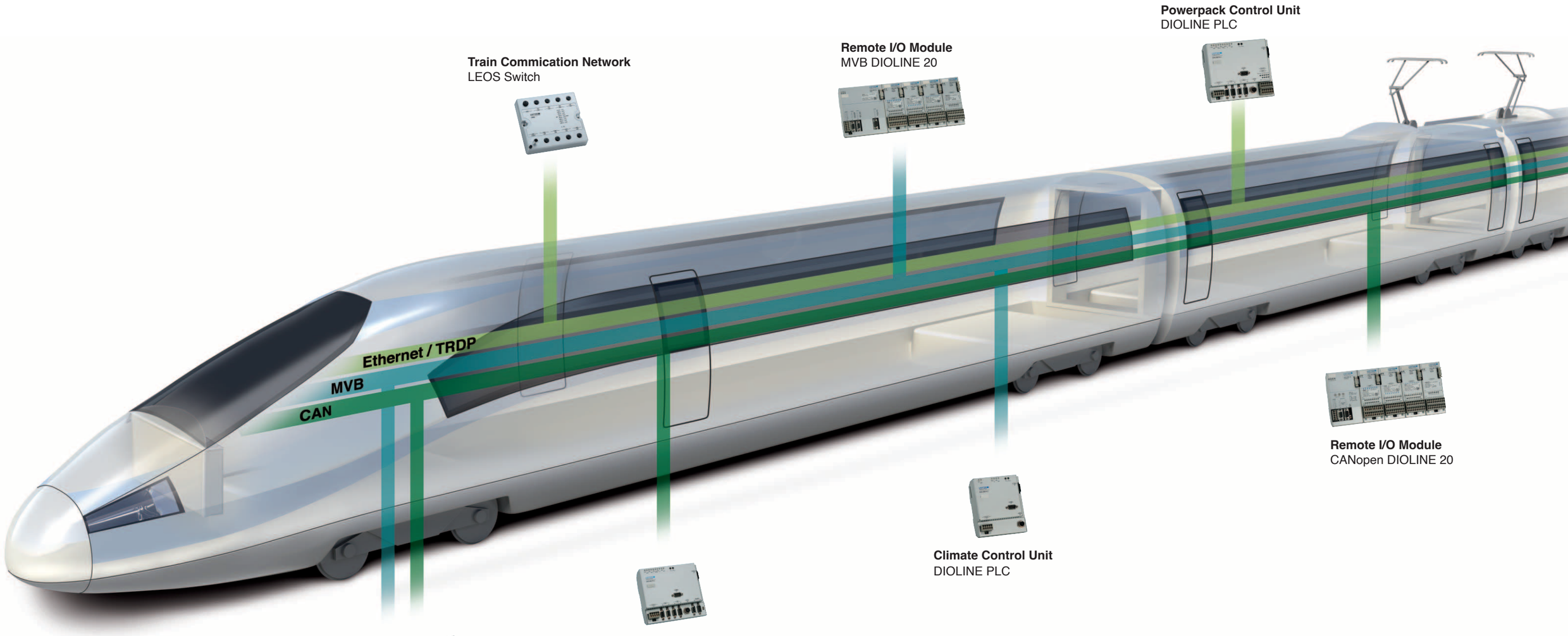
Transportation Solutions

DIOLINE - Train Control Management System

LUTZE TRANSPORTATION

LÜTZE Products and Solutions for Rail Vehicles



Train Commication Network
LEOS Switch

Remote I/O Module
MVB DIOLINE 20

Powerpack Control Unit
DIOLINE PLC

Remote I/O Module
CANopen DIOLINE 20

Climate Control Unit
DIOLINE PLC

Fire Protection Unit
DIOLINE PLC RS485

Traction Control Unit
MVB/CAN - Gateway with
local I/O DIOLINE PLC

Control and diagnostic systems play a key role in modern rail vehicles. Customizable platform concepts are required to ensure that vehicles are designed and manufactured efficiently in the face of control technology's ever increasing requirements.

Control technology components from LÜTZE are flexible to use and consistently accommodate this trend. So intelligent, special purpose solutions such as LÜTZE powerpack control unit are just as available as whole control technology systems, with perfectly coordinated individual components.

An example of this is the DIOLINE system, which comprises not just the vehicle control system but also the I/O level for all the usual signal voltages found in the railway sector.

LÜTZE TRANSPORTATION is following as an IRIS certified company strict quality guidelines and processes as basis for the development of hardware and software. This leads to the fact, that all systems have been developed under the compliance of following national and international standards:

- EN 50155
- EN 50121-3-2
- EN 61373
- EN 50124-1
- EN 50126
- EN 50128
- EN 50129
- EN 45545

DIOLINE PLC - Flexible Control System

The DIOLINE PLC is a flexible powerful compact control unit. It has been exclusively designed and developed for use in rail vehicles. The operating temperature range is between -40 °C and +70 °C and the power supply is DC 24 V.

The PLCs are freely programmable in a comfortable IEC 61131-3 development environment and all versions have an L-Bus interface for connection of modular I/O modules. The integrated field busses are available in following versions: MVB, CANopen, CAN2.0 (J1939), RS485, Profibus and Ethernet TCP/IP, TRDP.

The DIOLINE PLC can be used as a Gateway with additional control tasks as well as a powerful subsystem control unit. Existing programs can be transferred easily to several versions of the DIOLINE PLC, when it is necessary to use a PLC with a different fieldbus interface.

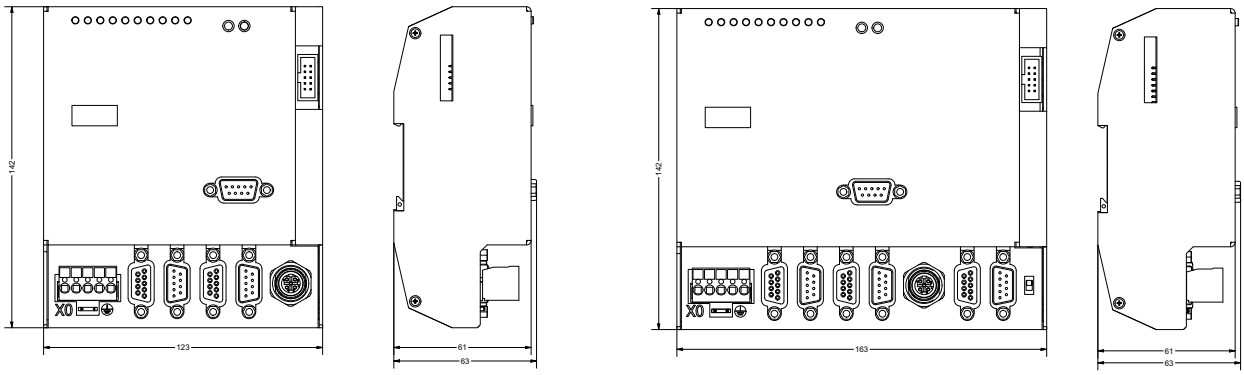
By the use of existing solution concepts for complex functions like load ratio control or diagnostic storage algorithms for system data, the engineering efforts and the time-to-market can be minimized. On request there are more communication protocols available, like MODBUS, Ethernet/IP or Profinet.

Overview Variants - DIOLINE PLC CAN

Part. No.	Description
746026	CANopen Master / CANopen Master L-Bus, RS232, Ethernet, TRDP, SD-Card-Slot, 123 mm width
746027	CANopen Master / CAN2.0 (J1939) L-Bus, RS232, Ethernet, TRDP, SD-Card-Slot, 123 mm width
746029	CANopen Master / RS485 L-Bus, RS232, Ethernet, TRDP, SD-Card-Slot, 163 mm width
746032	CANopen Slave / CANopen Master L-Bus, RS232, Ethernet, TRDP, SD-Card-Slot, 123 mm width
746039	CAN 2.0 L-Bus, RS232, Ethernet, TRDP, SD-Card-Slot, 123 mm width
746034	Ethernet L-Bus, RS232, TRDP, SD-Card-Slot, 123 mm width
746041	CANopen Slave / CAN 2.0 (J1939) L-Bus, RS232, Ethernet, TRDP, SD-Card-Slot, 123 mm width

Overview Variants - DIOLINE PLC MVB

Part. No.	Description
746028	MVB / CAN2.0 (J1939) L-Bus, RS232, Ethernet, TRDP, SD-Card-Slot, 123 mm width
746033	MVB / CANopen Master L-Bus, RS232, Ethernet, TRDP, SD-Card-Slot, 123 mm width
746036	MVB / CAN2.0 (J1939) / RS485 L-Bus, RS232, Ethernet, TRDP, SD-Card-Slot, 163 mm width
746037	MVB / CAN2.0 (J1939) / 4DI 24 V L-Bus, RS232, Ethernet, TRDP, SD-Card-Slot, 163 mm width
746038	MVB / CANopen Master / 4DI 24 V / 4 DO 24 V L-Bus, RS232, Ethernet, TRDP, SD-Card-Slot, 163 mm width
746040	MVB (ESD+) / CANopen Master L-Bus, RS232, Ethernet, TRDP, SD-Card-Slot, 123 mm width
746050	MVB / Profibus Master L-Bus, RS232, Ethernet, TRDP, SD-Card-Slot, 123 mm width
746051	MVB / Profibus Slave L-Bus, RS232, Ethernet, TRDP, SD-Card-Slot, 123 mm width

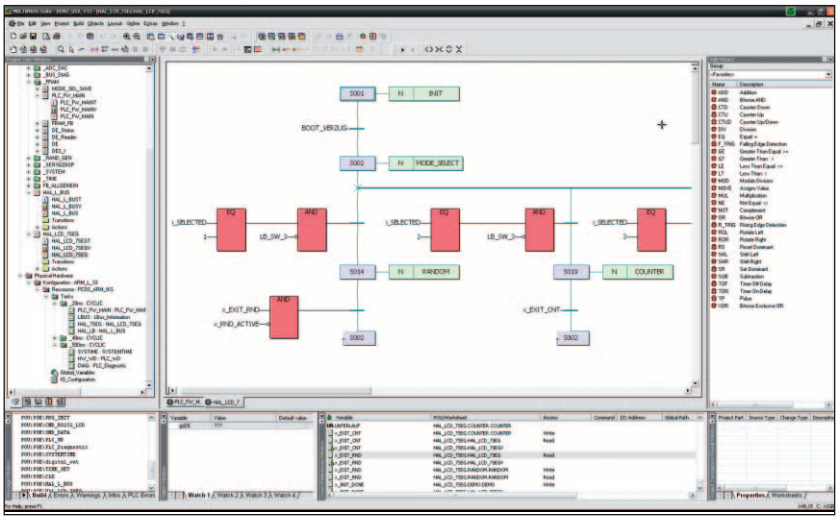


Software Engineering Tools

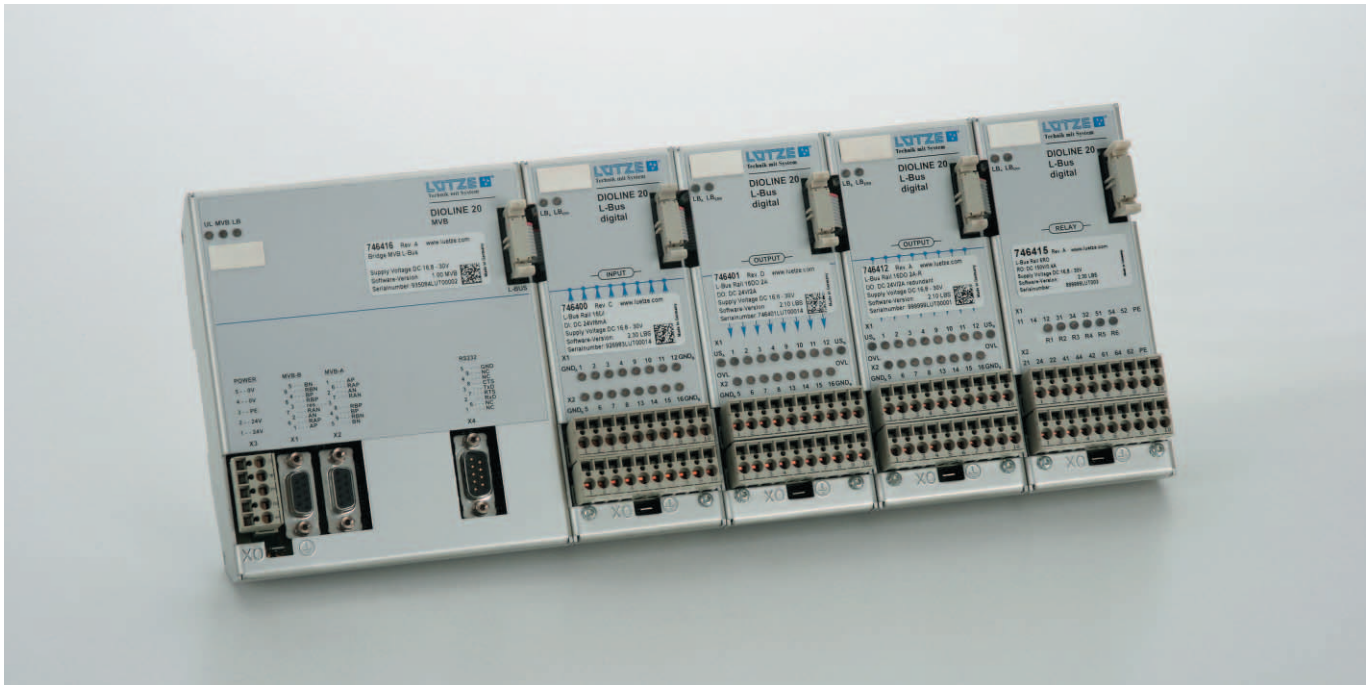
The IEC 61131 PLC programming system MULTIPROG from PHOENIX CONTACT SOFTWARE GmbH is the central standard engineering component of the LÜTZE PLC controller platform. MULTIPROG accelerates project handling and creation of the PLC application in all programming languages of the IEC 61131.

It supports the integration of fieldbus configuration and diagnostic tools for visualization and parameterization tasks. For this reason it is particularly suited to programming complex networks with distributed control components and also for diagnostics during the starting up and the series operation. High-performance engineering functions such as multi-user operation or automatic project generation enable flexible integration for train manufacturers and operators.

On request, the LÜTZE engineering team can support you to find solutions for your tasks in order to finish your project successfully.



DIOLINE 20 - Scalable Remote I/O-System



The robust I/O system DIOLINE 20 has been exclusively designed and developed for use in rail vehicles.

Thanks to the modularity, the bus coupler with a specific fieldbus interface as well as any I/O module can be exchanged easily fitting to the current operation. The flat mechanical design allows the system to be installed in areas with reduced space conditions, like for example under driver's desks.
The operating temperature range is between -40 °C and +70 °C and the power supply is DC 24 V.

Overview Bus Couplers

Part. No.	Description
746416	DIOLINE Bus Coupler MVB MVB EMD Slave Class 1.3 RS232 as diagnostic- and configuration interface The configuration can be defined and downloaded to the system by the LÜTZE MVB Slave Configurator software tool

Part. Nr.	Description
746409	DIOLINE Bus Coupler CANopen CANopen DS301 and DS401 Integrated switchable termination resistor The configuration of the bus parameters like baudrate and Node-ID can be performed by three rotary switches

Overview I/O Modules

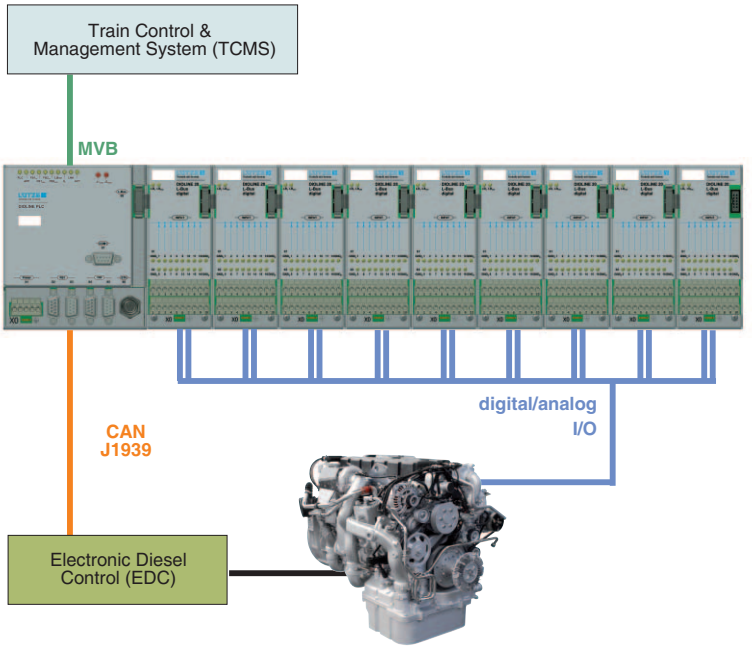
Part. No.	Description
Digital Inputs	
746400	16 digital Inputs DC 24 V, 2 potential groups
746417	16 digital Inputs DC 24 V, 4 potential groups
746428	16 digital Inputs DC 36 V, 2 potential groups
746408	16 digital Inputs DC 72 V, 2 potential groups
746425	16 digital Inputs DC 72 V, 4 potential groups
746413	16 digital Inputs DC 110 V, 2 potential groups
Digital Outputs	
746401	16 digital Outputs DC 24 V / 2 A, 2 potential groups
746412	16 digital Outputs DC 24 V / 2 A reverse current flow protection, 2 potential groups
746419	8 digital Outputs DC 24 V / 2 A , 4 potential groups, with extended diagnostics
746420	8 digital Outputs DC 24 V / 2 A, 2 potential grous, reverse current flow protection, with extended diagnostics
746424	6 digital Outputs DC 24 V … 110 V / 2 A, 3 potential groups
746414	6 digital Outputs DC 24 V … 110 V / 0,6 A reverse current flow protection, 3 potential groups
746415	6 change - over relay outputs DC 150 V / AC 250 V
Analog Inputs	
746403	4 analog Inputs 0 … 10 V
746426	4 analog Inputs -10 … +10 V
746404	4 analog Inputs 0 … 20 mA
746421	4 analog Inputs 0 … 24 mA
746410	4 analog Inputs PT100
746411	4 analog Inputs PT1000
Analog Outputs	
746405	4 analog Outputs 0 … 10 V
746427	4 analog Outputs -10 … +10 V
746406	4 analog Outputs 4 … 20 mA
746422	4 analog Outputs 0 … 20 mA
Combined Modules	
746402	8 digital Inputs DC 24 V 8 digital Outputs DC 24 V / 2 A
746407	2 analog Inputs configurable 0…20 mA / 0…24 mA / 4…20 mA / 0…40 mA / 0…10 V / -10…10 V / PT100 / PT1000 2 analog Outputs configurable 0…20 mA / 0…24 mA / 4…20 mA / 0…10 V / -10…10 V / -5…5 V

Redundant I/O Modules

Part. No.	Description
Redundant Modules	
746430	16 redundant digital Inputs DC 24 V, 2 potential groups
746431	16 redundant digital Inputs DC 24 V, 4 potential groups
746432	16 redundant digital Outputs DC 24 V / 1 A, 2 potential groups
746433	8 redundant digital Inputs DC 24 V, 8 redundant digital Outputs DC 24 V / 2 A
746434	8 redundant digital Outputs DC 24 V / 2 A, 4 potential groups, with extended diagnostics
746435	16 redundant digital Inputs DC 72 V, 4 potential groups
746436	6 redundant digital Outputs DC 24 V … 110 V / 2 A, 3 potential groups

Application Examples

Powerpack Control Unit

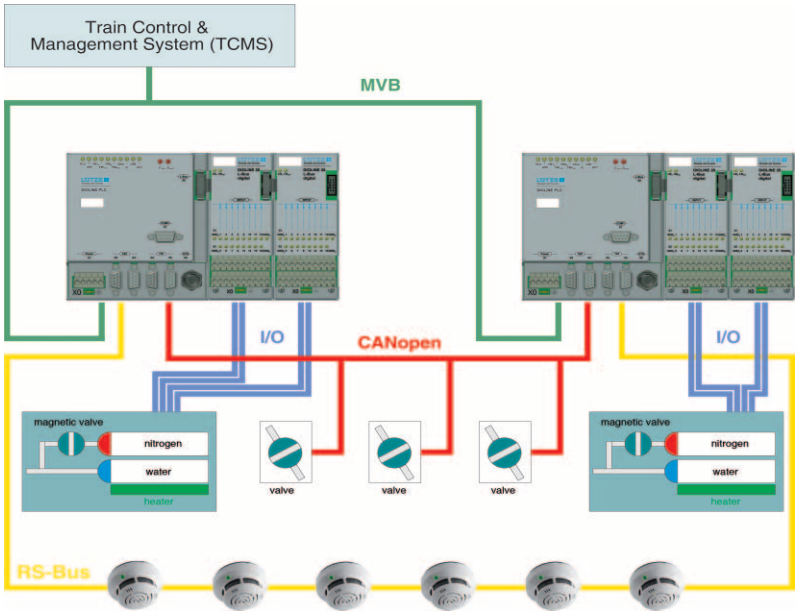


A typical application for the DIOLINE PLC compact control unit is the powerpack control unit in diesel-electric trains. The modularized preprocessing of all signals can be performed inside of the DIOLINE PLC. The compact control unit makes the decentralized intelligence of functions below the main control level possible.

The advantages are:

- Discharge of the central control unit and the field bus system
- Shortening of response times to critical signals
- Simplified error tracing
- High reliability and availability

Fire Protection Unit

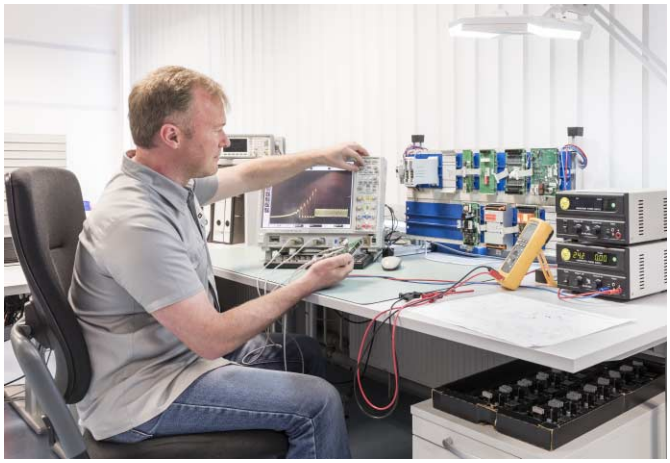


The DIOLINE PLC can easily control complex subsystems and self-operated systems in trains with different communication interfaces (MVB, CANopen, RS485, and Ethernet). This is pointed out here on the example of a Fire Protection Unit. The process of fire detection as well as the fire suppression is fixed in national and international standards. Based on the individual programming, the DIOLINE PLC makes the fieldbus-integration of the smoke detectors and the control of the suppression system uncomplicated and very flexible.

It is also possible to build up redundancies of the components by modularity of the DIOLINE system for reasons of availability.

The operator is able without complex training of the maintenance staff to adhere to the maintenance schedule of the system over the individually adaptable diagnostic software and visualization system.

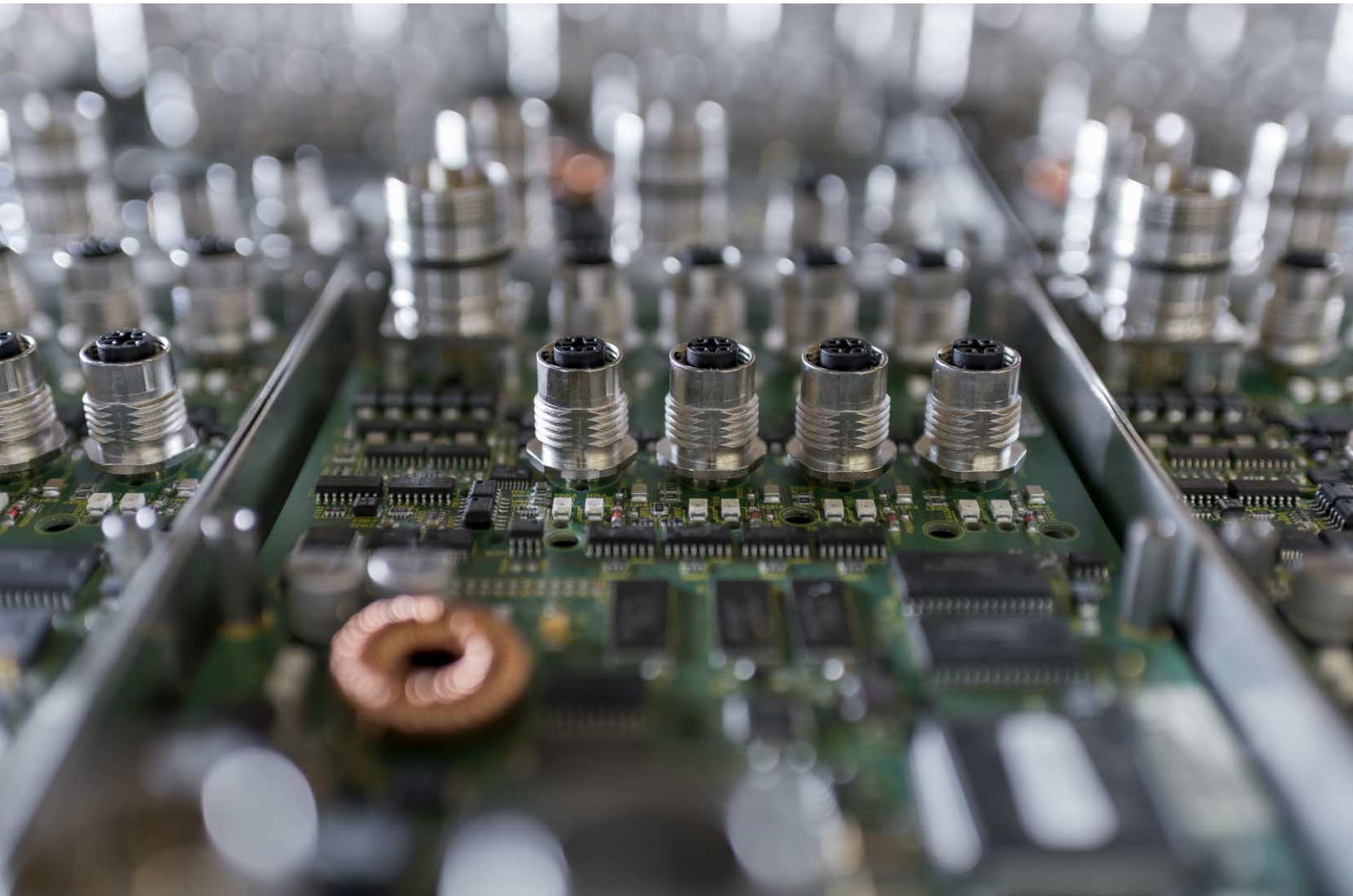
Railway Technology Competence



LÜTZE has been developing and manufacturing electrical components for rail vehicles for over 35 years. Our extensive product range of standard components carries out many automation tasks in the most diverse vehicle applications.

Are you still looking for the appropriate product adapted to suit your specific application?

Get in touch with us. Our developers help you to find the best solution for your product, including the specification and design for the application on the vehicle, regardless of whether you need components for your control technology, interface components or optical and acoustic signals.



Certificate

LÜTZE is ISO 22163:2023 / IRIS Rev.04 certified

In 2007, LÜTZE was among the first 25 companies worldwide to obtain the new Railway Industry Standard IRIS certification. In 2024, the IRIS Rev.04 standard was successfully met.
With the transition to the ISO 22163:2023 Standard IRIS goes significantly further than the requirements of the ISO 9001 standard and incorporates additional railway-specific requirements.

IRIS Certification

dqs

C E R T I F I C A T E

awarded to

Friedrich Lütze GmbH
Bruckwiesenstrasse 17-19
71384, Weinstadt
Germany

DQS GmbH

confirms, as an IRIS Certification® approved certification body, that the Management System of the above organization has been assessed and found to be in accordance with the

IRIS Certification ®

Performance Assessment:2023

Certification activities:
Design and development & Production & Service provision & EPPPS & Project management & Requirements management

Business category:
Rolling Stock

Product scope:
Systems

Certificate valid from: 21/05/2024

Certificate valid until: 20/05/2027*

Current date: 07/08/2024
Certificate-Register-No: 001737

* Providing that the subsequent surveillance audits are successful before the validity date of the previous audit.
Certification body address: August-Schanz-Straße 21, 60433 Frankfurt am Main, Germany

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IRIS Certification

dqs

Enclosure 1 of Certificate No.: 001737

awarded to

Friedrich Lütze GmbH
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The location is supported by the following supporting functions:

Address	Scope/Process
Lütze Transportation GmbH Grunbacher Straße 65 71384 Weinstadt, Germany	5.22 (Vehicle Control System)
Friedrich Lütze GmbH Heinkelstrasse 18 71384 Weinstadt, Germany	5.22 (Vehicle Control System)

Current date: 07/08/2024
Certificate-Register-No: 001737

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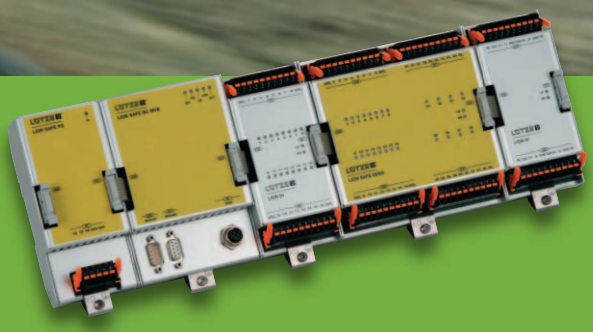
As a specialist for electronic components in rail vehicles, LÜTZE is aware of the high standards that your applications require from our products. Based on this quality awareness and our claim of supporting you with the latest technologies and designing your products reliably and cost-effectively, we have developed into the leading supplier in this market. In addition to the certification according to DIN EN ISO 9001:2015 LÜTZE also documents its leading position by means of a certified management system in accordance with the International Railway Industry Standard, IRIS.

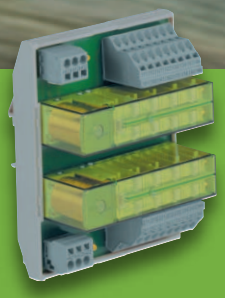
IRIS is a standardized method used worldwide for assessing the management systems of suppliers, which takes specific standards for the rail vehicle industry into account. With the IRIS certification, we have made another important step in the continual improvement of collaboration with you, our customers from the rail industry and we are looking forward to support you even better in your next projects.

We are on Track!

Electronic control for rail vehicles



Control Technology



Interface

Indication

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