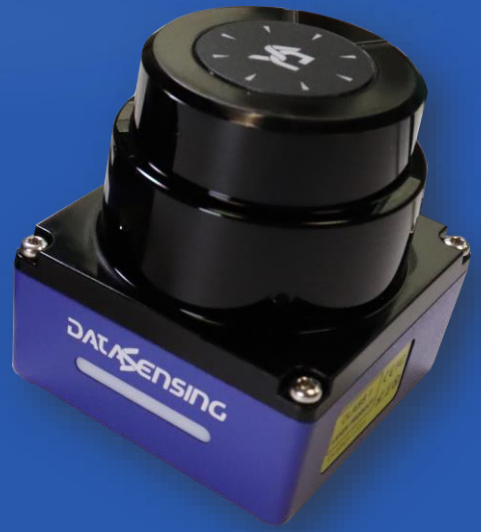
DATASENSING
easing automation challenges

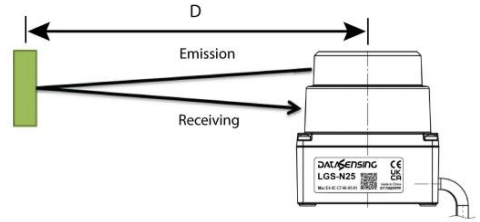
LGS A10
Compact Lidar



OUR EXPERTISE
MAKES YOUR WORK
EASIER

Enrico Lorenzoni

LGS-A10 at a glance

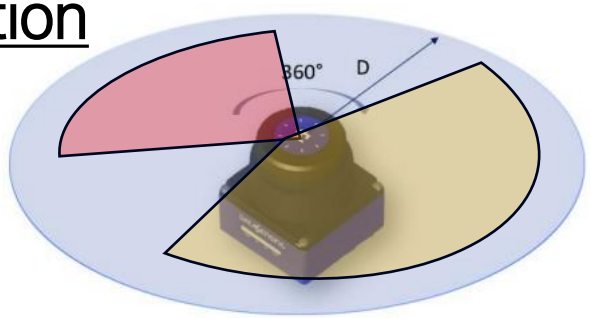


LGS-A10 : 360° lidar for **collision detection and object detection**

958200003

\+ LGS Pro

LGS Pro User Interface for detection areas drawing and device setting



The LGS-A10 is a rugged and compact lidar with excellent performances suitable for vehicles collision avoidance, object detection in programmable monitored areas for industrial-grade applications.
Particularly suitable in intralogistics for small automated mobile robots (AMR), automated guided vehicle (AGV), forklift and carts , it can be used as well in automated manufacturing or logistic plants for access monitoring and shapes control .

Its design and characteristics allow a reliable detection also for the outdoor use, so it can be used as well in applications in fields as agriculture, transportation, earth moving machines and more.

LGS-A10 is easy to set by a dedicated user interface and has a quick commissioning; it adopts an UDP standard by an Ethernet connection to supplies measurement data, and have a suite of physical I/O to monitoring the detection and to change the zone sets of monitored areas

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Main Performances

LGS-N25 **LGS-A10**

- INDOOR & OUTDOOR
  - *IP67*
  - *Immunity to moderate intensity rain*
  - *High ambient light rejection (120Klux)*
  - *High operating temperature range (-10 .. 60°C)*
- 65x65x70 mm
- 25Hz scan rate (with 1° angular resolution)
- 0,25° angular resolution (with 10Hz scan rate)
- 25m range@white 90% / 5m range@black 3.5%
- +/-30mm accuracy / 20mm Repeatability
- 360° Angular range
- 10m @ grey 10% range for detection
- 80 ms output response time (best)
- 3 simultaneous digital outputs
- 16 zone set available (by 4 input switch)

OUTDOOR

COMPACT SIZE

PERFORMANCES

PRICE

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Performances and specs

GENERAL SPECIFICATIONS	
Wavelength	905 ± 20 nm
Laser class	Class 1
Channel	1
Scanning angle	360°
Scanning rate	10,15, 25 Hz
Ambient light limit	>80000 LUX @ sunlight
Light spot divergence angle	8(H); 3(V) mrad
Horizontal plane error	<= 0,8°

INTERFACE	
Interface type	IEEE 802.3u 100Mbps Ethernet
Protocol	UDP TCP/IP

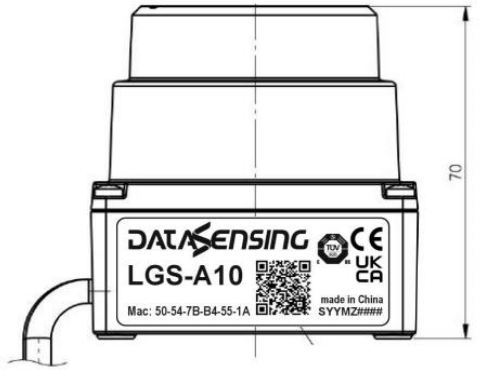
ELECTRICAL SPECIFICATIONS	
Operation voltage	9 to 30 VDC
Power consumption (25°C)	< 5W @15Hz
Input Max current	50 mA
Input Voltage Min for ON status	0 V
Input Voltage Max for OFF status	VDC-0.1 V
Input Impedence	6.8 KΩ
Input max switching frequency	4.5 / 6.5 / 10 Hz
Input protection	36 V
Output Max load current	50 mA
Output Voltage Min ON Status	0.7 V
Output Voltage Max OFF Status	VDC
Output Voltage Drop Max	30 V
Output Max Capacitive Load	1 uF
Output Max Capacitive Load	2.2 mH
Output Max Switching Frequency	8 / 11 /16 Hz
Output Protection	85° C
Power connector	12pin, M12x1 Connector Standard
Communication Interface	4pin, M12x1 socket D-coded

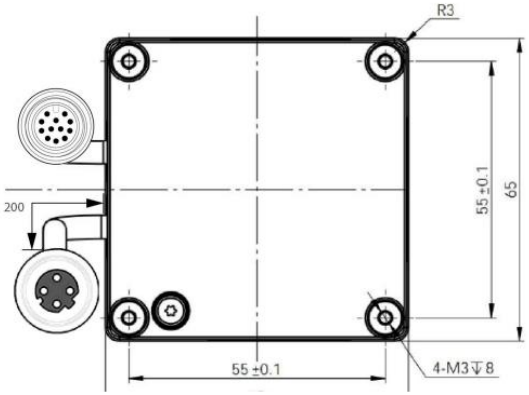
MEASUREMENT PARAMETERS	
Absolute accuracy	<± 30 (0.4~10m)
Repeat accuracy	<= 20 (0.4~10m)
Angle resolution	0.25° @ 10 Hz / 0.5° @ 15 Hz / 1° @ 25 Hz
Working distance (based on reflectivity)	0.1~10m @ 80%
Resolution of output distance	1 mm
Point cloud density	14.4K@10Hz, 10.8K@15Hz, 9K@25Hz
Signal intensity	0-20000

AMBIENT CONDITIONS	
Operating temperature	-10 to +60 °C
Storage temperature	-20 to +70 °C
Relative humidity	< 95% (No Condensation)

MECHANICAL SPECIFICATIONS	
Housing width	65 mm
Housing length	65 mm
Housing height	70 mm
Degree of protection	IP67
Material	Body and cap: aluminum Window: polycarbonate Panel and LED cover: polycarbonate and ABS
Mass	< 500 g

COMPLIANCE AND CERTIFICATIONS	
Vibration	IEC 60068-2-6:2007
Shock	IEC 60068-2-27:2008
EMC	IEC 61000-6-2:2016-08 / IEC 61000-6-3:2006-07
Laser safety	IEC 60825-1
ROHS	✓
Safety requirements	UL61010-1





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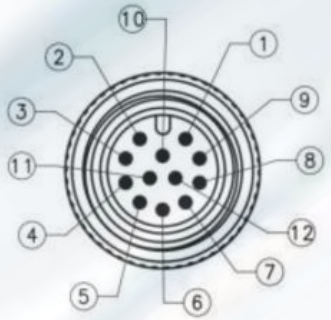
Connection

Ethernet

No.	DEFINITION
1	Transmit data +
2	Receive data +
3	Transmit data -
4	Receive data -



Power and I/O

PIN #	PIN NAME	PIN DESCRIPTION	CONNECTION DIAGRAM	NOTE ON I/O STATUS	WIRING COLOR
1	+VCC	POWER			Brown
2	GND	GROUND			Blue
3	INPUT 1	ZONE SET SWITCH INPUT 1		INPUT # = HIGH if floating or connected to VCC_I/O INPUT # = LOW if connected to GND_I/O	White
4	INPUT 2	ZONE SET SWITCH INPUT 2			Green
5	INPUT 3	ZONE SET SWITCH INPUT 3			Pink
6	INPUT 4	ZONE SET SWITCH INPUT 4			Yellow
7	GND I/O	GROUND for I/O			Black
8	OUT_1	DETECTION OUTPUT 1		No Target detection: Iload > 0 Target detection: Iload = 0	Grey
9	+VDC_I/O	POWER for I/O			Red
10	OUT_2	DETECTION OUTPUT 2		No Target detection: Iload > 0 Target detection: Iload = 0	Violet
11	OUT_3	DETECTION OUTPUT 3		No Target detection: Iload > 0 Target detection: Iload = 0	Grey/Pink
12	OUT_4	ERROR OUTPUT 4		No Error status: Iload > 0 Error status: Iload = 0	Red/Blue

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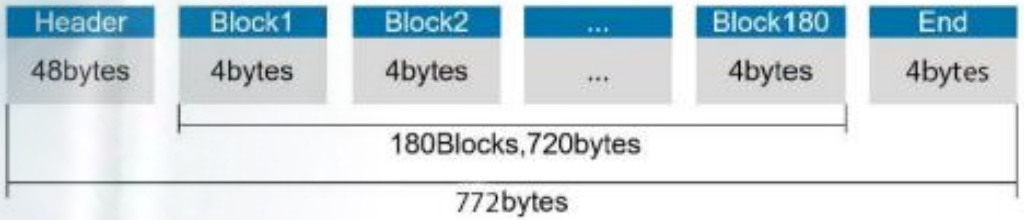
Data transmission

The output of LGS is a cloud of data related to the points detected around the scanner
The transmission is done through Ethernet port 100Mbs, with UDP/IP protocol.

Data used for localization:

In the header:	Timestamp	[ms]
In each block:	Angle	[°]
	Distance	[mm]
	Signal strenght	[0..65535]

INTERFACE	
Interface type	IEEE 802.3u 100Mbps Ethernet
Protocol	UDP TCP/IP

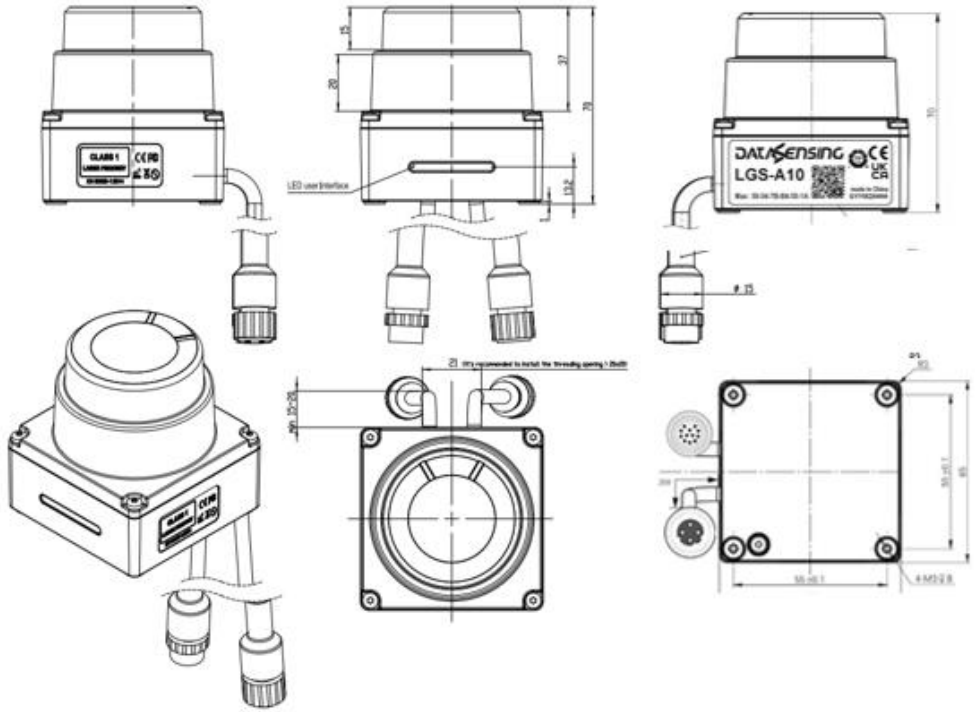


The signal strength is proportional to the intensity of the beam received and can be used to distinguish the reflector from other surfaces.

The drive for ROS node is available in the Datasensing website

Product user interface

LED	MEANING
🟢 🔴	**Power On.** Red and Green lights are always ON.
🟢 🔴	**Start.** Device self checking, Red and Green LED flash.
🟢 ○	**Normal operation.** Red OFF, Green LED flash.
🟢 🔴	**Fault.** Red ON, Green LED flash.
🟢 🔴	**OUT1 activation.** Green ON, Red flash. TON1=0.4s; TOFF1=2s
🟢 🔴	**OUT2 activation.** Green ON, Red flash. TON1=0.4s; TOFF1=0.4s; TON2=0.4s; TOFF2=2s
🟢 🔴	**OUT3 activation.** Green ON, Red flash. TON1=0.4s; TOFF1=0.4s; TON2=0.4s; TOFF2=0.4s; TON3=0.4s; TOFF3=2s
🟢 🔴	**Multi Area.** Green ON, Red flash. When any two areas are triggered simultaneously, the alarm status of the intercepted area with higher priority is displayed. Priority level: OUT 1 > OUT 2 > OUT 3



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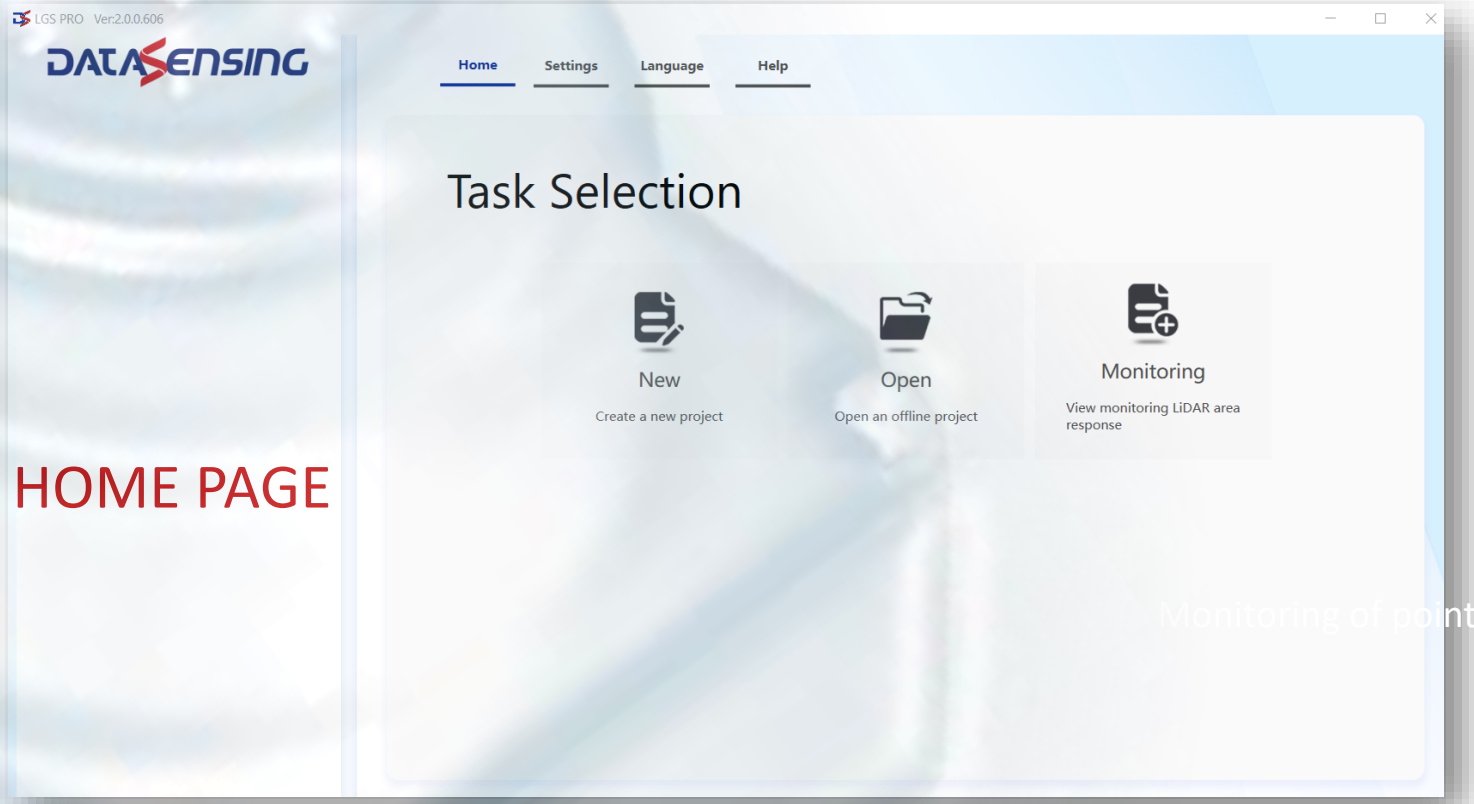
LGS-PRO user interface



LGS-PRO

- It’s a software for pc under Window operating system
- it’s needed to configurate the LGS-A10 and for its data monitoring
- it’s free of charge and available for download in Datasensing website

LGS-PRO user interface

LGS-PRO user interface

Drawing tools

Output selection for Area drawing

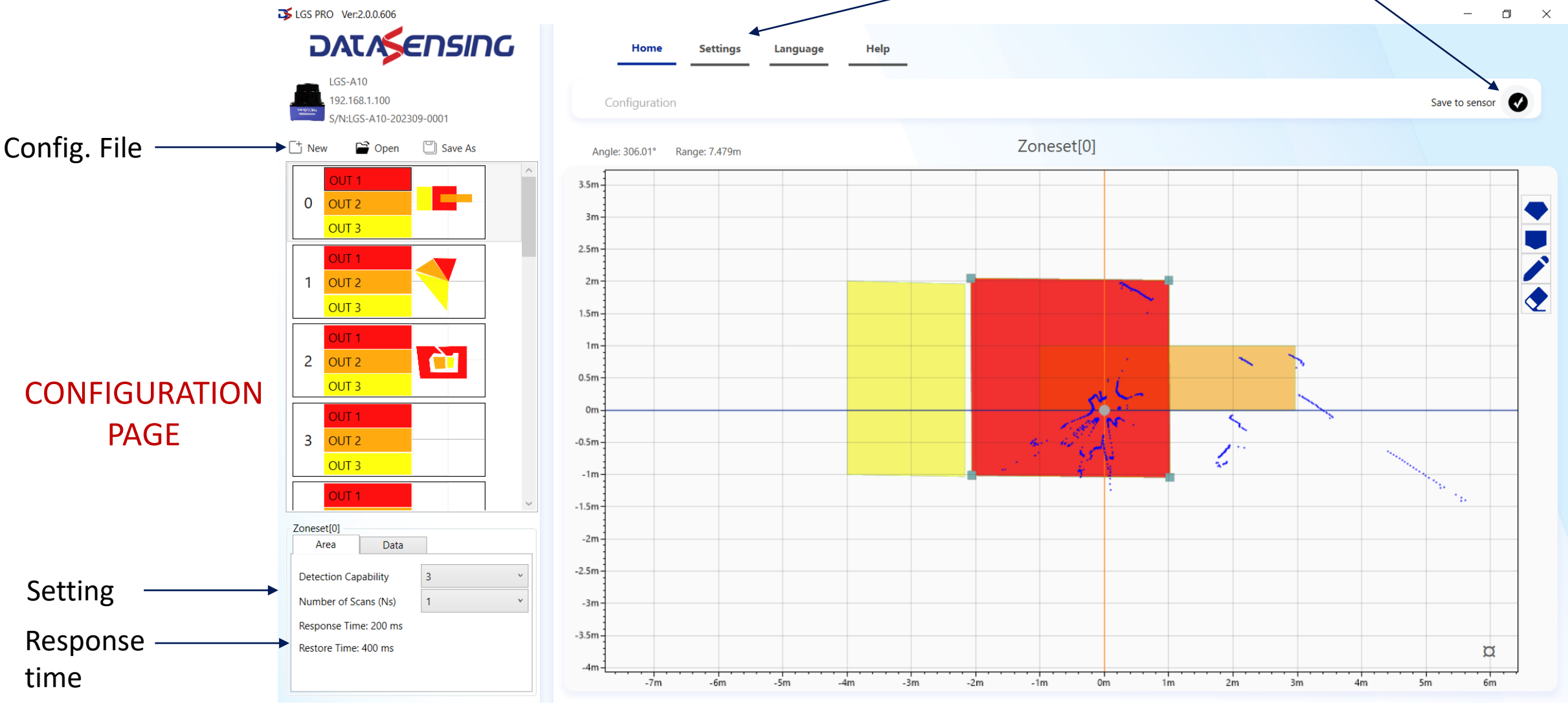
Zone set selection

CONFIGURATION PAGE

Manual input Area drawing

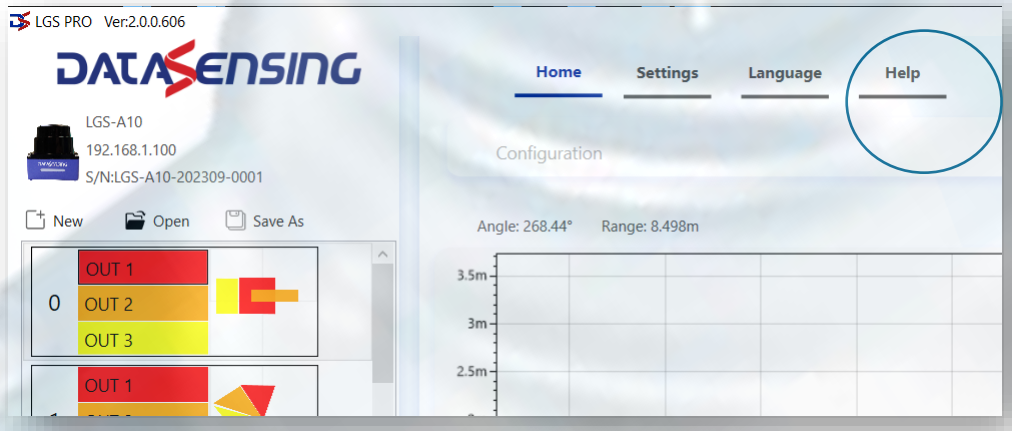
DATASENSING easing automation challenges

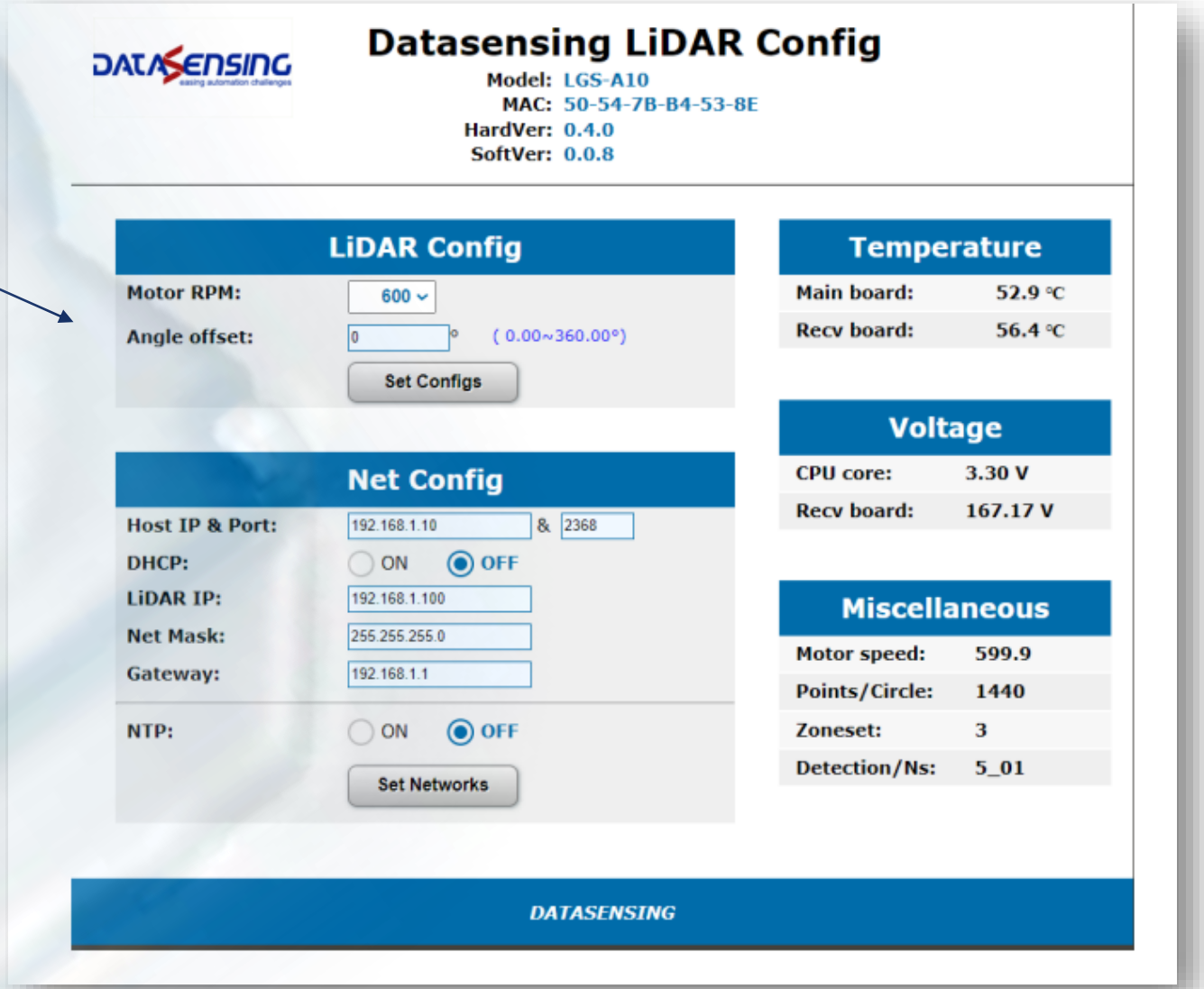
LGS-PRO user interface



LGS-PRO user interface

Lidar web page



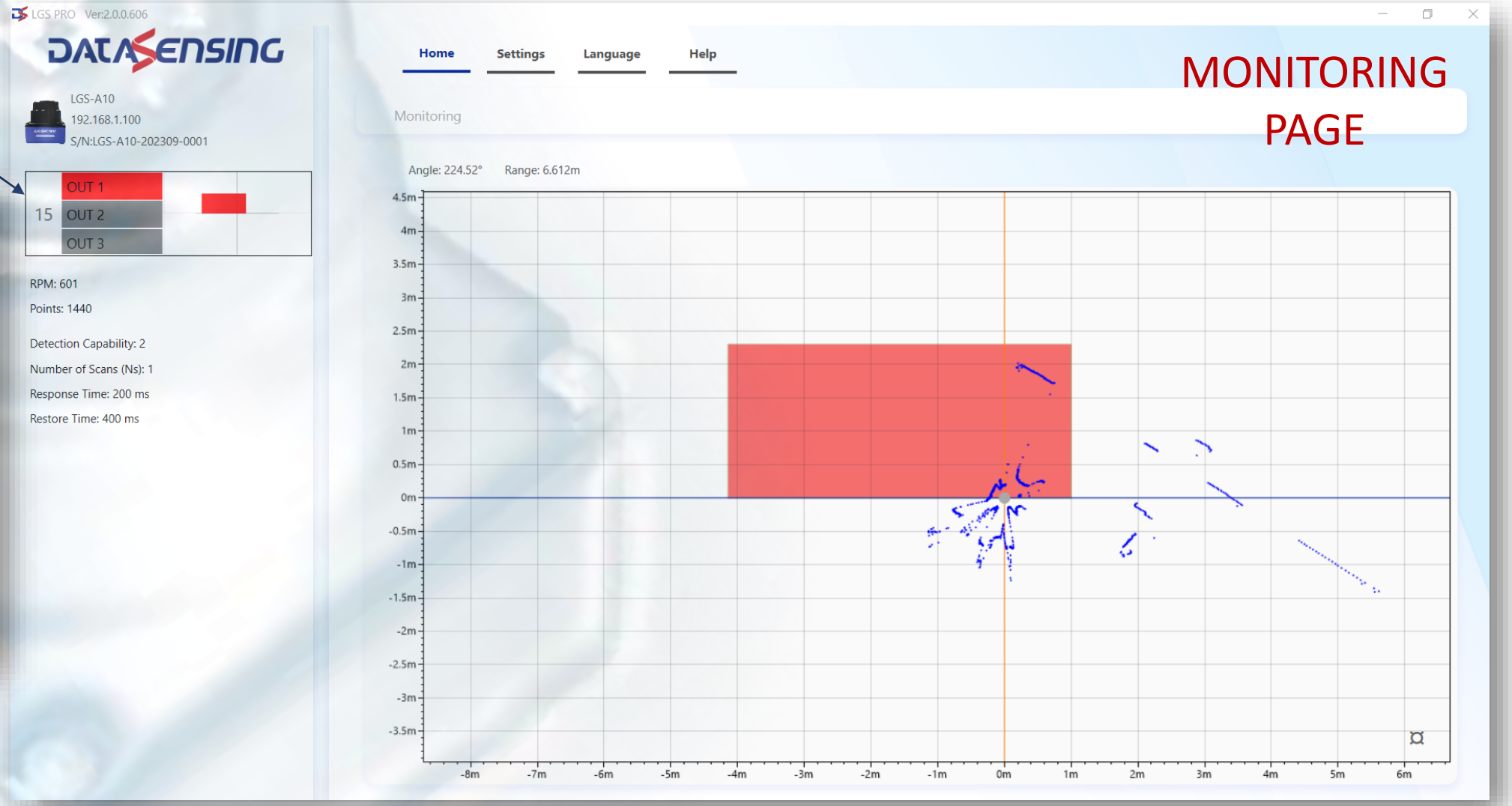


WEB SETTING PAGE

LGS-PRO user interface

Selected Zone Set

ZONE SET #	INPUT 1	INPUT 2	INPUT 3	INPUT 4
0	GND_I/O	GND_I/O	GND_I/O	GND_I/O
1	GND_I/O	GND_I/O	GND_I/O	+VCC_I/O (OR floating)
2	GND_I/O	GND_I/O	+VCC_I/O (OR floating)	GND_I/O
3	GND_I/O	GND_I/O	+VCC_I/O (OR floating)	+VCC_I/O (OR floating)
4	GND_I/O	+VCC_I/O (OR floating)	GND_I/O	GND_I/O
5	GND_I/O	+VCC_I/O (OR floating)	GND_I/O	+VCC_I/O (OR floating)
6	GND_I/O	+VCC_I/O (OR floating)	+VCC_I/O (OR floating)	GND_I/O
7	GND_I/O	+VCC_I/O (OR floating)	+VCC_I/O (OR floating)	+VCC_I/O (OR floating)
8	+VCC_I/O (OR floating)	GND_I/O	GND_I/O	GND_I/O
9	+VCC_I/O (OR floating)	GND_I/O	GND_I/O	+VCC_I/O (OR floating)
10	+VCC_I/O (OR floating)	GND_I/O	+VCC_I/O (OR floating)	GND_I/O
11	+VCC_I/O (OR floating)	GND_I/O	+VCC_I/O (OR floating)	+VCC_I/O (OR floating)
12	+VCC_I/O (OR floating)	+VCC_I/O (OR floating)	GND_I/O	GND_I/O
13	+VCC_I/O (OR floating)	+VCC_I/O (OR floating)	GND_I/O	+VCC_I/O (OR floating)
14	+VCC_I/O (OR floating)	+VCC_I/O (OR floating)	+VCC_I/O (OR floating)	GND_I/O
15	+VCC_I/O (OR floating)	+VCC_I/O (OR floating)	+VCC_I/O (OR floating)	+VCC_I/O (OR floating)



MONITORING PAGE

DATASENSING easing automation challenges

Benchmark

Player	Datasensing		P+F		P+F		SICK		TBD		SICK		SICK		SICK		SICK	
Model	LGS-A10		OBD10M-R2000-4EP		OBD30M-R2000-4EP		TIM-10x		TIM-15x		TIM-320		TIM-350		TIM-360		TIM-781	
Weight	Feature	value	score	value	score	value	score	value	score	value	score	value	score	value	score	value	score	value	score
10	Distance on dark 10%	10	3	3	1	10	3	1,5	-1	3	1	2	0	2	0	8	2	8	2
5	Distance on white 80%-90%	25	2	10	1	30	3	3	-1	10	1	4	0	10	1	10	1	25	2
10	Measurement data available	yes	1	yes	1	yes	1	no	0	no	0	no	0	no	0	no	0	yes	1
5	Systematic error	30	2	25	2	25	2	50	0	40	1	40	1	60	-1	60	-1	60	-1
5	Finest Angle resolution	0,25	2	0,071	3	0,071	3	1	0	1	0	1	0	1	0	0,33	1	0,33	1
2	Dimension WxL	65x65	2	106x106	0	106x106	0	60x59.5	3	60x59.5	3	60x60	3	60x60	3	60x60	3	60x60	3
8	Dimension H	70	3	116.5	0	116.5	0	75.8	3	75.8	3	79	2	79	2	79	2	79	2
5	Min. Response time	40	3	63	2	2	3	70	1	70	1	134	0	134	-1	134	-1	67	2
5	Configurable speeds	3	2	3	2	3	2	1	0	1	0	1	0	1	0	1	0	1	0
10	Simultaneous Zones	3	2	2	1	2	1	2	1	2	1	3	2	3	2	3	2	3	2
10	Banks (Zone Sets)	16	3	4	2	4	2	1	0	1	0	16	3	16	3	16	3	16	3
10	Opening angle	360	3	360	2	360	2	200	0	200	0	270	1	270	1	270	1	270	1
5	Minimum temperature	-10	0	-10	0	-10	0	-10	0	-10	0	-10	0	-25	2	-25	2	-25	2
5	Max. scan frequency	25	1	30	2	30	2	14,5	0	14,5	0	15	0	15	0	15	0	15	0
5	IP protection	IP67	2	IP65	0	IP65	0	IP65	0	IP65	0	IP65	0	IP67	2	IP67	2	IP67	2
	Performance	218		130		165		30		65		87		97		122		152	

SCORING SYSTEM

			negative	neutral	positive		
Weight	Feature/Score	yardstick	-1	0	1	2	3
5	Distance on dark 10%	m	< 2	2	3	8	> 8
10	Distance on white 80%-90%	m	< 4	4	10	25	> 25
10	Measurement data available	mps		No	Yes		
5	Systematic error	mm	> 50	50	40	30	< 30
5	Finest Angle resolution	°	> 1	1	0,33	0,25	> 0,25
2	Dimension WxL	mm	> 106x106	106x106	75x75	65x65	< 65x65
8	Dimension H	mm	> 85	85	80	75	< 75
5	Min. Response time	ms	134	130	70	63	< 63
5	Configurable speeds	#		1	2	3	> 3
10	Simultaneous Zones	#		1	2	3	> 3
10	Banks (Zone Sets)	#		1	2	4	> 4
10	Opening angle	°	180	200	270	300	360
5	Minimum temperature	°C	0	-10	-20	-25	< -25
5	Max. scan frequency	Hz	<15	15	25	30	> 30
5	IP protection			IP65	IP66	IP67	IP69K

LGS-A10

TOP OF RANKING

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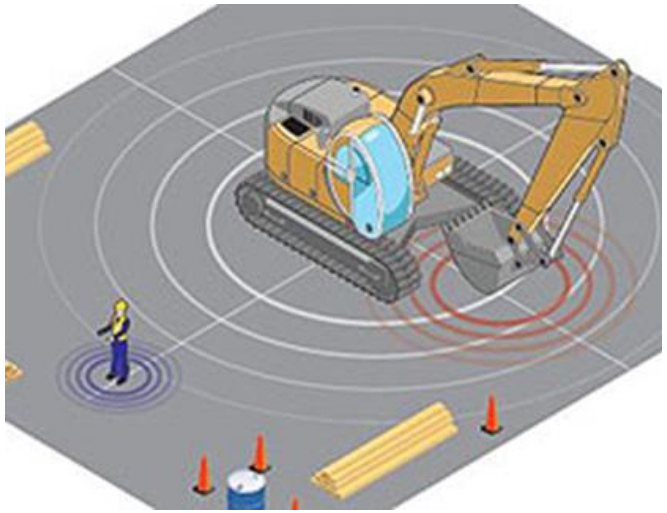
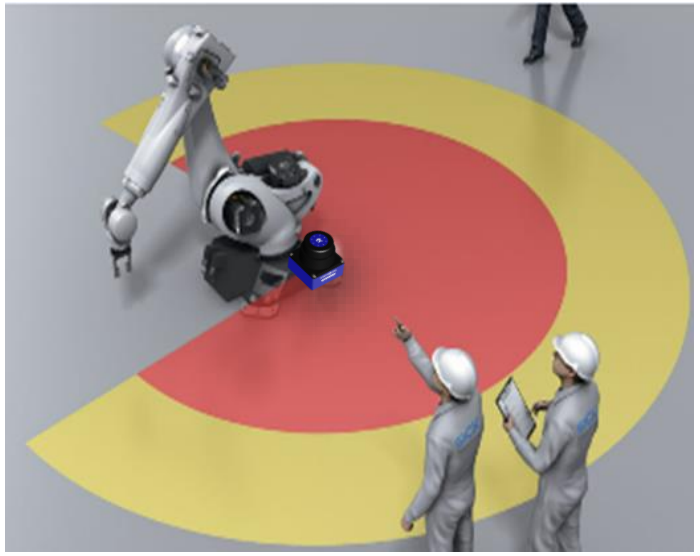
Function





COLLISION AVOIDANCE

- Robot collision avoidance
- Crane collision avoidance
- Earthmoving vehicles collision avoidance
- Agricolture vehicle collision avoidance
- Agricolture vehicle level control
- Intrusion detection

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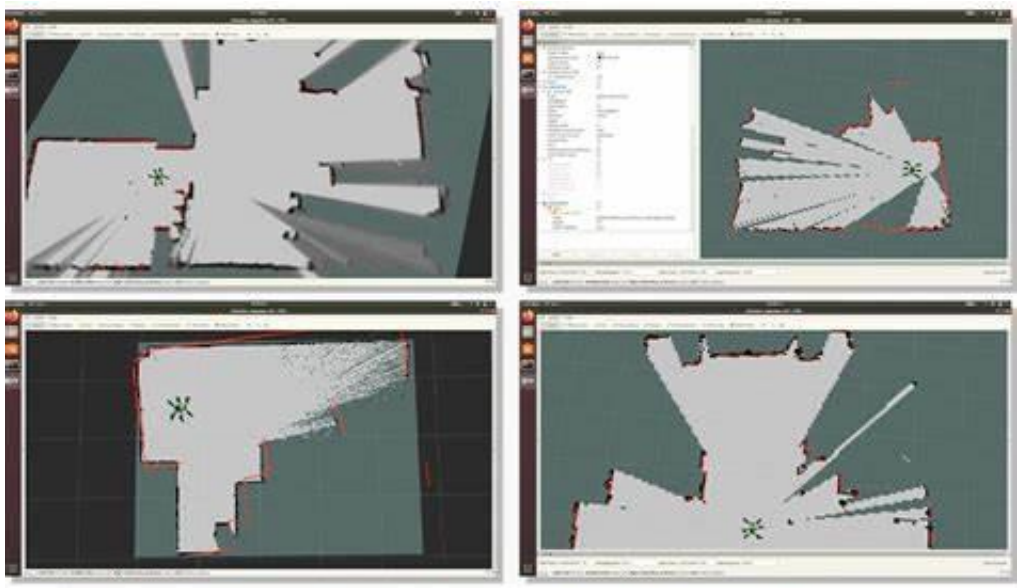
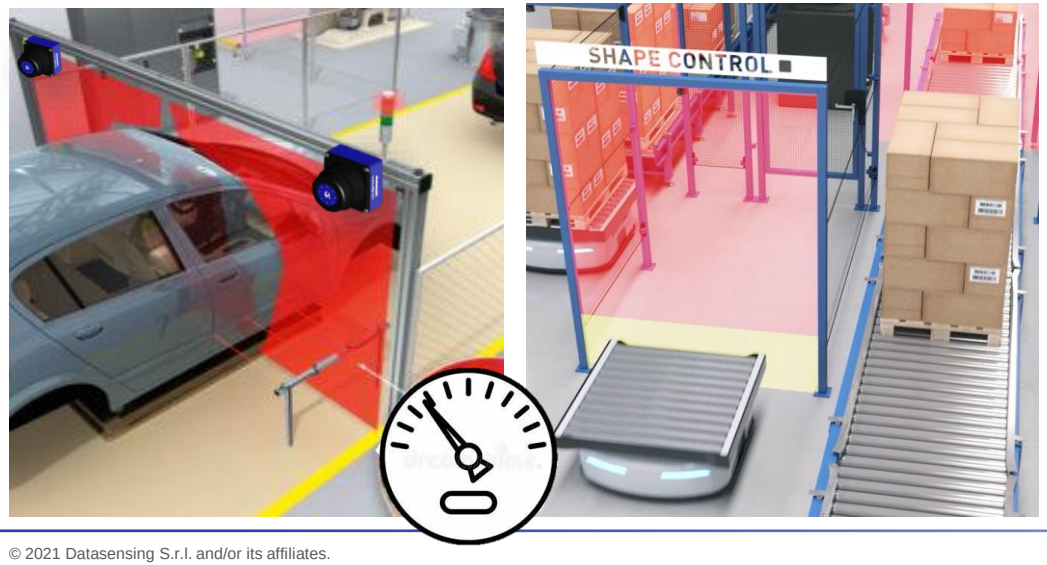
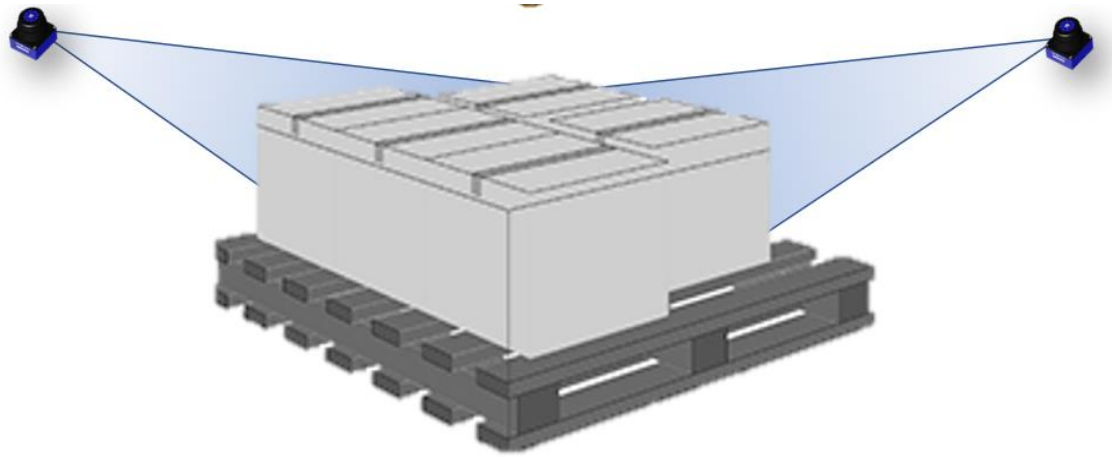
Function



MEASURING, MAPPING and OBJECT DETECTION

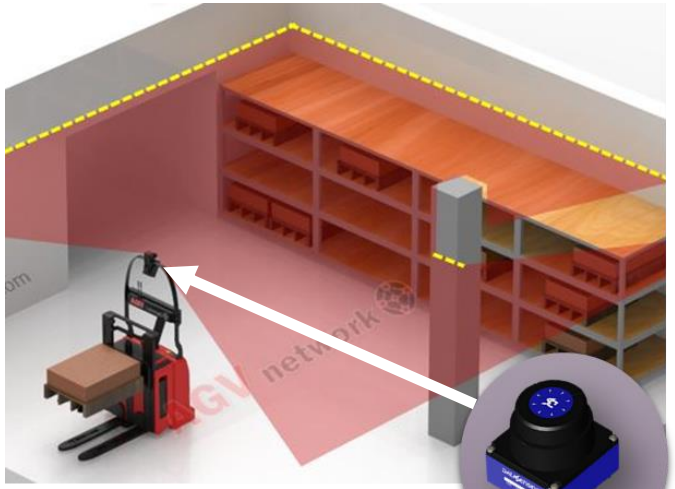
- Natural navigation for indoor/outdoor
- Environmental mapping
- Object Measuring
- Object Profiling
- Shape, Area and Volume control

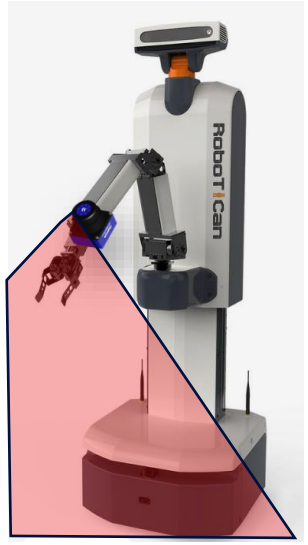




DATASENSING easing automation challenges

Specific Field Applications



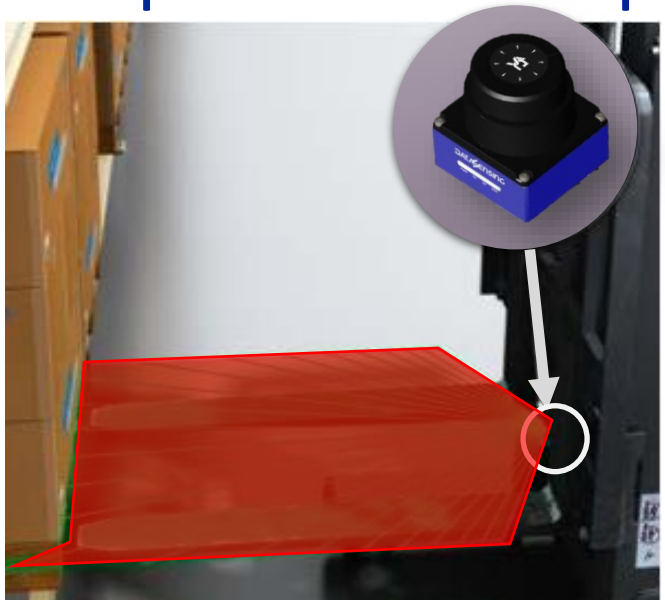


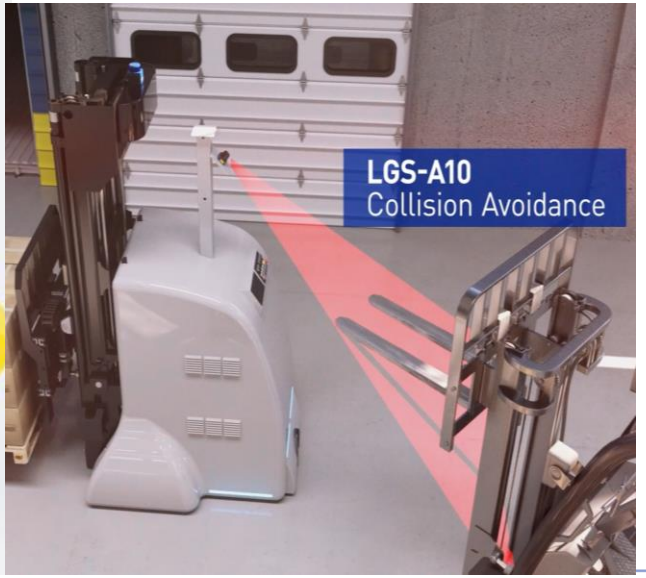
AMR & ROBOTICS

- Shape recognition
- Collision prevention and avoidance
- Collision prevention for postal sanitary shuttle
- Access monitoring
- Natural Navigation (Indoor & Outdoor)
- Other Auxiliary functions

DATASENSING easing automation challenges

Specific Field Applications



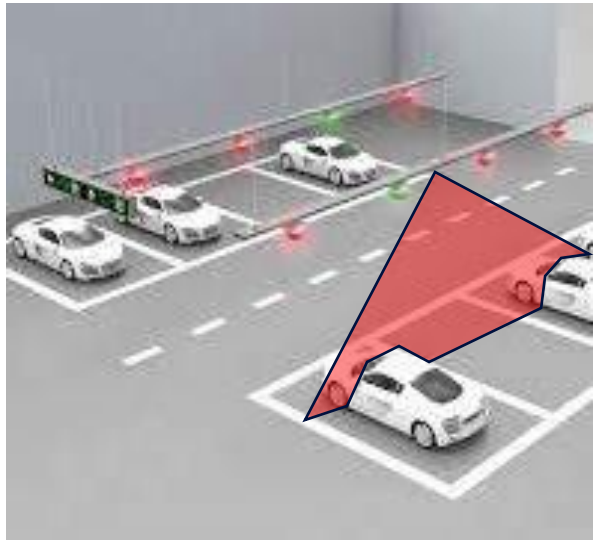


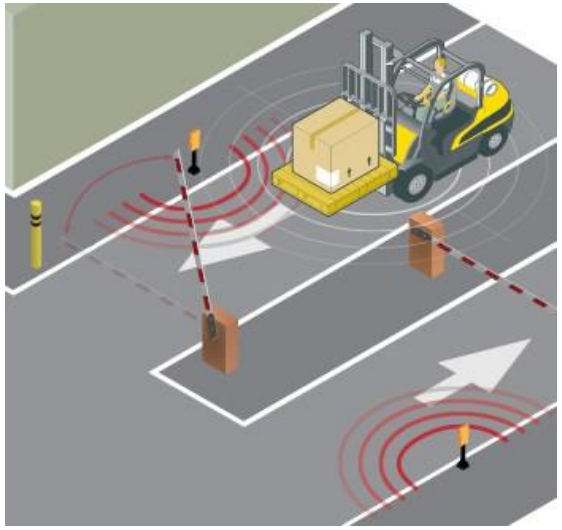
AGV & LOGISTIC

- Load handling
- Lateral monitoring
- Forklift pallet presence
- Rear monitoring and collision avoidance
- Collision prevention
- Dark zone monitoring
- Natural Navigation
- Warehouse pallet presence

DATASENSING easing automation challenges

Specific Field Applications





SECURITY, PARK and GATES CONTROLS

- Gate Monitoring
- Parking access control
- Security monitoring
- Object counter

DATASENSING easing automation challenges

Order information LGS-A10

LGS-A10	Collision avoidance Lidar 360°- 10m	958200002

ACCESSORIES

MAINTENANCE ACCESSORIES		
DESCRIPTION	MODEL	ORDER NO.
Liquid cleaner in spray bottle (1 lt)	SLS-CLEANER	95ASE2990
Cleaning cloth (22 cm x 22 cm), 100 pcs.	SLS-CLOTH	95ASE3000

MAIN CABLES	CS-A1-10-U-03	12 pin female	free wires	3 m	95A252720
	CS-A1-10-U-05			5 m	95A252730
	CS-A1-10-U-10			10 m	95A252740
	CS-A1-10-U-15			15 m	95A252750
	CS-A1-10-U-25			25 m	95A252760
ETHERNET TO HOST CABLES	CAB-ETH-M01 M12-IP67 ETHERNET CAB. (1M)	4 pin male	RJ45	1 m	93A051346
	CAB-ETH-M03 M12-IP67 ETHERNET CAB. (3M)			3 m	93A051347
	CAB-ETH-M05 M12-IP67 ETHERNET CAB. (5M)			5 m	93A051348
	CAB-ETH-M10 M12-IP67 ETHERNET CAB. (10M)			10 m	93A051391

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THANK YOU

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