

# LD OEM/LD PDS/LD PeCo



## Features

- LD OEM/PDS: 360° field of view
- LD PeCo: 90° field of view
- 14,400 Hz scan rate
- Class 1 (eye-safe laser)
- RS 232/RS 422 output
- 4 static outputs
- 5...20 Hz programmable scan frequency
- LD OEM: the basic platform to provide customized software programs on board and offers the possibility of incorporating your own application experience
- LD PeCo: people counting in public areas
- LD PDS: surveillance and security of buildings

Using time-of-flight technology, SICK provides solutions throughout the world. Even the most demanding applications are being served: anti-collision for large harbor cranes, automatic parking of planes, vehicle profiling in free-flow traffic tolling, guidance and protection of autonomous vehicles, intrusion detection in building security, and people counting in public areas.

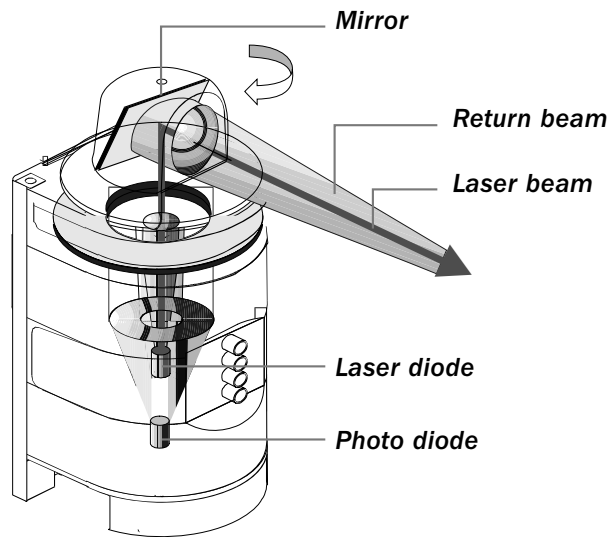
The foundation of the LD family is the LD OEM Laser Scanner. This powerful and flexible device is based on a dual-processor hardware structure. The first DSP (Digital Signal Processor) controls the laser measurement and the I/O data flow, while a second DSP is dedicated to run application

programs, such as positioning algorithms for autonomous vehicles. The two processors are connected by means of a high-speed bus which enables efficient real-time data collection and processing.

The DSP in the LD PDS Scanner secures areas from intrusions. With the user-friendly configuration software, any selectable area can be monitored.

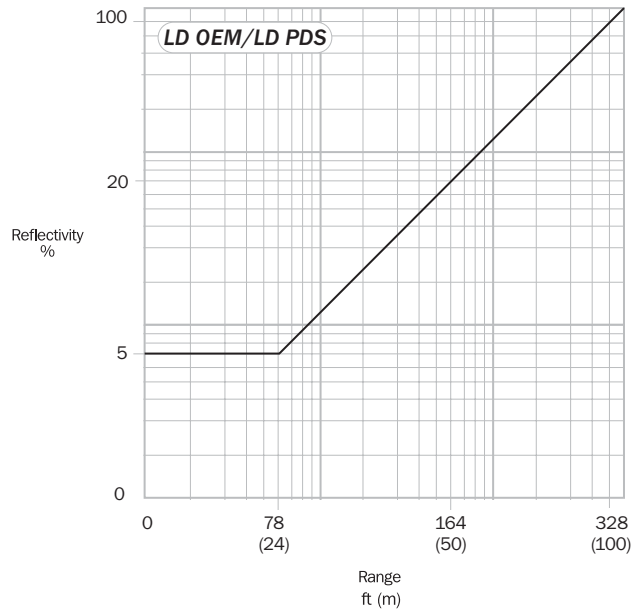
The DSP in the LD PeCo Scanner is programmed to count people in public areas, such as train stations, museums and shopping malls, to manage traffic flow for multiple commercial purposes.

LD Laser Scanner



Measurement Ranges

Dimensions in feet (m)



Technical Specifications

| LD PeCo                         |                                                                                                                                               |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Scanning Characteristics</b> |                                                                                                                                               |
| Mounting Height                 | 8.2...49.2 ft (2.5...15 m), depends on type                                                                                                   |
| Passage Width                   | 3.3...85.3 ft (1...26 m)                                                                                                                      |
| Speed of Passage                | Maximum 7.9 ft/s (2.4 m/s)                                                                                                                    |
| Scanning Angle                  | 90°                                                                                                                                           |
| Scanning Frequency              | 10 Hz ± 5%                                                                                                                                    |
| Light Emission                  | Via rotating scanner head and light emission windows                                                                                          |
| Laser Diode (wavelength)        | Infrared light ( $\lambda = 905$ nm)                                                                                                          |
| Pulse Frequency                 | 8 kHz ± 5%                                                                                                                                    |
| Laser Class                     | Class I (to DIN EN 60825-1), eye safe                                                                                                         |
| <b>Mechanical/Electrical</b>    |                                                                                                                                               |
| RS 422 Data Interface           | Serial                                                                                                                                        |
| Transfer Rate                   | 19,200 Bd                                                                                                                                     |
| Data Format                     | 8 data bits, 1 stop bit, no parity, fixed output format                                                                                       |
| Switching Outputs               | 2 x (Count IN, Count OUT)                                                                                                                     |
| Optical Indicators              | 4 x LED (status displays)                                                                                                                     |
| Power Consumption               |                                                                                                                                               |
| when switched on:               | Max. 36 W (1.5 A) at 24 V DC                                                                                                                  |
| operation:                      | 12 W (0.5 A) at 24 V DC, additional max. 0.5 A for each switching output                                                                      |
| Enclosure Rating                | IP 40 (to DIN 40 050)                                                                                                                         |
| Connectivity                    | 1 x 10-core terminal block on an internal terminal board<br>2 x conduit thread 11 cable connection (cross section 8...10 mm (0.32...0.39 in)) |
| Housing                         | Polystyrene                                                                                                                                   |
| Weight                          | Approx. 13.2 lb (6 kg)                                                                                                                        |
| Ambient Operating Temperature   | 32...104°F ( 0...40°C)                                                                                                                        |
| Storage Temperature             | -4...176°F (-20...80°C)                                                                                                                       |
| Relative Humidity               | 5...85%, non-condensing                                                                                                                       |
| Housing Color                   | White aluminum (RAL 9006)                                                                                                                     |
| Attachment                      | Pivot on the device, pipe clamping system with second pivot, safety cord                                                                      |

## Technical Specifications

| LD OEM/LD PDS                                                                                         |                                                                                                                                                                           |
|-------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Scanning Characteristics</b>                                                                       |                                                                                                                                                                           |
| Range (condition: full spot strike on the object)                                                     | 1.64...78.8 ft (0.5...24 m) on 5% black<br>1.64...328 ft (0.5...100 m) with 90% reflection<br>1.64...164 ft (0.5...50 m) with 20% reflection                              |
| Scanning Angle                                                                                        | 360°                                                                                                                                                                      |
| Angular Resolution                                                                                    | 0.125°                                                                                                                                                                    |
| Scanning Frequency                                                                                    | 5...20 Hz $\pm$ 5% in increments of 1 Hz                                                                                                                                  |
| Measurement Resolution                                                                                | 0.15 in (= 1/840 ft) (3.9 mm (=1/256 m))                                                                                                                                  |
| System Error (environmental conditions: good visibility, Ta = 73°F (23°C), reflectivity 10...10,000%) | $\pm$ 0.98 in (25 mm) with 20...90% reflection, from 1.64 ft (0.5 m) (as a result of temperature and drift)                                                               |
| Statistical Error                                                                                     | 1 sigma $\pm$ 0.98 in (25 mm) with 20...90% reflection, from 1.64 ft (0.5 m)                                                                                              |
| Beam Divergence                                                                                       | 5 mrad (0.286°)                                                                                                                                                           |
| Light Emission                                                                                        | Via rotating scanner head                                                                                                                                                 |
| Laser Diode (wavelength)                                                                              | Infrared light ( $\lambda$ = 905 nm)                                                                                                                                      |
| Pulse Frequency                                                                                       | Maximum 14.4 kHz (10.8 kHz with mean across 360°)                                                                                                                         |
| Laser Class                                                                                           | Class I (to DIN EN 60825-1), eye safe                                                                                                                                     |
| <b>Mechanical/Electrical</b>                                                                          |                                                                                                                                                                           |
| RS 232/422 Data Interface                                                                             | Serial                                                                                                                                                                    |
| Transfer Rate                                                                                         | 4,800 / 9,600 / 19,200 / 38,400 / 57,600 / 115,200 Bd                                                                                                                     |
| Data Format                                                                                           | 8 data bits, 1 stop bit, no parity, fixed output format                                                                                                                   |
| CAN Data Transfer Rate                                                                                | 10 Bit/s...1 MBit/s                                                                                                                                                       |
| ARCnet Data Interface (optional)                                                                      |                                                                                                                                                                           |
| Data Format                                                                                           | CAN to CAN standard 2.0A                                                                                                                                                  |
| Transfer Rate                                                                                         | 156.25 kBit/s...5 MBit/s                                                                                                                                                  |
| Switching Outputs                                                                                     | 4 x (Alarm 1, Alarm 2, Safe 1, Safe 2)<br>Highside semi-conductor, max. output current as a result of load per 0.5 A at 24 V DC"                                          |
| Optical Indicators                                                                                    | 4 x LED (status displays)                                                                                                                                                 |
| Connectivity                                                                                          | 1 x 6-pole terminal block via conduit thread 7 cable bushing (Ø max. 5.6 mm (0.22 in), for power supply and switching outputs<br>1 x 9-pin D-Sub plug for data interfaces |
| Display Indicators                                                                                    | 4 x LED status                                                                                                                                                            |
| Operating Voltage                                                                                     | 24 V DC $\pm$ 20% to IEC 364-4-41 (VDE 0100, Part 410)                                                                                                                    |
| Current Consumption                                                                                   |                                                                                                                                                                           |
| when switched on:                                                                                     | Maximum 36 W (1.5 A) at 24 V DC                                                                                                                                           |
| operation:                                                                                            | 12 W (0.5 A) at 24 VDC, additional max. 0.5 A for each switching output                                                                                                   |
| Housing                                                                                               | Die cast aluminum                                                                                                                                                         |
| Weight                                                                                                | Approx. 7 lb (3.2 kg)                                                                                                                                                     |
| Enclosure Rating                                                                                      | IP 40 (to DIN 40 050)                                                                                                                                                     |
| Electrical Protection Class                                                                           | Class III                                                                                                                                                                 |
| <b>Environmental</b>                                                                                  |                                                                                                                                                                           |
| EMC                                                                                                   | EN 61000-6-3, EN 61000-6-2                                                                                                                                                |
| Vibration                                                                                             | EN 60068-2-6                                                                                                                                                              |
| Ambient Operating Temperature                                                                         | 32...113°F (0...45°C)                                                                                                                                                     |
| Storage Temperature                                                                                   | -4...176°F (-20...80°C)                                                                                                                                                   |
| Relative Humidity                                                                                     | 5...85%, non-condensing                                                                                                                                                   |
| Housing Color                                                                                         | SICK blue (RAL 5012) black                                                                                                                                                |
| Attachment                                                                                            | 8 x securing threads M6x12mm (0.47 in)                                                                                                                                    |

## Models and Part Numbers

|                | LD PeCo       | LD PeCo        | LD PDS         | LD PDS         |
|----------------|---------------|----------------|----------------|----------------|
| Part Number    | 1 023 382     | 1 023 383      | 1 025 993      | 1 026 440      |
| Data Interface | RS 422        | RS 422         | RS 232         | RS 422         |
| Range          | 18 ft (5.5 m) | 49.2 ft (15 m) | 78.7 ft (24 m) | 78.7 ft (24 m) |

| LD OEM         |                                    |
|----------------|------------------------------------|
| Part Number    | 1 028 698                          |
| Data Interface | RS 232/422, CAN<br>TCP/IP Ethernet |
| Range          | 78.7 ft (24 m)                     |

**NOTE: Accessories information is located on pages 188 - 189.**

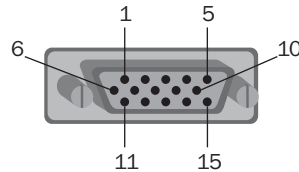
## Electrical Connections

### LD OEM/LD PDS Terminal Block



| Terminal | Signal   | Function                                            |
|----------|----------|-----------------------------------------------------|
| 1        | +24 V DC | Power supply                                        |
| 2        | GND      | Signal ground                                       |
| 3        | Alarm 1  | Switching output 1 (application-dependent function) |
| 4        | Alarm 2  | Switching output 2 (application-dependent function) |
| 5        | Safe 1   | Switching output 3 (application-dependent function) |
| 6        | Safe 2   | Switching output 4 (application-dependent function) |

### D-Sub Plug (Data Interface)



| Pin | Signal   | Function                        |
|-----|----------|---------------------------------|
| 1   | 24 V DC  | Voltage supply, sensor (24 VDC) |
| 2   | CAN L    | CAN bus (IN/OUT)                |
| 3   | CAN H    | CAN bus (IN/OUT)                |
| 4   | GND_Data | Ground                          |
| 5   | GND      | Ground, sensor                  |
| 6   | RD+-     | Not occupied                    |
| 7   | RD -     | RxD                             |
| 8   | TD+      | Not occupied                    |
| 9   | TD-      | TxD                             |
| 10  | OUT 1    | Output 1                        |
| 11  | TPIP     | Ethernet interface IN           |
| 12  | TPIN     | Ethernet interface IN           |
| 13  | TPOP     | Ethernet interface OUT          |
| 14  | TPON     | Ethernet interface OUT          |
| 15  | OUT 2    | Output 2                        |

### LD PeCo 10-core Terminal Block



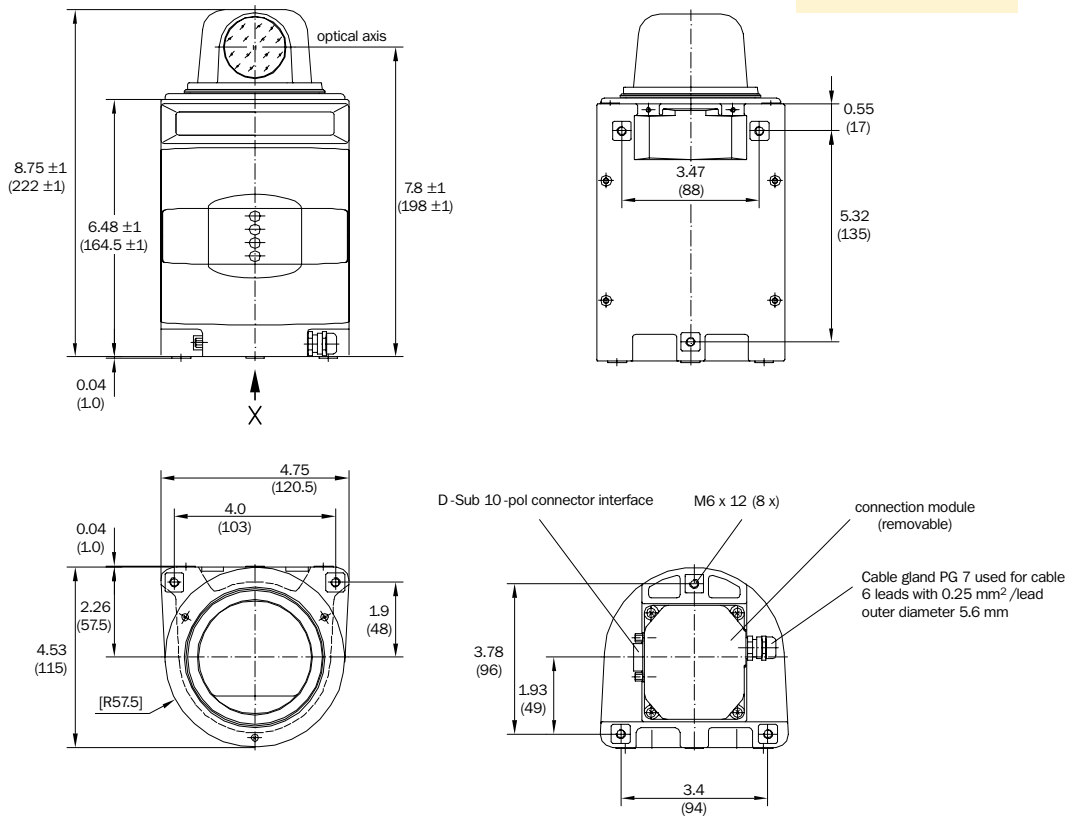
| Pin | Signal     | Interface                      |
|-----|------------|--------------------------------|
| 1   | +24 V DC   | Power Supply                   |
| 2   | GND        | Ground                         |
| 3   | Count IN   | Ground                         |
| 4   | Count OUT  | Switching Output <sup>1)</sup> |
| 5   | RX_Hi      | Switching Output <sup>1)</sup> |
| 6   | TX_Hi      | RS-422                         |
| 7   | TX_Lo      | RS-422                         |
| 8   | RX_Lo      | RS-422                         |
| 9   | Signal GND | RS-422                         |
| 10  | S-GND      | Signal ground                  |

<sup>1)</sup> Function depends on the selected count direction

Drawings

Dimensions in inches (mm)

LD OEM/LD PDS



LD PeCo

