

## TDD-BAD-BBN-TF LED TOF Distance Sensor



Technical Data	TDD-BAD-BBN-TF													
Gas Ex protection designation	II 2G Ex db IIC T6 Gb													
Dust Ex protection designation	II 2D Ex tb IIIC T100°C Db													
For use in Ex Zones	(0), 1, 2, (20), 21 and 22													
Light Source	860nm (LED)													
Measuring range	10cm to 1m													
Absolute measuring accuracy	±10%													
Response time	100ms													
Output type	RS485 + push-pull, inverted, max. 100mA, short circuit protected + LED													
Device designation according to EN 60947-5-1/2	D3ASS1													
Supply voltage, Ue	+24 VDC ±10%													
Absolute maximum supply voltage, Um	+30 VDC													
Current consumption	< 50mA													
Power consumption	1.2 W													
Power up delay time	3s													
Housing	M30, brass Ms 58, nickel plated													
Enclosure rating	IP67													
Ambient working temperature range, T <sub>amb</sub>	+10°C up to +50°C													
Storage temperature range	-10°C up to +80°C													
Connection cable	TPU insulation, AWM 20236, 5+PE x 0.5mm <sup>2</sup> , halogen free, shielded, leads numbering marked, oil resistant cable for trailing, length: 10m													
Accessories	<b>Included</b>	<b>Optional</b>												
	<ul style="list-style-type: none"> <li>1x Spare safety screw with packing ring for potentiometer sealing.</li> </ul>													
Wiring and Dimensions	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 20%;">Lead-No</th> <th style="width: 80%;">Function</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>+24V</td> </tr> <tr> <td>2</td> <td>0V</td> </tr> <tr> <td>3</td> <td>push-pull, inverted, max. 100mA, short circuit protected</td> </tr> <tr> <td>4</td> <td>RS485: A (D+)</td> </tr> <tr> <td>5</td> <td>RS485: B (D-)</td> </tr> </tbody> </table> <div style="text-align: center; margin-top: 10px;"> </div>		Lead-No	Function	1	+24V	2	0V	3	push-pull, inverted, max. 100mA, short circuit protected	4	RS485: A (D+)	5	RS485: B (D-)
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	<p style="text-align: center;"><b>Safe equipotential bonding for Ex devices</b></p> <div style="display: flex; justify-content: space-between;"> <div style="width: 30%;"> <p>Ensure local equipotential bonding by means of a corrosion-resistant PE connection.</p> </div> <div style="width: 40%; text-align: center;"> </div> <div style="width: 30%;"> <p>The end of the cable must be connected outside the hazardous locations.</p> <p>The cable shield is to connect to PE in a wide area.</p> </div> </div>													
<b>EX related markings</b>	<table style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;">                 CE 1258                  Typ: TDD-BAD-BBN-TF                  Gas: ⚡ II 2G Ex db IIC T6 Gb                  ATEX:                  IECEx:                  Tamb:                  Manufacturing date:             </td> <td style="width: 50%; vertical-align: top;">                 Manufacturer with Address                  Electrical data according table                  Dust: ⚡ II 2D Ex tb IIIC T100°C Db                  BVS 10 ATEX E130 X                  IECEx BVS 14.0108X                  +10°C up to +50°C                  Number 5 to 8 of the Serial Number (Year / CW)             </td> </tr> </table>		CE 1258 Typ: TDD-BAD-BBN-TF Gas: ⚡ II 2G Ex db IIC T6 Gb ATEX: IECEx: Tamb: Manufacturing date:	Manufacturer with Address Electrical data according table Dust: ⚡ II 2D Ex tb IIIC T100°C Db BVS 10 ATEX E130 X IECEx BVS 14.0108X +10°C up to +50°C Number 5 to 8 of the Serial Number (Year / CW)										
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TDD-BAD-BBN-TF\_e6/2023-06-27/MS

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 info@matrix-elektronik.com

## Operating Manual / EU-declaration of conformity

### Product description

- LED (860nm) TOF distance sensor proximity switch
- Switching distance controlled by potentiometer
- Distance reasing over RS-485
- Digital output (push-pull)
- Measurement range: 10cm to 1m

### General installation prescriptions

The electrical connections must be exactly as shown in the connection diagram. The cable shield must be connected short. The cable shield should be connected to protection earth, large-surfaced. Do not exceed the maximum ratings. Connection cables must not be installed parallel to high voltage cables.

### Ex installation prescriptions

It is necessary to take into consideration the valid international and national rules and regulations (IEC 60079-14). The maximum ratings must not be exceeded. The electrical connections must be done according to the wiring diagram. The local equipotential bonding must be connected corrosion resistant and permanently. The protective earth (PE) is solidly connected with the housing.

The cable shield must be solidly connected to protection earth. The cable have to be installed and protected against damages. The cable with termination fittings, or in cable tray systems and installed in a manner to avoid tensile stress at the termination fittings. To connect cables inside hazardous locations only use certificated Ex housings. All cable terminals must be connected outside hazardous locations.

Other then original manufacturer, additional optical lenses are not allowed in hazardous locations.

The product TDD-BAD-BBN-TF may only be installed and operated within Ex zones 1, 2, 21 and 22. The limited optical radiation may operate inside Ex zones 0 and 20.

### Function

RS-485 protocol (9600/8/1/no parity):

- ASCII-transfer
- Format: <xxxx> <CR>+<LF> (xxxx=Distnace in mm)
- Signal overview indication: "overfl <CR>+<LF>"
- Signal underflow indication: "no sig <CR>+<LF>"

Analog output:

- 10cm: 4mA; 1m: 20mA
- Overflow: 3mA; Underflow: 21mA

### General safety

The sensor must not be used for Accident-Prevention! In worst case the output can change to any state! When installing and operating the product, it is necessary to take into consideration all relevant international and other national regulations, especially those regarding explosion protection.

### Maintenance

No special maintenance is required.

Protect the product and any optical ports (if applicable) from pollution. Clean with **non-aggressive** solvents only. Strong solvents may damage certain fibre optics. The equipment must only be repaired or serviced by the manufacturer.

### General notes and disposal

We reserve the right to modify our products. Our products are designed in such a way, that it has the least possible adverse effect on the environment. It neither emits or contains any damaging or siliconized substances and use a minimum of energy and resources. No longer usable or irreparable units must be disposed of in accordance with local waste disposal regulations.

### EU-Declaration of Conformity

The product meets the requirements of the following standards and directives:

IEC 60079-0:2017, EN IEC 60079-0:2018, IEC/EN 60079-1:2014, IEC/EN 60079-28:2015, IEC 60079-31:2013, EN 60529:2014, EN 60950-1:2006, EN 61000-4-2 to EN 61000-4-6, EN 61000-6-1/-2, EN 61000-6-4, ATEX directive 2014/34/EU, Machine directive 2006/42/EC, EMC directive 2014/30/EU, RoHS directive 2011/65/EU

ATEX/IECEX-Designation:

Gas: II 2G Ex db IIC T6 Gb

Dust: II 2D Ex tb IIIC T100°C Db

ATEX EU-type examination certificate No.: BVS 10 ATEX E130 X

IECEX CoC No.: IECEX BVS 14.0108X

Ex CB IECEX: DEKRA Testing and Certification GmbH, Carl-Beyling-Haus, Dinen-dahlstrasse 9, D-44809 Bochum.

ATEX certification of quality management system, type production of Ex devices, in accordance to the directive 2014/34/EU:

Certification No.: SEV 21 ATEX 4580, QAR No.: CH/SEV/QAR21.0009/01, CB: Eurofins Electric & Electronic Product Testing AG, Luppmenstrasse 3, CH-8320 Fehraltorf CE 1258 Ident. Number: 1258

Pablo Ledergerber, Matrix Elektronik AG, is authorized to generation of documentation.

The conformity of the devices with all used standards and directives and the EC-type examination certificate and the observation of the Quality Management System ISO 9001:2015, declares:

Ehrendingen, 27.6.2023



Pablo Ledergerber, Matrix Elektronik AG