

ON TRACK!

The international magazine of the Lütze Transportation GmbH



LION

Scaleable safety

LCON

Rail-compatible all-rounder!

USB Charger

Power for Tablet & Co.

DIOLINE PLC

Distributed intelligence on board

LÜTZE nominated

LÜTZE nominated for
"Our Stars for Rail Systems 2014"

EDITORIAL

We are ON TRACK!

Even though our involvement in railway technology started with a simple coupling element, the LÜTZE Group has always been keenly interested in mobility topics.

While the development of products tailored to railways began with this simple module, there was much more to come: in the meantime, we have systematically enhanced our product portfolio from interface technology and control technology to safe decentralised I/O systems. High time to offer you a glimpse of our solutions in practice!

We are pleased to present **ON TRACK!**, the new magazine of LÜTZE Transportation. Using selected examples, we would like to tell you more about our services and applications for the railway technology segment.

This is the first edition, with more to follow. And who knows, one day **ON TRACK!** may even become a collector's item.

I hope you enjoy reading it!

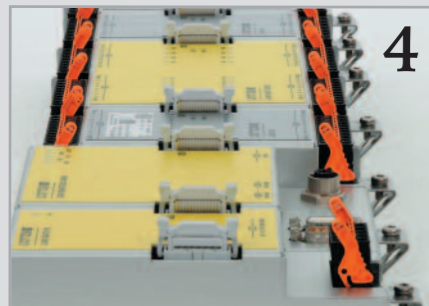
With kind regards,

Udo Lütze

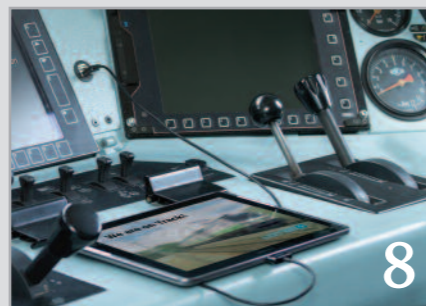


Udo Lütze
Lütze International Group

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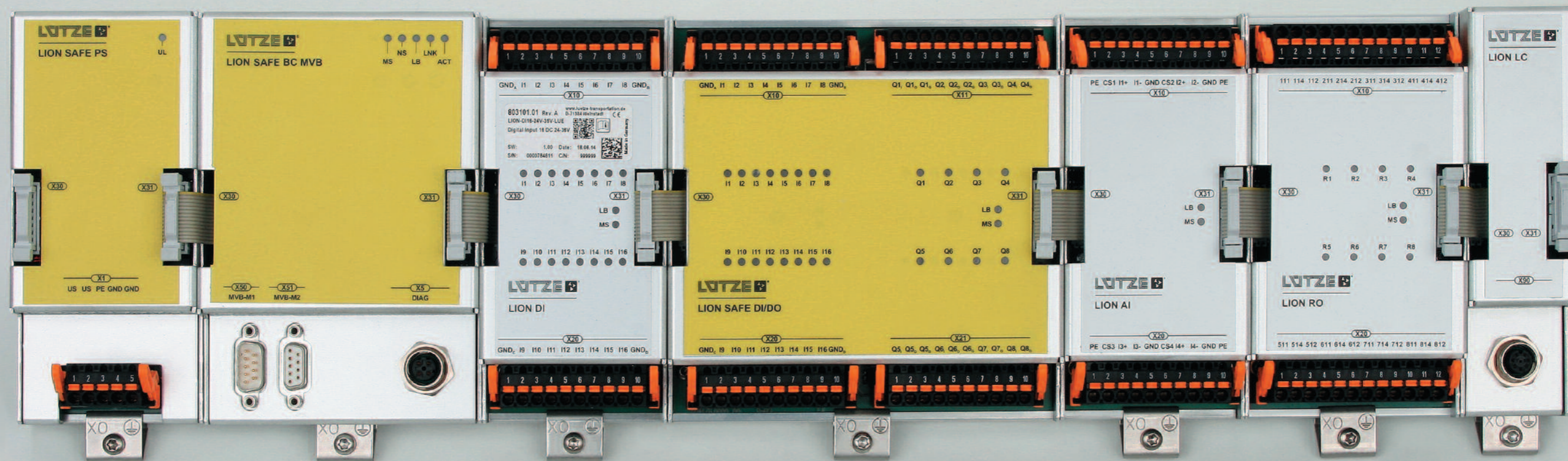
Cover image: BLS AG

Advancing modular safety systems

Author: Dimitrios Koutrouvis, Product Manager Train Control Systems

LION

LÜTZE TRANSPORTATION GbmH provides an intelligent, decentralised remote I/O system, via which analog and/or digital safe and non-safe modules can be operated together on the same bus. A separate network for processing safety-relevant signals is no longer required. For LÜTZE this marks a further development of predecessor model DIOLINE using the same modularity principle.



The worldwide market for rail vehicles is getting 'tighter'.

It's a truism to say that the cost pressure in the rail vehicle market is 'passed on' from private and public rail operators to the manufacturers, and then in turn to their suppliers. But how can we deal with this? Particularly considering that new approval criteria (that is to say, national and international standardisation guidelines) are constantly being introduced, and that these are

getting 'stricter'. Indeed, manufacturers and suppliers find themselves confronted by a deflationary trend.

Conversely, however, the consequence of this for vehicle manufacturers and their suppliers is that complying with standardisation and quality criteria (i.e. technical progress) is 'just' ONE necessary factor in the success of a rail vehicle. A sufficient condition is that 'technical progress' does not make a product more expensive, but cheaper!

LÜTZE Input Output Network LION. Higher performance with lower cost.

It was under the above premise that the engineers at LÜTZE TRANSPORTATION GmbH developed the modular and decentralized designed I/O system LION. Due to the flat design of the modules and any installation position on the DIN rail profile, the system is perfect for areas with limited space, such as the driver's cab of a locomotive. Here the system can carry out the tasks of

importing and controlling safe and non safe signals from the driver's desk controls and transfer these securely to the vehicle control.

The LION (LÜTZE Input Output Network) is an answer to the changing market situation for rail vehicles. The technical advancement will lead directly to cost advantages:

Cost advantage 1:
With LION, analogue and/or digital safe and non-safe assemblies can be operated

together on one bus. An expensive additional network installation for safety signals is no longer necessary.

Cost advantage 2:
If required, safe I/O modules can be installed, even retrospectively. Various different modules like power supplies, bus couplers as well as digital and analog input and output modules can be connected and functionalities combined.

Cost-effective engineering:
Only the modules which are actually needed for the respective field of operation in the vehicle must be installed. This means the system can be modified and retroactively expanded. The system is therefore open to modifications and subsequent expansions. Up to 32 I/O modules may be installed in an almost unlimited number of combinations.

LION

**Flexible field bus interface.
Exploring new territory.**

One of the main advantages of the LION is its flexibility in terms of installing different field bus interfaces. Two different hardware versions of the bus coupler may be operated in the LION. By replacing the bus coupler, the user can switch very easily between different field bus systems.

Internal communication through the enhanced LÜTZE L-Bus

The internal LÜTZE bus (L- bus) constitutes the ‘vegetative nervous system’ of the LION, through which all data is transferred at 4.5 Mbit/s between the I/O modules (slaves) and the bus coupler (master). The LÜTZE bus is driven internally by RS485 physics and supports the communication,

to address the intact modules. The functionality and availability of the overall system is thus retained in spite of the malfunction.

LÜTZE quality promise: High availability and longer product life cycle

All automation components in the field of rail technology are subject to very high and sustained load stress. Temperature fluctua-

operation of up to 30 years.

The robust aluminium housing of the LION modules make the system resistant to vibration and impact. The gold-coated connectors guarantee high transmission rates, resistance to corrosion, and a high number of ‘mating cycles’. The innovative ‘lock release’ mechanism ensures that the connection terminals are automatically lo-

**LÜTZE Transportation GmbH
At home all over the world.**

As an IRIS-certified company, Lütze Transportation GmbH bases its development of hardware and software on strict quality regulations. The LION system is accordingly developed in compliance with national and international approval criteria, such as EN 50155, EN 50121-3-2, EN 61373,

LION system architectures

With the LION it is possible to construct three different typical system architectures. These three architectures serve as basic variants and can be combined in any number of construction levels. The smallest possible I/O station includes a voltage supply unit, a bus coupler and an I/O module. Up to 32 modules can be operated on an I/O station.

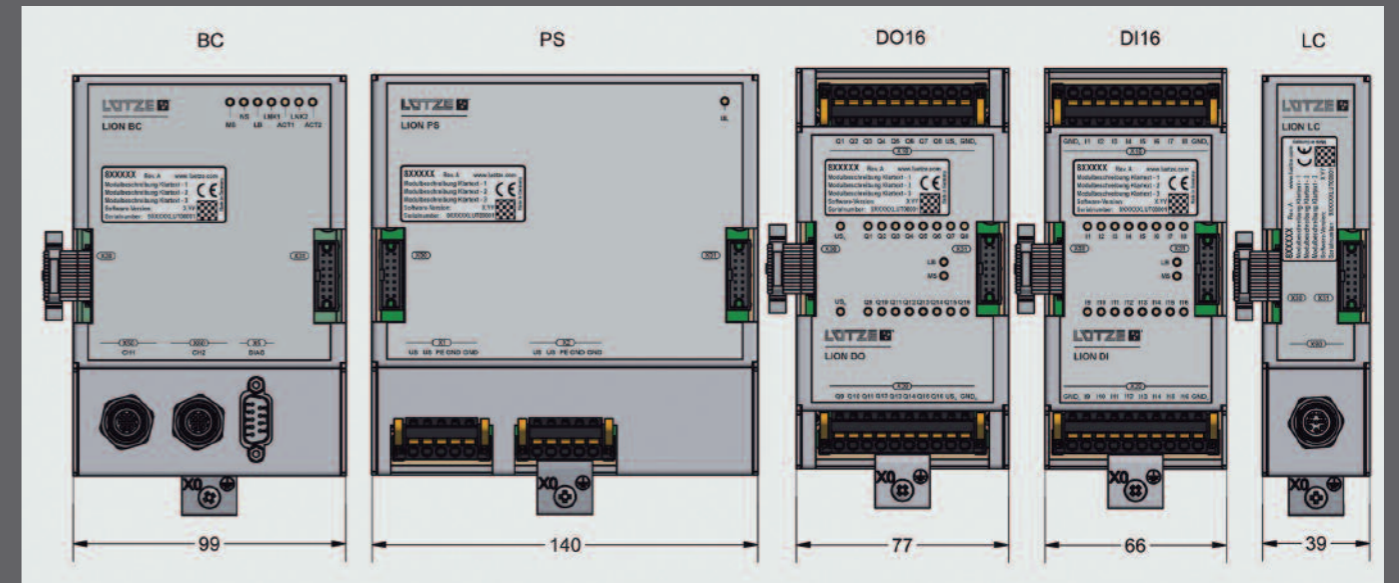
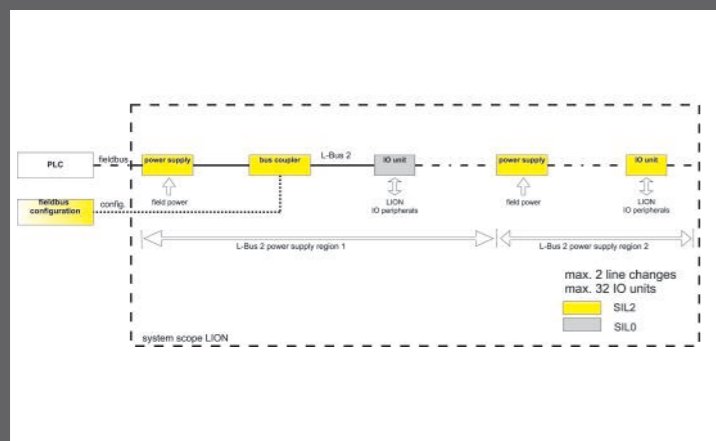
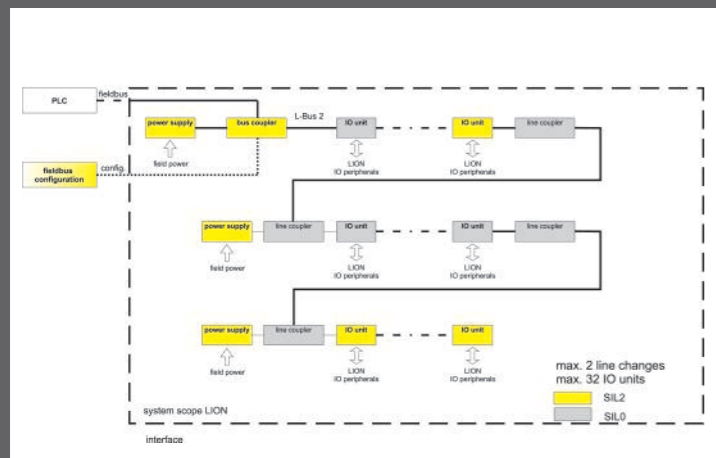
The I/O modules can be combined as desired. The maximum energy demand for the whole system depends on the number and type of the used I/O modules. If the energy supply via the voltage supply unit is not sufficient, an additional power supply can be connected between the I/O modules.

When using a line coupler at the beginning of the internal L-bus, an additional power supply should be connected to the L-bus. When using a line coupler at the start of the internal L-bus, an additional power supply should be used.

addressing and power supply of all I/O modules. The maximum bus length is 2 meters. By using line couplers, I/O modules can be connected at a distance of up to 10 meters to the I/O station.

In case of a malfunction of one or several I/O modules, the master can unambiguously record this malfunction and continue

The decentralised I/O system LION supports all bus systems available on the market, from MVB and CAN (on request) through to the Ethernet the „bus of the future“, (with available protocols CIP, PROFINET and also TRDP in the future). The firmware of the bus coupler can be modified by LÜTZE depending on the project specifications or use.



I/O modules on the LION system

- For use in the LION system, Lütze Transportation GmbH offers a variety of different I/O modules: Digital input modules.
- Digital output modules with expanded diagnostic functions.
- Relay output modules.
- Analog input modules.
- Analog output modules.

In combination with the following infrastructure components and the bus coupler, a wide range of applications can be mapped:

Two variants for power supply with wide-range input from 24 V to 110 V. Bus coupler Ethernet: Forms the gateway to the LÜTZE L-Bus. Can be used in a SIL environment.

tions from -40 °C to +70 °C, vibrations, impacts and strong electrical fields are part of everyday operation.

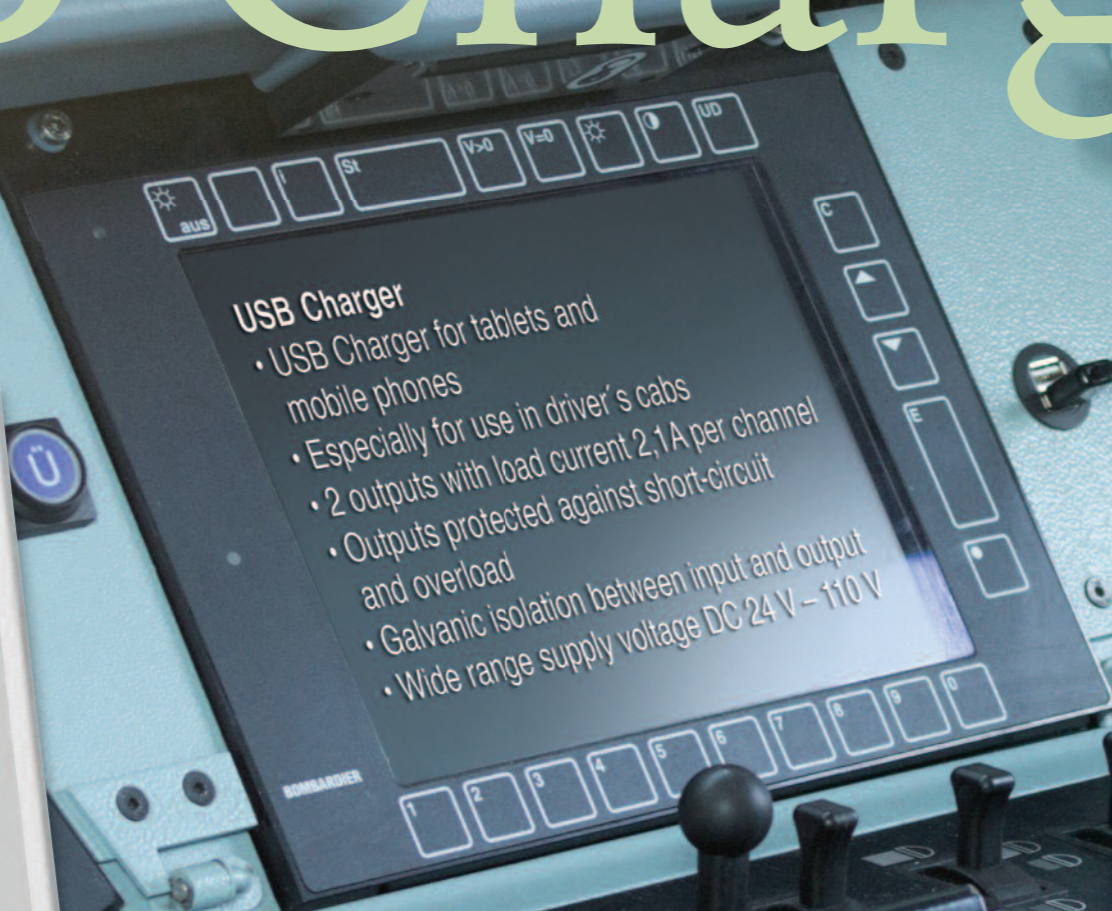
The engineers at Lütze Transportation GmbH therefore attach the highest importance to the quality and resilience of all components. All LION components are designed for standard maintenance-free

cked in place when plugged in. All synthetic materials used in the LION system are only selected if they fulfil national and international fire safety standards. The software is based on standardised procedures in accordance with EU 50128 for safety-relevant software on rail vehicles.

EN 50124-1, EN 50126, EN 50127, EN 50129 and N FF 16-101.

USB Charger

Power for Tablet & Co.



Tablets and smartphones are today an essential part of our everyday lives. These smart helpers have also made their way into rail vehicles. Where before numerous documents provided information on timetables, instructions and rules, the driver now receives all information compactly and up-to-date on an Internet-capable tablet PC. This saves paper, value space in the driver's cab

and time when searching for the right document. Even the distribution of the documents is much simpler. Where previously amended documents had to be distributed to thousands of train drivers and to numerous drive vehicles, today it just takes an update to the server and all of the relevant people have the latest documents in real time. The power supply for

devices could previously only be provided via temporary components. Frequently the non-train compatible charger devices from the tablet PC manufacturers were used in 230 V Schuko sockets. In addition to the missing type test, this solution has other disadvantages. There is no electric isolation between the vehicle network and the USB connection. The Schuko socket near the driver's desk is

permanently in use and the cable routing to the driver's desk can only be "floating". Therefore the Lütze Transportation GmbH has developed a tailor-made solution for this application scenario. The USB charger system has been specially designed for use on rail vehicles. The compact unit can be simply snapped on to an existing DIN hat rail and is also suitable for new vehicles and retrofits on existing fleets. Thanks to the wide range input, which is designed for a voltage range from DC 24 to 110 Volts, the charger system can be operated on all stan-

dard train battery networks. At the output there are connections for two USB devices, each has a charging current of 2.1 A per output. Due to the high output current, even powerful modern tablet PCs can be charged in a short amount of time and thanks to the second output, the driver's business mobile phone is also powered with electricity. The short circuit protected and overload protected outputs are designed plug-in spring terminals and provide individual connections for pre-fabrication USB mounting sockets. On request, Lütze

Transportation GmbH can also provide a complete set of USB charger devices and customer-specific pre-fabricated USB installation sockets, e.g. for installation in the driver's desk or wall panels.

Let's talk about it!

Author: Andreas Schindler, Product Manager Lütze Transportation GmbH

With the LÜTZE universal Audio Signal Transducer it is possible to play spoken alert sounds and melodies in the driver's cab and the passenger section. The audio signal transducer is freely configurable and supports audio files in wav and mp3 formats. The railway manufacturer VOSSLOH RAIL VEHICLES España relies already on the LÜTZE audio technology for their new EURO- LIGHT Diesel railway locomotive.

LÜTZE Audio Technology – Established for Decades

Until now buzzer modules were used for transmitting alert sounds and signals. Those buzzer modules rely on the piezo technology and can play up to 16 alert sounds. The frequency height is individual adjustable for every signal and alert sound. LÜTZE buzzer modules can be found worldwide in railways and trams. Big ad-

vantage: LÜTZE is the only manufacturer who offers DIN rail mounting options for those devices. If more than one warning signal is to be played, a corresponding number of modules must be installed.

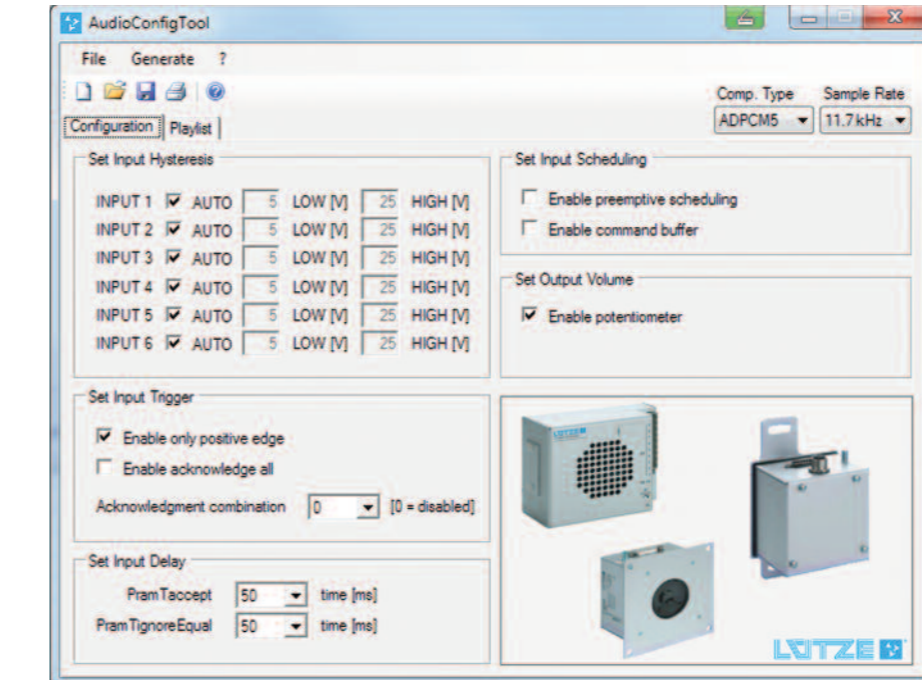
Expanded Safety and Comfort Requirements in Railway Technology

To meet the requirements of the market, LÜTZE offers a freely configurable Audio Signal Transducer. Spoken announcements for passengers and acoustic alert sounds in the driver's cab can be realized by the Audio Signal Transducer, for example for dead-man's vigilance device (SIFA). The Audio Signal Transducer supports also the accessibility in trains for example by multilingual announcements in disabled toilets and alerts at opening and closing the doors for blind passengers. For customer specific sounds and signals offers LÜTZE the ser-

vice for voice recording in professional sound studios.

Innovative Technology for New Application Fields

The engineers of Lütze Transportation GmbH developed a universal Audio Signal Transducer with a freely configurable audio module. The module has a compact and modular design and contains an amplifier as well as a broadband loud speaker. 63 Audio files be played via six digital inputs with BCD coding. The total length of all messages can be 4 minutes long. The Audio Signal Transducer can be operated in nearly every country and vehicle type because of the wide range voltage supply of DC 24 V to 110 V, the temperature range of -40 °C to + 70 °C and the observance of all common railway standards (for example EN 50155, EN 50124 and EN 61373).



The Programming of the LÜTZE Universal Audio Signal Transducer is done with the specially developed "LÜTZE AudioConfig Tool" software.

For the 63 signals, the volume can be adjusted individually in eight levels or steplessly via an integrated potentiometer. A maximum sound pressure of 90 dB can be reached at a distance of 30 cm via the installed broadband loudspeakers. The frequency bandwidth is between 250 and 10,000 Hertz.

The LÜTZE signal transducer is currently available in three different styles: A standard version for top-hat rail mounting, a special version for wall mounting with protection class IP 65 in the front area, and a version of controlling an external loudspeaker.



With the Programmer the Audio Signal Transducer is programmed with the Mem-file in a matter of seconds.

The easy programming and configuration with the LÜTZE Software and Handheld Tool leave nothing to be desired.

The configuration of the Audio Signal Transducer is done with the special "LÜTZE AudioConfig Tool" software. The customer can upload audio files and configure those according to his requirements. After all settings are done, a Mem-File can be generated. The file can be load comfortable from the computer on to the "LÜTZE Handheld Programmer".

The Handheld Programmer is a tool for programming the installed Audio Signal Transducer in the train. No need to remove the audio signal transducer or for extension configuration via a computer.

Let's talk about it!

The Handheld Programmer is connected to the Audio Signal Transducer via a special interface. By pushing the button of the Programmer, the Audio Signal Transducer is programmed with the Mem-file in a few seconds. The LEDs are indicating the status of the programming.

In vehicles with a high number of Audio Signal Transducer which need the same configuration, the Handheld Programmer saves a lot of time.

Euro Stage VOSSLOH EUROLIGHT realized with the LÜTZE Audio Signal Transducer

The railway manufacturer VOSSLOH RAIL VEHICLES in Valencia relies consistently on the new flexible LÜTZE audio technology for their new EUROLIGHT Diesel production series. With the EUROLIGHT Diesel locomotive VOSSLOH RAIL VEHICLES creates a European operational locomotive platform. With less than 20 tons of weight per axis EUROLIGHT offers the best available "Power-Weight-Ratio" in Europe. The new VOSSLOH RAIL VEHICLES production series is realised the first time for a railway company in Great Britain. VOSSLOH RAIL VEHICLES prefers suppliers which offer components for use in different countries.

Lütze Transportation GmbH with its Audio Signal Transducer belongs to the selected suppliers. In the driver's cab of the VOSSLOH EUROLIGHT is emits acoustic alert signals for the PZB (intermittent automatic train running control), SIFA (dead-man's vigilance device) and fire alerts and general alerts.

The LÜTZE Audio Signal Transducer fits perfectly in the VOSSLOH strategy. According to the country of application only the programming of the Signal Transducer has to be changed. Luis Mesa, responsible for the project management at VOSSLOH RAIL VEHICLES, feels certain: With the LÜTZE Audio Signal Transducer the extended requirements regarding quality, capacity and economy on railway vehicles are taken into account."

Important additional advantages of the

LÜTZE Audio Signal Transducer for VOSSLOH RAIL VEHICLES are the simple field installation on the hat profile, the angled connecting plug for optimal wiring and the adjustment of the volume via potentiometer.



The variant for wall mounting meets the requirements of protection class IP 65 and is normally built into the wall in the passenger section or mp3 audio files are played.



63 messages with a total length up to 4 minutes as wav or mp3 audio files can be put on the Audiosignal Transducer.

LÜTZE inside

To ensure China's continuous strong economic growth as in the past decade, in a country with large distances between industrial areas, effective and energy saving cargo solutions become a greater and greater challenge. The Chinese will be making huge investments in the development of a national railway system in the next few years.

To ensure that the traction system is working well, 2 sets of auxiliary traction converter systems are in operation. On the one hand, VVVF (variable voltage and variable frequency) converters are used, and on the other hand, CVCF (constant voltage and constant frequency) converters. This redundant system offers twice the safety. Luetze Trading (Shanghai) Co. Ltd. will

Luetze Trading (Shanghai) Co. Ltd. offers optimal solutions to address customers' needs. In the end, reducing the size of the cabinet and preventing wiring errors means reducing costs. We look forward to making our next contribution to the Chinese railway industry.



New Locomotives for China's Cargo Railway

Author: Frank Dong, Luetze Trading (Shanghai) Co.,Ltd.

For the economical transportation of cargo, the China North Railway Group has selected Datong HDX2C locomotives as the new generation of locomotives.

BCPC Propulsion Systems (Changzhou) Co. Ltd. is responsible for the development and production of traction converter modu-

supply different pre-assembled units to fulfil the demands to save space in the control module. These units pre-assembled by LÜTZE include all plug connectors and terminals and therefore demonstrate great flexibility and can be cabled without great effort.

DIOLINE PLC

Distributed intelligence on board

Author: Dimitrios Koutrouvis, Product Manager Train Control Systems



When used on rail vehicles, the LÜTZE DIOLINE PLC compact controller enables decentralised and autonomous preprocessing of functions below the main control level – the latter is thus relieved and becomes more reliable.

An ideal application for the LÜTZE DIOLINE PLC compact control system can be found in the new ALSTOM vehicles "Coradia Polyvalent". These vehicles are used for local transportation in eleven French regions. A special feature of this new vehicle type is the use of several hybrid drives. They are driven by diesel aggregates or catenaries. The proven LÜTZE DIOLINE PLC control nodes are used on these trains as "decentral intelligence" and control the motor management functions.

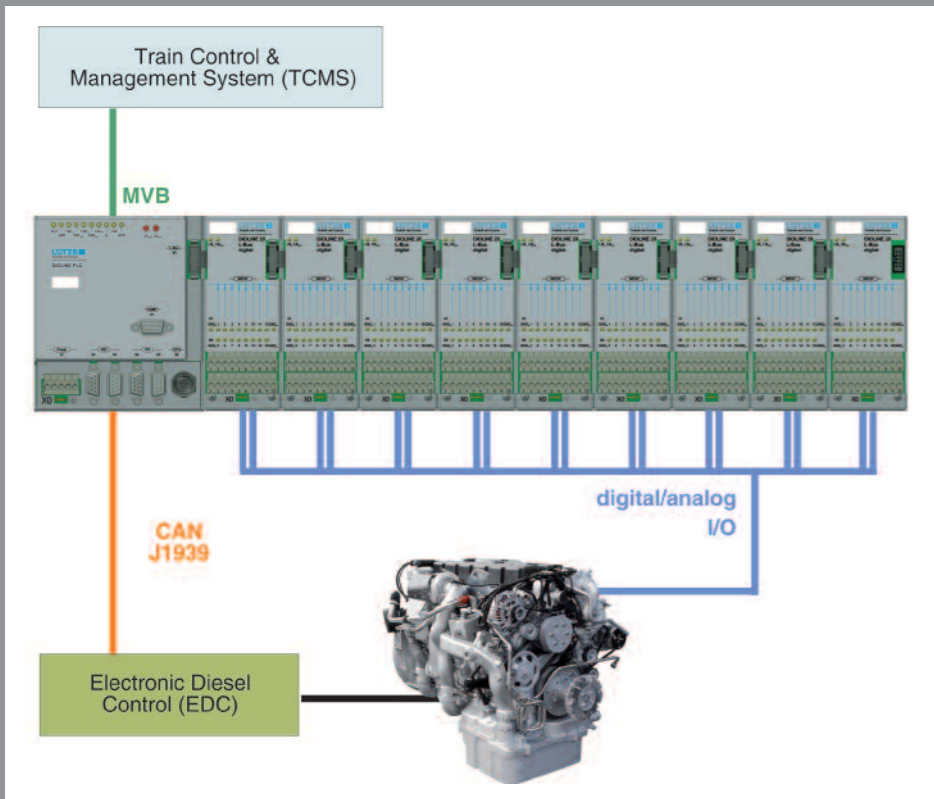
The control effort on modern rail vehicles is continually developing. In addition to the control technology for motor management functions, stricter safety and comfort standards demand greater control requirements.

Processing of this high signal density just at the main control level would be disadvantageous, as the main control would be overloaded with many "non-critical signals". Also, a tailoring to only one main control does not provide any redundancies and thus could affect reliability.

Decentralised data preprocessing with the DIOLINE PLC

Here, a modularised preprocessing of all signals with the LÜTZE DIOLINE PLC

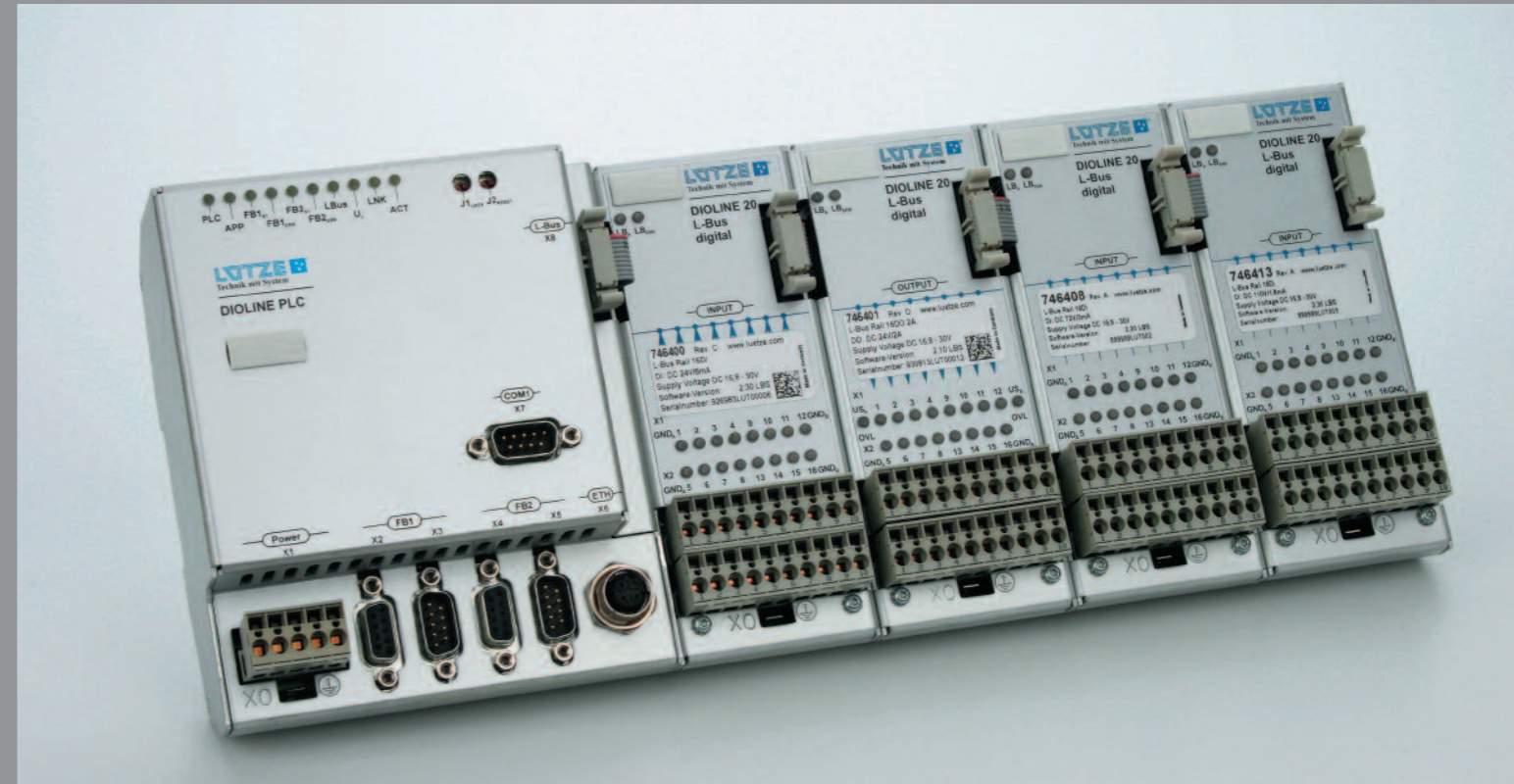
DIOLINE PLC



The LÜTZE DIOLINE PLC control nodes assume the motor management control via the MVB-CAN gateway



Regiolis train in dynamic tests on the grounds of the railway test centre in Barle-Duc, October 2012 © Alstom Transport / A. Février



The new "Coradia Polyvalent" from ALSTOM as used by SNCF have up to six hybrid motor units, so-called "power packs", controlled by one LÜTZE DIOLINE PLC each.

controller at subsystem level seems the ideal solution. The DIOLINE PLC allows "distributed intelligence" with partial control functions below the main control level. The benefits are obvious:

- Relieves the central control system and the bus system
- Reduces response times to critical signals
- Maintenance friendly: Simplified troubleshooting
- Increases availability: Creates redundancies through modularisation and therefore greater failure safety

Up to six LÜTZE DIOLINE PLC compact controls provide the congenial hardware platform in the form of remote bus units on the new "Coradia Polyvalent" as used by SNCF. This platform allows flexible field bus configuration: Firstly, via MVB for the communication with the main control system in the vehicle (TCMS) and secondly via CAN-J1939 for the communication with the motor unit (Powerpack).

All functions of the DIOLINE PLC can be freely programmed (acc. to IEC 61131-3). The LÜTZE DIOLINE modules which have

been proven for many years and are available as I/O interfaces with analogue and digital I/Os. These assemblies are integrated via the LÜTZE L-bus Interface.

Motor management for the new electro-diesel hybrid drive

ALSTOM has up to six so-called "power packs" for the new regional trains "Coradia Polyvalent". The Alstom "Powerpack" is a combined diesel-electro drive system that integrates all individual components: A diesel motor (340 kW) that, in combination

with the generator, forms a power aggregate and supplies DC power to the drive chain.

Each DIOLINE PLC acts as a SLAVE of the main control (TCMS). The management of the Diesel motor control (electronic Diesel controller) as well as the cooling unit (cooling control unit) is controlled via the CAN-J1939 bus interface. For this, the CAN-J1939 interface library of the DIOLINE PLC was further developed by LÜTZE for communication with the motor control device from MAN as well as the cooling system from Bosch Rexroth

The LÜTZE DIOLINE PLC records and processes the signals for the RPM target value, stator, supply and particle filter temperature, for the filling level of the motor oil and the water level in the cooling system. All data is recorded and processed separately for each Powerpack.

Individualised DIOLINE PLC designed for the ALSTOM needs

Lütze Transportation GmbH has modified the DIOLINE PLC accordingly to meet the special needs of the "Coradia Polyvalent":

- Development of a CAN-J1939 interface library for communication between DIOLINE PLC and motor control unit from MAN (BOSCH)
- Development of an expansion board with digital inputs for the control system DIOLINE PLC in order to be encode the position in the vehicle via these configuration inputs
- Extension of the internal diagnostic memory of DIOLINE PLC to 1 MB
- Use of internal and external plug connectors with gold-plated contacts

LCON

Rail-compatible all-rounder!



The new LÜTZE converters from the LCON series can be parameterized using FDT/DTM software and DIP switches.

The new threshold switches, which are available with either analogue inputs or inputs for temperature sensors, are freely configurable via micro USB port and FDT/DTM standard software. Two semiconductor outputs 24 V/100 mA are available at the output.

The up to 6000 input and output ranges of the transducer can alternatively be set via DIP switches. The threshold switches have

a galvanic 2-way isolation, while the converters have a 3-way isolation. The isolation voltage is 2.5 kV.

Further advantages of the new LCON family include the very rugged and compact construction, which on the one hand allows the use in temperature class TX (-40 °C to +70 °C) and on the other hand allows a very compact construction width with just 6.2 mm. The new converters have spring

terminals and can be snapped on to standard DIN hat profiles (TS 35). The extensively accessories include the programming cable LCON ZB USB, as well as jumper combs which facilitate the installation. The housing parts naturally meet the current fire protection regulations for rail vehicles.



"Our Stars for Rail Systems 2014" by SIEMENS

Lütze Transportation GmbH nominated for "Our Stars for Rail Systems 2014" by SIEMENS

As a long-standing, reliable, efficient and highly innovative partner of the SIEMENS Rail Systems Division, Lütze Transportation GmbH was nominated this year, for the first time, for the prize "Our Stars for

Rail Systems" in the field of "Control, Communication and Information".

The prize was awarded for third time at a gala at the Schönbrunn Palace in Vienna on 25th of March. In 7 categories the three best national and international suppliers were nominated.

This nomination also recognises the good working relationship that exists between Friedrich Lütze GmbH and Lütze Transportation GmbH. It is an award for the Transportation that everyone can be proud of and it reflects how well our structures work!

We are on Track!

Electronic control for rail vehicles



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