Optical reading head

PCV100-F200-R4-V19

Model Number
PCV100-F200-R4-V19
Read head for incident light positioning system

Features
• RS 485 interface
• Non-contact positioning on Data Matrix code tape
• Travel ranges up to 10 km, in X and Y direction
• Mechanically rugged: no wearing parts, long operating life, maintenance-free
• High resolution and precise positioning, especially for facilities with curves and switch points as well as inclines and declines.

Technical data

General specifications
Passage speed \(v\) \(\leq 8\) m/s
Measuring range \(\leq 10000\) m
Light type Integrated LED lightning (red)
Read distance 100 mm
Depth of focus \(\pm 20\) mm
Reading field 50 mm x 30 mm
Ambient light limit 100000 Lux
Resolution \(\pm 0.1\) mm

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

Functional safety related parameters
MTTFd 100 a
Mission Time (TM) 50 a
Diagnostic Coverage (DC) 0 %

Indicators/operating means
LED indicator 7 LEDs (communication, alignment aid, status information)

Electrical specifications
Operating voltage \(U_B\) 15 ... 30 V DC, PELV
No-load supply current \(I_0\) max. 200 mA
Power consumption \(P_0\) 3 W

Interface
Interface type RS 485 interface
Data output code binary code
Transfer rate 38400 ... 230400 Bit/s
Termination Switchable terminal resistor
Query cycle time \(\geq 10\) ms

Input
Input type 1 to 3 functional inputs, programmable
Input impedance \(\geq 27\) k\(\Omega\)

Output
Output type 1 to 3 switch outputs, PNP, programmable, short-circuit protected
Switching voltage Operating voltage
Switching current 150 mA each output

Standard conformity
Noise immunity EN 61000-6-2:2005
Vibration resistance EN 60068-2-6:2008

Ambient conditions
Operating temperature 0 ... 60 °C (32 ... 140 °F), -20 ... 60 °C (-4 ... 140 °F)
(noncondensing; prevent icing on the lens!)
Storage temperature -20 ... 85 °C (-4 ... 185 °F)
Relative humidity 90 %, noncondensing

Mechanical specifications
Connection type 8-pin, M12 x 1 connector
Housing width 70 mm
Housing height 70 mm
Degree of protection IP67
Material Housing PC/ABS
Mass approx. 160 g

Approvals and certificates
EAC conformity TR CU 020/2011
UL approval cULus Listed, General Purpose, Class 2 Power Source, Type 1 enclosure
CCC approval CCC approval / marking not required for products rated \(\leq 36\) V

Refer to “General Notes Relating to Pepperl+Fuchs Product Information”.

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**Optical reading head**

**Dimensions**

![Dimensions Diagram]

**Electrical Connection**

<table>
<thead>
<tr>
<th>Pin</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>OUT 1 / IN 1</td>
</tr>
<tr>
<td>2</td>
<td>OUT 2 / ADJ Z</td>
</tr>
<tr>
<td>3</td>
<td>OUT 3 / ADJ Y</td>
</tr>
<tr>
<td>4</td>
<td>PWR / ADJ</td>
</tr>
<tr>
<td>5</td>
<td>ERR / NO CODE</td>
</tr>
<tr>
<td>6</td>
<td>INTERNAL</td>
</tr>
<tr>
<td>7</td>
<td>DIAGNOSTIC</td>
</tr>
<tr>
<td>8</td>
<td>LED 1, 2, 3, 4, 5, 6, 7</td>
</tr>
</tbody>
</table>

**General**

The reading head is part of the positioning system in the method for measurement by Pepperl+Fuchs. It consists of a camera module and an integrated illumination unit among other things. The reading head detects position marks, which are put on an 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...).
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.
All reading heads can be optimally customized by parameterization for specific requirements. The parameterization of reading heads with a bidirectional 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.

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.

LEDs

<table>
<thead>
<tr>
<th>LED</th>
<th>Color</th>
<th>Label</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Yellow</td>
<td>COM</td>
<td>Communication active</td>
</tr>
<tr>
<td>2</td>
<td>Green/re</td>
<td>PWR/ADJ ERR/NO CODE</td>
<td>Code recognized/not recognized, Error</td>
</tr>
<tr>
<td>3</td>
<td>Yellow</td>
<td>OUT1</td>
<td>Output 1</td>
</tr>
<tr>
<td>4</td>
<td>Yellow</td>
<td>OUT2/ADJ Y</td>
<td>Output 2, Alignment aid Y</td>
</tr>
<tr>
<td>5</td>
<td>Yellow</td>
<td>OUT3/ADJ Z</td>
<td>Output 3, Alignment aid Z</td>
</tr>
<tr>
<td>6,7</td>
<td>red/green/yellow</td>
<td>INTERNAL DIAGNOSTICS</td>
<td>Internal diagnostics</td>
</tr>
</tbody>
</table>

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 is via button 2 on the reverse of the reading head. Button 2 must be pressed for more than 2 seconds. LED3 now flashes.
  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 2 s.
- A short press on button 2 ends the parameterization mode and the changed parameters are not stored volatile in the reading head.

Alignment aid for the Y and Z coordinates
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, the yellow LED5 lights up. If the distance of the camera to the code band 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.