

# User Manual

LIDAR Sensors

**LSE-4A5R2**

Thank you for purchasing an Autonics product.

This user manual contains information about the product and its proper use, and should be kept in a place where it will be easy to access.



# **Preface**

Thank you for purchasing an Autonics product.





Please familiarize yourself with the information contained in the Safety Precautions section before using this product.

This user manual contains information about the product and its proper use, and should be kept in a place where it will be easy to access.

# ***User Manual Guide***


- Please familiarize yourself with the information in this manual before using the product.
- This manual provides detailed information on the product's features. It does not offer any guarantee concerning matters beyond the scope of this manual.
- This manual may not be edited or reproduced in either part or whole without permission.
- A user manual is not provided as part of the product package. Visit our web site ([www.autonics.com](http://www.autonics.com)) to download a copy.
- The manual's content may vary depending on changes to the product's software and other unforeseen developments within Autonics, and is subject to change without prior notice. Upgrade notice is provided through out homepage.
- We contrived to describe this manual more easily and correctly. However, if there are any corrections or questions, please notify us these on our homepage.


# User Manual Symbols

Symbol	Description
 <b>Note</b>	Supplementary information for a particular feature.
 <b>Warning</b>	Failure to follow instructions can result in serious injury or death.
 <b>Caution</b>	Failure to follow instructions can lead to a minor injury or product damage.
 <b>Ex.</b>	An example of the concerned feature's use.
※1	Annotation mark.

# Safety Considerations

- Following these safety precautions will ensure the safe and proper use of the product and help prevent accidents, as well as minimizing possible hazards.
- Safety precautions are categorized as Warnings and Cautions, as defined below:

 <b>Warning</b>	<b>Warning</b>	Failure to follow these instructions may result in serious injury or death.
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 <b>Caution</b>	<b>Caution</b>	Failure to follow these instructions may result in personal injury or product damage.
--	----------------	---

## Warning

- Fail-safe device must be installed when using the unit with machinery that may cause serious injury or substantial economic loss. (e.g. nuclear power control, medical equipment, ships, vehicles, railways, aircraft, combustion apparatus, safety equipment, crime/disaster prevention devices, etc.)  
Failure to follow this instruction may result in fire, personal injury, or economic loss.
- This product is not safety sensor and does not observe any domestic nor international safety standard.  
Do not use this product with the purpose of injury prevention or life protection, as well as in the place where economic loss maybe expected.
- Do not connect, repair, or inspect the unit while connected to a power source.  
Failure to follow this instruction may result in fire.
- Check 'Connections' before wiring.  
Failure to follow this instruction may result in fire.
- Do not disassemble or modify the unit.  
Failure to follow this instruction may result in fire.

## Caution

- Do not stare at the laser emitter.  
Failure to follow this instruction may result in eye damage.
- Use the unit within the rated specifications.  
Failure to follow this instruction may result in fire or product damage.
- Use dry cloth to clean the unit, and do not use water or organic solvent.  
Failure to follow this instruction may result in electric shock or fire.
- Do not use the unit in the place where flammable/explosive/corrosive gas, humidity, direct sunlight, radiant heat, vibration, impact, or salinity may be present.  
Failure to follow this instruction may result in fire or explosion.
- Do not apply high pressure to the laser scanner to clean it.

**The above specifications are subject to change and some models may be discontinued without notice.**

**Be sure to follow cautions written in the instruction manual, user manual and the technical descriptions (catalog, homepage).**

## Caution during Use

- Follow instructions in 'Cautions during Use'. Otherwise, it may cause unexpected accidents.
- 24VDC power supply should be insulated and limited voltage/current or Class 2, SELV power supply device.
- After supplying power, the sensor performs self-check for about 10 sec. When self-checking, error occurrence, remote control setting, and teaching, the laser scanner outputs the same as it sensed obstacle.
- Mutual optical interference between laser scanners and photoelectric sensors may result in malfunction.
- Mutual optical interference between laser scanners may result in malfunction.
- Objects cannot be scanned when covering the front cover of the laser scanner.
- When the laser scanner is moved to another position, use it after re-teaching (Teach-in).
- Do not drop the unit. It may cause malfunction.
- Installing the laser scanner in the place where smoke, fog, dust, or corrosion is heavy may result in malfunction.
- When installing the laser scanner outdoors, take protective measures. Otherwise, it may result in product damage.
- Keep away from high voltage lines or power lines to prevent inductive noise. In case of installing power line and input signal line closely, use line filter or varistor at power line and shield wire at input signal line.  
Do not use the laser scanner near the equipment which generates strong magnetic force or high frequency noise.
- Cover with shields, hoods, or etc. to prevent direct incidence of strong light (direct rays of sunlight, incandescent) into the laser scanner beam spread angle.
- When fastening the laser scanner with the bracket, align with the mark line.
- When mounting the bracket onto an external object, remove the wire fixture so that the wire of the laser scanner is not pressed.
- Fix the laser scanner in position with the fixing screw. Vibration may result in malfunction.
- When IP address of the laser scanner and wireless router is same, the communication does not connected. Set the wireless network (Wifi) to "Disable" in the network settings of the Windows operating system.
- This unit may be used in the following environments.
  - ① Indoors/Outdoors (in the environment condition rated in 'Specifications')
  - ② Altitude max. 2,000m
  - ③ Pollution degree 2
  - ④ Installation category II





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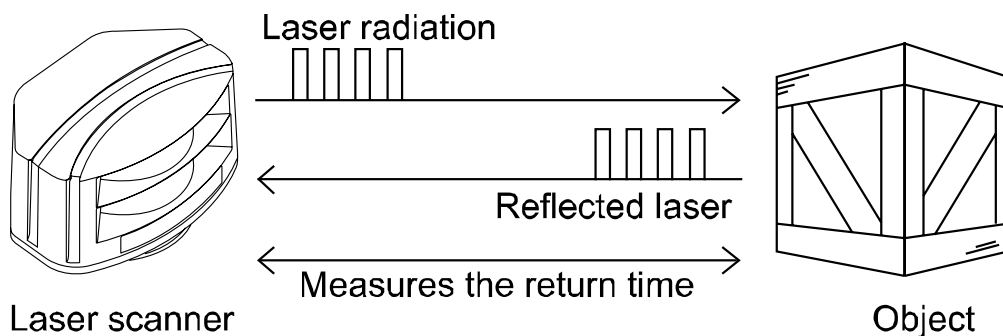
# 1 Product Introduction

## 1.1 Features

The laser scanner measures the time (TOF: Time-of-Flight) between radiation and reflection of the laser pulse and the object. It detects the object distance or obstacles existence.

The laser scanner utilizes for various environment: obstacles detection sensor for subway platform screen door (PSD), industrial door open/close sensor, security field surveillance sensor, industrial automation field sensor, etc.

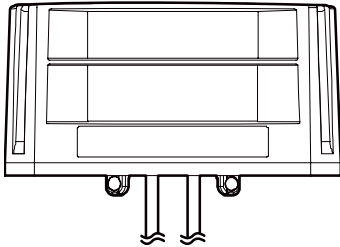
Ethernet communication supports to set parameters and real-time monitoring by PC.



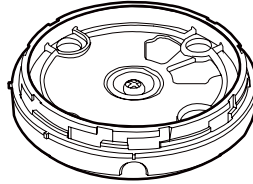
- Activated channel (s) among Ch1 to Ch4
  - Monitoring zone setting
  - Concentrated monitoring zone setting by channel
- Minimum size of the scanning target setting (W×H×L: approx. 5/10/15/20cm per each)
- Parameter setting and real-time monitoring by laser scanner program (atLidar) (Ethernet communication)
- Easy parameter setting via the remote control
- Emitting property: CLASS1, wavelength band (905nm), max. pulse output power: 75W
- Small size (W125×H80.3×L88mm) for various installation environment
- Protection structure: IP67 (IEC standard)

## 1.2 Components and accessories

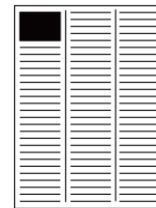
### 1.2.1 Components



Main unit



Bracket

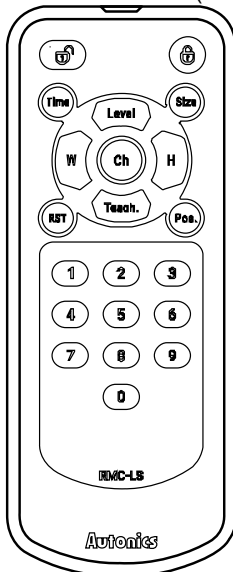
Tapping  
screw  
: 23mm allen  
wrenchInstruction  
manual

#### Note

Make sure all of the above components are included with your product package before use. If a component is missing or damaged, please contact Autonics or your distributor.

### 1.2.2 Sold separately


- Remote control (RMC-LS)



The remote control is available to set parameters of laser scanner.

## 2 Specifications

Model		LSE-4A5R2
Power supply		24VDC $\equiv$
Allowable voltage range		80 to 120% of rated voltage
Emitting property		Infrared laser
	Laser class	CLASS 1
	Wave length band	905nm
	Max. pulse output power	75W
Angular resolution		0.4°
Aperture angle		90°
Object reflectivity		Min. 2%
Scanning mode		Motion and presence
Monitoring zone $\ast 1$		0.3 x 0.3m to 5.6 x 5.6m (object reflectivity: at approx. 10%)
Min. size of the scanning target		<ul style="list-style-type: none"> <li>At detection distance of 3m: approx. W2.1 x H2.1 x L2.1cm</li> <li>At detection distance of 5m: approx. W3.5 x H3.5 x L3.5cm</li> <li>Object reflectivity: 90% (at Kodak Gray card R-27, white)</li> </ul>
Power consumption		Max. 8W
Response time $\ast 2$		Typ. 20 to 80ms+monitoring time
Input		Photocoupler input: 1 (output test mode) <ul style="list-style-type: none"> <li>[H]: min. 8VDC<math>\equiv</math> (max. 30VDC<math>\equiv</math>), [L]: max. 3VDC</li> <li>[H] operates as output test mode and outputs obstacle detection output and error status output</li> </ul>
Output		PhotoMOS relay output: 2 (obstacle detection output, error status output) <ul style="list-style-type: none"> <li>Galvanic isolation, non-polarity</li> <li>30VDC / 24VAC, max. DC80mA (resistive load)</li> <li>Output resistance: 30<math>\Omega</math></li> <li>Switching time: <math>t_{ON}=5ms</math>, <math>t_{OFF}=5ms</math></li> </ul>
Installation angle $\ast 3$	Laser scanner angle	-45°, 0°, 45°
	Bracket rotation angle $\ast 4$	-5 to 5°
	Bracket tilt angle	-3 to 3°
Front contamination		Normal operation with max. 30% contamination of one material
Communication interface $\ast 5$		Ethernet
Life expectancy		Max. 6.8years (60,000 hours)
Insulation resistance		Over 5M $\Omega$ (at 500VDC megger)
Dielectric strength		500VAC 50/60Hz for 1 min.

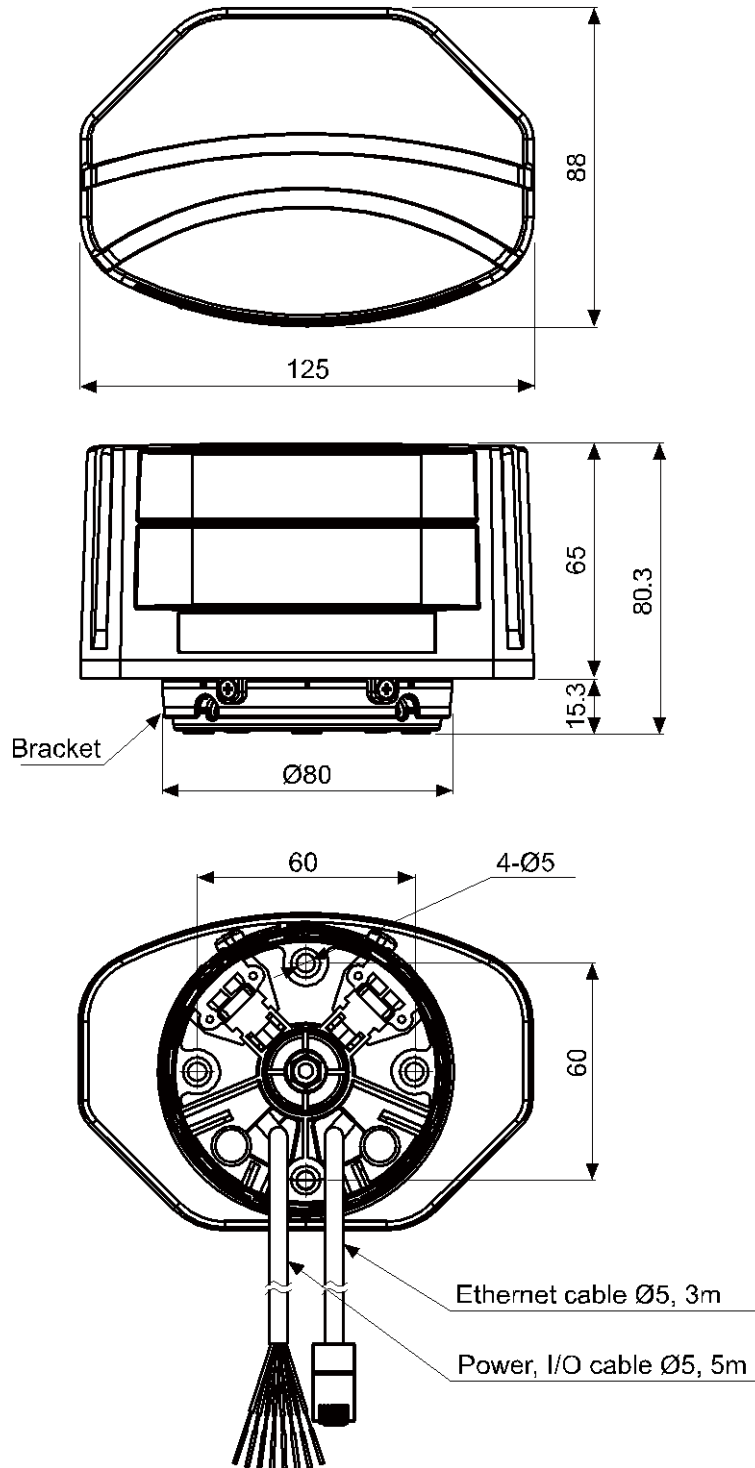
<b>Model</b>		<b>LSE-4A5R2</b>
Vibration		Max. 2G (18.7m/s <sup>2</sup> )
Shock		30G/18ms
Environment	Ambient illumination	Sunlight: max. 100,000lx
	Ambient temperature <sup>※6</sup>	-30 to 60°C
	Ambient humidity	0 to 95%RH, storage: 0 to 95%RH
Material		Polycarbonate
Protection structure		IP67 (IEC standard)
Cable	Power, I/O	Ø5mm, 8-wire, 5m (AWG 26, core diameter: 0.16mm, number of cores: 7, insulator out diameter: Ø1mm)
	Ethernet	Ø5mm, 4-wire, 3m, shielded cable (AWG 26, core diameter: 0.16mm, number of cores: 7, insulator out diameter: Ø1mm)
Component	Accessory	Bracket, M2.6xL6 Tapping screw (for fixing bracket rotation angle): 2, 3mm allen wrench
	PC program	atLidar (laser scanner program)
Korean Railway Standards		KRS SG 0068
Approval		CE, 
Weight <sup>※7</sup>		Approx. 0.96kg (approx. 0.58kg)

- ※1. The monitoring zone may be changed by the sensitivity level setting.
  - ※2. 'Monitoring time' is able to be set with the remote control or atLidar.
  - ※3. Please refer to '6 Installation'.
  - ※4. It represents alignment range of laser scanner and is able to be set within the range from -5° to 5° based on the mark line.
  - ※5. It is used for setting sensor positions, parameters, and monitoring status information.
  - ※6. Ambient temperature in power supplied status is -30 to 60°C and in power cut status is -10 to 60°C.
  - ※7. The weight includes packaging. The weight in parenthesis is for unit only.
- ※ The temperature or humidity mentioned in Environment indicates a non freezing or condensation.

### 3 Dimensions

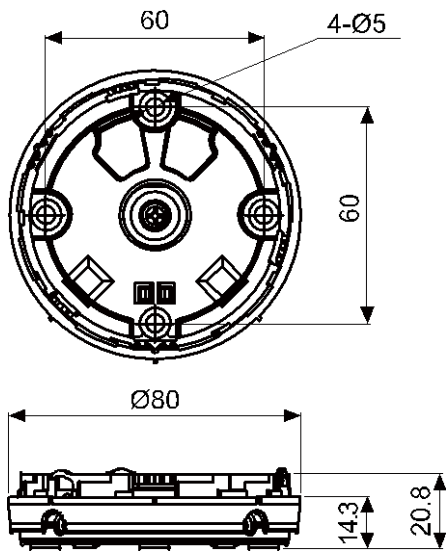
#### 3.1 Main unit

(unit: mm)



### 3.2 Bracket

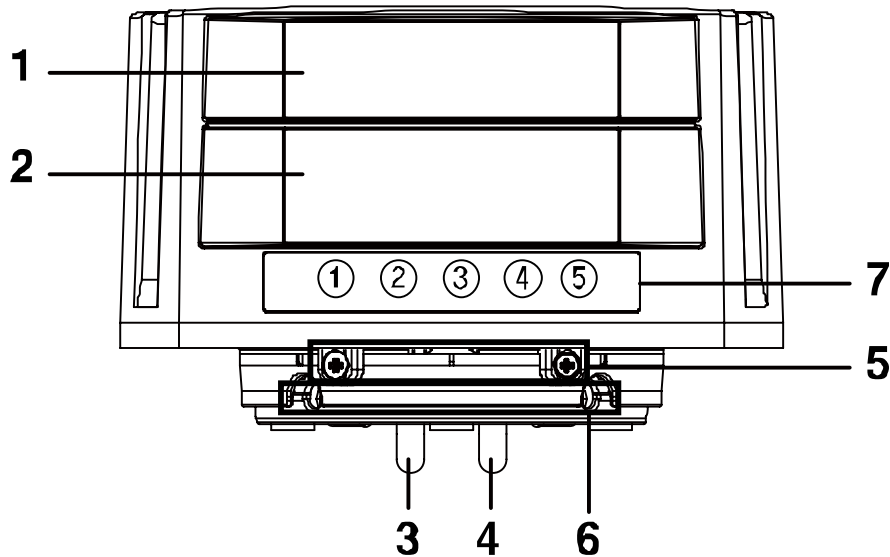
(unit: mm)





## 4 Unit Description and Functions

### 4.1 Laser scanner (LSE-4A5R2)



- (1) Laser emitter**
- (2) Laser receiver**
- (3) Power, I/O cable**
- (4) Ethernet cable**
- (5) Bracket rotation angle fixing part**
- (6) Bracket tilt angle fixing part**
- (7) LED indicators**

- ① Ethernet connection indicator (green)
- ② Power indicator (green)
- ③ Remote control operation indicator (green)
- ④ Operation indicator (red)
- ⑤ Error indicator (orange)

※For more operation, refer to '4.1.3 LED indicator'.

### 4.1.1 Power, I/O cable

Color	Signal	Function
Brown	+V	24VDC
Blue	GND	0VDC
Yellow	OUT1_A	Obstacle detection output
Green	OUT1_B	
Red	OUT2_A	Error status output
Gray	OUT2_B	
Black	IN_A	Output test mode
White	IN_B	



#### Note

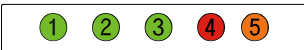
- ※ The input/output signals can operate in both direction regardless of the polarity.
- ※ When the photocoupler input is not used, do not wire both end of input terminal, or supply power under 3VDC.

### 4.1.2 Ethernet cable

The laser scanner communicates with atLidar.

Pin no.	Signal
1	TX+
2	TX-
3	RX+
4	-
5	-
6	RX-
7	-
8	-

### 4.1.3 LED indicator



Name	Color	Function
① Ethernet connection indicator	Green	Flashes when connected with the PC (Ethernet communication status)
② Power indicator	Green	Flashes when power is supplied
③ Remote control operation indicator	Green	Flashes when  key is pressed
④ Operation indicator	Red	Turns on when obstacle is scanned
⑤ Error indicator	Orange	Flashes according to the type of error

#### (1) LED indicator by situation

(☀: ON, ●: OFF, ◐: Flash)

Indicator		①	②	③	④	⑤
Status		①	②	③	④	⑤
Comm. cable connection		◐	-	-	-	-
Scanning waiting sequence	1	-	●	●	●	☀
	2	-	●	●	☀	☀
	3	-	●	☀	☀	☀
	4	-	●	◐ (flashing twice in every 0.5 sec)		
Scanning	-	◐ (every 1 sec)	●	-	●	
Detection	-	◐ (every 1 sec)	●	☀	●	
Remote control input key waiting	Pass word	-	●	◐ (every 0.05 sec)	●	●
	Menu	-	●	◐ (every 0.3 sec)	●	●
	Number	-	●	◐ (every 0.05 sec)	●	●
Teaching	-	◐ (flashing in every 1 sec for 35 sec)	●	◐ (flashing in every 1 sec for 35 sec)	●	
Output test mode	-	◐ (every 0.05 sec)	●	-	●	

※' - ' means nothing to ☀: ON, ●: OFF, ◐: Flash'.

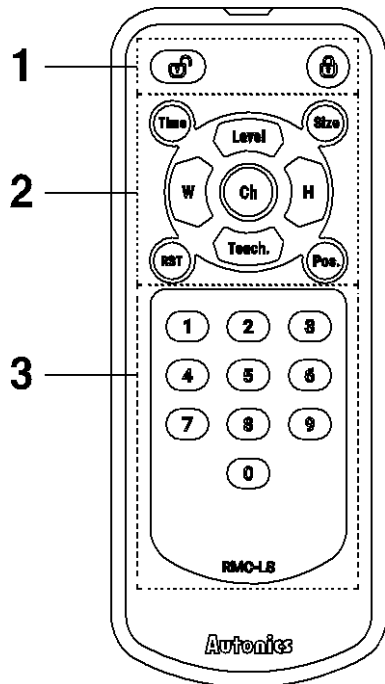
**(2) Error indicator**

(●: OFF, ○: Flashing once)

- ① Voltage error  
: Repeats “○ (0.2 sec) > ○ (0.2 sec) > ○ (0.2 sec) > ○ (1 sec) > ● (2 sec) ” operation.
- ② Temperature error  
: Repeats “○ (0.2 sec) > ○ (1 sec) > ○ (1 sec) > ○ (1 sec) > ● (2 sec) ” operation.
- ③ Internal error  
: Flashing of error indicator besides voltage error and temperature error means occurrence of internal error.

※When error occurs, the power indicator (green) and the remote control operation indicator (green) turn OFF and the operation indicator (red) turns ON.

## 4.2 Remote control (RMC-LS, sold separately)



### (1) LOCK / UN-LOCK

Key	Function	Description
	Unlock	Unlock to press menu key
	Lock	Lock remote control

### (2) Menu key

Key	Function	Description
	Monitoring time	Outputs after monitoring time when an obstacle is scanned
	Scanning target size	Sets size of the scanning target (approx. 5, 10, 15, 20cm)
	Initialization to factory default	Initializes all settings values to their factory default
	Sensor position	Sets installation position of the laser scanner (view and left, right, center)
	Activated channel (s)	Sets channel (Ch1, Ch2, Ch3, Ch4) to activate
	Sensitivity	Adjusts object scanning sensitivity of the laser scanner
	Width of the monitoring zone or concentrated monitoring zone	Sets width of the monitoring zone or concentrated monitoring zone
	Height of the monitoring zone or concentrated monitoring zone	Sets height of the monitoring zone or concentrated monitoring zone
	Teaching	Familiarizes with the space where the laser scanner will scan

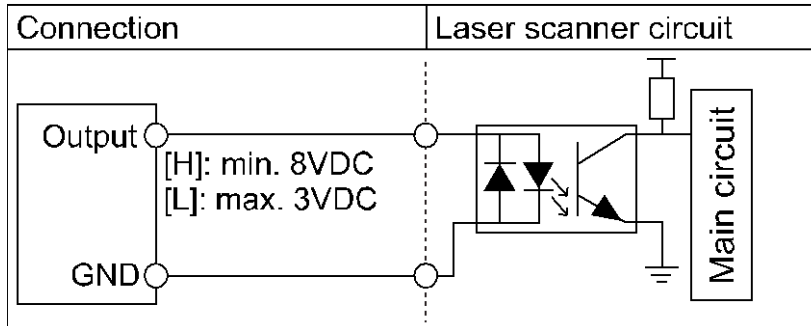
**(3) Number key**

: Setting values can be input to each menu, using 0 to 9 number keys.

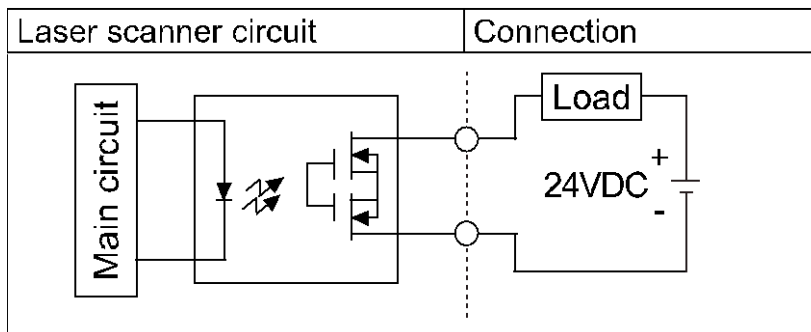
## 5 Control Input/Output

### 5.1 Circuit Diagram

#### 5.1.1 Photocoupler input



#### 5.1.2 PhotoMOS relay output



## 5.2 **Input / Output Status**

Output Input	OUT1 (obstacle detection output)	OUT2 (error status output)
ON	ON	ON
OFF	ON : obstacle detection, teaching, error status, scanning ready (approx. 10 sec. after supplying power)	ON : error status, scanning ready (approx. 10 sec. after supplying power)
	OFF: obstacle non-detection	OFF: Normal status



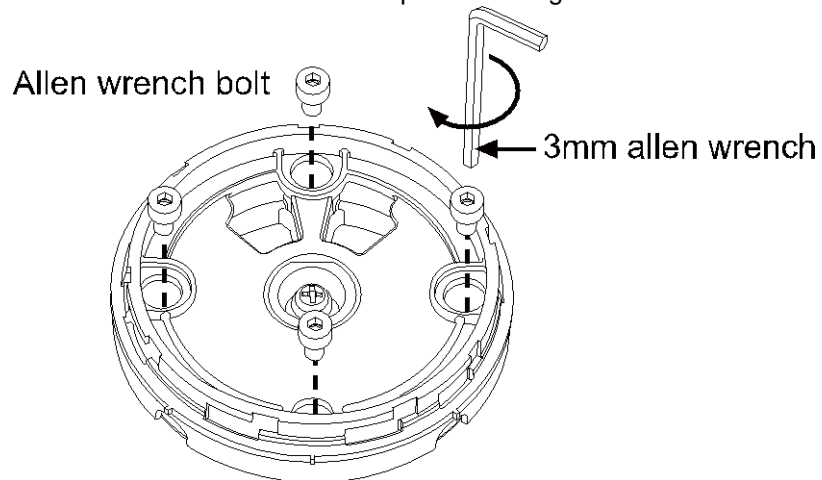
### Note

- ※When input signal is supplied over 8VDC, it is ON. When it is supplied below 3VDC, it is OFF.
- ※When OUT1, OUT2 ON output setting is N.O., it is closed. When it is N.C., it is open.  
When it is Pulse, it is closed.
- ※When power turns OFF, OUT1, OUT2 are closed.
- ※For 1 sec. right after supplying power, OUT1, OUT2 are closed.

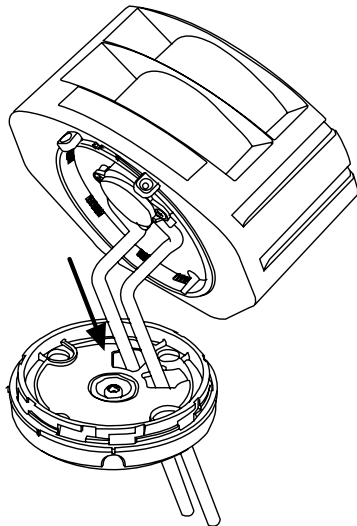


## 6 Installation

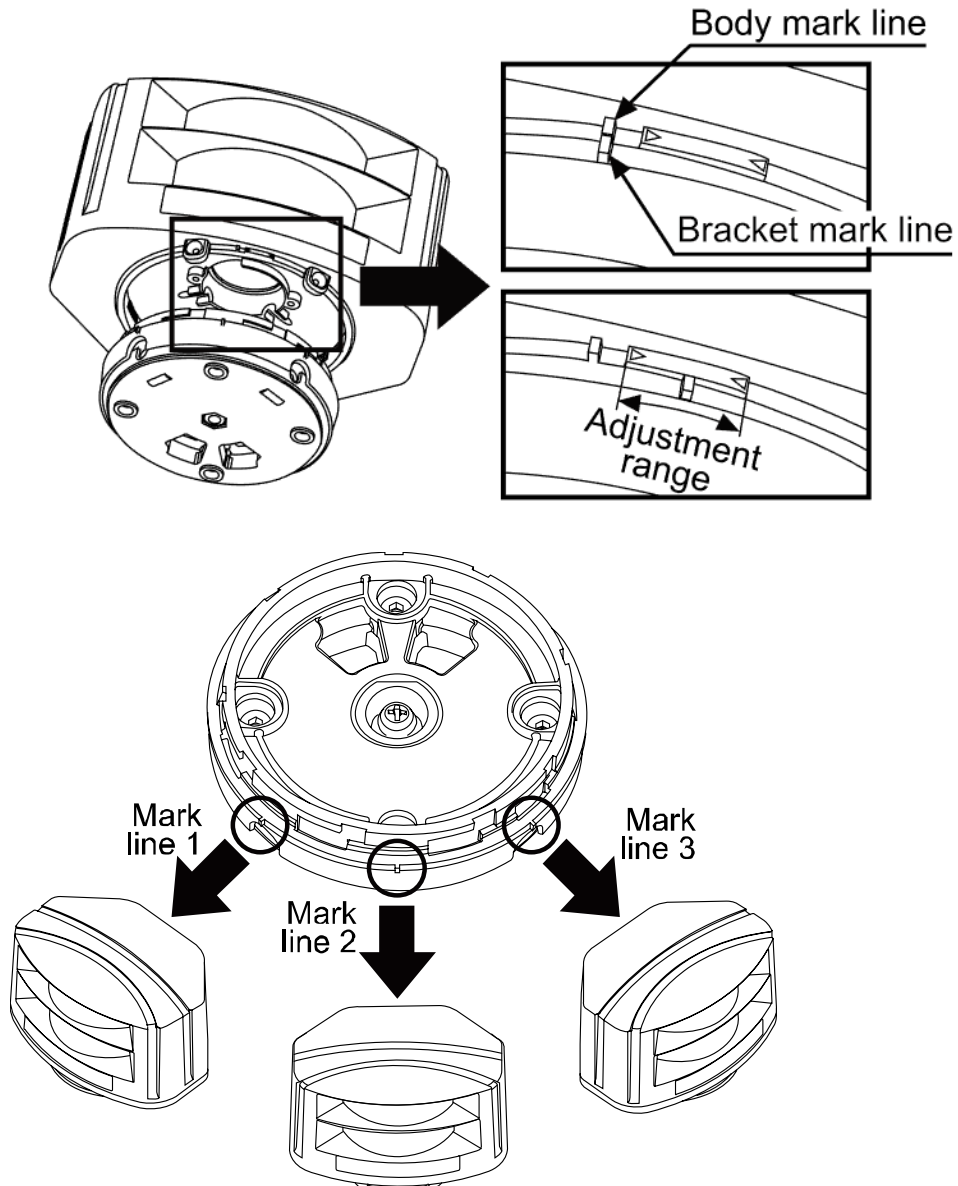
1st Fix the bracket at the installation position using four allen wrench bolts (M4, min. 5mm).



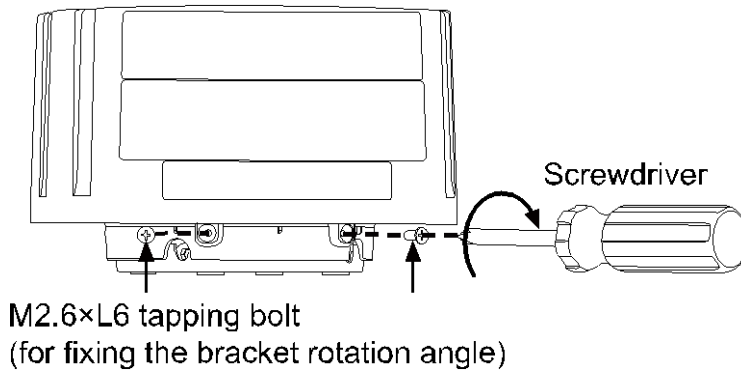
2nd Pass the power, I/O and Ethernet cable through the holes in the bracket.



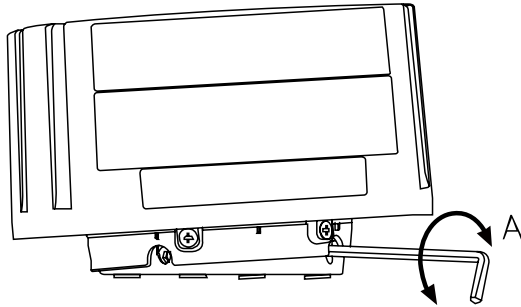
- 3rd Align the mark line of the body and one of the three mark lines of the bracket and turn the bracket clockwise to fix. Turn only within the adjustment range.



- 4th After setting the bracket rotation angle, fix the bracket and laser scanner with the screwdriver.

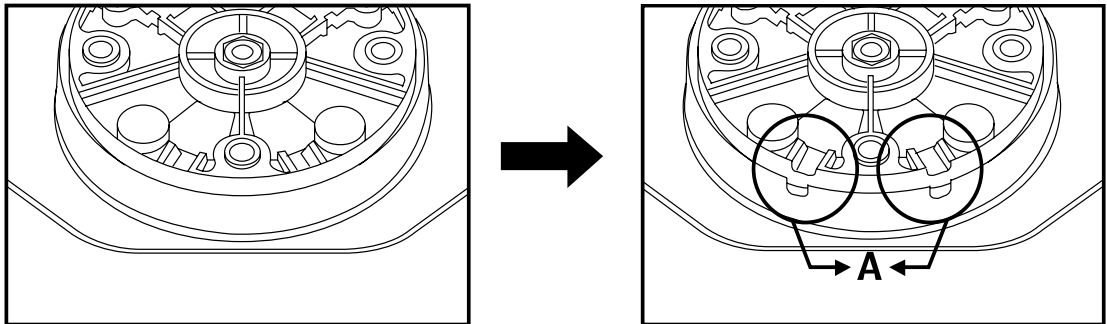


5th The bracket tilt angle ( $-3$  to  $3^{\circ}$ ) can be adjusted according to the situation of the installed location. Following image shows the example of rotating the allen wrench to the A direction.



### Note

Installing onto an external object



When installing the bracket onto the external object, it has possibility of applying excessive force on the cable due to the lack of space between the cable and the object.

If necessary, cut the A part and place the cable to be stable.

※When cutting the A part, be cautious of personal injury.



## 7 Remote control

Laser scanner functions are available to set via the remote control (sold separately) or Laser scanner program (atLidar).

Refer to the below table.

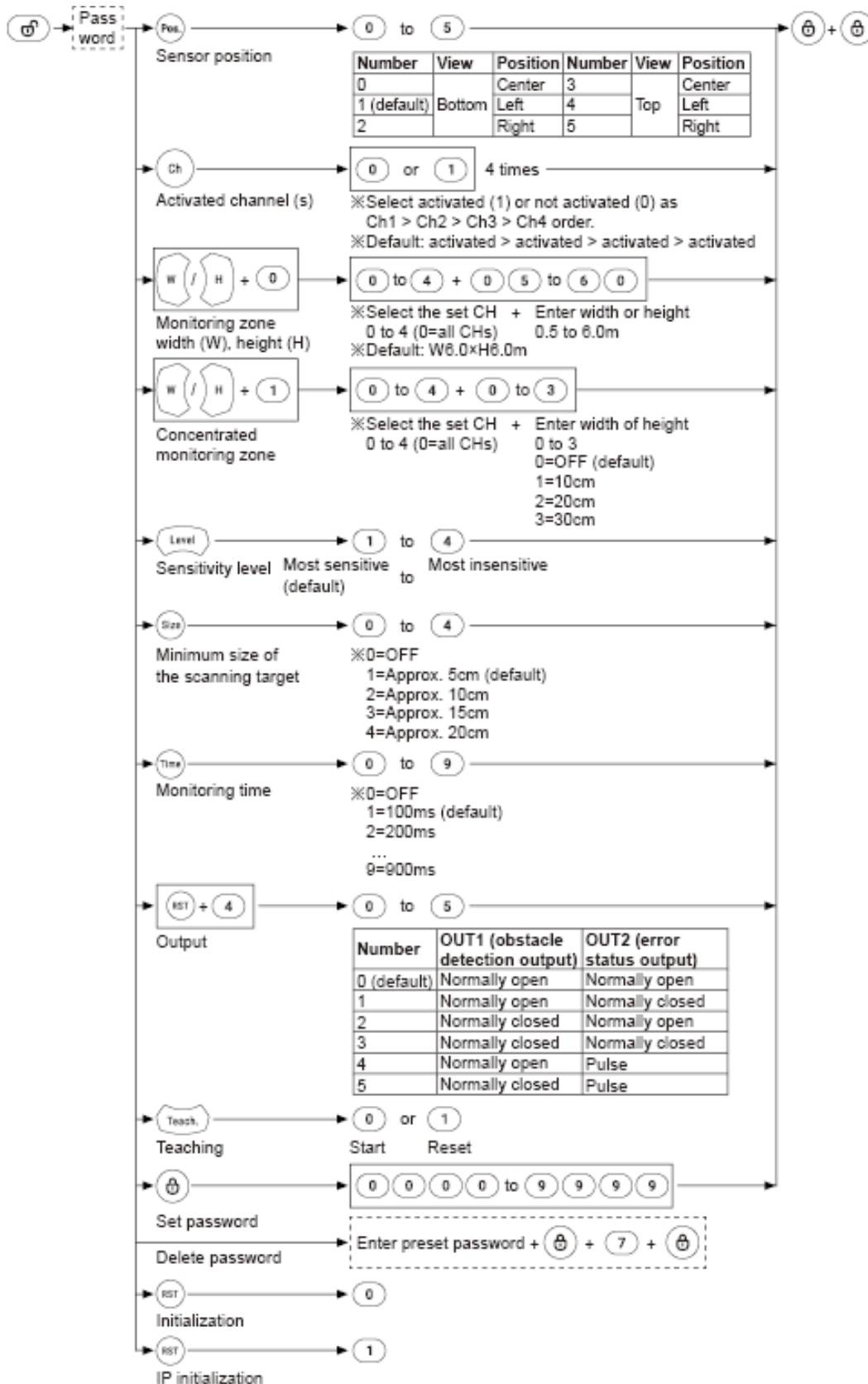


### Note

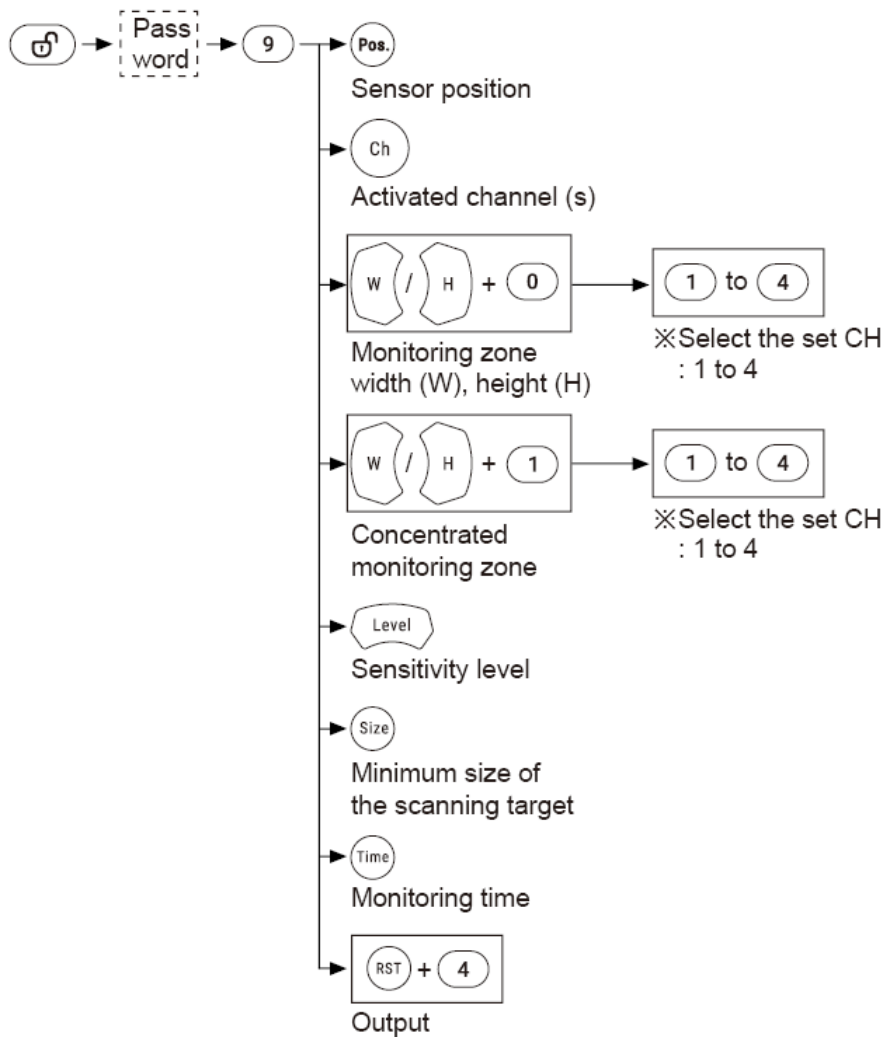
Setting method	Remote control (RMC-LS)	Laser scanner program (atLidar)
<b>Functions</b>		
Sensor position	●	●
Activated channel (s)	●	●
Monitoring zone width (W), height (H)	●	●
Concentrated monitoring zone	●	●
Sensitivity level	●	●
Minimum size of the scanning target	●	●
Monitoring time	●	●
Output	●	●
Teaching	●	●
Password	●	-
Initialization (except password)	●	-
IP initialization	●	-
Setting value initialization (except IP)	-	●

## 7.1 Function Setting and Checking SV via Remote Control

### 7.1.1 Function setting



### 7.1.2 Checking SV



#### Note

After checking setting and press the  key twice to return scanning mode.

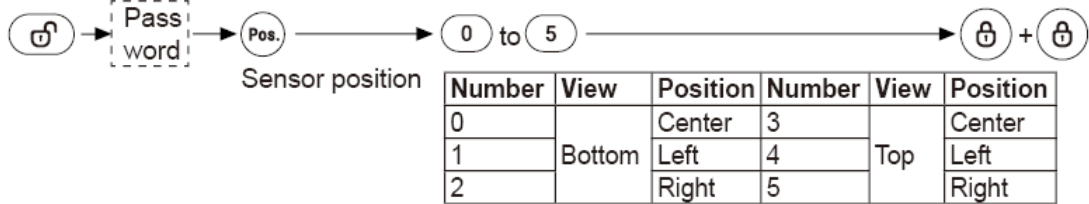
## 7.2 Functions

### 7.2.1 Sensor position

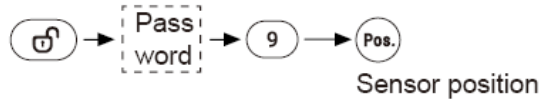
Set the actual installed laser scanner position: view (top or bottom) and installation (left, right, or center).

When a user look at the installed laser scanner and the sensor top, set the top view or the sensor bottom, set the bottom view.

- Factory default: Bottom view, Left installation
- Setting method



- Checking SV method



The remote control operation indicator and the operation indicator flash in the corresponding times of the entered number key.



#### Ex.

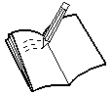
When the sensor position is set as bottom view, right installation, the remote control operation indicator and the operation indicator flash twice.



#### Note

- In case of left or right installation, setting value of monitoring zone width (W) and height (H) must be entered.
- In case of center installation, monitoring zone width (W), height (H) is not changeable.

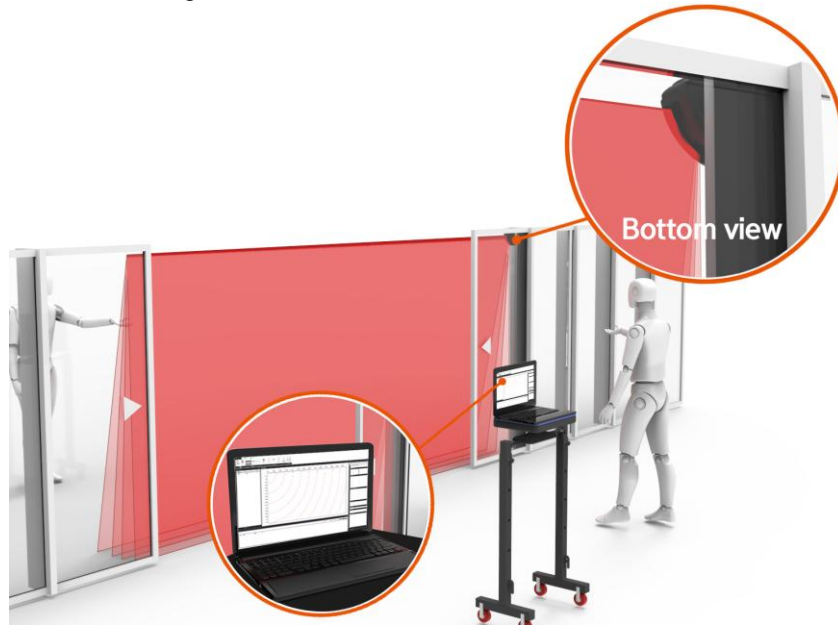




**Ex.**

[Platform screen door (PSD)]

- Bottom view, right installation



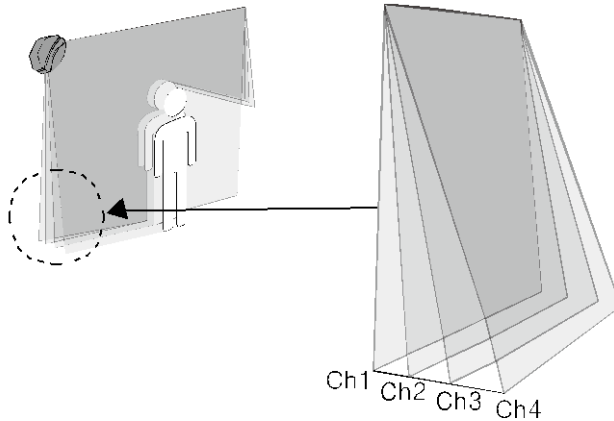
- Top view, left installation



### 7.2.2 Activated channel (s)

The laser scanner has 4 channels (Ch1, Ch2, Ch3, Ch4).

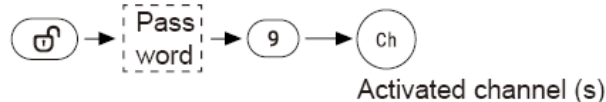
Activate the channel (s) for obstacle detection.



- Factory default: Ch1, Ch2, Ch3, Ch4 activated
- Setting method

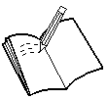


- Checking SV method



The remote control operation indicator and the operation indicator flash (activated) or do not flash (not activated) in the channel order (from Ch1).

Between channels from the previous Ch status to the next channel status, the power indicator, the remote control operation indicator, the operation indicator, and the error indicator flash once.



#### Ex.

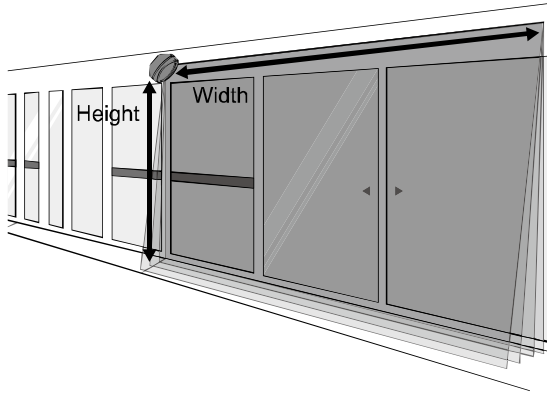
Example of activated Ch1, Ch3 and not activated Ch2, Ch4

- 1st The remote control operation indicator and the operation indicator flash once.
- 2nd The power indicator, the remote control operation indicator, the operation indicator, and the error indicator flash twice.
- 3rd The remote control operation indicator and the operation indicator flash once.
- 4th The power indicator, the remote control operation indicator, the operation indicator, and the error indicator flash once.

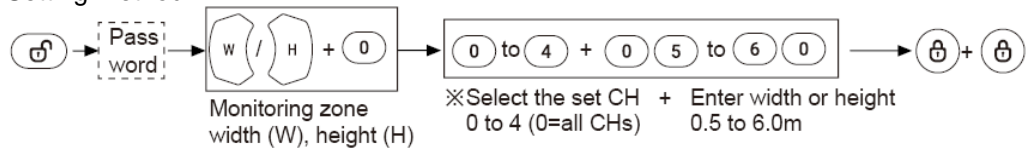
### 7.2.3 Monitoring zone width (W), height (H)

After setting sensor position, monitoring zone is available to set.

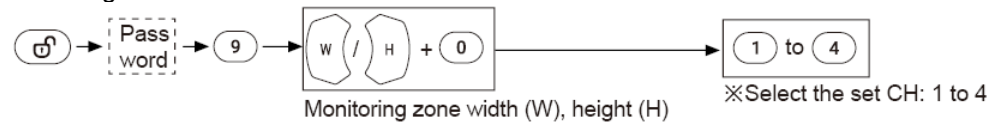
Monitoring zone width and height can be set in increments of 0.1m, within the range from 0.5x0.5m to 6x6m. In case of center installation, setting value of scanning width (W) and height (H) are fixed to 5.6x5.6m.



- Factory default: W6.0 x H6.0m
- Monitoring zone width (W), height (H) setting: 0.5 x 0.5m to 6.0 x 6.0m  
Enter among 05 to 60 range. 05 means 0.5m, 60 means 6.0m.
- Setting method



- Checking SV method



Remote control operation indicator, operation indicator flash in the corresponding times of the set integer and decimal value of width and height.

Before flashing the decimal value after flashing the integer value, the power indicator, the remote control operation indicator, the operation indicator, the error indicator flash once.



#### Ex.

Example of monitoring zone W3.4 x H4.9m and checking the height (4.9m)

- 1st The remote control operation indicator and operation indicator flash 4 times.
- 2nd The power indicator, the remote control operation indicator, the operation indicator, and the error indicator flash once.
- 3rd The remote control operation indicator and operation indicator flash 9 times.

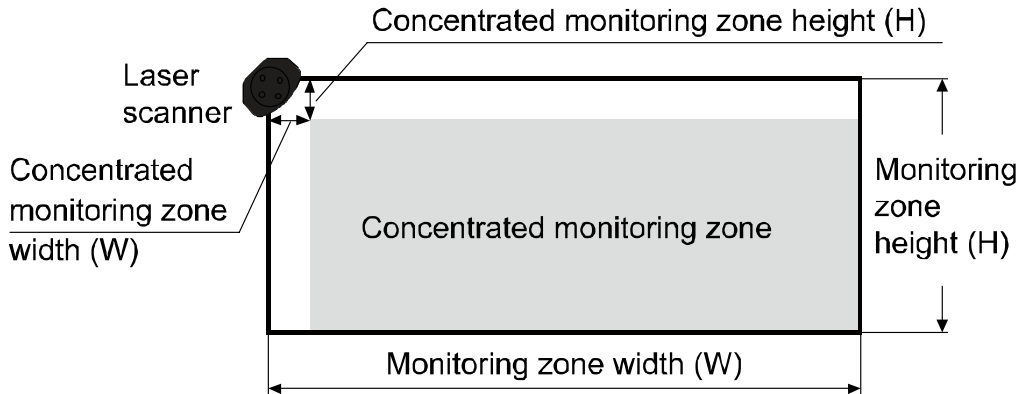


#### Note

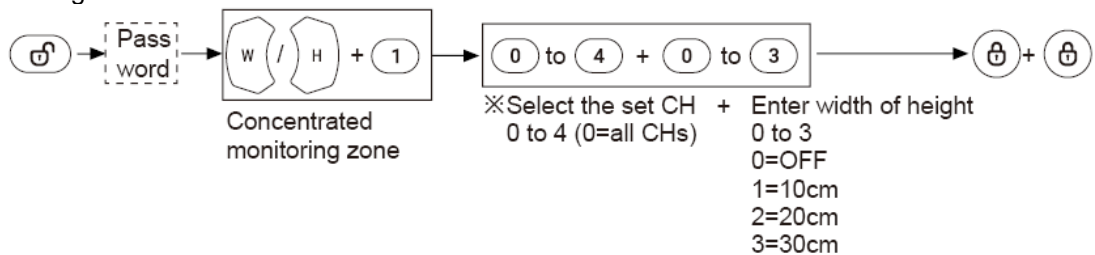
- When the set channel for width (W), height (H) is 0, 0 means all channels.
- Monitoring zone may be different by the reflectivity of obstacles.
- For the stable detection, the monitoring zone is set up to 6m.

### 7.2.4 Concentrated monitoring zone

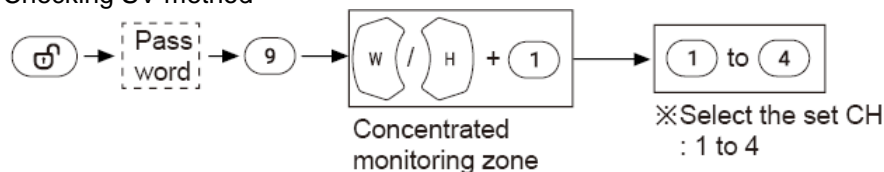
As shown in the below image, it is possible to set the area where obstacles are scanned intensively except for unnecessary area. Height and width are settable from OFF, 10, 20, 30cm individually.



- Factory default: OFF
- Setting method



- Checking SV method



The remote control operation indicator and the operation indicator flash in the corresponding times of the set concentrated monitoring zone (0 to 3).



#### Note

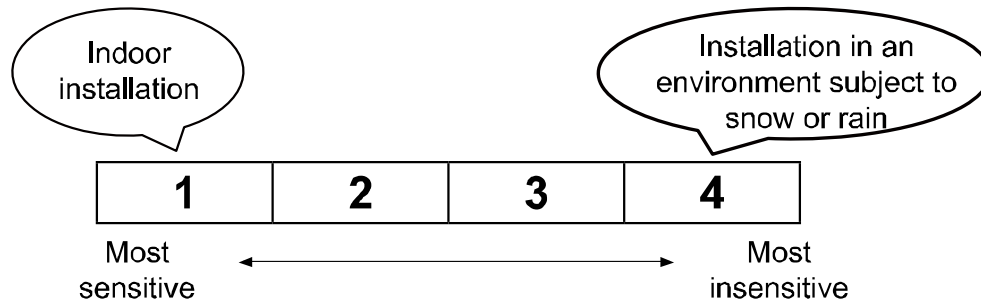
- When the set channel for width (W), height (H) is 0, 0 means all channels.
- In case of left or right sensor install position, the concentrated zone is available to set.

### 7.2.5 Sensitivity level

It is able to set the object scanning sensitivity of the laser scanner.

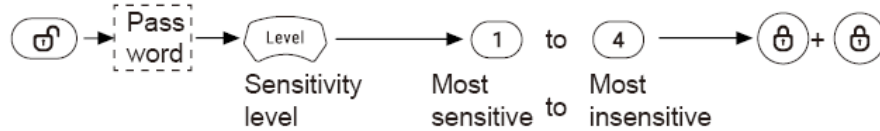
Setting range is from level 1 (most sensitive, indoor installation)

to level 4 (most insensitive, installation in an environment subject to snow or rain).

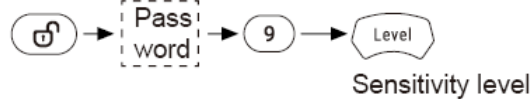


- Factory default: Level 1

- Setting method



- Checking SV method



The remote control operation indicator and the operation indicator flash in the corresponding times of the set sensitivity level (1 to 4).

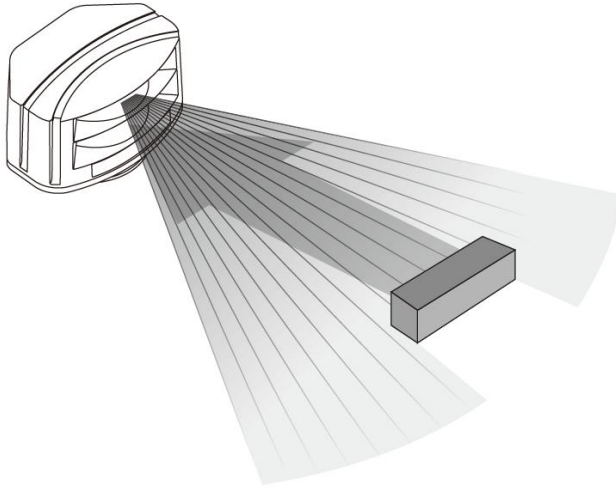
### 7.2.6 Minimum size of the scanning target

The minimum size of the scanning target can be set from OFF, approx. 5, 10, 15, 20cm.

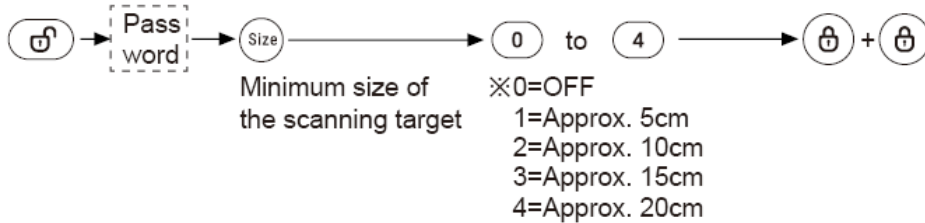
For example, when '5cm' is selected, the object of size over W5×H5×L5cm.

If the minimum size of the scanning target is set to OFF, the size of the scannable object is as follows.

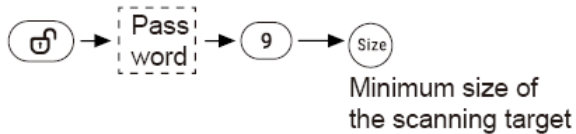
- At detection distance of 3m: approx. W2.1 x H2.1 x L2.1cm
- At detection distance of 5m: approx. W3.5 x H3.5 x L3.5cm



- Factory default: Approx. 5cm
- Setting method



- Checking SV method



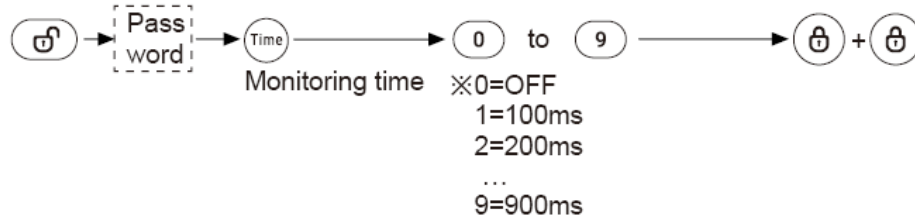
The remote control operation indicator and the operation indicator flash in the corresponding times of the set minimum size of the scanning target (0 to 4).

### 7.2.7 Monitoring time

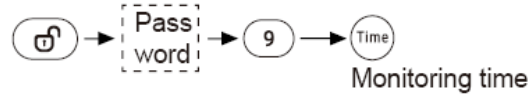
When an obstacle is scanned, obstacle detection output occurs after monitoring time.

By setting monitoring time longer, the laser scanner scans monitoring zone repeatedly and scans obstacles without being affected by snow or rain.

- Factory default: 100ms
- Setting method



- Checking SV method



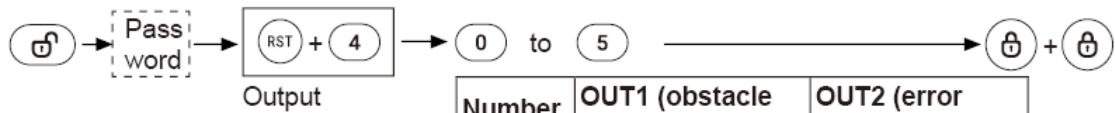
The remote control operation indicator and the operation indicator flash in the corresponding times of the set monitoring time (0 to 9).

### 7.2.8 Output

The type of obstacle detection output is settable to normally open or normally closed.

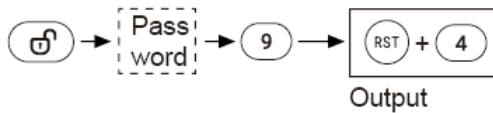
The type of error status output is settable to normally open, normally closed, or pulse.

- Factory default: N.O. / N.O.
- Setting method



Number	OUT1 (obstacle detection output)	OUT2 (error status output)
0	Normally open	Normally open
1	Normally open	Normally closed
2	Normally closed	Normally open
3	Normally closed	Normally closed
4	Normally open	Pulse
5	Normally closed	Pulse

- Checking SV method



The remote control operation indicator and the operation indicator flash in the corresponding times of the set output (0 to 5).



#### Note

In case of OUT2 (error status output) as pulse, it repeats open-close operation for 1 sec at the normal operation and it closes at error status.



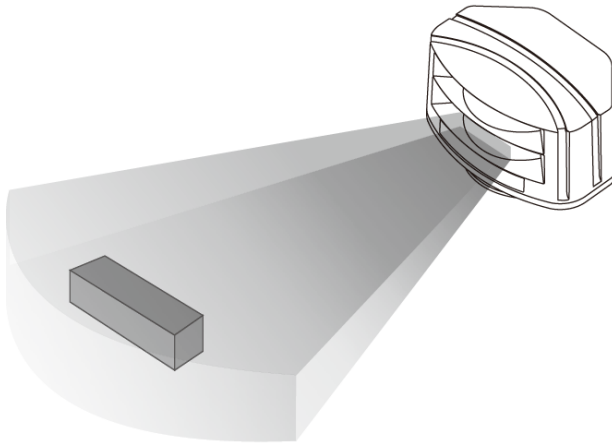
### 7.2.9 Teaching

This function is to familiarize the space which is set by the monitoring zone width (W) and height (H) in advance.

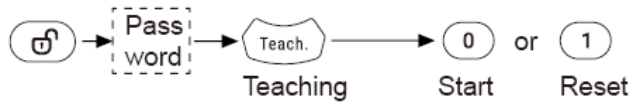
Objects in the space at moment of teaching are not regarded as obstacles.

When the environment is changed or some objects are removed or added in the space, newly operate teaching.

Teaching takes 35 seconds.




- Setting method



#### Note

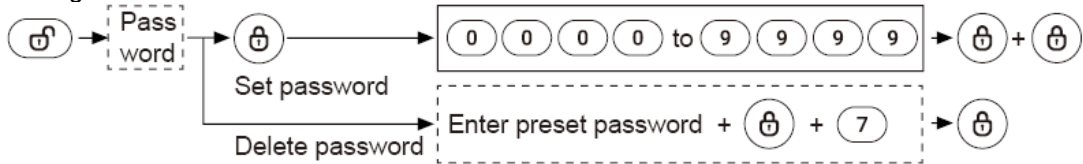
- For re-install the unit teaching already at no teaching required area, initial the unit. Do not re-teaching it.
- Operate teaching in the environment free from snow, rain, fog, hail, or mutual interference of another laser scanner.

### 7.2.10 Password


When entering the  key of the remote control, only the user who entered the right password changes the parameter settings of sensor position, monitoring zone width (W), height (H), etc.

When setting password, the password function is activated.

- Password setting range: 0000 to 9999
- Setting method



#### Note

- When losing the set password, re-supply the power and set the password again in 10 minutes.
- Please use the password function for preventing mutual interference of several units or malfunction.
- If any key is not entered for 1 sec after entering the  key, the laser scanner is scanning mode.
- For function settings,

1) **Password is set,**



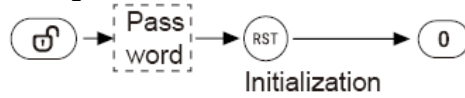
2) **Password is not set,**



### 7.2.11 Factory default initialization

The laser scanner's settings: sensor position, monitoring zone width (W), height (H), activated channel (s), etc. and IP, except password initializes as factory default.

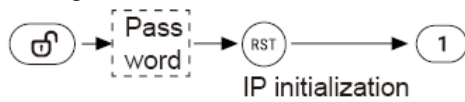
- Setting method



### 7.2.12 IP initialization

The laser scanner's IP address initializes as factory default.

- Setting method





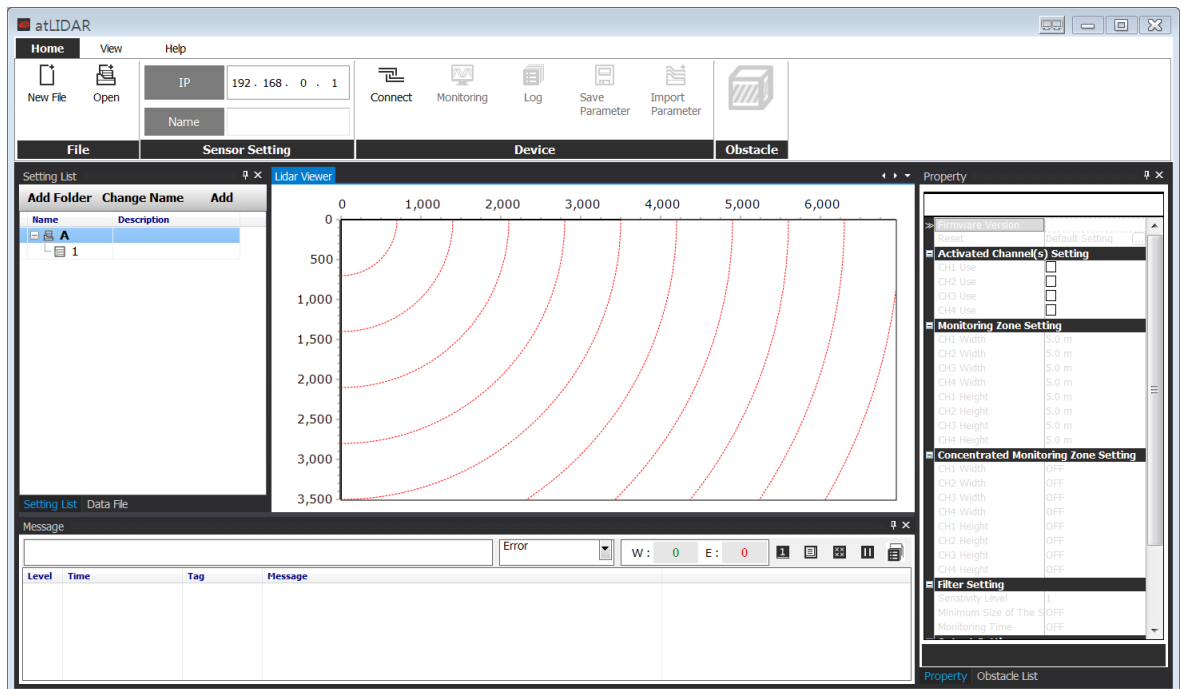
## 8 Laser Scanner Program [atLidar]

### 8.1 Overview

atLidar is laser scanner management program that can be used with laser scanner LSE-4A5R2.

atLidar is the management program for laser scanner installation, parameter settings, status information and monitoring data, etc.

This program communicates with the laser scanner via Ethernet communication.



## 8.2 **Features**

There are atLidar features.

### **(1) Convenient User Interface**

Freely arrange windows for data monitoring, properties, and projects.

### **(2) Parameter Management**

The set parameter values of the laser scanner are available to save.

The saved parameter values are also available to load.

Setting List consists for managing several laser scanners' IP.

### **(3) Monitoring Data Log**

When monitoring, data log files can be saved in atLidar data files (\*.ltd).

Define log data file naming/saving rules and destination folders to make file management convenient.

### **(4) Data Analysis**

Data files (\*.ltd) open at Data File of atLidar for graph printing and analysis. Data screen is saved as image files (\*.bmp, \*.wmf) at Lidar Viewer.

### **(5) Multilingual Support**

Supports Korean, English. To add a different language, modify the files in the Lang folder rename, and save.

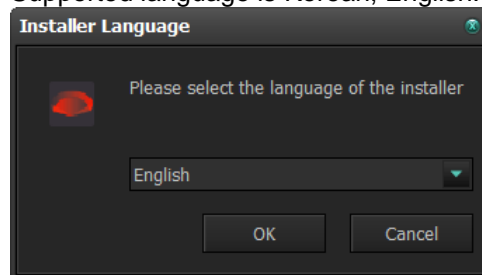
## 8.3 Installing the Program

### 8.3.1 System Requirements

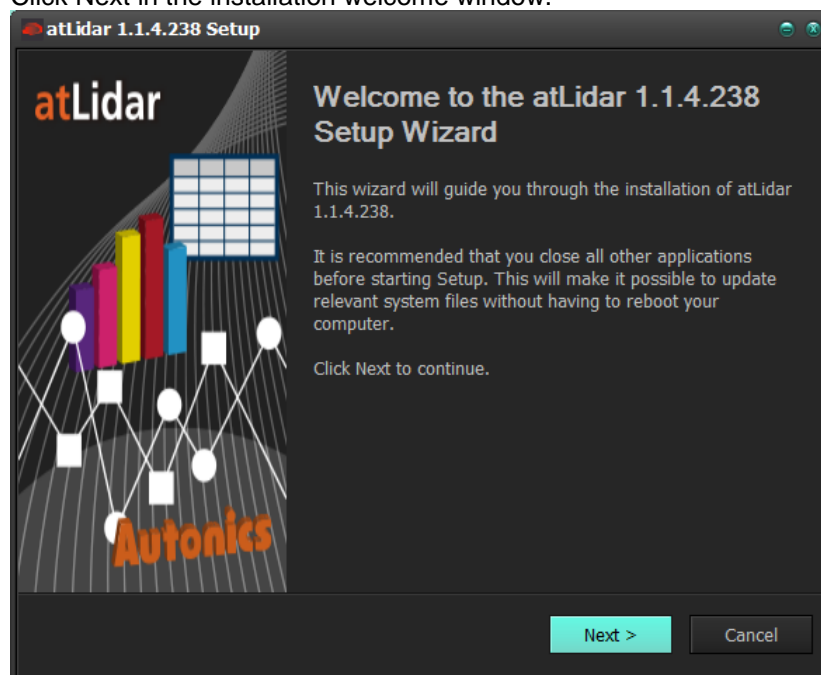
Item	Minimum specifications
System	32bit (x86) or 64bit (x64) processor over 1GHz
Operations	Microsoft Windows 7/8/10
Memory	4GB+
Hard disk	1GB+ of available hard disk space
VGA	Resolution: 1024x768 or higher

### 8.3.2 Preparations

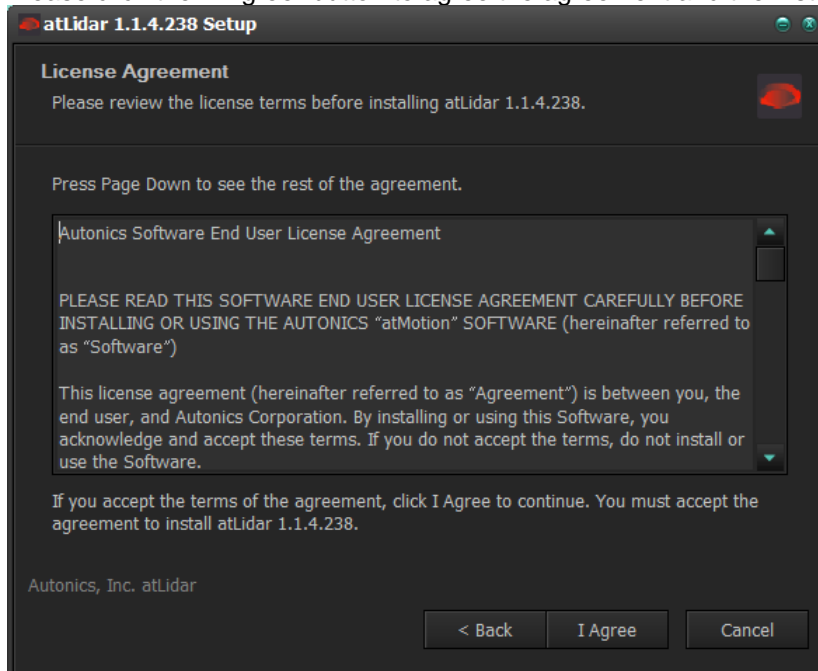
- 1st Download atLidar program at Autonics' web page ([www.autonics.com](http://www.autonics.com)).
- 2nd Close all programs before you start atLidar installation.  
Double-click atLidar setup.exe to start installation.
- 3rd Installer Language window appears. Select the language and click OK button.  
Supported language is Korean, English.



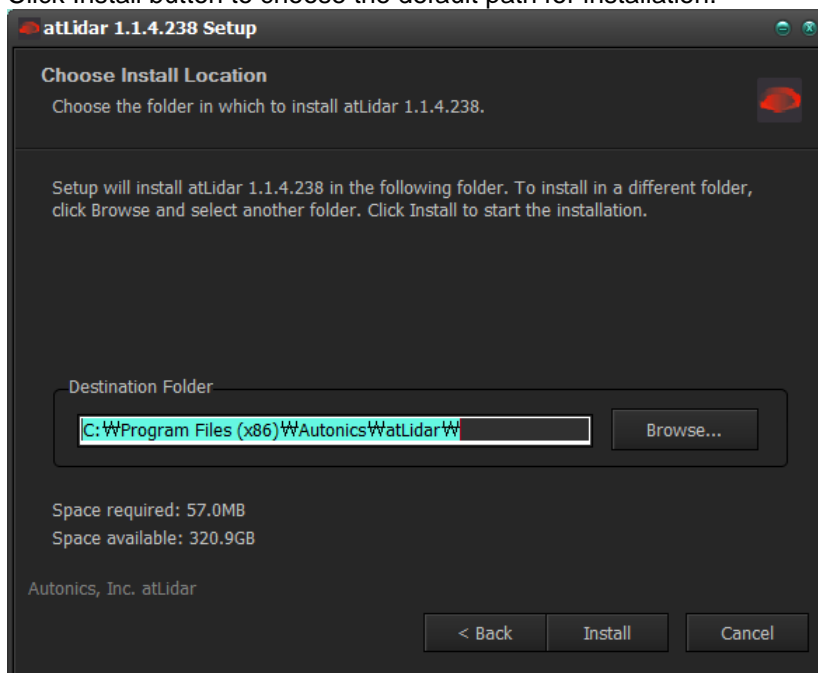
- 4th Click Next in the installation welcome window.



- 5th License Agreement process. Please read the whole license agreement by scaling mouse, clicking down arrow, or pressing the Page Down (PgDn) key.  
Please click the "I Agree" button to agree the agreement and the installation is continued.

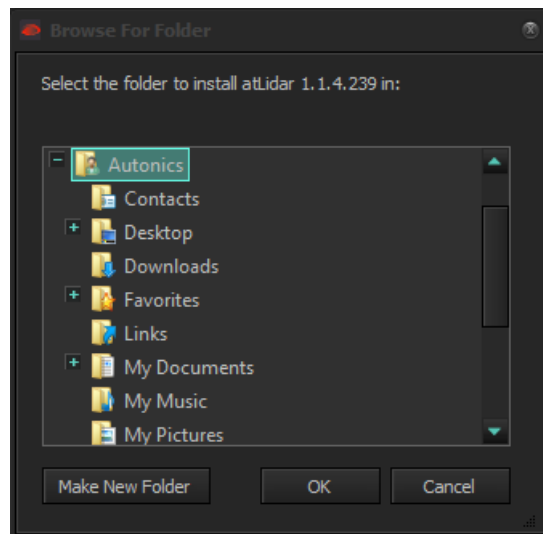


- 6th Choose Install Location window appears. Default installation path is as below.  
32bit operation system: C:\Program Files\ Autonics\ atLidar  
64bit operation system: C:\Program Files (x86)\Autonics\ atLidar  
Click Install button to choose the default path for installation.

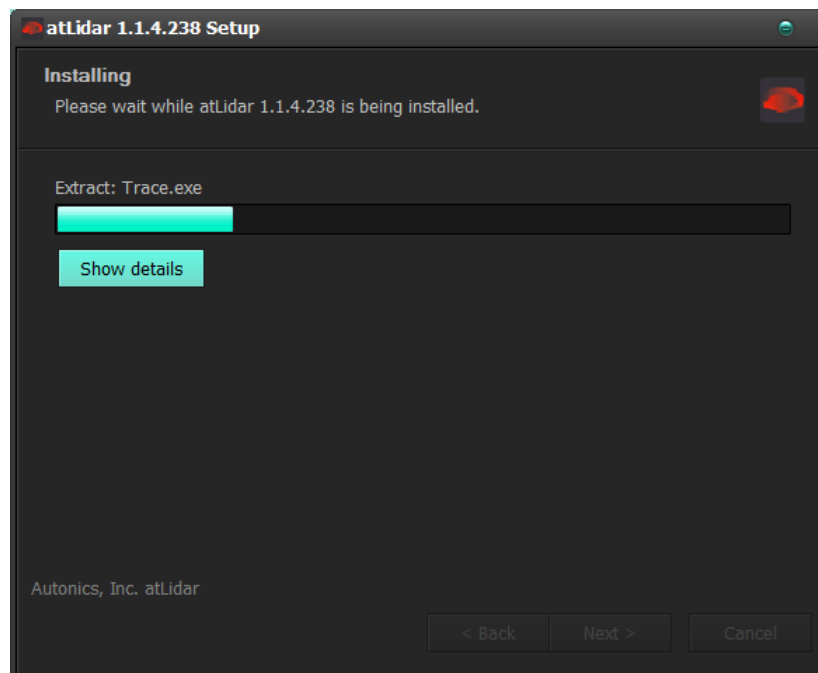




- 7th Click Browse button to change the installation path. In the Browse Folder window, select the desired destination folder and then click OK to start installation.



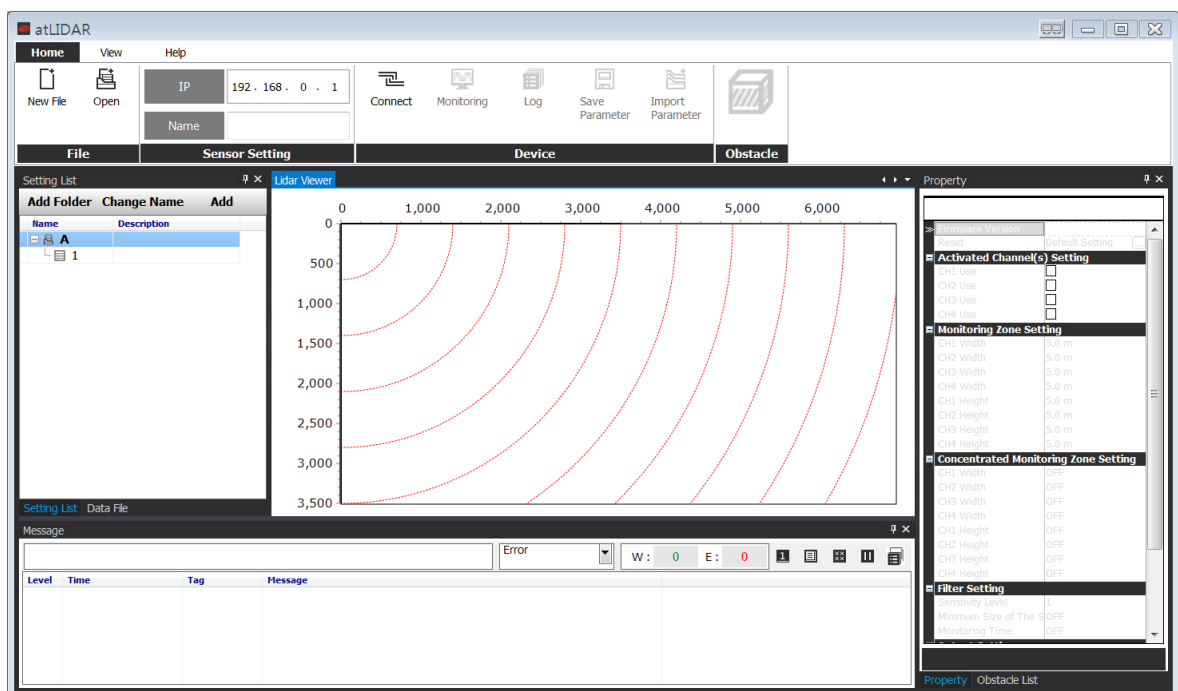
- 8th Installation progress is displayed in the status window as follows.



- 9th Installation Complete window appears after installation is completed.  
If the check box in the Installation Complete window is checked, atLidar runs upon completion of installation. You can now run atLidar by double-clicking the atLidar icon on the desktop.



When running the program for the first time, the initial screen displays the following.

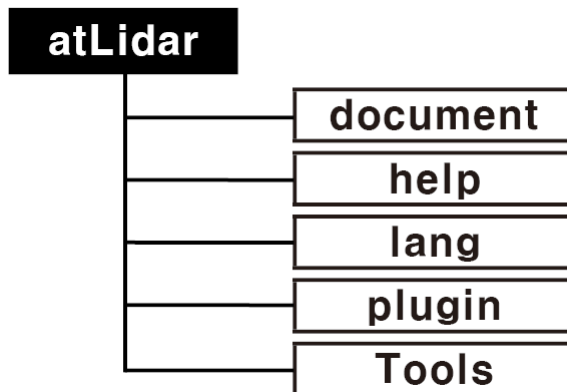


### 8.3.3 Installation Folder Structure

This section explains the folder structure created when you installed atLidar.

After atLidar installs completely, folders are created as below. The program and all relevant documents are stored in these folders.

If you select the default installation path during installation, the atLidar folder is created under [C:\Program Files] as a subfolder. If you select a new destination folder, atLidar folder is located in that folder.



#### (1) lang folder

The language information files (\*.lang) available in this program are contained here. The program reads all files in the folder and automatically adds them to the program when it runs. The language information files are written in a text file format, so you can modify and add text using XML Notepad. Korean, English, language files are in this folder by default.

#### (2) plugin folder

This folder contains library files (\*.dll) for TCP/IP communications.

#### (3) Tools folder

This folder contains base core library files (\*.dll) of atLidar program.

### 8.3.4 Uninstalling the Program

There are procedures to uninstall atLidar.

Select "Start > Program > atLidar > Uninstall" or select "Start > Setting > Control Panel > Add/Remove a Program > atLidar".

If you select Remove, a confirmation window will appear. Click Yes to remove atLidar from the computer.

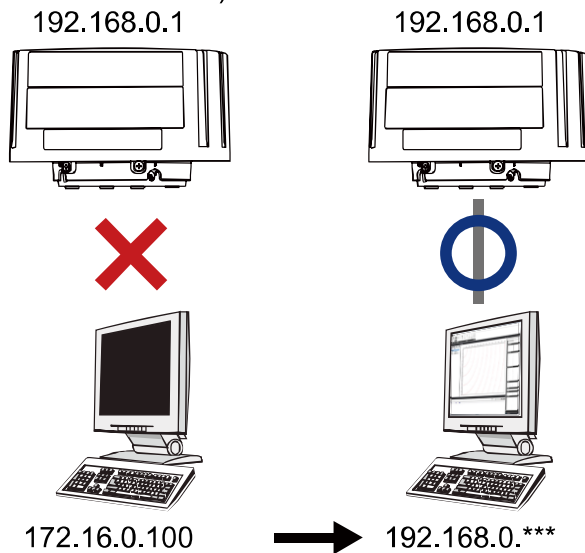
### 8.3.5 Network settings

#### (1) PC network

IP address of laser scanner is set as "192.168.0.1".

For connecting laser scanner and PC (atLidar), change the network setting of PC.

(Laser scanner IP)



1st For PC network setting, enter the "Start > Control Panel > Network and Internet" and click the "Local Area Connection > Properties".

2nd Double-click "Internet Protocol Version 4 (TCP/IPv4) > Properties" at "Local Area Connection > Properties".

3rd Click the [Advanced] button.

4th Click the [Add] button of IP Address and add the laser scanner IP address.

※For adding IP address, refer to the below table.

IP address	192.168.0.*** (***: 3 to 254)
Subnet mask	255.255.255.0

## 8.4 Start and Exit

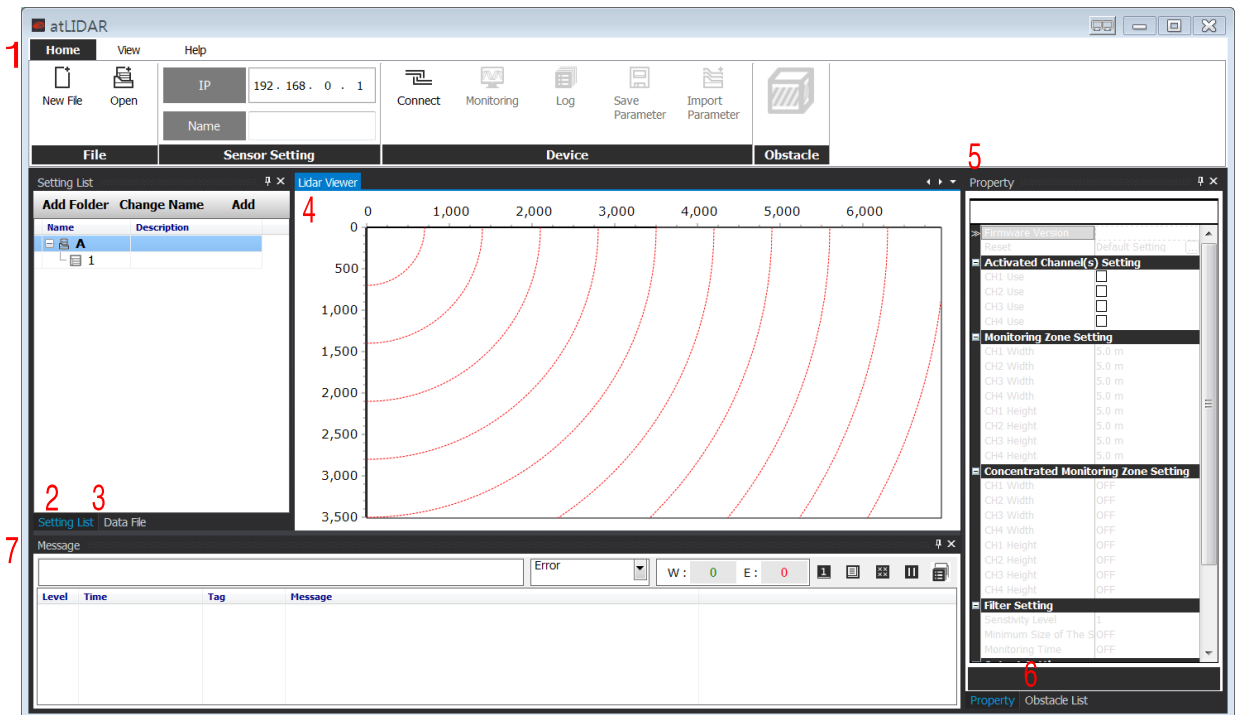
### 8.4.1 Start

Double-click atLidar on the desktop or select Start > Programs > atLidar to start atLidar.

### 8.4.2 Exit

Click X button on the top right corner of the screen to end the program.

## 8.5 atLidar Screen Layout

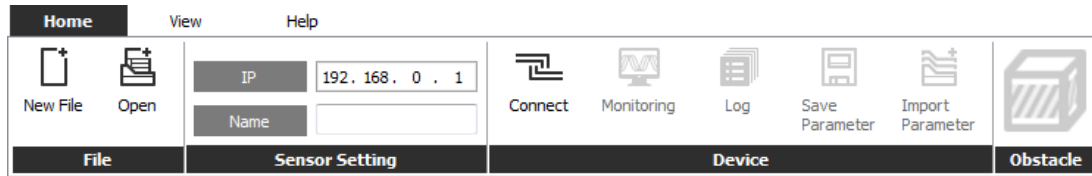


The program screen is divided into sections as shown in the preceding screenshot and each section is composed of the following items.

No.	Item	Description
1	Menu	Displays atLidar menus by category. If you select a menu, submenus appear.
2	Setting List	Set laser scanner IP, name, descriptions.
3	Data File	Displays logged data files.
4	Lidar Viewer	Displays the graph of real-time scan data and teaching data of the laser scanner.
5	Property	Set parameters of the connected unit for setting list, lidar viewer, message windows.
6	Obstacle List	Displays obstacle detection list.
7	Message	Records events. It displays communication connection and disconnection, errors.

## 8.5.1 Menu

### (1) Home



- 1) **File**
  - New File: Reset the open data file.
  - Open: Loads the saved data file.
- 2) **Sensor Setting**  
Loads the sensor information (IP address, name) by double-click the registered sensor at Setting List or enter the IP address directly.
- 3) **Device**

Connect/Disconnect



: Click the [Connect] and connect atLidar and the laser scanner which IP address are same at entered "Sensor Setting > IP".

In case of normal connection, the [Connect] button changes to [Disconnect] button.

Click [Disconnect] button to disconnect atLidar and laser scanner.

- Monitoring: Displays scan graph.
- Log



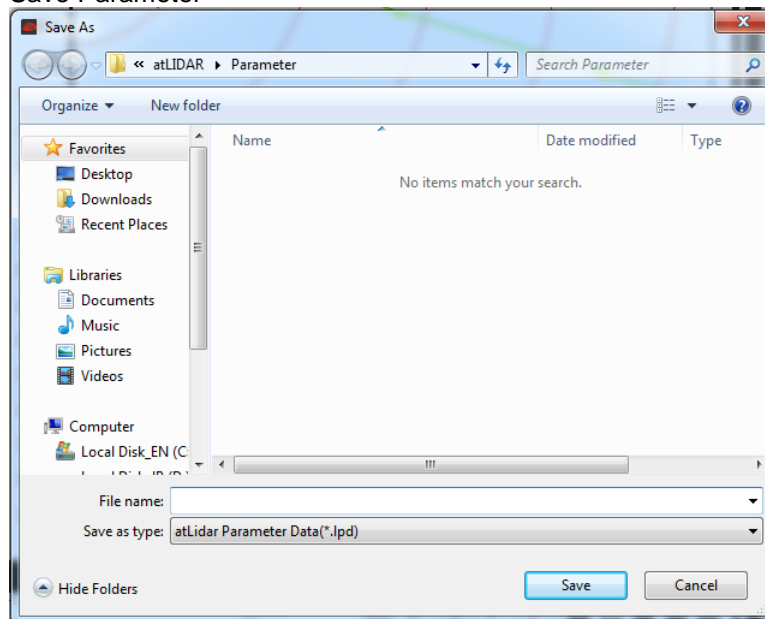
: At monitoring status, [Log] button is activated.



: Click the [Log] button and scan data is saved at the data file of atLidar.

During logging the data, you can check the 'Log Start Time' and 'Elapsed Time'.

- Save Parameter



: Saves the set parameter values of Property as file.

- Import Parameter

: Click the [Import Parameter] button to import the desired saved parameter.  
The below dialog box appears.



Click the [OK] button to import the parameter values for the laser scanner.

4) **Obstacle**

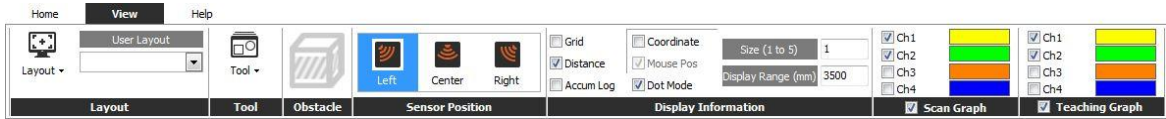
When connecting laser scanner, displays obstacle detection status in real-time.



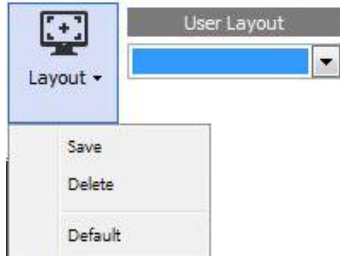
[obstacle is not detected]

[obstacle is detect]

**(2) View**

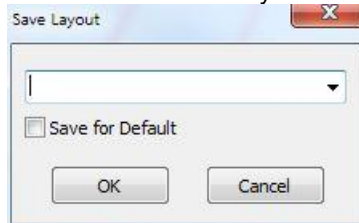


1) **Layout**

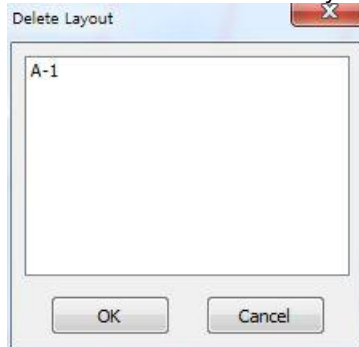


: Executes saving, deleting, loading layout.  
 You can select the saved layout at User Layout.

- **Save**  
 : Saves the current layout and adds it at User Layout.

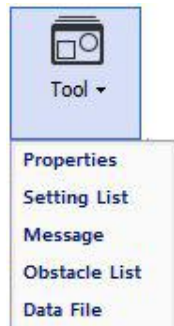


- **Delete:** Select the saved layout and delete it.



- **Default:** Changes docking screen layout to default layout.

2) **Tool**



: Opens Properties, Setting List, Message, Obstacle List, Data File windows.

3) **Obstacle**

Refer to 8.5.1 Menu > (1) Home> 4)Obstacle'.



4) **Sensor position**

: Set the actual installed laser scanner position: view (top or bottom) and installation (left, right, or center).

When a user look at the installed laser scanner and the sensor top, set the top view or the sensor bottom, set the bottom view.

5) **Display Information**

- Grid: Displays grid at Lidar Viewer.
- Distance: Displays the distance as dot line.
- Accum Log: Displays the detection accumulated data.
- Coordinate
  - : The coordinate is changeable by clicking the mouse. Displays the distance and angle of the position coordinates (X-axis, Y-axis) of the mouse cursor and the center of sensor.
- Mouse Position
  - : It is also activated when “Coordinate” is checked. Displays the desired point information (coordinate, distance and angle) when the mouse cursor is placed at Lidar Viewer.
- Dot Mode
  - : Displays the scan graph as dots. Uncheck this, it displays the scan graph as lines.
- Size (1 to 5): Set the dot size of scan graph.
- Display range (mm): Set distance display range at Lidar Viewer.

6) **Scan graph**

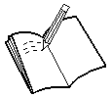
Set the displayed graph channels and channels' color at Lidar Viewer.

7) **Teaching graph**

Set the displayed teaching graph channels and channels' color at Lidar Viewer.

**Note**

You can change the color for each channel for scan graph, teaching graph by double-clicking the color.

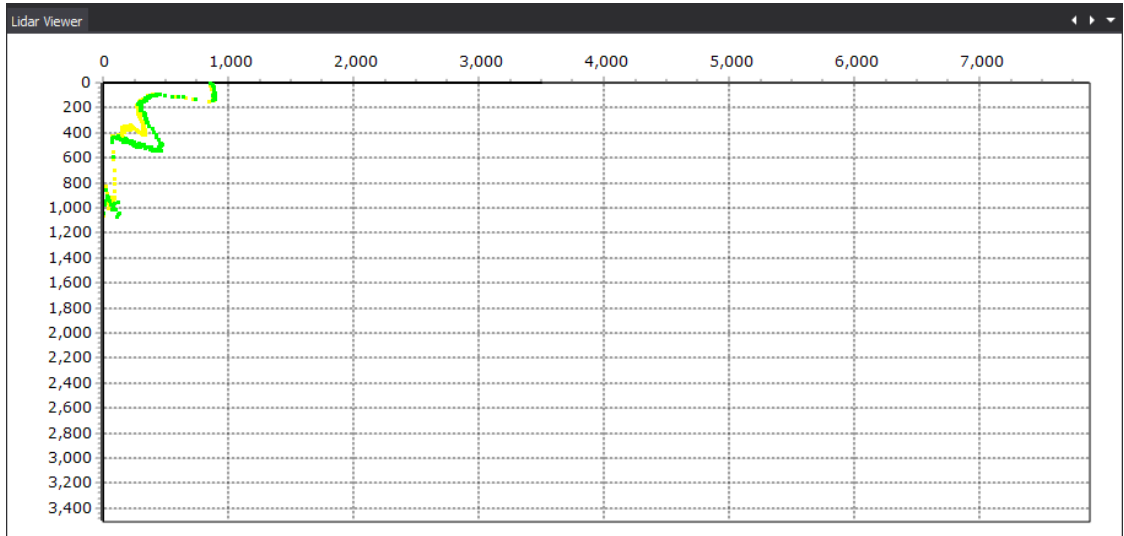


**Ex.**

[Scan graph]

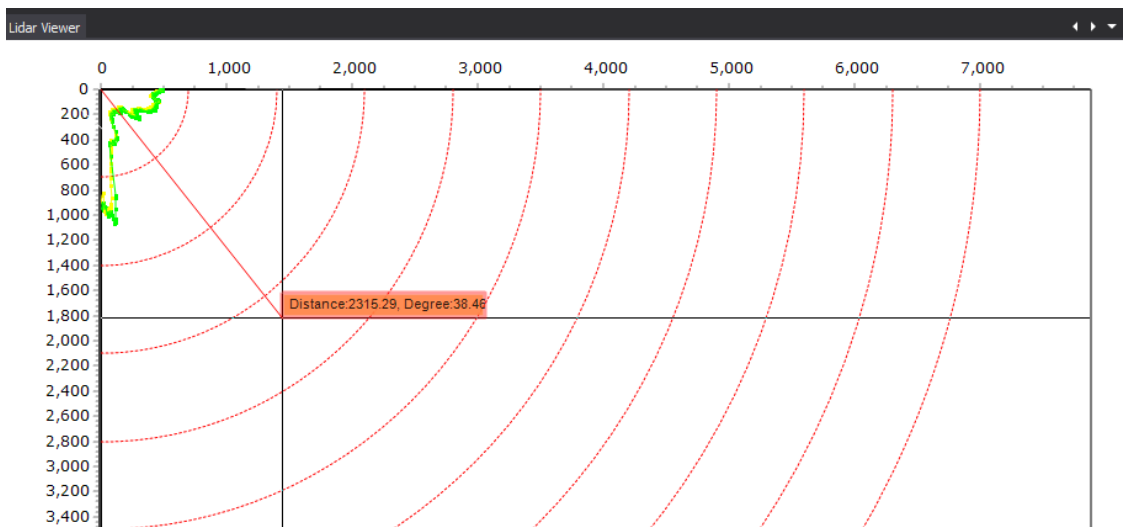
- Scan graph of Ch1, Ch2 with checking Grid and Dot mode

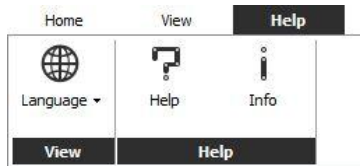
<input checked="" type="checkbox"/> Grid	<input type="checkbox"/> Coordinate	Size (1 to 5) <input type="text" value="1"/>	<input checked="" type="checkbox"/> Ch1		<input type="checkbox"/> Ch1	
<input type="checkbox"/> Distance	<input checked="" type="checkbox"/> Mouse Pos	Display Range (mm) <input type="text" value="3500"/>	<input checked="" type="checkbox"/> Ch2		<input type="checkbox"/> Ch2	
<input type="checkbox"/> Accum Log	<input checked="" type="checkbox"/> Dot Mode		<input type="checkbox"/> Ch3		<input type="checkbox"/> Ch3	
			<input type="checkbox"/> Ch4		<input type="checkbox"/> Ch4	
<b>Display Information</b>			<input checked="" type="checkbox"/> Scan Graph		<input type="checkbox"/> Teaching Graph	



- Scan graph of Ch1, Ch2 with checking Distance, Coordinate and unchecked Dot mode (as Line mode)

<input type="checkbox"/> Grid	<input checked="" type="checkbox"/> Coordinate	Size (1 to 5) <input type="text" value="1"/>	<input checked="" type="checkbox"/> Ch1		<input type="checkbox"/> Ch1	
<input checked="" type="checkbox"/> Distance	<input checked="" type="checkbox"/> Mouse Pos	Display Range (mm) <input type="text" value="3500"/>	<input checked="" type="checkbox"/> Ch2		<input type="checkbox"/> Ch2	
<input type="checkbox"/> Accum Log	<input type="checkbox"/> Dot Mode		<input type="checkbox"/> Ch3		<input type="checkbox"/> Ch3	
			<input type="checkbox"/> Ch4		<input type="checkbox"/> Ch4	
<b>Display Information</b>			<input checked="" type="checkbox"/> Scan Graph		<input type="checkbox"/> Teaching Graph	

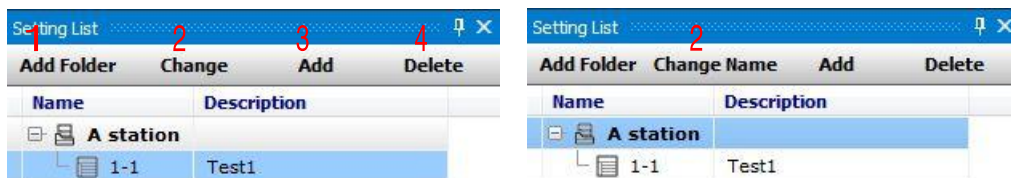


**(3) Help****1) Language**

: Changes atLidar language. Korean, English are supported.

**2) Help**

- Help: Opens the help file for atLidar.
- Info: Checks the atLidar version.

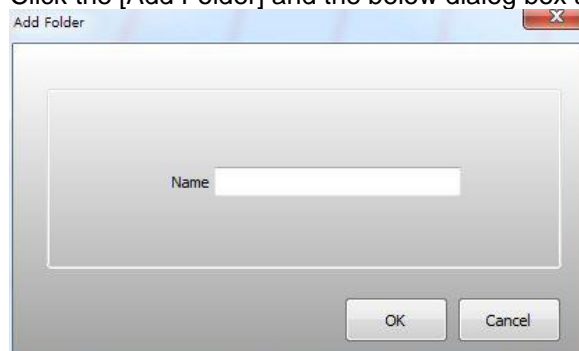
**8.5.2 Setting List**

At disconnected status, you can add the folder and set sensor information (IP address, name, descriptions).

You can change, add, or delete the sensor information. Double-click the desired sensor to read the information.

**(1) Add Folder**

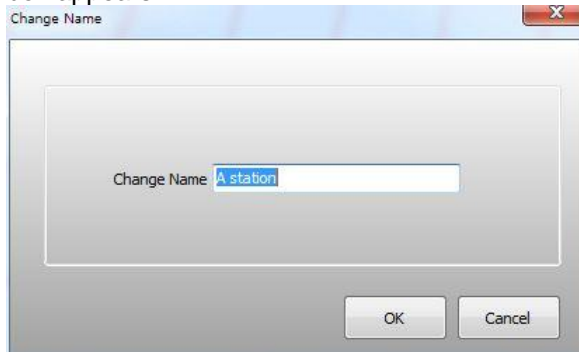
Click the [Add Folder] and the below dialog box appears. Enter the desired folder name.



Click the [OK] button and the folder is added.

**(2) Change Name / Change**1) **Change Name**

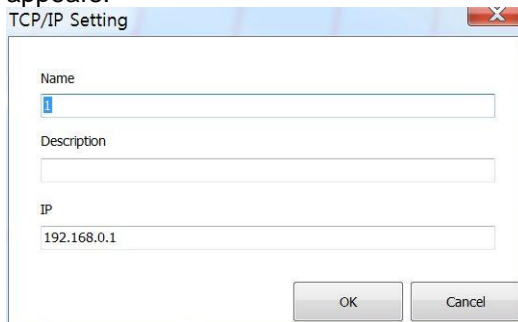
Select the folder to change the name and click the [Change Name]. The below dialog box appears.



Enter the desired name and click the [OK] button to change the folder name.

2) **Change**

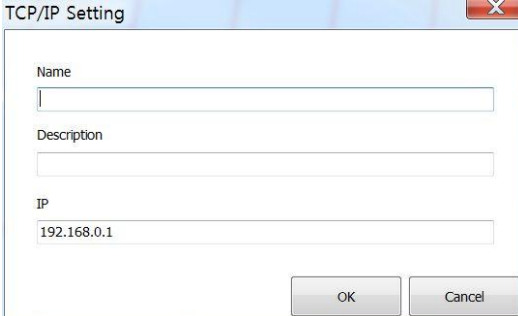
Select the sensor to change information and click the [Change]. The below dialog box appears.



Enter sensor name, description and click the [OK] button to change information.

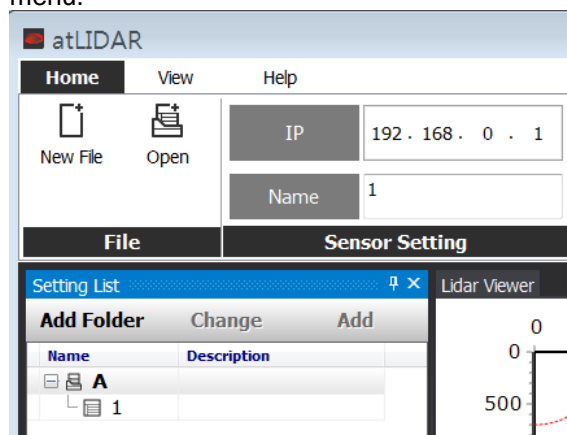
**(3) Add**

Select the desired folder and click the [Add] to add the sensor. The below dialog box appears. Enter name, description, and IP address and click [OK] button.



The image shows a dialog box titled "TCP/IP Setting". It contains three text input fields: "Name" (empty), "Description" (empty), and "IP" (containing "192.168.0.1"). At the bottom right, there are two buttons: "OK" and "Cancel".

At Setting List, double-click the sensor and sensor setting is changed automatically at Home menu.

**(4) Delete**

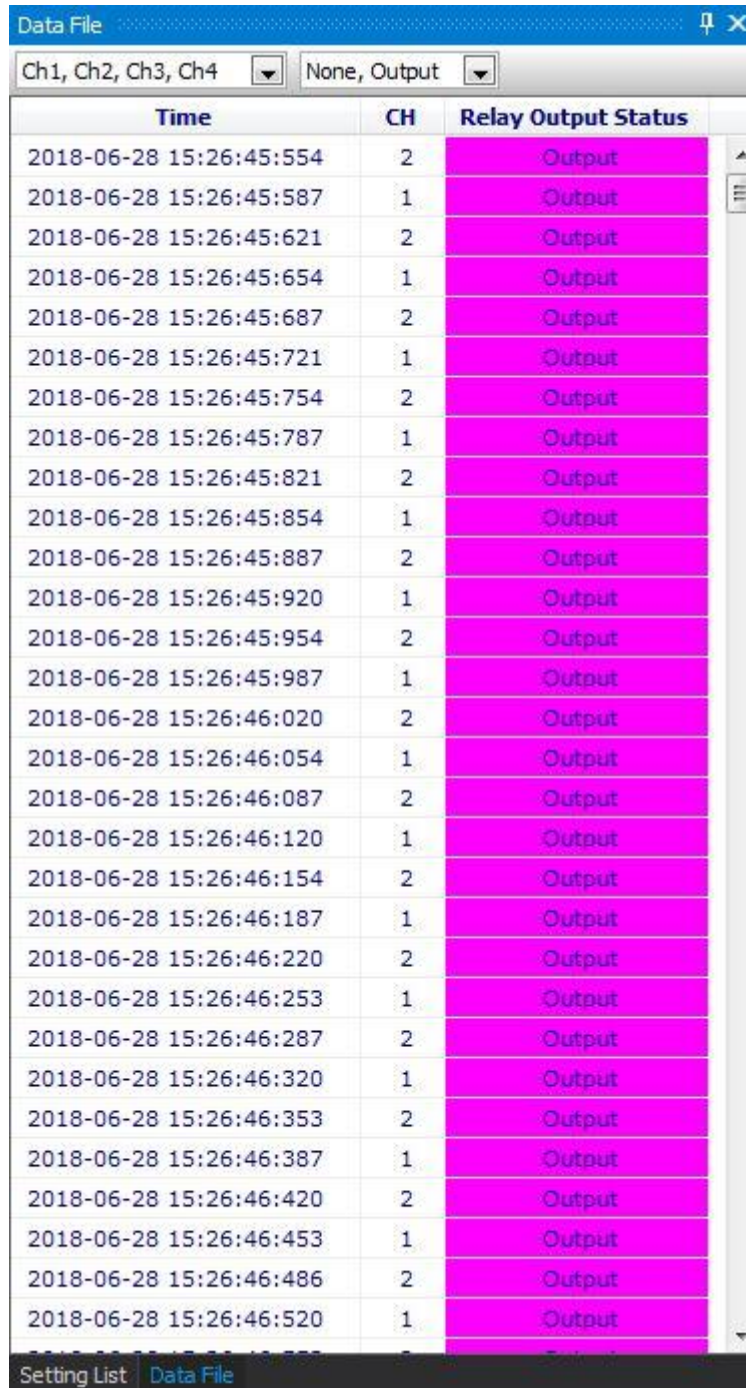
Select the desired folder or sensor and click [Delete] to delete it. The below dialog box appears. Click the [OK] button.



### 8.5.3 Data File

The log data is available to check the information at Data File.

“Home > Open” and select the desired log data file.

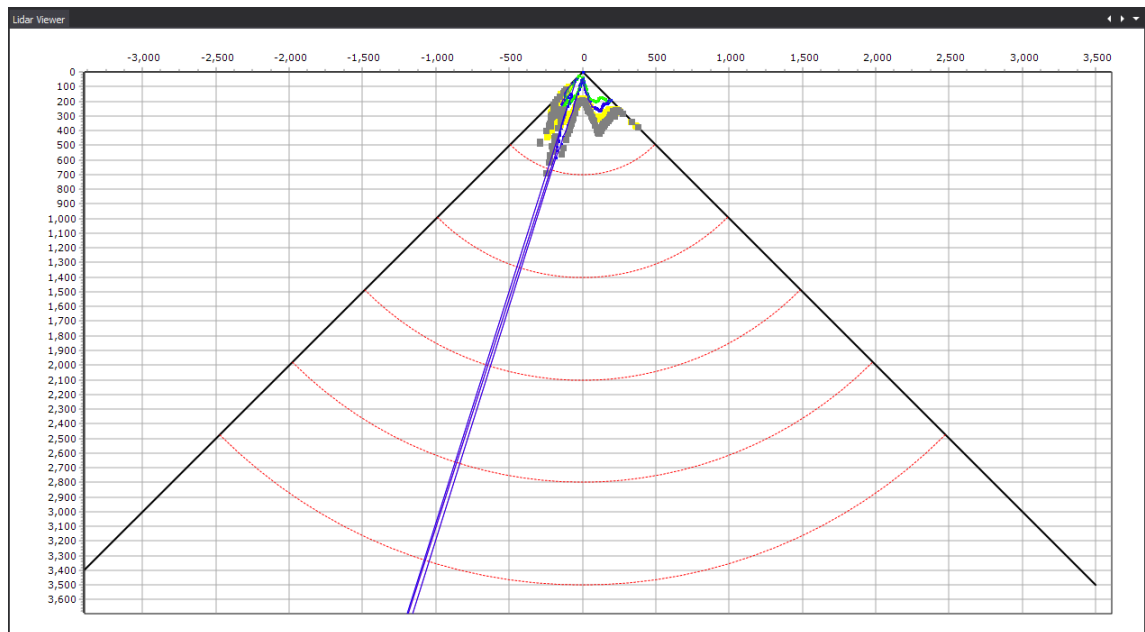


Time	CH	Relay Output Status
2018-06-28 15:26:45:554	2	Output
2018-06-28 15:26:45:587	1	Output
2018-06-28 15:26:45:621	2	Output
2018-06-28 15:26:45:654	1	Output
2018-06-28 15:26:45:687	2	Output
2018-06-28 15:26:45:721	1	Output
2018-06-28 15:26:45:754	2	Output
2018-06-28 15:26:45:787	1	Output
2018-06-28 15:26:45:821	2	Output
2018-06-28 15:26:45:854	1	Output
2018-06-28 15:26:45:887	2	Output
2018-06-28 15:26:45:920	1	Output
2018-06-28 15:26:45:954	2	Output
2018-06-28 15:26:45:987	1	Output
2018-06-28 15:26:46:020	2	Output
2018-06-28 15:26:46:054	1	Output
2018-06-28 15:26:46:087	2	Output
2018-06-28 15:26:46:120	1	Output
2018-06-28 15:26:46:154	2	Output
2018-06-28 15:26:46:187	1	Output
2018-06-28 15:26:46:220	2	Output
2018-06-28 15:26:46:253	1	Output
2018-06-28 15:26:46:287	2	Output
2018-06-28 15:26:46:320	1	Output
2018-06-28 15:26:46:353	2	Output
2018-06-28 15:26:46:387	1	Output
2018-06-28 15:26:46:420	2	Output
2018-06-28 15:26:46:453	1	Output
2018-06-28 15:26:46:486	2	Output
2018-06-28 15:26:46:520	1	Output

Click the time at Data File and the scan graph displays at Lidar Viewer.

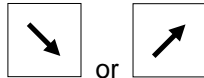
### 8.5.4 Lidar Viewer

Displays real-time scan graph and teaching data graph of the laser scanner.



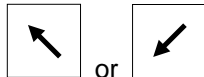
- Zoom In/Out mode

- Zoom In



On the graph, hold left mouse button and drag to upper/lower right-hand corner to enlarge the selected area.

- Zoom out



On the graph, hold left mouse button and drag to upper/lower left-hand corner to return the default scale.

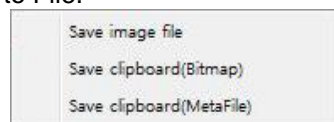
- Change X/Y Axis



On the graph, hold right mouse button and drag to change positions of X/Y axes.

- Save screen

On the graph, click the right mouse button and the pop-up menu appears. You can save the screen as image files. Select the desired save method: Save to Clipboard, or Save to File.




### 8.5.5 Obstacle List



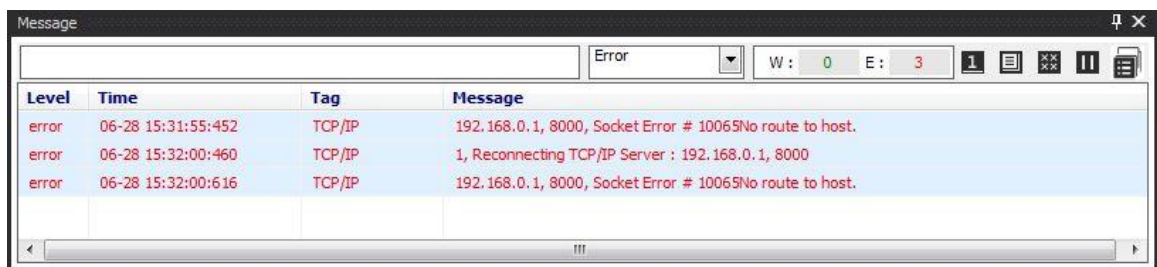
Displays obstacle detection list (detection start time, end time)

- Delete all

Click the  button to clear the obstacle list.

### 8.5.6 Message

Records events (communication status (start/stop communication, error), log status (start/stop log), etc.) during running the program.





### 8.5.7 Property

Property		↑	×
➤ Firmware Version	302		
Reset	Default Setting		...
<b>Activated Channel(s) Setting</b>			
CH1 Use	<input checked="" type="checkbox"/>		
CH2 Use	<input checked="" type="checkbox"/>		
CH3 Use	<input type="checkbox"/>		
CH4 Use	<input type="checkbox"/>		
<b>Monitoring Zone Setting</b>			
Ch All Width			
CH1 Width	6.0 m		
CH2 Width	6.0 m		
CH3 Width	6.0 m		
CH4 Width	6.0 m		
Ch All Height			
CH1 Height	6.0 m		
CH2 Height	6.0 m		
CH3 Height	6.0 m		
CH4 Height	6.0 m		
<b>Concentrated Monitoring Zone Setting</b>			
Ch All Width			▼
CH1 Width	OFF		▼
CH2 Width	OFF		▼
CH3 Width	OFF		
CH4 Width	OFF		
Ch All Height			▼
CH1 Height	OFF		▼
CH2 Height	OFF		▼
CH3 Height	OFF		
CH4 Height	OFF		
<b>Filter Setting</b>			
Sensitivity Level	1		▼
Minimum Size of The Scannin	5cm		▼
Monitoring Time	100ms		▼
<b>Output Setting</b>			
Output Relay	NO/NO		▼
<b>Teaching Setting</b>			
Teaching Run	Teaching Run		...
Teaching Initialization	Initialization Run		...
<b>TCP/IP Setting</b>			
Setting	TCP/IP Setting		...

For the proper laser scanner operation, you should set the parameters for the desired system.

Property consists of parameters and setting values.

Setting values are set as selection, edit, combo, or run type.

## 8.6 Functions

Laser scanner functions are available to set via the remote control (sold separately) or Laser scanner program (atLidar).

Refer to the below table.



### Note

Setting method	Remote control (RMC-LS)	Laser scanner program (atLidar)
<b>Functions</b>		
Sensor position	●	●
Activated channel (s)	●	●
Monitoring zone width (W), height (H)	●	●
Concentrated monitoring zone	●	●
Sensitivity level	●	●
Minimum size of the scanning target	●	●
Monitoring time	●	●
Output	●	●
Teaching	●	●
Password	●	-
Initialization (except password)	●	-
IP initialization	●	-
Setting value initialization (except IP)	-	●

### 8.6.1 Sensor position

Set the actual installed laser scanner position: view (top or bottom) and installation (left, right, or center).

When a user look at the installed laser scanner and the sensor top, set the top view or the sensor bottom, set the bottom view.

- Factory default: Bottom view, Left installation
- Setting method

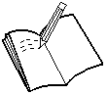


Select the actual installed sensor position at [View] menu.



#### Note

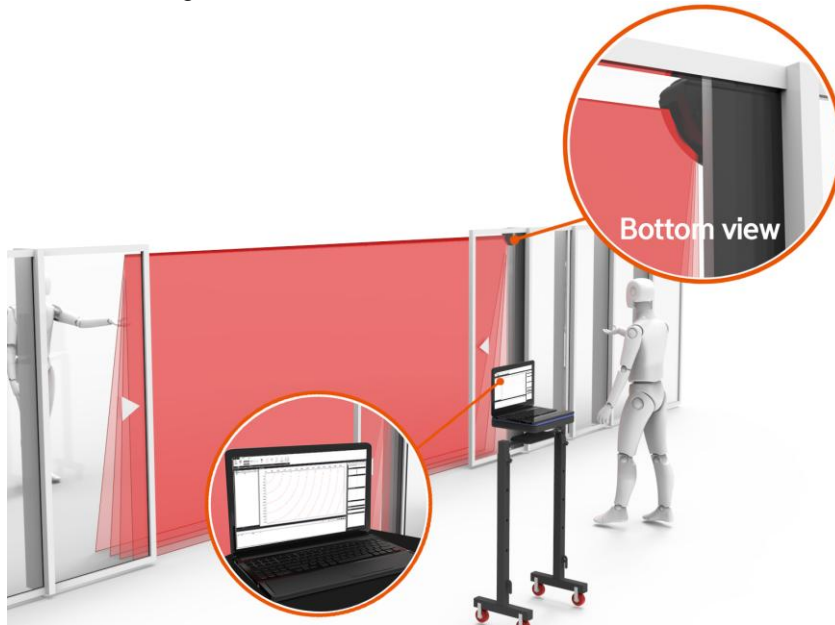
- In case of left or right installation, setting value of monitoring zone width (W) and height (H) must be entered.
- In case of center installation, monitoring zone width (W), height (H) is not changeable.



**Ex.**

[Platform screen door (PSD)]

- Bottom view, right installation



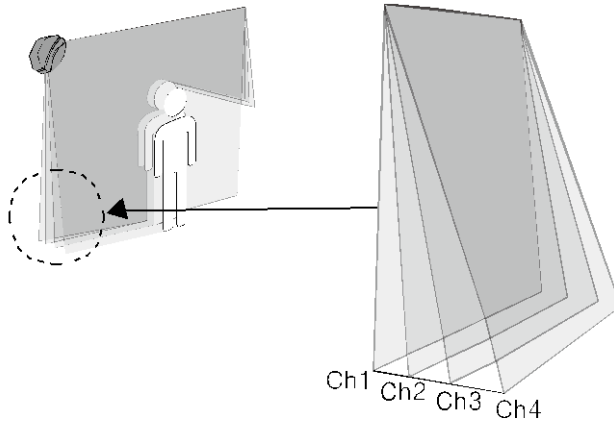
- Top view, left installation



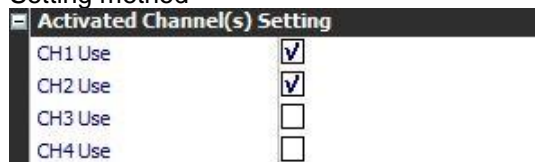
## 8.6.2 Activated channel (s)

The laser scanner has 4 channels (Ch1, Ch2, Ch3, Ch4).

Activate the channel (s) for obstacle detection.



- Factory default: Ch1, Ch2, Ch3, Ch4 activated
- Setting method



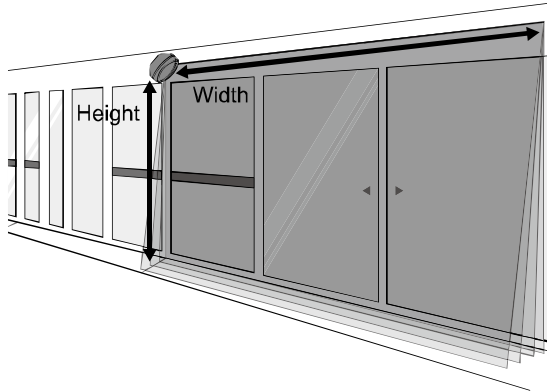
Check the channel to activate at [Property] window.

### 8.6.3 Monitoring zone width (W), height (H)

After setting sensor position, monitoring zone is available to set.

Monitoring zone width and height can be set in increments of 0.1mm, within the range from 0.5x0.5m to 6x6m.

In case of center installation, setting value of scanning width (W) and height (H) are fixed to 5.6x5.6m.



- Factory default: W6.0 x H6.0m
- Monitoring zone width (W), height (H) setting: 0.5 x 0.5m to 6.0 x 6.0m
- Setting method

Monitoring Zone Setting	
Ch All Width	
CH1 Width	6.0 m
CH2 Width	6.0 m
CH3 Width	6.0 m
CH4 Width	6.0 m
Ch All Height	
CH1 Height	6.0 m
CH2 Height	6.0 m
CH3 Height	6.0 m
CH4 Height	6.0 m

Enter the monitoring zone width (W), height (H) of the activated channel (s) at [Property] window.

You can enter the number.

When the mouse is close to the setting box, the setting range appears.

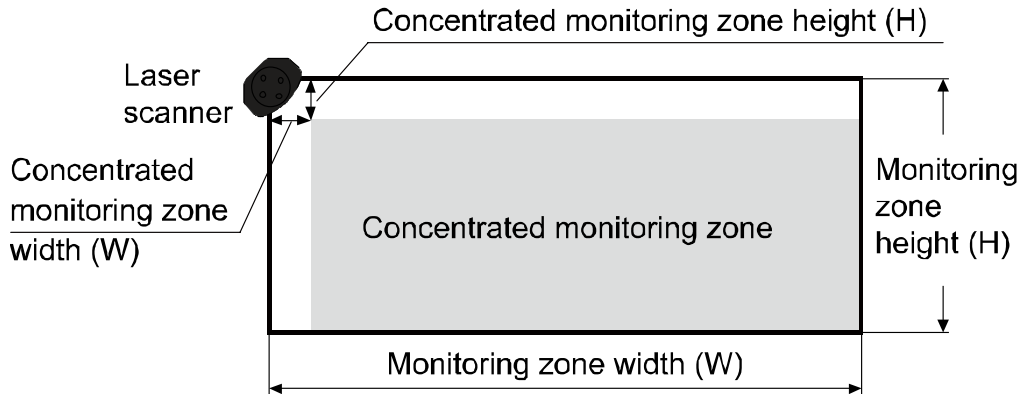


#### Note

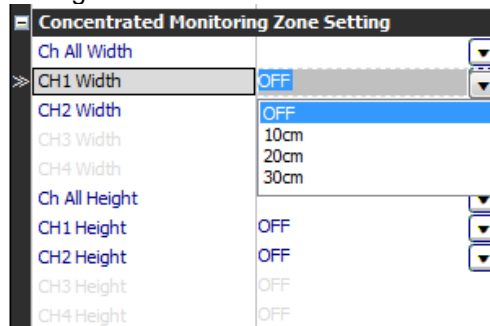
- Monitoring zone may be different by the reflectivity of obstacles.
- For the stable detection, the monitoring zone is set up to 6m.

### 8.6.4 Concentrated monitoring zone

As shown in the below image, it is possible to set the area where obstacles are scanned intensively except for unnecessary area. Height and width are settable from OFF, 10, 20, 30cm individually.



- Factory default: OFF
- Setting method



Click the desired value or pressing Alt + direction keys, from combo box or double-click the combo box and enter the value at [Property] window.



#### Note

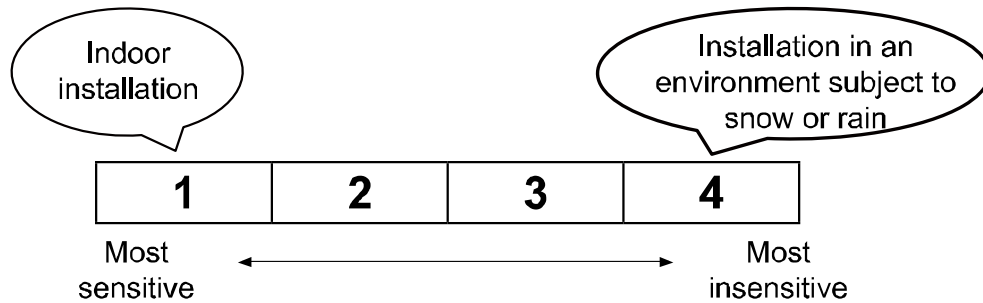
- In case of left or right sensor install position, the concentrated zone is available to set.

### 8.6.5 Sensitivity level

It is able to set the object scanning sensitivity of the laser scanner.

Setting range is from level 1 (most sensitive, indoor installation)

to level 4 (most insensitive, installation in an environment subject to snow or rain).



- Factory default: Level 1

- Setting method





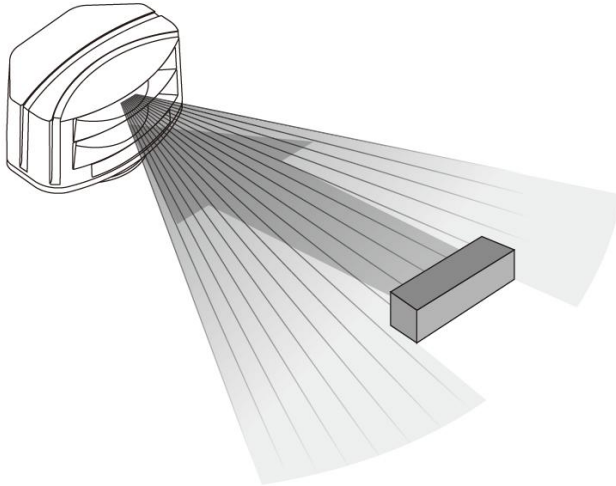
### 8.6.6 Minimum size of the scanning target

The minimum size of the scanning target can be set from OFF, approx. 5, 10, 15, 20cm.

For example, when '5cm' is selected, the object of size over W5×H5×L5cm.

If the minimum size of the scanning target is set to OFF, the size of the scannable object is as follows.

- At detection distance of 3m: approx. W2.1 x H2.1 x L2.1cm
- At detection distance of 5m: approx. W3.5 x H3.5 x L3.5cm



- Factory default: Approx. 5cm

#### Setting method

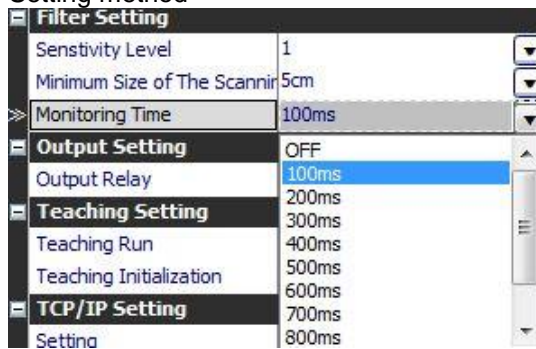
<b>Filter Setting</b>	
Sensitivity Level	1
Minimum Size of The Scanning Target	5cm
Monitoring Time	OFF
<b>Output Setting</b>	
Output Relay	5cm
	10cm
	15cm
<b>Teaching Setting</b>	
	20cm

### 8.6.7 Monitoring time

When an obstacle is scanned, obstacle detection output occurs after monitoring time. By setting monitoring time longer,

the laser scanner scans monitoring zone repeatedly and scans obstacles without being affected by snow or rain.

- Factory default: 100ms
- Setting method

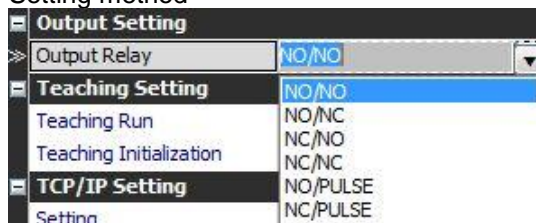


### 8.6.8 Output

The type of obstacle detection output is settable to normally open or normally closed.

The type of error status output is settable to normally open, normally closed, or pulse.

- Factory default: N.O. / N.O.
- Setting method



	OUT1 (obstacle detection output)	OUT2 (error status output)
N.O. / N.O.	Normally open	Normally open
N.O. / N.C.	Normally open	Normally closed
N.C. / N.O.	Normally closed	Normally open
N.C. / N.C.	Normally closed	Normally closed
N.O. / Pulse	Normally open	Pulse
N.C. / Pulse	Normally closed	Pulse



#### Note

In case of OUT2 (error status output) as pulse, it repeats open-close operation for 1 sec at the normal operation and it closes at error status.

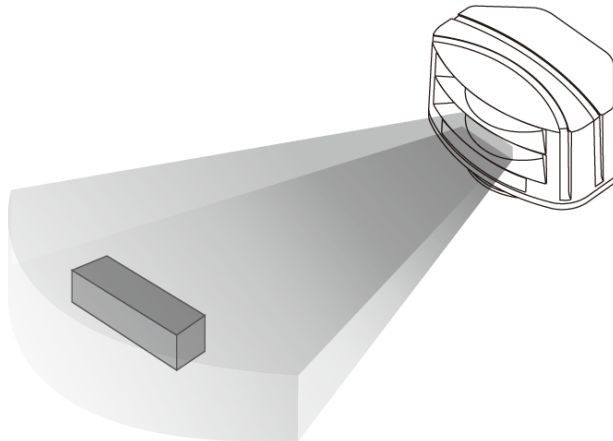
### 8.6.9 Teaching

This function is to familiarize the space which is set by the monitoring zone width (W) and height (H) in advance.

Objects in the space at moment of teaching are not regarded as obstacles.

When the environment is changed or some objects are removed or added in the space, newly operate teaching.

Teaching takes 35 seconds.



- Setting method



#### Note

- For re-install the unit teaching already at no teaching required area, initial the unit. Do not re-teaching it.
- Operate teaching in the environment free from snow, rain, fog, hail, or mutual interference of another laser scanner.

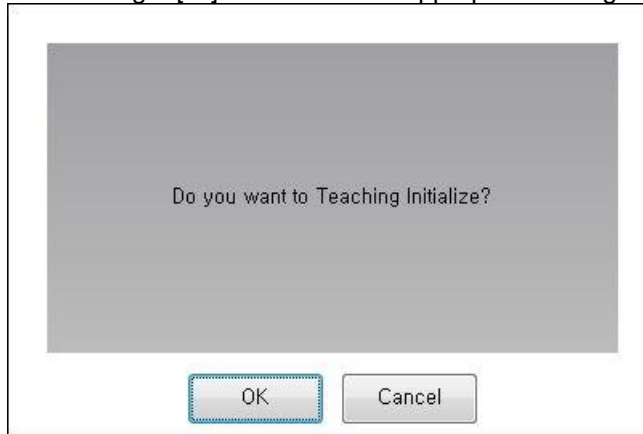
### 8.6.10 Setting initialization

The laser scanner's settings are initialized: sensor position, monitoring zone width (W), height (H), activated channel (s), etc. except IP as factory default.

- Setting method



Click the right [...] button and the appropriate dialog box appears.



### 8.6.11 TCP/IP Setting

IP address, gate way, subnet mask settings of TCP/IP are available to change.

- Setting method



Click the right [...] button and the appropriate dialog box appears.

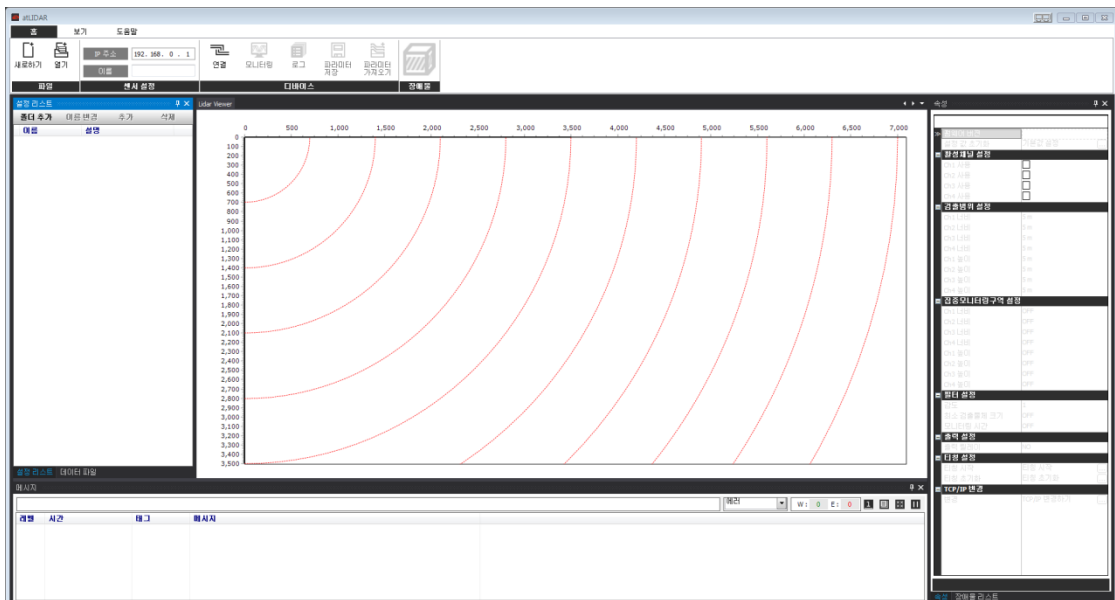
## 8.7 Changing Program Language

### 8.7.1 Change Language

Changes the program language. Default language is the program installation language.



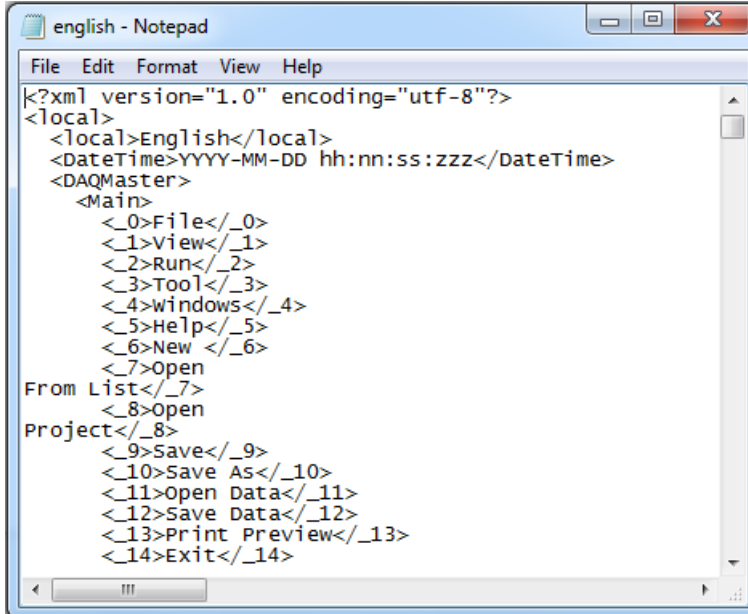
Select “Help > Language” from the main menu. Language option is applied immediately and the program is displayed in the selected language.



### 8.7.2 Modifying and Adding Languages

atLidar program allows users to add and modify the language. Language files reside in 'lang' folder in the installation folder. Its default format is XML.

To modify language, open the language file in Notepad as below, modify and save.



```

k?xml version="1.0" encoding="utf-8"?>
<local>
<local>English</local>
<DateTime>YYYY-MM-DD hh:nn:ss:zzz</DateTime>
<DAQMaster>
  <Main>
    <_0>File</_0>
    <_1>View</_1>
    <_2>Run</_2>
    <_3>Tool</_3>
    <_4>Windows</_4>
    <_5>Help</_5>
    <_6>New </_6>
    <_7>Open
From List</_7>
    <_8>Open
Project</_8>
    <_9>Save</_9>
    <_10>Save As</_10>
    <_11>Open Data</_11>
    <_12>Save Data</_12>
    <_13>Print Preview</_13>
    <_14>Exit</_14>
  
```

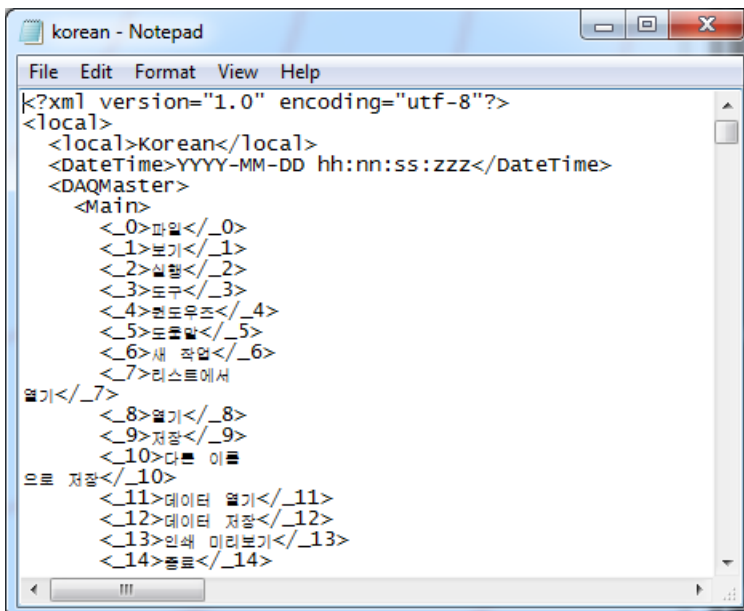
To add a language, copy and rename the existing language file.

Change the title of language in <local>English</local> section in English. (highlighted with a square in the image below), change the English contents to your desired language and save.



#### Ex.

For example, to change to Korean: Change 'File' to '파일'.




```

k?xml version="1.0" encoding="utf-8"?>
<local>
<local>Korean</local>
<DateTime>YYYY-MM-DD hh:nn:ss:zzz</DateTime>
<DAQMaster>
  <Main>
    <_0>파일</_0>
    <_1>보기</_1>
    <_2>실행</_2>
    <_3>도구</_3>
    <_4>윈도우즈</_4>
    <_5>도움말</_5>
    <_6>새 작업</_6>
    <_7>리스트에서
열기</_7>
    <_8>열기</_8>
    <_9>저장</_9>
    <_10>다른 이름
으로 저장</_10>
    <_11>데이터 열기</_11>
    <_12>데이터 저장</_12>
    <_13>인쇄 미리보기</_13>
    <_14>종료</_14>
  
```

## 9 Troubleshooting

Check the normal operation status of LSE-4A5R2 periodically.

Error	Causes	Troubleshooting
Power indicator (green) OFF	Supply the power voltage.	Check the rated power supply.
	Wrong polarity connection of power supply	Check the Connection diagram when wiring the unit.
Error indicator (orange) flashing	Voltage error	Use the unit within the rated voltage.
	Temperature error	Use the unit within the specified ambient temperature.
	Inside error	Contact the seller.
Relay output is ON without objects within teaching area	Detection by external environment (snow, rain, or hail, etc.)	Change the settings: sensitivity level, scanning target size, monitoring time.
	There is the equipment which generates strong magnetic force or high frequency noise (motor, generator, or power cable, etc.) near the laser scanner.	Install the laser scanner away from the equipment which generates strong magnetic force or high frequency noise.
Laser scanner does not react for remote control operation.	The batteries' life cycle of the remote control is over.	Change the batteries.
	Wrong direction control of the remote control	Operate the remote control towards the near laser scanner.
After pressing the  key of remote control, the setting is not available.	Password incorrect.	Turn OFF the power and re-supply the power, the password is available to reset.
		Contact the seller.
atLidar (PC program) and the laser scanner does not connected.	LAN connector connection error	Check the PC and LAN connector connection part.
	IP address is not same.	Check the IP address of the laser scanner and the user PC.
	IP address of the laser scanner and wireless router is same.	Set the wireless network (Wifi) to "Disable" in the network settings of the Windows operating system.

Make Life Easy: **Autonics**

\* Dimensions or specifications on this manual are subject to change and some models may be discontinued without notice.

**MSO-LSE4A5R2U1-V1.1-1901US**