



Data transmission  
photoelectric  
switches

# ISD: Data transmission photoelectric switches use infrared transmission to replace cable connections



The principal advantages of infrared data transmission are:

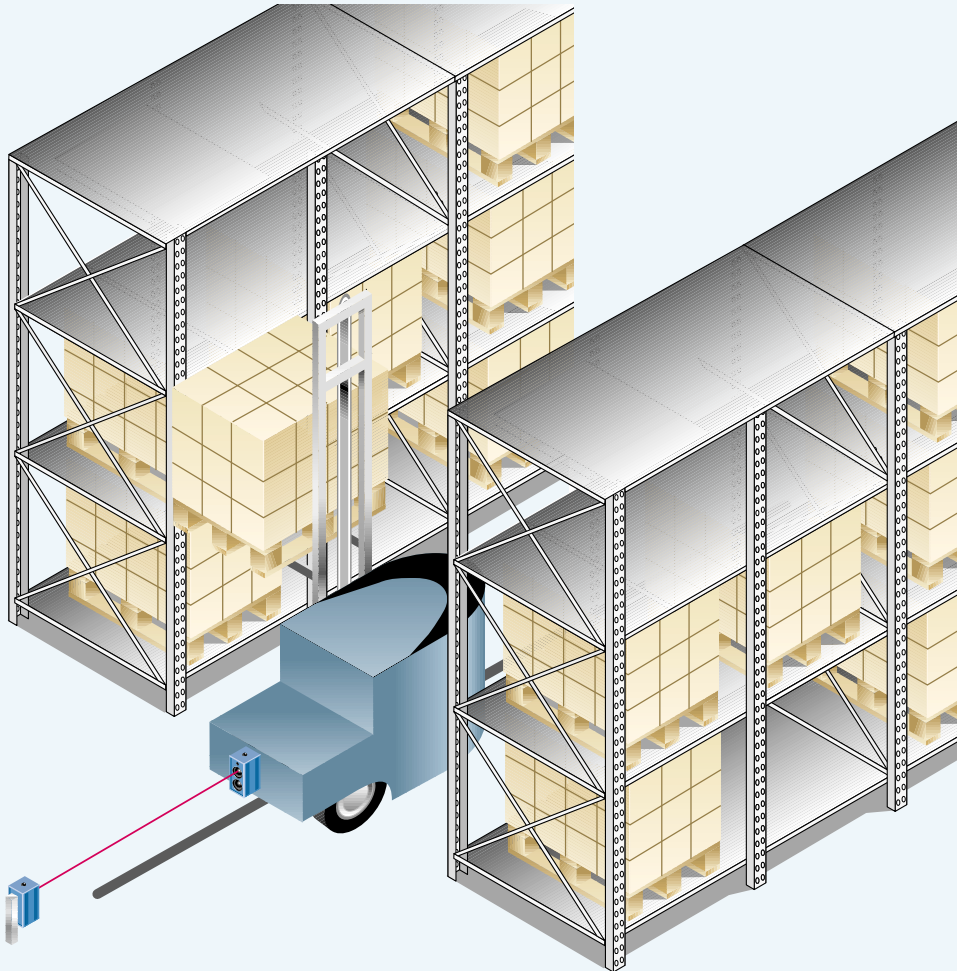
- low cable installation and maintenance costs,
- high level immunity against electromagnetic interference,
- high insensitivity to ambient light thanks to integrated daylight filter and modulation,
- sturdy metal housing,
- fast installation using integrated optical alignment aid,
- diagnosis display,
- electrical isolation of data interface and voltage supply (ISD 260/280),
- fast and simple assembly by means of three-point bracket (accessory),
- compatible with Profibus (ISD 260/280),
- compatible with Interbus-S (ISD 260/280),
- compatible with SSI (ISD 280).

The ISD infrared data transmission system enables cable-free data transmission to rail-mounted vehicles along the light beam.

This system is a friction-free alternative to trailing cables, e.g. with high-bay stackers. The system consists of a device pair, i.e. optical data sender and receiver.

Both units can communicate in both directions over large distances. The point-to-point light beam is monitored during data transmission. Interruption of the light beam is indicated both optically on the device and signalled via a special function interface.

► ISD infrared data transmission systems enable cable-free connection of high-bay stackers to the control components of, for example, Profibus DP. Trailing cables are no longer necessary.



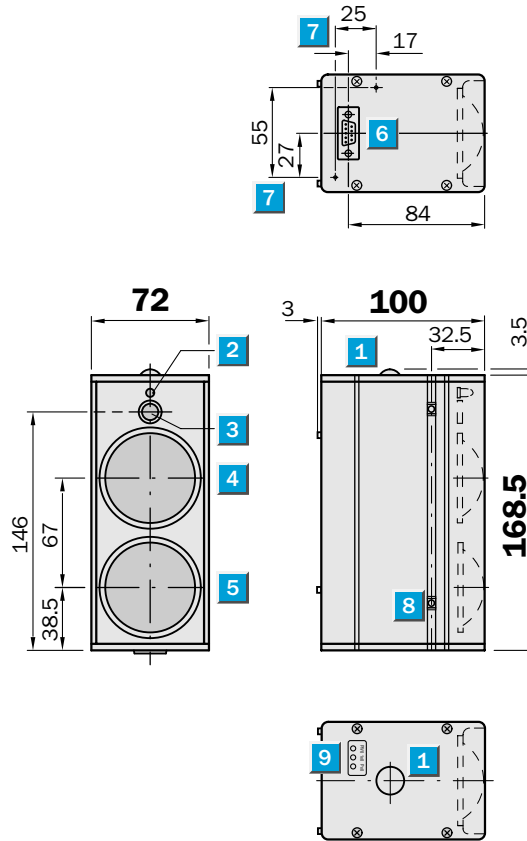
▲ The ISD data transmission system is ideal for use in, for example, aisles of high-bay warehouses. The system ensures high functionality, reliable transmission, simple installation and fast system alignment.

**Scanning range**  
**0.2...200 m**

**Data transmission systems**

- Duplex operation
- CL 20 mA, RS 232
- RS 422 /485
- 38,400 Bd

### Dimensional drawing



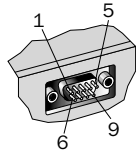
### Settings

See Operating Instructions (Part no. 8 008 207) for interface settings in the device.

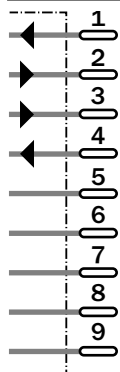
- 1** View of optical adjustment aid (cross-line)
- 2** LED function indicator "interrupted light beam"
- 3** Light inlet for optical adjustment aid
- 4** Receiver lens
- 5** Sender lens
- 6** 9-pin D-sub plug (all signals)
- 7** Mounting hole M3 threaded – 5 mm deep for plug cover
- 8** M5 running nut (in groove), max. screwing depth 10 mm from housing surface
- 9** LED function indicators "Power on", "Rx D" and "Tx D"



### Connection diagram and data interfaces



9-pin plug



#### Function interfaces

1	+ 24 V DC
2	Switching output <sup>2)</sup> , "pollution"
3	Switching output <sup>2)</sup> , "light path free"
4	Switching input, "sender off"
5	GND/0 V
6	
7	
8	
9	

#### Data interfaces

	CL 20 mA	RS 485 (2L)	RS 232
	RS 422		
	RS 485 (4L)		
	GND/0 V	GND/0 V	GND/0 V
	R+ <sup>3)</sup>	R+/T+ <sup>3)</sup> or B <sup>4)</sup>	R x D
	R- <sup>3)</sup>	R-/T- <sup>3)</sup> or A <sup>4)</sup>	-
	T+	-	T x D
	T-	-	-

Accessories	page
Cable plug	496
Three-point bracket	510
Plug cover	556

1) Wire cross-section on devices with heater; min. 0.25 mm<sup>2</sup> with 5 m cable  
 2) In PNP system

3) With additional cable connection (cable termination)  
 4) Symbols A and B apply to PROFIBUS and PROFIBUS-DP

Technical data		ISD 230-	2111	4111	5111	4121	5121					
<b>Scanning range</b>	0.2...200 m											
Light source	Infrared diode ( $\lambda = 860$ nm)											
Transmit/receive frequency	3 MHz $\pm$ 0.5 MHz											
Transmit/receive angle	Approx. $\pm 4^\circ$ /approx. $\pm 0.8^\circ$											
Light spot diameter	Approx. 0.7 m at 50 m											
	Approx. 1.4 m at 100 m											
<b>Data transfer rate</b>	Max. 38.4 kBd											
Signal delay	Max. 10 $\mu$ s											
(over a light path)												
LED function units	4 status functions ("light beam interruption", "Power on", "RxD", "TxD")											
Data interfaces	CL 20 mA a/p											
	RS-232/RS-422/RS-485											
	Sinec L1 (for bus terminal BT 777)											
<b>Switching inputs</b>	"Sender off", PNP $U_e = 24$ V, $I_e = 5$ mA											
<b>Switching outputs</b>	"Light path free", PNP, $U_a = 24$ V,											
	$I_{A \text{ max.}} = 20$ mA											
	"Pollution", PNP, $U_a = 24$ V,											
	$I_{A \text{ max.}} = 20$ mA											
<b>Electrical connections</b>	9-pin D-sub plug											
<b>Supply voltage <math>V_s</math></b>	24 V DC $\pm 20\%$ (to IEC 742)											
Current consumption	Max. 0.4 A											
	with heater max. 1.7 A											
<b>Enclosure rating</b>	IP 54 (to DIN 40 050),											
	with plug cover IP 65											
<b>Protection class</b>	$\diamond$ (to VDE 0106)											
<b>EMC vibration test</b>	To IEC 801/IEC 68-2-6 Test FC											
Mounting	Using 4 M5 running nuts,											
	2 in nut per side											
<b>Ambient temperature</b>	Operation 0 $^\circ$ C...+ 55 $^\circ$ C											
	- 38 $^\circ$ C...+ 55 $^\circ$ C											
	(with heater)											
	Storage - 20 $^\circ$ C...+ 70 $^\circ$ C											
Max. relative humidity	90 %, uncondensed											
<b>Weight</b> per unit	Approx. 1 kg (excluding accessories)											
<b>Housing material</b>	Aluminium (treated), glass/plastic lens											

**Notes:**

Two equivalent devices are required through plug bridges (see Operating Instructions, Part no. 8 008 207).  
The transfer frequencies are set

**Order information**

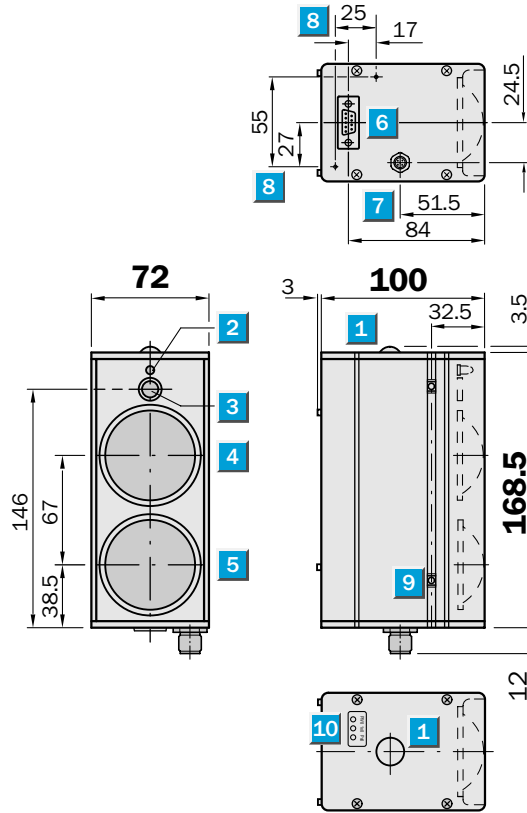
Type	Part no.
ISD 230-2111	1 017 388
ISD 230-4111	1 017 389
ISD 230-5111	1 017 390
ISD 230-4121	1 017 543
ISD 230-5121	1 017 544

**Scanning range**  
0.2...180 m

**Data transmission systems**

- Duplex operation
- RS 422/485
- Profibus
- Interbus S
- SSI Interface

**Dimensional drawing**



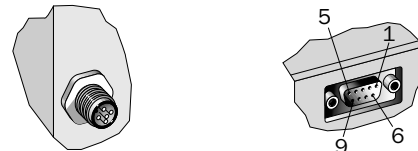
**Settings**

See Operating Instructions (Part No. 8 008 207) for interface settings in the device.

- 1** View of optical adjustment aid (cross-line)
- 2** LED function indicator "interrupted light beam"
- 3** Light inlet for optical adjustment aid
- 4** Receiver lens
- 5** Sender lens
- 6** 9-pin D-sub plug (data interface)
- 7** 5-pin, M 12 round plug (power supply and function interfaces)
- 8** Mounting hole M3 threaded – 5 mm deep for plug cover
- 9** M5 running nut (in groove), max. screwing depth 10 mm from housing surface
- 1 0** LED function indicators "Power on", "RxD" and "TxD"

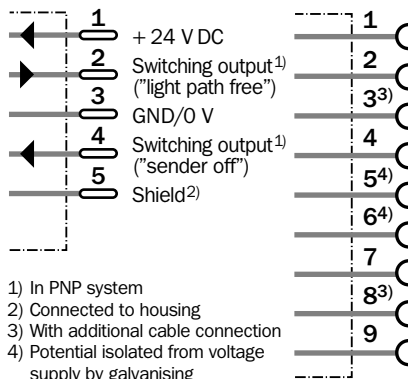


**Connection diagram and data interfaces**



5-pin, M 12

9-pin bush



- 1) In PNP system
- 2) Connected to housing
- 3) With additional cable connection
- 4) Potential isolated from voltage supply by galvanising

**Data interfaces**

RS 422	RS 485 (2L)	Profibus
RS 485 (4L)		Profibus-DP
1	NC	NC
2	NC	NC
3 <sup>3)</sup>	R+/T+	B
4	T+	Reserved
5 <sup>4)</sup>	GND	GND
6 <sup>4)</sup>	+ 5 V	+ 5 V
7	NC	NC
8 <sup>3)</sup>	R-	R-/T-
9	T-	Reserved

Accessories	page
Cable plug	496
Three-point bracket	510
Plug cover	556

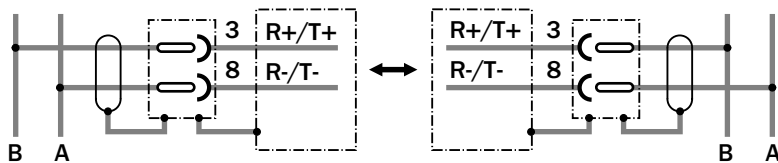
Technical data	ISD	260	260	280	280					
		-1111	-1121	-1111	-1121					
		-1112	-1122	-1121	-1122					
<b>Scanning range</b>	0.2...180 m									
Light source	Infrared diode ( $\lambda = 860$ nm)									
Transmit/receive frequency	4 MHz $\pm$ 0,5 MHz/11 MHz $\pm$ 0.75 MHz									
Transmit/receive angle	Approx. $\pm 4^\circ$ /approx. $\pm 0.8^\circ$									
Light spot diameter	Approx. 0.7 m at 50 m									
	Approx. 1.4 m at 100 m									
<b>Data transfer rate</b>	Max. 0.5 MBd									
	Max. 1.5 MBd									
Signal delay (over a light path)	Max. 2 $\mu$ s									
LED function units	4 status functions ("light beam interruption", "Power on", "RxD", "TxD")									
Data interfaces	RS-422 or RS-485 in 2 or 4 tip configurations									
<b>Switching inputs</b>	"Sender off", PNP $U_e = 24$ V, $I_e = 5$ mA									
<b>Switching outputs</b>	"Light path free", PNP, $U_a = 24$ V, $I_{Amax} = 20$ mA									
<b>Electrical connections</b>	9-pin D-sub plug									
	5-pin round plug									
<b>Supply voltage <math>V_s</math></b>	24 V DC $\pm$ 20 % (to IEC 742)									
Current consumption	Max. 0.4 A/with heater max. 1.7 A									
<b>Enclosure rating</b>	IP 54 (to DIN 40 050), with plug cover IP 65									
<b>Protection class</b>	$\diamond$ (to VDE 0106)									
<b>EMC vibration test</b>	To IEC 801/IEC 68-2-6 Test FC									
Mounting	Using 4 M5 running nuts, 2 in nut per side									
<b>Ambient temperature</b>	Operation 0 $^\circ$ C...+ 55 $^\circ$ C									
	- 38 $^\circ$ C...+ 55 $^\circ$ C (with heater)									
	Storage - 20 $^\circ$ C...+ 70 $^\circ$ C									
Max. relative humidity	90 %, uncondensed									
<b>Weight</b> per unit	Approx. 1 kg (excluding accessories)									
<b>Housing material</b>	Aluminium (treated), glass/plastic lens									

**Notes:**

A pair of devices with numbers ending in 1 and 2 are required to create a data transfer section.

**Data interface Profibus (L2 – DP)**

(for other bus coupling, see Operating Instructions)



A and B in accordance with EN 50 170

The data cables for the bus can be connected direct to the device via the Siemens Profibus plug (9-pin, D-sub) (compatible configuration). The cable then terminates in the plug.

**Order information**

Type	Part no.
ISD 260-1111	1 017 379
ISD 260-1112	1 017 380
ISD 260-1121	1 017 381
ISD 260-1122	1 017 382
ISD 280-1111	1 017 046
ISD 280-1112	1 017 047
ISD 280-1121	1 017 375
ISD 280-1122	1 017 376