

The international magazine of the Lütze Group

STILL ON TARGET FOR SUCCESS WITH THE RAILWAYS

LSC SYSTEM PROTECTS SPACE SHUTTLE

THE «NERVES» OF TECHNOLOGY

SUCCESSFUL «COMBINATION LEADS»

LÜTZE AS A PARTNER OF GFM

THE «NERVES» OF TECHNOLOGY

USB SOLUTIONS FOR INDUSTRIAL APPLICATIONS



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EDITORIAL

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Friedrich Lütze Founder of the Lütze Group

Our partner country France

France is our most important partner country. In no other country in Europe would it have been possible in such a short time to transform from an agricultural economy to the fourth largest economic power in the world.

Thanks to skilful restructuring, both French industry and the service sector have created not only many jobs, but also large numbers of production facilities. These include the automotive industry with such brand names as Renault, Peugeot and Citroën, as well as the aerospace industry, Michelin, Alstom, Framatome and many more besides.

Lütze SA has enjoyed excellent relationships with these companies for many years, and has been able to expand steadily year upon year thanks to its efficient team.

I would like to take this opportunity to express my sincere thanks to the many French customers with whom we have enjoyed pleasant co-operation as close business partners for many years.

Yours sincerely, F. Lütze

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FRADE FAIRS

Technik mit Syster

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Lütze goes around the world

| Exhibition | Place | Date | | |
|--------------------------|-----------|---------|----------|----------|
| SPS/IPC/DRIVES | Nuremberg | 22 - 24 | November | Lütze D |
| Eisenbahntechnik ET 2005 | Basel | 07 – 09 | December | Lütze CH |

Lütze SA France NEW MANAGER FOR SALES AND MARKETING COMPANY

> At the beginning of April 2005, **Armand Patte took** over the management of Lütze SA in France. As successor to Jimmy Oebel, who has now retired, he wants his experience to also benefit Lütze's customers.

> Before he took on this job, Armand Patte had already become familiar with the administration of the French branch in our factory in Weinstadt which he then reorganised. **Thanks to a central hub in Germany, Lütze SA now has access to an even larger stockholding** and has therefore been able to reduce administration costs substantially. Yet another advantage was the sustained improvement of the **serviced offered** because of **faster reaction times** and **shorter lead times.**

> > 3

Armand Patte can look back on 10 years of experience in the servo-systems business (brushless motors, speed converters, movement monitoring devices, etc.). After a period with the SSD Drives Parvex group of companies as branch manager in the USA and sales manager in France, Germany and Switzerland, he will now use his commercial and technical skills to the advantage of our French customers.

«We want to sell **customer-specific solutions** today. And the successes we have enjoyed in the fields of **LSC wiring systems,** assembled cables and **specific interface modules,** entitle us to do just that. They show that at Lütze, you will always be able to find a solution **that is specially customised to suit customer requirements.**»

LÜTZE STILL ON TARGET FOR SUCCESS WITH THE RAILWAYS

Andreas Kengerter, Germany



components for rolling stock. So it was possible to gather valuable experience with these technically relatively simple modules that is still relevant today when dealing with the development of much more complex products. For example, products from the early days include the **relay base modules** for the **safety relays** that are used in push-pull train control systems (Fig. 1). Even though they have been on the market since 1992, these modules are still a firm fixture in Lütze's product range. In the meantime, this product range has been expanded to include, as well as the most varied of **electromechanical re-** lays, a wide range of semi-conductor switches, headed up by powerful 10 - 60 A types for controlling hydromotors and magnetic track brakes. In 1996 a further milestone was passed with a successful entry into the lighting technology sector (Fig. 2). Firstly, incandescent and glow lamps, which can require frequent servicing and are used for signalling and illumination purposes inside the vehicle, were replaced by maintenancefree LED systems, and there soon followed the development of power electronics for controlling the UIC lighting. Based on this lamp control system, a complete

For Lütze the rail market is one of its fastest growing areas of business. This has been achieved by **consistent expansion of the product range** for rail applications. In the meantime, **large numbers of customised solutions** are available from Lütze for the most varied of tasks in rolling stock. Highly integrated microprocessor technology has also found its way into this market.

Product overview

The first components that Lütze developed for **rolling stock** do not vary from an electronic point of view from components already successfully introduced into industry. However, they had to be **modified** in order to be able to withstand the considerably more **difficult environmental conditions** that dominate the rolling-stock sector. So these components must be capable of operating at **temperatures between –40 and +70°C.** In addition, agitation and vibrations must not affect the functional efficiency of the modules. Again, when it comes to **EMC**, substantially **higher demands** are placed on





product family then came into being which, depending on the application, can also handle **complex duties** in combination with the **vehicle lighting.** In the latest generation, our lamp control systems have a bus inter-

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Fig. 1

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face and can be programmed by the user himself. Lütze products are also making electronic system design easier for vehicle manufacturers in other areas. So, in 1998, we introduced the **DIORAIL** family, an **efficient** and **flexible** range for **decentralised E/A with CANopen interface.** Also available are continuously further developed interface cards for all current signals used on vehicles. In addition, this product family has been further expanded by an **MVB interface.** With the **DIORAILPC**, an **efficient control system** was made available to the E/A level it (Fig. 3), so that it is now possible to control vehicles using Lütze products. Current developments, such as various **temperature controllers**, some with **integrated power electronics**, neatly round off our product range. As is the case in other markets, it is the constant dialogue with our customers that helps us to be able to supply the **optimal solution** for each **particular application**. We shall keep aiming for this objective in the future as well.

Fig. 3

Guardian, Inc. is using the Lütze LSC frames to control the weather protection systems LSC SYSTEM PROTECTS NASA SPACE SHUTTLE

Timur Oezer, USA

Since 1993, **Guardian Manufacturing** has grown to be a **leader** in **control system design** and **integration**. Their headquarter is in Rockledge, Florida. Their products and systems are installed throughout the United States, Canada, Europe, South America, Thailand, China and Turkey. **Guardian's reputation is excellent** in the industry.

Guardian chose to use the LSC frames because the new LSC design allows the NASA to use the control cabinet more than once. On earlier launches the control cabinets were burned away through the fire burst of the rockets. The new LSC control cabinet is sitting in a shielded housing which is fire-resistant. Especially important are the **space savings of 30 to 40% on the launch pad** which allows using the control cabinet in the fire-resistant housing. Improved heat distribution due to optimal ventilation and heat dissipation over the aluminium frame are another support to resist the fire burst of the rockets.

An additional advantage of the LSC system is the **reduction of the installation time** by over **80%**.

The LSC wiring system consists of an aluminium frame that replaces the conventional back panel and cable ducts. The LSC control cabinet stands at the Launch Complex 39A and is used to control the weather protection systems.

The weather protection systems at the Shuttle Launch Pads A and B are shielding the Shuttle also known as Orbiter from windblown debris, heavy rains and hail that could damage the craft's thermal protection system tiles and insulation blankets.

Huge metal doors that slide together between the orbiter's belly and the external tank provide protection for the lower portion of the orbiter. These doors, which are up to 53 feet (16 meters) long and 38 feet (11.6 meters) tall, weigh up to 46,000 pounds (20,866 kilo-



grams). They connect to the rotating service structure and the fixed service structure. The doors move together from opposite sides on wheeled flanges that ride on steel beams.

An inflatable seal that protects the top of the orbiter extends from the payload change-out room, forming a semicircle covering 90 degrees of arc between the vehicle and the external tank. A series of 20 or more bifold metal doors, about 80 by 4 feet (24.4 by 1.2 meters) in size, fold out from the payload change-out room on the rotating service structure to cover the side areas between the external tank and the orbiter.

Guardian reengineered the application for NASA, and with the help of Lütze, Inc. and their LSC frame the NASA is now able to use the control cabinet repeatedly.



LÜTZE PROVIDES SUCCESSFUL «COMBINATIONS»

Nigel Broad, Great Britain

With OEM's and machine builders continually striving to **cut costs**, all systems, processes and component applications are under **review.** With component costs at an all-time low, it is the machine and system building methods that can potentially yield the **greatest opportunities for savings.**

Cables are seen as methods of distributing electrical power and control signals. **Reliable** screening techniques are used

to ensure sensitive electronic signals, are protected and **ensure that EMC** is maintained.

The use of servo control equipment has increased in recent years, and as the cost and size of these products has decreased, this has driven the market towards the use of **«combination» cables.** This type of cable comprises conductors of **different sizes** often shielded from each other inside the cable. This means that **signal and power supply conductors** are transported together rather like putting wires in a conduit but with the added advantage of **integral shielding.**

Lütze has taken this concept further by introducing field bus transmission cable such as **Devicenet** and **CAN** with traditional control conductors and providing the facility to incorporate tubes within the cable construction. This facilitates the transmission of pneumatics and liquids within the cable medium allowing the cable to become the main distribution tool for all control functions. Working closely with customers in the UK, Lütze has designed «Combination» cables for continually flexing applications and for use in low-temperature environments in a variety of applications.

Connector ranges have developed to ensure that fast and secure terminations can be made.

This technology offers the opportunity to review connectivity issues cost-effectively and improve overall design concepts. **The product expertise** that exists within the **Lütze** organisation means that **assistance** can be made available at **all stages in the design and implementation process.**

Innovation for the world LÜTZE AS A PARTNER OF GFM

Bruno Horny, Austria

Gesellschaft für Fertigungstechnik und Maschinenbau, known globally as GFM, from the town of Steyr in upper Austria, is an innovative business partner for futureorientated production techniques in the fields of machine construction and mechanical engineering. In this respect, GFM provides solutions for the forging, rolling, milling, cutting and routing of high-quality alloys.

GFM has placed its trust in the products and know-how of Lütze for decades. The products we supply cover an extensive range, but above all they involve **interface technology** and **special conductors.**

Continuity as regards **support** and **expert advice** have forged a **firm partnership** from what was once a simple customer-supplier relationship. **GFM** appreciates the **reliability** and **quality** of Lütze products, which are supplied at competitive prices. Other factors influencing the many years of co-operation may well have been the **high level of product availability** and Lütze's **project-specific and customer-orientated solutions.**





The «nerves» of technology FIRE BEHAVIOUR OF CABLES AND CONDUCTORS

Niklaus Jöhl, Switzerland

Fires in buildings and technical installations are leading more and more to great damage and exposure to loss. They can never be ruled out entirely. However, preventative measures to protect against fire can minimise the risk potential to people, property and the environment. Halogen-free cables and conductors from Lütze have a significant contribution to make here. They reduce the risk of fires spreading, at the same time reducing the density of fumes and not giving off any corrosive pollutants at high temperatures.

For many years, soft PVC has been the most widespread material used for the insulation and sheathing of cables and conductors. The significance of the material PVC (polyvinyl chloride) is also founded in its basic property of being flame-retardant. This property is due to the proportion of halogens. Chlorine, fluorine and sometimes also bromine constituents have the effect of being flame-retardant, because these elements and their decomposition products prevent fire. However, this high level of flame resistance, which is achieved by the use of halogens, comes with a big disadvantage. In the event of a fire, in other words thermal action, the materials break down with heavy smoke production, corrosive and toxic pollutants such as halogenated hydrocarbons, organic halogenated compounds or dioxins. Together with the water vapour which always arises when there is a fire, they form acids, e.g. hydrofluoric and hydrochloric acid. If these acidic vapours are breathed in, they aggravate and irritate the respiratory tract. If the vapour condenses on a cooler surface or inside electronic equipment, the droplets of acid can then cause considerable damage to these items. Even reinforced concrete can be destroyed by corrosion. The consequential damage caused by the fire can easily come to **many times that of the damage caused by the fire** itself. The generation of large amounts of smoke should also not be underestimated if soot and acid particles are able to combine with one another. Smoke **hinders orientation**, **makes people panic**, **makes localisation of the seat of the fire difficult** and therefore also hampers work to extinguish the fire.

Safety in the event of a fire with halogen-free conductors

The effects of smoke gases described can only be reduced if materials are used for cables and conductors that contain no halogens (fluorine, chlorine, bromine, iodine) that could lead to the formation of acids.

Sheathing mixtures made of flame-retardant HM2 thermoplastic or hard-wearing polyurethane (PUR), as also used by Lütze, have proved themselves here. Halogen-free data, control and bus lines as well as highly flexible drag chain and special conductors where these materials are utilised are currently **available from Lütze**, which has a wide selection to choose from. A **high level of availability** (over 1,000 types available from stock), an **exceptional price-performance ratio**, as well as a great number of **practical solutions** can be found in Lütze's **extensive product range**. They fulfil all current specifications as laid down in a wide selection of standards (please see box).

Halogen-free data, control and drag chain conductors

These days, you can use halogen-free cables and conductors in very different areas of application. These **data and control lines are** suitable, for example, for use in **system, apparatus and machine tool construction** as well as in **heating, airconditioning and ventilation technologies.**



reduced.

Highly flexible drag chain lines are available for applications where moving parts of the installation have to be wired. They are suitable for maximum flexional stressing, e.g. in the case of a power supply or data line to robots, machine tools, in the transport and materials handling sector and basically everywhere there will be a lot of movement in continuous operation. Together with special screw connectors that relieve stress in cables when pulled, not only selectively but also over a large area, they guarantee the highest level of safety against wires being broken and the «corkscrew effect». Again in the case of «moving applications», thanks to the use of halogen-free conductors from Lütze, consequential loss to people and property as a result of fire can be substantially

THE MOST IMPORTANT STANDARDS FOR HALOGEN-FREE CABLES AND CONDUCTORS

Thermoplastic versions are halogen-free according to IEC 60 754-1 or VDE 0472 Part 815. Smoke emissions are low and comply with VDE 0482 Part 268. The oxygen index is 30%. Testing the oxygen index is described in the American regulation ASTMD 2863 and gives the percentage proportion of oxygen in a nitrogen-oxygen mixture, at which an ignited material sample will continue to burn. Fires are not spread (IEC 60 332-3 and VDE 0472 Part 804, test type C or IEC 60 332-1). The burning behaviour of the PUR versions also complies with the requirements of IEC 60 332-2.

They also stand out thanks to their resistance to aggressive coolants and lubricants.

LÜTZE INTERNATIONAL

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USB SOLUTIONS FOR INDUSTRIAL APPLICATIONS

Dimitrios Koutrouvis, Germany

The Universal Serial Bus (USB) was developed with the aim of standardising the large number of different interfaces on PCs and to make handling peripheral equipment easier. In this respect, the traditional areas of application for PCs, in other words in offices and home offices, stood centre stage, and a cost-effective universal interface was developed for this type of use. PC manufacturers and users were quick to accept this concept. Within a short period of time it penetrated the target markets. In the meantime, virtually all peripheral equipment for PCs is available with USB interfaces and to a certain extent the USB has completely replaced traditional data connections. For example, three years ago all printers were still equipped with a parallel port and finding a USB port on such products was the exception, but today precisely the opposite applies. It is because of this trend that the USB is also to be found more and more in industrial applications.

In principle, the USB can also be used in an industrial environment, but a few peculiarities have to be borne in mind here. When defining the standard, the main objective was low integration costs for manufacturers of PCs and peripheral equipment. In order to

Switch cabinet

10



Fig. 2 USB hub for industrial usage: the DIOUSB from Lütze

achieve this, it was decided to do without electrical isolation, as found in the case of Ethernet for instance. In an office environment, doing without secure isolation does not represent a problem for the most part. This is not the case in industrial applications, above

all, if the **USB** is not housed in a switch cabinet, but for instance fed through as a programming or diagnostic interface. In such a case, if an external voltage is connected due to an operating error, this voltage will be present in all the devices that are connected, which could lead to damage and even the total failure of the system.

Previously a further hindrance to the use of the USB in industry was the lack of components suitable for industrial use. The most important component here is the USB hub, which takes care of the allocation of the interfaces in the system. As opposed to products for use in offices, which exist in many different versions, an industrial standard USB hub requires a 24 V power supply and must also be capable of still operating reliably if there are fluctuations in temperature. To facilitate simple installation in a switch cabinet, a top hat rail fitting is also necessary.

Lütze has taken this subject on board in its role as a problem solver and developed an entire range of products which make it possible to also use these reasonably priced and versatile interfaces in industrial applications. Core products here are a family

of industrial standard USB hubs

Fig. 1

Possible structure of a USB network with internal and external USB participators

offering safe electrical isolation and 4 to 8 USB ports. In this way, components that can be mounted in a switch cabinet can be securely electrically isolated from outside (Fig. 1). For appli-

cations in which the USB is only networked inside a switch cabinet, we have versions without electrical isolation available. All products support USB 1.1, can be mounted on



top hat rails and have a 24 V power supply which is connected by means of plug terminals. The **upstream ports** are designed as **USB Type B** connectors, whereas the **downstream ports** are equipped with **Type A** connectors (Fig. 2).

The devices are operated in **self-powered mode**, in other words they provide 500 mA at each downstream **port** to power the devices that are connected. The **connecting system** has also been taken on board by **Lütze**. So apart from the hubs, the necessary cables are also available in order to hook up the **USB through the wall of the switch cabinet** (Fig. 3).

Thanks to this new USB product family from Lütze, the entire range of attractively priced peripheral equipment can now also be used with immediate effect in industrial applications.

Mercedes NCV3 project IN THE NAME OF EUROPEAN SYNERGY

Luigi Begnini, Italy

The Mercedes NCV3 project represents an extremely impressive example of the cooperation of different European automotive industries in the name of maximum synergy as well as the high level of technological content and reliability in the Italian automotive industry.

The company, **COMAU S.p.A. from Turin**, main contractor for the Mercedes NCV3 project in Italy, has commissioned the **Bora company in Orbassano (Turin province)** and **A.R. Impianti Borgaretto in Beinasco (Turin province)** to design the switch cabinets. Both companies are established suppliers to the COMAU Group.

Saving space, fast construction, simple wiring, an appealing design and a reduction of overall costs (whilst maintaining the number of components installed) were the decisive factors, so the technicians



involved decided on the LSC wiring system from Lütze.

From 0 to 200

The development of the first prototype of each of nine different types of rack was completed thanks to **co-operation** between **Lütze Italy/Germany, Bora and A.R. Impianti.** This stage involved detailed design and implementation in just **10 working days,** and then, a mere 15 days later, the first batch of finished racks was delivered. The total order for over 200 racks was completed without any delays, within the agreed delivery dates and to the **mutual satisfaction of the switch cabinet manufacturers and the Lütze workforce.**



Fig.3 USB switch cabinet feedthrough from Lütze