## **Technical data sheet Optical data transmission**

Part no.: 50146904 DDLS 538 120.4 H S3





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### **Technical data**

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Basic data		
Series	DDLS 500	
Special version		
Special version	Heating	
	Not influenced by reflective surfaces	
	Operation of parallel light axes	
Optical data		
Working range	100 120,000 mm	
Light source	Laser	
Transmission frequency	F4	
Usable opening angle transmitter	1 °	
Electrical data		
Performance data		
Supply voltage U <sub>B</sub>	18 30 V, DC	
Supply voltage SB	10 00 V, DO	
Inputs		
Number of digital switching inputs	1 Piece(s)	
Outputs		
Number of digital switching outputs	1 Piece(s)	
Interface		
Туре	EtherCAT link down 70 ms, EtherCAT	
	Safety-over-EtherCAT (FSoE)	
Connection		
Number of connections	2 Piece(s)	
Connection 1		
Type of connection	Connector	
Designation on device	POWER	
Thread size	M12	
Туре	Male	
No. of pins	5 -pin	
Encoding	A-coded	
Connection 2		
Connection 2		

Connection 2				
Type of connection	Connector			
Designation on device	BUS			
Thread size	M12			
Туре	Female			
No. of pins	4 -pin			
Encoding	D-coded			

Dimension (W x H x L)	100 mm x 156 mm x 99.5 mm	
Housing material	Metal	
Net weight	1,255 g	
Operation and display		
Type of display	Bar graph	
	LED	
Environmental data		
Ambient temperature, operation	-35 50 °C	
Ambient temperature, storage	-35 70 °C	
Certifications		
Degree of protection	IP 65	
Certifications	c UL US	
Test procedure for EMC in accordance	EN 1000-6-4	
with standard	EN 61000-6-2	
Test procedure for noise in accordance with standard	EN 60068-2-64	
Test procedure for oscillation in accordance with standard	EN 60068-2-6	
Test procedure for shock in accordance with standard	EN 60068-2-27	
Classification		
Customs tariff number	85365019	
ECLASS 5.1.4	19039001	
ECLASS 8.0	19179090	
ECLASS 9.0	19179090	
ECLASS 10.0	19179090	
ECLASS 11.0	19179090	
ECLASS 12.0	19179090	
ECLASS 13.0	19179090	
ETIM 5.0	EC000515	

EC000515

EC000310

EC000310

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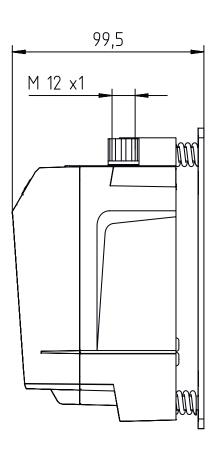
ETIM 6.0

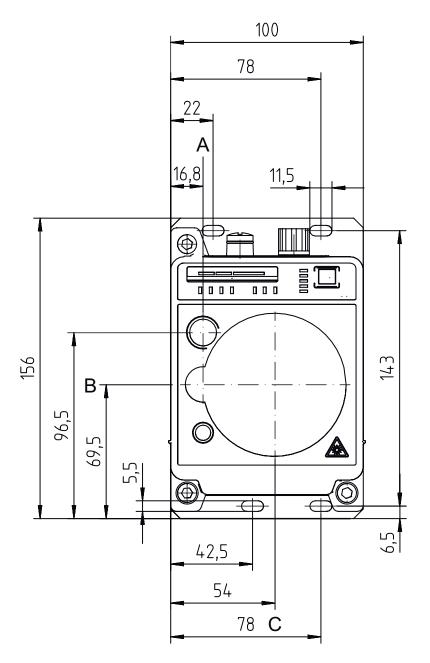
ETIM 7.0

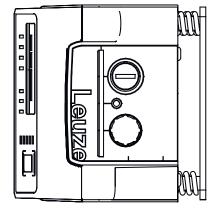
ETIM 8.0

### **Dimensioned drawings**

All dimensions in millimeters







Center axis of transmitter and alignment laser А

В Center axis of transmitter and receiver

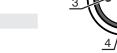
С Center axis of receiver Leuze

### **Electrical connection**

Connection 1	POWER	
Function	Signal IN	
	Signal OUT	
	Voltage supply	
Type of connection	Connector	
Thread size	M12	
Туре	Male	
Material	Metal	
No. of pins	5 -pin	
Encoding	A-coded	

#### Pin **Pin assignment**

1	VIN	
2	IO1	
3	GND	3
4	102	
5	FE/SHIELD	4



#### **Connection 2**

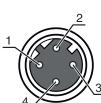
Connection 2	BUS	
Function	BUS IN	
Type of connection	Connector	
Thread size	M12	
Туре	Female	
Material	Metal	
No. of pins	4 -pin	
Encoding	D-coded	

Pin	Pin assignment
1	TD+
2	RD+
3	TD-
4	RD-

### **Operation and display**

LED		Display	Meaning	
1 AUT		Off	Operating mode not active	
		Green, continuous light	Operating mode "Automatic"	
2 MAN	IAN	Off	Operating mode not active	
		Green, continuous light	Operating mode "Manual"	
3 A	DJ	Off	Operating mode not active	
		Green, continuous light	Operating mode "Adjust"	
L L	.AS	Off	Operating mode not active	
		Green, continuous light	Operating mode "Alignment-laser mounting support"	
5 LLC	LC.	Off	Operating mode not active	
		Green, continuous light	LLC without interruption	
		Red, continuous light	LLC interrupted at least once	
P	WR	Off	No supply voltage	
		Green, flashing	Device ok, initialization phase	
		Green, continuous light	Data transmission active	
		Red, flashing	Data transmission interrupted	
		Red, continuous light	Device error	
' Т	MP	Off	Operating temperature OK	
		Orange, continuous light	Operating temperature critical	





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### **Operation and display**



LED Display Meanin		Meaning
7 TMP	Red, continuous light	Operating temperature exceeded or not met
8 LSR	Off	With function reserve
	Orange, continuous light	Device OK, warning set
9 MAS	Off	Installation on slave side
	Green, continuous light	Installation on master side
10 OLK	Off	Fault
	Green, continuous light	No data transmission
	Orange, continuous light	Data transmission active
11 ERL	Off	Link OK
	Orange, continuous light	Missing link (Ethernet cable connection) on the second device
	Red, continuous light	No cable-connected link to the connected device
12 LINK	Off	No cable-connected link to the connected device
	Green, continuous light	Link OK
	Orange, continuous light	Data transmission active
13 SIGNAL QUALIT	2 red, 2 orange and 4 green	Received signal level

### Suitable receivers

 Part no.	Designation	Article	Description
50146903	DDLS 538 120.3 H S3	Optical data transmission	Special version: Not influenced by reflective surfaces, Heating, Operation of parallel light axes Working range: 100 120,000 mm Transmission frequency: F3 Connection: Connector, M12

### Part number code

Part designation: DDLS 5XXX YYY.Z A B CC

DDLS	Optical transceiver for digital data transmission
5XXX	Series 508i: without integrated web server for remote diagnostics 508i: with integrated web server for remote diagnostics 538: without integrated web server for remote diagnostics (EtherCAT) 548i: with integrated web server for remote diagnostics
YYY	Range for data transmission in m
Z	Frequency of the transmitter 0: Frequency F0 1: Frequency F1 2: Frequency F2 3: Frequency F3 4: Frequency F4
A	Option L: integrated laser alignment aid (for transmitter/receiver) n/a: standard
В	Special equipment H: With heating n/a: no special equipment
сс	Special equipment S3: Optimized for EtherCAT transmission n/a: no special equipment



♦ A list with all available device types can be found on the Leuze website at www.leuze.com.

### Notes

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#### Observe intended use!

✤ This product is not a safety sensor and is not intended as personnel protection.

 $\ensuremath{^{\ensuremath{\Downarrow}}}$  The product may only be put into operation by competent persons.



-	Do not expose users of telescopic optics!
	The device satisfies the requirements of IEC 60825-1:2007 (EN 60825-1:2007) safety regulations for a product of <b>laser class 1M</b> as well as the U.S. 21 CFR 1040.10 regulations with deviations corresponding to Laser Notice No. 50 from June 24, 2007.
*	Do not expose users of telescopic optics! The device satisfies the requirements of IEC 60825-1:2007 (EN 60825-1:2007) safety regulations for a product of laser class 1M as well as the U.S. 21 CFR 1040.10 regulations with deviations corresponding to Laser Notice No. 50 from June 24, 2007.
	beam or in the direction of reflecting beams.
	<ul> <li>CAUTION! The use of operating and adjusting devices other than those specified here or the carrying out of differing procedures may lead to dange exposure to radiation!</li> <li>The use of optical instruments or devices (e.g., magnifying glasses, binoculars) in combination with the device increases the danger of eye damage</li> </ul>
	♥ Observe the applicable statutory and local laser protection regulations.
	☆ The device must not be tampered with and must not be changed in any way. There are no user-serviceable parts inside the device.
	Repairs must only be performed by Leuze electronic GmbH + Co. KG.

#### ATTENTION! LASER RADIATION – CLASS 1 LASER PRODUCT (alignment laser)

The device satisfies the requirements of IEC 60825-1:2007 (EN 60825-1:2007) safety regulations for a product of **laser class 1** as well as the U.S. 21 CFR 1040.10 regulations with deviations corresponding to Laser Notice No. 50 from June 24, 2007.

<sup>th</sup> The device satisfies the requirements of IEC 60825-1:2007 (EN 60825-1:2007) safety regulations for a product of laser class 1 as well as the U.S. 21 CFR 1040.10 regulations with deviations corresponding to Laser Notice No. 50 from June 24, 2007.

- ♦ Observe the applicable statutory and local laser protection regulations.
- <sup>t</sup> The device must not be tampered with and must not be changed in any way. There are no user-serviceable parts inside the device.

Repairs must only be performed by Leuze electronic GmbH + Co. KG.

### Accessories

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### Connection technology - Connection cables

	Part no.	Designation	Article	Description
	50132079	KD U-M12-5A-V1- 050	Connection cable	Connection 1: Connector, M12, Axial, Female, A-coded, 5 -pin Connector, LED: No Connection 2: Open end Shielded: No Cable length: 5.000 mm Sheathing material: PVC
Ŵ	50135074	KS ET-M12-4A-P7- 050	Connection cable	Suitable for interface: Ethernet Connection 1: Connector, M12, Axial, Male, D-coded, 4 -pin Connector, LED: No Connection 2: Open end Shielded: Yes Cable length: 5.000 mm Sheathing material: PUR

### Connection technology - Interconnection cables

	Part no.	Designation	Article	Description
	50137078	KSS ET-M12-4A- M12-4A-P7-050	Interconnection cable	Suitable for interface: Ethernet Connection 1: Connector, M12, Axial, Male, D-coded, 4 -pin Connection 2: Connector, M12, Axial, Male, D-coded, 4 -pin Shielded: Yes Cable length: 5,000 mm Sheathing material: PUR
	50135081	KSS ET-M12-4A- RJ45-A-P7-050	Interconnection cable	Suitable for interface: Ethernet Connection 1: Connector, M12, Axial, Male, D-coded, 4 -pin Connection 2: RJ45 Shielded: Yes Cable length: 5,000 mm Sheathing material: PUR

### Connection technology - Connectors

	Part no.	Designation	Article	Description
-	50020501	KD 095-5A	Connector	Connection: Connector with screw terminals, M12, Axial, Female, A-coded, 5 -pin
	50112155	S-M12A-ET	Connector	Suitable for interface: Ethernet Connection: Connector, M12, Axial, Male, D-coded, 4 -pin

### Accessories

## Leuze

### Services

	Part no.	Designation	Article	Description
ц. С	S981001	CS10-S-110	Start-up support	Details: Performed at location of customer's choosing, duration: max. 10 hours. Conditions: Devices and connection cables are already mounted, price not including travel costs and, if applicable, accommodation expenses. Restrictions: No mechanical (mounting) and electrical (wiring) work performed, no changes (attachments, wiring, programming) to third-party components in the nearby environment.
	S981005	CS10-T-110	Product training	Details: Location and content to be agreed upon, duration: max. 10 hours. Conditions: Price not including travel costs and, if applicable, accommodation expenses. Restrictions: Travel costs and accommodation expenses charged separately and according to expenditure.

	Note
6	A list with all available accessories can be found on the Leuze website in the Download tab of the article detailed page.