atLightCurtain

Safety Light Curtain Software

User Manual MWO-atLightCurtainU1-V2.3-2409US

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.

Autonics

Contents

Preface

Thank you for purchasing Autonics products.
Be sure to read and follow the **Safety Precautions** thoroughly before use.
This manual contains information about the product and how to use it properly, so keep it in a place where users can easily find it.

Manual Guide

- Use the product after fully reading the contents of the manual.
- The manual explains the product functions in detail and does not guarantee the contents other than the manual.
- Any or all of the manual may not be edited or copied without permission.
- The manual is not provided with the product. Download and use from our website (www.autonics.com).
- The contents of the manual are subject to change without prior notice according to the improvement of the product's performance, and upgrade notices are provided through our website.
- The picture of a screenshot may differ depending on the software version.
- We put a lot of effort to make the contents of the manual a little easier and more accurate. Nevertheless, if you have any corrections or questions, please feel free to comment through our website.

Common Symbols in the Manual

Failure to follow instructions may result in serious injury or death.

Failure to follow instructions may result in injury or product damage.

Supplementary explanation of the function

Example of that function

Important information about the feature

Safety Considerations

Observe all 'safety considerations' for safe and proper product operation to avoid hazards.

⚠ 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.
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. **SFL□-□-A models acquired the KCs certification as an industrial robot protection device.**
   Do not use it for any other purpose.
10. **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.
11. **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.
12. **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.
13. **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.
14. **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.
15. **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.
16. **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.
17. **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.

18. **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.
19. **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.
20. **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.
21. **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.**
22. **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.
23. **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.
24. **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.
25. **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.
26. **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.
27. **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.
28. **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 function and result in personal injury or fire.

29. **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.
30. **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.
31. **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.
32. **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.
33. **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.
34. **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.
35. **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.
36. **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 function and result in personal injury or fire.
37. **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.
38. **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.
39. **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.**

40. **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.
41. **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.
42. **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.**
43. **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.
44. **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.
    For the KCs certification models the use of this function is NOT guaranteed.
45. **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.
46. **Check 'Connections' before wiring. And make sure that there are no safety problems.**
    Failure to follow this instruction may result in fire.
47. **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.
48. **When using NPN output, be sure to connect the load between the OSSD output wire and +24V. Do not short the 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.
49. **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 function.
50. **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.

51. **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 danger because the safety function does not operate properly.
52. **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 because the safety function does 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 fire, damage, or malfunction of the product.
7. **Be sure that the 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 product.
8. **You must conduct regular inspections and maintenance procedures according to the items listed on the "Check and Maintenance" within six months.**
   Failure to follow this instruction may result in personal injury due to the malfunction of the product.
9. **Check the installation status, normal operation, breakage, modification, and manipulation in the situations shown below, and conduct the weekly inspection.**

   • When starting the safety system for the first time
   • When replacing the accessories of the safety system
   • 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 function does not operate 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 24 V_{DC} 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 F.G. terminal and connect the noise suppression capacitor between 0V and F.G. terminal.**
4. **Be sure to use separate F.G. between the product and equipment with a strong noise (welding machine). The same F.G. may result in malfunction.**
5. **When installing the product, connect the emitter and receiver with having the same version.**
   Failure to follow this instruction may cause malfunction or danger because the safety function does not operate properly.
6. **When installing the product, make sure that the bottom indicators of the emitter and receiver are aligned exactly.**
7. **Install the product in a place where the emitter and receiver are not affected by walls or reflecting surfaces.**
8. **If you use the product in multiple sets, arrange them not to interfere with each other, or install with a shading plate.**
9. **Do not install the product in places where it is exposed to intense disturbance from light sources (such as direct sunlight, sunlight, spotlights, fluorescent lights, and etc.) or where reflected light from glossary surface directly affects to the receiver. If it is difficult to install in such places, be sure to take additional safety measures such as shading plates, hoods, and etc.**
   Failure to follow this instruction may cause malfunction or danger because the safety function does not operate properly.
10. **Make sure that any unused wires, when installing the product, should be insulated.**
11. **Make sure that removable parts (including packing, end caps, product wires, covers, and etc.) are properly assembled. Also, tighten the screws with specified tightening torque.**
    Failure to follow this instruction may cause product degradation.
12. **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.**

13. **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.
14. **This product may be used in the following environments.**

    • Altitude max. 2000 m
    • Pollution Degree 3
    • 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(in catalog or website).

1. atLightCurtain

1.1. Overview

atLightCurtain allows you to easily configure the functions of the light curtain and monitor them. The SFLA, the high performance and advanced light curtain, provides safety-related functions in the muting, blanking, and parameter menus. You can make more safe environments for the operators and more effective manufacturing process by using these functions. The safety light curtain software, atLightCurtain, provides the following monitoring and login functions:

Incident light level

Allows for easy adjustment, maintenance, and management of the optical beams of the light curtain.

Wiring and switch

Enables easy checking of the input and output of connected wires and switch settings.

Errors and warnings

Helps reduce troubleshooting time by displaying error descriptions.

Administrator login mode

Helps protect your project by allowing only authorized users to access and modify the settings.

1.2. Installation

1.2.1. System Requirements

To use the atLightCurtain, meet the minimum system requirements in the table below.

System	IBM PC compatible computer with 1 GHz or faster processor
OS	≥ Windows 7
Memory	≥ 2GB
Hard disk	≥ 1GB
Resolution	≥ 1024 X 760
Others	USB port

1.2.2. atLightCurtain Installation

1. Download the atLightCurtain software on our Autonics website. (www.autonics.com)
2. Run the installer of atLightCurtain software.
3. Select the installation language and click the **OK**. The installation languages include Korean, English, and Chinese.
4. When the atLightCurtain installation wizard starts, click the **Next** to proceed with the installation.
5. Read the license agreement and click the **I agree**.
6. Select the installation components and click the **Next**.
7. Select the installation location and click the **Install**.
8. Please wait while installing the atLightCurtain.
9. To complete the installation, click the **Finish**.

If you selected the driver installation in the installation components:

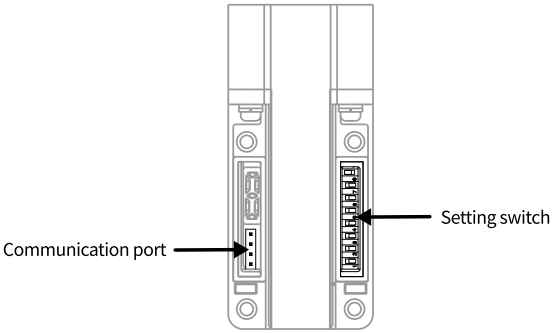
1. When the device driver installation wizard starts, click the **Next** to proceed with the installation.
2. Agree to the End User License Agreement and click the **Next**.
3. Check the installed driver and click the **Finish**.

1.2.3. Connect the Light Curtain with PC

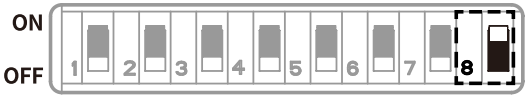
When using the series connection:

- The settings of the master light curtain are applied to the slave (light curtain).
- Connect the dedicated USB to Serial communication converter for SFL/SFLA (SCM-SFL, sold separately) to the PC communication port at the bottom of the master receiver.

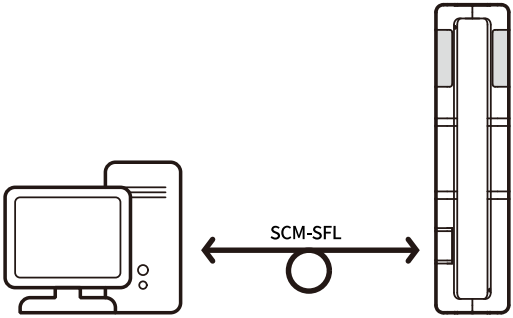
1. Check the positions of the PC communication port and and setting switch of the light curtain.
2. Open the front cover considering the size of the fixing screws (M2.6).
   - PC communication port: Open the cover at the bottom-left of the **receiver**.
   - Setting switch: Open the cover at the bottom-right of the **emitter** and **receiver**.



3. To apply the settings of atLightCurtain to the light curtain, set the position 8 of setting switches on the emitter and receiver to ON. The SFL series, the standard model of light curtain, is configured by positions 1 to 7 on the setting switch. Therefore, only monitoring function is available on the atLightCurtain. (The position 8 on the setting switch is deactivated.)



4. Connect the SCM-SFL to the PC communication port at the bottom of the receiver and the USB port of the PC. The driver installation will start automatically.



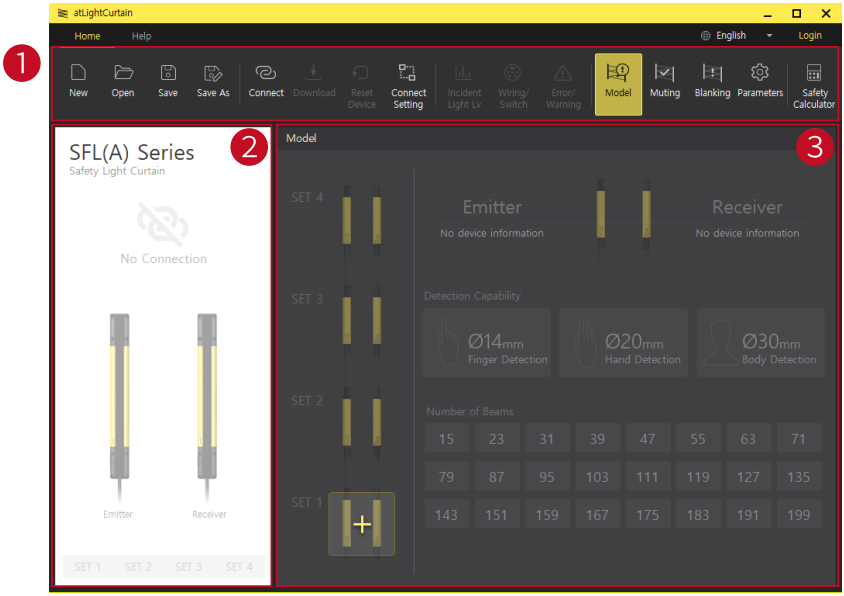
When connecting to a PC, the OSSD output can be turned ON or OFF regardless of the incident light level. If this software is used for purposes other than maintenance, the safety cannot be guaranteed.

PC communication status	OSSD output status
Communication (monitoring)	ON or OFF state
Apply settings (download)	Keeps OFF state
Auto scan (muting)	Keeps ON state
Auto scan (blanking)	Keeps OFF state

2. Screen

2.1. Start Screen

The atLightCurtain consists of a ribbon menu, a status display screen of the light curtain, and a monitoring and setting screen.



1. Ribbon menu	You can use the functions provided by atLightCurtain on the ribbon menu. For detailed information on the ribbon menu, refer to the 2.2, “Ribbon Menu”.
2. Status display screen	This display screen shows the product information and operation status of the connected light curtain. For detailed information on the status display screen, refer to the 2.3, “Status Display Screen”.
3. Monitoring and setting screen	This display screen shows the monitoring information and functional configuration items for connected light curtain. For detailed information on the monitoring and setting screen, refer to the 4.7, “Monitoring”.

2.2. Ribbon Menu

2.2.1. Files

New

You can create a new project file, but all current setting values are initialized.

1. Select the **New** menu and determine whether to initialize the settings.

Open

You can import the settings by opening the project file (.lcp) of atLightCurtain. Only one project is activated.

1. Select the **Open** menu.
2. Select the project file and click the **Open**.

Save

You can save the current settings to a project file.

• New project

: The current settings are saved to a new project.

• Existing Project

: The changed settings are written to the open project file.

1. Select the **Save** menu.
2. Determine a location to save and enter a file name. Click the **Save**.

Save As

You can save the current settings to a project file with a different name.

1. Select the **Save As** menu.
2. Determine a location to save and enter a file name. Click the **Save**.

2.2.2. Communication

Connect	You can connect the light curtain and PC.
Download	You can download the current values of setting page to the light curtain.
Reset Device	You can restart the light curtain to perform a self-test and apply the settings.
Connect Setting	You can select the communication port to connect with the light curtain.

2.2.3. Monitoring

Incident Light Lv	You can check the received light intensity of each beam axis of the connected light curtain.
Wiring/Switch	You can check the wiring and setting switch status of the connected light curtain.
Error/Warning	You can check the error and warning history, and maintenance information of the connected light curtain.

2.2.4. Function Settings

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

2.2.5. Safety Distance Calculator

Safety Calculator	You can calculate the minimum safety distance.

2.2.6. Help

Help	You can see the atLightCurtain user manual.
About	You can check the software version information of the atLightCurtain.

2.3. Status Display Screen

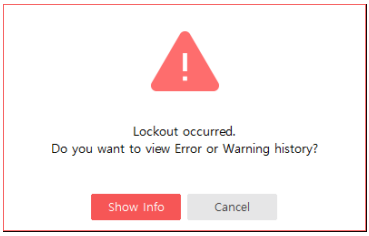
1. Series name	To minimize the screen size, click the **<**.
2. Model name and operating status	It shows the model name and operating status [01] of the connected light curtain.
3. Detailed information	It displays the detection capability, sensing distance, and LED indicators on the emitter/receiver of the connected light curtain.
4. Series connection	It shows the information of the connected light curtain in the series connection. To check the detailed information of the light curtain used in the SET, click the **SET**.

01) The operating status of the light curtain

Operating	Normal connection between the light curtain and PC
Muting	The muting function: activated • The OSSD output: ON state
Override	• The override function: activated • The OSSD output: ON state
Interlock	• The interlock function: activated • The OSSD output: OFF state
Reset-Hold	• The reset-hold function: activated • The light curtain is in the 'reset-hold wait time.'
Warning	The light curtain is operating normally but is in unstable conditions. • Cause 1: Unstable power supply • Cause 2: Sensitivity reduction, etc.
PC Setting	The light curtain is ready to download the setting configuration from your PC. • The OSSD output: OFF state • Use the reset device function to restore the light curtain to the normal state.
Lockout	• The lockout function: activated • The OSSD output: OFF state

When the light curtain has entered the lockout condition:

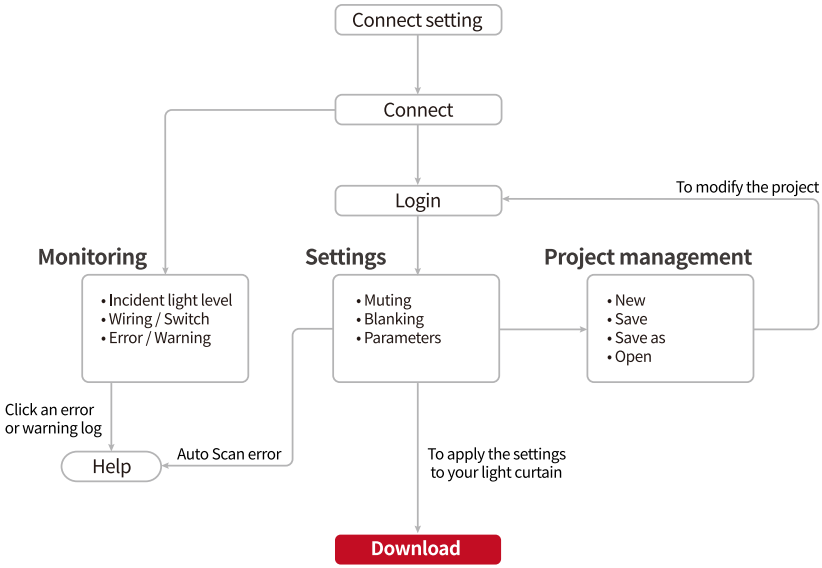
1. When the light curtain detects a defect, it enters the lockout condition and a pop-up window appears as shown below.
2. To see the corresponding history in the Error/Warning menu, click the **Show Info**.



- For detailed information on the error and warning history, refer to the 4.7.3, “Error/Warning”.
- For detailed information on the troubleshooting, refer to the 5, Troubleshooting.

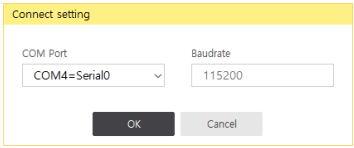
3. Getting started

Refer to the flow chart below before starting the atLightCurtain.



3.1. Connect Setting

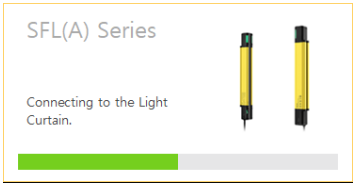
1. Select the **Connect Setting** in the ribbon menu.
2. To determine the communication (COM) port, click the combo box ▼ and check the port list.



3. To complete the connect setting, click the **OK**.

3.2. Connect to the Light Curtain

1. Complete the connect setting first.
2. Select the **Connect** in the ribbon menu.
3. A pop-up window showing the connection state appears as shown in the figure below, and the light curtain will be connected.



3.3. Login Setting

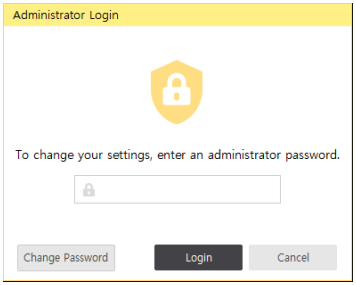
The atLightCurtain provides two kinds of the login mode:

- **Operator mode** You can use already configured settings without a password.
- **Administrator mode** You can change, modify, or manage the configured settings by using a password. To prevent unauthorized user's access and protect the project file's settings, we recommend that you change the initial password (which is 'admin') as soon as possible.

Ribbon menu		Operator mode	Admin mode
File	New	○	○
	Open		
	Save		
	Save As		
Communication	Connect	○	○
	Download	**N.A**	
	Reset Device	○	
	Connect Setting		
Monitoring	Incident Light Lv	○	○
	Wiring/Switch		
	Error/Warning		
Function settings	Model	○	○
	Muting	**N.A**	
	Blanking		
	Parameters		
Others	Safety Distance Calculator	○	○

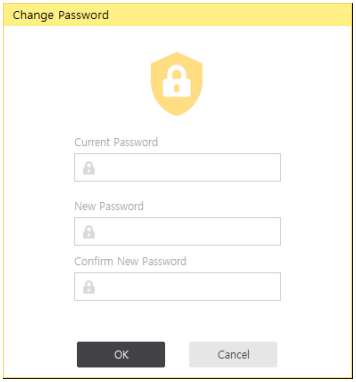
3.3.1. Administrator Login

1. Click the **Login** button at the top-right of the screen.
2. Enter your password to login.



3.3.2. Change the Password

1. Click the **Change Password** in **administrator login** window.
2. Enter the current password and new password, click the **OK**.
   (The password can be configured freely depending on your convenience.)



If you have forgotten your password:
You can reset your password by installing the atLightCurtain software again.

4. Functions

- Refer to the table below for the functions and factory defaults provided by the atLightCurtain software.
- Note that the SFL series, which is a general type of light curtain, does not allow for setting the atLightCurtain functions.

4.1. Safety-related Functions

Functions	Setting items	Factory default
Interlock	Enable start interlock	Disabled
	Enable restart interlock	Disabled
Reset-Hold	Enable	Disabled
	Timeout	8s
External device monitoring (EDM)	Enable	Disabled
	Timeout	300 ms (0.3 s)
Muting	Enable	Disabled
	Muting zone settings	All zones
	Muting mode	Standard
	Muting sequence	1 → 2
	Muting sensor type	N.O. (Mute 1, 2)
	Mute input time limit, Min value	30 ms (0.03 s)
	Mute input time limit, Max value	3000 ms (3 s)
	Muting timeout	60s
	Exit-only muting wait time	4000 ms (4 s)
Override	Enable	Disabled
	Min input time	3s
	Timeout	60s
Fixed blanking	Enable	Disabled
	Zone 1, 2, 3	-
	Tolerance	0
	Error mode	Warning

Functions	Setting items	Factory default
Floating blanking	Enable	Disabled
	Blanking zone settings	-
	Floating beams	1
	Tolerance	0
	Error mode	Warning
Reduced resolution	Enable	Disabled
	Ignored beams	1

4.2. Other Functions

Functions	Setting items	Factory default
Mutual interference prevention	Frequency A or B	Frequency A
Sensing distance	LONG or SHORT	LONG
Output polarity	PNP or NPN	PNP
AUX output emitter (AUX 2)	Output mode	Error/Lockout
	Output phase	Reverse
	Output pattern	Light On
AUX output receiver (AUX 1)	Output mode	OSSD ON/OFF
	Output phase	Reverse
	Output pattern	Light On
Lamp output emitter (Lamp 2)	Enable/Disable	Disabled
	Output mode	Muting/Override
	Output phase	Normal
	Output pattern	Light On
Lamp output receiver (Lamp 1)	Enable/Disable	Disabled
	Output mode	Muting/Override
	Output phase	Normal
	Output pattern	Light On

4.3. Table: Combinations of Safety-related Functions

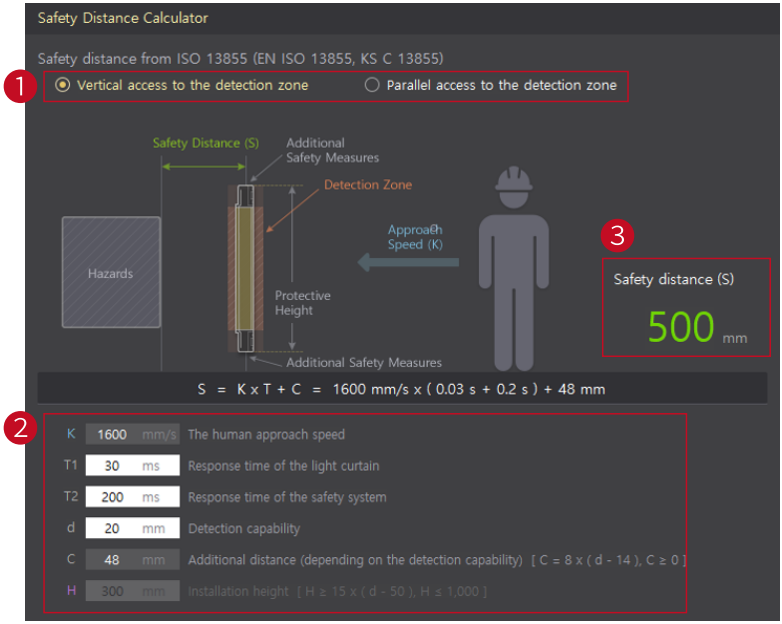
- Refer to the table below when using a combination of safety-related functions in the atLightCurtain software.
- For detailed information on the safety-related function, refer to the **SFL/SFLA Series User Manual**.

	Interlock	Reset-Hold	EDM	Muting	Override	Fixed Blanking	Floating Blanking	Reduced Resolution
Interlock	-	○ 01)	○	○	○	○	○	○
Reset-Hold	○ 01)	-	○	× 02)	× 02)	× 03)	× 03)	○
EDM	○	○	-	○	○	○	○	○
Muting	○	× 02)	○	-	○	○ 04)	○ 04)	×
Override	○	× 02)	○	○	-	○	○	×
Fixed Blanking	○	× 03)	○	○ 04)	○	-	○ 05)	×
Floating Blanking	○	× 03)	○	○ 04)	○	○ 05)	-	×
Reduced Resolution	○	○	○	×	×	×	×	-

01) The reset-hold function is only available when the manual reset is activated.
02) The auxiliary output of the emitter (AUX2) and reset-hold functions are not available when muting or override is activated.
03) The functional combinations with the reset-hold, fixed blanking, and floating blanking are unavailable.
04) Both the muting zone and blanking zone can be set simultaneously.
05) Both two functions, the fixed blanking and floating blanking, are simultaneously configurable, but a zone where the two functions overlap cannot be set.

4.4. Safety Distance Calculator

- You can calculate the safety distance that the light curtain must be installed from the hazards based on ISO 13855 (EN ISO 13855, KS C 13855).
- Note that the calculation method for safety distance may differ based on the laws, regulations, and standards of each country. Therefore, be sure to install the light curtains under the appropriate calculation method in your the country.
- For detailed information on the safety distance calculation, refer to the **SFL/SFLA Series User Manual**.



1. Type of approach direction

Select the safety distance formula based on the detection zone, and approach direction of the body or body part.

- **Vertical access to the detection zone**
- **Parallel access to the detection zone**

2. Input part

Enter the values to be substituted into the formula.

- **K** : The human approach speed (mm/s)

→ The K is automatically set based on the detection capability (d).

- **T1** : The response time (T_{OFF}) of the light curtain (ms)
- **T2** : The response time of the safety system (ms)
- **d** : The detection capability (mm)
- **C** : The additional distance calculated by detection capability (mm)

→ The C is calculated based on the detection performance (d) or installation height (H).

- **H** : The installation height (mm)

→ The H is only activated under the condition of parallel access to the detection zone.

3. Result value

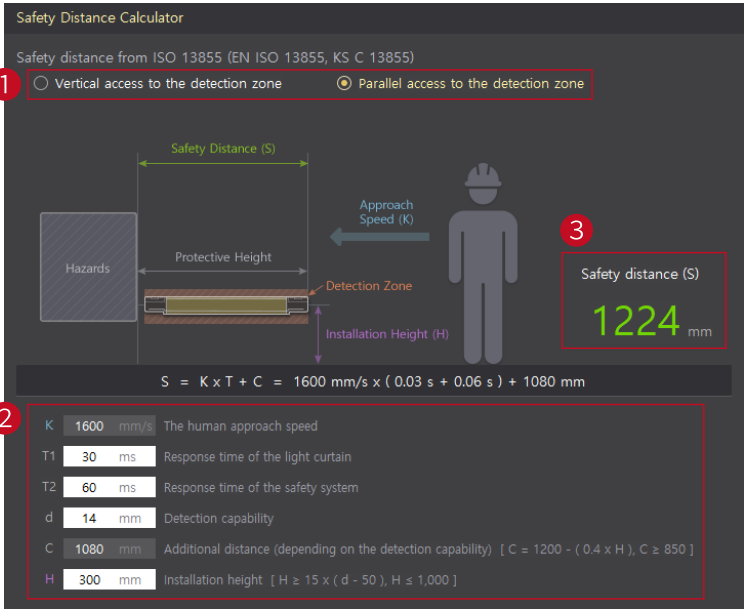
You can see the calculated safety distance (S).

Usage example

Calculate the safety distance:
when the approach direction of the human body or body part, and detection zone of the light curtain are parallel with the following conditions.

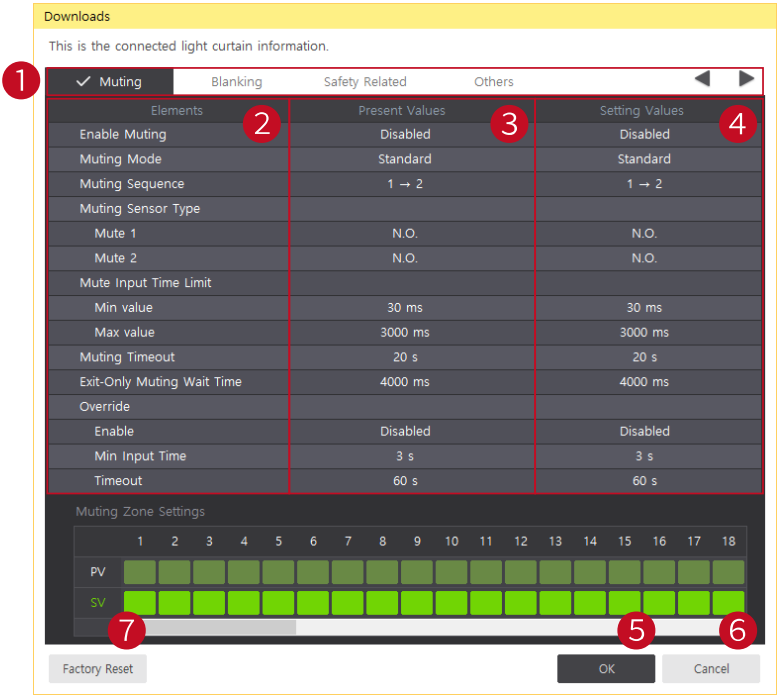
Parameters	Input value
T1: response time (T_{OFF}) of the light curtain	30
T2: response time of the safety system	60
D: detection capability	14
H: installation height	300

1. Select the **Parallel access to the detection zone**.
2. Enter the values of T1, T2, d, H in the input field.
3. Check the calculated safety distance.



4.5. Download

- The Download function can be used in administrator mode.
- You can send the atLightCurtain settings to the connected light curtain, or initialize the light curtain via the Factory Reset.
- To use the download function, be sure to check that the position no. 8 of the setting switches on the emitter and receiver are ON state.

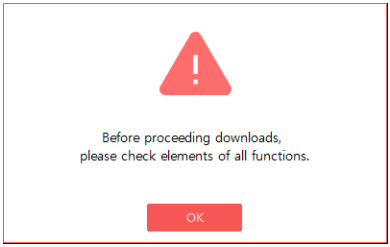


1. Title bar

It consists of muting, blanking, safety-related function, and other function.

• To check the setting information for each function, click the name of each function or ◀, ▶.

• Before downloading the configuration, check the setting information of all functions.



2. Elements

It displays setting parameters for each function.

• If the present value and the setting value are different, ✔ is displayed on the left of the parameter name.

3. Present value

It is the setting value saved in the connected light curtain.

4. Setting value

It is the value set by the user in atLightCurtain.

5. OK

It proceeds download.

6. Cancel

It cancels download.

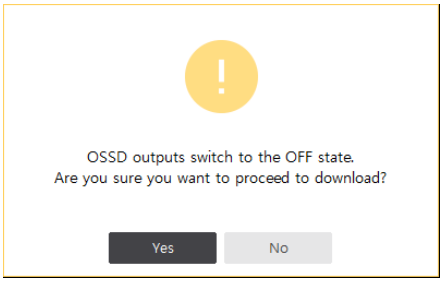
7. Factory reset

It restores the connected light curtain to the factory default.

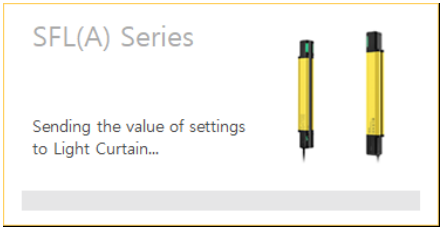
• The error and warning logs are not initialized.

Usage example

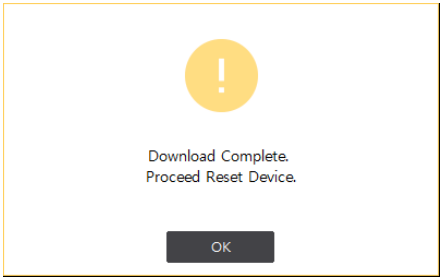
1. Select the **Download** and open the **Download** pop-up window.
2. Check the all setting values of muting, blanking, safety-related, and other function and click the **OK**.
3. When a pop-up window appears as shown below, click the **Yes**.



4. Download is in progress.



5. When the pop-up window appears as shown below, click the **OK**. The download is completed.

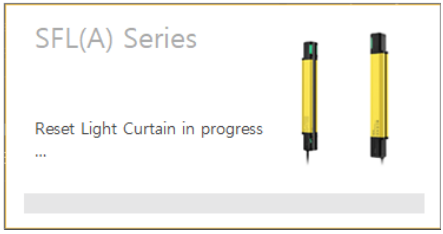


4.6. Reset Device

- Restart the light curtain to perform a self-test and apply 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 a situation where the light curtain has entered to the lockout condition due to an error or does not return in the PC setting state.
- To apply the setting values of the atLightCurtain after performing the self-test, check the position no. 8 of setting switches on the emitter and receiver is ON state.

Usage example

1. Select the **Device Reset**. A pop-up window will appear as shown below.



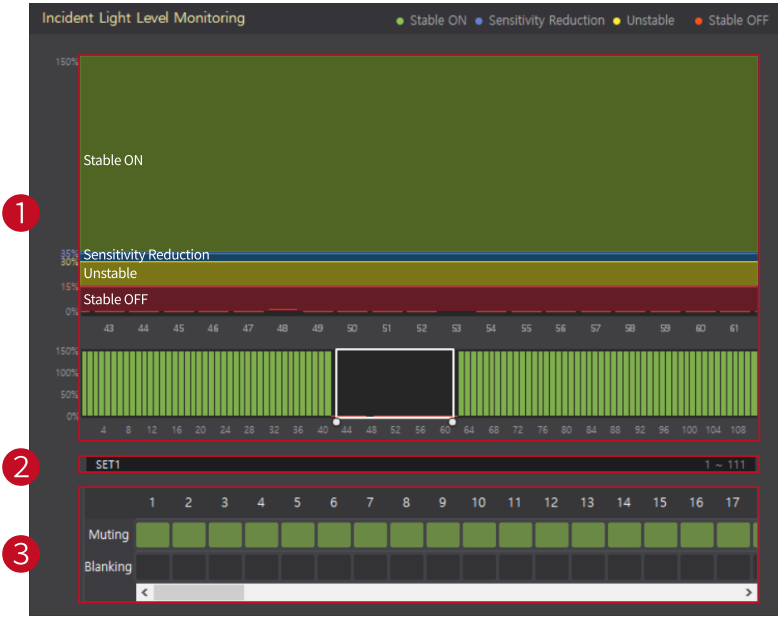
2. The light curtain restarts.

4.7. Monitoring

The monitoring function can be used in the SFL/SFLA series, which are general/advanced type of the light curtain.

4.7.1. Incident Light Level

You can check the received light amount of each beam of connected light curtain. The incident light level is displayed as four-colored bar graphs according to the criteria for incident light level.
For detailed information on the incident light level, refer to the **SFL/SFLA Series User Manual**.



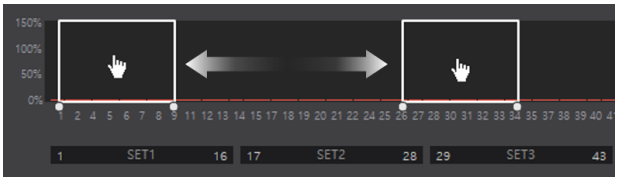
1. Incident light lv.	It shows the incident light level of each beam of the connected light curtain.  : Stable ON (incident light level: 30 to 150%, OSSD output: ON state)  : Sensitivity reduction (incident light level: 30 to 35%, OSSD output: ON state) : Unstable (incident light level: 15 to 30%, OSSD output: ON or OFF state)  : Stable OFF (incident light level: 0 to 15%, OSSD output: OFF state)
2. SET	It shows the number of beams for each SET of the connected light curtain.
3. Muting and blanking zones	It shows the muting and blanking zone of the connected light curtain.  : No setting value  : Muting  : Fixed blanking  : Floating blanking

Usage example

1. Select the beams to be monitored. When you hover your mouse over the end of the white square box, the mouse cursor will be changed to an arrow. You can adjust the range as many as the desired number of beams by clicking and dragging the mouse. At this time, the number of beams can be conveniently designated with referring to the number of beams in each SET.

   - The number of beams in SET 1 of the light curtain: 1 to 16

2. You can monitor as many as the specified number of beams by clicking and dragging inside the selected area.



3. Check the incident light level of the corresponding beams in the enlarged screen.

4.7.2. Wiring/Switch

You can check the wiring and switch settings of connected light curtain: wiring status of pin connectors, configured information on the setting switch or your PC.

1. Wiring status

It shows the color of wire and assigned function of connected light curtain.

The table below shows the wire color and function in each connector pin, and the function assigned to each wire is displayed in white or gray text.

• White: Input or output is activated, and ON state

• Gray: Input or output is deactivated, and OFF state

Pin no.	Color	Emitter	Receiver
1	Blue	0 V	0 V
2	Orange	Reset-Hold input / Mute 1 input	EDM input
3	Yellow	RS485(B)	RS485(B)
4	Red	RS485(A)	RS485(A)
5	Pink	AUX 2 output / Mute 2 input	AUX 1 output
6	Black	External test input	OSSD 1 output
7	White	Reset input	OSSD 2 output
8	Brown	+24 VDC	+24 VDC

2. Setting switch status

It shows the setting switch or PC setting mode based on the status of the position no. 8 on the setting switch. The setting value for each function is displayed in yellow.

• When the position 8 of setting switch is OFF: Switch setting mode

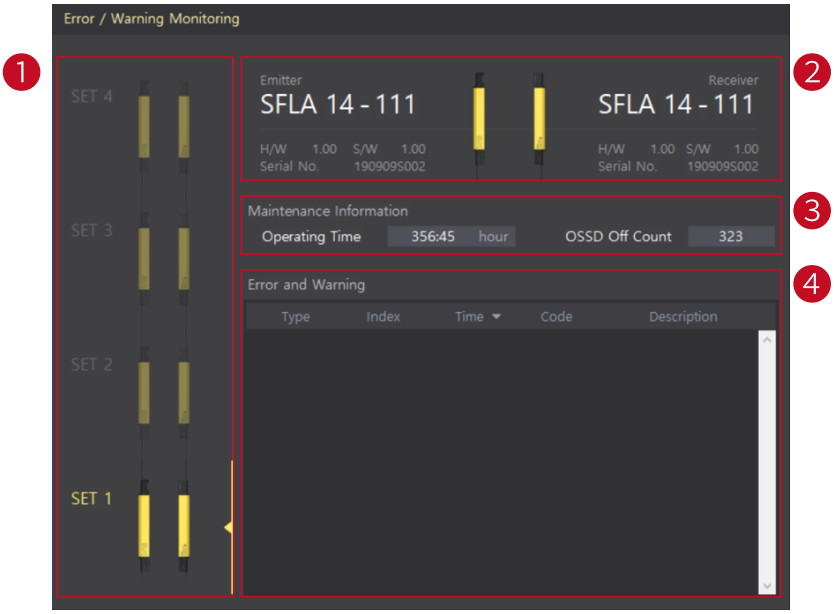
Switch Configurations	Emitter	Receiver	PC
1 Polarity	PNP	PNP	PNP
2 Sensing Distance	LONG	LONG	LONG
3 Frequency	A	A	A
4 Reset-Hold	X	X	X
5 Interlock	AUTO	AUTO	AUTO
6 EDM	X	X	X
7 Muting	X	X	O
8 Switch / PC	Switch	Switch	-

• When the position 8 of setting switch is ON: PC (atLightCurtain) setting mode

Switch Configurations	Emitter	Receiver	PC
1 Polarity	PNP	PNP	NPN
2 Sensing Distance	LONG	LONG	LONG
3 Frequency	A	A	A
4 Reset-Hold	X	X	X
5 Interlock	AUTO	AUTO	AUTO
6 EDM	X	X	X
7 Muting	X	X	O
8 Switch / PC	PC	PC	-

4.7.3. Error/Warning

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



1. Series connection	It shows the connected light curtain for each SET.
2. Product information	It shows the detailed information of the light curtain for each SET. • **Hardware version** • **Firmware version** • **Serial number**
3. Product life cycle	It shows the product maintenance information fir each SET. The maintenance information of the light curtain is updated every 15 minutes. • **Operating time**: It displays the operating time after the power is supplied to the light curtain. • **OSSD off count**: It displays the number of times that OSSD output is switched from ON to OFF state.
4. Error and warnings	It shows the error and warning history of light curtains for each SET. To check the cause and troubleshooting method, double-click the error log. • The warning log will be deleted when the light curtain is turned off. • The error and warning logs are not initialized even if the factory reset is performed. • For detailed information on the troubleshooting, refer to the 5, Troubleshooting.

4.8. Model

Before you begin

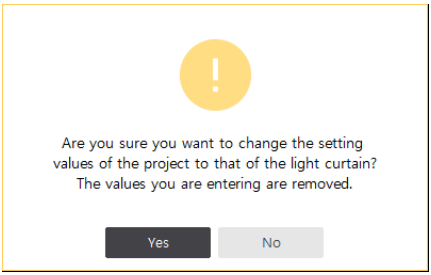
- To manage project files when the light curtain and PC are not connected (in offline mode), create one or more models.
- When creating a model in offline mode, you can only download the setting values to the light curtain if the specifications - such as the standard/advanced type, detection capability, and number of beams - match those of the light curtain to be connected.
- When the light curtain is configured in series connection, the total number of beams is up to 300 beams for the standard type, and is up to 400 beams for the advanced type.
- You can make a preset in muting, blanking, and parameters in offline mode, it means that you can create/save/modify the project file in advance. It can be used in an environment where the same settings are applied to multiple light curtains.

4.8.1. Model Setting

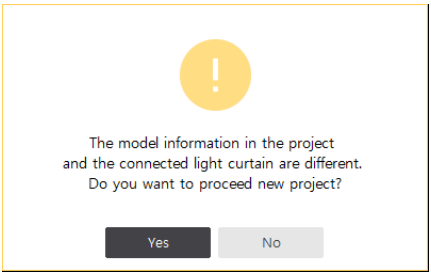
1. To create a model, click the + button. (To delete a model, click the ⊗ button.)
2. Select the detection capability.
3. Select the number of beams.
4. You can see that the model name will be changed depending on the detection capability and the number of beams.

Sending the project file

1. Create a model.
2. Configure the muting, blanking, and parameter settings and click the **Save** or **Save As** to save the project.
3. To select the project file you want to use, click the **Open**.
4. To connect the light curtain and PC, click the **Connect** .
   - When the model created by atLightCurtain **matches** the light curtain:



     - To apply the settings of the light curtain, select the **Yes**.
     - To use the opened project, select the **No**.
       To apply the settings to the light curtain, select the **Download**.
   - When the model created by atLightCurtain **fails to match** the light curtain:



     - To apply the settings of the light curtain, select the **Yes**.
     - To stop the connection with the light curtain, select the **No**.

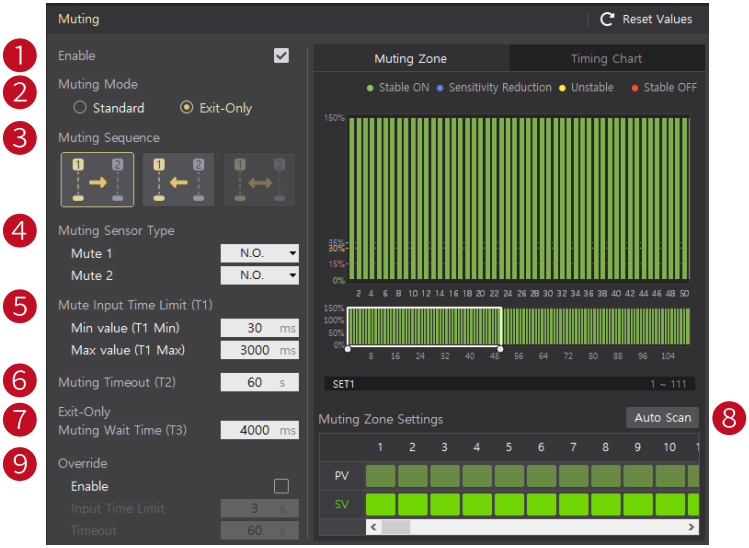
4.8.2. Checking the Model Information

- When the light curtain and PC are connected, you can see the model information of the light curtain as shown in the figure below.
- Creating or deleting the model is unavailable in this state.

4.9. Muting

- For detailed information on the muting function, refer to the **SFL/SFLA Series User Manual**.
- This function can be used in the administrator mode, allowing you to check the settings of muting/override function, muting zone, and muting timing chart.
- To check the initial setting value of the muting function, refer to the 4, Functions.
- Some function are affected by activating or deactivating the muting and blanking function. When changing the settings of the muting and blanking function in the atLightCurtain, check the function settings below again.
  1. Reduced resolution
  2. Reset-hold
  3. Auxiliary output of the emitter (AUX2)

4.9.1. Muting Settings



Follow the steps below to configure the muting function:

1. Enable	To set the muting function, click the checkbox. When the muting function is activated, an override function can be set.
2. Muting mode	You can select the standard mode or exit-only mode. **Standard** : Starts and ends the muting function based on the external input conditions. **Exit-only** : Maintains the muting condition until the (opaque) object is completely removed.
3. Muting sequence	You can select the input sequence of muting sensor (Mute 1, Mute 2). **Muting sequence** : 1 → 2 / 2 → 1 / 1 ↔ 2 [01] 01) It is deactivated in exit-only mode.
4. Muting sensor type	You can select the contact type of the muting sensor (Mute 1, Mute 2) depending on the output polarity (NPN, PNP). **N.O.** : Normally Open contact type **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)** : 30 to 3,900 ms (0.03 to 3.9 s) setting range of **Max value (T1 Max)** : 100 to 10,000 ms (0.1 to 10 s)
6. Muting timeout (T2)	You can set the duration of muting condition. • Setting range: 0 to 3,600 s
7. Exit-only muting wait time (T3)	You can set the exit-only muting wait time when muting mode is selected to exit-only mode. • Setting range: 100 to 4,000 ms (0.1 to 4 s)
8. Muting zone settings	You can select between the manual or auto scan mode to set the muting zone.

9. Override

Enable : To set the override function, click the checkbox.

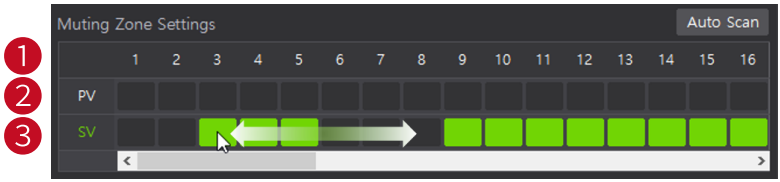
Min input time : You can set the time period that the reset input maintains OFF state to start override.

• Setting range : 1 to 5 s

Timeout : You can set the duration of the override function.

• Setting range : 0 to 60 s

4.9.1.1. Manual Setting of Muting Zone



1. Number of beams It is the beam number of the light curtain.

2. PV It is the present value of the light curtain.

3. SV The muting zone set by the atLightCurtain software is displayed. The muting zone can also be set discontinuously.

To select the muting zone:
Drag the mouse over the beam range that corresponds to the muting zone, or click on the first beam and end beam while holding down the **Shift** key.

4.9.1.2. Automatic Setting of Muting Zone

- **When using the automatic muting setting function, the OSSD output of the light curtain may temporarily goes to ON due to the operation of facilities, such as production lines and conveyers during measurement. Therefore, it is essential to implement safety measures in the workplace.**
  Be sure to implement additional safety measures, such as installing a separate guard, to prevent potential risk.
- **After setting or changing the function of the light curtain via atLightCurtain software, be sure to check that the light curtain operates as you intended.**
  Failure to follow this instruction may result in personal injury.

The atLightCurtain software provides an auto-scan function for you to set up the muting zone quickly and easily. During the measurement time (= scan time), the software detects the facility and suggests the muting zone and time suitable for the installation environment. You can also modify the suggested values to respond flexibly to different situations.

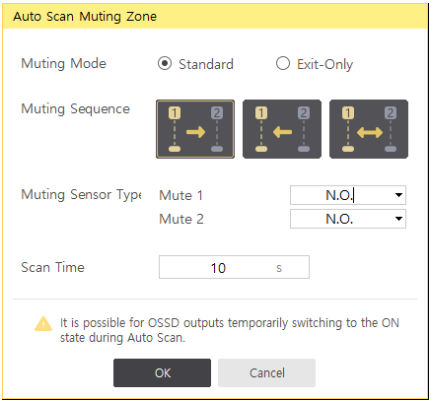
Before you begin

1. Make sure that all beams are clear.
2. Make sure that there are no objects within the detection zone of the light curtain.
3. Inspect the operation status of the muting sensors, and make sure that there are no objects within the sensing area of the muting sensors.
4. Make sure that the light curtain's wiring, output type and setting switch are suitable for using the muting function.

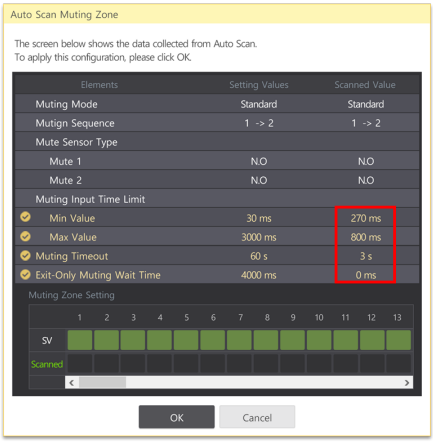
Setting the muting zone and time

1. Connect the light curtain and your PC.
2. Click the **Enable** checkbox in the muting menu.
3. To activate the muting function, click the **Download**.
4. Be sure to check the installation environment of the muting sensor and the passing time of the object with referring to the timing chart tab of the muting menu.
   Mute 1, Mute 2 input and the duration of the light ON/OFF condition must be satisfied.
5. Place an object outside the area of the muting sensors.
6. Click the **Auto Scan**.

7. Configure the muting mode, muting sequence, muting sensor type, and scan time. The scan time should be set longer than the time it takes for an object to pass through the muting sensors and light curtain. Note that the scan time is only possible for the object passes through once within the scan time.
   - The setting range of scan time : 1 to 600 s

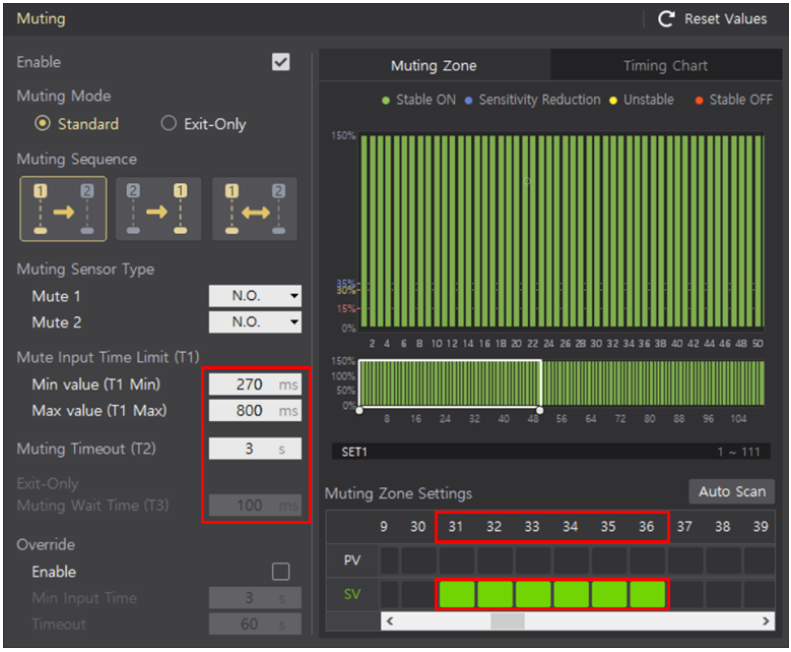


8. To start the scan, select the **OK**. After the mute 1 and 2 input are applied, the blocked beams are designated to the muting zone.
9. When the scan is completed, you can see the setting values, scanned values of the muting function, and muting zone. Check these result values and select the **OK**.
   (is displayed for elements that have different setting and scanned values.)



10. When the pop-up window appears, to apply the scanned value, select the **Yes**.

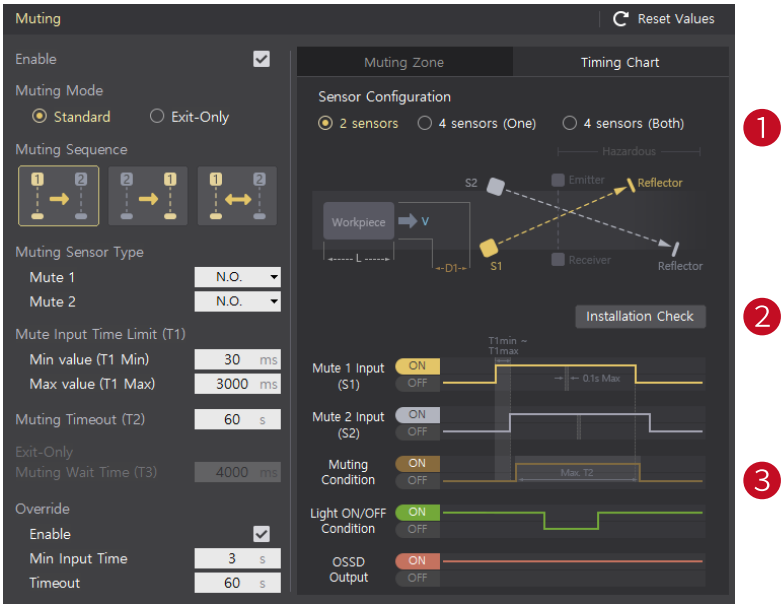
11. The muting zone and time have been set automatically.



- The scanned values can be modified on the muting function setting screen.
- When the auto scan is failed, click the **Show Info** to see the troubleshooting method. For detailed information on the troubleshooting, refer to the 5.3, “Muting Zone Error Display and Troubleshooting”.

4.9.2. Muting Timing Chart

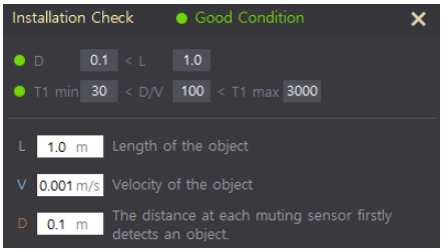
Note that the installation environment and muting timing chart shown in the software are only visual references for your understanding. Make sure that the configuration is suitable for the actual installation environment.



1. Sensor configuration	You can select the sensor configuration to be used for muting function. • Muting mode : Standard mode **2 sensors** : It shows the installation environment and timing chart for when two muting sensors are used. **4 sensors (one direction)** : It shows the installation environment and timing chart for when four muting sensors are used and the object passes through in only one direction. **4 sensors (both direction)** : It shows the installation environment and timing chart for when four muting sensors are used and the object passes through in both directions. • Muting mode : Exit-only mode **2 sensors** : It shows the installation environment and timing chart for when two muting sensors are used.
2. Installation check	You can check the installation environment of the muting sensor by entering the values below. • **L** : Length of the object • **V** : Velocity of the object • **D** : Distance between points where the muting sensor firstly detects an object.
3. Muting timing chart	It shows the timing chart based on the muting mode, muting sequence, and sensor configuration.

4.9.2.1. Checking the Muting Environment

1. Select the sensor configuration. The two sensors are selected for this document.
2. Select the **Installation check**. **Installation Check** pop-up window appears.
3. Enter the values of L, V, and D to satisfy the two calculation formulas as shown in the figure below. T1 min and T1 max are the maximum and minimum values of the mute input time limit (T1), which are pre-set when configuring the muting function.



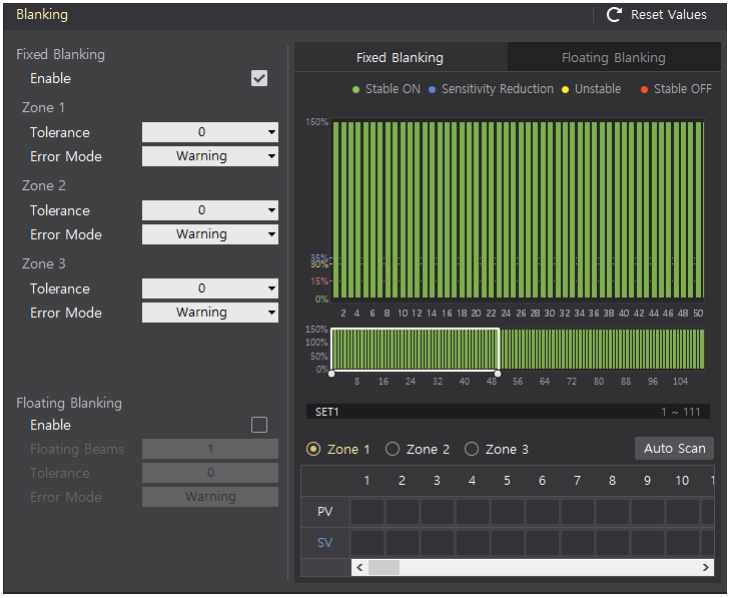
4. If both calculations are met, the **Good Condition** is displayed, otherwise the **Bad Condition** is displayed.

4.10. Blanking

- For detailed information on the blanking functions and blanking zone setting conditions, refer to the **SFL/SFLA Series User Manual**.
- This function can be used in administrator mode, allowing you to configure both the fixed blanking and floating blanking functions. While it is possible to use these two functions simultaneously, it is not possible to set up overlapping zones.
- To check the initial setting value of the blanking function, refer to the 4, Functions.
- Some function are affected by activating or deactivating the muting and blanking function. When changing the settings of the muting and blanking function in the atLightCurtain, check the function settings below again.

  1. Reduced resolution
  2. Reset-hold
  3. Auxiliary output of the emitter (AUX2)

4.10.1. Fixed Blanking Settings



Follow the steps below to configure the fixed blanking function:

1. Enable	To set the fixed blanking function, click the checkbox.
2. Fixed blanking zone settings	You can select between the manual or auto scan mode to set the fixed blanking zone.
3. Zone 1, 2, 3	You can set the tolerance and error mode for each fixed blanking zone. Setting range of **tolerance** : 0 to 2 Setting range of **error mode** : warning, lockout

4.10.1.1. Manual Setting of Fixed Blanking Zone

1. Zone — You can set the fixed blanking zone up to three zones.

2. Number of beams — It is the beam number of the light curtain.

3. PV — It is the present value of the light curtain.

4. SV — The fixed blanking zone set by the atLightCurtain software is displayed. The blanking zone can only be set continuously.

To select the fixed blanking zone:
Drag the mouse over the beam range that corresponds to the fixed blanking zone, or click on the first beam and end beam while holding down the **Shift** key.

4.10.1.2. Automatic Setting of Fixed Blanking Zone

- **When using the automatic fixed blanking setting function, the OSSD output of the light curtain may temporarily goes to OFF.**
  Note that the operating status of light curtain can be changed.
- **After setting or changing the function of the light curtain via atLightCurtain software, be sure to check that the light curtain operates as you intended.**
  Failure to follow this instruction may result in personal injury.

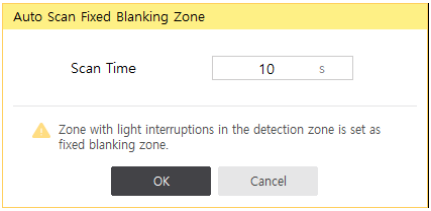
The atLightCurtain software provides an auto-scan function for you to set up the fixed blanking zone quickly and easily. During the measurement time (= scan time), the software detects the facility and suggests the fixed blanking zone. You can also modify the suggested values to respond flexibly to different situations.

Before you begin

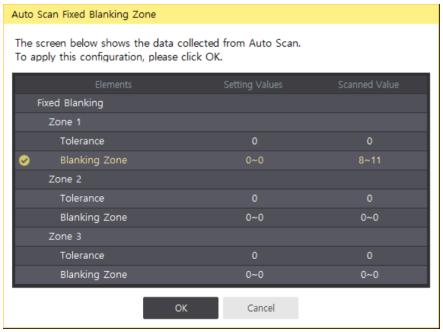
1. Make sure that all beam are clear.
2. Place an object (or shield) that blocks specific beams within the detection zone of the light curtain.

Setting the fixed blanking zone

1. Connect the light curtain and your PC.
2. Click the **Enable** checkbox in the fixed blanking menu.
3. Activate the fixed blanking function of the light curtain.
4. Click the **Auto Scan**.
5. To search the blocked beams, enter a scan time and click the **OK**.
   - The setting range of scan time: 1 to 600 s

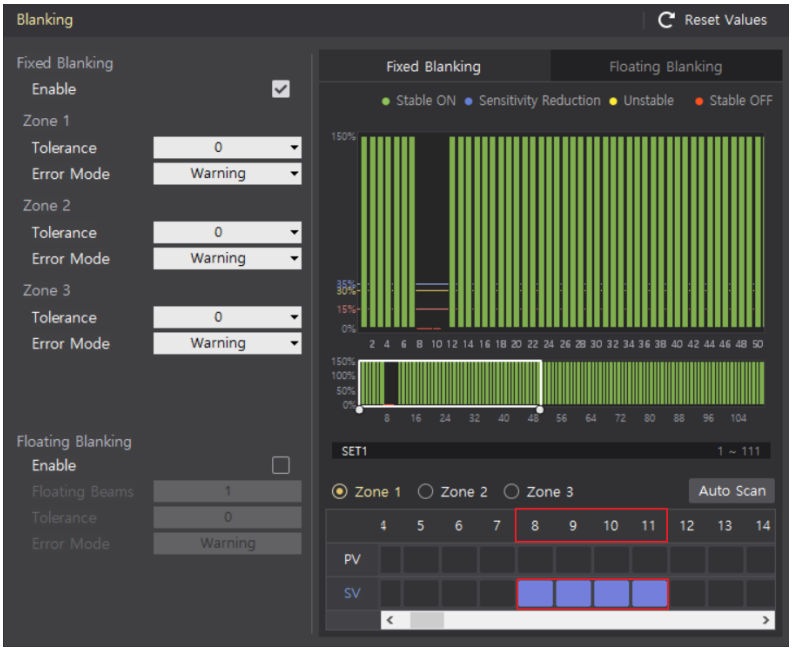


6. When the scan is completed, you can see the setting values and scanned values of the fixed blanking zone. Check these result values and select the **OK**.
   (✓ is displayed for elements that have different setting and scanned values.)



7. When the pop-up window appears, to apply the scanned value, select the **Yes**.

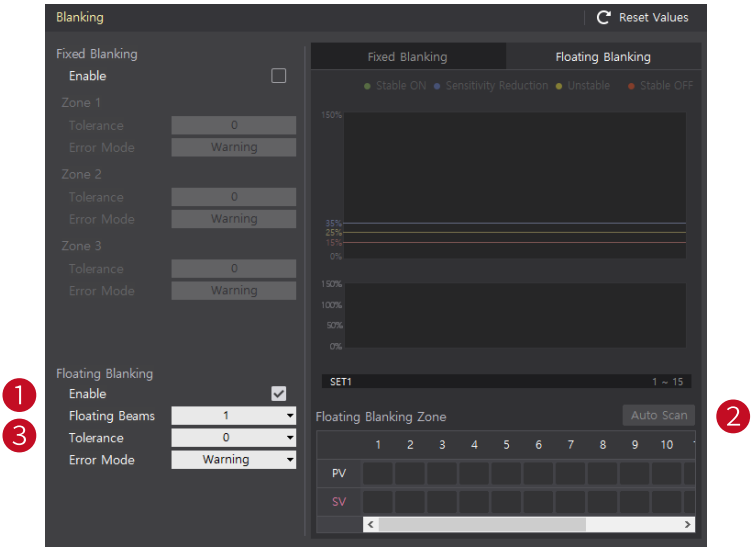
8. The fix blanking zone has been set automatically.



- The scanned values can be modified on the blanking function setting screen.

- When the auto scan is failed, click the **Show Info** to see the troubleshooting method. For detailed information on the troubleshooting, refer to the 5.4, “Blanking Zone Error Display and Troubleshooting”.

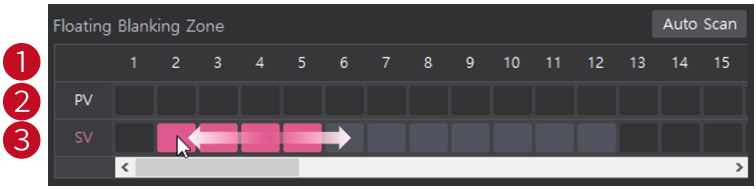
4.10.2. Floating Blanking Settings



Follow the steps below to configure the floating blanking function:

1. Enable	To set the floating blanking function, click the checkbox.
2. Floating blanking zone settings	You can select between the manual or auto scan mode to set the floating blanking zone.
3. Floating beams	You can set the consecutive beams for one floating zone. • Setting range: 1 to 15
3. Tolerance	You can set the tolerance for each floating blanking zone. • Setting range: 0 to 5
3. Error mode	You can set the error mode for each floating blanking zone. • Setting range: warning, lockout

4.10.2.1. Manual Setting of Floating Blanking Zone



1. Number of beams It is the beam number of the light curtain.

2. PV It is the present value of the light curtain.

3. SV The floating blanking zone set by the atLightCurtain software is displayed. The blanking zone can only be set continuously.

To select the floating blanking zone:
Drag the mouse over the beam range that corresponds to the floating blanking zone, or click on the first beam and end beam while holding down the **Shift** key.

4.10.2.2. Automatic Setting of Floating Blanking Zone

- **When using the automatic floating blanking setting function, the OSSD output of the light curtain may temporarily goes to OFF.**
  Note that the operating status of light curtain can be changed.
- **After setting or changing the function of the light curtain via atLightCurtain software, be sure to check that the light curtain operates as you intended.**
  Failure to follow this instruction may result in personal injury.

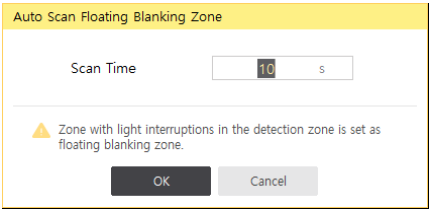
The atLightCurtain software provides an auto-scan function for you to set up the floating blanking zone quickly and easily. During the measurement time (= scan time), the software detects the facility and suggests the floating blanking zone. You can also modify the suggested values to respond flexibly to different situations.

Before you begin

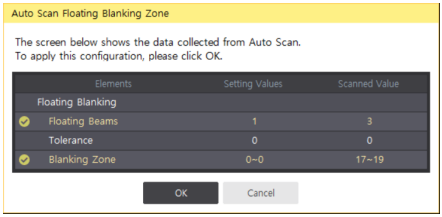
1. Make sure that all beams are clear.
2. Place an object that moves specific beams within the detection zone of the light curtain.

Setting the floating blanking zone

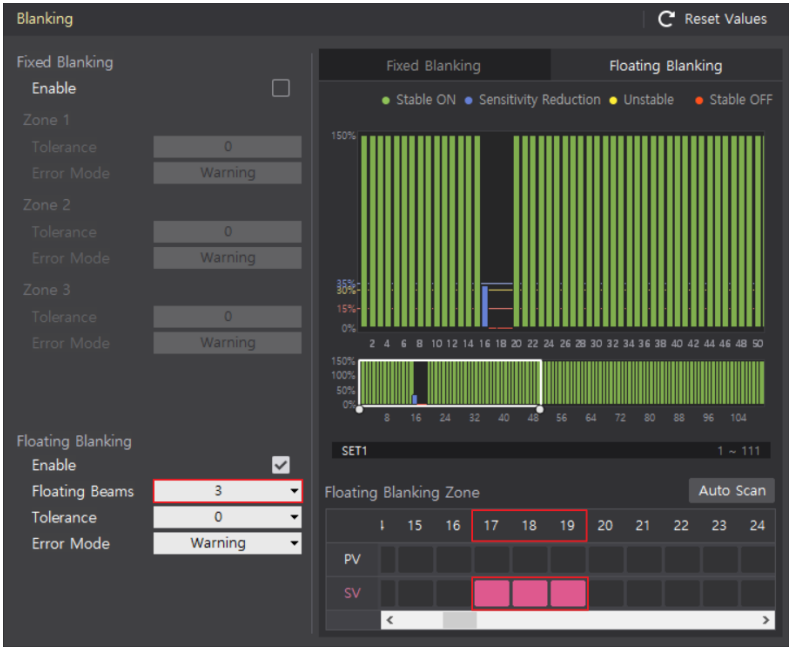
1. Connect the light curtain and your PC.
2. Click the **Enable** checkbox in the floating blanking menu.
3. Activate the floating blanking function of the light curtain.
4. Click the **Auto Scan**.
5. To search the blocked beams, enter a scan time and click the **OK**.
   - The setting range of scan time: 1 to 600 s



6. When the scan is completed, you can see the setting values and scanned values of the floating blanking zone. Check these result values and select the **OK**.
   (is displayed for elements that have different setting and scanned values.)



7. When the pop-up window appears, to apply the scanned value, select the **Yes**.
8. The floating blanking zone has been set automatically.

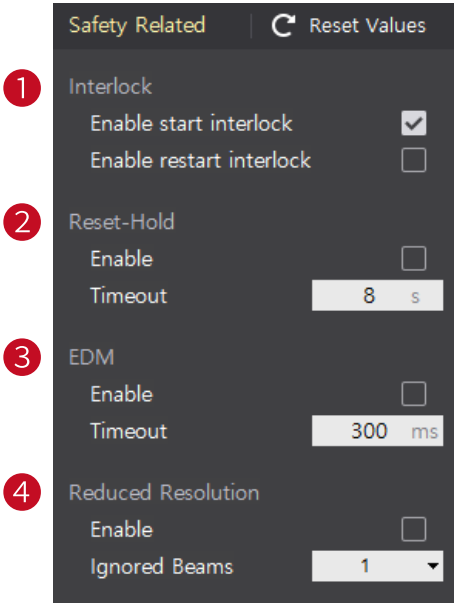


- The scanned values can be modified on the blanking function setting screen.
- When the auto scan is failed, click the **Show Info** to see the troubleshooting method. For detailed information on the troubleshooting, refer to the 5.4, “Blanking Zone Error Display and Troubleshooting”.

4.11. Parameters

4.11.1. Safety-related Functions

- For detailed information on the safety-related function, refer to **SFL/SFLA Series User Manual**.
- To check the initial setting value of the safety-related function, refer to the 4, Functions.
- For the combination of reset-hold and reduced resolution functions, refer to the 4.3, “Table: Combinations of Safety-related Functions”.



1. Interlock

Enable start interlock

: The OSSD output remains in the OFF state when power is supplied to the light curtain or the lockout reset occurs.

Enable restart interlock

: The OSSD output remains in the OFF state even if the light is received again under certain condition, such as when a light interruption occurs during operation.

Interlock reset

: You can select an interlock release method from the four available combinations shown in the table below.

Interlock release function	Enable start interlock	Enable restart interlock
Auto reset	-	-
Manual reset	V	-
	-	V
	V	V

2. Reset-hold

Enable

: To configure the reset-hold function, click the checkbox.

Timeout

: You can set the time period for applying the reset input after the reset-hold input has been applied to release the interlock condition.

• Setting range: 1 to 60 s

3. EDM

Enable

: To configure the external device monitoring (EDM) function, click the checkbox.

Timeout

: You can set the time period for allowing the EDM input.

• Setting range: 100 to 4,000 ms (0.1 to 4 s)

4. Reduced resolution

Enable

: To configure the reduced resolution function, click the checkbox.

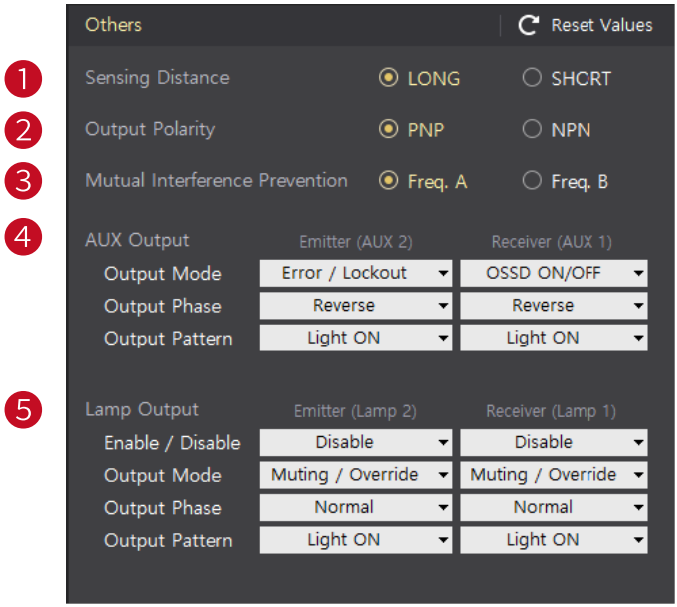
Ignored Beams

: You can set the maximum number of beams that are blocked.

• Setting range: 1 to 3 beams

4.11.2. Other Functions

- For detailed information on other functions, refer to the **SFL/SFLA Series User Manual**.
- To check the initial setting value of the other function, refer to the 4, Functions.
- For the combination of auxiliary outputs, refer to the 4.3, “Table: Combinations of Safety-related Functions”.



1. Sensing distance

You can select between the 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 (m)
LONG	Finger	0.2 to 10
	Hand, hand-human body	0.2 to 15
SHORT	Finger	0.2 to 5
	Hand, hand-human body	0.2 to 8

2. Output Polarity

You can select the input level (ON/OFF) based on the output type of the light curtain.
For detailed information on the wiring method based on the output type, refer to the **SFL/SFLA Series User Manual**.

Output polarity	ON voltage	OFF voltage
PNP	9 to 24 V_{DC}	Open or 0 to 3 V_{DC}
NPN	0 to 3 V_{DC}	Open or 9 to 24 V_{DC}

3. Mutual interference prevention

You can select the frequency to prevent mutual interference of the light curtain.
• Setting range: **Frequency A** or **Frequency B**

4. Auxiliary output (AUX)

It is a non-safety output for monitoring the light curtain. The AUX output is assigned to the bottom of the emitter/receiver of the light curtain.

Function	Setting item	Setting value
Emitter (AUX 2)	Output mode	[Table 1]
	Output phase	Normal, reverse
	Output pattern	Light On, flashing
Receiver (AUX 1)	Output mode	[Table 1]
	Output phase	Normal, reverse
	Output pattern	Light On, flashing

5. Lamp output (Lamp)

It is a non-safety output for monitoring the light curtain. The lamp output is assigned to the bottom of the emitter/ receiver of the light curtain. Connect with the SFL-LC, a dedicated lamp output cable for the light curtain.

Function	Setting item	Setting value
Emitter (Lamp 2)	Enable/Disable	Enable, disable
	Output mode	[Table 1]
	Output phase	Normal, reverse
	Output pattern	Light On, flashing
Receiver (Lamp 1)	Enable/Disable	Enable, disable
	Output mode	[Table 1]
	Output phase	Normal, reverse
	Output pattern	Light On, flashing

[Table 1] Supported output mode

No.	Output mode	Description
1	OSSD output ON/OFF	When the OSSD output remains in the ON state.
2	Error/Lockout	When the light curtain detects an error or is in the lockout condition.
3	Warning	When the light curtain is in the warning condition.
4	Muting/Override	When the muting or override function is activated.
5	Blanking	When the blanking function is activated by settings.
6	Blanking error	When the beams designated for the fixed or floating blanking zone are not blocked.
7	External test	When the external test input is ON state.
8	Interlock	When the light curtain is in the status of start interlock or restart interlock.
9	Reset-hold	When the light curtain is in the reset-hold wait time.
10	Stable light ON	All beam are clear and stable.
11	Sensitivity reduction	When the light intensity is less than 15 to 35% of the maximum light intensity for more than 30 minutes. • For detailed information on the incident light level, refer to the **SFL/SFLA Series User Manual**.

4.12. Reset

1. Click the **Reset values** on the upper right of the muting/blanking/parameters setting screen.
2. Click the **Yes** in the pop-up window to initialize the settings.

4.13. Language

1. Click the **Korean ▼** combo box at the top right of the ribbon menu.
2. Select the language you want to use.
   - Supported languages: Korean, English, Chinese

4.14. Help

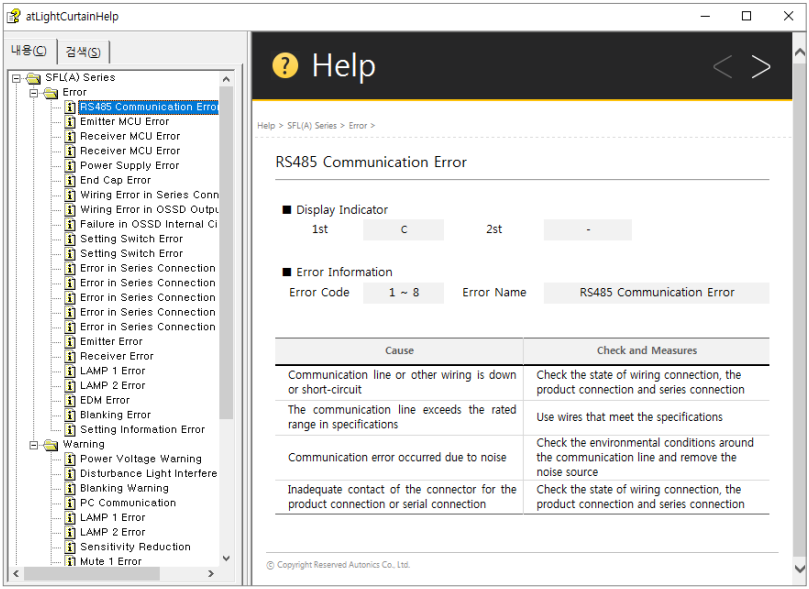
1. To see the atLightCurtain user manual (*.pdf), click the ⓘ **Help**.
   - Supported languages: Korean, English, Chinese

4.15. Software Information

1. To check the version of atLightCurtain software, click the i **About**.

5. Troubleshooting

- When an error occurs in the light curtain or during the auto scan function, You can check the error information in the **Help** window.



5.1. Error Display and Troubleshooting

- If the light curtain has any of the following issues during operation, be sure to stop operation and take troubleshooting instructions. For detailed information on the troubleshooting, refer to the **SFL/SFLA Series User Manual**.
- If the light curtain does not operate normally even after performing the troubleshooting method, please contact us.

Error code	Name	Cause	Troubleshooting
1 to 8	Communication Error	The 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.
		The communication error occurred due to the noise.	Check the environmental condition around the communication line and remove the noise source.
		The 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 to 14	Emitter MCU Error	An error is detected at the internal MCU of the emitter.	Replace the emitter.
20 to 24 30 to 33	Receiver MCU error	An error is detected at the internal MCU of the receiver.	Replace the receiver.
40 to 41	Power Supply Error	The power voltage is out of rated range.	• Connect to the rated power voltage (24 V_{DC} ± 20%). • Use a dedicated power source not shared with other devices.

Error code	Name	Cause	Troubleshooting
50 to 53	End cap Error	The end cap is assembled incorrectly or is not connected.	Check the connection of the end cap.
	Communication Line Error	Unstable state in the communication line between the emitter and receiver	Check the poor contact, disconnection, incorrect wiring, and others of the communication line between the emitter and receiver.
	Incorrect Series Connection	Incorrect series connection between the emitter and receiver	Check the connections of the series connection cable, wiring of the lamp, and others.
60 to 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 o r 2 is invalid.	Check whether the wires of OSSD 1 or 2 output are correctly connected or replace the receiver.
65 to 66	Failure in OSSD Internal Circuit	The internal circuit of the OSSD 1 or 2 output is broken.	Replace the receiver.
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.

Error code	Name	Cause	Troubleshooting
71	Setting Switch Error	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 to 82	Communication Line Error	Unstable state in the communication line between the emitter and receiver.	Check the poor contact, disconnection, incorrect wiring, and others of the communication line between the emitter and receiver.
	Series Connection Error	Incorrect series connection between the emitter and receiver.	Check the connections of the series connection cable, wiring of the lamp, and others.
83	Series Connection Error	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	Series Connection Error	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	Series Connection Error	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	Series Connection Error	The configuration of series connection exceeds the rated range.	In case of the series connection, check whether the total number of optical axes of the connected light curtains is wit hin the rated range.

Error code	Name	Cause	Troubleshooting
90 to 94	Emitter Error	The internal circuit of emitter is broken or the internal setting is invalid.	Replace the emitter.
100 to 106	Receiver Error	The internal circuit of receiver is broken or the internal setting is invalid.	Replace the receiver.
120 to 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).
122 to 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.
-	Internal System Error	An error occurred in the internal system of the light curtain	Replace the emitter or receiver.

5.2. Warning Display and Troubleshooting

- If the light curtain has any of the following issues during operation, be sure to stop operation and take troubleshooting instructions. For detailed information on the troubleshooting, refer to the **SFL/SFLA Series User Manual**.
- If the light curtain does not operate normally even after performing the troubleshooting method, please contact us.

Warning code	Name	Cause	Troubleshooting
1 to 2	Power Voltage Warning	Power voltage is in unstable condition.	• Connect to the rated power voltage (24 V_{DC} ± 20%). • Use the dedicated power supply not shared with other devices.
3	Disturbance Light Interference	The receiver is affected by interference of light.	Remove or block the light sources and objects, causing disturbances placed near the receiver.
4 to 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 op tical 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 the atLightCurtain.
		The download for the setting information is incomplete.	Check the connection with PC and communication status.
11	Sensitivity Reduction	The sensitivity reduction is occurred.	Check the alignment of the optical axes.
12	Mute 1 Warning	The sensor connected to the mute 1 input is in unstable state.	Check the status of muting sensor 1.

Warning code	Name	Cause	Troubleshooting
13	Mute 2 Warning	The sensor connected to the mute 2 input is in unstable state.	Check the status of muting sensor 2.

5.3. Muting Zone Error Display and Troubleshooting

- If the light curtain has any of the following issues during the auto scan, be sure to take troubleshooting instructions and start the auto scan again.

Error code	Name	Cause	Troubleshooting
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.

Error code	Name	Cause	Troubleshooting
5	Invalid Muting Sequence	The muting sequence is incorrect.	Install the 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 deactivated 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.

5.4. Blanking Zone Error Display and Troubleshooting

- If the light curtain has any of the following issues during the auto scan, be sure to take troubleshooting instructions and start the auto scan again.

Error code	Name	Cause	Troubleshooting
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.	Place the object on the position you want to use as the blanking zone.

Autonics

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

www.autonics.com