TIME OF FLIGHT

MEASUREMENT SENSORS

Catalogue

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About BEA

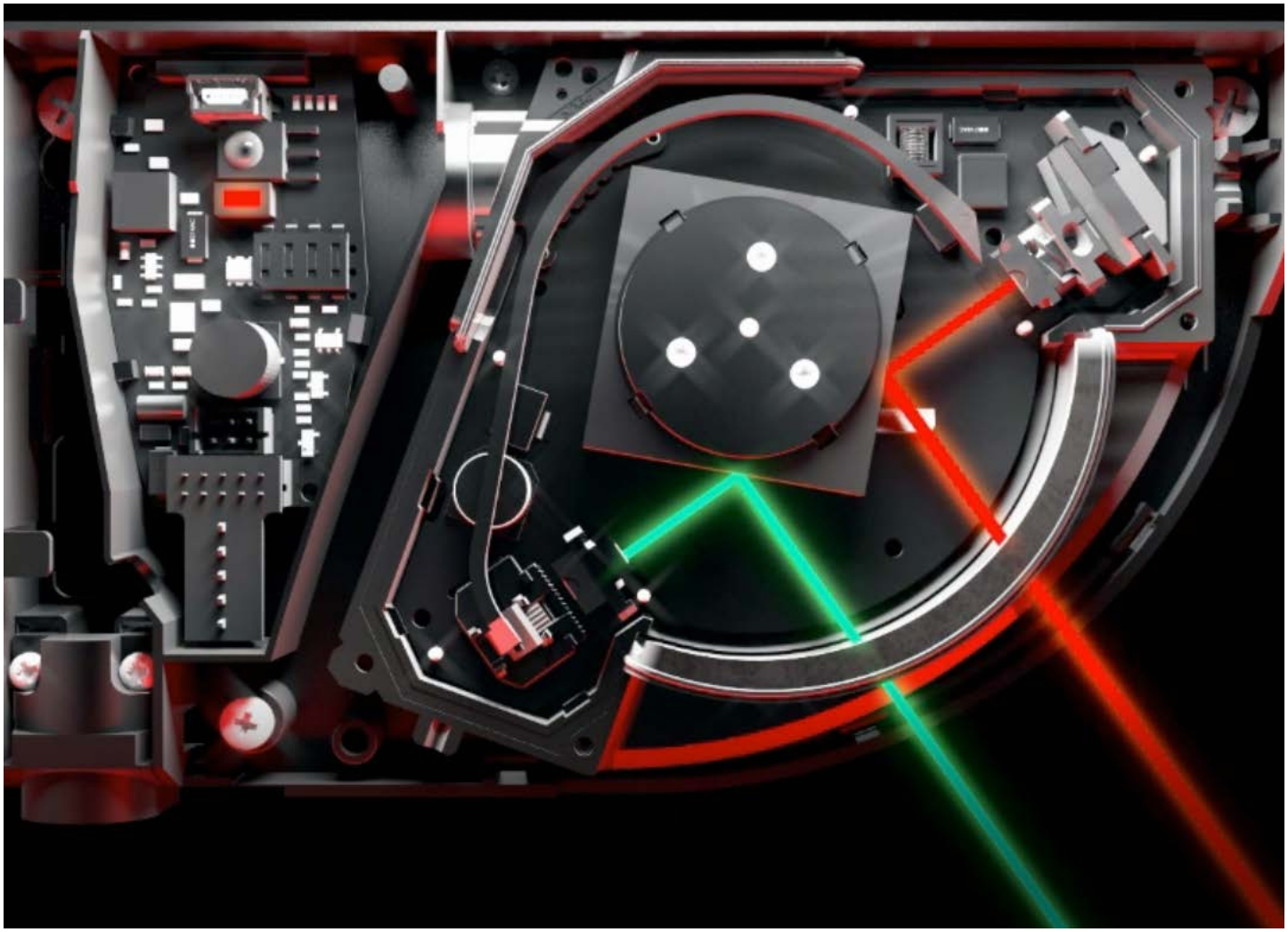
BEA, founded in Belgium in 1965, has now over 500 employees around the globe. A pioneer in the sensor industry, BEA was one of the first companies to launch a Doppler microwave radar specially adapted for automatic doors.

Based in Beijing, the APAC regional head office covers all the Asian countries. This regional center gathers skilled and passionate people from different cultures, different backgrounds and experiences. They speak different languages and are working together as a team to support our customers in the best conditions.

Our goal is to partner with our customers in order to add value and innovation to their solutions, raise the safety awareness on the market and bring satisfaction to BEA users.

A **Halma** company

Since 2002, BEA has been a member of the British HALMA Group, which includes 50+ companies around the world designing, producing and marketing products for the safety of public and industrial automatic installations.



Technology

LASER technology works according to the principle of time of flight. The sensor sends an intense light impulse in a defined direction and measures the time until the signal returns. As the speed of light is a constant value (approximately 300.000 km/s), this time is directly proportional to the distance between the sensor and the first object encountered by the light impulse.

As a result, and by sending multiple beams in multiple directions (2D or 3D), the sensor is capable of knowing the exact position of any object in its detection area at any given time.

By analyzing this information over a very short period of time, it is easy to determine the shape, speed, and direction of any object.

LASER technology is the most precise and accurate method used in BEA products and delivers the highest ever level of safety.

Comparison of the LZR® Raw Platforms

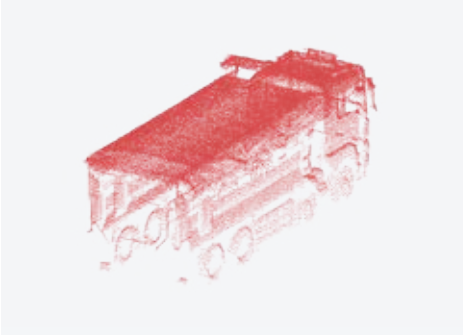
	LZR® Raw-U	LZR® Raw-F	LZR® Raw-M
Detection range	Max.65m	Max.8m	Max.10m
Opening angle	Max.96°	Max.108°	Max.100°
Angular resolution	Min.0.35°	Min.0.18°	Min.0.32°
Planes			
Laser spot size @2m	32×13mm	25×3mm	25×3mm
Dimensions	L:124.8mm D: 92.5mm H: 77.3mm	L:114mmD: 79mm H: 17.5mm	L:98mm D: 53mm H: 45mm
Scanning frequency	60Hz 15Hz	Max.93Hz	22.5Hz

LZR® Raw Platforms

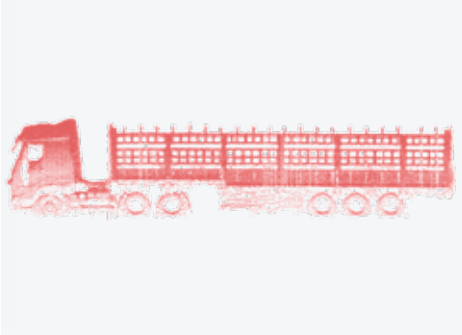
LZR® Raw-U

- Wide measurement range.
- High scanning frequency.
- Muti-planes, provide 3D measurement data.
- High precision detection.
- Capable for harsh outdoor environments.
- Strong anti-interference ability, like rain, snow fog, light...
- Visible spots.

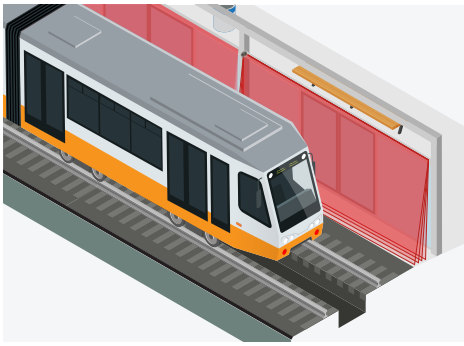
APPLICATIONS



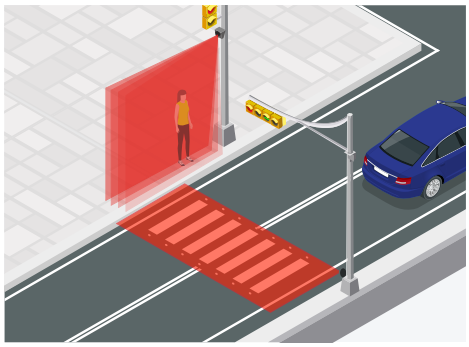
Vehicle profiling



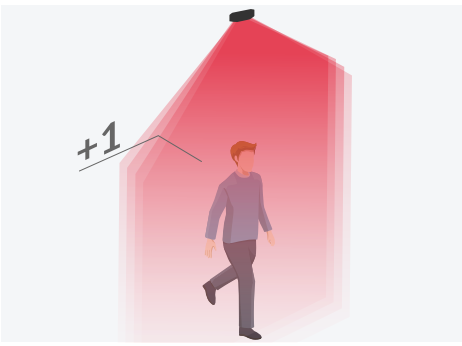
Axle counting



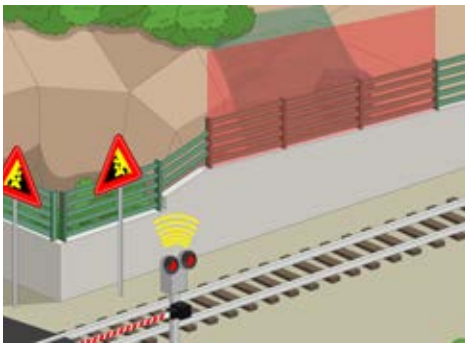
PSD protection



Smart city



People counting



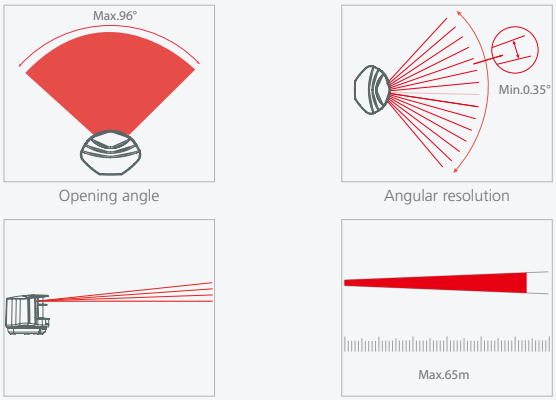
Perimeter protection

LZR® Raw-U453

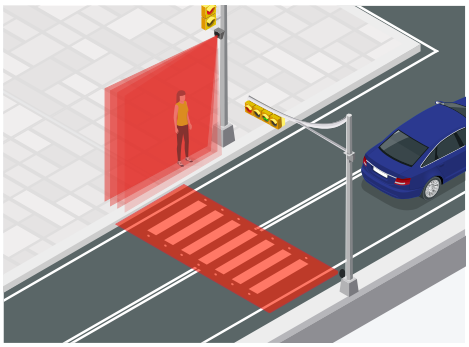
The LZR® Raw-U453 is a raw data laser-based measurement device measuring distances on up to 4 planes. This sensor is widely used for smart city and PSD protection.

FEATURES

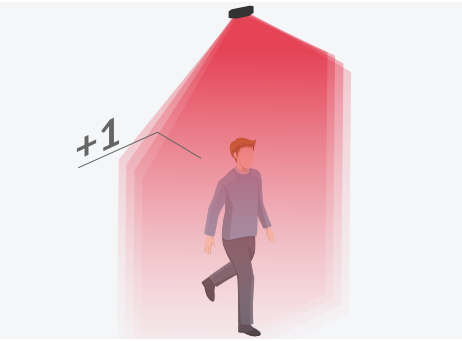
- Wide measurement range.
- Muti-planes, provide 3D measurement data.
- High precision detection.
- Capable for harsh outdoor environments.
- Strong anti-interference ability, like rain, snow fog, light...
- Visible spots.



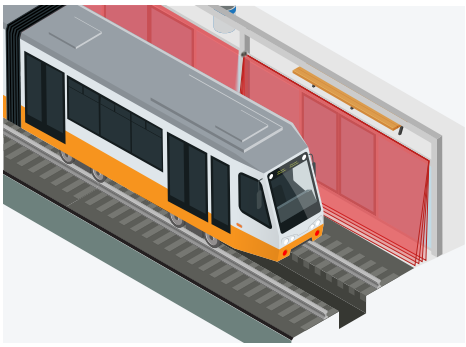
APPLICATIONS



Smart city

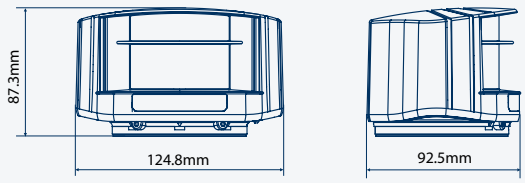


People counting



PSD protection

DIMENSIONS



SPECIFICATIONS

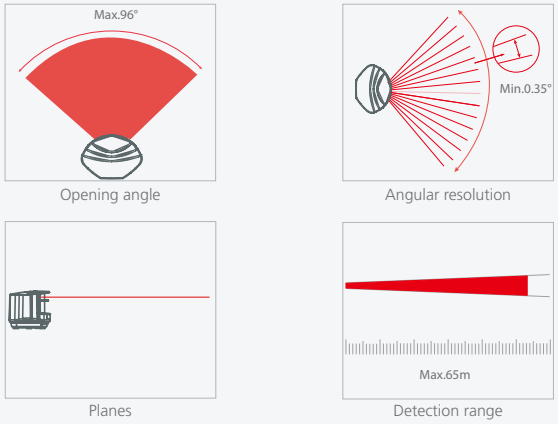
Technology	Laser scanner, time-of-flight measurement
Measurement range	Max 65 m; 10m@2% reflectivity; 30m@10% reflectivity
Number of planes	4 (0°/2°/4°/6°)
Number of points/plane	Max. 274
Angular resolution	Min. 0.3516°
Angular coverage	Max. 96°
Scanning frequency	15 Hz
Supply voltage	10-35V DC
Power consumption	< 5 W
Communication	RS 485, 460800 bit/sec (Max: 921600 bit/sec)
Protection degree	IP65
Temperature range	-30°C to +60°C if powered; -10°C to +60 C unpowered
Conformity	IEC 60825-1; EN 61000-6-2 EMC - Industrial level - immunity EN 61000-6-3 EMC - Commercial level - emission

LZR® Raw-U153

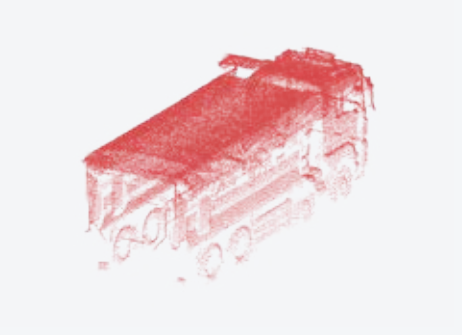
The LZR® Raw-U153 is a raw data laser-based measurement device measuring distances on 1 plane. This sensor is widely used for vehicle profiling and classification.

FEATURES

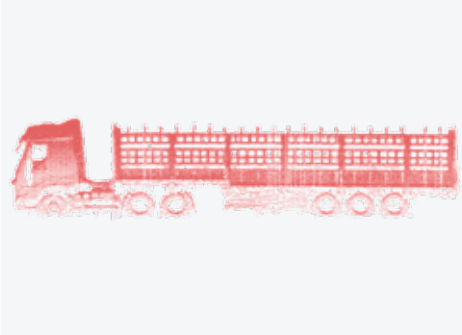
- Wide measurement range.
- High scanning frequency.
- High precision detection.
- Capable for harsh outdoor environments.
- Strong anti-interference ability, like rain, snow, fog, light...
- Visible spots.



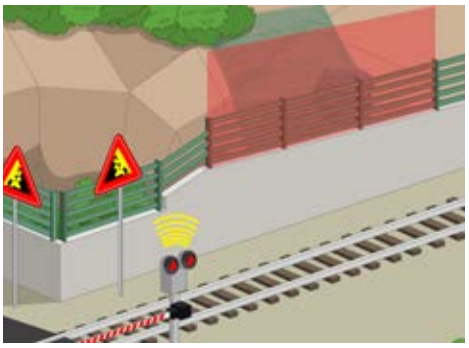
APPLICATIONS



Vehicle profiling

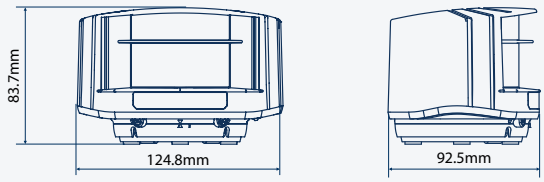


Axle counting



Perimeter protection

DIMENSIONS



SPECIFICATIONS

Technology	Laser scanner, time-of-flight measurement
Measurement range	Max 65 m; 10m@2% reflectivity, 30 m@10% reflectivity
Number of planes	1
Number of points/plane	Max. 274
Angular resolution	Min. 0.3516°
Angular coverage	Max. 96°
Scanning frequency	60 Hz
Supply voltage	10-35V DC
Power consumption	< 5 W
Communication	RS 485, 460800 bit/sec (Max: 921600 bit/sec)
Protection degree	LZR® Raw-U153: IP65, LZR® Raw-U154 :IP66
Temperature range	-30°C to +60°C if powered; -10°C to +60°C unpowered
Conformity	IEC 60825-1; EN 61000-6-2 EMC - Industrial level - immunity EN 61000-6-3 EMC - Commercial level - emission

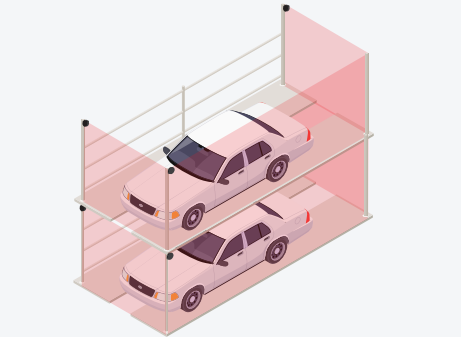
LZR® Raw Platforms

LZR® Raw-F

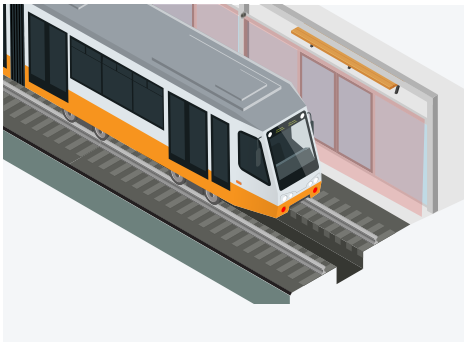
- Compact, ultra-thin and light.
- High definition and high speed dual-detection modes.
- High angular resolution.
- High scanning frequency.
- Capable for harsh outdoor environments.
- Flexible for secondary development.

APPLICATIONS

Forklift positioning



Perimeter protection



PSD protection

AGV Anti-collision

Toll gate tailgating

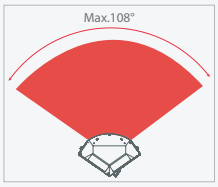
Interactive system

LZR® Raw-F122

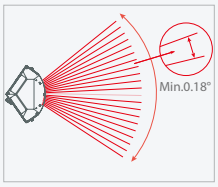
The LZR® Raw-F122 is a laser-based device measuring distances with 1 plane. It can be easily installed to scan in any direction and is designed to provide the best performance with maximum flexibility. It communicates the raw measurement data for further calculation or control tasks. This sensor is widely used for perimeter protection and interactive system.

FEATURES

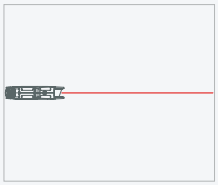
- Compact, ultra-thin and light.
- High definition and High speed dual-detection modes.
- High angular resolution.
- High scanning frequency.
- Flexible for secondary development, can provide only the core measuring unit.



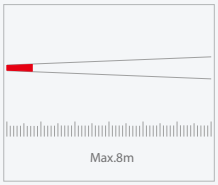
Opening angle



Angular resolution

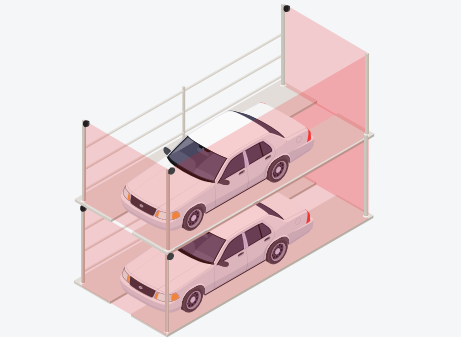


Planes



Detection range

APPLICATIONS

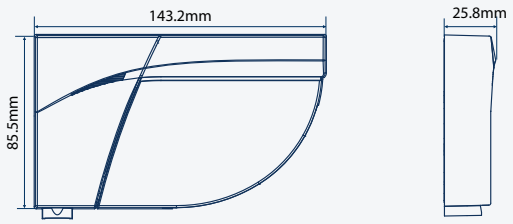


Perimeter protection

Toll gate tailgating

Interactive system

DIMENSIONS



SPECIFICATIONS

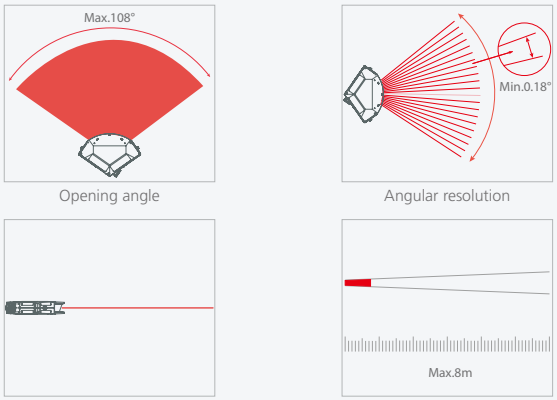
Technology	Laser scanner, time-of-flight measurement
Measurement range	Max. 8 m; 4m@2% reflectivity
Number of planes	1
Number of points/plane	Max. 400
Angular resolution	Min. 0.18°
Angular coverage	Max. 108°
Scanning frequency	93 Hz. @ HS; 23.25Hz. @ HD
Supply voltage	12-24V DC ± 15 %
Power consumption	< 2 W
Communication	RS 422, Max. 921600 bit/sec (configurable)
Protection degree	IP54
Temperature range	-30°C to +60°C if powered; -10°C to +60°C unpowered
Conformity	IEC 60825-1; EN 60950-1; EN 50581 EN 61000-6-2 EMC - Industrial level - immunity EN 61000-6-3 EMC - Commercial level - emission

LZR® Raw-F124

The LZR® Raw-F124 is a laser-based device measuring distances with 1 plane. It can be easily installed to scan in any direction and is designed to provide the best performance with maximum flexibility. It communicates the raw measurement data for further calculation or control tasks. This sensor is widely used for PSD protection and vehicle separation.

FEATURES

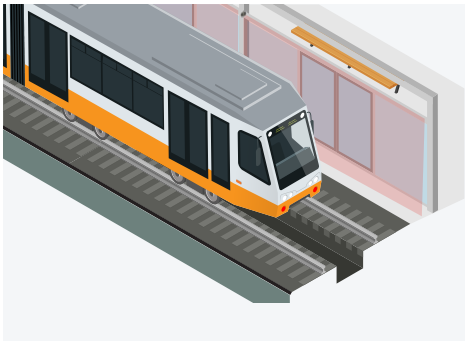
- Compact, ultra-thin and light.
- High definition and High speed dual-detection modes.
- High angular resolution.
- High scanning frequency.
- Capable for harsh outdoor environments.
- Flexible for secondary development.



APPLICATIONS

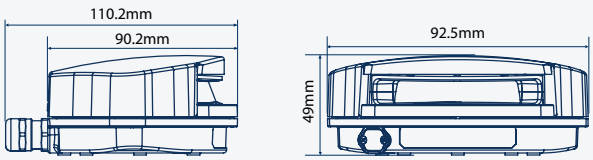
Forklift positioning

Toll gate tailgating



PSD protection

DIMENSIONS



SPECIFICATIONS

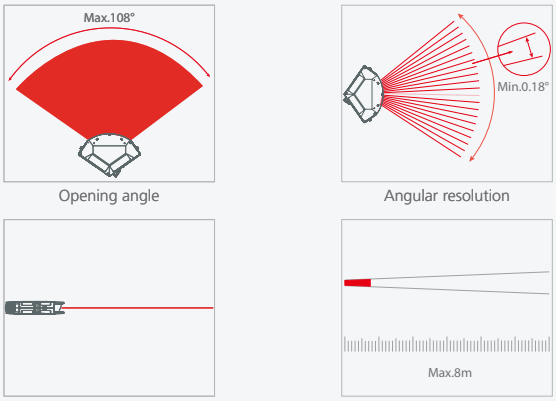
Technology	Laser scanner, time-of-flight measurement
Measurement range	Max. 8 m; 4m@2% reflectivity
Number of planes	1
Number of points/plane	Max. 400
Angular resolution	Min. 0.18°
Angular coverage	Max. 108°
Scanning frequency	93 Hz. @ HS; 23.25 Hz. @ HD
Supply voltage	12-24V DC ± 15 %
Power consumption	≤ 2.3W, peak current: 1A, Max. 20ms
Communication	RS 422, Max. 921600 bit/sec (configurable)
Protection degree	IP65
Temperature range	-30°C to +60°C if powered; -10°C to +60 C unpowered
Conformity	IEC 60825-1; EN 60950-1; EN 50581 EN 61000-6-2 EMC - Industrial level - immunity EN 61000-6-3 EMC - Commercial level - emission

LZR® Raw-F120

The LZR® Raw-F120 is a laser-based device measuring distances with 1 plane. It can be easily installed to scan in any direction and is designed to provide the best performance with maximum flexibility. It communicates the raw measurement data for further calculation or control tasks. This sensor is widely used for AGV anti-collision and PSD protection.

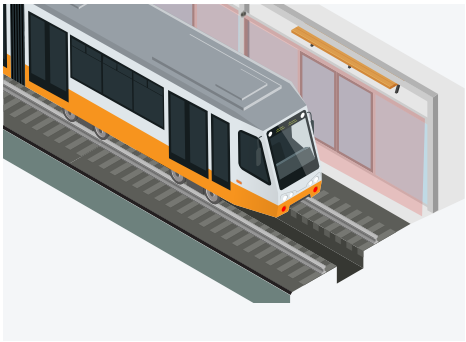
FEATURES

- Compact, ultra-thin and light.
- High definition and High speed dual-detection modes.
- High angular resolution.
- High scanning frequency.
- Capable for harsh outdoor environments.
- Flexible for secondary development.



APPLICATIONS

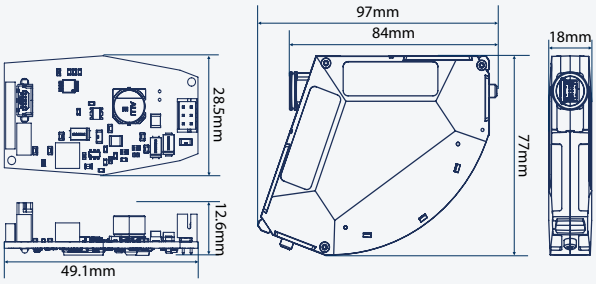
AGV Anti-collision



PSD protection

Interactive system

DIMENSIONS



SPECIFICATIONS

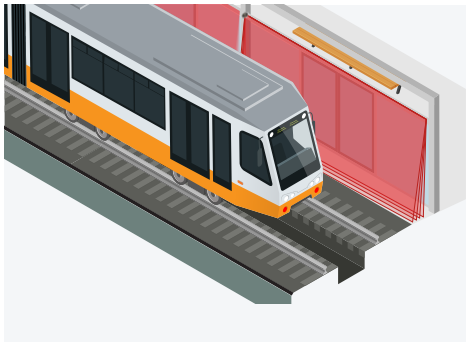
Technology	Laser scanner, time-of-flight measurement
Measurement range	Max. 8 m; 4m@2% reflectivity
Number of planes	1
Number of points/plane	Max. 400
Angular resolution	Min. 0.18°
Angular coverage	Max. 108°
Scanning frequency	93 Hz @ HS; 23.25 Hz @ HD
Supply voltage	12 - 24V DC ± 15 %
Power consumption	< 2W, peak current: 0.8A, Max. 20ms @ 24V
Communication	RS 422, Max. 921600 bit/sec (configurable)
Protection degree	NA
Temperature range	-30°C to +60°C if powered; -10°C to +60°C unpowered
Conformity	IEC 60825-1; EN 60950-1; EN 50581 EN 61000-6-2 EMC - Industrial level - immunity EN 61000-6-3 EMC - Commercial level - emission

LZR® Raw Platforms

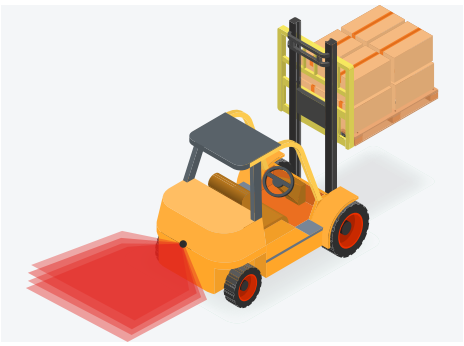
LZR® Raw-M

- Compact, light.
- Up to 4 planes providing 3D measurement data.
- Flexible for secondary development.
- Angular resolution adjustable, highly flexible for integration.
- Strong anti-interference ability, like rain, snow, fog, light...

APPLICATIONS

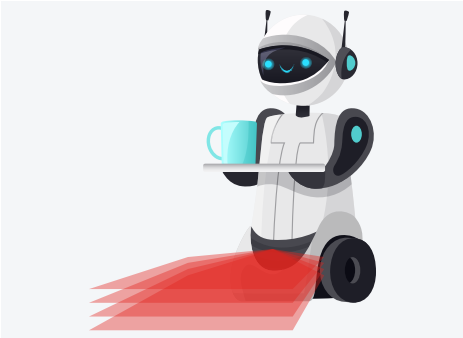


PSD protection

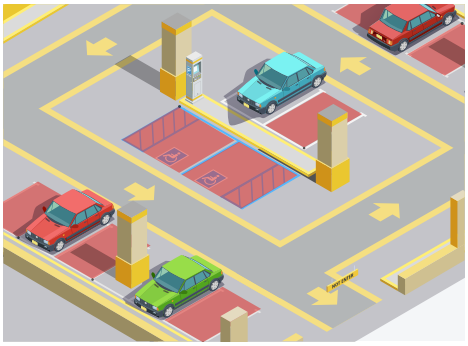


Folklift anti-collision

Forklift positioning



Service robot



Parking occupancy detection

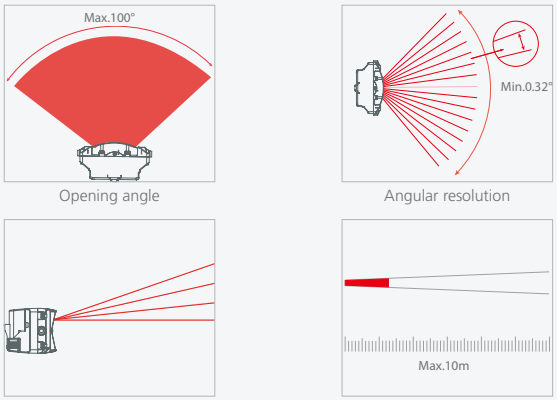
Escalator passengers counting

LZR® Raw-M420S

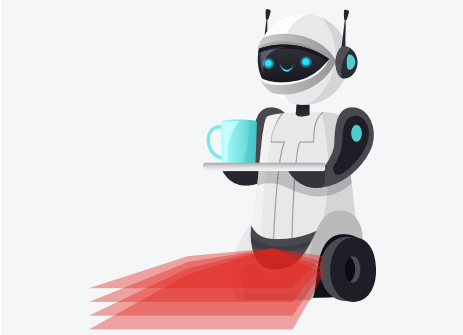
The LZR® Raw-M420S is a 4-plane laser measurement device with bi-directional bus communication. This sensor is widely used for PSD and AGV 3D protection.

FEATURES

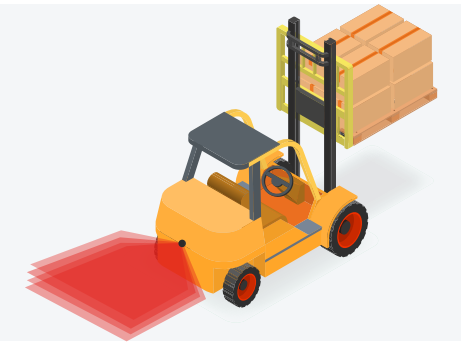
- Compact, light.
- Up to 4 planes provide 3D measurement data.
- Flexible for secondary development.
- Angular resolution adjustable, highly flexible for integration.
- Strong anti-interference ability, like rain, snow, fog, light...



APPLICATIONS



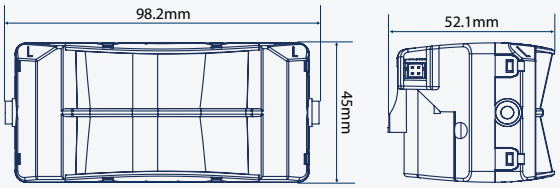
Service robot



Folklift anti-collision

Escalator passengers counting

DIMENSIONS



SPECIFICATIONS

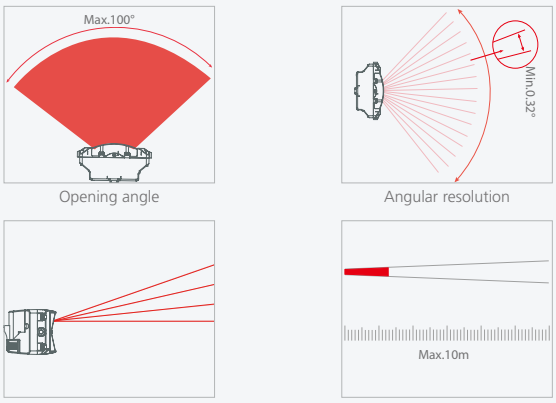
Technology	Laser scanner, time-of-flight measurement
Measurement range	Max. 10 m; 4 m @ 5% reflectivity
Number of planes	Max. 4 (0°/7.2°/17.2°/27.2°)
Number of points/plane	Max. 250
Angular resolution	Max. 0.32°
Angular coverage	Max. 100°
Scanning frequency	22.5Hz
Supply voltage	12-24V DC/AC (±10%)
Power consumption	< 4 W, peak current :1.5A (Max. 30ms @24V)
Communication	RS 422, Max. 921600 bit/sec (configurable)
Protection degree	NA
Temperature range	-25°C to +55°C if powered; -15°C to +55°C unpowered
Conformity	IEC 60825-1 EN 61000-6-2 EMC - Industrial level - immunity EN 61000-6-3 EMC - Commercial level – emission

LZR® Raw-M420P

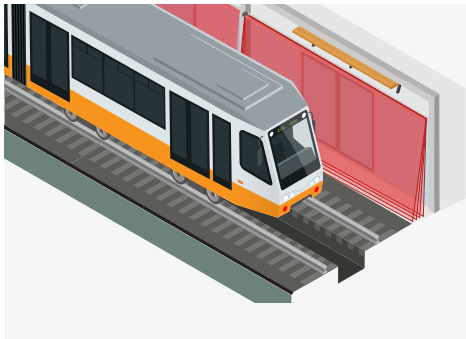
The LZR® Raw-M420P is a 4-plane laser measurement device with bi-directional bus communication. This sensor is widely used for PSD and AGV 3D protection.

FEATURES

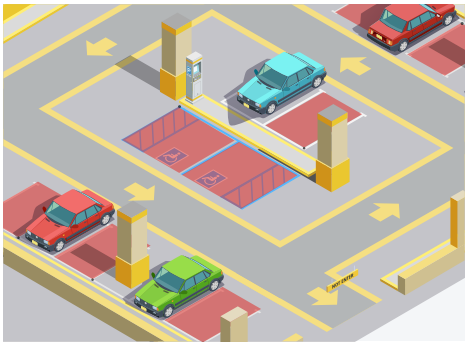
- Compact, light.
- Up to 4 planes provide 3D measurement data.
- Flexible for secondary development.
- Angular resolution adjustable, highly flexible for integration.
- Strong anti-interference ability, like rain, snow, fog, light...



APPLICATIONS



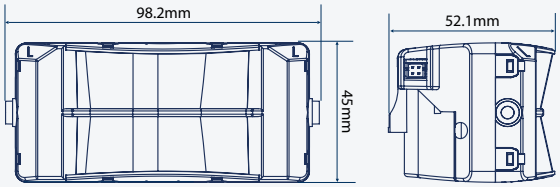
PSD protection



Parking occupancy detection

Forklift positioning

DIMENSIONS



SPECIFICATIONS

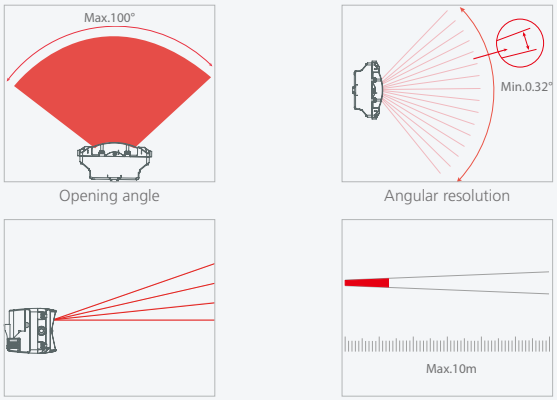
Technology	Laser scanner, time-of-flight measurement
Measurement range	Max 10 m; 4m@5% reflectivity
Number of planes	Max. 4 (0°/2°/4°/6°)
Number of points/plane	Max. 250
Angular resolution	Max. 0.32°
Angular coverage	Max. 100°
Scanning frequency	22.5Hz
Supply voltage	12-24V DC/AC (±10%)
Power consumption	< 4 W,peak current :1.5A (Max. 30ms @24V)
Communication	RS 422, Max. 921600 bit/sec (configurable)
Protection degree	NA
Temperature range	-25°C to +55°C if powered; -15°C to +55°C unpowered
Conformity	IEC 60825-1; EN 60950-1; EN 50581 EN 61000-6-2 EMC - Industrial level - immunity EN 61000-6-3 EMC - Commercial level - emission

LZR® Raw-M422P

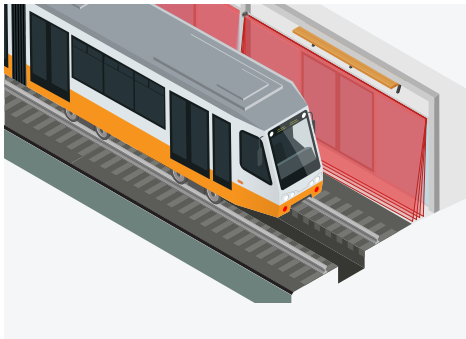
The LZR® Raw-M422P is a 4-plane laser measurement device with bi-directional bus communication. This sensor is widely used for PSD and AGV 3D protection.

FEATURES

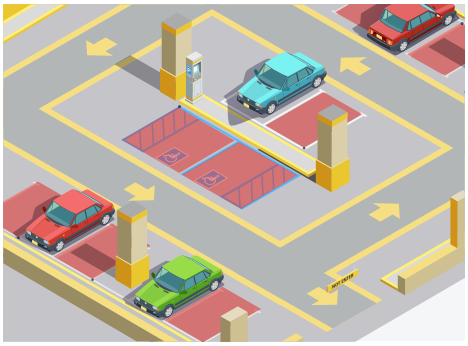
- Compact, light.
- Up to 4 planes provide 3D measurement data.
- Flexible for secondary development.
- Angular resolution adjustable, highly flexible for integration.
- Strong anti-interference ability, like rain, snow, fog, light...



APPLICATIONS



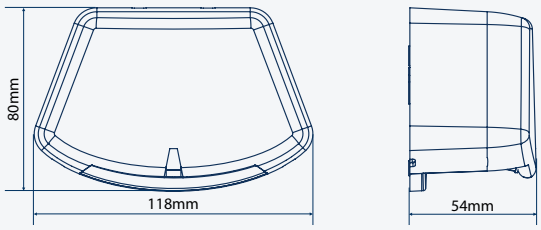
PSD protection



Parking occupancy detection

Forklift positioning

DIMENSIONS

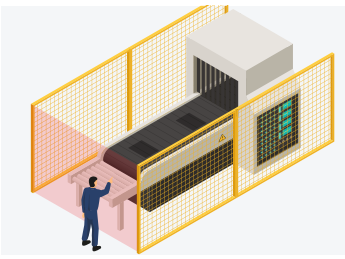


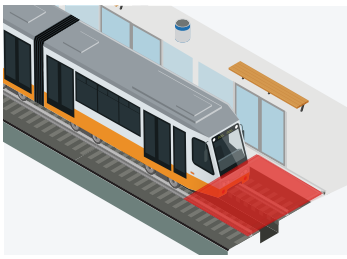
SPECIFICATIONS

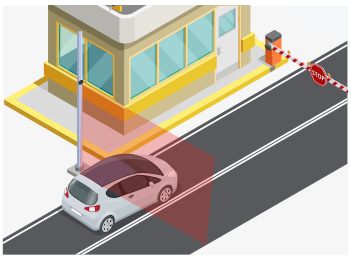
Technology	Laser scanner, time-of-flight measurement
Measurement range	Max 10m; 4m@5% reflectivity
Number of planes	Max. 4 (0°/2°/4°/6°)
Number of points/plane	Max. 250
Angular resolution	Max. 0.32°
Angular coverage	Max. 100°
Scanning frequency	22.5Hz
Supply voltage	12-24V DC/AC (±10%)
Power consumption	< 4 W,peak current :1.5A (Max. 30ms @24V)
Communication	RS 422, Max. 921600 bit/sec (configurable)
Protection degree	IP53
Temperature range	-25°C to +55°C if powered; -15°C to +55°C unpowered
Conformity	IEC 60825-1; EN 60950-1; EN 50581 EN 61000-6-2 EMC - Industrial level - immunity EN 61000-6-3 EMC - Commercial level - emission

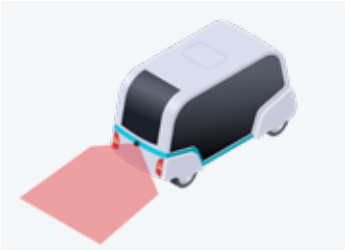
Other Applications

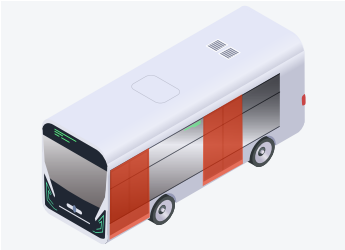

Art protection

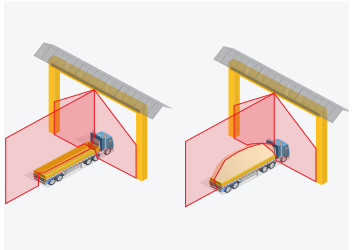

Machine protection

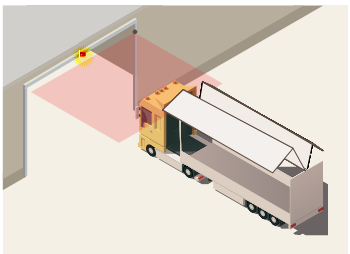

Train positioning

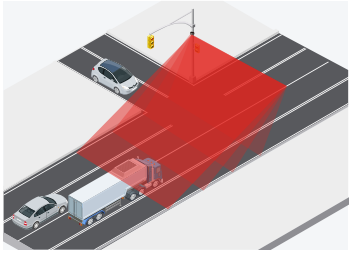

Car classification


Driverless cars anti-collision


Driverless bus door protection


Load detection


Height limitation detection


Smart traffic

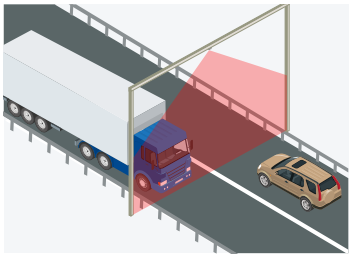

Lane change detection

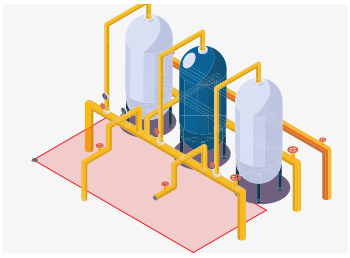

Railway crossing protection


Packaging detection


Profile analysis


Collision avoidance


Free-flow analysis


Leakage detection

Growing a safe automated world,

creating peace of mind for everyone, everywhere

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