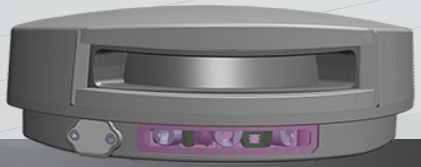
PLEASE KEEP FOR FURTHER USE - DESIGNED FOR COLOUR PRINTING

EN



LZR®- FLATSCAN VS305

COMPACT LASER SCANNER

User's Guide

I. INTRODUCTION IN GENERAL

FLATSCAN VS305 is a detective laser scanner with a single curtain.

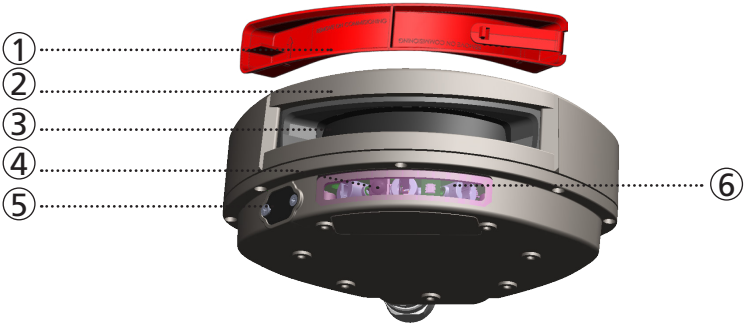
Thanks to the compact and slim design, it can be installed in the narrow gap easily and effectively detect vehicle separation and then the output data can be used for vehicle anti-trailing, vehicle counting and other related applications.

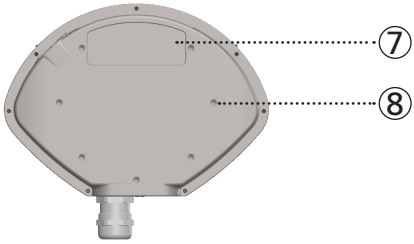
The laser scanner is CLASS 1 certified device according to IEC 60825-1, which has no damage or impact on human eyes & bodies. The visible laser spots are CLASS 2, which can be shut down during normal work.

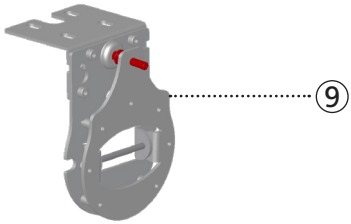
With 400 spots scanning within the curtain, the scanner covers the detection area with high resolution, provides more accurate application results. It could be used for a variety of applications with laser technology. Convenient to install on-site with the transceiver design.

- Please read through the user's guide carefully.
- Please install, configure and use the devices in the given conditions illustrated in the user's guide.
- Please do not disassemble the device without the authority of the manufacturer, otherwise, the manufacturer will not take any responsibility for the defect of devices.
- Please conduct a self-evaluate for the functional feasibility when you intend to use outside of vehicle seperation.

II. DESCRIPTION







1. Front Cover (protective cover)
2. Housing
3. Laser window
4. LED-signal
5. USB connector (internal use)
6. Visible laser beams
7. Internal calibration interface*
8. Screw hole (with screw kit)
9. Bracket (optional)

* DON'T OPEN!

III. LED-SIGNALS


detection


error LED


LED flashes quickly


LED flashes slowly


power on


no power or LED is off


LED flashes

IV. SYMBOLS


Caution!
Laser radiation


Remote control sequence

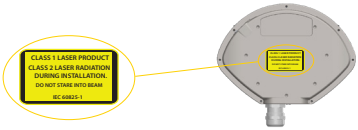

Possible remote control adjustments


Factory values


Attention


Note

V. SAFETY TIPS



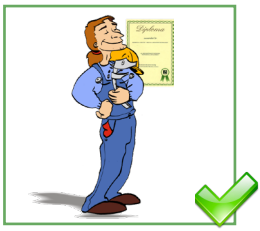
The device contains IR and visible laser spots.
IR laser: Wavelength 905nm; Max. output pulse power 25W.
(Class 1 according to IEC 60825-1)
Visible laser: Wavelength 635nm; Max. output CW power 0.95mW.
(Class 2 according to IEC 60825-1)

The visible laser spots can be deactive during normal functioning.
The installer can activate the visible spots if needed.

CAUTION!
Use of controls, adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.
Test the good functioning of the installation before leaving the premises.


Do not look into the laser emitter or the visible red laser beams.


The warranty is invalid if unauthorized repairs are made or attempted by unauthorized personnel.


Only trained and qualified personnel may install and setup the scanner.

VI. INSTALLATION AND MAINTENANCE

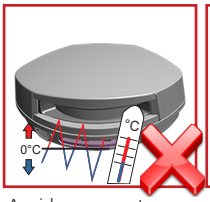
Avoid extreme vibrations.

Do not cover the laser window.

Avoid moving objects and light sources in the detection field.

Avoid the prensence of smoke and fog in the detection field.

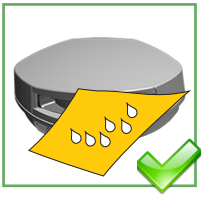
Avoid condensation.



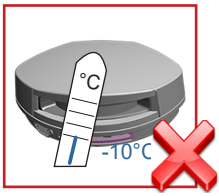
Avoid exposure to sudden and extreme temperature changes.

Avoid direct exposure to high pressure cleaning.

Do not use dry or dirty towels or aggressive products to clean the laser window.



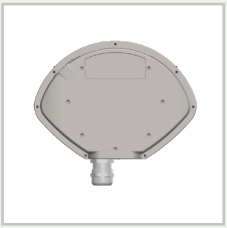
Clean the laser window with compressed air. When needed, wipe the laser window only with a soft, clean and damp microfibre cloth.



Keep the scanner permanently powered in environments where the temperature can descend below -10°C.

VII. INSTALLATIONS

1 MOUNTING



Please do a thorough inspection and evaluation to the installation field to make sure the way of installing the scanner is suitable to the application.

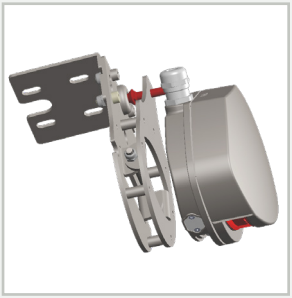
- Please strip away the front cover and make sure the laser window is not covered by anything before power on and configuration.
- Always take appropriate action to secure the safety of installer.
- Grounding: Connect to the earth.

Bracket installation

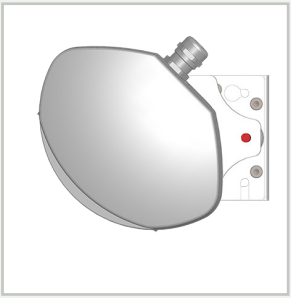
- Choose appropriate or universal bracket according to the filed condition.
- Fix the scanner on the bracket in a proper position, where can make sure the laser window at its right angle.
- Fix the bracket with the scanner on a firm wall or pole where the laser curtain could shoot on the right place.
- Avoid moving objects in or near the detection field, or that may activate the scanner.

* The bracket is an optional accessary.

Prepare the bracket for installation.



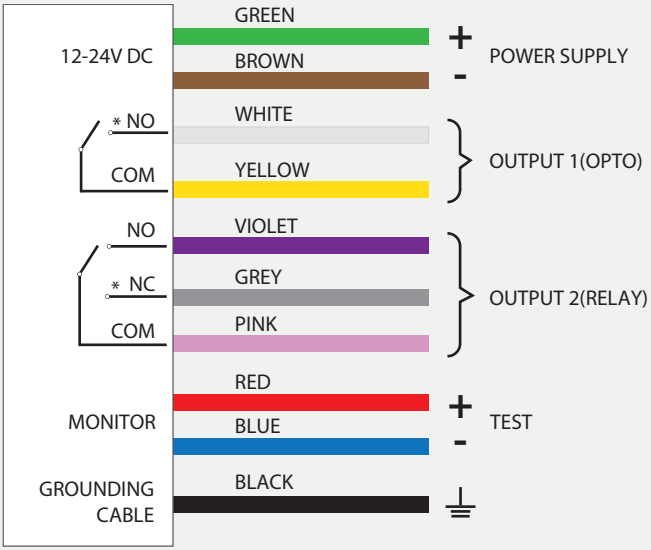
Fix the laser scanner on the bracket at right position.



Install the bracket with laser scanner at a solid and appropriate place.

- Only the authorized installer could implement the installation and configuration.
- If the environment temperature is lower than -10°C, please make sure the scanner keeps the power on.
- Avoid using the scanner in an environment with heavy rain/fog/vibration.
- Please install the scanner vertically for detecting vehicle separation.

2 WIRING



* Output status when the scanner is operational. (Factory default connection)

If the monitor is not connected, the cable must be wired to the power cable.

VIII. HOW TO USE THE REMOTE CONTROL

Before using the remote control, please check the following points:

1. The effective control distance is 4 meters. Please always use remote control within 4 meters of the scanner.
2. The scanner curtain should not be perpendicular to the high reflective surface. A 3-degree angle in between is necessary to guarantee communication between the scanner and the remote control.
3. To avoid an unexpected operation, the authorized operator or installer could set a password to get into the parameter setting process.

After unlocking, the red LED flashes and the scanner can be adjusted by remote control.

If the red LED flashes quickly after unlocking, you need to enter an access code from 1 to 4 digits.

To end an adjustment session, always lock the scanner.

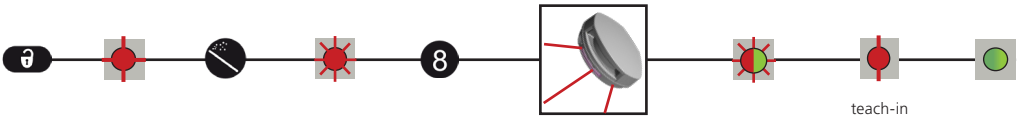
ADJUSTING ONE OR MORE PARAMETERS

CHECKING A VALUE

X = THE NUMBER OF FLASHES INDICATES THE VALUE OF THE PARAMETER

= field width: 4.2 m

RESTORING TO FACTORY VALUES



SAVING AN ACCESS CODE

The access code is recommended for scanners installed close to each other.

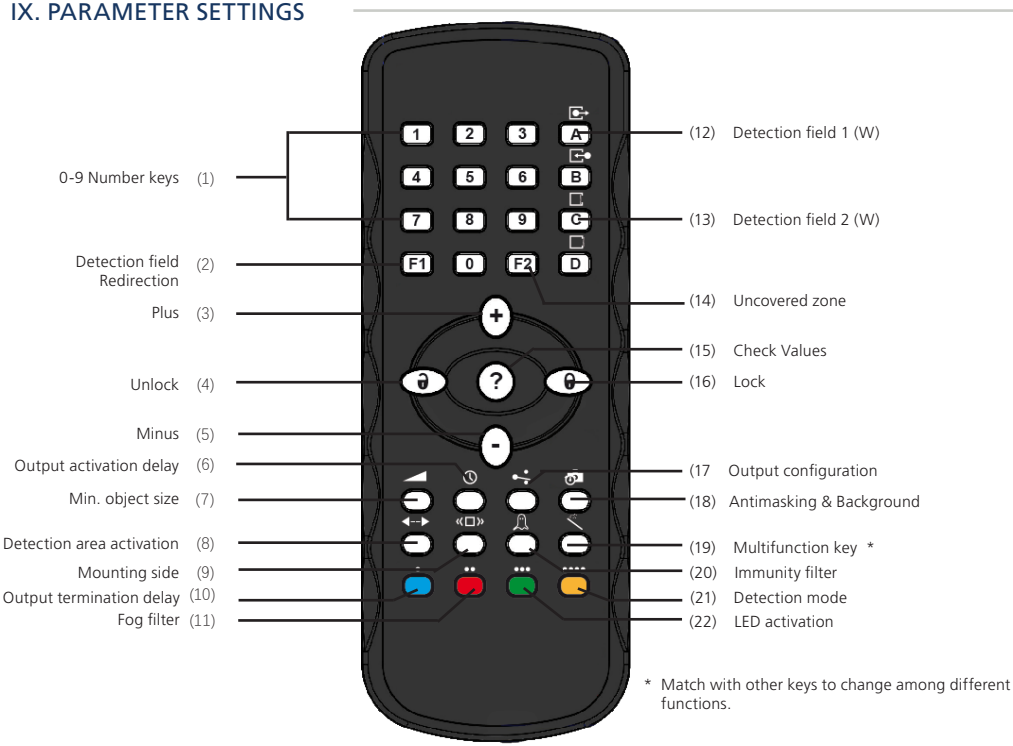
* Setting will take effect 1 minute later.

DELETING AN ACCESS CODE

* Please complete this setting within 1 minute after power on.

30 minutes after last use, the scanner locks access to the remote control session.
Cut and restore power supply. The remote control session is accessible again within 30 minutes.

IX. PARAMETER SETTINGS

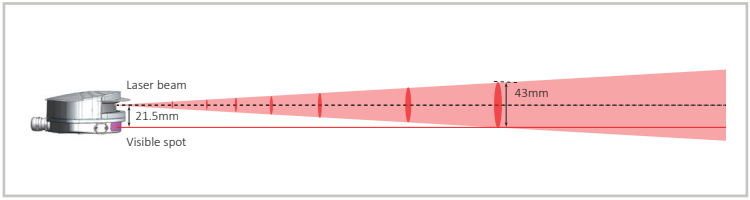


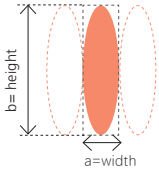
VISIBLE SPOTS

turn on /off the visble spots

ALIGNMENT

- Confirm the wiring of the scanner.
- Power on.
- Switch on the visible spots, then align the curtain position precisely (refer to remote control instruction).
- Adjust the tilt angle to make sure the curtain installs in a reasonable location.
- The shape of the laser spot is oval. The further the laser spot shoots, the bigger the spot diffuses. Refer to the below diagram to calculate the size, avoid unwanted detections.





Distance (m)	b (mm)	a (mm)
1	12.5	1.5
2	25	3
3	37.5	4.5
4	50	6
5	62.5	7.5

⚠ Do not look into the visible beams directly!
The visible spot has around ±1.5cm deviation at a 3m distance. Please makes sure the correct curtain position. The visible spot is used for rough calibration only. It's not sufficient to get the precise position only by visible spots.

Parameter Setting (Mandatory)

MOUNTING SIDE

«□»	1	2
	left	right

The scanner can be configured on the left side and right side.
Please note that the scanner will automatically find the mounting side during the teach-in process*. After finishing the teach-in process, use a remote control to change the parameter if needed. This parameter must be defined before setting the configuration, as the detection area will link to this parameter.

⚠ Please always ensure that the mounting side you adjusted is the same as the actual one on site.

* For more installation information, please refer to Application Note (AN).

TEACH-IN

setting the field 1&2 through Teach-in*

** Learn more about the Teach-in, please see page 10* **TEACH-IN**

Parameter Setting (Optional)

DETECTION FILED

FIELD 1

W	A	000	-	550
		0 - 550 cm	400	cm

FIELD 2*

W	C	000	-	550
		0 - 550 cm	400	cm

Detection area: detection will only happen when objects are located in the detection area. The dimension of the detection area could be adjusted by adjusting the parameter.

* Please note that the detection range can be guaranteed with 5% reflectivity @4m diagonal when the fog filter value is set to 0. If the fog filter value is not 0, then the guaranteed detection distance will be shortened with 5% reflectivity.

FACTORY VALUES

UNCOVERED ZONE

F2	0	1	2	3	4	5	6	7	8	9	
	5	10	15	20	25	30	35	40	45	50	cm

Uncovered zone: an increase in case of snow, dead leaves, etc. Measured in specific conditions and determined by application and installation.

IMMUNITY FILTER

	0	1	2	3	4
	no filtering	low	>	>	high

Immunity Filter: when there's interference from environment such as rain, snow which could create some false detection, occasional false detection could be decreased by increasing immunity level.

FOG FILTER

	0	1	2	3	4	5	6	
	400	374	349	324	299	274	250	cm

Fog filter: different values means different max. detection distances with 5% reflectivity.

MIN. OBJECT SIZE

	0	1	2	3	4	5	6	7	8	9	
	off	5	8	10	15	20	25	30	35	40	cm

Minimum object size: continuous detection will only happen when the object size is bigger than the given minimum object size.

OUTPUT ACTIVATION DELAY

	0	1	2	3	4	5	6	7	8	9	
	0	20	50	100	200	300	400	500	600	700	ms

Output activation delay: the detection will generate output only when detection lasts longer than the given number.

DETECTION AREA ACTIVATION

	0	1	2	9
	off	field 1	field 2	field 1 and field 2

Detection area activation: detection field 1 or detection field 2 can be activated or deactivated.

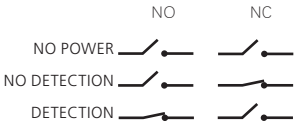
FACTORY VALUES

DETECTION FIELD REDIRECTION

F1	0	1	2	3
R1	field 1	field 2	field 1 or field 2	error alarm
R2	field 2	field 1	error alarm	field 1 or field 2

OUTPUT CONFIGURATION

	1	2	3	4
R1	NO	NC	NC	NO
*R2	NC	NO	NC	NO



NO = normally open
NC = normally closed

* R2 R2 default connection: Pink/ Grey

ANTIMASKING & BACKGROUND

	0	1	2	3
antimasking	OFF	OFF	ON	ON
background	OFF	ON	OFF	ON

Antimasking: when the laser window is covered, the scanner will go into error mode.
Background: when the background is changed, the scanner will go into error mode.

LED ACTIVATION

0	1
LED OFF	LED ON

OUTPUT TERMINATION DELAY

0	1	2	3	4	5	6	7	
20	50	80	100	200	300	400	500	ms

Output termination delay: After the detection signal disappears, the output will remain the set duration, then switch off.

DETECTION MODE

0	1
HD MODE	HS MODE

HD: High resolution mode
HS: High speed mode

⚠ Please launch a new teach-in with every adjustment.

FACTORY VALUES

TEACH-IN

setting the field 1 through Teach-in.

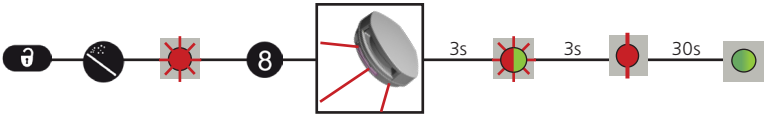
setting the field 2 through Teach-in.

setting the background through Teach-in.

setting the field 1&2 through Teach-in.

Teach-in: the scanner could automatically learn the environment profile as its detection field with a self-learning function; this feature provides great convenience when there are irregular objects that exist within the detection field, which should be considered as background.

RESET TO FACTORY SETTINGS



reset all the parameters to factory settings.

reset all the parameters outside of the detection field to factory settings.

IMPORTANT: Test the good functioning of the installation before leaving the premises.

X. TROUBLESHOOTING

The FLATSCAN VS305 is designed to be able to give troubleshooting through the LED.

	The ORANGE LED is on permanently.	The scanner encounters a memory problem or a config fault.		Send the scanner back to manufacturer.
1 2 3	The ORANGE LED flashes 1 x /2 x /3 x every 3 seconds.	The scanner signals an internal fault.	1	Check power supply and wiring.
			2	Cut and restore power supply.
			3	If orange LED flashes again, send the scanner back to the manufacturer.
4	The ORANGE LED flashes 4 x every 3 seconds.	Error for antimasking or boundary.	1	Check if there's pollution on the front window.
			2	Check if there's a problem with the background.
5	The ORANGE LED flashes 5 x every 3 seconds.	Error happened during the teach-in process.		Relaunch a teach-in process.
8	The ORANGE LED flashes 8 x.	Head fault.		Send the scanner back to manufacturer.

FACTORY VALUES

XI. TECHNICAL SPECIFICATIONS

Technology	LASER scanner, time-of-flight measurement (ToF)
Max. detection range	Max. 5.5m*5.5m (4m@5% reflectivity)
Opening angle	90°
Angular resolution	0.23° (Max 400 spots within 90°)
Emission characteristics	Wavelength 905nm; Max. output pulse power 25W (CLASS 1) Wavelength 635nm; Max. output CW power 0.95mW (CLASS 2) Visible spot
Supply voltage	12-24V DC ± 15%
Power consumption	≤ 2.3W, peak current: 1A
Output	1 opto (galvanic isolation - polarity free) Max. switching voltage: 42V AC/DC Max. switching current: 100mA 1 Relay (free of potential contact) Max. contact voltage: 42V AC/DC Max. contact current: 1A (resistive) Max. switching power: 30W DC/60VA AC
LED-signals	1 tri-colored LED: detection / output status
Colour	Black
Tilt angles	±3° (with bracket)
Temperature range	-30°C to +60°C if powered
Humidity	0-95% non-condensing
Vibrations	< 2G
Dimensions	124 mm (L) × 90 mm (H) × 50 mm (D) (without bracket)
Cable length	10 m
Norm conformity	IEC 60825-1; EN 60950-1; EN 61000-6-2; EN 61000-6-3; EN 60529

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

SAFETY INSTRUCTIONS
The integrator or installer that use the sensor is responsible for carrying out a risk assessment and installing the scanner and the system in compliance with applicable national and international regulations and standards.
Only trained and qualified personnel may install and setup the scanner.
The warranty is void if unauthorized repairs are made or attempted by unauthorized personnel.
Avoid touching any electronic and optical components.

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BEA hereby declares that the LZR®-FLATSCAN VS305 is in compliance with European directives 2014/30/EU and 2011/65/EU.

FOR EC COUNTRIES: THIS PRODUCT SHOULD BE DISPOSED OF SEPARATELY FROM UNSORTED MUNICIPAL WASTE.