

## Laser-Position-Transducer



## **LLD Series**

### **Key-Features:**

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- Measurement range: 0.1 to 150 m
- Resolution: 0.1 mm
- Repeatability: ±0.5 mm
- Linearity: ±2 mm on white surfaces, ±3 mm on natural surfaces
- Protection class: IP65
- Working temperature: -10 to 50 °C, with heating: -40 to 50 °C
- Measuring frequency selectable: 10Hz or 50Hz
- Analog output: 4..20mA (must be configured with the included software)
- Digital outputs: RS232, RS422, Profibus, SSI



### **Content:**

Technical Data	
Technical Drawings	
Types Of Output	
Configuration Software	
Order Code	
<b>Options &amp; Accessories</b>	

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## TECHNICAL DATA

Measurement range	0.130 m on all natural diffuse reflecting surfaces, on target board up to 150 m		
Resolution	0.1 mm		
Linearity	$\pm 2$ mm on white surfaces (+15+30 °C), $\pm 3$ mm on natural surfaces (+15+30 °C), $\pm 5$ mm (-10+50 °C)		
Repeatability	≤0.5 mm		
Selectable measuring frequency	10 Hz or 50 Hz		
Measuring rate	0.166 s (10 Hz), 0.02 s (50 Hz)		
Supply voltage	1030 VDC		
Max. power consumption	1.5 W, Profibus: 3.2 W		
Max. power consumption, option H	24 W (24 VDC), Profibus, SSI: 25.7 W (24 VDC)		
Analog output	420 mA ( parameterise using RS232/ RS422), load $\leq$ 500 Ohm		
Digital Output	RS232, RS422, Profibus, SSI		
Transfer rate	2,4 / 4,8 / 9,6 / 19,2 / 38,4 kBaud for RS232 and RS422, max. 12 MBaud for Profibus, 501000 kHz for SSI		
Switching outputs	1 (max. capacity load 0.5 A), Profibus, SSI: 2 (max. capacity load 0.5 A)		
Trigger input *	trigger impulse 24 V		
Connection	12-pole M16-connector; for Profibus, SSI in addition: 5-pole M12-connector (male) and M12-connector (female)		
Light source	laser diode (red), wavelength 650 nm		
Laser class	2, ≤1 mW		
Protection class	IP65		
Storage temperature	-40+70 °C		
Working temperature	-10+50 °C		
Working temperature, option H	-40+50 °C, by heating		
Weight	760 g, Profibus, SSI: 770 g		
Electromagnetic compatibility (EMC)	EN 61326-1		
* not available for models with option H (heating)			

TECHNICAL DRAWINGS

85

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72,5

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210

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## **GETTING STARTED**

For initial operation, the sensor has to be set into operation mode, i.e. the autostart function must be configured. This function decides on the mode generally to be activated after switching on. Single point and continuous measurement (distance tracking) in different modes are available. Before using the analog output, the measurement range must be scaled: 4 mA is assigned to the minimum, 20 mA to the maximum measurement range. All these settings are quickly performed by means of the WayCon configuration software included in the delivery.

## DIFFERENT TYPES OF OUPUT

#### Analog output 4...20 mA

The analog output allows for transmission of the results by an analog 4...20 mA signal. The current of the line is proportional to the detected distance. The measurement range must be scaled during initial operation. Connector 12-pole, M18

#### RS232 output

This classical low-price interface for short distances between sensor and PC/control-system/display is ideally suited to laboratory and PC applications. Data rate 38.4 kBaud max. Connector 12-pole, M18

#### RS422 output

Differential interface with RS232 protocol, i.e. the data is transmitted by RS232, just that RXD and TXD are transmitted differential on RS422 basis. Optimized for environment with background noise and long lines (up to 100 m). Since standard PC's generally do not offer an RS422 interface, this type of communication requires an RS422 interface card or a converter RS422-to- RS232. Data rate 38.4 kBaud max. Connector 12pole, M18

#### **Profibus output**

Plug-and-play interface for fieldbus applications. Configuration by Profibus firmware data file (gsd file), available at www.waycon.de Data rate 12 Mbaud max. Connector: 1x 12-pole, M18, 2x 5-pole M12

#### SSI output

Synchronous interface for industrial applications. 24 bit, Gray-coded, 1 MHz max. Connector: 1x 12-pole, M18, 2x 5-pole M12

#### **Digital switching output**

This output allows for supervision of the targets, e.g. with respect to the excess of preset thresholds. A corresponding measurement window must be parametrized beforehand, which determines the beginning and the end of the monitored range. The desired switching point can be set inside this range. The details are discussed in a separate manual included in the delivery.

#### Trigger input (not for models with heating)

A distance measurement can also externally be initiated by a signal (voltage pulse 3..24 V), transmitted via trigger input. The user has to configure the desired delay as well as the pulse edge for triggering. All details are described in the manual included in the delivery.

## **INCLUDED IN DELIVERY**

### LLD sensor

Manual

- WayCon CD with LLD-configuration software "LLD-communication & data acquisition"

## CONFIGURATION-SOFTWARE

Before starting to work with the LLD-Sensor, the user has to select the operational mode, either via a terminal program like "Hyperterminal" (WinXP), normally included in a Win32 operating system, or by performing the configuration by means of the conveniently designed user interface of the WayCon software, available in English language.

The latter choice uses the serial interface and is therefore possible only for the RS232 or RS422 LLD-Laser sensors, (not for the Profibus, SSI version). Please be aware that normal PC's and Laptops do not have a RS422 interface and hence a RS422/RS232 converter is required. When establishing the connection, the distance between converter and PC (RS232 line) should be kept as short as possible. The possibly long and EMI (electromagnetic interference) loaded distance between converter and LLD-sensor thus represents the RS422 line.

The parameters shown in the graphic user interface correspond to the parameters described in the manual of the sensor. For stand-alone operation (i.e. without connection to a PC or a PLC), essential parameters are Autostart and Analog Range Begin/End, used to configure the sensor for instantaneous automatic selection of the measurement mode after switching on.

The WayCon Configuration Software furthermore offers the possibility to save measured distances in ASCII format by means of a data logger.

LLD-Communication and Data Ac	equisition v1.0.2			
Measurement settings Average value Set average value Set measure time Set measure time Set factor Scale factor Scale factor Set distance offset Distance offset Distance offset Distance offset Distance offset Set distance to offset Set distance to offset Set distance to offset Set distance to offset Store Data Store Data	Annalog olitiplit settings       Range end         Set analog range end	Operational modes         Push Modes         Distance Tracking         Push Data         Push Data         Push Data         Poll modes         Distance measurement         Distance delay         totax         Set trigger delay         totax         Set trigger mode         Set trigger mode         Off         Falling edge	Laser ON Laser OFF Reset settings Set autostart Autostart ID Set baudrate Baudrate Laser 9600 Set display format Dec Baudrate Hoos 9600 COM-Port COM-Port COM-Port COM-Port	

### **CONFIGURATION-SOFTWARE**

As described above the LLD-Sensor has to be switched into the operational mode, before measurements can be made. WayCon offers the possibility for the RS232- and RS422-based laser sensors to make a pre-configuration. In this case the desired measurement range is required, e.g. 5 m measurement range begin, 25 m measurement range end. After this configuration by WayCon 4 mA will be the output at the measurement range begin and 20 mA at the measurement range end. The laser sensor can then be used right after unpacking, without any additional adjustments.

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### ORDER CODE



## **OPTIONS AND ACCESSORIES**

Accessories RS232 / RS422		Accessories Profibus	i
KAB-LLD-2M	Interface cable 2 m	KAB-LLD-2M-PROF	Interface cable 2 m, supply
KAB-LLD-5M	Interface cable 5 m	KAB-LLD-5M-PROF	Interface cable 5 m, supply
KAB-LLD-10M	Interface cable 10 m	KAB-LLD-10M-PROF	Interface cable 10 m, supply
LLD Aktivierung	Pre-configuration by WayCon for RS232, RS422 models	94133	Profibus-OUT M12 connector, male
		94136	Profibus IN M12 connector, female
Option for all models		94145	Profibus M12 terminating resistance
Н	Heating	K5P2M-B-M12-PROF	Cable 2 m, female connector 5-pol. M12, open ends
		K5P2M-SB-M12-PROF	Cable 2 m, female 5-pol. M12, male 5-pol. M12
		K5P2M-B-M12-PROF	Cable 2 m, male connector 5-pol. M12, open ends
Target Board (for measurement distances 30 m and greater)		K5P5M-B-M12-PROF	Cable 5 m, female connector 5-pol. M12, open ends
ZT51_WEISS	Target board for Laser Type LLD	K5P5M-SB-M12-PROF	Cable 5 m, female 5-pol. M12, male 5-pol. M12
		K5P5M-S-M12-PROF	Cable 5 m, male connector 5-pol. M12, open ends
		K5P10M-B-M12-PROF	Cable 10 m, female connector 5-pol. M12, open ends
		K5P10M-SB-M12-PROF	Cable 10 m, female 5-pol. M12, male 5-pol. M12
		K5P10M-S-M12-PROF	Cable 10 m, male connector 5-pol. M12, open ends

#### General safety instructions

Attention radiation laser.

Do not stare into beam.

Do not point the laser beam towards someone's eye.

It is recommended to stop the beam by a matte object or matte metal shield.

Laser regulations require the power to the sensor be switched off when turning off the whole system this sensor is part off.

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Subject to change without prior notice.

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