to reduce this. Maintenance work can also be optimized in this way, whether it be for future extensions or adaptations.
The advantage: significant time savings and lower requirement for skilled personnel at the train operator. Consequently, Selectron offers optimum solutions – both for the current requirements of the market and future solutions, corresponding to the visions of Industry 4.0.

Even greater flexibility: new converters & communication cards

This means Selectron is ready for Ethernet, the technology of the future. But what about migration? What happens to the abundance of existing communication systems such as CAN, MVB or RS232/485? These will still be common in the rail market due to their long life cycles, whether due to modules that do not support Ethernet or because it will be necessary to connect to existing vehicles.
Protocol converters are used where such different bus systems and communication protocols have to interact with one another.
Of course, the most straightforward way is to use devices designed specifically for the project; however, they do suffer from a decisive disadvantage: if application scenarios change, this entails an enormous adaptation effort.

The new family of converters from Selectron eliminates this disadvantage, which used to be a decisive one: it allows users flexibly to adjust numerous transmission details on their own – without having to make any changes to the converter itself. For even more flexibility, Selectron also offers communication cards and system-on-a-chip solutions for seamless integration into your products.

Ubiquitous communication

Ethernet has become a standard for digital communication – also in the railway sector.

Selectron with a New Look

Last year, Knorr-Bremse unveiled its new brand identity, marking an important milestone for the future. In line with the parent company's new brand strategy, Selectron is also presenting itself in a new guise. Selectron is undergoing a change with the rebranding, but our focus remains on our strengths.

Knorr-Bremse Strengthens Global Brand Presence with New Brand Strategy

Knorr-Bremse is the world market leader for braking systems and other systems for rail and commercial vehicles. The Group owns numerous corporate brands that previously had their own brand names – including Selectron (TCMS), but also the brands IFE (entry systems), Merak (air-conditioning systems), Kiepe Electric (energy supply), Microelettrica (energy control) and others. With a rebranding, this brand landscape has now been transferred into a uniform brand architecture. This means that the individual brands have been visually integrated more strongly into the Group family. This is reflected in the adapted logos and the uniform corporate design.

The result: The corporate image has been harmonized and the cohesion of the brands strengthened. The core and the strength of the brand have been expressed even better, both internally and externally. Three core values have emerged from the new brand concept: Reliable, Innovative and Leading. This also resulted in a new positioning statement: "Driven to create the best solutions." The One Brand gives Knorr-Bremse a uniform and modern global image.

Our Look Is Changing – Our Commitment Is Not

SELECTRON

Selectron has also refreshed its appearance in the course of this. Following the example of the parent company, Selectron is now also presenting itself with a modern corporate design and a new logo. This will become visible step by step in our media, both online and offline. While our visual identity is changing, our strengths remain the same: our expertise and innovative strength in the field of TCMS and cybersecurity for rail vehicles as well as the proximity to our customers.

We would like to take this new departure as an opportunity to thank all our customers and business partners – thank you for our excellent partnership with cooperation, as well as for your support and loyalty! We look forward to continuing this in the spirit of the new appearance. We remain passionately committed to our customers and partners, and are tirelessly seeking new ways to optimize our collaboration even further – as you already know and expect from the Selectron team.

DRIVEN TO CREATE THE BEST SOLUTIONS.

WE SET STANDARDS.

WE DEVELOP FUTURE TECHNOLOGIES.

WE ARE THE TRUSTED PARTNER.

Leadership Means: Vision and Responsibility

FROM LEFT TO RIGHT:
Jonathan Orditz, Head of Research and Development
Dr. Thomas Fischer, CEO
Marco Fanger, CEO
Simone Mantello, CFO
Tomislav Radjenovic, Head of Strategic Marketing – CMO

Leadership means shaping a vision, sharing it with others and pursuing it with burning ambition. One of the central questions facing all types of management is how to get employees to run as independently as possible in a direction that is, on the one hand, consistent and strategically target-oriented on the other. The more dynamic the environment, the more room for maneuver in decision-making has to be delegated down the hierarchy, since in such an environment central decision-making is usually too slow; however, decentralization carries the risk of divergence. It is therefore essential for management that all employees should be aware of the main goal – the vision – as well as the strategy and its direction.

How do we invest in the future? By investing in our employees. This is our commitment to ensuring the long-term sustainability of our corporate activities. We ensure an appropriate corporate culture of innovation that encourages creativity and in which all employees feel respected, valued, supported and that they are playing their part.

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