LGS-N25

USER MANUAL



Compact LiDAR Scanner for Guidance, Measuring and Object Profiling



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ORIGINAL INSTRUCTIONS (ref. 2006/42/EC)

CONTENTS

PREFACE	IV
About this Manual	iv
Manual Conventions	
Technical Support	
Support Through the Website	
Reseller Technical Support	
DOCUMENT DESCRIPTION	1
SAFETY INSTRUCTIONS	2
Handle laser device properly	2
Handle electrical connection properly	2
WORKING PRINCIPLES	3
INSTALLATION AND USAGE	5
Mechanical connection	5
Electrical connection	6
Power connector	
Ethernet connector	
Communication	
LEDs	
DATA PACKET FORMAT	
Overview	
Definition of Header	
Definition of Block	
Data conversion	
Angle calculation Distance calculation	
Calculation of signal strength	
PARAMETER CONFIGURATION	
Configuration through LGS View PC software Operating environment	
Network environment	
LGS View: Windows Firewall	
Using LGS View	
Menu icons	
Basic measurement	
Reset the LiDAR	
Firmware upgrade	23
TECHNICAL PARAMETERS	25
CABLES AND ACCESSORIES	27
Cables	
Accessories	
TROUBLESHOOTING	
DATA PACKET	
MECHANICAL DIMENSIONS	
RECOMMENDATIONS FOR MECHANICAL INSTALLATION	
CLEANING OF SENSORS	
Precautions	
Required materials	
Cleaning method	

PREFACE

ABOUT THIS MANUAL

This User Manual (UM) is provided for users seeking advanced technical information, including connection, programming, maintenance and specifications.

Manual Conventions

The following conventions are used in this document:

The symbols listed below are used in this manual to notify the reader of key issues or procedures that must be observed when using the reader:



Notes contain information necessary for properly diagnosing, repairing and operating the reader.



The CAUTION symbol advises you of actions that could damage equipment or property.



The WARNING symbol advises you of actions that could result in harm or injury to the person performing the task.

TECHNICAL SUPPORT

Support Through the Website

Datasensing provides several services as well as technical support through its website. Log on to (www.datasensing.com).

For quick access, from the home page click on the search icon Q, and type in the name of the product you're looking for. This allows you access to download Data Sheets, Manuals, Software & Utilities, and Drawings.

Reseller Technical Support

An excellent source for technical assistance and information is an authorized Datasensing reseller. A reseller is acquainted with specific types of businesses, application software, and computer systems and can provide individualized assistance.



CHAPTER 1 DOCUMENT DESCRIPTION

In order to maintain the normal performance of the product and prevent damage to the device, please do not try to open the sensor.

- Read the description: please read all the safety and operation information before using this product.
- Keep the description: please keep all the safety and operation information properlyfor future reference.
- Pay attention to the warnings: please read all the warnings in the manuals and on the product carefully.
- Follow the instructions: please follow all the operation instructions in this manual.
- Maintenance instructions: please follow the instructions for troubleshooting, do
 not try to repair the equipment by yourself. Contact our technicians promptly to
 solve the problems.
- Any equipment damage caused by violating the above safety regulations shall not be covered by the warranty.



CHAPTER 2 SAFETY INSTRUCTIONS

HANDLE LASER DEVICE PROPERLY



This product emits an invisible laser beam with a laser safety rating of Class 1.



Please do not open the LiDAR cover without authorization because the laser might be still on after the cover is removed and the operator would be exposed to laser.



It is not guaranteed that the laser remains Class 1 safety status after opening the cover.

HANDLE ELECTRICAL CONNECTION PROPERLY



Disconnect the power supply when connecting or disconnecting electrical cables.



The power supply connected with the device must comply with the requirements included in the operation instructions.



Please connect the reference potential properly when using the device to avoid injury caused by equal potential current.



CHAPTER 3 WORKING PRINCIPLES

The LGS-N25 is a 2D LiDAR that scans the surrounding area in a single plane with the help of an infrared invisible laser beam. The LGS-N25 uses 2D polar coordinates to characterize the surrounding environment based on its measurement origin.

With a scanning angle range of 360°, the LGS-N25 can detect and output information of the angle, distance and signal strength of the target, which facilitating better target identification by SLAM systems.

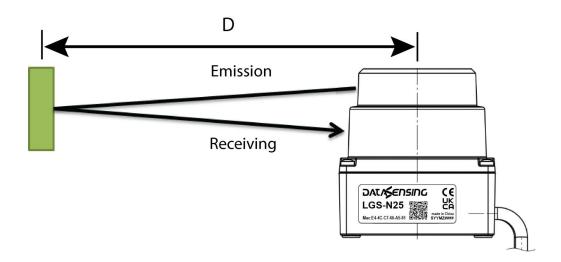
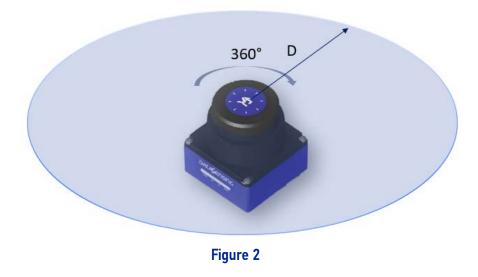


Figure 1 - LGS-N25 working principle





The LGS-N25 measurement principle is shown in the figure above, and it uses the timeof-flight principle to measure distance. LiDAR emits laser pulses at uniform and very short intervals, and the laser light is reflected back when it encounters an obstacle. The LiDAR receives the reflected light signal and calculates the distance information between the object and the LiDAR based on the time difference (i.e., the time of flight of the laser) T between the emission and reception and the speed of light C. The calculation method is shown below.

D=c*T/2

Where:

D = distance

T = flying time

c = speed of light



CHAPTER 4 INSTALLATION AND USAGE

MECHANICAL CONNECTION

The LGS-N25 LiDAR can be mounted thanks to the four M3 screw holes located on the bottom side of the device, we suggest to use M3 x 8 screws.

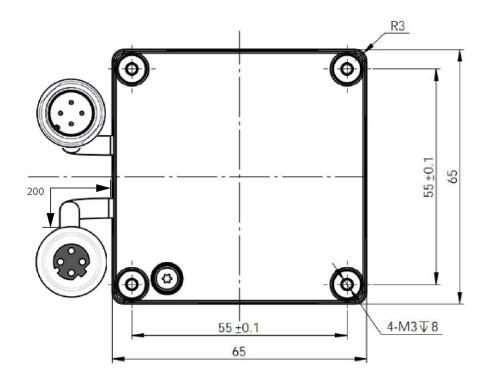


Figure 1 - LGS-N25 Mounting interface



ELECTRICAL CONNECTION

The LGS-N25 has 2 pig tail connectors, a 4-pole M12 male connector for power supply and a 4-pole M12 D-coded female connector for Ethernet communication. As shown in the figure below.

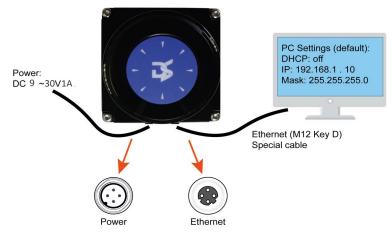


Figure 2 - LGS-N25 Connection

Power connector

M12-4 Poles Male - pig tail. Length of pig tail cable = 200mm

The supply voltage must be between 9 and 30Vdc. Here below the connector pinout.

No.	DEFINITION	WIRING COLOR
1	+VCC	Brown
2	NC	White
3	GND	Blue
4	NC	Black

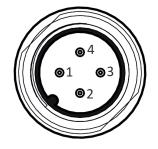


Figure 3 - Power connector

Ethernet connector

M12-4 Poles Female - pig tail. Length of pig tail cable = 200 mm



The pin definitions of Ethernet connector are as follows:

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

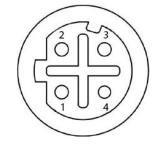


Figure 4 - Ethernet connector

COMMUNICATION

The standard Ethernet RJ-45 connector is used to connect the LGS-N25 to the computer.

The computer IP address needs to be set before communication, the first three segments of the computer IP address must be set the same as the LiDAR (192.168.1.X) and be in the same subnet. The last segment of the computer IP cannot be set to 100 to prevent conflict with the LiDAR default IP.

Port number of the point cloud packet is 2368

The default factory settings for LiDAR are shown below:

- LIDAR IP:192.168.1.100
- LiDAR subnet mask: 255.255.255.0

The recommended computer IP settings are shown below:

- Computer IP: 192.168.1.10
- Computer subnet mask: 255.255.255.0



The setting process in the computer is shown below:

$\leftrightarrow \rightarrow \ \ \sim \ \uparrow$	Sontrol Panel > Network	ind Internet > Network					
Control Panel Home		ind internet + network	and Sharing Center 🗸 🗸	С	Search Control Panel		م
			ion and set up connections				
Change adapter settin	View your active ne ngs	tworks					
Local Connection Stat	us X		Access type: Internet				
eneral			Connections: <i>I</i> Ethernet				
Connection IPv4 Connectivity: IPv6 Connectivity: Media State: Duration: Speed:	No network access No network access Enabled 00:20:11 100.0 Mbps	enticated) ing settings	Access type: No network access Connections: & <u>Local Connection</u>				
Details Activity Sent Packets:		ot problems	PN connection; or set up a router or access point.				
Properties Vis	1						

Figure 5 - Computer IP Setting: Step 1

ochonding	Authentication	Sharing		
Connect us	ing:			
🚅 Intel	(R) Ethernet Con	nection (5) 1219)-LM	
			Configure	
This conne	ction uses the fo	llowing items:	Conigar	
	ient for Microsoft			
The second se	le and Printer Sh		oft Networks	1
-	end Micro NDIS	-		
🗹 🏆 Tr	end Micro Light	Neight Filter Dri	ver	
	oS Packet Sche			
And Address of the Owner of the	ternet Protocol V	and the second	and the second second	
LI 🔔 M	icrosoft Network	Adapter Multipl	exor Protocol	
Insta	ıl	Uninstall	Propertie	s
Insta Descriptio		Uninstall	Properties	s
Descriptio	on ssion Control Pro	tocol/Internet P	rotocol. The defau	
Descriptio Transmis wide are	on ssion Control Pro	tocol/Internet P col that provides	rotocol. The defau	
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Descriptio Transmis wide are	on ssion Control Pro a network protoc	tocol/Internet P col that provides	rotocol. The defau	

Figure 6 - Computer IP Setting: Step 2



eneral	
	automatically if your network supports eed to ask your network administrator
Obtain an IP address autom	natically
OUse the following IP address	s:
IP address:	192 . 168 . 1 . 10
Subnet mask:	255.255.255.0
Default gateway:	
Obtain DNS server address	automatically
O Use the following DNS serve	er addresses:
Preferred DNS server:	
Alternate DNS server:	
Validate settings upon exit	Advanced

Figure 7 - Computer IP Setting: Step 3



When network addresses (IP LiDAR, IP Host, Net Mask, etc.) are changed, a power cycle of the LGS-N25 should always be performed. This way when the device reboots, it uses the new values.

LEDs

There are 2 LED indicators.



Figure 8 - LGS-N25 LEDs



LED	MEANING
•	Power On. Red and Green lights are always ON.
• •	Start. Device self checking, Red and Green LED flash.
• 0	Normal operation. Red OFF, Green ON.
• •	Fault. Red ON, Green LED flash.



CHAPTER 5 DATA PACKET FORMAT

The LGS-N25 enables laser point cloud data transmission. Please refer to the following for the analysis of LiDAR point cloud data.

The transmission of information between the LGS-N25 and the PC follows the UDP standard network protocol. The data is in Little-endian format, with the low byte first and the high byte second.

OVERVIEW

Total length of data packet is 772 bytes, including 48 bytes for the header file, 720 bytes for the laser return data and 4 bytes for the CRC32.

Header	Block1	Block2		Block180	End
48bytes	4bytes	4bytes		4bytes	4bytes
		180Blocks	720bytes		
		772b	/tes		

Figure 1 - Format of point cloud information packet

The total length of a data frame is 772 bytes, including:

- Frame header: 48 bytes
- Data block: 180 x 4 = 720 bytes
- CRC32: 4 bytes



DEFINITION OF HEADER

Total length of data packet is 772 bytes, among which 48 bytes represent the header, 720 bytes represent the data returned by laser and 4 bytes represent the CRC32.

OFFSET	LENGTH	DESCRIPTION	REMARK
0	2	Identifiers. Fixed as 0xFEAC	
2	2	Protocol Version: 0x0301	Protocol Version: 0x0301
4	4	Packet size, including header + data+CRC32	Packet size, including header + data+CRC32
			Total bytes
8	2	Head size	The number of bytes in the packet header of this packet
10	1	Distance ratio	Used to calculate the distance. Distance = Distance count x Distance scale. For current proximity products, this scale value is 1, unit mm
11	1	Data type of data area	0x01:range (uint16) + intensity (uint16)
12	2	Scan count, starting from 0 and restarting from 0 when the limit is reached	Scan count from power-on, 0, 1, 265535, 0, 1
14	2	Packet counting, starting from 0 and restarting from 0 when the upper limit is reached	Count of packets sent from power-up, 0, 1, 265535, 0, 1
16	4	Timestamp, NTP64 format, fractional part	The decimal part of the NTP64 format timestamp, which can be synchronized with the time- stamp server. Unsynchronized indicates the time from the start of the main program; syn- chronized indicates the time from 1900-01-01 00:00:00
20	4	Timestamp, NTP64 format, integer part	The integer part of the NTP64 format timestamp, which can be synchronized with the time- stamp server. Unsynchronized indicates the time from the start of the main program; syn- chronized indicates the time from 1900-01-01 00:00:00
24	2	Bit[14:0]: Rotational Speed, Unit: 0.01Hz; Bit 15: Rotation direction (0: Clockwise, 1: Counterclock- wise)	LiDAR real-time rotational speed. The highest bit indi- cates the direction of rotation: 0 represents clockwise, 1 rep- resents counterclockwise; the value of the lower 15 bits indi- cates the rotational speed, the unit RPM (revolutions per min- ute) and Hz relationship: RPM = Hz × 60



DEFINITION OF HEADER

OFFSET	LENGTH	DESCRIPTION	REMARK
26	2	Points included in 360 ° for calculating horizontal angu- lar resolution	Indicates the number of angles in the range of 360 degrees, which is used to calculate the angular resolution. For example: 1600 means the angular resolution is 360/
28	2	Input	1600=0.225° Input IO state, Bit[3:0] corre- sponds to Input3~0
30	2	Output	Output IO status, Bit[3:0] corre- sponds to Output3~0
32	4	System Status	0 indicates normal operation, and each Bit indicates a state. Bit31:Not ready, Bit0:Motor fault, Bit1:Voltage, Bit2:Tem- perature, Bit3:Measurement system
36	2	Scan start point serial num- ber, starting from 0	Scan the starting point serial number, convert the angle: serial number × the above cal- culation of the angular resolu- tion, such as the angular resolution calculated after get- ting 0.25, serial number value of 400 × 0.25 = 100 °
38	2	Scan end point serial num- ber, starting from 0	Scan the last point serial num- ber, convert the angle: serial number × the angular resolu- tion calculated above, such as the angular resolution calcu- lated after getting 0.25, serial number value of 1000 × 0.25 = 250 °
40	2	The starting point serial number of this package start from 0.0 represents 0°	This package starting point serial number, conversion angle: serial number × the above calculation of the angu- lar resolution, such as the angular resolution calculation to get 0.25 after the serial number value of $400 \times 0.25 =$ 100°
42	2	Number of measurement points in this package N	The number of points contained in this packet.
44	4	Reserved	



DEFINITION OF BLOCK

The length of data block is 720 bytes and contains:

- 2 bytes related to distance
- 2 bytes related to the signal strength for the 180 points acquired in each packet.

OFFSET	LENGTH	DESCRIPTION	REMARK
0	2	Distance reading 0, unsigned integer which is, "the value of the reading × the distance ratio of the package head" to get the measurement distance (unit: mm)	The distance reading, together with the distance ratio, calcu- lates the measured distance. Measured distance = distance reading × distance ratio in the package head. Example: read- ing 100, proportion 1, the mea- sured distance is $100 \times 1 = 100$ mm
2	2	Signal strength reading 0, unsigned integer	
4	2	Distance reading1, unsigned integer which is, "the value of the reading × the distance ratio of the package head" to get the measurement distance (unit: mm)	The distance reading, together with the distance ratio, calcu- lates the measured distance. Measured distance = distance reading × distance ratio in the package head. Example: read- ing 100, proportion 1, the mea- sured distance is 100 × 1 = 100 mm
6	2	Signal strength reading 1, unsigned integer	

DATA CONVERSION

Angle calculation

The calculation of the LGS-N25 angle is shown in the following example.

- 1. The 27th/28th byte of the header file converts the points contained in 360° to calculate the horizontal angular resolution. For example: 1440 means the angle resolution is 360/1440=0.25°.
- 2. Conversion angle: serial number \times the angle resolution calculated above, for example, the serial number value is 400 \times 0.25 = 100 °.



Distance calculation

The distance calculation for LGS-N25 is shown in the following example.

- 1. Obtain distance value: 0x11 & 0x12
- 2. Byte High-Low Swap: 0x12 & 0x11
- 3. Combine to unsigned hexadecimal number: 0x1211
- 4. Convert to decimal numbers: 4625
- 5. Multiply the distance ratio: Assume a distance ratio of 1mm
- 6. Result: 4625 mm

Calculation of signal strength

The signal strength of LGS-N25 is calculated as shown in the following example.

- 1. Obtain signal strength values: 0x11 & 0x12
- 2. Byte High-Low Swap: 0x12 & 0x11
- 3. Combined into unsigned hexadecimal numbers. 0x1211
- 4. Convert to decimal numbers: 4625
- 5. Result: 4625



CHAPTER 6 PARAMETER CONFIGURATION

Type the device's IP on a web browser to enter in the LiDAR configuration windows (see figure below):

	LiDAR Config Model: LGS_N25 MAC: 50-54-7B-49-F9-94 HardVer: 0.4.0 SoftVer: 0.0.2		
	LiDAR Config	Tempe	rature
Motor RPM:	1500 ~	Main board:	45.2 ℃
Angle offset:	90 • (0.00~360.00°) Set Configs	Recv board:	47.3 ℃
		Volt	age
	Net Config	CPU core:	3.30 V
Host IP & Port:	192.168.1.10 & 2368	Recv board:	153.61 V
DHCP:	ON OFF		
LIDAR IP:	192.168.1.100	Miscella	aneous
Net Mask:	255.255.255.0	Motor speed:	1387.7
Gateway:	192.168.1.1	Points/Circle:	360
NTP:			
NTP server:	192.168.1.10		
	Set Networks		

CONFIGURATION THROUGH LGS VIEW PC SOFTWARE



If you upgrade or downgrade the LGS View app, first uninstall the current version through the Windows Control Panel (Control Panel\Programs\Programs and Features).





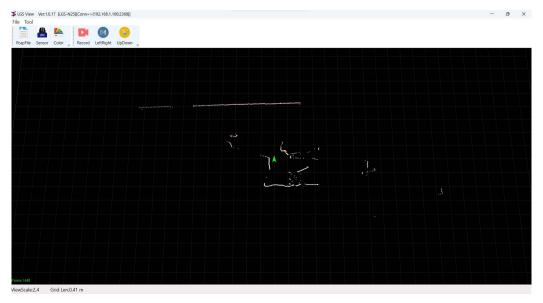


Figure 1 - Sample of PC software interface



The PC software interface may change due to product update.



If Windows Firewall is active on the configuration PC, a pop-up window will appear. Follow the procedure described in "LGS View: Windows Firewall" on page 18.

Operating environment

The required environment for the software to run is as follows:

- OS: Windows 10 and above
- .NET Framework: 4.5.2
- Pcap: wpcap runtime

Network environment

The default factory static IP for LiDAR is as follows:

- LiDAR IP: 192.168.1.100
- Net mask: 255.255.255.0

The following static IP must be configured on the PC:

- Host IP: 192.168.1.10
- Net mask: 255.255.255.0



LGS View: Windows Firewall

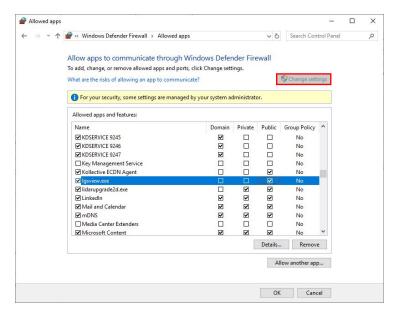
If Windows Firewall is active on the configuration PC, a pop-up window will appear.



Do not close the pop-up window before allowing access to both private and public networks of the PC to communicate and exchange data with the device through the Ethernet port.



If you close the pop-up window before confirming the Firewall authorization, go to Control Panel > System and Security > Windows Defender Firewall > Allowed apps, and click on "Change settings".





Scroll down the list and check the boxes on the lgsview.exe row as shown in the figure below, then click *OK*. The Firewall is now disabled on LGS View.

For your security, some settings are managed by your system administrator. Allowed apps and features: Name Domain Private Public Group KDSERVICE 9245 W	p Policy *		
For your security, some settings are managed by your system administrator. Allowed apps and features: Name Domain Private Public Group KDSERVICE 9245 W	p Policy		
Allowed apps and features: Name Domain Private Public Group ØKDSERVICE 9245 Ø		^	
Name Domain Private Public Group ØLKDSERVICE 9245 Ø Image: Comparison of the system N N ØLKDSERVICE 9246 Ø Image: Comparison of the system N N ØLKDSERVICE 9247 Ø Image: Comparison of the system N N ØLKDERVICE 9247 Ø Image: Comparison of the system Image: Comparison of the system N ØLKDIREXTECEDN Agent Image: Comparison of the system Image: Comparison of the system N		•	
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M KO5EWICE 9247 Image: Constraint of the service Image: Constraintof the service			
Key Management Service Image: Constraint of the service Image: Kollective ECDN Agent Image: Constraint of the service	No		
Kollective ECDN Agent	No		
	No		
	No		
🖌 Igsview.exe 🖉 🗹 🗹 N	No		
🗹 lidarupgrade2d.exe 🛛 🔽 🗹 🛛 N	No		
🗹 Linkedin 🗹 🗹 🗹 N	No		
Mail and Calendar 🗹 🗹 N	No		
🗹 mDNS 🗹 🗹 🕅 N	No		
Media Center Extenders	No		
Microsoft Content	No 1	~	
Details			

Using LGS View

Menu icons

The menu icons have the following functions:



Capture file: read a previously saved .pcap file containing a scanner measure data. Alternatively, go to *File > Open > Capture File*.



Select Sensor: select and connect a scanner to read its measure data in real time. Alternatively, go to *File > Open > Select Sensor*.



Color Coding: change the color coding representing the intensity value for each point being displayed. The software will provide scheme level graphics in the Color directory that loads the root at initialization. The graphic size is 256*23;*.bmp (24 bit).





Record: record a sequence of measure data and save it on a .pcap file.



LeftRight: Change the display of the target from the LiDAR. After the button is pressed, the target displayed to the right of the GUI will be displayed to the left.



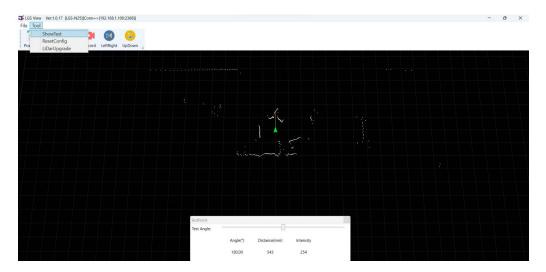
UpDown: Change the display of the target from the LiDAR. After the button is pressed, the target displayed at the bottom of the GUI will be displayed at the top.

To zoom in and out, use the mouse wheel (or two fingers in the case of a touchpad).

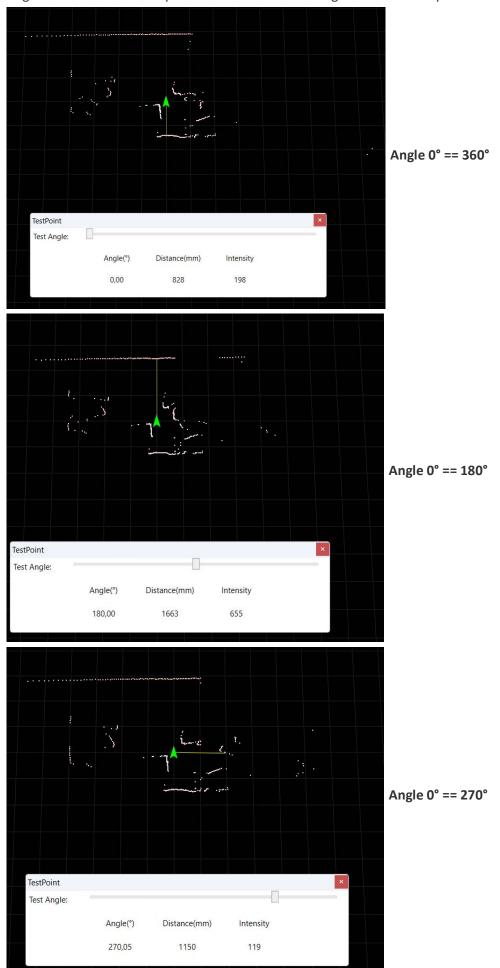
To center/decenter the measurement images, hold down the right mouse button and move the cursor.

Basic measurement

Go to *Tool > ShowTest*. The purpose of LGS View is to monitor in real time the cloud of points generated by LGS-N25 inside a system of coordinates. The *ShowTest* function can be used to measure the angle (°), distance (mm) and intensity of each point.







Angles start from 0° in the point behind the LiDAR and go on clockwise up to 360°:



To set an offset angle, go to the configuration page (see "Configuration through LGS View PC software" on page 16). The offset angle is added to the actual angle of each point, causing a clockwise rotation of a cloud of points:



Reset the LiDAR

The ResetConfig software program can be used to restore the following settings to factory configuration:

- IP: 192.168.1.100
- Host: 192.168.1.100:2368

From the LGS View software program go to *Tool* > *ResetConfig* or launch the ResetConfig software program. The following window is displayed. Click on the *Reset(S)* button to restore settings to factory configuration.

ResetConfig	Ver:1.0.15	-
JAT/		Refresh(R) Manual(M)
LiDar Info: —		Model: LGS-N25
Model:	LGS-N25	MAC: 38-3B-26-77-F9-42
HardVer: 0.4	4.0	
SoftVer:	0.0.0	
MAC:	38-3B-26-77-F9-42	
DHCP:	OFF	
IP:	192.168.1.100	
Host:	192.168.1.20:2368	
PC Info: IP address:	192.168.1.20 v	

Figure 2 - ResetConfig software program



Firmware upgrade

Going to *Tool > LidarUpgrade* opens the firmware upgrade module:

<table-of-contents> LiDarUpgra</table-of-contents>	ade Ver:1.0.15	- 🗆 X
JAC		File Information:
LiDar IP:		Model Name: LGS-N25
MAC:		Hard version: 0.4.0
Mask:		Soft version: 0.0.0
DHCP:		Build Time: 2023/04/17 09:35:15
	Upgrade	Drag and drop or Browse your file
	Continuous mode	
Ldrup	C:\X23C00025.ldrup	
	73 KB	

To upgrade the firmware, follow the procedure below:

1. Click on the gray box to the right and select the .ldrup firmware file (or drag it to the specified area).



Check the "Continuous mode" box to automatically upgrade the firmware on each device that will be consecutively connected to the computer.

2. Click on the *Upgrade* button.

LiDarUpg	grade Ver:1.0.15	– 🗆 X
JAG		File Information:
	easing automation challenges	
LiDar IP:	192.168.1.100	Model Name: LGS-N25
MAC:	38-3B-26-77-F9-42	Hard version: 0.4.0
Mask:	255.255.255.0	Soft version: 0.0.0
DHCP:	OFF	Build Time: 2023/04/17 09:35:15
	Cancel	Drag and drop or Browse your file
	Continuous mode	
	C:\X23C00025.ldrup	
	52,0 KB of 72,5 KB	Uploading72%

- 3. Power cycle the device while keeping LGS View connected. The progress bar will fill up.
- 4. Open the LiDAR configuration web page and check that the firmware has been upgraded.





CHAPTER 7 TECHNICAL PARAMETERS

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	4(H); 0.3(V) mrad
Horizontal plane	<= 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	
Power connector	4pin, M12x1 Connector Standard	
Communication Interface	4pin, M12x1 socket D-coded	

MEASUREMENT PARAMETERS		
Absolute accuracy	<± 30 (0.4~25m)	
Repeat accuracy	<= 20 (0.4~25m)	
Angle resolution	0.25° @ 10 Hz / 0.5° @ 15 Hz / 1° @ 25 Hz	
Working distance	0.1~5m @ 3,5%	
(based on	0.1~10m @ 10%	
reflectivity)	0.1~25m @ 80%	
	0.1~25m @ High Reflection	



MEASUREMENT PARAMETERS

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	
	Body and cap: aluminum	
Material	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	\checkmark	
Safety requirements	UL61010-1	

	INDICATORS
LED indicator	RGB*2 Color
Operation indicator	Green LED: Power ON
Function indicator	Red LED: LiDAR fault

SOFTWARE					
Basic software	Datasensing LGS View				
Dasic software	OS required: Windows 10 and above				



CHAPTER 8 CABLES AND ACCESSORIES

CABLES

	MODEL	1ST END	2ND END	LENGTH	CODE	
POWER CABLE	CS-A1-02-U-03		free wires	3 m	95ASE1120	
	CS-A1-02-U-05			5 m	95ASE1130	
	CS-A1-02-U-10	4 pin female		10 m	95ASE1140	
	CS-A1-02-U-15			15 m	95ASE1150	
	CS-A1-02-U-25			25 m	95ASE1160	
	CAB-ETH-M01 M12-IP67		RJ45	1 m	93A051346	
	ETHERNET CAB. (1M)			1 111	754051540	
	CAB-ETH-M03 M12-IP67			3 m	93A051347	
ETHERNET	ETHERNET CAB. (3M)	4 pin male		5111	/3A03134/	
TO HOST CABLES	CAB-ETH-M05 M12-IP67	4 pin mate		5 m	93A051348	
	ETHERNET CAB. (5M)			5111	754051540	
	CAB-ETH-M10 M12-IP67			10 m	93A051391	
	ETHERNET CAB. (10M)			10111	/ 5/ 63 1 3 / 1	

ACCESSORIES

MAIN	TENANCE 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



CHAPTER 9 TROUBLESHOOTING

PROBLEM	SOLUTION
LiDAR fails to scan	Check power connection
	 Check whether voltage meets 9 to 30 VDC
	If failure persists, contact Datasensing Technical Support.
	Check net connection
	 Check the IP setting of the data receiver
	 Try to use a third-party data capture tool to check whether data can be obtained normally
LiDAR scan produces no data	 Check if only one LiDAR software is started
	 Verify that the firewall on the receiving end of the data is turned off, or that there is no other security software or process blocking data transmission.
	If failure persists, contact Datasensing Technical Support.

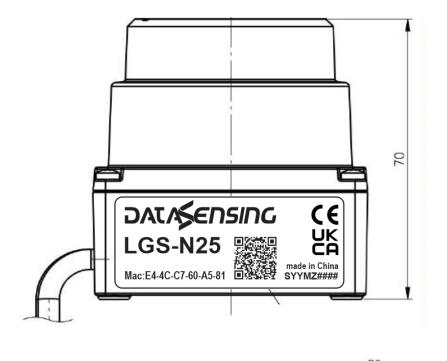


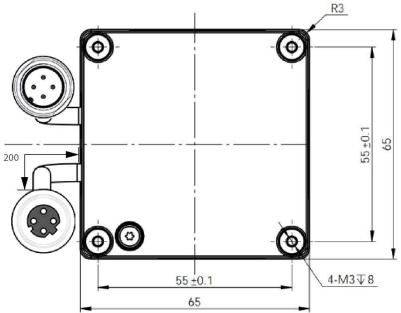
APPENDIX A DATA PACKET

lica un filtro di visualizza		🛓 📃 📃 @, @, @,	10							
-										
Time	Source	Destination	Protocol	Length Info						
655 8.170813	192.168.1.100	192.168.1.20	UDP	814 2368 → 2368 Len=772						
656 8.180710	192.168.1.100	192.168.1.20	UDP	814 2368 → 2368 Len=772						
657 8.190575	192.168.1.100	192.168.1.20	UDP	814 2368 → 2368 Len=772						
658 8.201924	192.168.1.100	192.168.1.20	UDP	814 2368 → 2368 Len=772						
659 8.210559	192.168.1.100	192.168.1.20	UDP	814 2368 → 2368 Len=772						
660 8.220833 661 8.230542	192.168.1.100 192.168.1.100	192.168.1.20 192.168.1.20	UDP	814 2368 → 2368 Len=772 814 2368 → 2368 Len=772						
662 8.261024	192.168.1.100	192.168.1.20	UDP	814 2368 → 2368 Len=772						
663 8.270677	192.168.1.100	192.168.1.20	UDP	814 2368 → 2368 Len=772 814 2368 → 2368 Len=772						
664 8.280704	192.168.1.100	192.168.1.20	UDP	814 2368 → 2368 Len=772						
665 8.290502	192.168.1.100	192.168.1.20	UDP	814 2368 → 2368 Len=772						
666 8,300485	192.168.1.100	192.168.1.20	UDP	814 2368 → 2368 Len=772						
567 8.310502	192.168.1.100	192.168.1.20	UDP	814 2368 → 2368 Len=772						
568 8.320673	192.168.1.100	192.168.1.20	UDP	814 2368 → 2368 Len=772						
569 8.330562	192.168.1.100	192.168.1.20	UDP	814 2368 → 2368 Len=772						
570 8.360717	192.168.1.100	192.168.1.20	UDP	814 2368 → 2368 Len=772						
571 8.370630	192.168.1.100	192.168.1.20	UDP	814 2368 → 2368 Len=772						
672 8.380639	192.168.1.100	192.168.1.20	UDP	814 2368 → 2368 Len=772						
673 8.391030	192.168.1.100	192.168.1.20	UDP	814 2368 → 2368 Len=772						
hernet II, Src: ternet Protocol	NanjingQ_b4:54:89 (50:54:7b:b4:54:89), D .168.1.100, Dst: 192.	st: Dell_3c) on interface \Device\NPF_{1C874 :93:fc (a0:29:19:3c:93:fc)	0010 0020 0030 0040 0050	03 20 01 64 00 00 86 01 14 09 40 09 40 03 00 00 30 00 01 01 20 00 00 58 82 a0 55 66 9f 05 d0 02 b4 00 00	Oc 32 e3 ac fe 00 64 01 d7 a3 00 00 00 00 00 00 00 00 00 00 00 00 00	01 03 04 03 70 7d 0d 00 00 00 00 00 93 02 b2 06	· d· · · · · d· · · · · · · · · · · · ·	
ta (772 bytes)						91 02 b2 06 9c 02 b2 ab 02 b2 06 a0 02 ab				
					0070 0080 0090 00a0 00b0	ab 02 b2 06 a0 02 at a0 02 b2 06 a3 02 b2 a3 02 b2 06 97 02 b2 96 02 b9 06 8e 02 b9 80 02 2b 06 90 02 45	06 ab 02 b2 06 06 a9 02 b2 06 06 99 02 b2 06 06 8d 02 bf 06 06 8d 02 bf 06 03 f8 02 0f 03	a1 02 b2 06 a6 02 b2 06 94 02 b2 06 87 02 cd 06 cf 02 f4 02		
					0070 0080 0090 00a0 00b0 00c0 00c0 00d0 00e0	ab 02 b2 06 a0 02 ab a0 02 b2 06 a3 02 b2 a3 02 b2 06 97 02 b2 96 02 b9 06 8e 02 b2	06 ab 02 b2 06 06 a9 02 b2 06 06 99 02 b2 06 03 f8 02 off 03 02 66 01 38 02 04 97 01 38 02 02 07 01 04 02 02 04 01 05 02	a1 02 b2 06 a6 02 b2 06 94 02 b2 06 87 02 cd 06 cf 02 f4 02 1a 01 26 02 10 01 0d 02 52 01 fd 01		



APPENDIX B MECHANICAL DIMENSIONS







APPENDIX C RECOMMENDATIONS FOR MECHANICAL INSTALLATION

- 1. Protect the product respect to high shock and vibration source.
- 2. Do not expose it to any direct sunlight (windows, skylights) or any other heat source in order to keep the temperature as the standard profile
- 3. It is recommended that the installation base used to fix the LiDAR be as flat as possible without any unevenness.
- 4. The positioning posts on the installation base should strictly follow the depth of the positioning posts at the bottom of the LiDAR. The height of the positioning posts should not be higher than 4mm. The material of the mounting base is recommended to be aluminum alloy or similar metallic material.
- 5. When installing the LiDAR, if there are contact mounting surfaces above and below the LiDAR, please ensure that the distance between the mounting surfaces is greater than the height of the LiDAR to avoid damaging to his parts.
- 6. When installing and wiring the LiDAR, do not pull excessively the wires and keep it a bit loose.
- 7. In order to avoid any impact on measurement accuracy due to mutual interference between LiDARs, we recommend installation as shown below

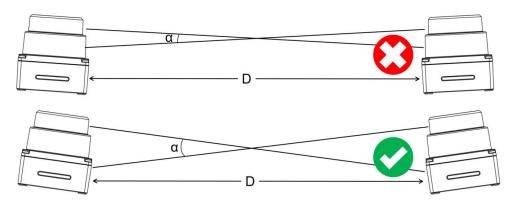


Figure 1 Multiple liDARs on the same plane to prevent optical path crosstalk

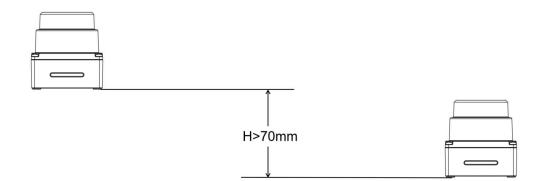


Figure 2 Multiple liDARs forward placement

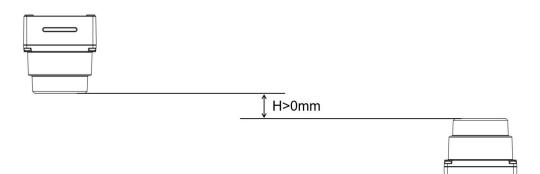


Figure 3 Multiple liDARs window covers placed opposite each other

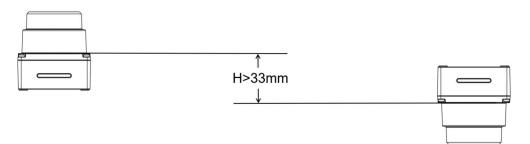
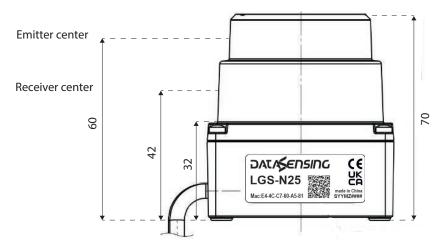


Figure 4 Multiple liDARs bottoms placed opposite each other







APPENDIX D CLEANING OF SENSORS

In order to accurately sense the surrounding environment, LGS-N25 needs to be kept clean, especially the ring-shaped optical window.

Precautions

Please read the contents of this Appendix D carefully and completely before cleaning LGS-N25 liDAR otherwise improper operation may damage the equipment.

Required materials

- 1. Clean fiber cloth ref. maintenance accessory "SLS-CLOTH" 95ASE3000
- 2. Spray filled with clean water
- Anti-static alcohol free solution ref. maintenance accessory "SLS-CLEANER" 95ASE2990
- 4. Clean gloves

Cleaning method

If there is only some dust adhered to the surface of the radar, you can directly use the clean fiber cloth 95ASE3000 with a small amount of anti-static alcohol free solution 95ASE2990 to gently wipe the surface of the window LiDAR, and then wipe it dry with a dry and clean fiber cloth.

If the surface of liDAR's optical window is stained with lumps of foreign matter such as mud, clean water should first be sprayed on the surface of the dirty parts to remove the mud and other foreign matter.



Do not wipe off the mud directly with a fiber cloth, as this may scratch the surface irreparably).

If the first operation result not effective, secondly, spray warm water, with eventually mild soap, on the dirty area.

The lubricating effect of soapy water can accelerate the removal of foreign matter.

Gently try to wipe the surface of the liDAR with the fiber cloth again, but be careful not to scratch the window surface.

Finally, clean the soap residue on the liDAR surface with clean water (if there is still residue on the surface clean it again with anti-static alcohol free solution), and wipe it dry with a dry microfiber cloth









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