Make Life Easy

User Manual

Software for Safety Light Curtains

atLightCurtain

MWO-atLightCurtainU1-V1.0-2008US

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.

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Preface

Thank you for purchasing Autonics product.
Please familiarize yourself with the information contained **in the Safety Considerations section** before using this product. This user manual contains information about the porduct 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.
- This manual is not provided as part of the product package.
  Please visit our website (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 our homepage.
- This user's manual is based on atLightCurtain 1.0.0.

User Manual Symbols

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

Safety Considerations

- Please observe all safety considerations for safe and proper product operation to avoid hazards.
- Safety considerations consist of 'warning' and 'caution. The following symbols represent caution due to particular circumstances in which hazards may occur

Warning	Warning	Failure to follow instructions can result in serious injury or death.
Caution	Caution	Failure to follow instructions can lead to a minor injury or product damage.

Warning

1. **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 personal injury, economic loss or fire.
2. **Do not use the unit in the place where flammable/explosive/corrosive gas, high humidity, direct sunlight, radiant heat, vibration, impact, or salinity may be present.**
   Failure to follow this instruction may result in explosion or fire
3. **Do not connect, repair, inspect, or replace the unit while connected to a power source.**
   Failure to follow this instruction may cause malfunction or danger due to the safety-related function that does not operate properly. For more information, please refer to laws, regulations and standards in the country or region.
4. **Do not disassemble or modify the unit.**
   Failure to follow this instruction may result in personal injury or fire. In addition, the manufacturer does not guarantee the performance and functionality.
5. **After 3 seconds of power input, use a machine or mechanical system.**
   Failure to follow this instruction may cause malfunction or danger due to the safety-related function that does not operate properly.
6. **Responsible person for use is an operator who:**
   - is fully knowledgeable about the installation, settings, use and maintenance of the product.

- is familiar with the requirements of laws, regulations and standards in the country or region where the product is installed and used. Responsible person for use has an obligation to educate the requirements to machine users.
Machine users are persons who have been fully trained by the responsible person for use and can operate the machine correctly. When any error occurs during the operation of the
machine control system, they have a responsibility to report it to the responsible person for use immediately.
If an unqualified person operates the product, it may result in personal injury, economic loss or fire.

7. **Qualified personnel shall carry out installation, configuration and combination with the machine control system.**
   If an unqualified person carries out installation, configuration and combination with the machine control system, it may cause malfunction or result in accidents due to undetected human body.
8. **Make sure that only the responsible person uses the keys or tools for accessing and setting the light curtains.**
   Failure to follow this instruction may cause malfunction or result in accidents.
9. **When the machine is not operating after installation, check that functions and settings of the product operate correctly as you intended.**
   Failure to follow this instruction may result in personal injury due to undetected human body.
10. **Always make sure that the safety distance between the light curtain and the hazardous part (hazardous zone or hazardous source) of the machine.**
    The machine may not stop before an operator reaches the hazardous zone so that it may result in personal injury. For more information on the safety distance, please refer to laws, regulations and standards in the country or region.
11. **To access the hazardous part (hazardous zone or hazardous source) of the machine, you shall install the light curtain as human body passes through the detection zone. If the hazardous part of the machine is accessible beyond the detection zone, install additional guards. In addition, when working in the hazardous zone, make sure that a part of human body is within the detection zone.**
    If the installation does not detect the human body, it may result in personal injury.
12. **Do not arrange or use the light curtain as a reflective or retroreflective type with reflector.**
    If the installation does not detect the human body, it may result in personal injury.

13. **Do not use the light curtain to detect flying objects toward the detection zone.**
    If there is a risk, take additional safety measures, such as installing an additional safety guard.
14. **The auxiliary output (AUX) is non-safety output, therefore, do not use it for safety purposes.**
    Failure to follow this instruction may result in serious injury because the safety cannot be guaranteed.
15. **The lamp output (Lamp) is non-safety output, therefore, do not use it for safety purposes.**
    Failure to follow this instruction may result in serious injury because the safety cannot be guaranteed.
16. **Only qualified personnel shall use the PC setting tool (atLightCurtain) to configure functions of light curtain and manage the changed settings.**
    If an unqualified person tries to change settings of function via the PC setting tool, it may cause malfunction or result in personal injury due to undetected human body.
17. **After setting or changing the function of light curtain via the PC setting tool, check that light curtain operates as you intended.**
    Failure to follow this instruction may result in personal injury.
18. **When installation, if you have changed the configuration of light curtain (replacement of light curtain, change the number of beams, change the number of series connection, etc.), set the function of the light curtain via the PC setting tool again.**
    Failure to follow this instruction may result in personal injury due to unintended settings.
19. **If the (master) receiver has been replaced, send the setting information of PC setting tool to the replaced receiver gain.**
    Failure to follow this instruction may result in personal injury due to unintended settings.
20. **Install the devices for releasing Interlock condition (e.g. switch) in a location where the entire hazardous zone can be seen or the devices cannot be handled within the hazardous zone.**
21. **When restarting the machine in interlock condition, make sure that no operators are in the hazardous zone.**
    Failure to follow this instruction may result in personal injury due to undetected human body.
22. **Follow the requirements described in this manual for the muting devices and installation method to use muting function.**
    For more information, please refer to laws, regulations and standards in the country or

region. Failure to follow these requirements, the functions and performance are not guaranteed. It may result in personal injury.

23. **Install the muting devices in a location that can be changed by only qualified and responsible person for use.**
    Change the installation location under the supervision of responsible person for use.
24. **The muting function temporarily stops the safety related functions of light curtain.**
    If the function is activated, take additional safety measures for the safety of the machine control system.
25. **When the muting function is activated, make sure that no operator is in the hazardous zone.**
    Take additional safety measures to prevent the human body from entering the hazardous zone.
26. **When you need to inform that the muting function is activating, install the indicators with any forms (e.g. alarm lamp) where it can be seen from all sites.**
    For more information, please refer to laws, regulations and standards in the country or region.
27. **Qualified and responsible person for use should conduct the risk assessment on the time related to the muting function, set the time correctly according to the conditions described in this manual. In particular, set the muting timeout (T2) to a finite value in the PC setting tool.**
    Failure to follow this instruction may cause the failure of safety related function and result in personal injury or fire.
28. **When you use the auto scan for muting zone via PC setting tool, the OSSD output may temporarily go to ON state due to the operation of line or facilities for scan and measurement. Therefore, safety measures in workplace shall be implemented.**
    If there is a risk, take additional safety measures, such as installing an additional safety guard.
29. **The installation environment and timing chart shown in the PC setting tool are examples for your understanding. Make sure that the qualified and responsible person for use check the light curtain operates in the actually installed site as intended.**
    Failure to follow this instruction may result in personal injury due to undetected human body.

30. **Follow the requirements described in this manual for the devices and installation method to use the override function.**
    For more information, please refer to laws, regulations and standards in the country or region. Failure to follow these requirements, the functions and performance are not guaranteed. It may result in personal injury.
31. **Connect the override switch to reset input to use the override function.**
    Failure to release the override condition with the override switch may result in personal injury.
32. **The override function temporarily stops the safety related functions of light curtain. Therefore, safety measures in workplace shall be implemented.**
    If the function is activated, take additional safety measures for the safety of the machine control system.
33. **When the override function is activated, make sure that no operator is in the hazardous zone.**
    Take additional safety measures to prevent the human body from entering the hazardous zone.
34. **When you need to inform that the override function is activating, install the indicators with any forms (e.g. alarm lamp) where it can be seen from all sites.**
    For more information, please refer to laws, regulations and standards in the country or region.
35. **Qualified and responsible person for use should conduct the risk assessment on the time related to the override function, set the time correctly according to the conditions described in this manual. In particular, set the override timeout to a finite value in the PC setting tool.**
    Failure to follow this instruction may cause the failure of safety related function and result in personal injury or fire.
36. **After setting the fixed blanking function, check that it operates as intended.**
    Failure to follow this instruction may result in personal injury due to undetected human body.
37. **If the tolerance is set for the fixed blanking function, the detection capability will be larger.**
    Calculate the safety distance suitable for the minimum detection capability to secure minimum safety distance
38. **If you use the fixed blanking function, conduct additional safety measures to prevent a part of human body from entering the hazardous zone passing by beams for the blanking zone.**

39. **After setting the floating blanking function, check that it operates as intended.**
    Failure to follow this instruction may result in personal injury due to undetected human body.
40. **If the tolerance is set for the floating blanking function, the detection capability will be larger.**
    Calculate the safety distance suitable for the minimum detection capability to secure minimum safety distance
41. **If you use the floating blanking function, conduct additional safety measures to prevent a part of human body from entering the hazardous zone passing by beams for the blanking zone.**
42. **If you use the auto scan function for the fixed and floating blanking zone via the PC setting tool, the OSSD output temporarily goes to the OFF state.**
    Please note that the operating status of the light curtain may be changed.
43. **If you use the reduced resolution function, the detection capability will be larger.**
    Calculate the safety distance suitable for the minimum detection capability to secure minimum safety distance
44. **Only qualified and responsible person for use shall use the factory reset via the PC setting tool. Also, check the safety distance and the operation of the light curtain again.**
    Failure to follow this instruction may result in personal injury due to undetected human body.
45. **Check 'Connections' before wiring. And make sure that there are no safety problems.**
    Failure to follow this instruction may result in fire.
46. **When using PNP output, be sure to connect the load between the OSSD output wire and 0V. Do not short the OSSD output wires to +24V.**
    Incorrect wiring or shut down of the power supply is dangerous because the OSSD output is always in ON state.
47. **When using NPN output, be sure to connect the load between the OSSD output wire and +24V. Do not short the two OSSD output wires to 0V.**
    Incorrect wiring or shut down of the power supply is dangerous because the OSSD output is always in ON state.
48. **Use only the two OSSD output wires in this product to construct safety systems, and do not use output signals (e.g. auxiliary output) other than the OSSD output for safety purposes.**
    When you use only one OSSD output or use other output signal as a safety output, the machine cannot be stopped in the event of a malfunction and result in personal injury due

to the failure of safety related function.

49. **When wiring, all input/output wires with double insulation or reinforced insulation should be used between the circuits.**
    Failure to follow this instruction may result in fire.
50. **Do not install all input/output wires in the same piping with high voltage wire and power line.**
    Failure to follow this instruction may cause malfunction or dangerous due to the safety-related function do not operate properly.
51. **Use a separate power supply for the load and the product, and do not exceed the specified ratings.**
    Failure to follow this instruction may result in damage or malfunction of the product.

Caution

1. **Use the product within the rated specifications.**
   Failure to follow this instruction may result in fire or product damage.
2. **Use a dry cloth to clean the unit, and do not use water or organic solvent.**
   Failure to follow this instruction may result in fire.
3. **Use the cable within the rated length and do not modify, change, and extend the cable.**
   If the cable is longer, it may cause malfunction or danger due to the safety related function do not operate properly.
4. **To use the light curtain in "PSDI mode", configure the appropriate control circuit between the light curtain and the machine according to the requirements of laws, regulations and standards in the country or region.**
5. **Do not use the product outdoors.**
   Failure to follow this instruction may result in damage and malfunction of the product.
6. **Keep the product away from metal chip, dust, and wire residue which flow into the unit.**
   Failure to follow this instruction may result in personal injury due to the malfunction of the light curtain.
7. **Be sure for responsible person for use to change the password of PC setting tool to prevent the setting change by the machine users (or operator). Securely manage your password and avoid forgetting the password.**
   Failure to follow this instruction may result in personal injury due to the malfunction of the light curtain.
8. **You must conduct regular inspections and maintenance procedures within six**

months according to the items listed on the "10. Check and maintenance" at SFL/SFLA Series user manual.

Failure to follow this instruction may result in personal injury due to the malfunction of the light curtain.

9. **Check the installation status, normal operation, breakage, modification, and manipulation in the situations shown below, and conduct the weekly inspection.**

   ① When starting the safety system for the first time

   ② When replacing the accessories of the safety system

   ③ When the safety system has not been operated for a long time

   Failure to follow this instruction may result in personal injury because the safety-related function may not work properly due to the malfunction of the product.

Caution during Use

1. **Follow instructions in "Cautions during Use". Otherwise, it may cause unexpected accidents.**
2. **The power input of 24VDC model is insulated and limited voltage/current or supply via power supply with SELV and Class 2.**
3. **When supplying power with SMPS, ground the FG terminal and connect the noise suppression capacitor between 0V and FG terminal.**
4. **When installing the light curtain, make sure that the bottom indicators of the emitter and receiver are aligned exactly.**
5. **Install the light curtain in a place where the emitter and receiver are not affected by walls or reflecting surfaces.**
6. **If you use the light curtain as several sets, arrange them not to interfere with each other, or install with a shading plate.**
7. **Do not install the light curtain in place where it is exposed to intense disturbance light (such as direct sunlight, sunlight, spotlights fluorescent lights, and etc.) or reflected light from glossary surface is directly incident on the receiver. If it is difficult to install in such a place, take additional safety measures using shading plates, hoods, etc.**
   Failure to follow this instruction may cause malfunction or danger due to the safety related function do not operate properly.
8. **Make sure that any unused wires, when installing the product, should be insulated.**
9. **Make sure that removable parts (including packing, end caps, product wires, covers, etc.) are properly assembled. Also, tighten the screws with specified tightening torque.**
   Failure to follow this instruction may cause product degradation.
10. **Assessment of conformity to the required safety level is evaluated for the entire system. Please consult with a certified certification body regarding the assessment procedure.**
11. **It should be done away regarded as an industrial waste.**
    For more information, please refer to laws, regulations and standards in the country or region.

12. This product may be used in the following environments.

① Indoor (in the environment condition rated in 'Specifications')

② Altitude max. 2000 m

③ Pollution degree 3

④ Installation category II

※ The specifications and dimensions of this manual are subject to change without any notice.

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

Table of Contents

1 atLightCurtain

1.1 Overview

atLightCurtain makes you can easily configure the functions of the light curtain and monitor them. SFLA, the high-performance and advanced, provides safety-related functions in muting, blanking, and parameter menus. Using this, you can make more safe environments for the operators and more effective manufacturing process. You can monitor your light curtain via atLightCurtain.

• Incident light level: Easy to adjust, maintain, and manage beams.

• Wiring and switch: Easy to check the I/O and switch status of the currently connected wiring.

• Error and warnings: Help to reduce the time required for troubleshooting by displaying error descriptions.

Administrator login mode allows only authorized person to modify settings so that you can protect and secure it.

1.1.1 System requirements

To use atLightCurtain, the following Operating system and PC environment are necessary.

The system requirements for using atLightCurtain are as follows:

Item	Minimum specifications
System	IBM PC compatible computer with 1GHz or faster processor
Operating system	Microsoft Windows 7 or later
Memory	2GB or more
Hard disk	1GB free hard disk space
VGA	1024 X 760 or higher resolution display
ETC	USB port

1.1.2 Install atLightCurtain

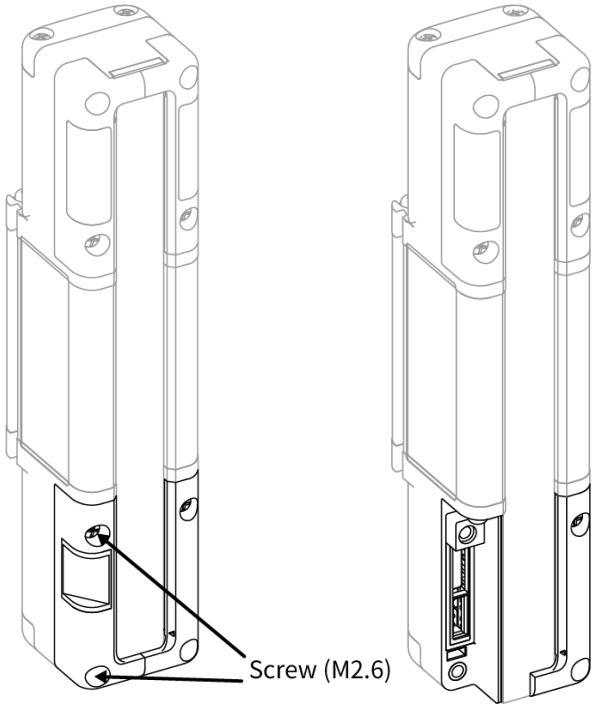
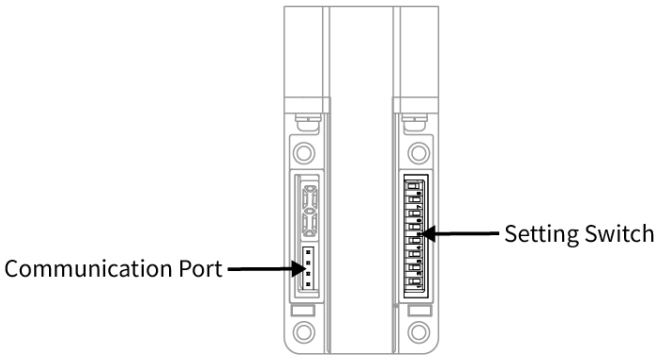
1st For installing atLightCurtain, visit our website(www.autonics.com) and download atLightCurtain installer.

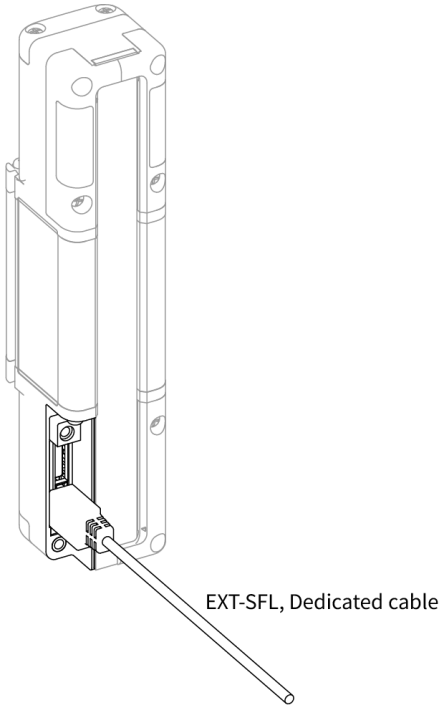
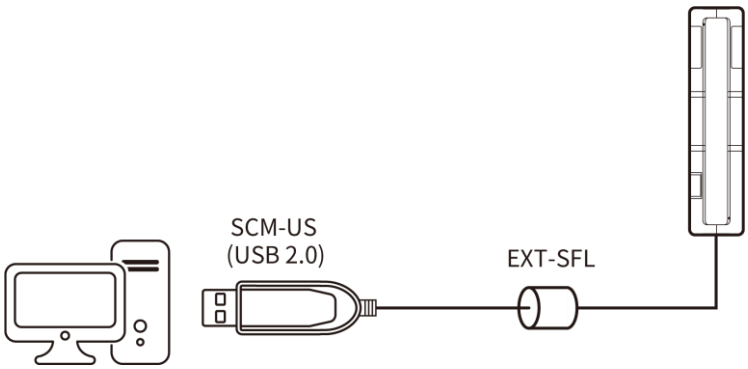
2nd Run the installer and then the window for software display language will appear. Select a desired language between the Korean and English.

3rd Click ‘Next>’ to start the installation. After proceeding with the License Agreement and selecting the installation location, please wait for a while until the installation complete.

4th Click ‘Finish’ to run atLightCurtain.

2 Connect light curtain with PC

Connecting the light curtain to your PC	Description
	•PC Communication port: Open the cover on the bottom-left corner of *the receiver.* •Setting switch: Open the cover on the bottom-right corner of *the emitter and receiver.*
	Be sure to check the positions of the PC communication port and setting switch.
	•To apply the settings in atLightCurtain to the light curtain, set the *position 8* of setting switches on the emitter and receiver to *ON* for PC setting. •In the case of series connection, the setting of the master light curtain is applied to the slave. •In case of SFL (standard type), the settings of position 1 to 7 are applied to the light curtain, and monitoring is only available. (Position 8 is deactivated.)

Connecting the light curtain to your PC	Description
	•Connect our converter cable (EXT-SFL, sold separately) to the PC communication port on the bottom of the receiver. •If you configure the light curtains in series connection, connect to the port on the master receiver (the first receiver among the connected receivers.).
	•Connect the communication converter (SCM-US) and the converter cable (EXT-SFL). •Connect our communication converter (SCM-US, sold separately) to the USB port of PC. The driver installation will start automatically.

Note

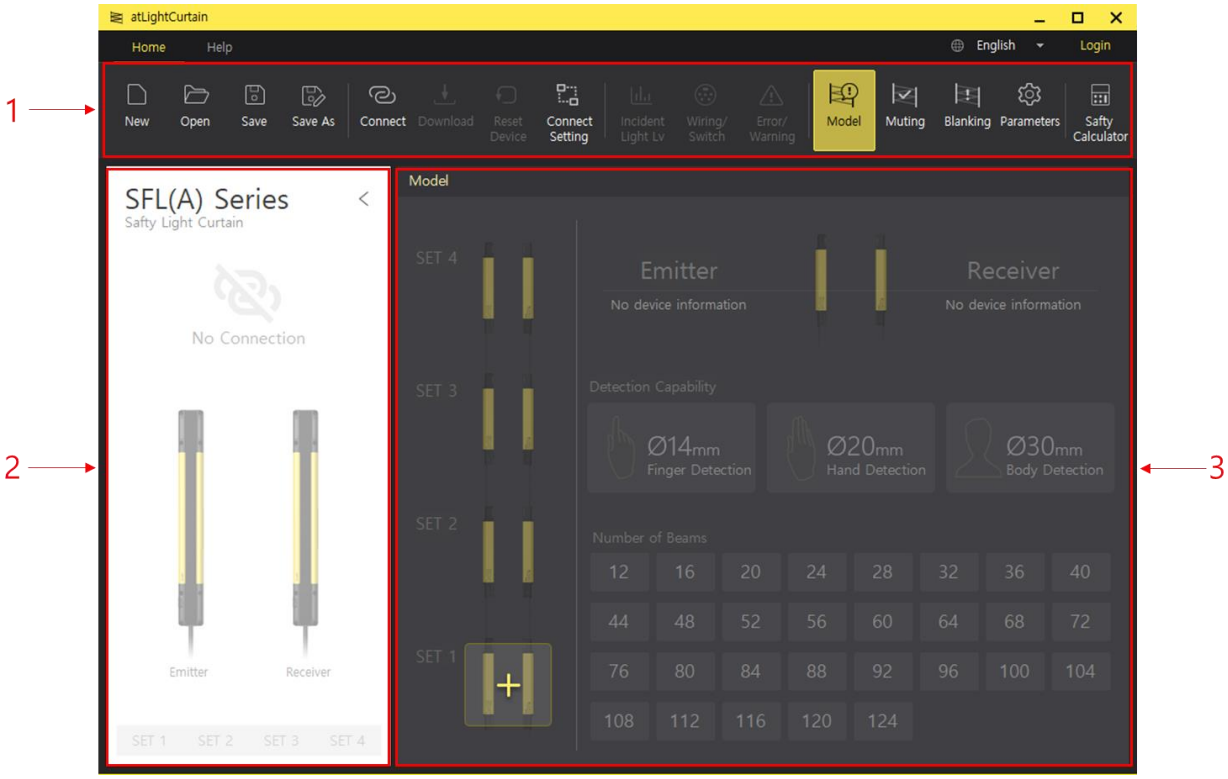
- When the PC is connected, the OSSD output can be ON or OFF state regardless of incident light level.
  Using atLightCurtain other than for maintenance is not guarantee the safety.

PC communication status	OSSD status
Communication (monitoring)	ON or OFF state
Apply settings (download)	Keep OFF state
Auto Scan (muting)	Keep ON state
Auto Scan (blanking)	Keep OFF state

3 Screen

3.1 Start screen and UI configuration

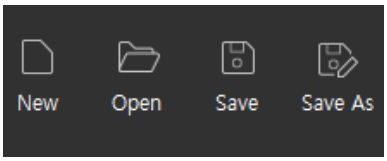
It consists of a ribbon menu and screens for showing the status of the connected light curtain, monitoring, and settings.



No.	Name	Description
1	Ribbon menu	Shows the functions of atLightCurtain For more information, see *3.2 Menu.*
2	Status screen of the light curtain	Displays specifications and operating status of the connected light curtain. For more information, see *3.3 Status display screen.*
3	Monitoring and setting screen of the light curtain	Displays monitoring data and settings information of the connected light curtain. For more information, see *8 Monitor your light curtain.*

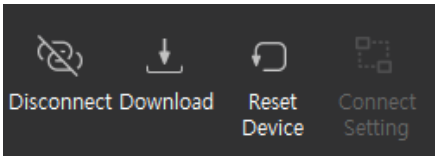
3.2 Menu

3.2.1 Files



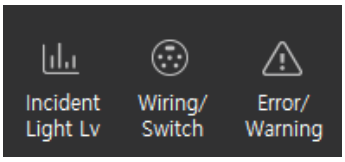
Function	Description
New	Create a new project file However, all current values are initialized.
Open	Open the project file(*.lcp) to import the settings
Save	Save the current values as a project file
Save as	Save the current values as a project file with a different name

3.2.2 Communication



Function	Description
Connect	Connect the light curtain to your PC.
Download	The light curtain downloads the current values of settings page.
Reset Device	Restart the light curtain to carry out a self-testing and apply the settings.
Connect Setting	Set communication environment: COM port

3.2.3 Monitoring

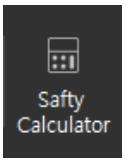


Function	Description
Incident Light Lv	Monitor incident light level of each beam of the connected light curtain
Wiring/ Switch	Monitor wiring and switch settings of the connected light curtain
Error/ Warning	Monitor error and warning history, and maintenance information of the connected light curtain

3.2.4 Setting

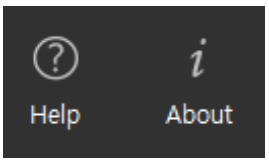
Function	Description
Model	• Before connecting with the light curtain: You can create a model and simulate functions. • After connecting with the light curtain: Import the model information of the connected light curtain to your PC.
Muting	You can set the muting function.
Blanking	You can set the blanking function.
Parameters	You can set the safety-related and other functions.

3.2.5 Safety Caculator



Function	Description
Safety distance calculation	You can calculate the minimum safety distance.

3.2.6 Help



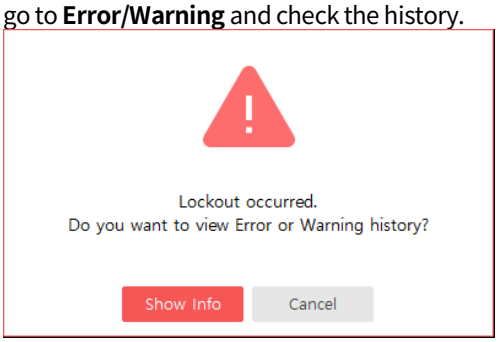
Function	Description
Help	You can see the user manual of atLightCurtain(*.pdf).
About	You can check the version information of atLightCurtain.

3.3 Status display screen

No.	Description
1	Click < to minimize the screen size
2	The model name and operating status※ of the connected light curtain.
3	The detection capability, sensing distance and LED indicators of the connected light curtain.
4	You can check the information of the connected light curtain in series connection. By selecting the SET, you can see that the status display screen is changed.

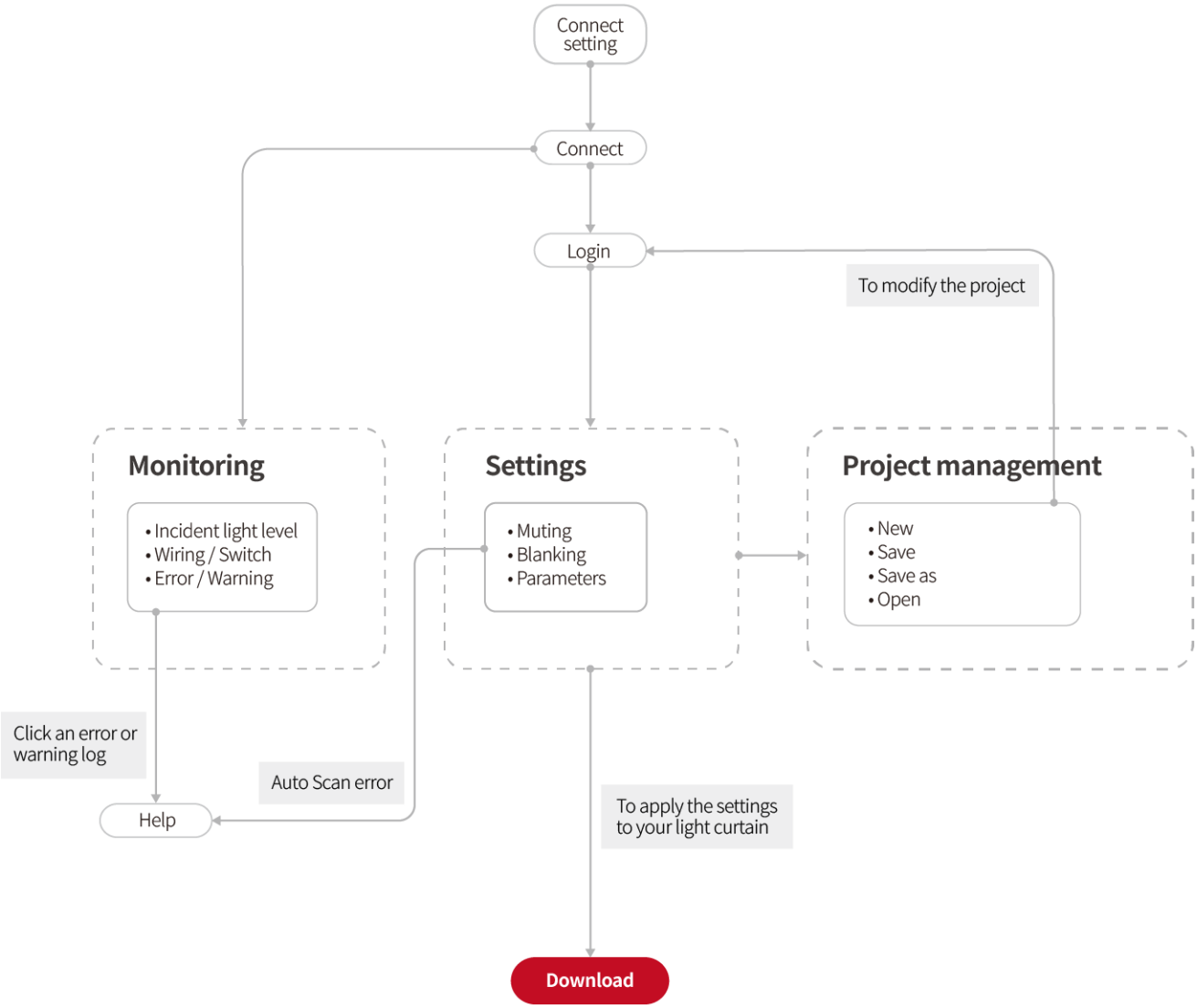
※ The operating status of the light curtain

Operating status	Description
Operating	The light curtain and PC are normally connected.
Muting	With the muting function is activated, OSSD output keeps in ON state.
Override	With the override function is activated, OSSD output keeps in ON state.
Interlock	With the interlock function is activated, OSSD output keeps in OFF state.

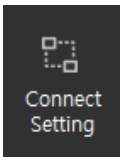
Operating status	Description
Reset-Hold	The reset-hold function is activated. It is in the 'reset-hold wait time.'
Warning	Although the light curtain performs normally, it is in unstable conditions (e.g. power instability or sensitivity reduction, etc.).
PC Setting	The light curtain is ready to download the setting value from your PC. OSSD output keeps in OFF state. ※ Use the reset device function to shift the state of the light curtain from the PC setting to normal operation.
Lockout	The light curtain detects a defect while initializing or operating. OSSD output keeps in OFF state. ※ If the lockout occurs, the dialog box pops up like below. If you click **Show Info**, go to **Error/Warning** and check the history.  ※ For more information on error and warning history, see 8.3 Error and Warning ※ For more information on troubleshooting, see 16 Troubleshooting

4 Get Started

See the overall flowchart in below before starting the atLightCurtain.



4.1 Communication settings

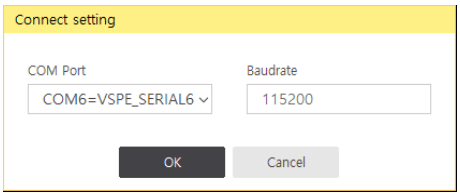


Note

- Click combo box of the COM Port to see the list of available ports.

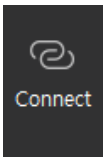
1st Select **Connect Setting.**

2nd Set the COM Port.



3rd Click **OK** to complete the Connect Setting.

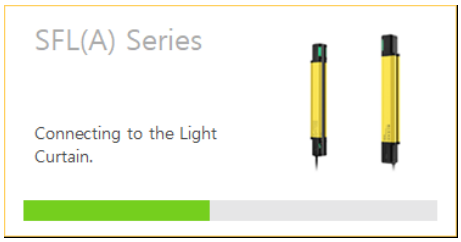
4.2 Connect



1st Complete **Connect Setting** first.

2nd Select **Connect.**

3rd The window showing the progress of connetion pops up, completing the connection with the light curtain.



4.3 Login

atLightCurtain provides two kinds of mode:

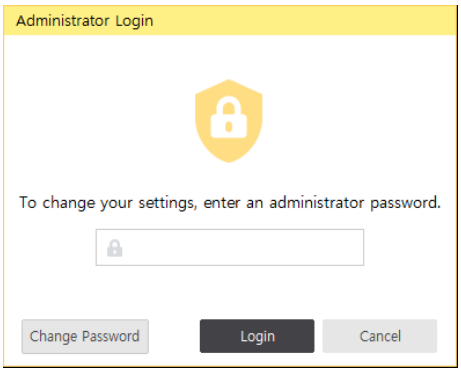
- **Operator mode**: It is only available for the information already set. No password required.
- **Administrator mode**: You can change and manage the settings of the function. Password required. (The initial password is “admin”.) For protection, we recommend that you change the initial password, preventing an unqualified person from accessing the project and settings.

Functions (Ribbon menu)		Access restriction	
		Operator	Administrator
Files	New	O	O
	Open		
	Save		
	Save as		
Communication	Connect	O	O
	Download	X	
	Reset Device	O	
	Connect Setting	O	
Monitoring	Incident Light Lv	O	O
	Wiring/Switch		
	Error/Warning		
Setting	Model	O	O
	Muting	X	
	Blanking		
	Parameters		
Others	Safety distance calculator	O	O

4.3.1 Login as the administrator mode

1st Select Login in the top-right corner of ribbon menu.

2nd Enter your password and login. (Default password: admin)

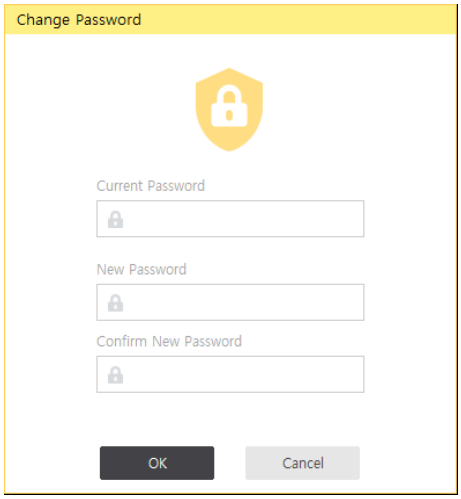


4.3.2 Change your password

1st Select Change Password in the administrator login dialog box.

2nd Enter the current password and new password, and click OK.

(Password can be configured freely depending on your convenience.)



3rd Login with your new password.

Note

- If you forgot the password: You can reset the password by installing atLightCurtain again.

5 Functions

The table below shows the safety-related and other functions with initial values.

Functions		Setting items	Initial value	SFL	SFLA
Safety-related functions	Interlock	Enable start interlock	Disabled	X	O
		Enable restart interlock	Disabled		
	Reset-Hold	Enable	Disabled		
		Timeout	8s		
	EDM	Enable	Disabled		
		Timeout	300ms (0.3s)		
	Muting	Enable	Disabled		
		Muting Zone Settings	All zones		
		Muting Mode	Standard		
		Muting Sequence	1→2		
		Muting Sensor Type	N.O (Mute1, 2)		
		Mute Input Time Limit, Min value	30ms (0.03s)		
		Mute Input Time Limit, Max value	3000ms (3s)		
		Muting Timeout	60s		
		Exit-Only Muting Wait Time	4000ms (4s)		
	Override	Enable	Disabled		
		Min Input Time	3s		
		Timeout	60s		
	Fixed Blanking	Enable	Disabled		
		Zone 1,2,3	—		
		Tolerance	0		
		Error Mode	Warning		
	Floating Blanking	Enable	Disabled		
		Blanking Zone Settings	—		
		Floating Beams	1		
		Tolerance	0		
		Error Mode	Warning		
	Reduced Resolution	Enable	Disabled		
		Ignored Beams	1		

Functions		Setting items	Default values	SFL	SFLA
Other functions	Mutual Interference Prevention	Frequency A or B	Freq. A	X	O
	Sensing Distance	LONG or SHORT	LONG		
	Output Polarity	PNP or NPN	PNP		
	AUX Output Emitter (AUX2)	Output Mode	Error / Lockout		
		Output Phase	Reverse		
		Output Pattern	Light ON		
	AUX Output Receiver (AUX1)	Output Mode	OSSD ON/OFF		
		Output Phase	Reverse		
		Output Pattern	Light ON		
	Lamp Output Emitter (Lamp2)	Enable / Disable	Enabled		
		Output Mode	Muting / Override		
		Output Phase	Normal		
		Output Pattern	Light ON		
		Error Mode	Lockout		
	Lamp Output Receiver (Lamp1)	Enable / Disable	Enabled		
		Output Mode	Muting / Override		
		Output Phase	Normal		
		Output Pattern	Light ON		
		Error Mode	Lockout		

5.1 Combination of functions

- When you configure the safety related functions in atLightCurtain, see the table below.
- For more information about the functions, see "*SFL/SFLA Series user manual.*"

O: available / X: unavailable

	Interlock	Reset Hold	EDM	Muting	Override	Fixed Blanking	Floating Blanking	Reduced Resolution
Interlock	—	O※5	O	O	O	O	O	O
Reset Hold	O※5	—	O	X※1	X※1	X※2	X※2	O
EDM	O	O	—	O	O	O	O	O
Muting	O	X※1	O	—	O	O※3	O※3	X
Override	O	X※1	O	O	—	O	O	X
Fixed Blanking	O	X※2	O	O※3	O	—	O※4	X
Floating Blanking	O	X※2	O	O※3	O	O※4	—	X
Reduced Resolution	O	O	O	X	X	X	X	—

※1. The auxiliary output of emitter (AUX2) and reset-hold functions are not available when the muting or override is activated.

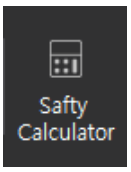
※2. The functional combination of the reset-hold with fixed blanking and floating blanking is unavailable.

※3. Both the muting zone and blanking zone can be set simultaneously.

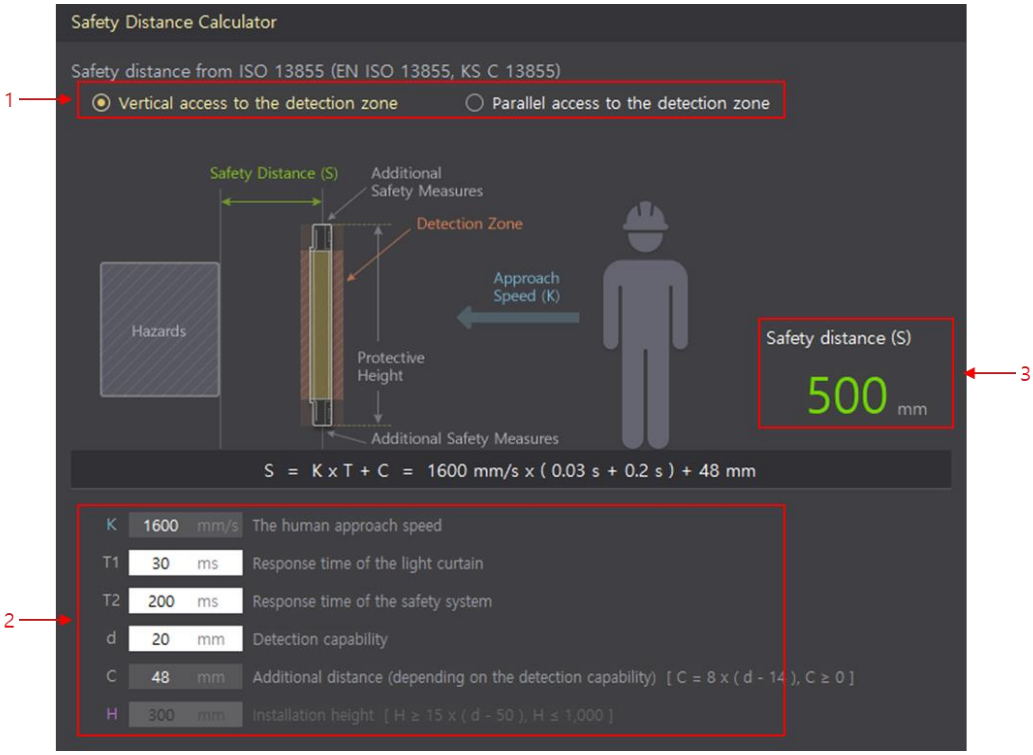
※4. Both fixed and floating blanking functions are simultaneously configurable, but the zone of the two functions cannot be overlapped.

※5. The reset-hold function is available only when the manual reset is enabled.

5.2 Safety Distance Calculator



- You can calculate the safety distance that the light curtain must be installed from the hazards according to ISO 13855 (EN ISO 13855, KS C 13855).
- The calculation method for safety distance may differ based on the laws, regulations, and standards. Be sure to install the light curtains under the appropriate calculation method of the country.
- For more information about the safety distance, see "*SFL/SFLA Series user manual*."



No.	Name	Description
1	Types of approach direction	Calculation formula will be applied based on the types of the approach direction of the body or part of the body and detection zone. (1) Vertical access to the detection zone (2) Parallel access to the detection zone
2	Part of input	Enter the values for the formula. **K** — The human approach speed (mm/s) ※ The K is automatically set based on the detection capability (d). **T1** — Response time of the light curtain (ms) **T2** — Response time of the safety system (ms) **d** — Detection capability (mm)

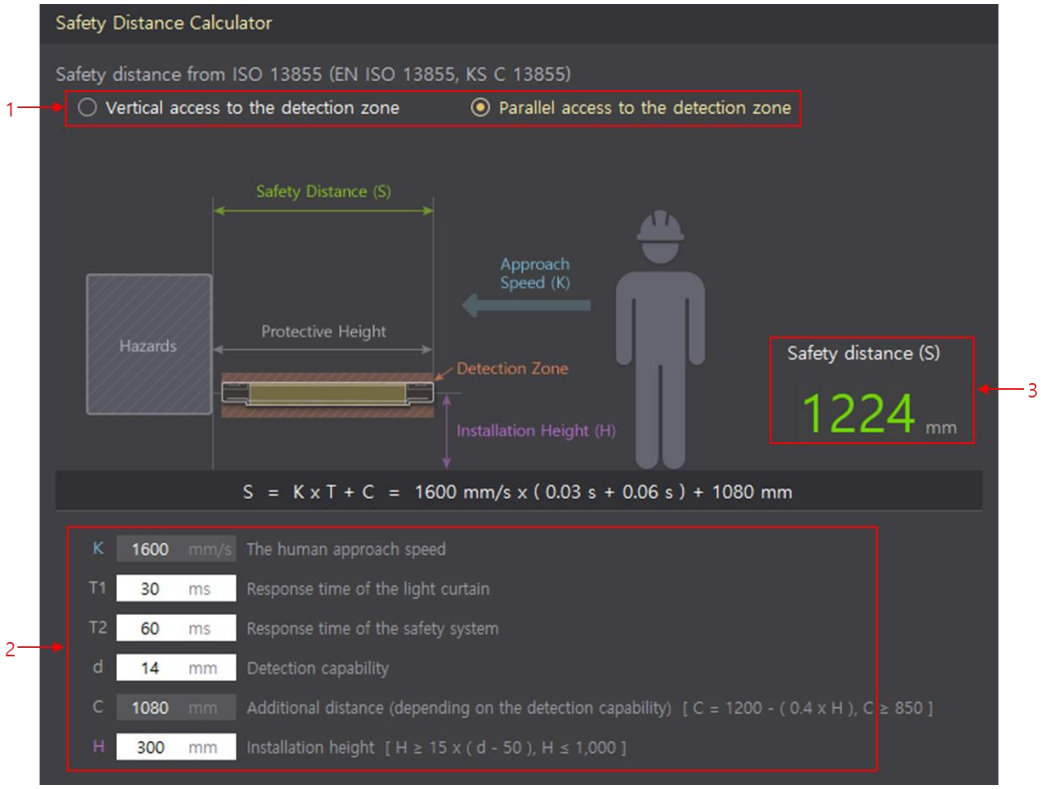
No.	Name	Description
		C Additional distance depending on the (d) (mm). ※The C is calculated based on the detection capability (d) or installation height (H). **H** Installation height (mm) ※The H is only activated under the condition for parallel access to the detection zone.
3	Result value	You can see the calculated safety distance (S).

Ex.

- Calculate the safety distance when the approach direction of the body or a part of the body and detection zone of the light curtain are positioned in parallel with the following condition.

※**Condition**

Parameters		Input value
T1	Response time of the light curtain (ms)	30
T2	Response time of the safety system (ms)	60
d	Detection capability (mm)	14
H	Installation height (mm)	300



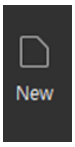
1st Select **Parallel access to the detection zone**.

2nd Enter the values for T1, T2, d, and H.

3rd Check the safety distance.

6 Manage files

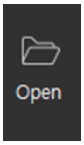
6.1 New



Create a new project file and initialize all setting values of atLightCurtain.

1st Go to **New**, then select either initialize all settings or not.

6.2 Open

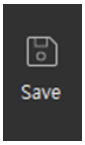


Open the saved project file(*.lcp). Only the one project file can be activated in the atLightCurtain.

1st Go to **Open**

2nd Select the project file and click **Open(O)**.

6.3 Save



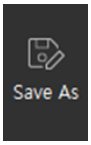
Save all settings you configured as a project file in the atLightCurtain.

- New project: Save the current settings as a new project file
- Existing project: Write values you changed to the existing project file and save it.

1st Go to **Save**

2nd Check the location and enter a file name, and click **Save(S)**

6.4 Save As



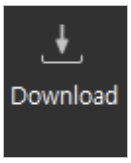
Save all settings you configured as a project file with a different name in the atLightCurtain.

1st Go to **Save As**

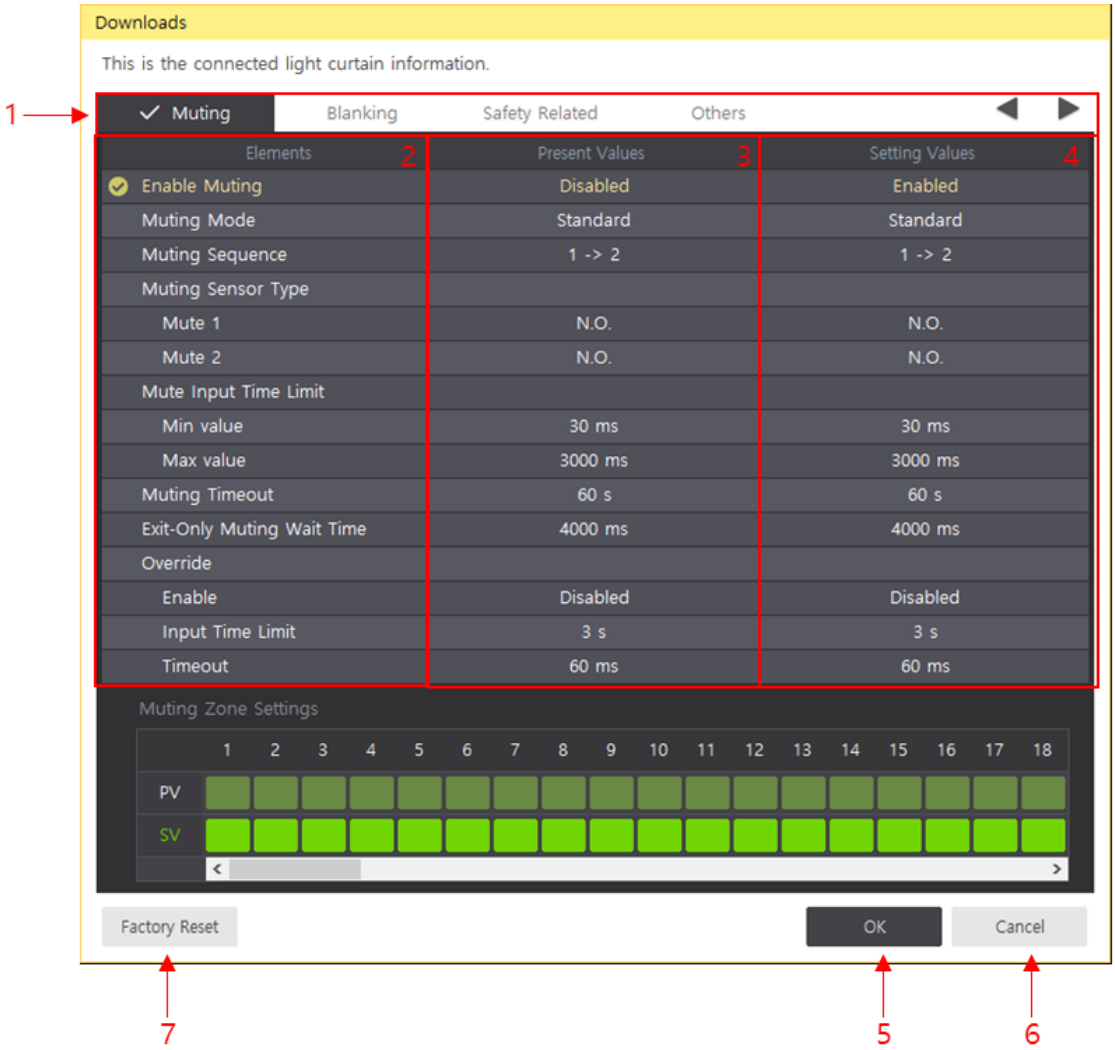
2nd Check the location and enter a file name, and click **Save(S)**

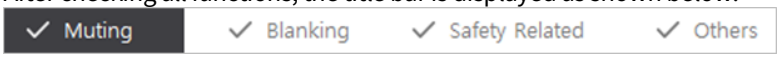
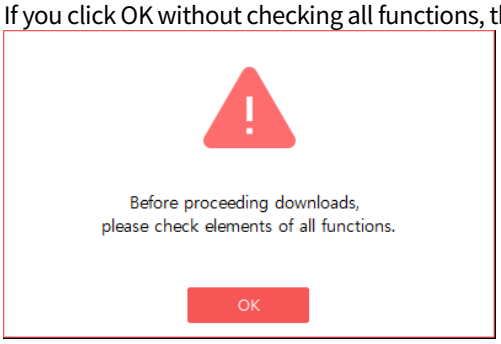
7 Send settings to your light curtain

7.1 Download



- This function is only available for the administrator.
- You can send the setting values of atLightCurtain to the connected light curtain or initialize the light curtain via Factory Reset.



No.	Name	Description
1	Title bar	If consists of the functions: Muting, blanking, safety related and others. You can check the setting information by clicking each function or ◀ ▶ After checking all functions, the title bar is displayed as shown below.  If you click OK without checking all functions, the dialog box pops up like below. 
2	Elements	Display the list of items to configure in each function. shows an element that the present value and setting value are different.
3	Present Value	The values saved in the connected light curtain.
4	Setting Value	The values configured by atLightCurtain.
5	OK	Proceed to the download.
6	Cancel	Cancel the download.
7	Factory Reset	Restore the connected light curtain to the factory settings. ※ Error and warning logs are not initialized.

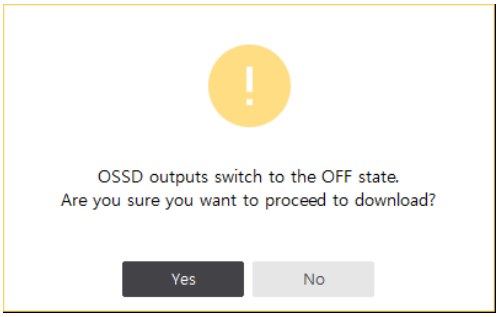
7.1.1 Use download function

1st Go to **Download**.

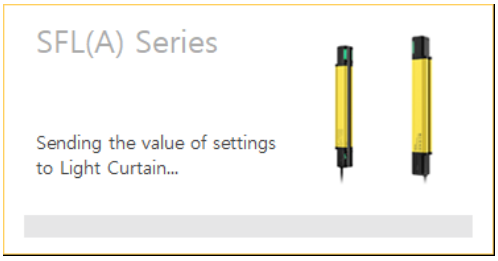
2nd The downloads dialog box pops up.

3rd Check the all setting values about the functions: Muting, blanking, safety-related and others.
You have to check all elements to proceed with the download.

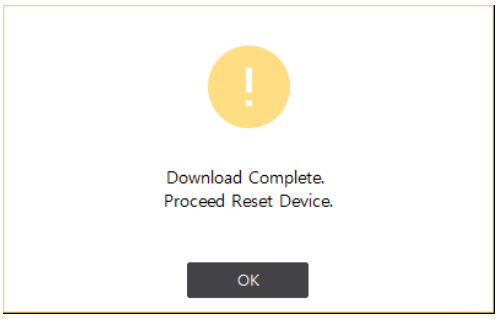
4th Click **OK** and the dialog box in below pops up.



5th Click **Yes** and the connected light curtain will begin to download the setting values of atLightCurtain.

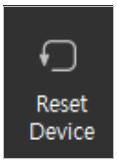


6th When the light curtain completes the download, the dialog box in below pops up.



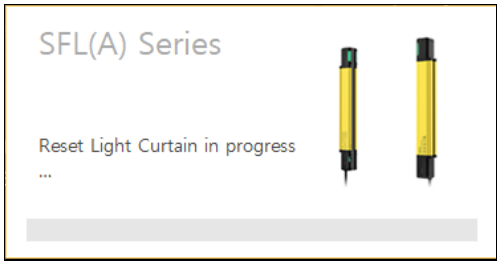
7th Click **OK**.

7.2 Reset Device



- It makes the light curtain to start again and execute a self-test for applying the settings. The current operating status of the light curtain is initialized and returns to the normal state.
- You can use the reset device function in these situations: The light curtain goes to the lockout condition due to an error or not return to the normal state from the PC setting state.

1st Go to **Reset Device**.



2nd The light curtain starts again.

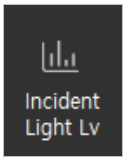
Note

- To apply the PC settings to the light curtain after the self-test, set the position 8 of setting switches on the emitter and receiver to ON for PC setting.

8 Monitor your light curtain

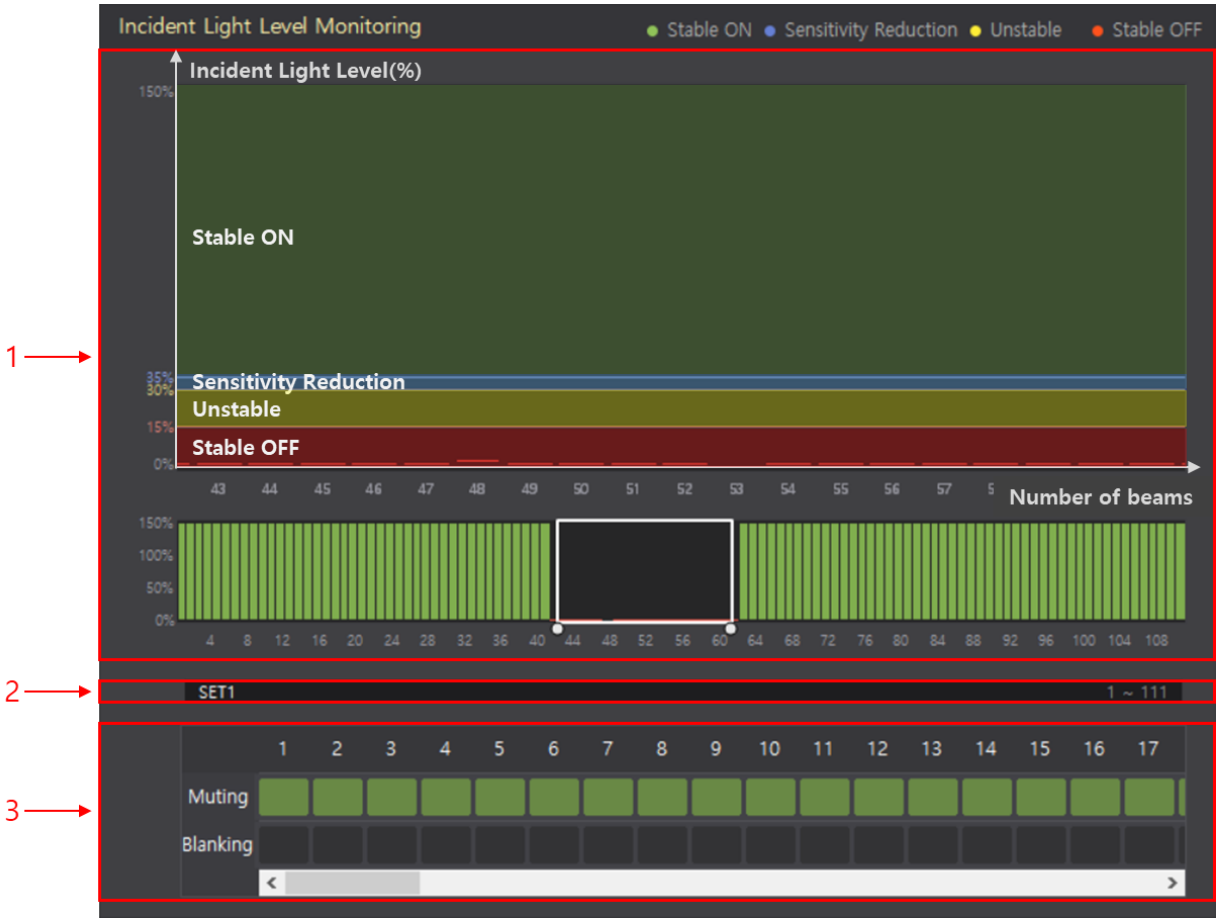
SFL and SFLA support this function.

8.1 Incident light level



- You can monitor the incident light level of each beam of the connected light curtain. It displays four-colored bar graphs based on the criteria for incident light level.
- For more information about the functions, see "*SFL/SFLA Series user manual*."
- Criteria for incident light level

	Incident Light Level (%)	OSSD output
Stable ON	35 to 150	ON
Sensitivity Reduction	30 to 35	ON
Unstable	15 to 30	ON or OFF
Stable OFF	0 to 15	OFF



No.	Name	Description
1	Screen of incident light level	Displays the incident light level of each beam of the connected light curtain.
2	SET (no.)	Displays the number of beams in each SET of the series connection.
3	Muting and blanking zones	Displays muting and blanking zones of the connected light curtain. Color / Zone No setting value Muting Fixed blanking Floating blanking

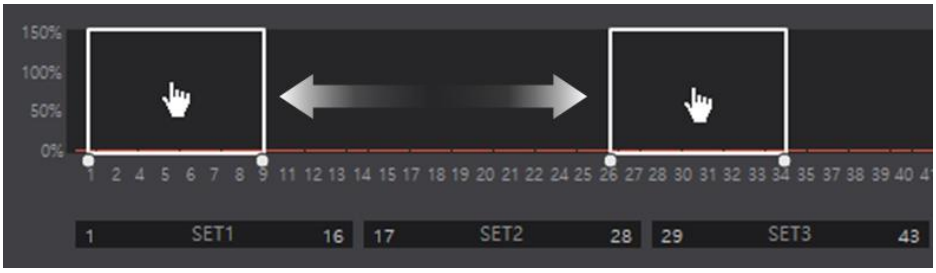
8.1.1 Select the incident light level

1st Select beams to monitor.

At the end of the white square box, the mouse cursor is changed to the double-headed arrow. Click and drag to adjust its width as you want to monitor. At that time, refer to the total number of each SET. You can change the width more easily.

The number of beams in each SET

2nd Click inside the adjusted area and drag. You can monitor the incident light level as same number of beams.



3rd You can monitor the incident light level in the enlarged screen.

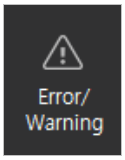
8.2 Wiring and switch

- You can check wiring status of pin connectors and settings of the switch or PC.

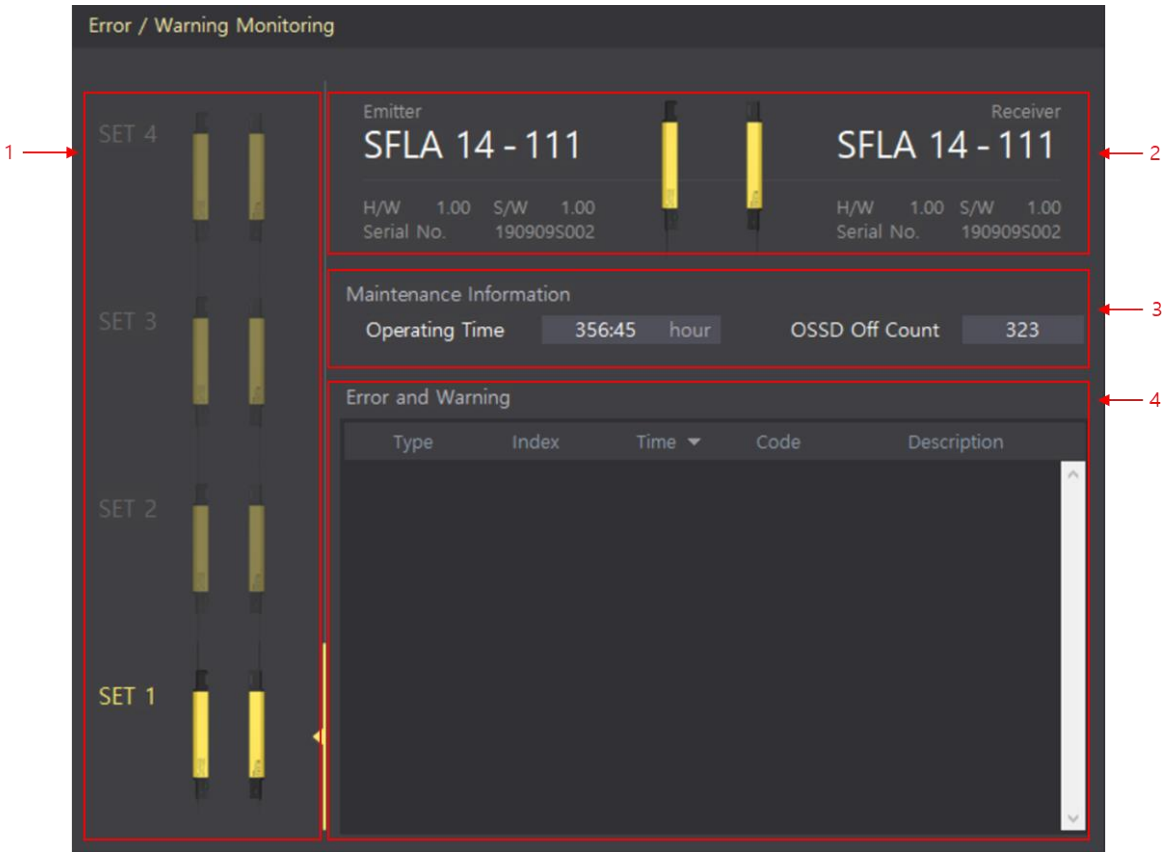
<table>
<tr><th>No.</th><th>Screen</th><th>Description</th></tr>
<tr><td>1</td><td>Wiring status</td><td>Displays the function assigned to the pin positions of the connected light curtain.
The table below shows the color and assigned function.
The functions in each pin connector are shown in white or gray letters.
• White: Input or output is activated and ON state.
• Gray: Input or output is deactivated and OFF state
<table>
<tr><th>Pin No.</th><th>Color</th><th>Emitter</th><th>Receiver</th></tr>
<tr><td>1</td><td>Blue</td><td>0V</td><td>0V</td></tr>
<tr><td>2</td><td>Orange</td><td>Reset-Hold Input / Mute 1 Input</td><td>EDM Input</td></tr>
<tr><td>3</td><td>Yellow</td><td>RS485(B)</td><td>RS485(B)</td></tr>
<tr><td>4</td><td>Red</td><td>RS485(A)</td><td>RS485(A)</td></tr>
<tr><td>5</td><td>Pink</td><td>AUX 2 Output / Mute 2 Input</td><td>AUX 1 Output</td></tr>
<tr><td>6</td><td>Black</td><td>External Test Input</td><td>OSSD 1 Output</td></tr>
<tr><td>7</td><td>White</td><td>Reset Input</td><td>OSSD 2 Output</td></tr>
<tr><td>8</td><td>Brown</td><td>+24VDC</td><td>+24VDC</td></tr>
</table></td></tr>
<tr><td>2</td><td>Switch status</td><td>Displays the setting information based on the state of the position 8 of setting switch.
The values of current mode are displayed in yellow.

• The state of the no.8 switch position is OFF: Switch setting mode
<table>
<tr><th>Switch Configurations</th><th>Emitter</th><th>Receiver</th><th>PC</th></tr>
<tr><td>1 Polarity</td><td>PNP</td><td>PNP</td><td>PNP</td></tr>
<tr><td>2 Sensing Distance</td><td>LONG</td><td>LONG</td><td>LONG</td></tr>
<tr><td>3 Frequency</td><td>B</td><td>B</td><td>A</td></tr>
<tr><td>4 Reset-Hold</td><td>X</td><td>X</td><td>X</td></tr>
<tr><td>5 Interlock</td><td>AUTO</td><td>AUTO</td><td>AUTO</td></tr>
<tr><td>6 EDM</td><td>X</td><td>X</td><td>X</td></tr>
<tr><td>7 Muting</td><td>X</td><td>X</td><td>O</td></tr>
<tr><td>8 Switch / PC</td><td>Switch</td><td>Switch</td><td>-</td></tr>
</table>
• The state of the no.8 switch position is ON: PC setting mode
<table>
<tr><th>Switch Configurations</th><th>Emitter</th><th>Receiver</th><th>PC</th></tr>
<tr><td>1 Polarity</td><td>PNP</td><td>PNP</td><td>NPN</td></tr>
<tr><td>2 Sensing Distance</td><td>LONG</td><td>LONG</td><td>LONG</td></tr>
<tr><td>3 Frequency</td><td>A</td><td>A</td><td>A</td></tr>
<tr><td>4 Reset-Hold</td><td>X</td><td>X</td><td>X</td></tr>
<tr><td>5 Interlock</td><td>AUTO</td><td>AUTO</td><td>AUTO</td></tr>
<tr><td>6 EDM</td><td>X</td><td>X</td><td>X</td></tr>
<tr><td>7 Muting</td><td>X</td><td>X</td><td>O</td></tr>
<tr><td>8 Switch / PC</td><td>PC</td><td>PC</td><td>-</td></tr>
</table></td></tr>
</table>

8.3 Error and Warning

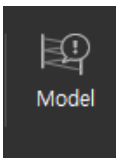


- You can check the product and product life cycle information, and error and warning history of the connected light curtain.



No.	Name	Description
1	Series connection	Displays the light curtain in series connection as each SET
2	Product information	Displays the product information of each SET • Hardware version • Software version • Serial number
3	Product life cycle	Displays the maintenance information of each SET • Operating Time: The time when the power of light Curtain is supplied and have operated. • OSSD Off Count: The number of times that the OSSD output is switched from ON to OFF state. ※ The maintenance information is updated every 15 minutes.
4	Error and warnings	Displays error and waring history of each SET Double click the error to see the cause and measures. ※ The warning log is deleted when the light curtain is turned off. ※ In the factory reset, error and warning logs are not initialized. ※ For more information on troubleshooting, *see 16 Troubleshooting.*

9 Model



9.1 Manage project file in offline mode

- Create one or more models to manage project file when the light curtain is not connected to the PC (offline mode).
- When you create a model in the offline mode, the specifications - configuration of SFL or SFLA, detection capability and number of beams, etc. – of light curtain must meet that of the light curtain to be connected. You can send the setting values to the light curtain when this condition is satisfied.
- If you want to configure the light curtain as series connection, the total number of beams of SFL is up to 300 beams and SFLA is up to 400 beams.
- In offline mode, you can try muting, blanking and parameter settings. You can also create, save and modify the project files in advance. It takes advantage of the environments where you need to apply the same settings to many light curtains.

9.1.1 Create a model

1st To create a model, click  (To delete a model, click )

2nd Select the detection capability.

3rd Select the number of beams.

4th You can figure out a model name is changed by selecting the detection capability and number of beams.

9.1.2 Send the project file

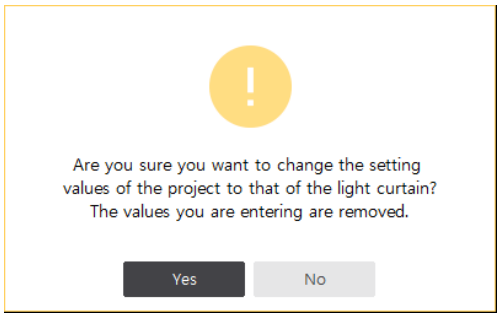
1st Create a model.

2nd Set values of muting, blanking and parameters. And click **Save** or **Save As** to save your project.

3rd Click **Open** and select a project file you want to use.

4th To connect the light curtain to the PC, go to **Connect**.

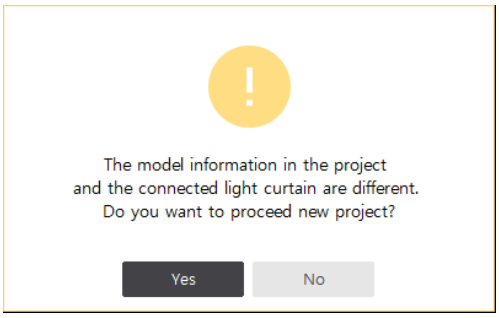
(1) In case of the created model and connected light curtain are **same**: The dialog box pops up like below.



• If you click **Yes**, the settings of connected light curtain is applied to the atLightCurtain.

• If you click **No**, the project file you selected remains. Click **Download** to set your light curtain as the project file.

(2) In case of the created model and connected light curtain are **different**: The dialog box pops up like below.



• If you click **Yes**, the settings of conencted light curtain is applied to the atLightCurtain.

• If you click **No**, stop connecting to light curtain.

9.2 Import model of your light curtain

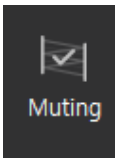
- When the light curtain is connected to your PC, the model information of the light curtain is automatically imported.
- You cannot create or remove the model in this case.

1st Check the model name, hardware and software version, and serial number of the connected light curtain.

2nd Check the detection capability.

3rd Check the number of beams.

10 Muting

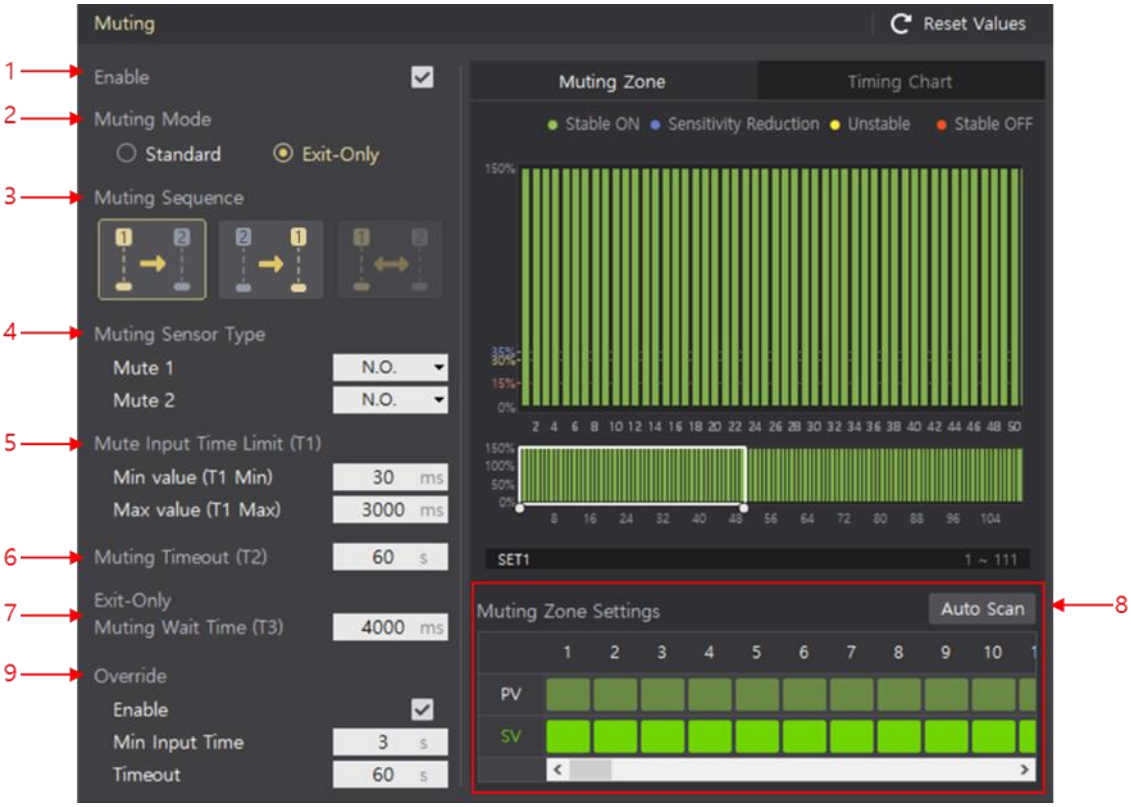


- This function is available in the administrator mode. You can set muting and override functions and check the muting zone and its timing chart.
- There are functions affected by activating or inactivating the muting and blanking. If you change the settings of muting and blanking in atLightCurtain, please check these functions again.
  - Reduced resolution
  - Reset-hold
  - Auxiliary output of the emitter (AUX2)

Note

- For more information on the muting function, see "*SFL/SFLA Series user manual.*"
- To check the initial values, see *5 Functions.*

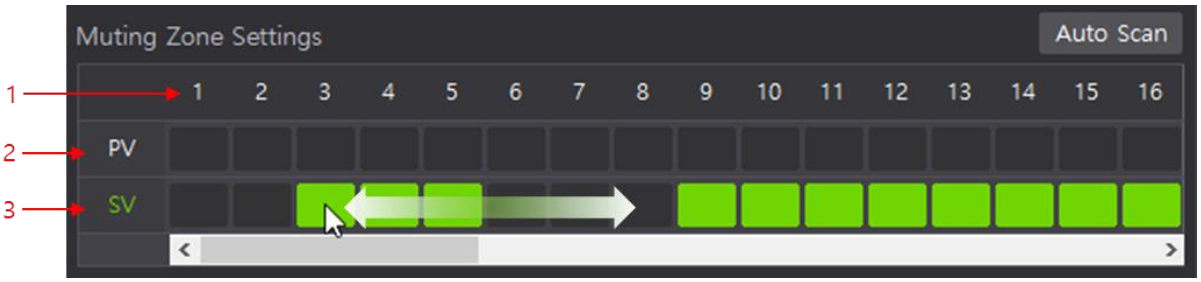
10.1 Set muting function



※ **Follow the order in the table below to set the muting function.**

No.	Function	Description
1	Enable	Click the checkbox to set the muting function. You can set the override function when enabling the muting function.
2	Muting Mode	You can set the standard or exit-only mode. (1) Standard: Starts and ends the muting function based on the external input conditions. (2) Exit-Only: Keeps the muting condition until an opaque object is completely removed. ※ In Exit-Only mode, the muting sequence (1↔2) is deactivated.
3	Muting Sequence	You can set the specific input sequence of the muting sensors (mute1 and mute2) where the muting function starts. Muting sequence: 1→2, 2→1, 1↔2
4	Muting Sensor Type	You can set the contact type of the muting sensors based on the output polarity (PNP and NPN). (1) N.O: Normally open contact type (2) N.C: Normally closed contact type
5	Mute Input Time Limit (T1)	You can set the time period from mute 1 input to mute 2 input. Setting range of Min value (T1 Min): from 30 to 3,900ms (from 0.03 to 3.9s) Setting range of Max value (T1 Max): from 100 to 10,000ms (from 0.1 to 10s)
6	Muting Timeout (T2)	You can set the duration of muting condition. Setting range: from 0 to 3,600s
7	Exit-Only Muting Wait Time (T3)	You can set the exit-only muting wait time (T3) However, the muting mode should be set to exit mode. Setting range: from 100 to 4,000ms (from 0.1 to 4s)
8	Muting Zone Settings	You can set the muting zone manually or automatically.
9	Override	(1) Enable: Click the checkbox to set the override function. (2) Min Input Time: You can set the time period that the reset input is in off state to start the override function. Setting range: from 1 to 5s (3) Timeout: You can set the duration of the override condition. Setting range: from 0 to 60s

10.2 Manual setting of muting zone



No.	Name	Description
1	Number of beams	It is the beam number of the light curtain.
2	PV	The present value of the connected light curtain.
3	SV	The muting zone you set via atLightCurtain is displayed in green. The muting zone can be set discontinuously. • How to set the muting zone: Drag a range of beams to be muting zone, or click an end beam, hold down the shift key, and click the other end beam again.

⚠ **Warning**	• **When you use the auto scan for muting zone via atLightCurtain, the OSSD output may temporarily go to ON state due to the operation of line or facilities for scan and measurement. Therefore, safety measures in workplace shall be implemented.** If there is a risk, take additional safety measures, such as installing an additional safety guard. • **After setting or changing the function of light curtain via atLightCurtain, check that light curtain operates as you intended.** Failure to follow this instruction may result in personal injury.

10.3 Automatic setting of muting zone

- Auto Scan function makes you setup the muting conveniently and straightforwardly. This function provides you the right settings of the muting zone and time for your installation environment through detecting the equipment operation during the Scan Time. Also, you can modify the values suggested by Auto Scan, helping a flexible response depending on the situation.

(1) Before using the auto scan function

- Make sure that all beams are clear.
- Make sure that there are no objects in the detection zone.
- Inspect the operation of the muting sensors and check whether there is no detection object in the sensing area of the sensors.
- Check whether the wiring, output types and setting switches are suitable for using the muting function.

(2) Set the muting zone and time

1st Connect your PC with the light curtain

2nd Click check box of **Enable** on the Muting menu.

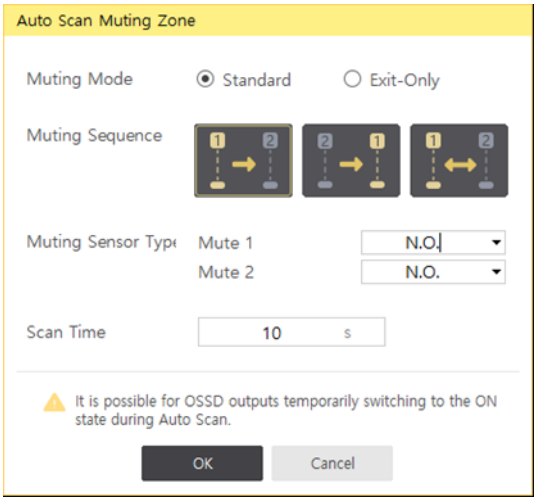
3rd To active the muting function, select **Download**.

4th See timing chart tab of the muting menu and check the muting sensor's installation environment and the time the object passes. The mute 1 and mute 2 inputs, and the duration of the light ON/OFF condition must be satisfied.

5th Put the object outside the area of the muting sensor.

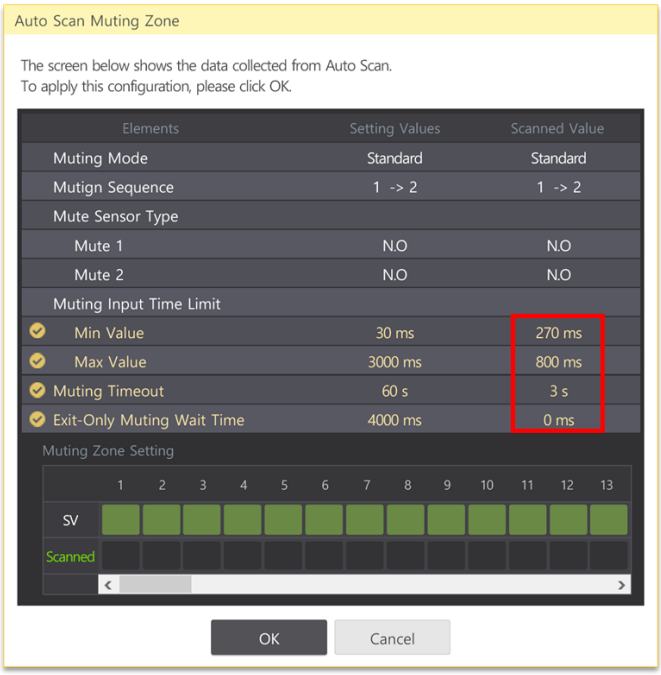
6th Click Auto Scan

7th Set the muting mode, muting sequence, muting sensor type and scan time, and click OK to start the scan. Set the Scan Time to have a longer value than the time that the object passes through the muting sensors and the light curtain. However, measurement is only possible for object that passes once within the scan time. (setting range of scan time: 1 to 600 s)



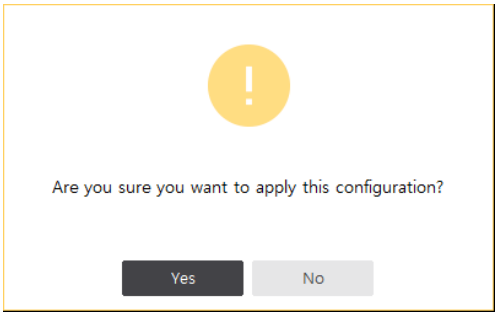
8th Click **OK** to start Auto Scan. The blocked beams after the mute 1 and mute 2 input are set to the muting zone.

9th After completing the scan, you can check the setting values, scanned values and muting zone. (If the setting values and scanned values are different, is marked.)

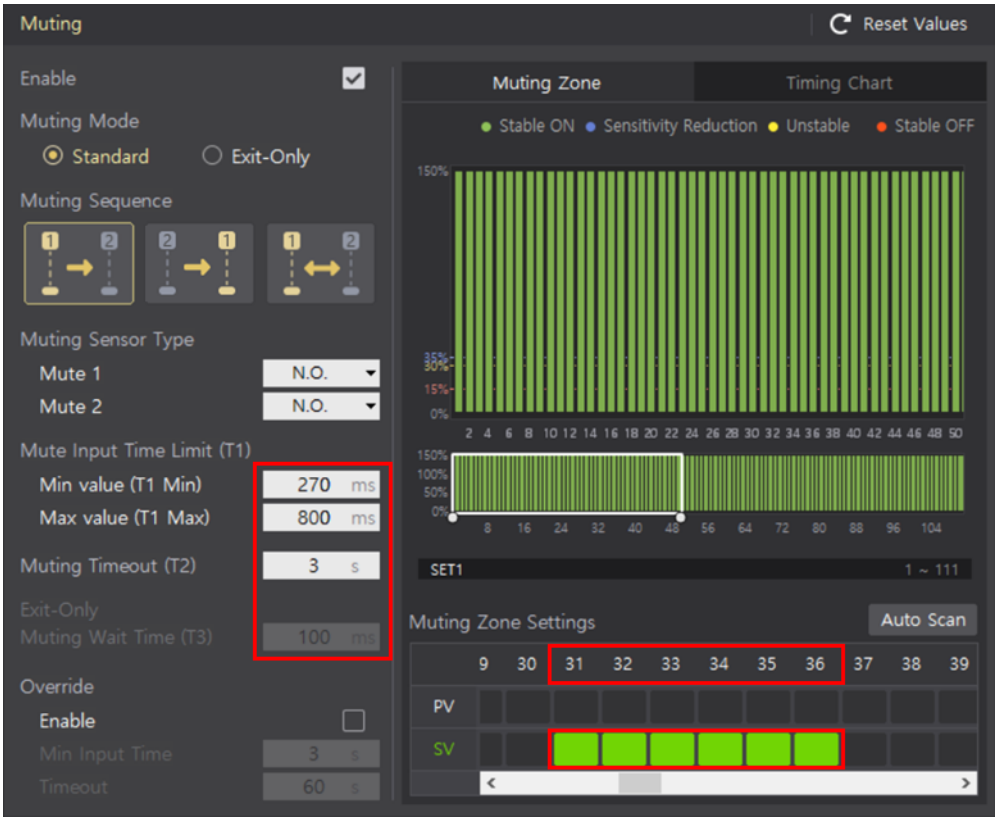


10thClick **OK** and the dialog box pops up like below.

Click **Yes** to change the setting value to the scanned value.



11thThe muting zone and time have been set automatically.



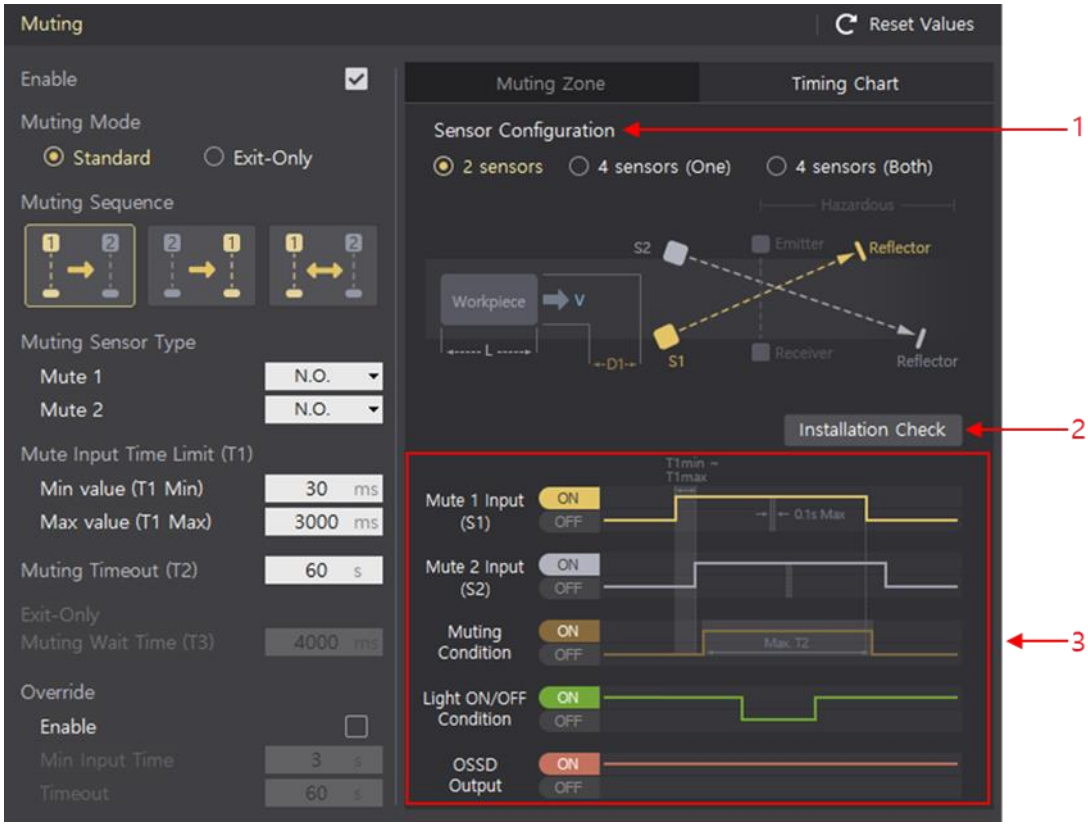
Note

- You can modify the scanned value in the setting screen.
- When the Auto Scan fails, click Show Info to see how to fix the problem. For more information, see *16.3 Error displays of muting zone.*

10.4 Muting Timing Chart

Note

- The installation environment and timing chart shown in the PC setting tool are examples for your understanding. Be sure to check the light curtain operates in the actually installed site as intended.



No.	Name	Description
1	Sensor Configuration	You can select the sensor configuration to use for the muting function. (1) In case of the standard mode: • 2 sensors: It shows the installation environment and timing chart when using two muting sensors. • 4 sensors (One direction): It shows the installation environment and timing chart when the object moves to one direction with using four muting sensors. • 4 sensors (Both directions): It shows the installation environment and timing chart when the object moves to both directions with using four muting sensors.

No.	Name	Description
		(2) In case of the exit-only mode: • 2 sensors: It shows the installation environment and timing chart when using two muting sensors.
2	Installation Check	To check the muting sensor's installation in advance, enter the length of the object (L), the velocity of the object (V), and the distance between where each muting sensor firstly detects the object (D).
3	Muting Timing Chart	You can check the timing chart based on the muting mode, muting sequence and sensor configuration.

10.4.1 Use installation check

1st Click Installation Check

2nd The dialog box for the installation check pops up.

Enter values for L, V, and D to meet the two formulas presented in the figure above.

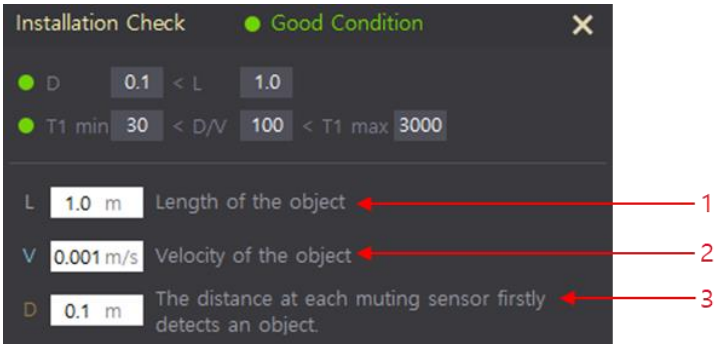
In the formula, the T1 min and T1 max are minimal, and the maximum amount of mute input time limit (T1) entered to set the muting function.

If both formulas are met, the installation environment is displayed as Good Condition

if not, Bad Condition

Ex.

- In case of selecting two sensors as the sensor type



1st Enter L value: a length of the object

2nd Enter V value: a velocity of the object

3rd Enter D value: a distance at each muting sensor firstly detects the object

4th Be sure to check the values satisfy both formulae.

11 Blanking

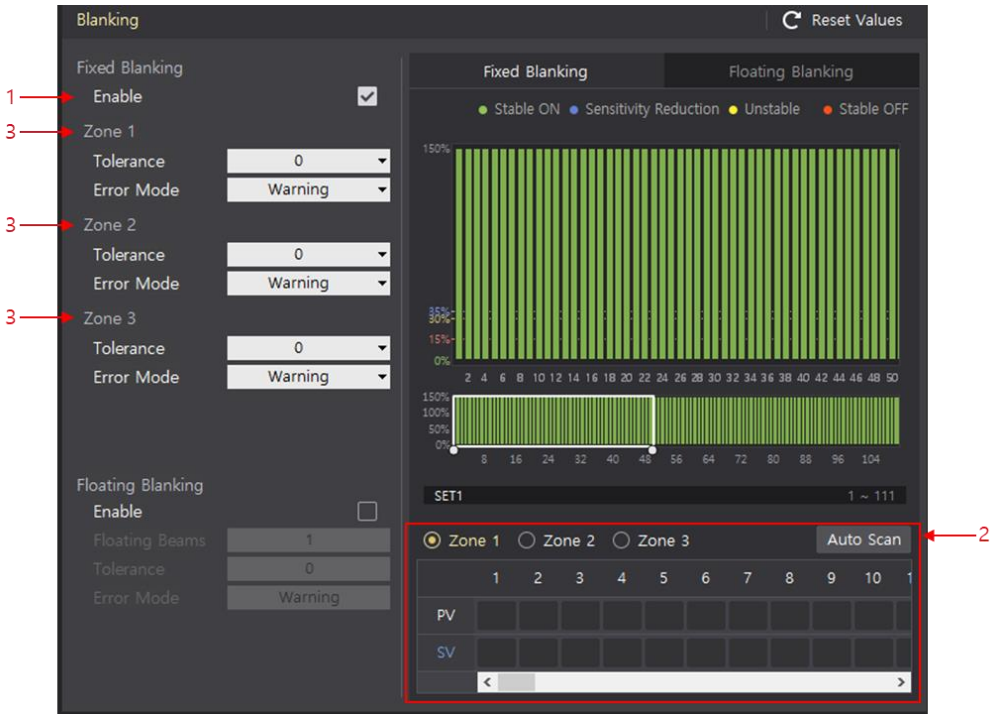
- This function is available in the administrator mode. You can set fixed and floating blanking function. Both fixed and floating blanking functions are simultaneously configurable, but the zone of the two functions cannot be overlapped.
- There are functions affected by activating or inactivating the muting and blanking. If you change the settings of muting and blanking in atLightCurtain, please check these functions again.
  - Reduced resolution
  - Reset-hold
  - Auxiliary output of the emitter (AUX2)

11.1 Fixed Blanking

Note

- For more information on the fixed blanking, see "*SFL/SFLA Series user manual.*"
- To check the initial value, see *5 Functions*.

11.1.1 Set fixed blanking function



※ **Follow the order in the table below to set the fixed blanking function.**

No.	Function	Description
1	Enable	Click the checkbox to set the fixed blanking function.
2	Fixed Blanking Zone Settings	You can set the fixed blanking zone manually and automatically.
3	Zone 1, 2, 3	You can set the tolerance and the error mode for each blanking zone. Setting range of tolerance: from 0 to 2 Setting range of error mode: warning, lockout

11.1.2 Manual setting of fixed blanking zone

No.	Name	Description
1	Zone	You can set the fixed blanking zone up to 3.
2	Number of beams	It is the beam number of the light curtain.
3	PV	The present value of the connected light curtain.
4	SV	The fixed blanking zone you set via atLightCurtain is displayed in blue. The fixed blanking in each zone can only be set continuously. • How to set the fixed blanking zone: Drag a range of beams to fixed blanking zone, or click an end beam, hold down the shift key, and click the other end beam again.

Note

- For more information on the setting conditions for the blanking zone, see *"SFL/SFLA Series user manual."*

⚠ **Warning**	• **If you use the auto scan function for the fixed blanking zone via atLightCurtain, the OSSD output temporarily goes to the OFF state.** The operating status of the light curtain can be changed. • **After setting or changing the function of light curtain via atLightCurtain, check that light curtain operates as you intended.** Failure to follow this instruction may result in personal injury.

11.1.3 Automatic setting of fixed blanking zone

- Auto Scan function makes you setup the fixed blanking conveniently and straightforwardly. This function provides you the right settings of the fixed blanking zone for your installation environment through detecting the equipment operation during the Scan Time. Also, you can modify the values suggested by Auto Scan, helping a flexible response depending on the situation.

(1) Before using the auto scan function

- Make sure that all beams are clear.
- Place an object that always block the certain beams within the detection zone of the light curtain.

(2) Set the fixed blanking zone

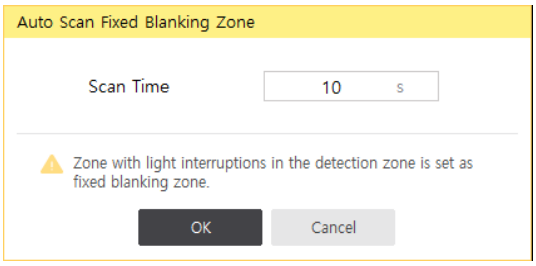
1st Connect the light curtain to the PC

2nd Click check box of **Enable** on the Blanking menu.

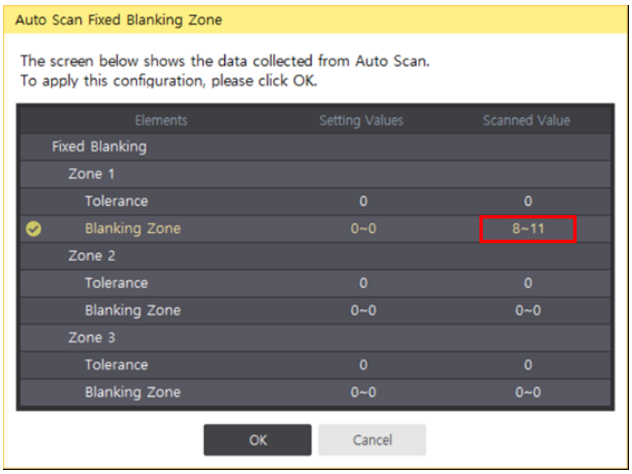
3rd Activate the fixed blanking function of the light curtain.

4th Click Auto Scan

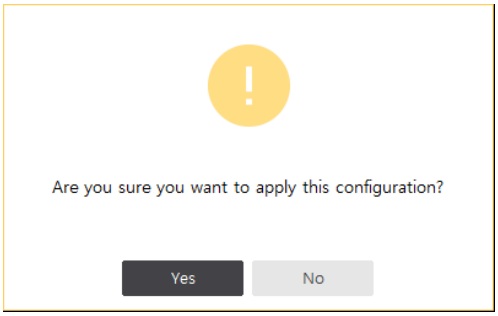
5th Enter a scan time and click OK to search for the blocked beams.
(setting range of the scan time: 1 to 600s)



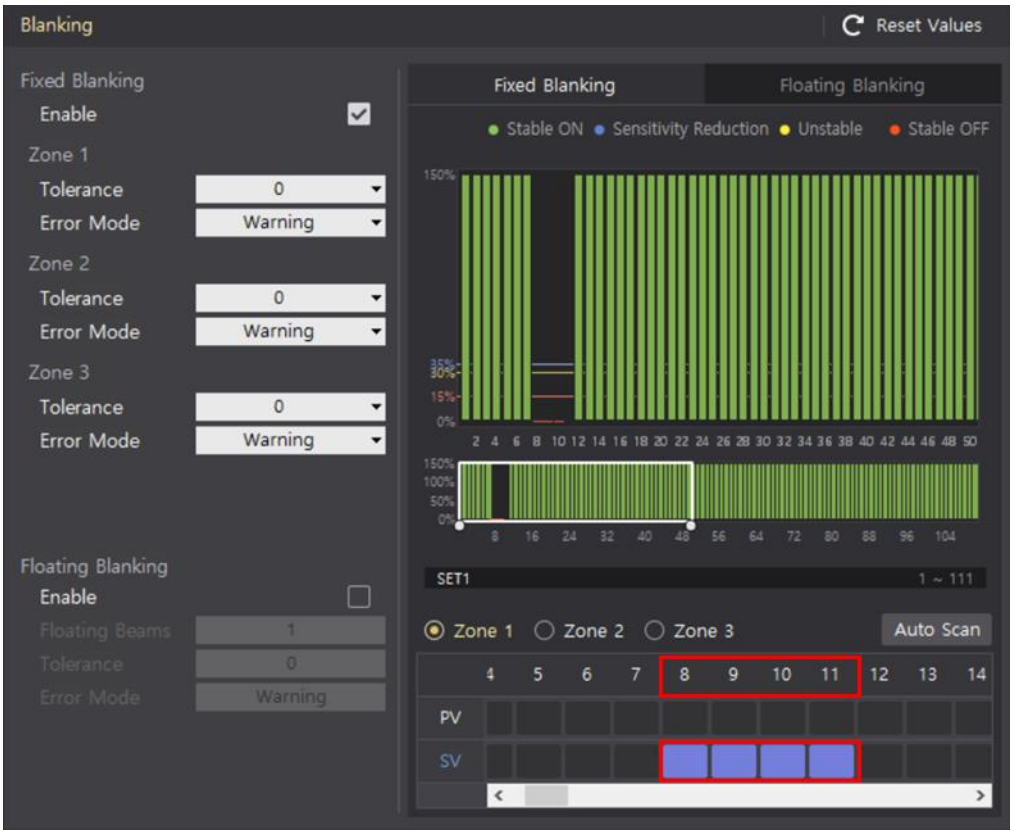
6th After completing the scan, you can check the setting and scanned values.
(If these values are different, is marked.)



7th Click **OK** and the dialog box pops up like below.
Click **Yes** to change the setting value to the scanned value.



8th The fixed blanking zone is set automatically.



Note

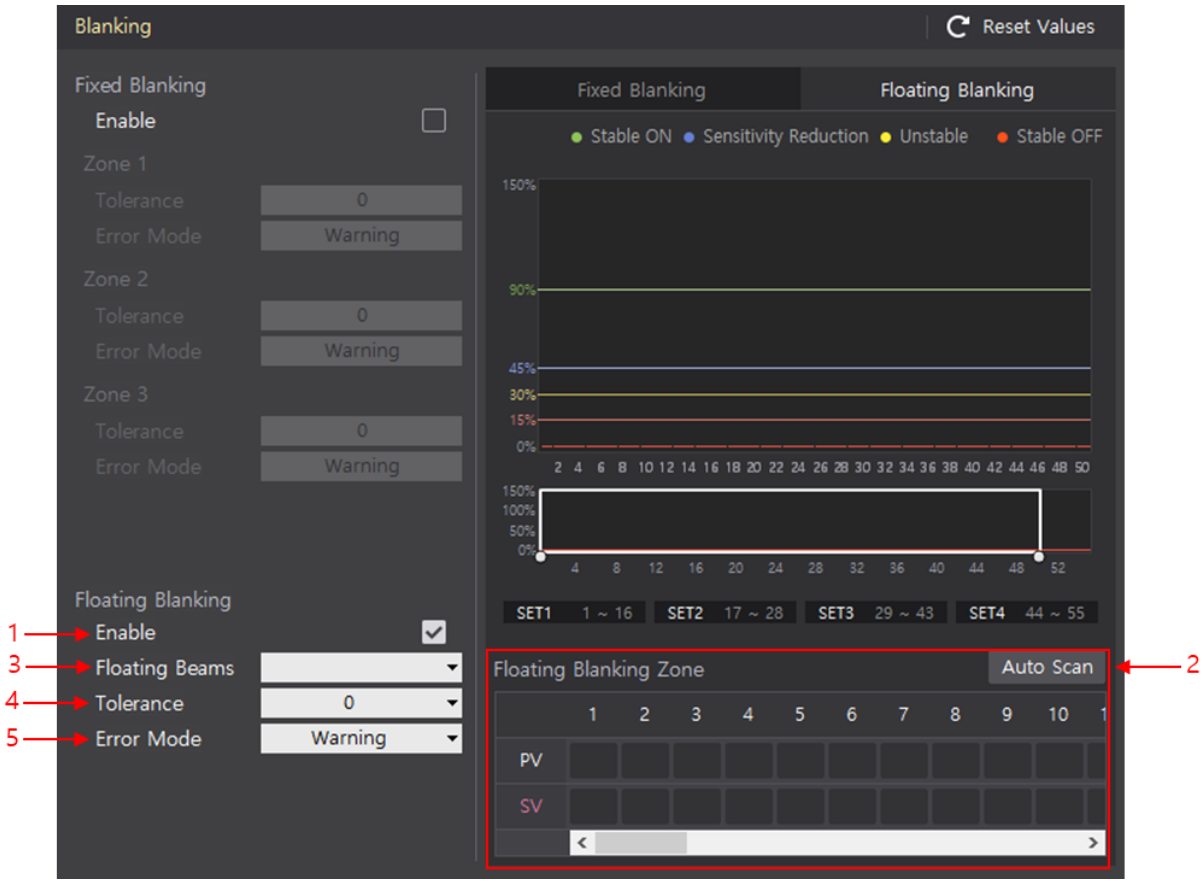
- You can modify the scanned value in the setting screen.
- When the Auto Scan fails, click Show Info to see how to fix the problem. For more information, see *16.4 Error displays of blanking zone.*

11.2 Floating Blanking

Note

- For more information on the floating blanking function, see *"SFL/SFLA Series user manual."*
- To check the initial values, see 5 *Functions.*

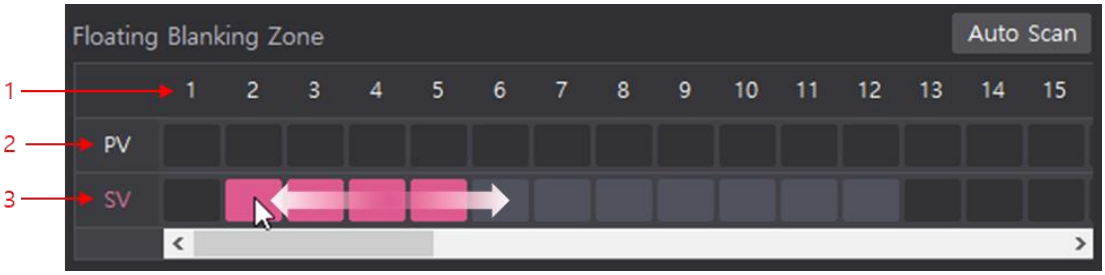
11.2.1 Set floating blanking function



※ Follow the order in the table below to set the floating blanking function.

No.	Function	Description
1	Enable	Click the checkbox to set the floating blanking function.
2	Floating Blanking Zone Settings	You can set floating blanking zone manually and automatically.
3	Floating Beams	You can partially set one floating blanking zone with continuous beams. Setting range: from 1 to 15
4	Tolerance	You can set the tolerance for the floating blanking zone. Setting range: from 0 to 5
5	Error Mode	You can set the error mode of floating blanking zone. Setting range: warning, lockout

11.2.2 Manual setting of floating blanking zone



No.	Name	Description
1	Number of beams	It is the beam number of the light curtain.
2	PV	The present value of the connected light curtain.
3	SV	The floating blanking zone you set via atLightCurtain is displayed in pink. The floating blanking zone can only be set continuously. • How to set the floating blanking zone: Drag a range of beams to be floating blanking zone, or click an end beam, hold down the shift key, and click the other end beam again.

Note

- For more information on the setting conditions for the blanking zone, see *"SFL/SFLA Series user manual."*

⚠ **Warning**	• **If you use the auto scan function for the floating blanking zone via atLightCurtain, the OSSD output temporarily goes to the OFF state.** The operating status of the light curtain can be changed. • **After setting or changing the function of light curtain via atLightCurtain, check that light curtain operates as you intended.** Failure to follow this instruction may result in personal injury.

11.2.3 Automatic setting of floating blanking zone

- Auto Scan function makes you setup the floating blanking conveniently and straightforwardly. This function provides you the right settings of the floating blanking zone for your installation environment through detecting the equipment operation during the Scan Time. Also, you can modify the values suggested by Auto Scan, helping a flexible response depending on the situation.

(1) Before using the auto scan function

- Make sure that all beams are clear.
- Place an object that moves as the amount of the specific beams within the detection zone of the light curtain.

(2) Set the floating blanking zone

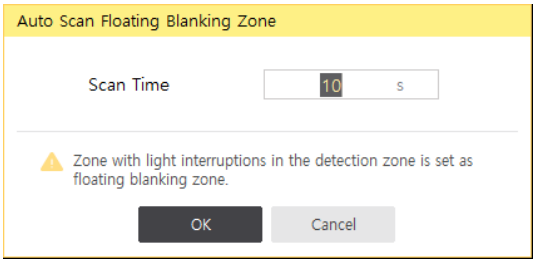
1st Connect the light curtain to the PC

2nd Click check box of **Enable** on the Blanking menu

3rd Activate the floating blanking function of the light curtain.

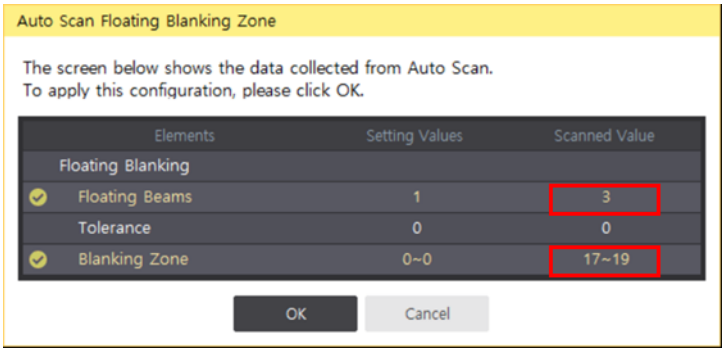
4th Click Auto Scan

5th Enter a scan time and click OK to search for the blocked beams.
(setting range of the scan time: 1 to 600s)



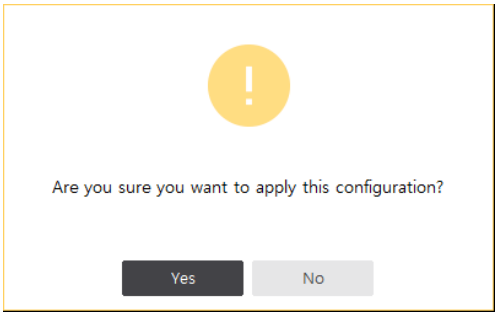
6th After completing the scan, you can check the setting and scanned values.

(If these values are different, is marked.)

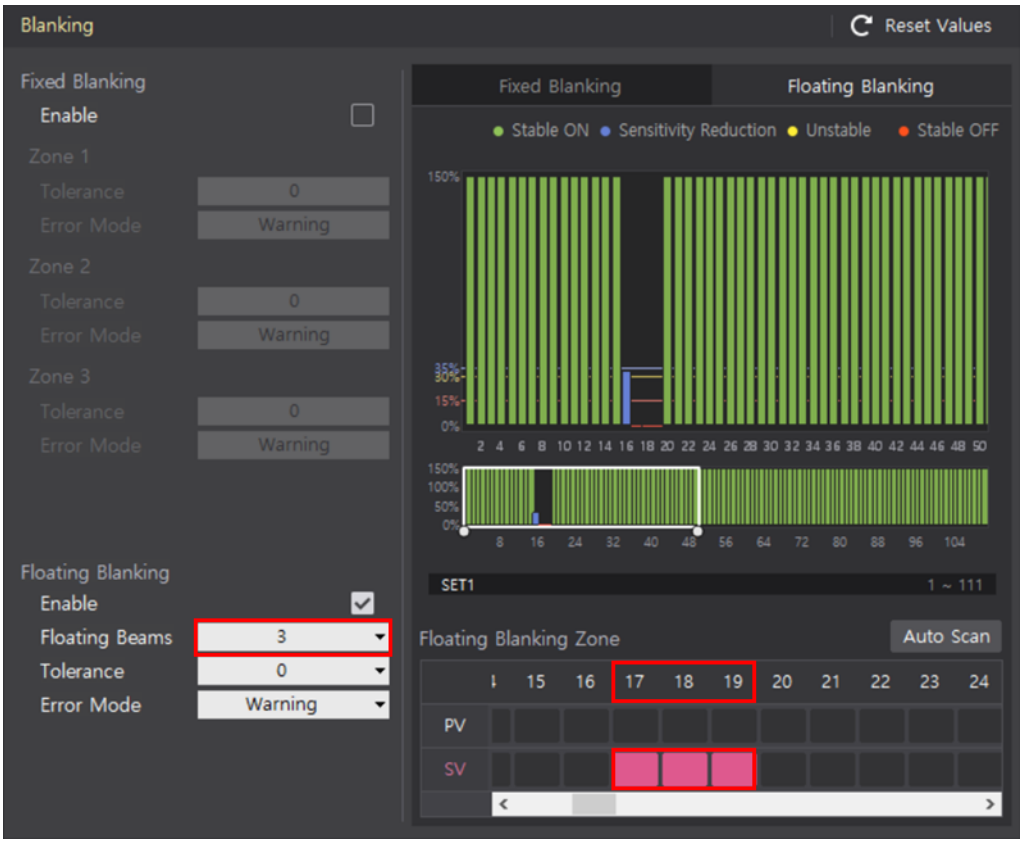


7th Click **OK** and the dialog box pops up like below.

Click **YES** to change the setting value to the scanned value.



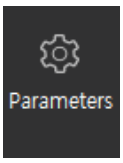
8th The floating blanking zone is set automatically.



Note

- You can modify the scanned value in the setting screen.
- When the Auto Scan fails, click Show Info to see how to fix the problem. For more information, see *16.4 Error displays of blanking zone*.

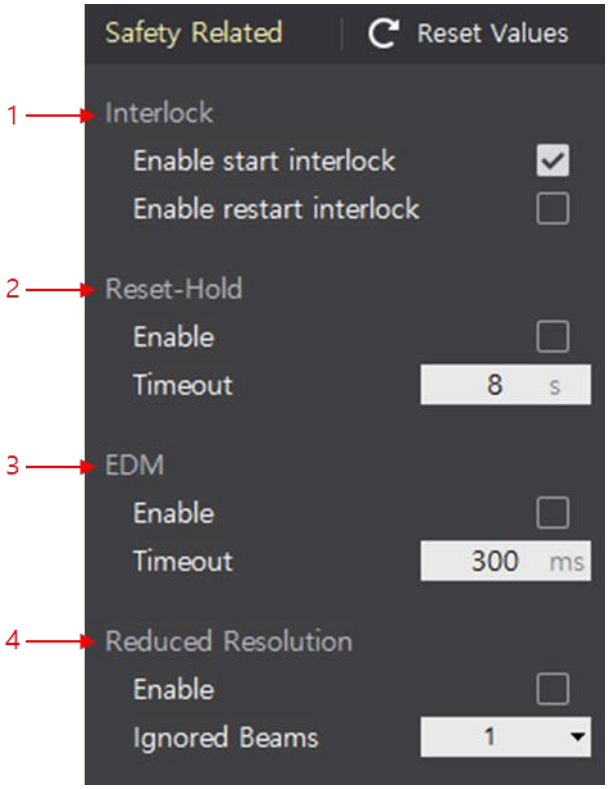
12 Parameters



12.1 Safety related functions

Note

- For more information on the safety related functions, see *"SFL/SFLA Series user manual."*
- To check the initial values, see *5 Functions.*
- For more information on the combination of the safety related functions including reset-hold and reduced resolution, see *5.1 Combination of functions.*



No.	Function	Description
1	Interlock	• Enable start interlock: It keeps the OSSD outputs in the OFF state, without being switched to ON state, when the power of the light curtain is ON, or a lockout reset occurs. • Enable restart interlock: When the beams are interrupted during the operation, the OSSD output maintains the OFF state even if the beams become clear. • You can set the interlock release method (reset method)※ with four interlock combinations.

No.	Function	Description
2	Reset-Hold	• Enable: Click the checkbox to set the reset-hold function • Timeout: You can set a time range that reset input occurs after reset-hold input is applied to release the interlock condition. Setting range: from 1 to 60s
3	EDM	• Enable: Click the checkbox to set EDM function. • Timeout: You can set a time range that the EDM input is allowed to monitor external devices. If it is out of the time, the light curtain enters to lockout condition. Setting range: from 100 to 4,000ms (from 0.1 to 4s)
4	Reduced Resolution	• Enable: Click the checkbox to set the reduced resolution function • Ignored Beams: You can set the maximum number of beams, allowing beams are blocked. Setting range: from 1 to 3

※ Interlock release method (reset method)

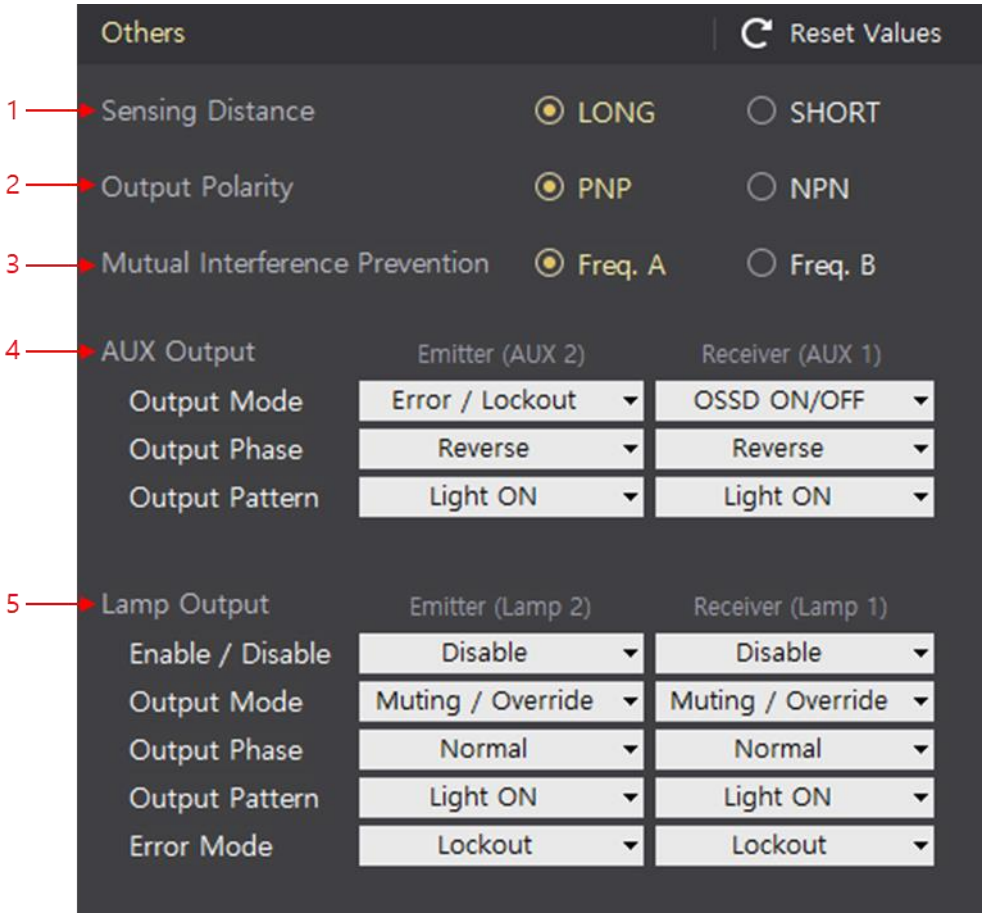
(✓: activated, —: deactivated)

Enable start interlock	Enable restart interlock	Interlock release function
—	—	Auto reset
✓	—	Manual reset
—	✓	
✓	✓	

12.2 Other functions

Note

- For more information on other functions, see *"SFL/SFLA Series user manual."*
- To check the initial values, see *5 Functions.*
- For more information on the combination of functions related to auxiliary output, see *5.1 Combination of functions.*



No.	Function	Description
1	Sensing Distance	You can set LONG or SHORT mode. The sensing distance is set based on the selected mode and detection capability of the light curtain.

Sensing distance mode	Detection capability	Sensing distance
LONG	Finger	0.2 to 10m
	Hand, body	0.2 to 15m
SHORT	Finger	0.2 to 5m
	Hand, body	0.2 to 8m

<table>
<tr><th>No.</th><th>Function</th><th>Description</th></tr>
<tr><td>2</td><td>Output Polarity</td><td>You can set the input level (ON/OFF) based on the output type of the light curtain.
<table>
<tr><th>Output type</th><th>ON voltage</th><th>OFF voltage</th></tr>
<tr><td>PNP</td><td>9 to 24VDC</td><td>Open or 0 to 3VDC</td></tr>
<tr><td>NPN</td><td>0 to 3VDC</td><td>Open or 9 to 24VDC</td></tr>
</table>
※ For more information on wiring connection based on the output polarity, see “SFL/SFLA Series user manual.”</td></tr>
<tr><td>3</td><td>Mutual Interference Prevention</td><td>By changing the frequency, you can prevent mutual interference between the light curtains.
• Frequency A or B</td></tr>
<tr><td>4</td><td>AUX Output</td><td>The AUX outputs are non-safety related output to monitor the state of the light curtain. Each one is assigned to the bottom of the emitter and receiver.
<table>
<tr><th>Function</th><th>Setting item</th><th>Setting value</th></tr>
<tr><td>Emitter (AUX2)</td><td>Output mode</td><td>※1</td></tr>
<tr><td></td><td>Output phase</td><td>Normal, reverse</td></tr>
<tr><td></td><td>Output pattern</td><td>Light ON, flashing</td></tr>
<tr><td>Receiver (AUX1)</td><td>Output mode</td><td>※1</td></tr>
<tr><td></td><td>Output phase</td><td>Normal, reverse</td></tr>
<tr><td></td><td>Output pattern</td><td>Light ON, flashing</td></tr>
</table></td></tr>
<tr><td>5</td><td>Lamp Output</td><td>The Lamp output is non-safety related output to monitor the state of the light curtain. Each one is assigned to the top of the emitter and receiver. Use the dedicated lamp output cable (SFL-LC) to connect a lamp.
<table>
<tr><th>Function</th><th>Setting item</th><th>Setting value</th></tr>
<tr><td>Emitter (Lamp2)</td><td>Enable/Disable</td><td>Enable, disable</td></tr>
<tr><td></td><td>Output mode</td><td>※1</td></tr>
<tr><td></td><td>Output phase</td><td>Normal, reverse</td></tr>
<tr><td></td><td>Output pattern</td><td>Light ON, flashing</td></tr>
<tr><td></td><td>Error mode</td><td>Warning, lockout, none</td></tr>
<tr><td>Receiver (Lamp1)</td><td>Enable/Disable</td><td>Enable, disable</td></tr>
<tr><td></td><td>Output mode</td><td>※1</td></tr>
<tr><td></td><td>Output phase</td><td>Normal, reverse</td></tr>
<tr><td></td><td>Output pattern</td><td>Light ON, flashing</td></tr>
<tr><td></td><td>Error mode</td><td>Warning, lockout, none</td></tr>
</table></td></tr>
</table>

※1. The details of output mode

Output Mode	Description
OSSD ON/OFF	The OSSD output is in the ON state.
Error / Lockout	The light curtain is in the error or lockout condition.
Warning	The light curtain is in the warning condition.
Muting / Override	The muting or override function is activated.
Blanking	The blanking function is activated.
Blanking Error	All beams of fixed or floating blanking zone are not blocked.
External Test	The external test input is in the ON state.
Interlock	The interlock function is activated.
Reset-Hold	The light curtain is in the reset-hold wait time.
Light ON/OFF	All beams are clear and stable.
Sensitivity Reduction※	The incident light level falls to less than sensitivity reduction level.

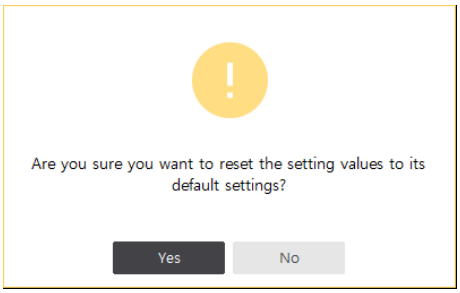
※ When the current incident light level lasts for 30 minutes, with 15 to 30% of the maximum level, the alarm occurs to notice the sensitivity reduction. For more information on the incident light level, see *"SFL/SFLA Series user manual."*

13 Reset

You can initialize muting, blanking and parameter settings.

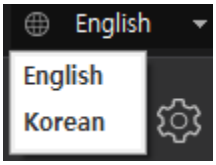
1st Click Reset Values

2nd Click **Yes** to restore the setting values you are creating to the initial values.



14 Change language

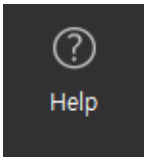
1st Click the **Korean** or **English** button at the top of the ribbon menu.



2nd Select the language you want to use.

15 Help

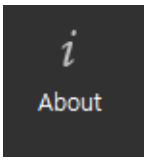
15.1 Help



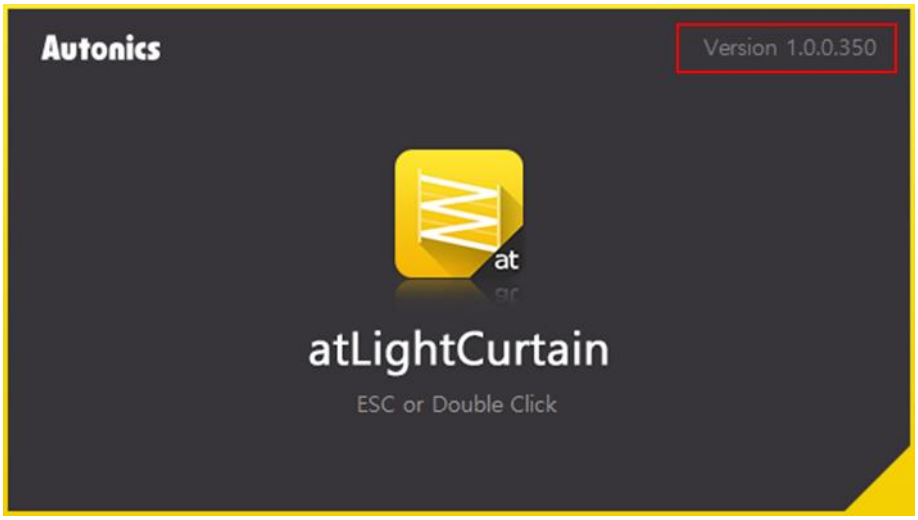
You can see the user manual(*.pdf) of atLightCurtain.

The user manual is available in Korean or English, depending on the selected language.

15.2 Software information

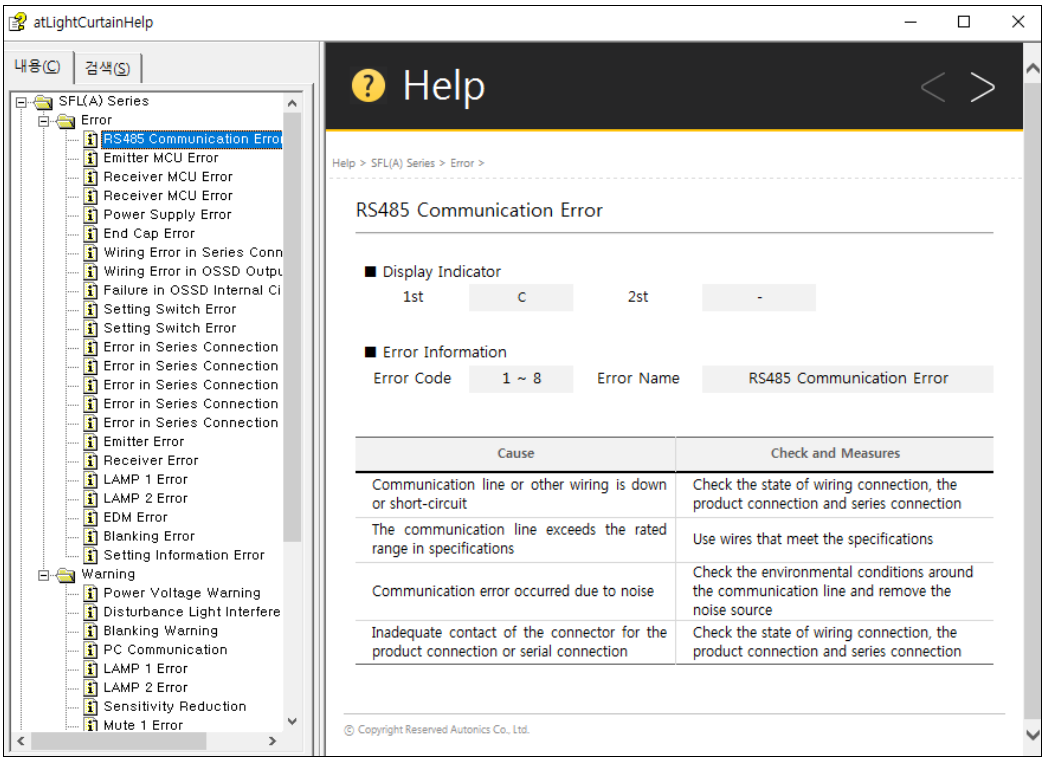


You can check the version information on atLightCurtain.



16 Troubleshooting

If an error occurs in the light curtain or when using the auto scan function, you can check the error information as shown below.



16.1 Error displays of light curtain

If an error occurs in the light curtain, be sure to stop operation and take measures.

For more information, see *"SFL/SFLA Series user manual."*

Error code	Error name	Cause	Check and measures
1–8	RS485 Communication Error (Communication error between Emitter and Receiver)	Communication line or other wiring is broken or short-circuited.	Check the power I/O cable and series connection cable.
		The communication line does not meet the specifications.	Use wires that meet the specifications.
		Communication error occurred due to noise.	Check the environmental conditions around the communication line and remove the noise source.
		Contact failure occurred at the connector of power I/O cable or that of series connection cable.	Check the power I/O cable and series connection cable.
10–14	Emitter MCU Error	Error is detected at the internal MCU of the emitter.	Replace the emitter.
20–24	Receiver MCU Error	Error is detected at the internal MCU of the receiver.	Replace the receiver.
30–33			
40–41	Power Supply Error	Power voltage is out of the rated range.	Connect to the rated power voltage (24VDC±20%).
			Use the dedicated power supply. Do not use the power with other devices.
50, 52	End Cap Error	The end cap is assembled incorrectly or is not connected.	Check the connection of the end cap.
51, 53	Incorrect Series Connection	The series connection is incorrect.	Check the connection of the series connection cable.
60–64	Wiring Error in OSSD Outputs	The wire of OSSD 1 or 2 is broken or short-circuited.	Check whether the wiring connection of OSSD 1 or 2 output is correct.
		The OSSD 1 or 2 output is affected by external noise.	Check whether an external noise is flowing through the wiring of the OSSD 1 or 2 output and remove the noise source.
		Too much current flows into the OSSD 1 or 2 output.	Check the load connected to the wiring of OSSD 1or 2 output meets the rated range.
		The output of OSSD 1 or 2 is invalid.	Check whether the wires of OSSD 1 or 2 output are correctly connected or replace the receiver.
65–66	Failure in OSSD Internal Circuit	The internal circuit of the OSSD 1 or 2 output is broken.	Replace the receiver

Error code	Error name	Cause	Check and measures
70	Setting Switch Error	The positions of the setting switch on the emitter and the receiver are not the same.	Check whether the settings of setting switch on the connected emitter and receiver are the same.
			In case of the series connection, check whether the settings of setting switch of the each master set are the same.
71		The positions of the setting switch on the emitter and the receiver are changed during operation.	Check whether the settings of setting switch are the same as the settings before the operation.
			In the series connection, check whether the settings of setting switch on the master set are the same as before the operation.
80–82	Error in Series Connection	The series connection is incorrect.	Check the series connection cable.
83		The series connection is configured with the combination of SFA and SFLA.	Check whether the series connection is configured with combination of SFL and SFLA.
84		The series connection is configured with the combination of the emitter and the receiver.	In the series connection, check whether the connection is configured with combination of the emitter and receiver.
85		The configuration of series connection exceeds the rated range.	In case of the series connection, check whether the total number of connected light curtain (SET) is within the rated range.
86			In case of the series connection, check whether the total number of optical axes of the connected light curtains is within the rated range.
90–94	Emitter Error	The internal circuit of emitter is broken or the internal setting is invalid.	Replace the emitter.
100–106	Receiver Error	The internal circuit of receiver is broken or the internal setting is invalid.	Replace the receiver
110–111	Lamp 1 Error	The wire of lamp 1 output is broken or short-circuited.	Check whether the wiring of lamp 1 output is correct.
		Too much current flows into the lamp 1 output.	Check whether the load that is connected to the lamp 1 output meets the rated range.
112–113	Lamp 2 Error	The wire of lamp 2 output is broken or short-circuited.	Check whether the wiring of lamp 2 output is correct.
		Too much current flows into the lamp 2 output.	Check whether the load that is connected to the lamp 2 output meets the rated range.
120–121	EDM Error	The EDM input is not normally applied.	Check the external devices (e.g. Relay).
		The contact of the EDM input terminal is invalid.	Check the connection of external devices (e.g. Relay).
		The EDM input is not applied within the time limit.	Check the response time of external devices (e.g. Relay).

Error code	Error name	Cause	Check and measures
122–123	Blanking Error	The beams of the fixed blanking zone are clear. (except for the tolerance)	Check whether there is a detection object in the fixed blanking zone.
		The number of blocked beams is less than a certain level. (The number of beams of the floating blanking - tolerance)	Check whether there is a detection object in the floating blanking zone.
124	Setting Information Error	The muting and reset-hold are activated at the same time.	On the setting switch of the connected emitter and receiver, check whether the muting and reset-hold are activated at the same time.
150	Internal System Error	An error occurs in the internal system of the light curtains.	Replace the emitter or the receiver.

16.2 Warning displays of light curtain

If a warning occurs in the light curtain, the light curtain is in the normal operating state but take measures. For more information, see *"SFL/SFLA Series user manual."*

Warning code	Warning name	Cause	Check and measures
1–2	Power Voltage Warning	Power voltage is in unstable condition.	Connect to the rated power voltage (24VDC±20%).
			Use the dedicated power supply. Do not use the power with other devices.
3	Disturbance Light Interference	Receiver is affected by interference of light.	Remove or block the light sources and objects, causing disturbances placed near the receiver.
4–5	Blanking Warning	The optical axis for the fixed blanking zone is not blocked except for the tolerance.	Check whether there is a detection object in the fixed blanking zone.
		The number of blocked optical axes is lower than a certain level. (The number of axes for the floating blanking - tolerance)	Check whether there is a detection object in the floating blanking zone.
6	PC Communication Warning	The setting information transferred from the PC is invalid.	Check whether the product specification or model name is correctly selected in atLightCurtain.
		The download for the setting information is incomplete.	Check the connection with PC and communication status.
7–8	Lamp 1 Warning	Lamp1 output is down or short-circuit.	Check whether the wiring connection of Lamp 1 output is correct.
		Too much current is flowing through the Lamp 1 output.	Check whether the load connected to the Lamp 1 output meets the rating.
9–10	Lamp 2 Warning	Lamp 2 output is down or short-circuit.	Check whether the wiring connection of Lamp 2 output is correct.
		Too much current is flowing through the Lamp 2 output.	Check whether the load connected to the Lamp 2 output meets the rating.
11	Sensitivity Reduction	The sensitivity reduction is occurred.	Check the alignment of the optical axes.
12	Mute 1 Warning	Sensor connected to the MUTE 1 input is in unstable state.	Check the status of muting sensor 1.
13	Mute 2 Warning	Sensor connected to the MUTE 2 input is in unstable state.	Check the status of muting sensor 2.

Note

If you cannot resolve an error and warning with the help, please contact the Autonics.

16.3 Error displays of muting zone

If an error occurs when using the auto scan function, take measures, and start the auto scan again.

Error code	Error name	Cause	Check and measures
1	Auto Scan Canceled	The Auto Scan is canceled by user.	—
2	Exceed Mute Input Time Limit (T1)	It exceeds the mute input time limit (T1).	Adjust the installation environment of muting sensors: location of muting sensors and velocity of detection object, etc. Under these environmental conditions, the difference of mute inputs should be applied within the valid range, from T1 Min value to T1 max value of the mute time limit (T1).
3	Exceed Muting Timeout (T2)	It exceeds the mute timeout (T2).	Adjust the installation environment of muting sensors: location of muting sensors and velocity of detection object, etc. Or extend muting timeout (T2) within the valid range.
4	Exceed Exit-Only Muting Wait Time (T3)	It exceeds the exit-only muting wait time (T3).	Adjust the installation environment of muting sensors: location of muting sensors and velocity of detection object, etc. Or extend exit-only muting wait time (T3) within the valid range.
5	Invalid Muting Sequence	The muting sequence is incorrect.	Install muting sensors in accordance with the selected muting sequence.
		The detection zone of the light curtain is blocked before starting the scan.	Remove the cause of the interruption and arrange all beams to be clear.
6	Invalid Mute Inputs	The first mute input ends before the second mute input is applied.	Check the installation distance (D) between muting sensors and the length (L) of the object and then adjust the installation environment of muting sensors.
7	Auto Scan Terminated Suddenly	The auto scan terminated abnormally during the measurement.	Install the muting sensors in the same way as the settings of muting function in atLightCurtain.
8	Deactivated Muting Function	The muting function is inactivated in the light curtain's internal settings.	Check whether the wiring connections, output type, and settings of setting switch of the light curtain are suitable for using the muting function.

16.4 Error displays of blanking zone

If an error occurs when using the auto scan function, take measures, and start the auto scan again.

Error code	Error name	Cause	Check and measures
1	Auto Scan Canceled	The Auto Scan is canceled by user.	—
2	Exceed Blanking Zone	It does not meet the setting conditions of blanking zone.	Fixed blanking zone: Check the object to block a zone continuously within the three zones.
			Floating blanking zone: Check the object to block a zone continuously within the one zone.
3	Overlapping zone	The measured area overlaps with another blanking zone.	Change the zone not to overlap the previous zone and the blanking zone.
4	Exceed Floating Beams	It exceeds the valid range of floating beam for floating blanking.	Change the number of beams or use an object that meets the valid range.
5	Exceed Tolerance	It exceeds the valid range of tolerance for blanking.	Change the tolerance or check the factors that affect the shape or deformation of the object.
6	No Object Detected	There is no object in the blanking zone.	Put the object on the position you want to use as the blanking zone.

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