

## DESCRIPTION



### Optical read head for incident light positioning system

- consists of a camera module and an integrated illumination unit
- RS-485 Interface
- High resolution and precise positioning, especially for facilities with curves and switch points as well as inclines and declines
- Non-contact positioning on Data Matrix code tape
- Travel ranges up to 100 km
- Mechanically rugged: no wearing parts, long operating life, maintenance-free
- Quality assessment of the scene

## GENERAL

The optical reading head is part of the positioning system in the incident light process from BBH Products. It consists of a camera module and an integrated illumination unit among other things. The reading head detects position marks, which are put on adhesive code band in the form of Data Matrix code. The mounting of the code band is as a rule stationary on a firm part of the plant (elevator shaft, overhead conveyor mounting rails ...); that of the reading head is parallel on the moving „vehicle“ (elevator car, overhead conveyor chassis ...). In combination with our SMX-PXV devices\* or SDU-PXV devices\*\*, the positioning system realizes safety level SIL 3 / PL e with only one single sensor.

\* SMX compact basic modules: SMX11-PXV/2, SMX12-PXV/2, SMX12-1-PXV/2; optional: integrated communication interface (/DNM, /DBM);  
SMX modular extension modules: SMX11x-PXV/2/D, SMX12x-PXV/2

\*\* SCU Series SCU Slave: SDU-x-PXV

# PXV100AS-F200-R4-V19-BBH

Sensors » Optical reading head

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## SAFETY RELATED CHARACTERISTIC DATA

Performance Level	PL e, SIL3
PFH / architecture	$1,09 \times 10^{-8}$ 1/h typ / Cat 4 MTTF <sub>d</sub> = 99 years
Proof test interval	50 years = max. operating period

## GENERAL DATA

Passage speed v	≤ 10 m/s
Measuring range	max. 100000 m
Light type	Integrated LED lighting (red/blue)
Read distance	100 mm
Depth of focus	± 40 mm
Reading field	60 mm x 35 mm
Ambient light limit	30000 Lux
Resolution	± 1 mm
Accuracy	
Non-safe X	± 0,2 mm
safe X	see PXV Installation manual
Measuring rate	100 Hz

## NOMINAL RATINGS

Camera	
Type	CMOS, Global Shutter
Processor	
Clock pulse frequency	600 MHz
Speed of computation	4800 MIPS

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## ELECTRICAL DATA

Supply voltage $U_b$	20 ... 30 V DC; PELV
No-load supply current $I_0$	max. 200 mA
Max. Power consumption $P_0$	3 W
<b>Rated data inputs</b>	
Input type	2 functional inputs
Pegel	Low: 0 ... 8 V High: 10 V ... + $U_b$
<b>Rated data outputs</b>	
Output type	1 switch output pnp, PNP, programmable, short-circuit protected
Switching voltage	Supply voltage
Switching current	150 mA each output

## ENVIRONMENTAL DATA

Temperature	0°C ... +60°C, -20°C ... +60°C operation (noncondensing; prevent icing on the lens!) -40°C ... +85°C storage
Relative humidity	90% , noncondensing
<b>Standard conformity</b>	
Emitted interference	DIN EN 61000-6-4:2007 +A1:2011
Noise immunity	DIN EN 61000-6-2:2005
Shock resistance	DIN EN 60068-2-27:2009
Vibration resistance	DIN EN 60068-2-6:2008

## MECHANICAL DATA

Dimension (HxDxW [mm])	70x50x70
Weight [g]	approx.. 160
Class of protection	IP67
Type of connection	Connector 1 x M12, 8-pin, brass, nickel-plated
Material (housing)	PC/ABS

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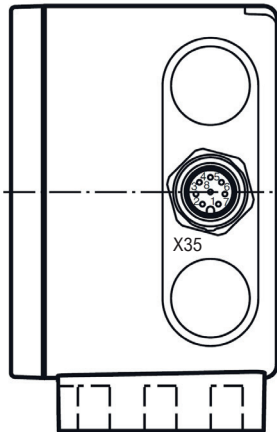
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## DEVICE INTERFACES

### Encoder interface X35 (RS-485)

### Pin assignment



Pin	RS 485	Interface
1	I/O2 (Enable Blue)	<p>X35</p>
2	+ U <sub>B</sub>	
3	Data + / TX / 485+	
4	Data - / RX / 485-	
5	O1 (Sync Out)	
6	I1 (Enable Red)	
7	- U <sub>B</sub> (Ground)	
8	I/O3 (not connected)	

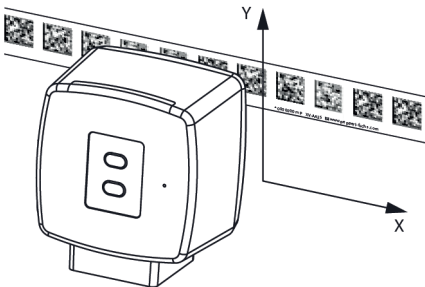
## ENCODER SPECIFICATION

### PXV100AS-F200-R4-V19-BBH

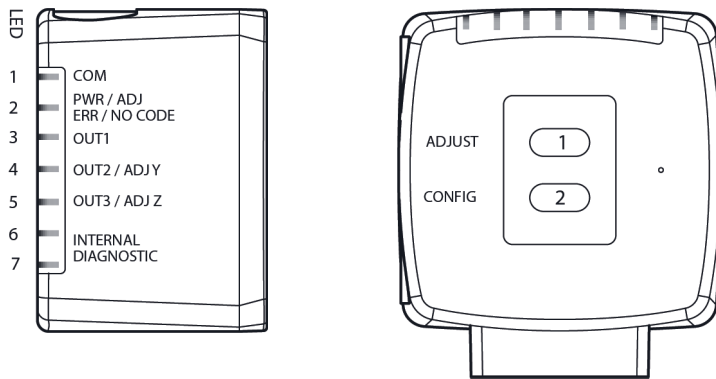
Interface type	RS 485 interface
Data format	Binary code
Transfer rate	115200 Bit/s
Type of connection	Connector 1x M12, 8-pin
Termination	120 Ω, switchable terminal resistor
<b>General data</b>	
Passage speed v	≤ 10 m/s
Measuring range	max. 100000 m
Resolution	± 1 mm
Measuring frequency	100 Hz
Query cycle time	≥ 5 ms

## ADDITIONAL INFORMATION

### Position Data



### Displays and Controls



The reading head allows visual function check and fast diagnosis with 7 indicator LEDs. The reading head has 2 buttons on the reverse of the device to activate the alignment aid and parameterization mode.

LED	Colour	Label	Meaning
1	yellow	COM	Communication active
2	green / red	PWR / ADJ ERR / NO CODE	Code recognized / not recognized, Error
3	yellow	OUT1	Output 1
4	yellow	OUT2 / ADJ Y	Output 2, Alignment aid Y
5	yellow	OUT3 / ADJ Z	Output 3, Alignment aid Z
6,7	red / gree / yellow	INTERNAL DIAGNOSTIC	Internal diagnostics

## Mounting and commissioning

Mount the reading head such that its optical surface captures the optimal read distance to the code band (see Technical Data). The stability of the mounting and the guidance of the vehicle must be provided such that the depth of field of the reading head is not closed during operation. The reading head can be optimally customized by parameterization for specific requirements. The parameterization of reading heads with bi-directional interface (all except SSI-interface) can take place via the interface itself (internal parameterization) or via an optical parameterization code (external parameterization). The reading heads with SSI interface only have the possibility of external parameterization via optical parameterization codes.



PXV\* with grounding terminal on X35 X35

### Shielding Cables

The shielding of connection lines is required to suppress electromagnetic interference. Only use connection lines with braid. Avoid connection lines with foil shield.

The shielding is integrated at both ends, i.e., on the control panel, **and** on the reader. The grounding terminal (PCV-SC12-BBH) available as an accessory allows easy integration in the equipotential bonding circuit.

## External parameterization

For external parameterization you require the parameterization code as Data Matrix with the desired reading head parameters. Data Matrix Code cards for step-by-step external parameterization are printed in the reading heads operating instructions.

Parameterization is only possible within 10 minutes of switching on the reading head. If a button is pressed after 10 minutes subsequent to switching on, there is visual signaling via the LEDs (LED1, yellow/LED2, red/LED3, yellow/LED4, yellow/LED5, yellow flash for 2 seconds)

- The switchover from normal operation to parameterization mode via button 2 on the reverse of the reading head.

**Note:** Parameterization mode automatically ends after 1 minute of inactivity. The reading head returns to normal operation and works with unchanged settings.

- Place the parameterization code in the view of the camera module. After recognition of the parameterization code, the green LED2 lights up for 1s. In the event of an invalid parameterization code, the red LED2 lights up for 2s.
- A short press on button 2 ends parameterization mode and the changed parameters are not stored volatile in the reading head.



## Alignment aid for the Y and Z coordinates

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The activation of the alignment aid is only possible within 10 minutes of switching on the reading head. The switchover from normal operation to alignment aid operating mode is via button 1 on the reverse of the reading head.

- Press the button 1 for longer than 2 s. LED2 flashes green for a recognized code band. LED2 flashes red for an unrecognized code band.
- **Z coordinate:** If the distance of the camera to the code band too small or too large, the yellow LED5 lights up. Within the target range, the yellow LED5 flashes at the same time as the green LED2.
- **Y coordinate:** If the optical axis of the camera is too deep in relation to the middle of the code band, the yellow LED4 lights up. If the optical axis is too high, the yellow LED4 extinguishes. Within the target range, the yellow LED4 flashes at the same time as the green LED2.
- A short press on button 1 ends the alignment aid and the reading head changes to normal operation.

# PXV100AS-F200-R4-V19-BBH

Sensors » Optical reading head



## ORDER INFORMATIONS

### OPTICAL READING HEAD

item	description	item no.
PXV100AS-F200-R4-V19-BBH	<b>Optical reading head for incident light positioning system</b>	2581
PXV-AA25-*	<b>Data Matrix code tape, System components</b>	2582

### ACCESSORIES

item	description	item no.
V19-G-BKx-PUR-U/ABG-BBH	<b>Female cordset, M12, 8-pin, shielded, PUR Cable</b> Cores: 8 x 0,25 mm <sup>2</sup> Length: 1,5m; 2m; 5m	on request
V19-G-BKx-PUR-U/ABG-V19-G-BBH	<b>Connection cable, M12 to M12, 8-pin, shielded, PUR Cable</b> Cores: 8 x 0,25 mm <sup>2</sup> Length: 1,5m; 2m; 5m (item no.: 2626)	on request
V19-G-ABG-PG9-BBH	Female connector, M12, 8-pin, shielded, field attachable	2583
V19-G-ABG-PG9-FE-BBH	Female connector, M12, 8-pin, shielded, field attachable	on request
PCV-SC12-BBH	<b>Grounding clip</b> for PXV system	on request
PCV-LM25-BBH	Marker head for 25 mm code tape	on request
PCV-MB1-BBH	<b>Alignment guide</b> for PXV100-* reading head	on request
PCV-AG100-BBH	<b>Mounting bracket</b> for PCV* reading head	on request
PCV-USB_RS485-Converter Set	USB to RS-485 interface converter	on request
PCV-KBL-V19-STR-RS485-BBH	Cable unit with power supply for USB / RS 485 interface converter	on request

### SOFTWARE

item	description	item no.
SafePLC <sup>2</sup> 1st	Programming software, 1te License incl. Hardlock	1244
SafePLC <sup>2</sup> 2nd	Programming software, 2te License incl. Hardlock	1646
SafePLC <sup>2</sup> 3rd	Programming software, 3te License incl. Hardlock	1647

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