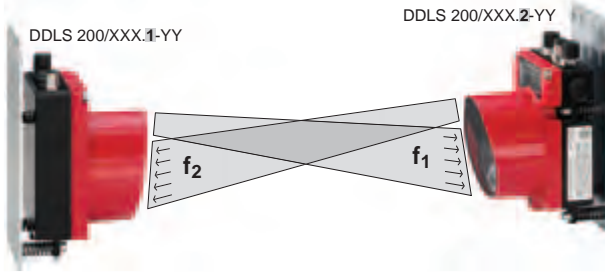


# SELECTION GUIDE

## Serial optical data transmission systems

### Operating principle





















In applications where data must be transmitted to and from moving objects, optical data transmission systems provide an ideal solution. With the Series DDLS ..., Leuze electronic offers high-performance optical data transmission systems. The optical data transceivers are robust and operate wear free.

To prevent the devices from mutually interfering with one another during data transmission in duplex operation, use 2 frequency pairs. These are identified by the type designations ....1 and ....2 as well as by the labels **frequency f<sub>1</sub>** and **frequency f<sub>2</sub>** on the control panel.

The received signal level is checked on both devices and can be read on an LED bar graph display. If the received signal level drops below a certain value, e.g. due to increasing soiling of the optics, a warning output is activated.

### Products / Interfaces

	<b>DDLS 200 ... - 10 - ...</b>	from <b>page 382</b>
	PROFIBUS interface Terminals/M12	
	<b>DDLS 200 ... - 2x - ...</b>	from <b>page 386</b>
	Interbus interface FOC/copper wires	
	<b>DDLS 200 ... - 40 - ...</b>	from <b>page 390</b>
	DataHighway+ / Remote I/O Interface	
	<b>DDLS 200 ... - 50 - ...</b>	from <b>page 392</b>
	CANopen/DeviceNet Interface	
	<b>DDLS 200 ... - 60 - ...</b>	from <b>page 394</b>
	Ethernet Interface 10/100Mbit/s	
	<b>DDLS 78</b>	from <b>page 406</b>
	RS 232 Interface	
	<b>DDLS 78</b>	from <b>page 400</b>
	RS 485 Interface	
	<b>DDLS 78</b>	from <b>page 404</b>
	RS 422 Interface	
	<b>DDLS 78</b>	from <b>page 402</b>
	TTY Interface	

### Features

- Operating ranges up to 500m possible
- Transmission rates up to 2Mbit/s
- Network interfaces with integrated repeater function
- Low ambient light sensitivity through special FSK method

# OPTICAL DATA TRANSMISSION SYSTEMS



Stationary  
bar code  
identification

Mobile  
bar code  
identification

2D-code  
identification

RF  
identification

Industrial  
image processing

Distance meas.  
Positioning

Optical  
data transmission

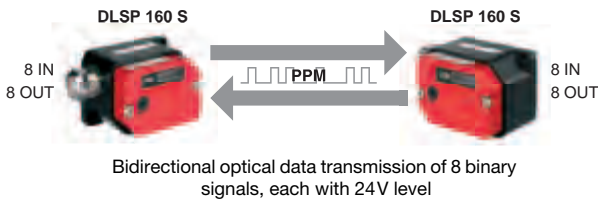
Networking  
Connector units

Accessories

Services

## Parallel optical data transmission systems

### Operating principle



The DLSP 160 S is a parallel optical data transceiver. Binary signals with a level of 24VDC can be connected to the 8 inputs of the DLSP 160 S. These are transmitted optically and are again available at the outputs on the opposing side with a level of 24V.

### Products / Interfaces




from page 408

### Features

- Operating ranges up to 2.8m possible
- Data communication within 400µs
- Insensitive to interference through 24V technology
- Low ambient light sensitivity through the pulse-pause modulation method

## SELECTION TABLE

Series	Dimensions in mm (WxHxD)	Housing material		Operating range in m				
		Plastic	Metal	10	50	100	300	500
 <b>DDLS 200... -10...</b>	90 x 190 x 120		●	0,2 ————— 500				
 <b>DDLS 200... -20...</b>	90 x 190 x 120		●	0,2 ————— 500				
 <b>DDLS 200... -21...</b>	90 x 190 x 120		●	0,2 ————— 300				
 <b>DDLS 200... -40...</b>	90 x 190 x 120		●	0,2 ————— 300				
 <b>DDLS 200... -50...</b>	90 x 190 x 120		●	0,2 ————— 300				
 <b>DDLS 200... -60...</b>	90 x 190 x 120		●	0,2 ————— 300				

We reserve the right to make changes • Auswahltablelle\_Datenuebertragung\_1\_EN.fm



Detailed information on the dimensioned drawings or the specifications can be found in the respective data sheet or in the technical description.

# OPTICAL DATA TRANSMISSION SYSTEMS



Stationary  
bar code  
identification

Mobile  
bar code  
identification

2D-code  
identification

RF  
identification

Industrial  
image processing

Distance meas.  
Positioning

Optical  
data transmission






Networking  
Connector units

Accessories

Services

Light source	Max. baud rate		Interfaces											Page		
	Red light	Infrared light	kbit/s	Mbit/s	PROFIBUS DP/FMS/MPI	Interbus-S	Interbus-S FOC	DH+ / Remote I/O	CANopen / DeviceNet	Ethernet	RS 485	RS 422	RS 232		TTY	Parallel 8 I/O (24VDC)
	●			1,5	●						●					382
	●		500		●						●					386
	●			2,0		●										388
	●		230,4				●									390
	●			1,0					●							392
	●			10/ 100					●							394

## SELECTION TABLE

Series	Dimensions in mm (WxHxD)	Housing material		Operating range in m					
		Plastic	Metal	10	50	100	300	500	
 <b>DDLS 78.5</b>	104 x 185 x 36		●	0,5		120			
 <b>DDLS 78.6</b>	104 x 185 x 36		●	0,5		200			
 <b>DDLS 78.7</b>	104 x 185 x 36		●	0,5		200			
 <b>DDLS 78.6.1</b>	104 x 185 x 36		●	0,5		120			
 <b>DLSP 160 S</b>	75 x 55 x 45		●	0 2,8					

We reserve the right to make changes • Auswahltablelle\_Datenuebertragung\_2\_EN.fm



Detailed information on the dimensioned drawings or the specifications can be found in the respective data sheet or in the technical description.

# OPTICAL DATA TRANSMISSION SYSTEMS



Stationary  
bar code  
identification

Mobile  
bar code  
identification

2D-code  
identification

RF  
identification

Industrial  
image processing

Distance meas.  
Positioning

Optical  
data transmission

Networking  
Connector units

Accessories

Services

Light source	Max. baud rate		Interfaces											Page		
	Red light	Infrared light	kbit/s	Mbit/s	PROFIBUS DP/FMS/MPI	Interbus-S	Interbus-S FOC	DH+ / Remote I/O	CANopen / DeviceNet	Ethernet	RS 485	RS 422	RS 232		TTY	Parallel 8 I/O (24VDC)
	●		9,6		●							●	●	●		400
	●		19,2		●							●	●	●		400
	●		38,4		●							●	●	●		400
●			19,2		●							●	●	●		400
	●															
		●													●	410

# OVERVIEW



Data transmission to high-bay storage device in conveyor and storage technology

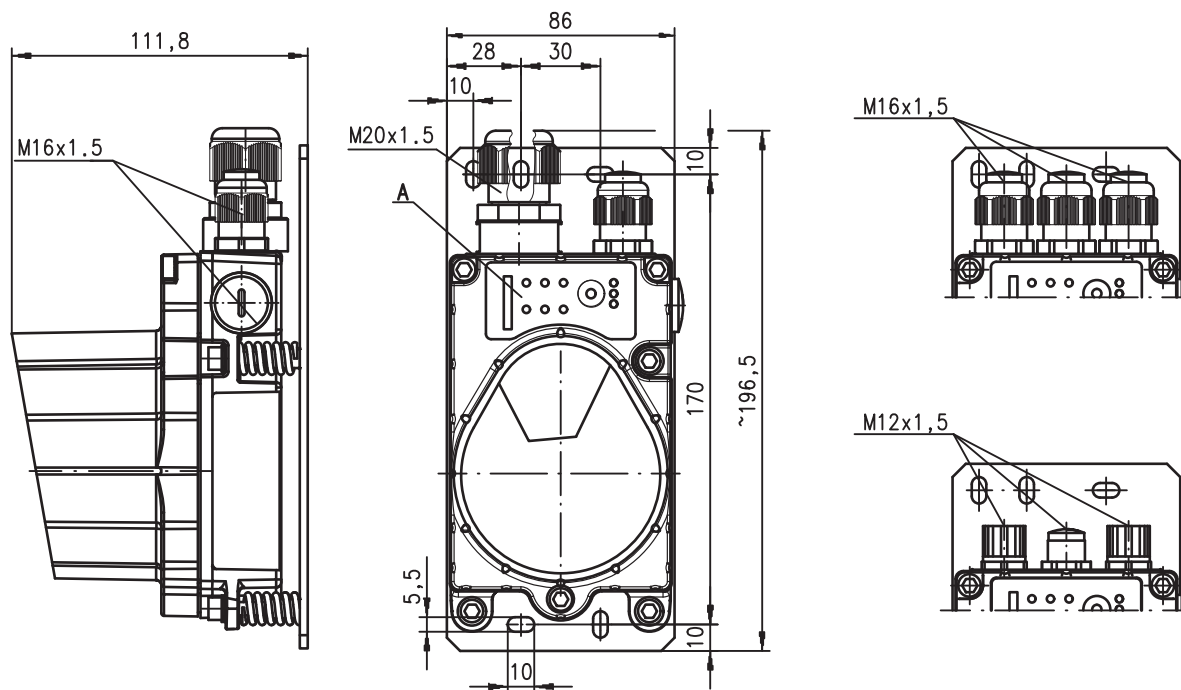


Data transmission to transverse side-tracking skate in the automobile industry



Data transmission to moving system components in conveyor and storage technology

## Dimensioned drawing



A Control panel

We reserve the right to make changes • DDLS200\_Overview\_EN.fm



**DDLS 200**  
Page 380




**DDLS 78**  
Page 398



**DLSP 160 S**  
Page 408

# OPTICAL DATA TRANSMISSION SYSTEMS DDLS 200

Optical data transmission systems	Interface	Page
 DDLS 200 / ... - 10... DDLS 200 / ... - 20... DDLS 200 / ... - 21... DDLS 200 / ... - 40... DDLS 200 / ... - 50... DDLS 200 / ... - 60...	PROFIBUS / RS 485 <sup>1)</sup>	382
	Interbus / RS 422	
	Interbus fibre-optic cable	
	Rockwell Automation DH+ / RIO	
	DeviceNet / CANopen	
	Ethernet TCP/IP (10/100 Mbit/s)	

1) on request



Common technical data		
<b>Electrical data</b>	Operating voltage $U_B$	18 ... 30VDC
	Current consumption (at 24VDC)	w/o heating: $\leq 200$ mA w. heating: $\leq 800$ mA
	Switching input	activation input
	Switching output	1 x PNP, warning output
<b>Indicators and operational controls</b>	Individual LEDs	voltage supply, operating mode, state, diagnostics (type dependent)
	LED strip	receiving level bar graph
	Keypad button	change of operating mode
<b>Mechanical data</b>	Housing	diecast aluminum
	Optics	glass
	Weight	approx. 1200g
<b>Environmental data</b>	Ambient temperature operation (storage)	w/o heating: -5 ... +50 °C w. heating: -30 ... +50 °C (-30 ... +70 °C)
	Protection class	IP 65
	Air humidity	<... 90% (non-cond.)
<b>Optical data</b>	Infrared LED, wavelength 880nm Class 1 acc. to EN 60825-1:1994+A1+A2	
	Extraneous light	> 10,000Lux

## Features

- Integrated mounting and alignment plate
- Patented alignment process
- Clamp connection or M12 connector
- Integrated repeater function
- Continuous display of the alignment quality
- Extensive bus-specific diagnostics
- Warning output for falling received signal level
- Contact- and wear-free transmission
- Not affected by extraneous light
- Not affected by lasers or reflective tape



Stationary bar code identification

Mobile bar code identification

2D-code identification

RF identification

Industrial image processing

Distance meas. Positioning

Optical data transmission

Networking Connector units

Accessories

Services



## DATA TRANSMISSION SYSTEMS, PROFIBUS

Part description Part No. ....1 -... / ....2 -...	Description	Op. range [m]	Opening angle [°]	Interface	Connection
<b>Optical data transmission systems</b>					
<b>DDLS 200 / 30.1 - 10 - W</b> <b>DDLS 200 / 30.2 - 10 - W</b> 50039704 / 50039705	Opt. data transmission, -5 ... +50°C, wide angle version	30	± 1.5	PROFIBUS 1.5Mbit/s	Terminals
<b>DDLS 200 / 80.1 - 10 - W</b> <b>DDLS 200 / 80.2 - 10 - W</b> 50102312 / 50102313	Opt. data transmission, -5 ... +50°C, wide angle version	80	± 1.0	PROFIBUS 1.5Mbit/s	Terminals
<b>DDLS 200 / 120.1 - 10</b> <b>DDLS 200 / 120.2 - 10</b> 50036282 / 50036283	Opt. data transmission, -5 ... +50°C	120	± 0.5	PROFIBUS 1.5Mbit/s	Terminals
<b>DDLS 200 / 120.1 - 10 - M12</b> <b>DDLS 200 / 120.2 - 10 - M12</b> 50106023 / 50106024	Opt. data transmission, -5 ... +50°C	120	± 0.5	PROFIBUS 1.5Mbit/s	M12 connector
<b>DDLS 200 / 200.1 - 10</b> <b>DDLS 200 / 200.2 - 10</b> 50036280 / 50036281	Opt. data transmission, -5 ... +50°C	200	± 0.5	PROFIBUS 1.5Mbit/s	Terminals
<b>DDLS 200 / 200.1 - 10 - M12</b> <b>DDLS 200 / 200.2 - 10 - M12</b> 50106025 / 50106026	Opt. data transmission, -5 ... +50°C	200	± 0.5	PROFIBUS 1.5Mbit/s	M12 connector
<b>DDLS 200 / 300.1 - 10</b> <b>DDLS 200 / 300.2 - 10</b> 50038284 / 50038285	Opt. data transmission, -5 ... +50°C	300	± 0.5	PROFIBUS 1.5Mbit/s	Terminals
<b>DDLS 200 / 300.1 - 10 - M12</b> <b>DDLS 200 / 300.2 - 10 - M12</b> 50106027 / 50106028	Opt. data transmission, -5 ... +50°C	300	± 0.5	PROFIBUS 1.5Mbit/s	M12 connector
<b>DDLS 200 / 500.1 - 10</b> <b>DDLS 200 / 500.2 - 10</b> 50040131 / 50040132	Opt. data transmission, -5 ... +50°C	500	± 0.5	PROFIBUS 93.75kbit/s	Terminals



An optical data transmission path always consists of a device pair whose individual DDLS 200 units transmit at 2 different frequencies.  
For this reason, please always order a DDLS 200/....1 -... and DDLS 200/....2 -... device pair!

### Accessories / connection cables

More accessories can be found from **page 472** onwards

Part No.	Designation	Features
50104557	K - D M12A - 5P - 5m - PVC	M12 connection cable for PWR, socket axial on one end, 5m
50104559	K - D M12A - 5P - 10m - PVC	M12 connection cable for PWR, socket axial on one end, 10m
see P. 472	KB PB-...	PROFIBUS connection cables, see page 472
50038539	TS 02-4-SA	M12 connector, integrated terminating resistor for BUS OUT
50038937	M12 Cable set PB	M12 connector set for DDLS 200 with PROFIBUS



**DDLS 200**  
Page 380



**DDLS 78**  
Page 398



**DLSP 160 S**  
Page 408

**DDLS 200**  
Data transmission system



Stationary  
bar code  
identification

Mobile  
bar code  
identification

2D-code  
identification

RF  
identification

Industrial  
image processing

Distance meas.  
Positioning

Optical  
data transmission

Networking  
Connector units

Accessories


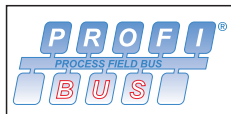

Services

**Features**

- Operating ranges of 30m, 80m, 120m, 200m, 300m, 500m
- Protocol-independent transmission of PROFIBUS DP, FMS, MPI, FMS mixed operation
- Electrically insulated interface
- No PROFIBUS address necessary
- Integrated repeater function (can be switched off)
- With integrated heating operable to -30°C
- Available with either connection terminal or M12 connection
- Possible to cascade multiple DDLS 200 units
- Adjustable baud rates
- RS 485 on consultation with Leuze electronic



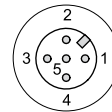
**DDLS 200 / ... - 10 ...**

	<b>Oper. range from 0.2m</b>	<ul style="list-style-type: none"> <li>30m</li> <li>80m</li> <li>120m</li> <li>200m</li> <li>300m</li> <li>500m</li> </ul>
	<b>Baud rate</b>	9.6 kbit/s ... 1.5 Mbit/s
	<b>Protocols</b>	FMS DP MPI RS 485
	<b>Approvals</b>	

**Electrical connection**

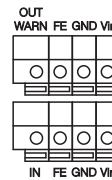
**Power**

M12 - male, A-cod.



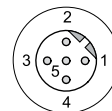
PIN	Signal
1	Vin
2	OUT WARN
3	GND
4	IN/Trans./Rec. off
5	FE

**Terminals**



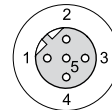
**PROFIBUS**

BUS IN - male, B-cod.



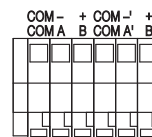
PIN	Signal
1	NC
2	A (N)
3	NC
4	B (P)
5	Shield / FE

BUS OUT - female, B-cod.



PIN	Signal
1	VCC
2	A (N)
3	GND
4	B (P)
5	Shield / FE

**Terminals**



## DATA TRANSMISSION SYSTEMS, PROFIBUS, HEATING

Part description Part No. ....1 -... / ....2 -...	Description	Op. range [m]	Opening angle [°]	Interface	Connection
<b>Optical data transmission systems with integrated heating</b>					
<b>DDLS 200 / 80.1 - 10 - W - H</b> <b>DDLS 200 / 80.2 - 10 - W - H</b> 50102494 / 50102495	Opt. data transmission, -30 ... +50 °C, wide angle, heating	80	± 1.0	PROFIBUS 1.5 Mbit/s	Terminals
<b>DDLS 200 / 120.1 - 10 - H</b> <b>DDLS 200 / 120.2 - 10 - H</b> 50036286 / 50036287	Opt. data transmission, -30 ... +50 °C, heating	120	± 0.5	PROFIBUS 1.5 Mbit/s	Terminals
<b>DDLS 200 / 120.1 - 10 - H - M12</b> <b>DDLS 200 / 120.2 - 10 - H - M12</b> 50106029 / 50106030	Opt. data transmission, -30 ... +50 °C, heating	120	± 0.5	PROFIBUS 1.5 Mbit/s	M12 connector
<b>DDLS 200 / 200.1 - 10 - H</b> <b>DDLS 200 / 200.2 - 10 - H</b> 50036284 / 50036285	Opt. data transmission, -30 ... +50 °C, heating	200	± 0.5	PROFIBUS 1.5 Mbit/s	Terminals
<b>DDLS 200 / 200.1 - 10 - H - M12</b> <b>DDLS 200 / 200.2 - 10 - H - M12</b> 50106031 / 50106032	Opt. data transmission, -30 ... +50 °C, heating	200	± 0.5	PROFIBUS 1.5 Mbit/s	M12 connector
<b>DDLS 200 / 300.1 - 10 - H</b> <b>DDLS 200 / 300.2 - 10 - H</b> 50038286 / 50038287	Opt. data transmission, -30 ... +50 °C, heating	300	± 0.5	PROFIBUS 1.5 Mbit/s	Terminals
<b>DDLS 200 / 300.1 - 10 - H - M12</b> <b>DDLS 200 / 300.2 - 10 - H - M12</b> 50106033 / 50106034	Opt. data transmission, -30 ... +50 °C, heating	300	± 0.5	PROFIBUS 1.5 Mbit/s	M12 connector
<b>DDLS 200 / 500.1 - 10 - H</b> <b>DDLS 200 / 500.2 - 10 - H</b> 50040133 / 50040134	Opt. data transmission, -30 ... +50 °C, heating	500	± 0.5	PROFIBUS 93.75 kbit/s	Terminals



An optical data transmission path always consists of a device pair whose individual DDLS 200 units transmit at 2 different frequencies.

For this reason, please always order a DDLS 200/....1 -... and DDLS 200/....2 -... device pair!

### Accessories / connection cables

More accessories can be found from **page 472** onwards

Part No.	Designation	Features
50104557	K - D M12A - 5P - 5m - PVC	M12 connection cable for PWR, socket axial on one end, 5m
50104559	K - D M12A - 5P - 10m - PVC	M12 connection cable for PWR, socket axial on one end, 10m
see P. 472	KB PB-...	PROFIBUS connection cables, see page 472
50038539	TS 02-4-SA	M12 connector, integrated terminating resistor for BUS OUT
50038937	M12 Cable set PB	M12 connector set for DDLS 200 with PROFIBUS



**DDLS 200**  
Page 380



**DDLS 78**  
Page 398



**DLSP 160 S**  
Page 408

**DDLS 200**  
Data transmission system



Stationary  
bar code  
identification

Mobile  
bar code  
identification

2D-code  
identification

RF  
identification

Industrial  
image processing

Distance meas.  
Positioning

Optical  
data transmission

Networking  
Connector units

Accessories


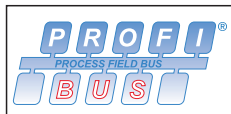

Services

**Features**

- Operating ranges of 30m, 80m, 120m, 200m, 300m, 500m
- Protocol-independent transmission of PROFIBUS DP, FMS, MPI, FMS mixed operation
- Electrically insulated interface
- No PROFIBUS address necessary
- Integrated repeater function (can be switched off)
- With integrated heating operable to -30°C
- Available with either connection terminal or M12 connection
- Possible to cascade multiple DDLS 200 units
- Adjustable baud rates
- RS 485 on consultation with Leuze electronic



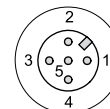
**DDLS 200 / ... - 10 - H ...**

	<b>Oper. range from 0.2m</b>	<ul style="list-style-type: none"> <li>30m</li> <li>80m</li> <li>120m</li> <li>200m</li> <li>300m</li> <li>500m</li> </ul>
	<b>Baud rate</b>	9.6 kbit/s ... 1.5 Mbit/s
	<b>Protocols</b>	FMS DP MPI RS 485
	<b>Approvals</b>	

**Electrical connection**

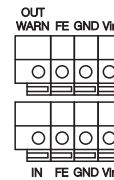
**Power**

M12 - male, A-cod.



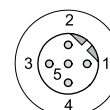
PIN	Signal
1	Vin
2	OUT WARN
3	GND
4	IN/Trans./Rec. off
5	FE

**Terminals**



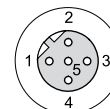
**PROFIBUS**

BUS IN - male, B-cod.



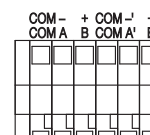
PIN	Signal
1	NC
2	A (N)
3	NC
4	B (P)
5	Shield / FE

BUS OUT - female, B-cod.



PIN	Signal
1	VCC
2	A (N)
3	GND
4	B (P)
5	Shield / FE

**Terminals**



## DATA TRANSMISSION SYSTEMS, INTERBUS/RS 422

Part description Part No. ....1 -... / ....2 -...	Description	Op. range [m]	Opening angle [°]	Interface	Connection
<b>Optical data transmission systems</b>					
<b>DDLS 200 / 30.1 - 20 - W</b> <b>DDLS 200 / 30.2 - 20 - W</b> 50041339 / 50041338	Opt. data transmission, -5 ... +50°C, wide angle version	30	± 1.5	Interbus/ RS 422 500kbit/s	Terminals
<b>DDLS 200 / 80.1 - 20 - W</b> <b>DDLS 200 / 80.2 - 20 - W</b> 50106252 / 50106253	Opt. data transmission, -5 ... +50°C, wide angle version	80	± 1.0	Interbus/ RS 422 500kbit/s	Terminals
<b>DDLS 200 / 120.1 - 20</b> <b>DDLS 200 / 120.2 - 20</b> 50036290 / 50036291	Opt. data transmission, -5 ... +50°C	120	± 0.5	Interbus/ RS 422 500kbit/s	Terminals
<b>DDLS 200 / 200.1 - 20</b> <b>DDLS 200 / 200.2 - 20</b> 50036288 / 50036289	Opt. data transmission, -5 ... +50°C	200	± 0.5	Interbus/ RS 422 500kbit/s	Terminals
<b>DDLS 200 / 300.1 - 20</b> <b>DDLS 200 / 300.2 - 20</b> 50038288 / 50038289	Opt. data transmission, -5 ... +50°C	300	± 0.5	Interbus/ RS 422 500kbit/s	Terminals
<b>DDLS 200 / 500.1 - 20</b> <b>DDLS 200 / 500.2 - 20</b> 50040135 / 50040136	Opt. data transmission, -5 ... +50°C	500	± 0.5	RS 422 100kbit/s	Terminals
<b>Optical data transmission systems with integrated heating</b>					
<b>DDLS 200 / 120.1 - 20 - H</b> <b>DDLS 200 / 120.2 - 20 - H</b> 50036294 / 50036295	Opt. data transmission, -30 ... +50°C, heating	120	± 0.5	Interbus/ RS 422 500kbit/s	Terminals
<b>DDLS 200 / 200.1 - 20 - H</b> <b>DDLS 200 / 200.2 - 20 - H</b> 50036292 / 50036293	Opt. data transmission, -30 ... +50°C, heating	200	± 0.5	Interbus/ RS 422 500kbit/s	Terminals
<b>DDLS 200 / 300.1 - 20 - H</b> <b>DDLS 200 / 300.2 - 20 - H</b> 50038290 / 50038291	Opt. data transmission, -30 ... +50°C, heating	300	± 0.5	Interbus/ RS 422 500kbit/s	Terminals
<b>DDLS 200 / 500.1 - 20 - H</b> <b>DDLS 200 / 500.2 - 20 - H</b> 50040137 / 50040138	Opt. data transmission, -30 ... +50°C, heating	500	± 0.5	RS 422 100kbit/s	Terminals

We reserve the right to make changes • DDLS200\_4\_EN.fm



An optical data transmission path always consists of a device pair whose individual DDLS 200 units transmit at 2 different frequencies.  
For this reason, please always order a DDLS 200/....1 -... and DDLS 200/....2 -... device pair!



**DDLS 200**  
Page 380



**DDLS 78**  
Page 398



**DLSP 160 S**  
Page 408

**DDLS 200**  
Data transmission system



Stationary  
bar code  
identification

Mobile  
bar code  
identification

2D-code  
identification

RF  
identification

Industrial  
image processing

Distance meas.  
Positioning

Optical  
data transmission

Networking  
Connector units

Accessories




Services

**Features**

- Operating ranges of 30m, 80m, 120m, 200m, 300m for Interbus
- Operating range up to 500m for RS 422
- Protocol-independent RS 422 data transmission
- Electrically insulated interface
- The DDLS 200 is not an INTERBUS subscriber
- Baud rate for Interbus fixed at 500kbit/s
- With integrated heating operable to -30°C
- Possible to cascade multiple DDLS 200 units



**DDLS 200 / ... - 20 ...**

 	Oper. range from 0.2m	30m 80m 120m 200m 300m 500m
	Baud rate	100 kbit/s 500 kbit/s
	Protocols	Interbus 500 kbit/s RS 422 500 kbit/s
	Approvals	

**Electrical connection**

Power

Terminals

OUT  
WARN FE GND Vin

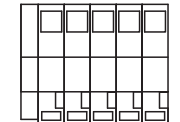


IN FE GND Vin

Interbus / RS 422

Terminals

COM	D11	D11	D01	D01	In
COM	D02	D02	D12	D12	Out
COM	Tx-	Tx+	Rx-	Rx+	



## DATA TRANSMISSION SYSTEMS, INTERBUS, FOC

Part description Part No. ....1 -... / ....2 -...	Description	Op. range [m]	Opening angle [°]	Interface	Connection
<b>Optical data transmission systems</b>					
<b>DDLS 200 / 200.1 - 21</b> <b>DDLS 200 / 200.2 - 21</b> 50036296 / 50036297	Opt. data transmission, -5 ... +50°C	200	± 0.5	Interbus fibre- optic cable 2Mbit/s	Terminals, FOC-plug
<b>DDLS 200 / 300.1 - 21</b> <b>DDLS 200 / 300.2 - 21</b> 50038292 / 50038293	Opt. data transmission, -5 ... +50°C	300	± 0.5	Interbus fibre- optic cable 2Mbit/s	Terminals, FOC-plug
<b>Optical data transmission systems with integrated heating</b>					
<b>DDLS 200 / 200.1 - 21 - H</b> <b>DDLS 200 / 200.2 - 21 - H</b> 50036298 / 50036299	Opt. data transmission, -30 ... +50°C, heating	200	± 0.5	Interbus fibre- optic cable 2Mbit/s	Terminals, FOC-plug
<b>DDLS 200 / 300.1 - 21 - H</b> <b>DDLS 200 / 300.2 - 21 - H</b> 50038294 / 50038295	Opt. data transmission, -30 ... +50°C, heating	300	± 0.5	Interbus fibre- optic cable 2Mbit/s	Terminals, FOC-plug



An optical data transmission path always consists of a device pair whose individual DDLS 200 units transmit at 2 different frequencies.  
For this reason, please always order a DDLS 200/....1 -... and DDLS 200/....2 -... device pair!



**DDLS 200**  
Page 380



**DDLS 78**  
Page 398



**DLSP 160 S**  
Page 408

**DDLS 200**  
Data transmission system



Stationary  
bar code  
identification

**Features**

- Operating ranges of 200m and 300m for Interbus with fibre-optic cable connection
- Transmission protected against interference through the use of fibre-optic cables
- Bus connection by means of polymer-fibre cables with FSMA connector
- The DDLS 200 is an INTERBUS subscriber (Ident-Code: 0x0C = 12<sub>dec</sub>)
- Adjustable transmission rate of 500kBit/s or 2MBit/s
- With integrated heating operable to -30°C
- Possible to cascade multiple DDLS 200 units





Mobile  
bar code  
identification

2D-code  
identification

RF  
identification

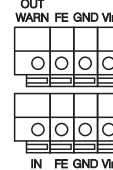
DDLS 200 / ... - 21 ...

	Oper. range from 0.2m	<div style="display: flex; justify-content: space-around;"> <div style="width: 20px; height: 10px; background-color: gray;"></div> 200m             <div style="width: 20px; height: 10px; background-color: gray;"></div> 300m           </div>
	Baud rate	500 kbit/s 2 Mbit/s
	Protocols	Interbus 500 kbit/s Interbus 2 Mbit/s
	Approvals	

**Electrical connection**

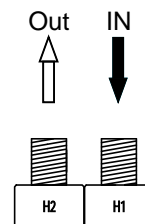
Power

Terminals



Interbus FOC

FSMA connectors



Industrial  
image processing

Distance meas.  
Positioning

Optical  
data transmission

Networking  
Connector units

Accessories

Services



## DATA TRANSMISSION SYSTEMS, DH+/RIO

Part description Part No. ....1 -... / ....2 -...	Description	Op. range [m]	Opening angle [°]	Interface	Connection
<b>Optical data transmission systems</b>					
<b>DDLS 200 / 120.1 - 40</b> <b>DDLS 200 / 120.2 - 40</b> 50038300 / 50038301	Opt. data transmission, -5 ... +50°C	120	± 0.5	DH+ / RIO	Terminals
<b>DDLS 200 / 200.1 - 40</b> <b>DDLS 200 / 200.2 - 40</b> 50036300 / 50036301	Opt. data transmission, -5 ... +50°C	200	± 0.5	DH+ / RIO	Terminals
<b>DDLS 200 / 300.1 - 40</b> <b>DDLS 200 / 300.2 - 40</b> 50038296 / 50038297	Opt. data transmission, -5 ... +50°C	300	± 0.5	DH+ / RIO	Terminals
<b>Optical data transmission systems with integrated heating</b>					
<b>DDLS 200 / 120.1 - 40 - H</b> <b>DDLS 200 / 120.2 - 40 - H</b> 50038302 / 50038303	Opt. data transmission, -30 ... +50°C, heating	120	± 0.5	DH+ / RIO	Terminals
<b>DDLS 200 / 200.1 - 40 - H</b> <b>DDLS 200 / 200.2 - 40 - H</b> 50036302 / 50036303	Opt. data transmission, -30 ... +50°C, heating	200	± 0.5	DH+ / RIO	Terminals
<b>DDLS 200 / 300.1 - 40 - H</b> <b>DDLS 200 / 300.2 - 40 - H</b> 50038298 / 50038299	Opt. data transmission, -30 ... +50°C, heating	300	± 0.5	DH+ / RIO	Terminals



An optical data transmission path always consists of a device pair whose individual DDLS 200 units transmit at 2 different frequencies.  
For this reason, please always order a DDLS 200/....1 -... and DDLS 200/....2 -... device pair!



**DDLS 200**  
Page 380



**DDLS 78**  
Page 398



**DLSP 160 S**  
Page 408

**DDLS 200**  
Data transmission system



Stationary  
bar code  
identification

**Features**

- Operating ranges of 120m, 200m, 300m
- Electrically insulated interface
- Direct connection to the Data Highway + or Remote I/O bus from Rockwell Automation
- The DDLS 200 is not a bus subscriber
- Adjustable transmission rate 57.6kbit/s, 115.2kbit/s or 230.4kbit/s
- With integrated heating operable to -30°C
- Possible to cascade multiple DDLS 200 units






Mobile  
bar code  
identification

2D-code  
identification

RF  
identification

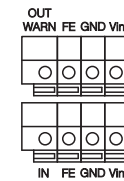
**DDLS 200 / ... - 40 ...**

		<b>Oper. range from 0.2m</b>	<ul style="list-style-type: none"> <li>30m on request</li> <li>80m on request</li> <li>120m</li> <li>200m</li> <li>300m</li> </ul>
		<b>Baud rate</b>	<ul style="list-style-type: none"> <li>57,6 kbit/s</li> <li>115,2 kbit/s</li> <li>230,4 kbit/s</li> </ul>
		<b>Protocols</b>	Data Highway + Remote I/O
		<b>Approvals</b>	

**Electrical connection**

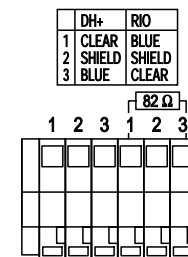
Power

Terminals



DH+ / RIO

Terminals



Industrial  
image processing

Distance meas.  
Positioning

Optical  
data transmission

Networking  
Connector units

Accessories

Services

## DATA TRANSMISSION SYSTEMS, DeviceNet/CANopen

Part description Part No. ....1 -... / ....2 -...	Description	Op. range [m]	Opening angle [°]	Interface	Connection
<b>Optical data transmission systems</b>					
<b>DDLS 200 / 120.1 - 50</b> <b>DDLS 200 / 120.2 - 50</b> 50039937 / 50039938	Opt. data transmission, -5 ... +50°C	120	± 0.5	DeviceNet / CANopen	Terminals
<b>DDLS 200 / 200.1 - 50</b> <b>DDLS 200 / 200.2 - 50</b> 50039939 / 50039940	Opt. data transmission, -5 ... +50°C	200	± 0.5	DeviceNet / CANopen	Terminals
<b>DDLS 200 / 300.1 - 50</b> <b>DDLS 200 / 300.2 - 50</b> 50039941 / 50039942	Opt. data transmission, -5 ... +50°C	300	± 0.5	DeviceNet / CANopen	Terminals
<b>Optical data transmission systems with integrated heating</b>					
<b>DDLS 200 / 120.1 - 50 - H</b> <b>DDLS 200 / 120.2 - 50 - H</b> 50039943 / 50039944	Opt. data transmission, -30 ... +50°C, heating	120	± 0.5	DeviceNet / CANopen	Terminals
<b>DDLS 200 / 200.1 - 50 - H</b> <b>DDLS 200 / 200.2 - 50 - H</b> 50039945 / 50039946	Opt. data transmission, -30 ... +50°C, heating	200	± 0.5	DeviceNet / CANopen	Terminals
<b>DDLS 200 / 300.1 - 50 - H</b> <b>DDLS 200 / 300.2 - 50 - H</b> 50039947 / 50039948	Opt. data transmission, -30 ... +50°C, heating	300	± 0.5	DeviceNet / CANopen	Terminals



An optical data transmission path always consists of a device pair whose individual DDLS 200 units transmit at 2 different frequencies.  
For this reason, please always order a DDLS 200/....1 -... and DDLS 200/....2 -... device pair!

We reserve the right to make changes • DDLS200\_6\_EN.fm

### Accessories / connection cables

More accessories can be found from **page 473** onwards

Part No.	Designation	Features
50039348	M12 Cable set DN/CAN	M12 connector set for DDLS 200 DeviceNet/CANopen
50104557	K - D M12A - 5P - 5m - PVC	M12 connection cable for PWR, socket axial on one end, 5m
50104559	K - D M12A - 5P - 10m - PVC	M12 connection cable for PWR, socket axial on one end, 10m



**DDLS 200**  
Page 380



**DDLS 78**  
Page 398



**DLSP 160 S**  
Page 408

**DDLS 200**  
Data transmission system



Stationary  
bar code  
identification

**Features**

- Operating ranges of 120m, 200m, 300m
- The DDLS 200 can transmit both DeviceNet as well as CANopen protocols
- Electrically insulated interface
- The DDLS 200 does not occupy an address
- CAN controller acc. to 2.0B standard
- Can simultaneously process 11-bit and 29-bit identifiers
- Baud rates can be set (10, 20, 50, 125, 250, 500, 800kBit/s, 1 MBit/s)
- Baud rate conversion possible
- With the DDLS 200 it is possible to extend the overall size of a CAN network
- With integrated heating operable to -30°C
- Possible to cascade multiple DDLS 200 units



Mobile  
bar code  
identification

2D-code  
identification

RF  
identification

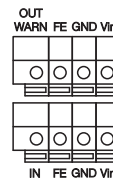
**DDLS 200 / ... - 50 ...**

	<b>Oper. range from 0.2m</b>	<ul style="list-style-type: none"> <li>30m on request</li> <li>80m on request</li> <li>120m</li> <li>200m</li> <li>300m</li> </ul>
<b>CANopen</b>	<b>Baud rate</b>	125 kbit/s 1 Mbit/s
<b>DeviceNet</b>	<b>Protocols</b>	CANopen DeviceNet
	<b>Approvals</b>	

**Electrical connection**

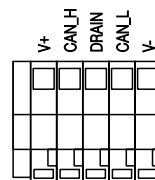
Power

Terminals



DeviceNet/CANopen

Terminals



Industrial  
image processing

Distance meas.  
Positioning

Optical  
data transmission

Networking  
Connector units

Accessories

Services

## DATA TRANSMISSION SYSTEMS, ETHERNET

Part description Part No. ....1 -... / ....2 -...	Description	Op. range [m]	Opening angle [°]	Interface	Connection
<b>Optical data transmission systems</b>					
<b>DDLS 200 / 120.1 - 60</b> <b>DDLS 200 / 120.2 - 60</b> 50040929 / 50040930	Opt. data transmission, -5 ... +50°C	120	± 0.5	Ethernet 10/100Mbit/s	Terminals, RJ45
<b>DDLS 200 / 120.1 - 60 - M12</b> <b>DDLS 200 / 120.2 - 60 - M12</b> 50106035 / 50106036	Opt. data transmission, -5 ... +50°C	120	± 0.5	Ethernet 10/100Mbit/s	M12 connector
<b>DDLS 200 / 200.1 - 60</b> <b>DDLS 200 / 200.2 - 60</b> 50040933 / 50040934	Opt. data transmission, -5 ... +50°C	200	± 0.5	Ethernet 10/100Mbit/s	Terminals, RJ45
<b>DDLS 200 / 200.1 - 60 - M12</b> <b>DDLS 200 / 200.2 - 60 - M12</b> 50106037 / 50106038	Opt. data transmission, -5 ... +50°C	200	± 0.5	Ethernet 10/100Mbit/s	M12 connector
<b>DDLS 200 / 300.1 - 60</b> <b>DDLS 200 / 300.2 - 60</b> 50040937 / 50040938	Opt. data transmission, -5 ... +50°C	300	± 0.5	Ethernet 10/100Mbit/s	Terminals, RJ45
<b>DDLS 200 / 300.1 - 60 - M12</b> <b>DDLS 200 / 300.2 - 60 - M12</b> 50106039 / 50106040	Opt. data transmission, -5 ... +50°C	300	± 0.5	Ethernet 10/100Mbit/s	M12 connector



An optical data transmission path always consists of a device pair whose individual DDLS 200 units transmit at 2 different frequencies.  
For this reason, please always order a DDLS 200/....1 -... and DDLS 200/....2 -... device pair!

### Accessories / connection cables

More accessories can be found from **page 473** onwards

Part No.	Designation	Features
50104557	K - D M12A - 5P - 5m - PVC	M12 connection cable for PWR, socket axial on one end, 5m
50104559	K - D M12A - 5P - 10m - PVC	M12 connection cable for PWR, socket axial on one end, 10m
see P. 469	KB ET - ... - SA	M12 data lines: Industrial Ethernet (D-coded)



**DDLS 200**  
Page 380



**DDLS 78**  
Page 398



**DLSP 160 S**  
Page 408

**DDLS 200**  
Data transmission system



Stationary  
bar code  
identification

**Features**

- Operating ranges of 120m, 200m, 300m
- Supports 10Base-T and 100Base-TX (half and full duplex)
- Supports autopolarity and autonegotiation
- Frames up to 1522 bytes in length
- The DDLS 200 does not occupy a MAC or IP address
- Transmission of all protocols that are based on TCP/IP and UDP
- RJ45 connector, screwed cable gland provides IP 65
- Optional M12 connector version (D-coded)
- Increased network expandability owing to optical data transmission
- With integrated heating operable to -30°C
- Possible to cascade multiple DDLS 200 units



Mobile  
bar code  
identification

2D-code  
identification

RF  
identification

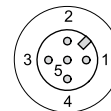
**DDLS 200 / ... - 60 ...**

	<b>Oper. range from 0.2m</b>	<ul style="list-style-type: none"> <li>30m on request</li> <li>80m on request</li> <li>120m</li> <li>200m</li> <li>300m</li> </ul>
	<b>Baud rate</b>	<ul style="list-style-type: none"> <li>10 Mbit/s</li> <li>100 Mbit/s</li> </ul>
	<b>Protocols</b>	<b>All protocols are based on TCP/IP and UDP</b>
	<b>Approvals</b>	

**Electrical connection**

**Power**

M12 - male, A-cod.



PIN	Signal
1	Vin
2	OUT WARN
3	GND
4	IN
5	FE

**Terminals**

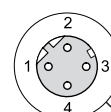
OUT WARN FE GND Vin



IN FE GND Vin

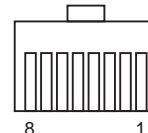
**Industrial Ethernet**

M12 - female, D-cod.



PIN	Signal
1	TD+
2	RD+
3	TD-
4	RD-
SH	Shield

**RJ45**



PIN	Signal
1	TD+
2	TD-
3	RD+
4	NC
5	NC
6	RD-
7	NC
8	NC

Industrial  
image processing

Distance meas.  
Positioning

Optical  
data transmission

Networking  
Connector units

Accessories

Services

## DATA TRANSMISSION SYSTEMS, ETHERNET, HEATING

Part description Part No. ....1 -... / ....2 -...	Description	Op. range [m]	Opening angle [°]	Interface	Connection
<b>Optical data transmission systems with integrated heating</b>					
<b>DDLS 200 / 120.1 - 60 - H</b> <b>DDLS 200 / 120.2 - 60 - H</b> 50040931 / 50040932	Opt. data transmission, -30 ... +50 °C, heating	120	± 0.5	Ethernet 10/100Mbit/s	Terminals, RJ45
<b>DDLS 200 / 120.1 - 60 - H - M12</b> <b>DDLS 200 / 120.2 - 60 - H - M12</b> 50106041 / 50106042	Opt. data transmission, -30 ... +50 °C, heating	120	± 0.5	Ethernet 10/100Mbit/s	M12 connector
<b>DDLS 200 / 200.1 - 60 - H</b> <b>DDLS 200 / 200.2 - 60 - H</b> 50040935 / 50040936	Opt. data transmission, -30 ... +50 °C, heating	200	± 0.5	Ethernet 10/100Mbit/s	Terminals, RJ45
<b>DDLS 200 / 200.1 - 60 - H - M12</b> <b>DDLS 200 / 200.2 - 60 - H - M12</b> 50106043 / 50106044	Opt. data transmission, -30 ... +50 °C, heating	200	± 0.5	Ethernet 10/100Mbit/s	M12 connector
<b>DDLS 200 / 300.1 - 60 - H</b> <b>DDLS 200 / 300.2 - 60 - H</b> 50040939 / 50040940	Opt. data transmission, -30 ... +50 °C, heating	300	± 0.5	Ethernet 10/100Mbit/s	Terminals, RJ45
<b>DDLS 200 / 300.1 - 60 - H - M12</b> <b>DDLS 200 / 300.2 - 60 - H - M12</b> 50106045 / 50106046	Opt. data transmission, -30 ... +50 °C, heating	300	± 0.5	Ethernet 10/100Mbit/s	M12 connector



An optical data transmission path always consists of a device pair whose individual DDLS 200 units transmit at 2 different frequencies.  
For this reason, please always order a DDLS 200/....1 -... and DDLS 200/....2 -... device pair!

### Accessories / connection cables

More accessories can be found from **page 473** onwards

Part No.	Designation	Features
50104557	K - D M12A - 5P - 5m - PVC	M12 connection cable for PWR, socket axial on one end, 5m
50104559	K - D M12A - 5P - 10m - PVC	M12 connection cable for PWR, socket axial on one end, 10m
see P. 469	KB ET - ... - SA	M12 data lines: Industrial Ethernet (D-coded)



**DDLS 200**  
Page 380



**DDLS 78**  
Page 398



**DLSP 160 S**  
Page 408

**DDLS 200**  
Data transmission system



Stationary  
bar code  
identification

**Features**

- Operating ranges of 120m, 200m, 300m
- Supports 10Base-T and 100Base-TX (half and full duplex)
- Supports autopolarity and autonegotiation
- Frames up to 1522 bytes in length
- The DDLS 200 does not occupy a MAC or IP address
- Transmission of all protocols that are based on TCP/IP and UDP
- RJ45 connector, screwed cable gland provides IP 65
- Optional M12 connector version (D-coded)
- Increased network expandability owing to optical data transmission
- With integrated heating operable to -30°C
- Possible to cascade multiple DDLS 200 units



Mobile  
bar code  
identification

2D-code  
identification

RF  
identification

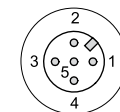
**DDLS 200 / ... - 60 ...**

	<b>Oper. range from 0.2m</b>	<ul style="list-style-type: none"> <li>30m on request</li> <li>80m on request</li> <li>120m</li> <li>200m</li> <li>300m</li> </ul>
	<b>Baud rate</b>	<ul style="list-style-type: none"> <li>10 Mbit/s</li> <li>100 Mbit/s</li> </ul>
	<b>Protocols</b>	All protocols are based on TCP/IP and UDP
	<b>Approvals</b>	

**Electrical connection**

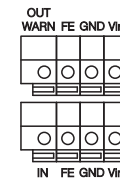
**Power**

M12 - male, A-cod.



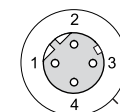
PIN	Signal
1	Vin
2	OUT WARN
3	GND
4	IN
5	FE

**Terminals**



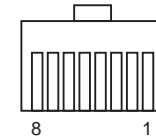
**Industrial Ethernet**

M12 - female, D-cod.



PIN	Signal
1	TD+
2	RD+
3	TD-
4	RD-
SH	Shield

**RJ45**



PIN	Signal
1	TD+
2	TD-
3	RD+
4	NC
5	NC
6	RD-
7	NC
8	NC

Industrial  
image processing

Distance meas.  
Positioning

Optical  
data transmission

Networking  
Connector units

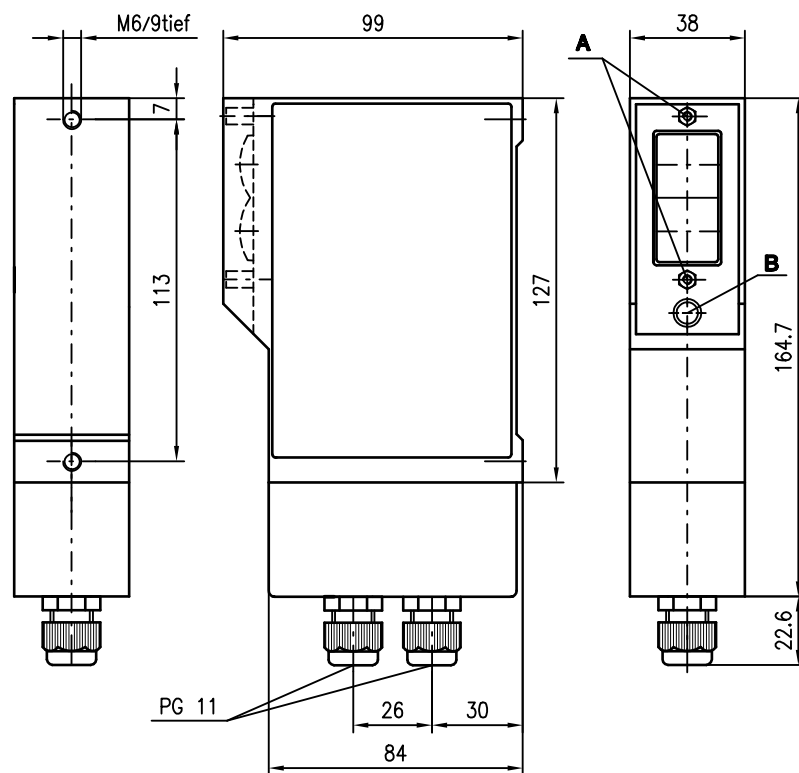
Accessories

Services



## OVERVIEW

### Dimensioned drawing



- A** Bolts for fastening the laser-alignment aid
- B** Multifunction display diode

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


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**DLSP 160 S**  
Page 408

# OPTICAL DATA TRANSMISSION SYSTEMS DDLS 78

Optical data transmission systems	Interface <sup>1)</sup>	Page
 DDLS 78... DDLS 78... + IM 04-RS485 DDLS 78... + IM 01-RS422 DDLS 78... + IM 01-RS232	TTY (20mA) PROFIBUS / RS 485 RS 422 RS 232	400

1) Depending on selected IM... interface module



Common technical data		
<b>Electrical data</b>	Operating voltage $U_B$	12 ... 30VDC
	Current consumption	≤ 300mA
	Interface	TTY (20mA), optional RS 232, RS 422 or RS 485 via interface modules
	Inputs	activation input, carrier frequency changeover
	Outputs	warning output, error output, message output (alignment)
<b>Indicators</b>	LED (multicolor)	alignment
<b>Mechanical data</b>	Housing	diecast aluminum
	Optics	glass
	Weight	approx. 340g
<b>Environmental data</b>	Ambient temperature operation (storage)	w/o heating: -20 ... +60°C w. heating: -35 ... +60°C (-30 ... +70°C)
	Protection class	IP 65
	Air humidity	< 90% (non-cond.)
<b>Optical data</b>	Light source	DDLS 78.6.1: LED, red light others: LED, infrared light
	LED class	1 (EN 60825-1:1994+A1+A2)

## Features

- Full-duplex transmission in one housing
- A transmission path consists of 2 identical devices
- Electrically insulated interfaces
- Insensitive to extraneous light through FSK modulation
- Fast and simple alignment with multifunction LED
- With optics heating for operation at temperatures as low as -35°C



Stationary bar code identification

Mobile bar code identification

2D-code identification

RF identification

Industrial image processing

Distance meas. Positioning

Optical data transmission

Networking Connector units

Accessories

Services

## SERIAL DATA TRANSMISSION SYSTEMS, PROFIBUS

Part description Part No.	Description	Op. range [m]	Opening angle [°]	Baud rate [kbit/s]	Connection
<b>Serial optical data transmission systems</b>					
<b>DDLS 78.5</b> 50017928	Opt. data transmission, infrared light, -20 ... +60°C	120	± 1.5	9,6	see connection unit AT 78 ...
<b>DDLS 78.6</b> 50018692	Opt. data transmission, infrared light, -35 ... +60°C, optics heating	200	± 1.5	19,2	see connection unit AT 78 ...
<b>DDLS 78.6.1</b> 50021128	Opt. data transmission, red light, -35 ... +60°C, optics heating	120	± 1.5	19,2	see connection unit AT 78 ...
<b>DDLS 78.7</b> 50020024	Opt. data transmission, infrared light, -35 ... +60°C, optics heating	200	± 1.5	38,4	see connection unit AT 78 ...
<b>Interface module</b>					
<b>IM 04 - RS485</b> 50025583	PROFIBUS Interface module				
<b>Connection unit</b>					
<b>AT 78 - 01</b> 50021454	Connection unit for DDLS 78, solder connection				
<b>AT 78 - 02</b> 50021455	Connection unit for DDLS 78, terminal connection				



An optical data transmission path always consists of two identical DDLS 78.  
For this reason, please always order 2 devices with the appropriate interface modules and connection units!

### Accessories / connection cables

More accessories can be found from **page 460** onwards

Part No.	Designation	Features
50006902	BT 16	Fastening/alignment system with wobble plate for DDLS 78
50023547	ARH 2	Laser alignment aid with battery operation for DDLS 78



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**DLSP 160 S**  
Page 408

**DDLS 78**  
Data transmission system



Stationary  
bar code  
identification

Mobile  
bar code  
identification

2D-code  
identification

RF  
identification

Industrial  
image processing

Distance meas.  
Positioning

Optical  
data transmission

Networking  
Connector units

Accessories

Services

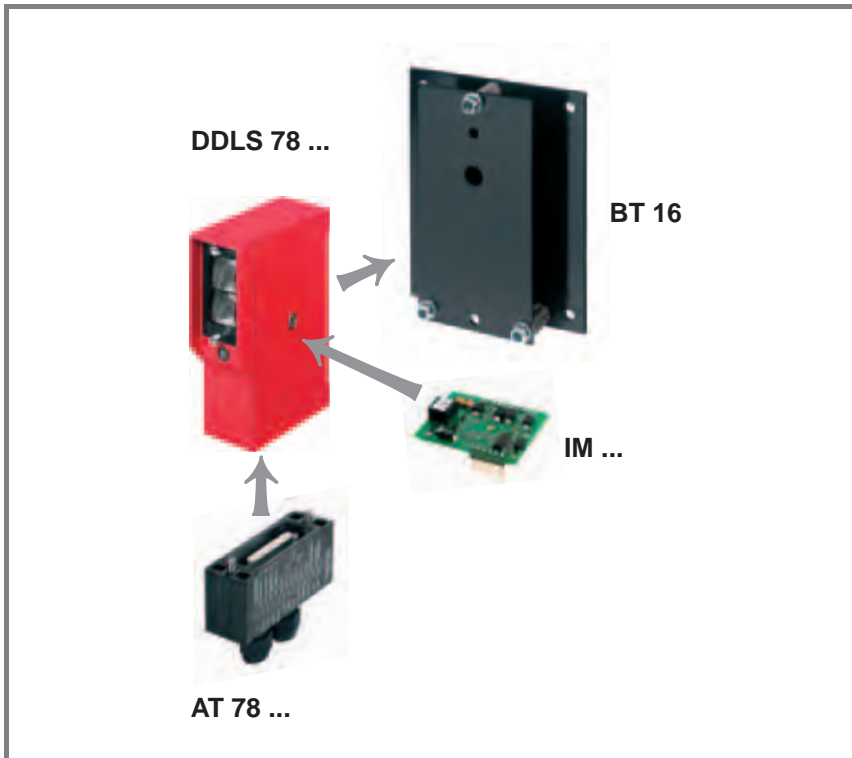
**Features**

- Full-duplex transmission in one housing
- A transmission path consists of 2 identical devices
- Electrically insulated interfaces
- Insensitive to extraneous light through FSK transmission technology
- Fast and simple alignment with multifunction LED
- With optics heating for operation at temperatures as low as -35°C



**Modular construction**

**DDLS 78**



**Electrical connection**

PROFIBUS / RS 485

Sub-D - male, 25-PIN

1 2 3 4 5 6 7 8 9 10 11 12 13



14 15 16 17 18 19 20 21 22 23 24 25

PIN	Signal
1	FE
2	-T/R
3	PULL-UP 2.2 kΩ
4	res.
5	res.
6	res.
7	res.
8	IN f SELECT
9	VIN
10	GND
11	IN ACTIVATE
12	OUT FAULT
13	OUT WARN
14	+T/R
15	SHIELD
16	PULL-DOWN 2.2 kΩ
17	res.
18	res.
19	res.
20	res.
21	res.
22	res.
23	res.
24	OUT MEAS
25	GND OUT

## SERIAL DATA TRANSMISSION SYSTEMS, TTY (20mA)

Part description Part No.	Description	Op. range [m]	Opening angle [°]	Baud rate [kbit/s]	Connection
<b>Serial optical data transmission systems</b>					
<b>DDLS 78.5</b> 50017928	Opt. data transmission, infrared light, -20 ... +60°C	120	± 1.5	9,6	see connection unit AT 78 ...
<b>DDLS 78.6</b> 50018692	Opt. data transmission, infrared light, -35 ... +60°C, optics heating	200	± 1.5	19,2	see connection unit AT 78 ...
<b>DDLS 78.6.1</b> 50021128	Opt. data transmission, red light, -35 ... +60°C, optics heating	120	± 1.5	19,2	see connection unit AT 78 ...
<b>DDLS 78.7</b> 50020024	Opt. data transmission, infrared light, -35 ... +60°C, optics heating	200	± 1.5	38,4	see connection unit AT 78 ...
<b>Interface module</b>					
<b>IM 01 - TTY</b>	TTY (20mA) interface module, <b>integrated as standard feature in all DDLS 78 models</b>				
<b>Connection unit</b>					
<b>AT 78 - 01</b> 50021454	Connection unit for DDLS 78, solder connection				
<b>AT 78 - 02</b> 50021455	Connection unit for DDLS 78, terminal connection				



An optical data transmission path always consists of two identical DDLS 78.  
For this reason, please always order 2 devices with the appropriate connection units!

### Accessories / connection cables

More accessories can be found from **page 460** onwards

Part No.	Designation	Features
50006902	BT 16	Fastening/alignment system with wobble plate for DDLS 78
50023547	ARH 2	Laser alignment aid with battery operation for DDLS 78



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**DDLS 78**  
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**DLSP 160 S**  
Page 408

**DDLS 78**  
Data transmission system



Stationary  
bar code  
identification

**Features**

- Full-duplex transmission in one housing
- A transmission path consists of 2 identical devices
- Electrically insulated interfaces
- Insensitive to extraneous light through FSK transmission technology
- Fast and simple alignment with multifunction LED
- With optics heating for operation at temperatures as low as -35°C



Mobile  
bar code  
identification

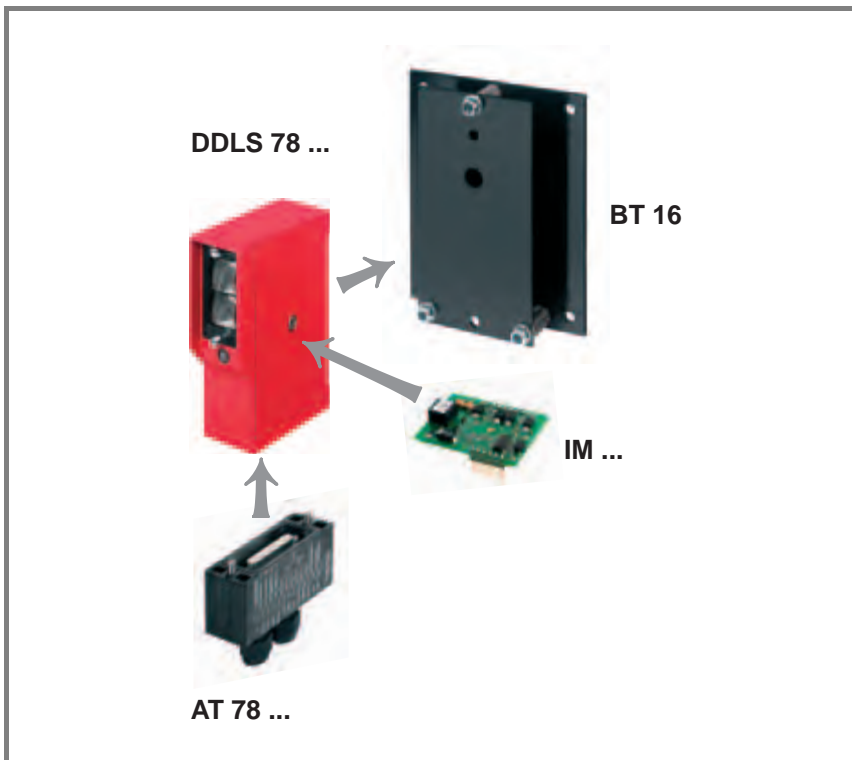
2D-code  
identification

RF  
identification



**Modular construction**

**DDLS 78**



**Electrical connection**

TTY (20 mA)

Sub-D - male, 25-PIN

1 2 3 4 5 6 7 8 9 10 11 12 13



14 15 16 17 18 19 20 21 22 23 24 25

PIN	Signal
1	FE
2	res.
3	res.
4	res.
5	res.
6	res.
7	res.
8	IN f SELECT
9	VIN
10	GND
11	IN ACTIVATE
12	OUT FAULT
13	OUT WARN
14	res.
15	res.
16	res.
17	res.
18	REF Tx
19	Tx+
20	Tx-
21	Rx+
22	Rx-
23	REF Rx
24	OUT MEAS
25	GND OUT

Industrial  
image processing

Distance meas.  
Positioning

Optical  
data transmission

Networking  
Connector units

Accessories

Services

## SERIAL DATA TRANSMISSION SYSTEMS, RS 422

Part description Part No.	Description	Op. range [m]	Opening angle [°]	Baud rate [kbit/s]	Connection
<b>Serial optical data transmission systems</b>					
<b>DDLS 78.5</b> 50017928	Opt. data transmission, infrared light, -20 ... +60°C	120	± 1.5	9,6	see connection unit AT 78 ...
<b>DDLS 78.6</b> 50018692	Opt. data transmission, infrared light, -35 ... +60°C, optics heating	200	± 1.5	19,2	see connection unit AT 78 ...
<b>DDLS 78.6.1</b> 50021128	Opt. data transmission, red light, -35 ... +60°C, optics heating	120	± 1.5	19,2	see connection unit AT 78 ...
<b>DDLS 78.7</b> 50020024	Opt. data transmission, infrared light, -35 ... +60°C, optics heating	200	± 1.5	38,4	see connection unit AT 78 ...
<b>Interface module</b>					
<b>IM 01 - RS422</b> 50021537	RS 422 interface module				
<b>Connection unit</b>					
<b>AT 78 - 01</b> 50021454	Connection unit for DDLS 78, solder connection				
<b>AT 78 - 02</b> 50021455	Connection unit for DDLS 78, terminal connection				



An optical data transmission path always consists of two identical DDLS 78.  
For this reason, please always order 2 devices with the appropriate interface modules and connection units!

### Accessories / connection cables

More accessories can be found from **page 460** onwards

Part No.	Designation	Features
50006902	BT 16	Fastening/alignment system with wobble plate for DDLS 78
50023547	ARH 2	Laser alignment aid with battery operation for DDLS 78



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**DDLS 78**  
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**DDLS 78**  
Data transmission system



Stationary bar code identification

Mobile bar code identification

2D-code identification

RF identification

Industrial image processing

Distance meas. Positioning

Optical data transmission

Networking Connector units

Accessories

Services

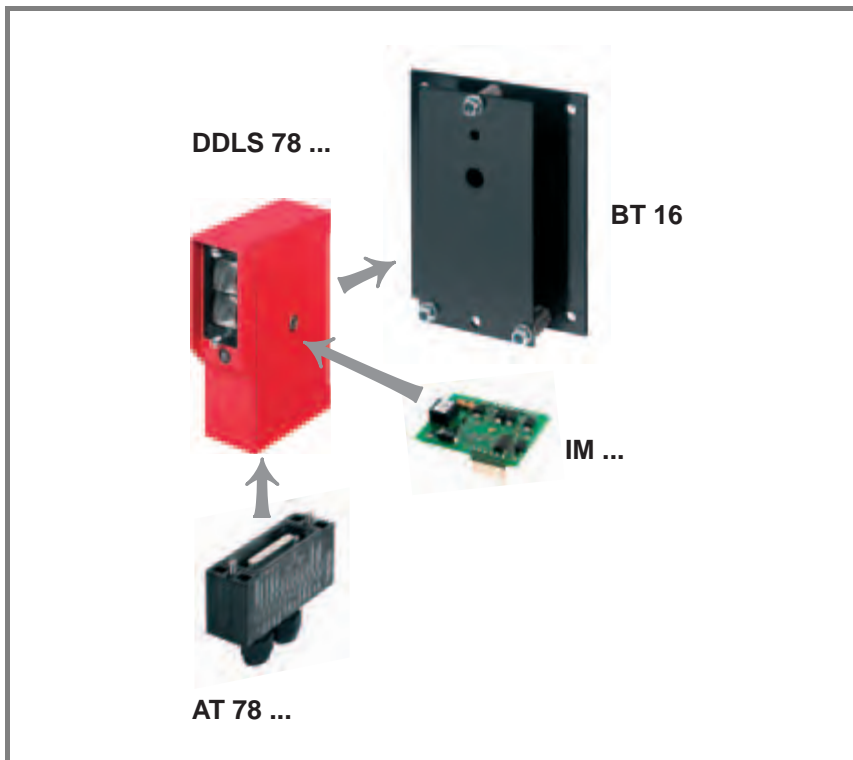
**Features**

- Full-duplex transmission in one housing
- A transmission path consists of 2 identical devices
- Electrically insulated interfaces
- Insensitive to extraneous light through FSK transmission technology
- Fast and simple alignment with multifunction LED
- With optics heating for operation at temperatures as low as -35°C



**Modular construction**

**DDLS 78**



**Electrical connection**

RS 422

Sub-D - male, 25-PIN

1 2 3 4 5 6 7 8 9 10 11 12 13



14 15 16 17 18 19 20 21 22 23 24 25

PIN	Signal
1	FE
2	TxD+
3	RxD+
4	RTS+
5	CTS+
6	SHIELD
7	GND RS422
8	IN f SELECT
9	VIN
10	GND
11	IN ACTIVATE
12	OUT FAULT
13	OUT WARN
14	TxD-
15	RxD-
16	RTS-
17	CTS-
18	res.
19	res.
20	res.
21	res.
22	res.
23	res.
24	OUT MEAS
25	GND OUT



## SERIAL DATA TRANSMISSION SYSTEMS, RS 232

Part description Part No.	Description	Op. range [m]	Opening angle [°]	Baud rate [kbit/s]	Connection
<b>Serial optical data transmission systems</b>					
<b>DDLS 78.5</b> 50017928	Opt. data transmission, infrared light, -20 ... +60°C	120	± 1.5	9,6	see connection unit AT 78 ...
<b>DDLS 78.6</b> 50018692	Opt. data transmission, infrared light, -35 ... +60°C, optics heating	200	± 1.5	19,2	see connection unit AT 78 ...
<b>DDLS 78.6.1</b> 50021128	Opt. data transmission, red light, -35 ... +60°C, optics heating	120	± 1.5	19,2	see connection unit AT 78 ...
<b>DDLS 78.7</b> 50020024	Opt. data transmission, infrared light, -35 ... +60°C, optics heating	200	± 1.5	38,4	see connection unit AT 78 ...
<b>Interface module</b>					
<b>IM 01 - RS232</b> 50021536	RS 232 interface module				
<b>Connection unit</b>					
<b>AT 78 - 01</b> 50021454	Connection unit for DDLS 78, solder connection				
<b>AT 78 - 02</b> 50021455	Connection unit for DDLS 78, terminal connection				



An optical data transmission path always consists of two identical DDLS 78.  
For this reason, please always order 2 devices with the appropriate interface modules and connection units!

### Accessories / connection cables

More accessories can be found from **page 460** onwards

Part No.	Designation	Features
50006902	BT 16	Fastening/alignment system with wobble plate for DDLS 78
50023547	ARH 2	Laser alignment aid with battery operation for DDLS 78



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**DDLS 78**  
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**DDLS 78**  
Data transmission system



Stationary bar code identification

Mobile bar code identification

2D-code identification

RF identification

Industrial image processing

Distance meas. Positioning

Optical data transmission

Networking Connector units

Accessories

Services

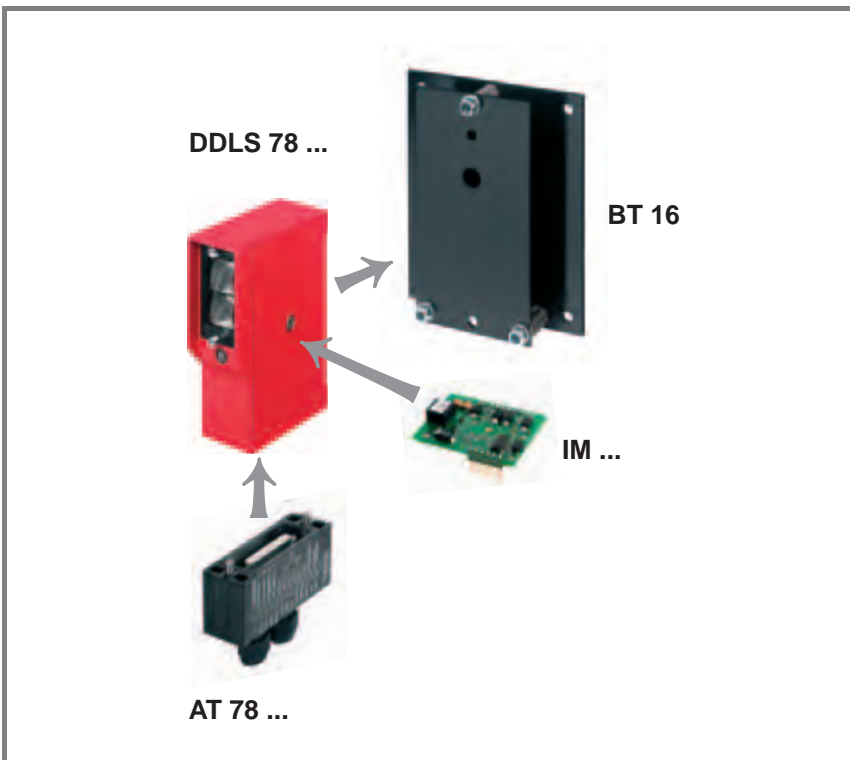
**Features**

- Full-duplex transmission in one housing
- A transmission path consists of 2 identical devices
- Electrically insulated interfaces
- Insensitive to extraneous light through FSK transmission technology
- Fast and simple alignment with multifunction LED
- With optics heating for operation at temperatures as low as -35°C



**Modular construction**

**DDLS 78**



**Electrical connection**

RS 232

Sub-D - male, 25-PIN

1 2 3 4 5 6 7 8 9 10 11 12 13

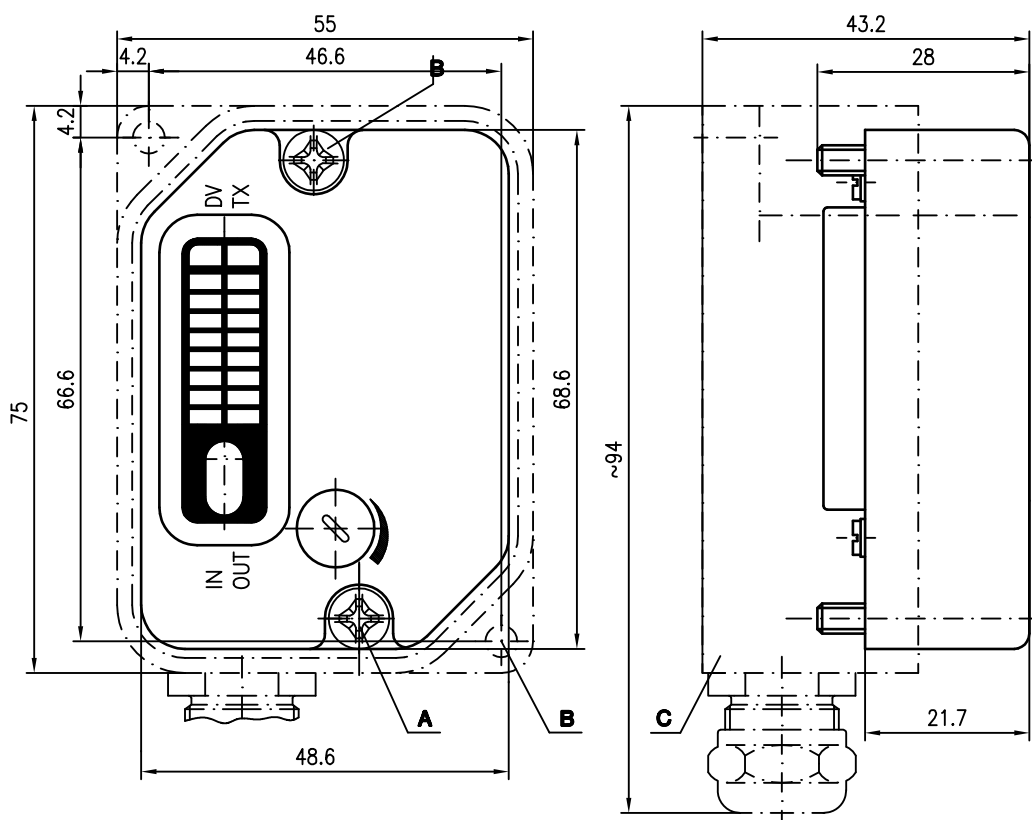


14 15 16 17 18 19 20 21 22 23 24 25

PIN	Signal
1	FE
2	TxD+
3	RxD+
4	RTS+
5	CTS+
6	SHIELD
7	SHIELD
8	IN f SELECT
9	VIN
10	GND
11	IN ACTIVATE
12	OUT FAULT
13	OUT WARN
14	GND RS232
15	GND RS232
16	GND RS232
17	GND RS232
18	res.
19	res.
20	res.
21	res.
22	res.
23	res.
24	OUT MEAS
25	GND OUT

## OVERVIEW

### Dimensioned drawing



- A** Fastening screws M4 x 25
- B** Attachment holes  $\varnothing$  4.2
- C** AT 160 - 01 / AT 160 - 02

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**DDLS 78**  
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**DLSP 160 S**  
Page 408

# OPTICAL DATA TRANSMISSION SYSTEMS DLSP 160 S


Optical data transmission systems	Page
 <p>The DLSP 160 S data transmission system transmits 24VDC signals contact-free. Each device is equipped with both 8 inputs and 8 outputs. The transmitter converts the input signals into a serial telegram. An invisible light beam transmits this telegram to the receiver where the telegram is output at the outputs as electrical signals. Data transmission occurs simultaneously in both directions.</p>	410



Common technical data		
<b>Electrical data</b>	Operating voltage $U_B$	16 ... 35VDC
	Current consumption	approx. 130mA
	Interface	8 bit parallel
	Inputs	8
	Outputs	8
<b>Indicators</b>	16 LEDs	state and diagnostics
<b>Mechanical data</b>	Housing	aluminium, anodised
	Optics	glass
	Weight	approx. 200g
<b>Environmental data</b>	Ambient temp. (operation/storage)	-20 ... +60°C / -30 ... +70°C
	Protection class	IP 65
	Air humidity	< 90 % (non-cond.)
<b>Optical data</b>	Light source	LED, infrared light
	LED class	1 (EN 60825-1:1994+A1+A2)
	Modulation	PPM (pulse pause module.)
	Opening angle	$\pm 20^\circ$
	Data exchange time	< 400µs
	Extraneous light	> 30,000Lux

**Features**

- **Low space requirements**
- **Fast mounting with 2-part device: 1 connection plate for mounting and 1 plug-on electronic unit**
- **Fast installation through efficient connection system (soldering, ribbon cable, spring terminals)**
- **Transmitter and receiver in one housing (same device)**
- **Simple and fast alignment thanks to large opening angle**
- **Problem-free commissioning through display of the inputs and outputs**
- **No adjustment of the transmission parameters necessary**



Stationary bar code identification

Mobile bar code identification

2D-code identification

RF identification

Industrial image processing

Distance meas. Positioning

Optical data transmission

Networking Connector units

Accessories

Services

## PARALLEL DATA TRANSMISSION SYSTEMS

Part description Part No.	Description	Op. range [m]	Opening angle [°]	Interface	Connection
<b>Parallel optical data transmission systems</b>					
<b>DLSP 160 S</b> 50021432	Opt. data transmission, infrared light	2,8	± 20	8 bit parallel, 24VDC	see connection unit AT 160 ...
<b>Connection unit</b>					
<b>AT 160 - 01</b> 50022008	Connection unit for DLSP 160 S, solder connection				
<b>AT 160 - 02</b> 50022009	Connection unit for DLSP 160 S, ribbon cable				
<b>AT 160 - 03</b> 50024059	Connection unit for DLSP 160 S, spring terminals				



An optical data transmission path always consists of two identical DLSP 160 S.  
For this reason, please always order 2 devices with the appropriate connection units!



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**DDLS 78**  
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**DLSP 160 S**  
Page 408

**DLSP 160 S**  
Data transmission system



Stationary  
bar code  
identification

**Features**

- Low space requirements
- Fast mounting with 2-part device: 1 connection plate for mounting and 1 plug-on electronic unit
- Fast installation through efficient connection system (soldering, ribbon cable, spring terminals)
- Transmitter and receiver in one housing (same device)
- Simple and fast alignment thanks to large opening angle
- Problem-free commissioning through display of the inputs and outputs
- No adjustment of the transmission parameters necessary

Mobile  
bar code  
identification

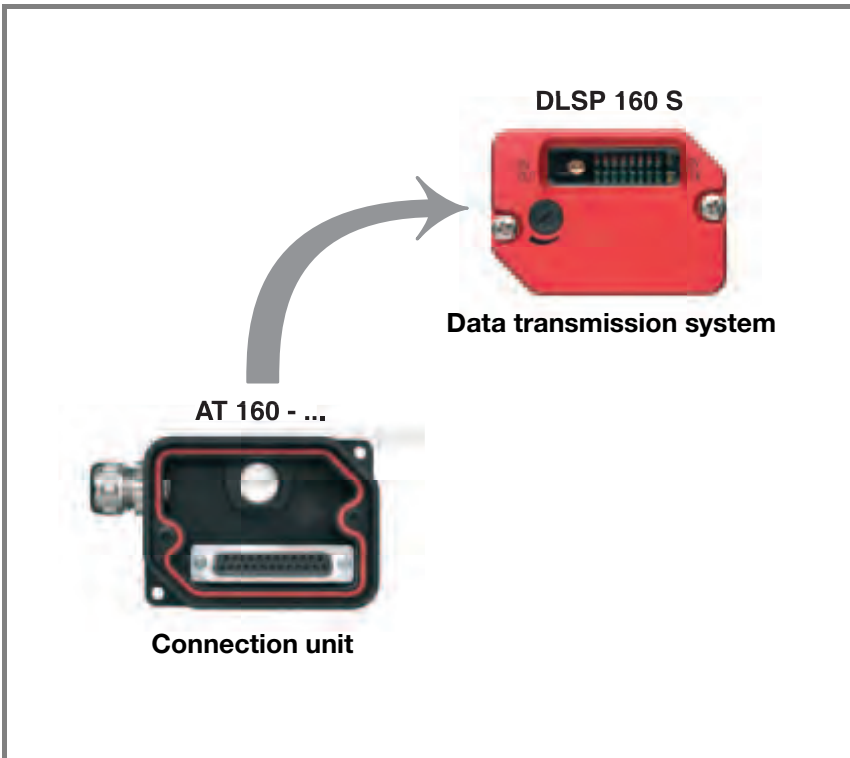
2D-code  
identification

RF  
identification



**Modular construction**

DLSP 160 S



**Electrical connection**

AT 160-01 AT 160-02 PIN	AT 160-03 PIN	Signal
1	1	FE
2	2	VIN
3	3	GND
4	4	DI8
5	5	DI7
6	6	DI6
7	7	DI5
8	8	DI4
9	9	DI3
10	10	DI2
11	11	DI1
12	12	res.
15	13	DATA VALID
16	14	DO8
17	15	DO7
18	16	DO6
19	17	DO5
20	18	DO4
21	19	DO3
22	20	DO2
23	21	DO1
24	22	OUTPUT ENABLE
25	23	TRANSMIT DATA
13	24	res.
14	25	res.

Industrial  
image processing

Distance meas.  
Positioning

Optical  
data transmission

Networking  
Connector units

Accessories

Services