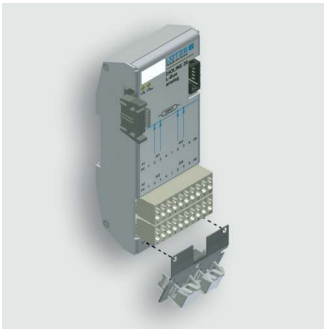


## Technical data sheet

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### DIOLINE local-bus expansion module with 4 analog inputs, DC 0 ... 10 V



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#### Identification

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Type DL-LB-AI-4-U-12 0-10V  
Part No. [746403](#)

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#### Product version

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Hardware revision E  
Software version 2.40  
Datasheet version 03

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#### Use/Application/Properties

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Description DIOLINE local-bus expansion module with 4 analog inputs for use on rail vehicles

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#### Bus interface

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Bus system Lütze bus  
Data capacity in process image 8 Byte analog inputs  
Transmission medium Flat conductor, 10-pin  
Connection type, incoming bus Socket connector IDE, 10-pin  
Connection type, continuing bus Plug connector IDE, 10-pin

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#### Supply module electronic

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Rated current (at  $U_N$ ) nom. 50 m A

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#### Inputs

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Number 4  
Connection, analog input 1 X1, pin 1-5, clamp-type terminal, 10-pin  
Connection, analog input 2 X2, pin 1-5, clamp-type terminal, 10-pin  
Connection, analog input 3 X1, pin 6-10, clamp-type terminal, 10-pin  
Connection, analog input 4 X2, pin 6-10, clamp-type terminal, 10-pin

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#### Lütze Transportation GmbH

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25.05.2022 • Subject to technical modification

Part No. [746403](#) • Datasheet version: 03

page 1 of 5

## Technical data sheet

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Connection type input	Spring terminal 0.14 mm <sup>2</sup> – 2.5 mm <sup>2</sup> AWG 22 – AWG 12 Strip length: 11 mm Screwdriver: 3.5 × 0.6 mm
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### Voltage inputs

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Input signal	Voltage DC 0 ... 10 V
Input characteristic impedance	200 – 220 kΩ
Data capacity in process image	4 × 16 bit analog input
Resolution	12 Bit, 1 LSB = DC 2.44 mV
Accuracy	±0.5 %
Sampling frequency	20 Hz (50 ms)
Input voltage	max. DC ±35 V
Protective measure	protected against polarity reversal
Measured-value representation	16 Bit unsigned Intel format 0 V – 0000 hex 5 V – 0800 hex 10 V – 0FFF hex

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### Diagnostics

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Diagnosis indications	The module status flag of the local bus is set to "1" during the runtime by corrupt calibration data which are occurring during the module initialization and AD transducer malfunctions. Internal bus active (LB <sub>A</sub> ), LED green Internal bus error (LB <sub>ERR</sub> ), LED rouge
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### Electrical isolation

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Potential groups	See diagram "Potential groups"
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### General

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Housing material	Aluminum
Installation place	1: closed electrical operating areas 2: driver's cabin and passenger area
Mounting	DIN rail mounting
Installation position	Installation space: top: 5 mm (for assembly) bottom: 5 mm (for assembly) side: 0 mm
Dimensions (w × h × d)	57.0 mm × 141.5 mm × 48.0 mm
Weight/unit	0.2 kg

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### Technical data

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Storage temperature range	-40 °C ... +85 °C
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## Technical data sheet

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### Environmental service conditions

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Altitude	2000 m
Operating temperature class	OT4: -40 °C ... +70 °C
Switch-on extended Operating temperature class	ST1: OTx + 15 °C (+85 °C 10 min.)
Temperature variation class	H1:no requirements
Shock/Vibration	Category 1, class B
Class of supply voltage interruption	S2: 10 ms
Supply change-over class	C1: 100 ms
Useful life class	L4: 20 years
Degree of pollution	PD2
Over voltage category	OV2
Socket and edge connector	K2: Sockets for ICs and/or edge connectors are not used
Protective coating class	PC2: lacquered on both sides
Degree of protection	IP20

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### PE connection

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Connection tab	6.3 mm × 0.8 mm
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### Failure Rate Prediction (MTBF)

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Standards	Electronic components – Reliability – Reference conditions for failure rates and stress models for conversion: EN/IEC 61709 Failure Rates of Components – Expected values: SN 29500
Failure rate at +45 °C	1493 fit
Failure rate at +45 °C	669897 h
	1 fit equals one failure per 10 <sup>9</sup> component hours
	The indicated temperature is the mean component ambient temperature.
Comments	The results are valid under following conditions: Automotive environment or industrial areas without extreme dust levels and harmful substances Continuous operation 8760 h per year

## Technical data sheet

### Standards/Certifications

#### Standards

**EN 50155:2007:** Railway applications – Rolling stock – Electronic equipment  
**EN 50155:2021:** Railway applications – Rolling stock – Electronic equipment – only testing according to chapter 13.3  
Withstand voltage test: routine test with 1 s test duration  
**EN 50121-3-2:2016:** Railway applications – Electromagnetic compatibility – Part 3-2: Rolling stock – Apparatus  
**EN 50124-1:2017:** Railway applications – Insulation coordination – Part 1: Basic requirements – Clearances and creepage distances for all electrical and electronic equipment  
**EN 61373:1999:** Railway applications – Rolling stock equipment – Shock and vibration tests  
**EN 61373:2010:** Railway applications – Rolling stock equipment – Shock and vibration tests  
**Regulation No. EMC 06:** Technical Rules on Electromagnetic Compatibility - Verification of radio compatibility of rail vehicles with railroad radio services  
**EN 45545-2:2020:** Railway applications – Fire protection on railway vehicles – Part 2: Requirements for fire behaviour of materials and components

### Equipment/Spare parts

#### Accessories

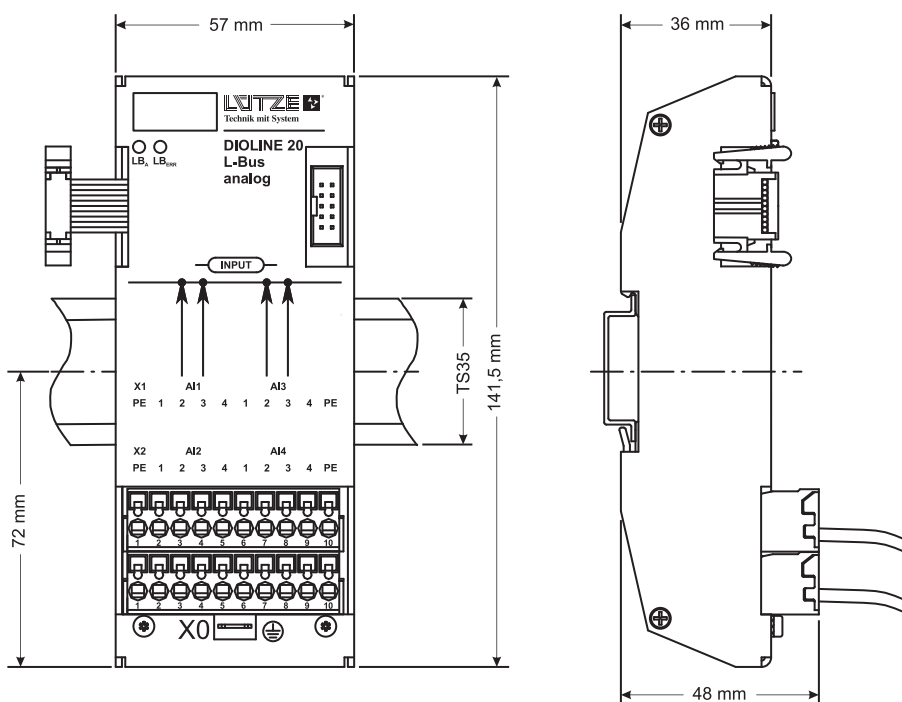
Not included in the delivery:  
EMC-Shield clip set, part number 746894  
Included in the delivery:  
Terminal clamp set, part number 745862

### Notes and Comments

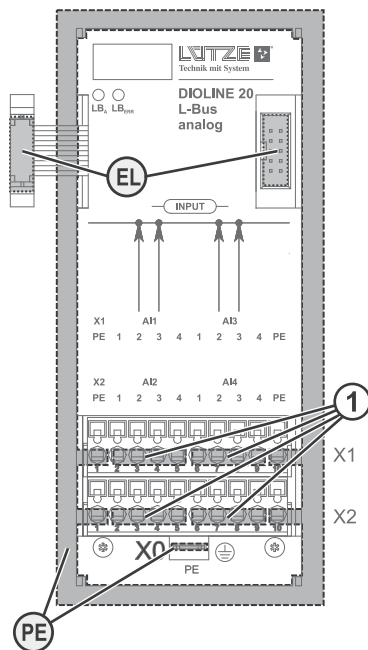
#### Note

An EMC performance according to the standards is only possible if the EMC shield clip set is mounted.

### Dimensions



## Potential groups



1.
  - DE** Potentialgruppen
  - EN** Potential groups
  - FR** Groupes de potentiel
- (PE): PE (X0, X1.1, X1.10, X2.1, X2.10), HOUSING  
Potential PE
- (EL): SUPPLY (L-Bus), ELECTRONIC  
Potential EL
- (1): AI (ANALOG INPUTS):  
Potential A:  
INPUT AI1 (X1.2 - X1.5)  
INPUT AI2 (X2.2 - X2.5)  
INPUT AI3 (X1.6 - X1.9)  
INPUT AI4 (X2.6 - X2.9)
2.
  - DE** Kapazitive Kopplung
  - EN** Capacitive coupling
  - FR** Couplage capacitif
- ca. 100 nF:  
(PE) ↔ (EL)
- ca. 4.7 nF:  
(PE) ↔ (1)
3.
  - DE** Trennspannung/
  - EN** Isolating voltage/
  - FR** Tension d'isolement
- 3.1  
Basisisolierung/  
Basic insulation/  
Isolation de base  
-
- 3.2  
Verstärkte Isolierung/  
Reinforced insulation/  
Isolation renforcée  
-
- 3.3  
Funktionsisolierung/  
Functional insulation/  
Isolation fonctionnelle
- AC 500 V:  
(1) ↔ (EL) + (PE)
4.
  - DE** Weitere Kopplungsarten
  - EN** Other coupling types
  - FR** Autres types de couplage
- Varistor: 40 Vrms:  
(PE) ↔ (EL)