# Human Detector-PowerRail   HD-PR

User's Guide

Human Detector®
COMPACT LASER SCANNER
FOR POWERRAIL INSTALLATION

INTRODUCTION

The powerrail laser scanners **HD-P**R are laser sensors designed for the protection of artwork, buildings and other valuables.

It generates an invisible curtain with 400 laser beams, which covers the detection area of 550 cm by 550 cm with a high resolution.

DESCRIPTION OF INTERNAL LASER MODULE
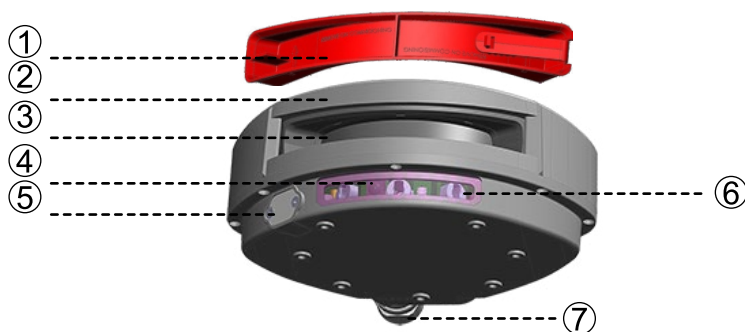
1. Front cover (protective cover)
2. Housing
3. Laser window
4. LED-signal
5. USB connector (only for factory use)
6. Visible laser beams
7. Cable gland

LED-SIGNALS

🔴 detection	🟠 error LED	✳️ LED flashes quickly	🔴 LED flashes slowly
🟢 power on	⚪ no power	✳️ LED flashes	⚫ LED is off

SYMBOLS

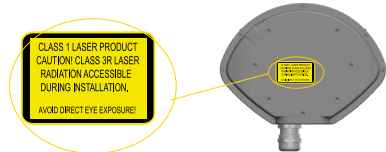|						
Caution! Laser radiation	Remote control sequence	Possible remote control adjustments	Factory values settings	Platform laser scanner settings	Attention	Note

SAFETY TIPS

CLASS 1 LASER PRODUCT
CAUTION! CLASS 3R LASER
RADIATION ACCESSIBLE
DURING INSTALLATION,
AVOID DIRECT EYE EXPOSURE!

The device contains IR and visible laser spots.
IR laser: Wavelength 905nm; average output power 0.05mW
(Class 1 according to IEC 60825-1)
Visible laser: Wavelength 650nm; max. output CW power 3mW
(Class 3R according to IEC 60825-1)

The visible laser beams are CLASS 3R spots and must be turned off during normal functioning.
The installer can activate the visible lasers 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.

Avoid extreme vibrations.

Do not cover the laser window.

Avoid moving objects and light sources in the detection field.

Avoid the presence 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 .

INSTALLATION

⚠ The device cannot be used for purposes other than its intended use, and particularly not the protection of persons. All other uses than those specified cannot be guaranteed by the manufacturer of the sensor.
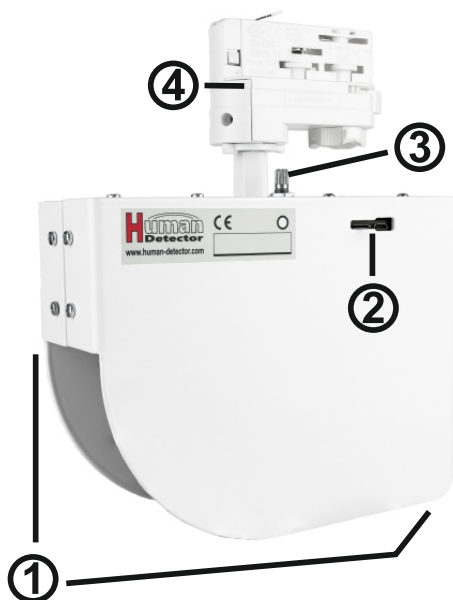
GENERAL INFORMATION AND MOUNTING

Please do a thorough inspection and evaluation of the installation area to make sure the sensor's installation will suit the intended use.

Only remove the front cover right before putting the sensor into service.
Make sure the laser window is never covered.

CONTROL ELEMENTS AND COMPONENTS

1   Optical Window for Lasersanner

2   Slot for MP3-Audio File

Use standard audio file 001.MP3 for audio output. For 2 sector use please contact the manufacturer or reseller.

Use integrated memory for alarm messages or Micro-SD-card for extanded messages. Please use standard Micro-USB cable for connection.

3   Potentiometer for Audio Out

4   Adapter for 3-Phase Powerrail

5   Hold Button for Laser Unit

Please open to adjust laserscanner vertical position. Please tighten so that the laser cannot move, otherwise errors will occur.

6   Loudspeaker

HOW TO USE THE REMOTE CONTROL

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

1. The max. distance between the sensor and the remote control is 4 m.
2. The sensor's curtain should not be perpendicular to a high reflective surface. A 3-degree angle is necessary between them to guarantee communication between the sensor and the remote control.
3. The authorized operator or installer can set a password to avoid unwanted modifications in the chosen settings.
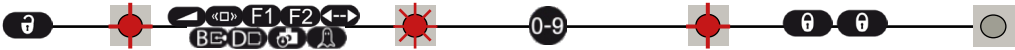
After unlocking, the red LED flashes and adjustments can be made by remote control.

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

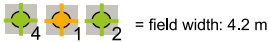To end an adjustment session, always lock the sensor.
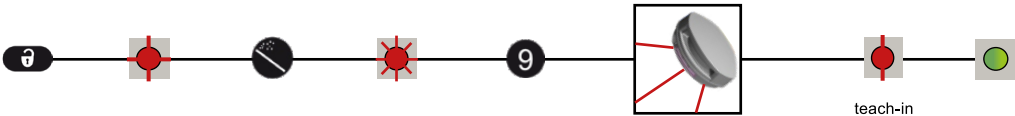
ADJUSTING ONE OR MORE PARAMETERS

CHECKING A VALUE

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

4 1 2 = field width: 4.2 m

RESTORING TO FACTORY VALUES

teach-in

SAVING AN ACCESS CODE

An access code is recommended for sensors installed close to each other.
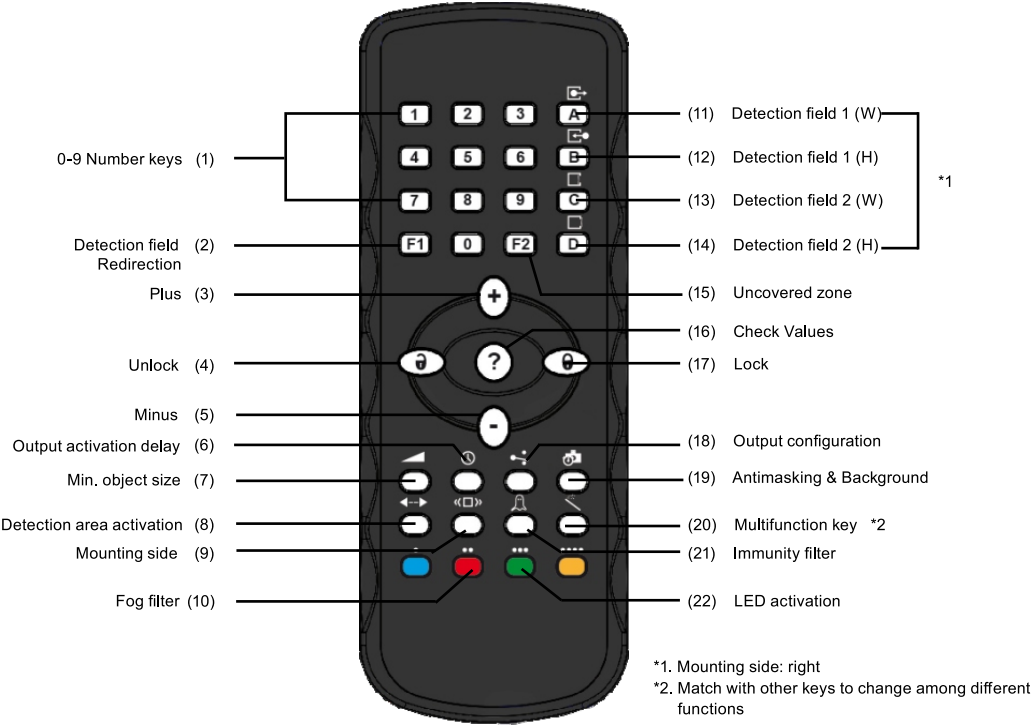
The setting will take effect 1 minute later.

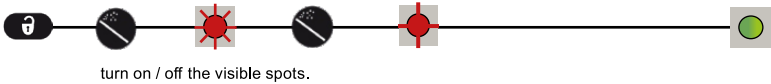## DELETING AN ACCESS CODE

After power on, you have 1 minute to choose this setting.

> ⚠ 30 minutes after last use, the sensor locks the access to the remote control session.
> Cut and restore power supply : the remote control session will be accessible again during 30 minutes.

SETTINGS

0-9 Number keys (1)

Detection field (2)
Redirection

Plus (3)

Unlock (4)

Minus (5)

Output activation delay (6)

Min. object size (7)

Detection area activation (8)

Mounting side (9)

Fog filter (10)

(11) Detection field 1 (W)
(12) Detection field 1 (H)
(13) Detection field 2 (W)
(14) Detection field 2 (H)

*1

(15) Uncovered zone
(16) Check Values
(17) Lock
(18) Output configuration
(19) Antimasking & Background
(20) Multifunction key *2
(21) Immunity filter
(22) LED activation

*1. Mounting side: right
*2. Match with other keys to change among different functions

## VISIBLE SPOTS

turn on / off the visible spots.

The visible spots will be automatically deactivated after 10 minutes.
30 minutes after the installation, you will need to reboot the sensor to be able to re-activate the visible spots.

ALIGNMENT

- Check the sensor's wiring.
- Set power to on.
- Switch on the visible spots, then align the curtain position precisely (refer to remote control instruction). If necessary, adjust the tilt angle (with the laser scanner housing) to make sure the curtain covers the whole detection area.
- The laser spots have an oval shape. The further the laser spot hits, the bigger the spot diffuses (see diagram below).

Laser beam- detection

Visible spot- alignment
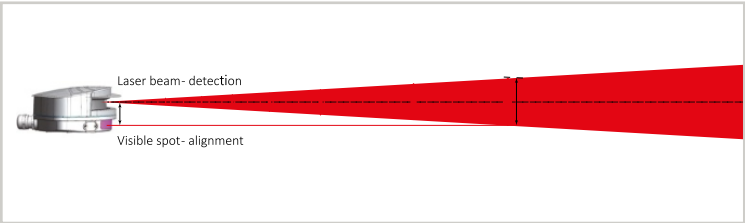
⚠ Do not look into the visible beams directly!
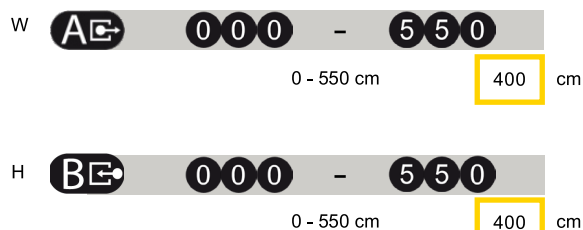Please make sure the detection curtain is in the right position for the intended application.

MOUNTING SIDE

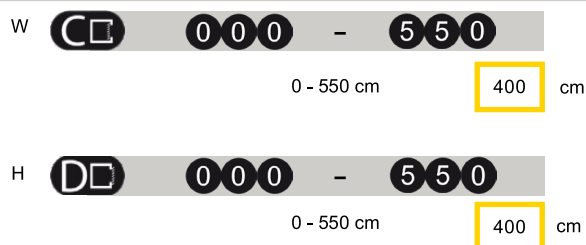| «□»	❶	❷	❸
	left	right	center

right

left

center
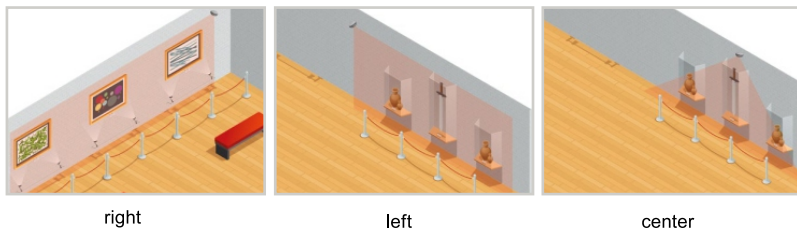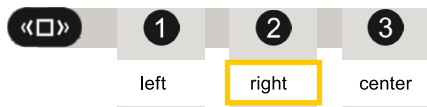
The **HD-PR** can be placed either on the left side, right side or in a central position. This function is only useful in combination with two detection fields.

DETECTION FIELD

FIELD 1

W **A** 🔲 ➟ ⓪⓪⓪ – ⑤⑤⓪

0 - 550 cm   400   cm

H **B** 🔲 ➟ ⓪⓪⓪ – ⑤⑤⓪

0 - 550 cm   400   cm

FIELD 2

W **C** 🔲 ⓪⓪⓪ – ⑤⑤⓪

0 - 550 cm   400   cm

H **D** 🔲 ⓪⓪⓪ – ⑤⑤⓪

0 - 550 cm   400   cm

📌 Detection area: detection will only be triggered by objects located in the detection area. The dimension of detection area can be adjusted via the parameter.
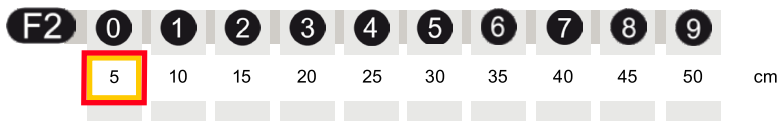
Please note that the detection range can be guaranteed with a 5% reflectivity @4m diagonal when the fog filter value is set to 0.

If the fog filter value is not set to 0, then the guaranteed detection distance with 5% reflectivity will be shortened.
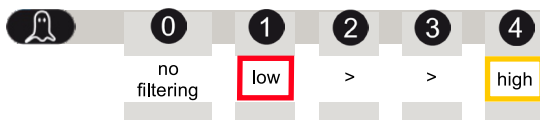
▢ FACTORY VALUES

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: can be increased 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: is increased to filter out environmental interferences such as rain or snow which can trigger false detection.

FOG FILTER

0	1	2	3	4	5	6	
400	374	349	324	299	274	250	cm
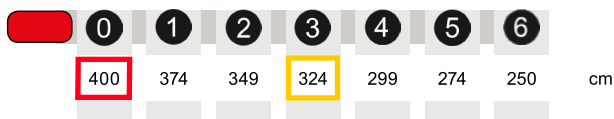
Fog filter: you can change the max. detection distance with a 5% reflectivity.

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

OUTPUT ACTIVATION DELAY

0	1	2	3	4	5	6	7	8	9	
0	100	200	300	400	500	600	700	800	900	ms

Output activation delay: the detection will generate an output only when the detection lasts longer than the chosen time.

☐ FACTORY VALUES   ☐ RECOMMENDED FOR POWERRAIL LASER SCANNER

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 actived or deactived according to the application.

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	NC
NO POWER		
NO DETECTION		
DETECTION		

NO = normally open
NC = normally closed
R2 default connection: Pink/ Grey

ANTIMASKING & BACKGROUND

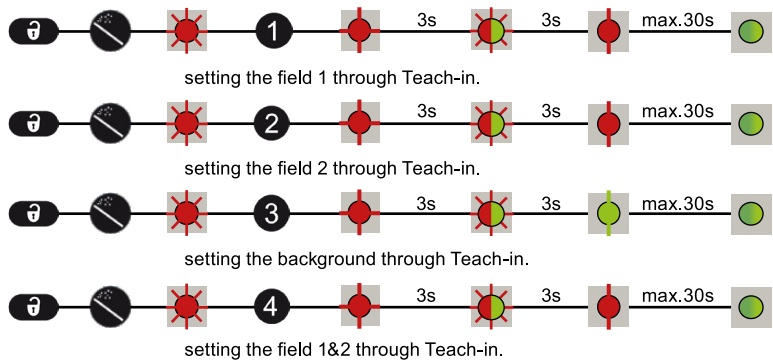| ⬤	0	1	2	3
antimasking	OFF	OFF	ON	ON
background	OFF	ON	OFF	ON

> Antimasking: when the laser window is covered, the sensor will enter the error mode.
> Background: when the background has changed, the sensor will enter the error mode.

LED ACTIVATION

⬤	0	1
	LED OFF	LED ON

☐ FACTORY VALUES

☐ RECOMMENDED FOR PLATFORM LASER SCANNER

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 sensor can automatically learn its environment and its detection field. It will adapt its detection field when the background changes.

RESET TO FACTORY SETTINGS	

reset all the parameters to factory settings.

reset the parameters outside of the detection field to factory settings.
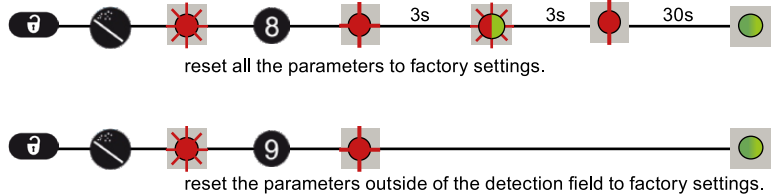
⚠ IMPORTANT: Test the good functioning of the installation before leaving the premises.

TROUBLESHOOTING

⬤	The ORANGE LED is on permanently.	The sensor encounters a memory problem.		Send the sensor back for a technical check-up.
1 2 3	The ORANGE LED flashes 1 x /2 x /3 x every 3 seconds.	The sensor signals an internal fault.	1	Cut and restore power supply.
		If the internal error still appears after 3 resettings, the LED will flash 9 times and the sensor will be locked.	2	If orange LED flashes again, send the sensor back to manufacturer.
4	The ORANGE LED flashes 4 x every 3 seconds.	Masking or background error	1	Remove any pollution on the front window
			2	Check background and remove any object that could provoke the error
5	The ORANGE LED flashes 5 x every 3 seconds.	Error during the teach-in process.		Relaunch a teach-in process

TECHNICAL SPECIFICATIONS

Technology	Laser scanner, time-of-flight measurement
Detection mode	Presence
Max. detection range	Max. 5.5m x 5.5m (4m@5% reflectivity)
Opening angle	90°
Angular resolution	0.23° (400 spots within 90°)
Emission characteristics (IEC/EN 60825)	Wavelength 905nm; average output power 0.05 mW CLASS 1 Wavelength 650nm; max. output CW power 3mW (CLASS 3R) Visible spot
Supply voltage	12-24V DC ± 15% (to be supplied from a SELV power source only)
Power consumption	≤ 2.3W, peak current: 1A
Response time	Max. 50ms + output activation delay (if requested)
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
Dimensions **Weight**	185mm (L) × 227mm (H) × 60mm (D) 1220 gr
Colour	RAL 9016 traffic-white (other colors on request)
Tilt angles	±2° (with vertical or horizontal housing)
Protection degree	IP66 (EN 60529)
Temperature range	-30°C to +60°C if powered
Humidity	0-95% non-condensing
Vibrations	< 2G
Conformity	IEC 60825-1; IEC 61000-6-2; IEC 61000-6-3

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

⚠️ **SAFETY INSTRUCTIONS**
Only trained and qualfied personnel may install and setup the scanner.
The warranty is void if unauthorized repairs are made or attempted by unauthorized personnel.

Human Detector