



PRESS INFORMATION

for Innotrans 2022



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1. Long-term partnerships and experience in the rail sector

More than 30 years of experience distinguishes Elma as a reliable partner for components and systems in the railway industry. With a significant presence around the world, Elma supports its customers with extensive know-how in the development and sale of suitable solutions.

Elma's electronic components, subracks, power supplies, and systems are perfectly tailored to applications on the train, along the tracks, or in signal boxes. The possible applications are vast and help to ensure mobility, safety, and comfort.

Always in use

In railway operation it is important to guarantee the mobility of the vehicle and control centers in order to avoid high downtime costs. The electronic components and systems used must therefore be particularly reliable and resistant to interference fields. Whether in the diesel engine starter, lubrication and braking systems, or the automatic door lock, system solutions are used in many places. Especially in the area of train control and drive and vehicle electronics, Elma has developed and overseen customer projects and thus contributed to securing mobility.

Safely to the destination

On-board safety is the utmost priority. This not only involves the controls of monitoring instruments, such as cameras or train control and monitoring systems, but also emergency call systems or monitoring applications, for example. To this end, Elma assists its customers with the selection and development of the suitable system – from the 19" subrack and the associated components to the integrated system. In this way, the aluminum profile frame of Elma cabinets can be specifically optimized for the requirements of railway applications. They are configured and manufactured for specific projects on the basis of flexible cabinet platforms. The cabinets are used as subracks to accommodate the vehicle electronics on trains. In particular, the two subrack platforms TechFrame 40 and Systemkit 12K Rail can be used. With almost complete vertical integration, Elma also delivers customized drilled, milled, and printed front panels made of various materials.

Comfort makes travel better

Passenger comfort is becoming increasingly important in presenting the railway as a compelling mode of transportation for private and commercial travel. For this purpose, Elma's power supply product range offers DC/AC inverters that feed battery-supported AC grids, such as those required for refrigerators and freezers in bistro wagons. In-house developed HMI solutions, monitors, and on-board computers are also used in passenger information (PIS) and diagnostic systems. Another important element on the train is a functioning on-board electrical system that enables the sending of information and allows passengers to connect to the Internet.

2. Expertise in power supply

Electrical power is indispensable in all aspects relating to the mobility of railway transportation. The appropriate power supply is therefore a highly critical factor in the proper functioning of the system. As experts in the area of standardized and customer-specific solutions, Elma Electronic not only impresses in this respect with deep know-how and reliable supply chains, but also with a comprehensive selection of products compliant with all common railway standards. Not to mention a standard product range that includes AC/DC power supplies, battery chargers, DC/DC converters, and DC/AC inverters as well as systems that are specially developed for the customer.

Power supplies in rail transportation

Elma's product range includes battery chargers and converters for the vehicle's on-board electrical system. A battery charger converts AC voltage from the vehicle's auxiliary converter into DC voltage, charges the battery, and simultaneously feeds various consumers directly or via on-board DC/DC converters.

Since many consumers are supplied with 24 V, they usually cannot be connected directly to the on-board electrical system. DC/DC converters are therefore used to convert the on-board voltage into the required low voltages. DC/DC converters are also used in sub-systems that are connected directly to the on-board electrical system.

Power supplies in the track field

Field elements such as signals, balises, switches, and barriers along railway lines require a powerful and reliable power supply. Until now, this was ensured by available grid connections, whereby balises have been fed with currents induced as they are passed over by a train. However, new technologies and higher safety requirements demand greater amounts of energy. Current supply concepts therefore envisage a voltage below 750 V DC in order to keep line losses to a minimum over long distances.

For this purpose, Elma provides scalable power supplies and a variety of DC/DC converters for the operation of consumers along the tracks and in control centers. DC/AC inverters are used for switch and barrier motors that are powered with AC voltage. Power supplies can be monitored and controlled via Ethernet. Elma's cabinets, backplanes, and mechanical systems for trackside control units are also used in the control centers of railway operators and in trackside outdoor cabinets.

3. Autonomous rail

Autonomous vehicles are not only the future for logistics and private passenger transportation but are also gaining increasing importance in rail transportation. In autonomous rail operation, the vehicle moves completely independently within the transportation area using on-board sensors and artificial intelligence. Ideally, it reaches its destination without external information and aids and can react to unforeseen changes in the environmental conditions. The sensors detect whether the track is free. To avoid deadlocks, the train has a system for communicating with other vehicles and the on-board computer monitors the route and the permissible speed. This is only made possible by data collection, learning processes, thus so-called artificial intelligence. Elma has developed two new innovative products for the megatrend in the field of artificial intelligence (AI). The JetKit-3010 fits perfectly into an existing CompactPCI Serial ecosystem and provides a boost of computing power for AI applications such as autonomous driving. The second product, the JetSys-5320, increases visual intelligence throughout transportation and defense applications, including high-resolution sensor systems. Both products are based on Nvidia Jetson™ technology.

4. Reliability on the Gotthard train

Elma is a proud partner of renowned manufacturers and suppliers in the railway industry. For example, Elma has accompanied various projects throughout Europe and developed customer-specific solutions together with the Swiss market leader Stadler. Like Stadler, Elma also focuses on cutting-edge technology, economical operation, and passenger comfort.

The EC250 electric multiple units, which are called “Giruno” by the SBB, run through the Gotthard base tunnel and connect Zürich with Milan in record time. These units required redundant and flat converters, which, among other things, are installed in areas that are difficult to access and must meet the highest standards of reliability. On the basis of standard DC/DC converters, Elma developed scalable power supply units with an output of up to 900 W. The devices meet all requirements according to EN50155 and provide full performance over the entire temperature range from -40 °C to 70 °C without a fan.

Further sources:

- <https://www.deutschebahn.com/de/Die-DB-ist-Vorreiter-beim-autonomen-Fahren--6898634>
- https://www.eba.bund.de/SharedDocs/Downloads/DE/Vortraege/FET_2019/2019-04_08_Fachtagung_Eisenbahnrecht_und_Technik_Autonomes_Fahren_technisch_betrachtet.pdf?__blob=publicationFile&v=3

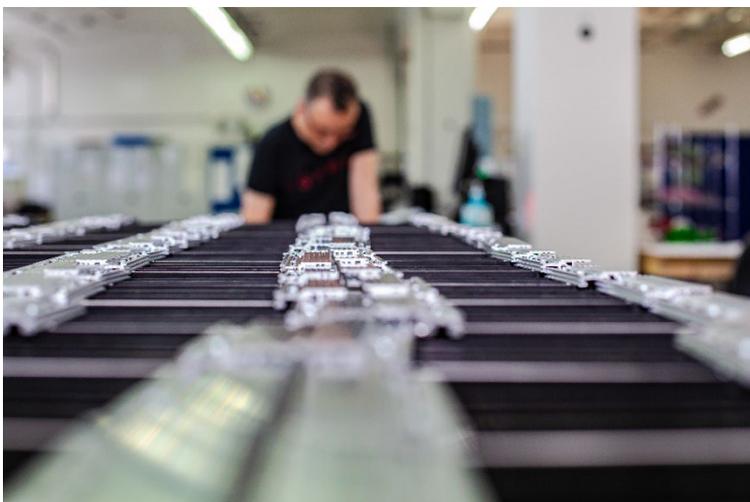
5. Image selection:



Giruno-Gotthard-train



DC/DC-converters-for-the-Gotthard-train



Enclosure-assembly-at-Elma



Assembly-at-Elma