



EN



LZR[®]-VISIOSCAN RD

RAW-DATA LASER SCANNER FOR FACTORY
AUTOMATION AND AGV / AMR APPLICATIONS

User's Guide for product model VISIOSCAN RD, product version
V1.1.0 and higher.

(refer to the label on the product)

SAFETY TIPS



Do not open the housing.



Only trained and qualified personnel may install and adjust the laser scanner.

INSTALLATION AND MAINTENANCE



Avoid extreme vibrations.



Do not cover the optical window.



Avoid the presence of smoke, fog, or light sources in the measurement field.



Ensure functional grounding via the shield of the connection cable.



Avoid condensation.



Avoid exposure to sudden and extreme temperature changes.



Avoid direct exposure to high pressure cleaning.



Keep the laser scanner permanently powered in environments where the temperature can descend below 0°C.

CLEANING THE OPTICAL WINDOW

Please take precautions when cleaning the optical window, as the polycarbonate window can be scratched and will compromise the detection performance of the laser scanner.



Wipe the optical window regularly with a clean and damp cloth.



Do not use aggressive products to clean the optical window.

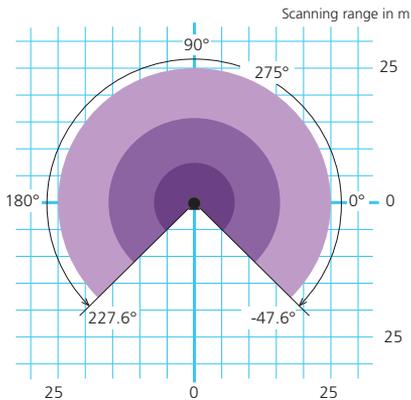
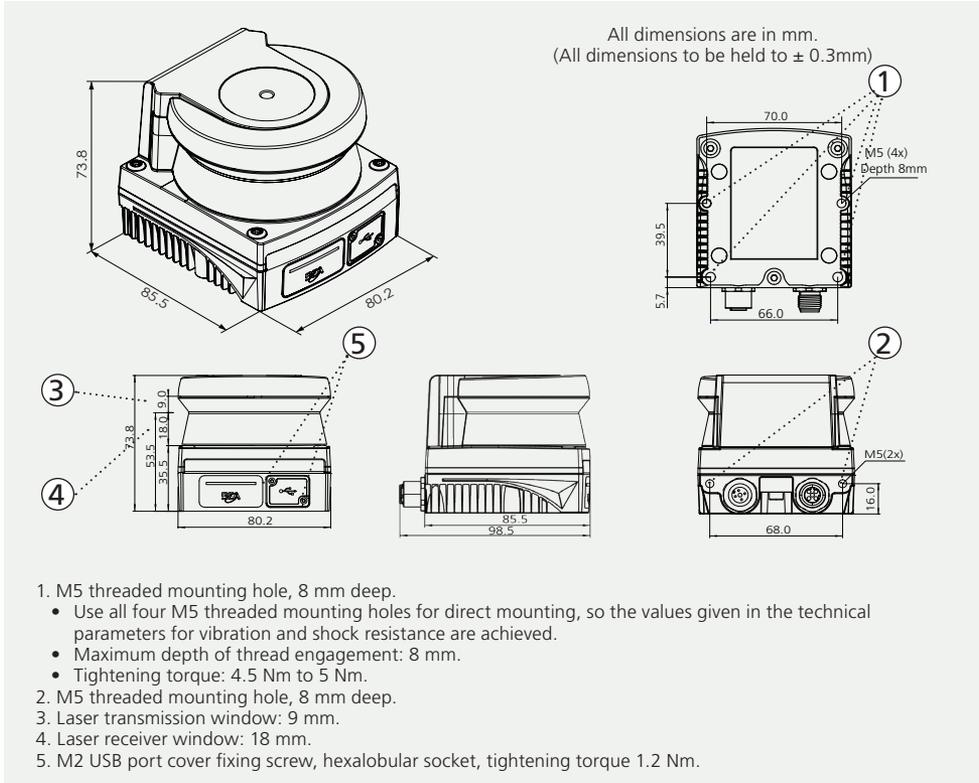


Avoid rubbing the dirt on the surface.

INTRODUCTION

The LZR®-VISIOSCAN RD is a laser scanner that scans a single curtain over an angle of 275°. The laser scanner outputs accurate measurement data at a high scanning frequency through Ethernet communication, enabling further processing to achieve a variety of applications such as navigation and obstacle avoidance for AGV/AMRs, etc.

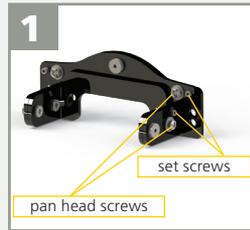
DESCRIPTION



- Scanning range for objects up to 1.8% reflectivity, typ. 7 m.
- Scanning range for objects up to 10% reflectivity, typ. 15 m.
- Max. scanning range 25 m.

DEVICE INSTALLATION

1 MOUNTING



Prepare the mounting bracket.
(A Mounting kit including the mounting bracket and screws can be ordered separately).



Mount the mounting bracket onto the back of the laser scanner using two M5 hexagon socket head cap screws.



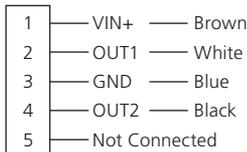
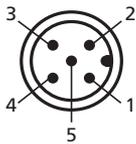
Adjust the tilt angle of the laser scanner by using the two pan head screws on the side of the bracket, then lock the bracket using the two set screws.



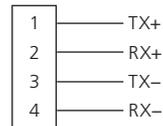
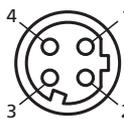
Align the laser curtain by using the two pan head screws on the back of the bracket, then lock the bracket using the two set screws.

2 WIRING & PIN ASSIGNMENT

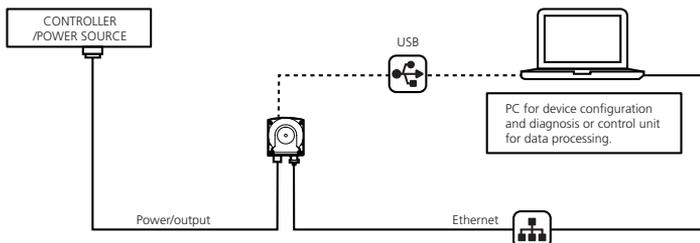
Power/output: A-coded



Ethernet: D-coded



3 COMMISSIONING AND CONFIGURATION



1. Power up the laser scanner by connecting the power/output connector to a power source.
2. Connect the laser scanner to a PC using either the Ethernet or USB interface.
3. Start the <Visioscan Set> software* on the PC and establish communication between the laser scanner and the software by using the default IP address and port number (192.168.1.2 : 3050).

* Visioscan Set is the configuration software for BEA LZR@-VISIOSCAN, and can be downloaded on BEA's website. <<https://eu.beasensors.com/en/bea-tools/>>

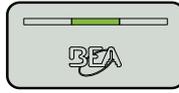
LED INDICATION

LED 1 : Power status



- Power off.
No supply voltage.
- * Power on.
- External power supply error.

LED 2 : Ethernet Connectivity



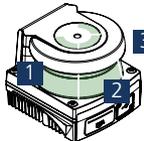
- No ethernet connection.
- * Ethernet connection established,
no measurement data transfer.
- * Ethernet measurement data
transmission (default off).

LED 3 : Sensor status



- Power off.
No supply voltage.
- * Normal operation,
no error.
- Internal error.
- Fatal error.

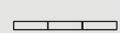
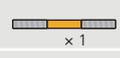
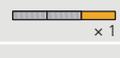
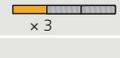
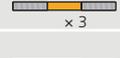
* NOTE : BEA Logo and green indications can be turned OFF



3 LED 1, 2 & 3 also flash orange to notify the level of contamination of the left/central/right part of the optical window. For further details, please refer to troubleshooting.

1	-47.5°~44.2°
2	44.2°~135.8°
3	135.8°~227.5°

TROUBLESHOOTING

	All LED are OFF	Power off All LED are turned OFF	Check cables and connections. Check LED settings.
	LED 1 is permanently red.	Power supply is out of limit.	Check the power supply.
	LED 2 is off.	Ethernet connection is not established.	Check ethernet cable and connections.
	LED 3 is permanently orange.	Internal error.	Reboot sensor.
	LED 3 is permanently red.	Fatal error.	Send sensor back for a technical check-up.
	LED 1 is flashes 1 x every 2 seconds.	Contamination in the left side of the optical window has reached the warning threshold.	Clean the optical window by wiping it with a clean damp cloth.
	LED 2 is flashes 1 x every 2 seconds.	Contamination in the center of the optical window has reached the warning threshold.	Clean the optical window by wiping it with a clean damp cloth.
	LED 3 is flashes 1 x every 2 seconds.	Contamination in the right side of the optical window has reached the warning threshold.	Clean the optical window by wiping it with a clean damp cloth.
	LED 1 is flashes 3 x every second.	Contamination in the left side of the optical window has reached the error threshold.	Clean the optical window by wiping it with a clean damp cloth.
	LED 2 is flashes 3 x every second.	Contamination in the center of the optical window has reached the error threshold.	Clean the optical window by wiping it with a clean damp cloth.
	LED 3 is flashes 3 x every second.	Contamination in the right side of the optical window has reached the error threshold.	Clean the optical window by wiping it with a clean damp cloth.

TECHNICAL SPECIFICATIONS

Technology	Laser scanner, time-of-flight measurement
Optical characteristics	IR LASER: wavelength 905 nm; Output power < 0.1 mW; Class 1 (IEC/EN 60825-1)
Scanning angle	275°
Scanning frequency	80 Hz / 40 Hz (adjustable)
Angular resolution	0.2° @ 80 Hz, 0.1° @ 40 Hz
Scanning range	0.08 – 25 m; 7 m @ 1.8% reflectivity; 15 m @ 10% reflectivity
Light spot size	
Diameter of the light spot	12.5 mm x 1.5 mm @ 1 m (at 90% spot energy)
Beam divergence	12.5 mm/m (longitudinal) x 1.5 mm/m (transversal)
Flatness of scanning plane	± 0.2°
Measurement accuracy	
Measurement speed	110 080 measurements per second
Systematic error	± 20 mm*
Statistical error (1σ)	≤ 6 mm (0.08 – 7 m); ≤ 10 mm (7 – 10 m); ≤ 15 mm (10 – 15 m)* ≤ 6 mm (0.08 – 25 m) for reflectors
Electrical specifications **	
Supply voltage	12 – 24 V DC, - 10% / + 30%
Power consumption	< 5.5 W
Interfaces **	
Ethernet	TCP/IP, UDP/IP
Default IP address	192.168.1.2
Port	3050
USB	USB 2.0, Type-C
Digital Outputs	2 x PNP (Max. 30 V DC, 100 mA)
Indicators	3 x Status LEDs (Tri-color), 1 x Logo LED (Blue)
Mechanical specifications	
Degree of protection	IP67 (only with the USB port cover in place, IEC/EN 60529)
Dimensions	73.8 mm (H) x 80.2 mm (W) x 85.5 mm (D) (not including connectors) (All dimensions to be held to ± 0.3 mm)
Weight	Approx. 560 g
Housing material	Zinc / Plastic
Optical window material	Plastic / PC
Connection type	1 x Power/output, 5-pin, M12 male connector, A-coded 1 x Ethernet, 4-pin, M12 female connector, D-coded 1 x USB, Type-C, socket
Ambient conditions	
Operating temperature	- 30 °C to + 60 °C
Storage temperature	- 40 °C to + 70 °C
Relative humidity	< 95%, non-condensing
Ambient light immunity	100 000 lux (ambient light); 3 000 lux (IEC/EN 61496-3)
EMC	
Class of immunity	Industrial environments (IEC/EN 61000-6-2)
Class of emission	Commercial environments (IEC/EN 61000-6-3)

Vibration resistance

Class	5M2 (IEC/EN 60721-3-5)
Sinusoidal vibrations	3.5 mm, 5 – 9 Hz (IEC/EN 60721-3-5) 1.0 g, 9 – 200 Hz (IEC/EN 60721-3-5) 1.5 g, 200 – 500 Hz (IEC/EN 60721-3-5) 0.35 mm, 10 – 55 Hz (IEC/EN 60068-2-6)

Shock resistance

Class	5M2 (IEC/EN 60721-3-5)
Single shock	15 g, 11 ms, 3 shocks per axis (IEC/EN 60721-3-5)
Continuous shock	10 g, 16 ms, 1000 shocks per axis (IEC/EN 60068-2-27)

* Typical value at 10% reflectivity up to 7m scanning range or as specified; real values depends on ambient conditions and the target object.

** External electrical sources must ensure double insulation from primary voltages.

*Specifications are subject to changes without prior notice.
All values measured in specific conditions.*

ADDITIONAL INFORMATION

Additional information about the product can be found on the BEA website and the BEA Sensors Github page.

Explore the LZR®-VISIOSCAN RD:

<https://eu.beasensors.com/en/product/lzr-visioscan-rd/>

- Product Information
- Technical Specifications
- Product Documentations
- Declaration of Conformity
- Visioscan Set Configuration Software
- Protocol Documentation
- API Documentation



Access to BEA ROS Drives:

github.com/BEASensors

