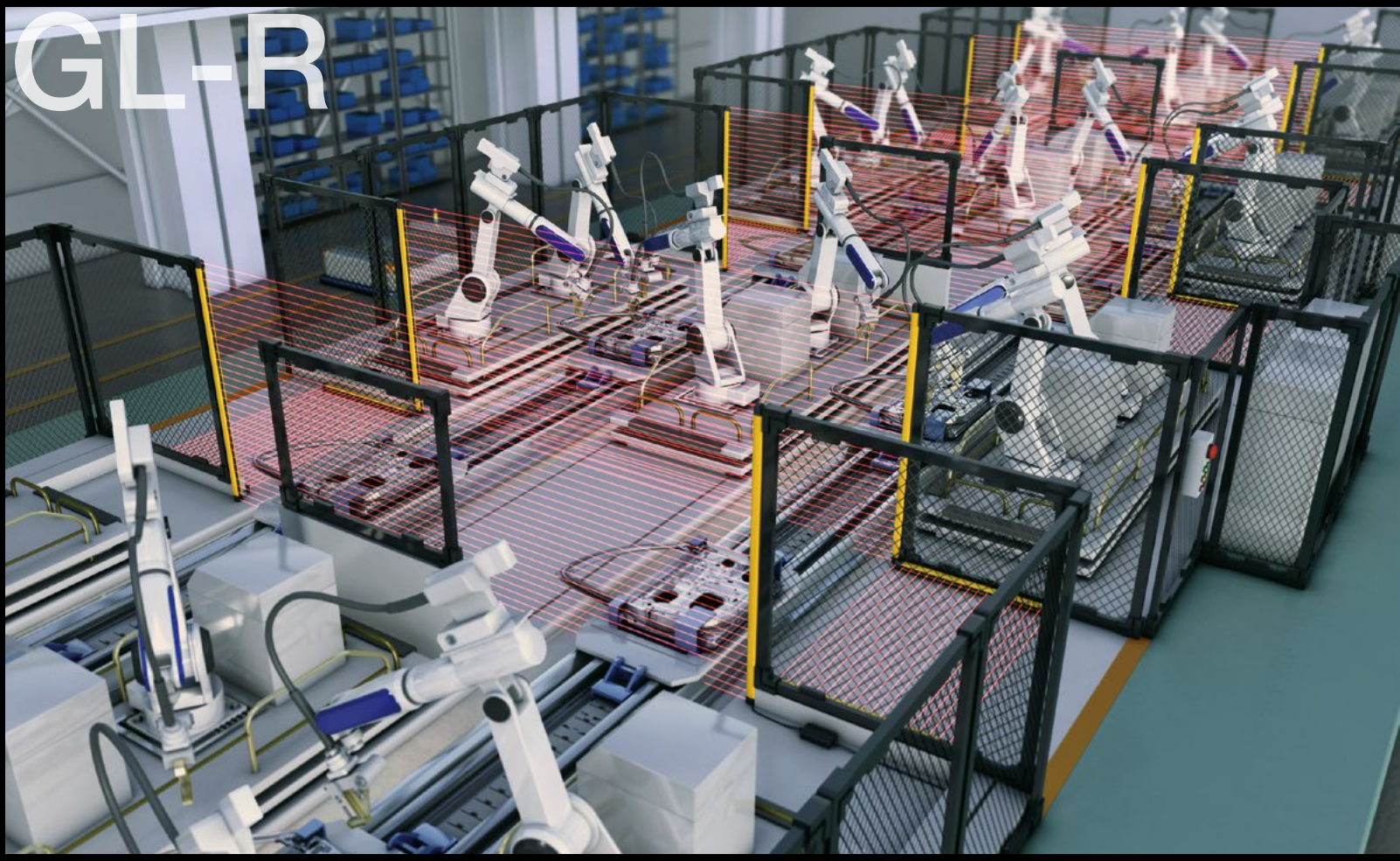
KEYENCE

NEW Safety Light Curtain
GL Series

Maximum safety standard
Type 4 | SIL3 | PLe

INDUSTRY LEADING SAFETY LIGHT CURTAINS

GL-R/GL-S Series



SAFETY LIGHT CURTAINS DESIGNED TO MEET THE NEEDS

GL-R SERIES

ROBUST

The GL-R's design features a heavy-duty, waterproof housing with a recessed lens which allows it to stand up to almost any industrial environment.

HIGH POWER

With a maximum operating distance that is nearly twice that of previous models, the GL-R Series has the power to not only span long ranges, but also to maintain consistent, stable operation, even when buildup is present.

BUILT-IN FUNCTIONALITY

KEYENCE safety light curtains provide complete safety solutions by equipping each unit with the functionality to satisfy both basic, and advanced safety applications.

STANDARD TYPE

GL-RF
(Detection capability: ø**14** mm ø0.55")

GL-RH
(Detection capability: ø**25** mm ø0.98")

GL-RL
(Detection capability: ø**45** mm ø1.77")

GL-S SERIES

COMPACT DESIGN

The GL-S lineup features two space-saving designs that are roughly half the size of conventional light curtains. These designs facilitate unobtrusive integration into areas where both safety and space are major concerns.

EFFORTLESS INSTALLATION

Installation has never been easier with pre-attached mounting brackets that secure each curtain in place with only two screws. These curtains also offer tool-free cable connections and reduced wiring to further minimize installation time.

HIGHLY VISIBLE INDICATORS

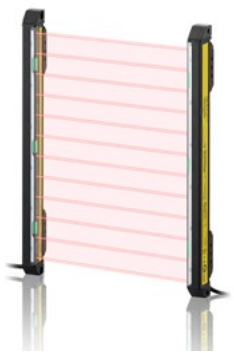
The GL-S Series light curtains are equipped with innovative, three-color indicators that can display the operational status of the light curtains. In addition, they may also be controlled externally through input signals to completely replace conventional work-instruction lights.

SLIM TYPE

GL-SS
(Detection capability: ø**25** mm ø0.98")

FLAT TYPE

GL-SF
(Detection capability: ø**25** mm ø0.98")



OF ANY APPLICATION

GLOBAL SAFETY STANDARDS

Complies with worldwide safety standards and regulations

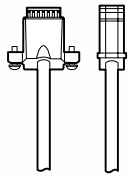
GL Series light curtains comply with the World's highest safety standards.

Type 4 **PLe** **SIL3**

执行标准号 GB/T4584

GL Series light curtains support both PNP and NPN output formats

PNP or NPN output selection is as simple as selecting the appropriate cables. This allows the units to easily conform to the output needs of existing safety systems.



Exceptional enclosure ratings: IP65 & IP67

The GL Series enclosure rating encompasses both IP65 & IP67 on the basis of IEC and JIS standards. This enables these light curtains to be used in a multitude of environments.

IP65
Dustproof and water-jet resistant

IP67
Dustproof and watertight

SAME DAY PROCESSING

PEACE OF MIND EVEN WHEN UNEXPECTED PROBLEMS OCCUR

KEYENCE provides same-day shipping for items ranging from sensor mounting brackets to safety light curtains and safety laser scanners. This allows customers to quickly react to unexpected design changes or emergencies that require products to prevent downtime.

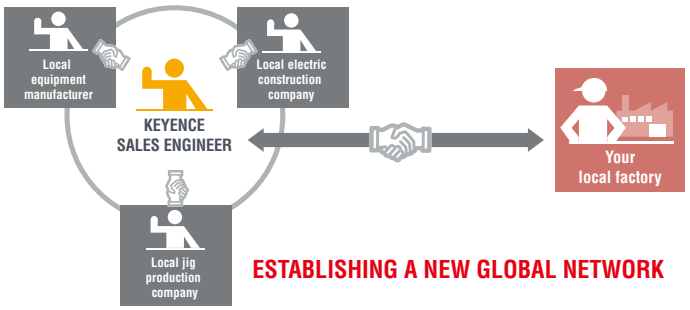
KEYENCE

Same-day shipping of products is provided standard by KEYENCE, to ensure that equipment is up and running as quickly as possible.

ON-SITE CUSTOMER SUPPORT

PRODUCT SELECTION, PROCESS IMPROVEMENT, AND FOLLOW-UP

KEYENCE prides itself on working closely with machine builders and end-users to not only provide assistance with product selection, but also to provide recommendations for process improvements and to assist in follow up support.



DIRECT SALES

DIRECT SUPPORT PROVIDED BY KEYENCE REPRESENTATIVES

KEYENCE is a direct sales organization. Our technically trained sales engineers have extensive product knowledge and training along with application and industry experience. Customers can depend on KEYENCE representatives to act as valuable resources in countless aspects of their business.

KEYENCE

Other Manufacturers

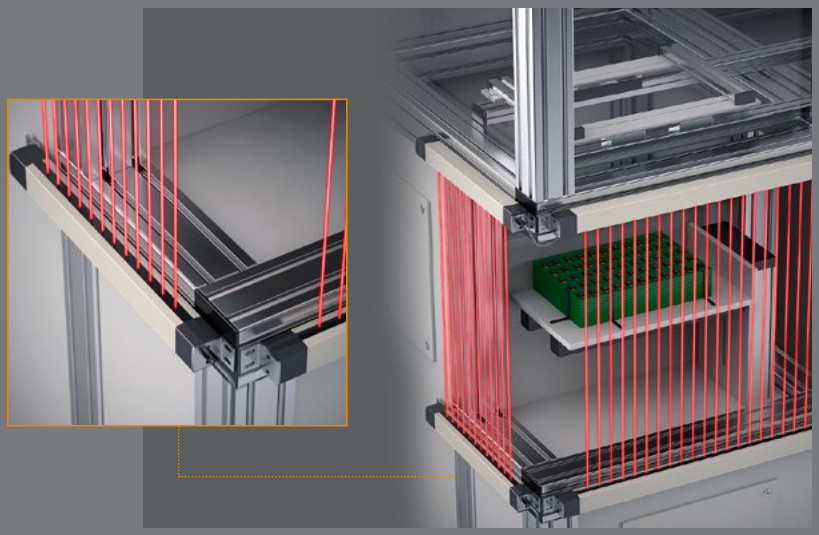
On-site line operation stalls while waiting for support

PROVIDING THE OPTIMUM SOLUTION FOR COMMON SAFETY ISSUES

DESIGN

Additional design work is required to ensure an area is fully protected

- Light curtains without edge to edge detection typically require additional guarding to cover unprotected areas
- Cables that exit directly from the bottom of a curtain and bulky mounting brackets prevent flush installation



With the GL Series

- All GL Series light curtains provide full-length protection and eliminate the need for additional guarding! P8 P9
- Specialty mounting brackets, unique cable positioning, and a compact design make flush integration into machine openings possible! P8 P9

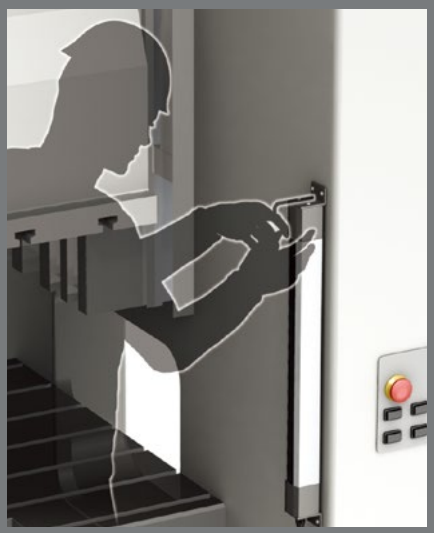
GL-R GL-S FULL LENGTH PROTECTION

GL-R GL-S SEAMLESS INTEGRATION

INSTALLATION

Complicated and time-consuming installation

- Difficulty aligning curtains properly
- Complicated and excessive wiring
- Routing cables through a machine is a hassle



With the GL Series

- The innovative wiring options offered by the GL Series not only minimize the total number of wires, but also allows customers to choose the wiring configuration that best fits their machine! P10 P11
- Beam axis alignment has never been easier! P12 P13

GL-R GL-S MINIMAL WIRING

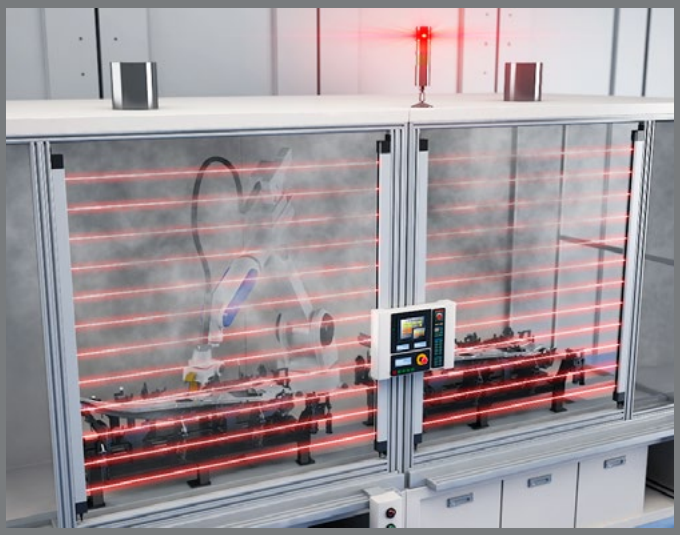
GL-R GL-S WIDE APERTURE ANGLE

GL-R GL-S HIGH POWER

GL-R GL-S SIMPLE MOUNTING BRACKET

OPERATION

Environmental factors cause unnecessary equipment stoppages



- Dirt buildup leads to nuisance trips
- Physical damage and other harsh environmental factors can lead to damage and equipment stoppage

With the GL Series

- The GL Series light curtains feature high powered light sources to blast through buildup. Additional features like high enclosure ratings and protective guarding make them suitable for even the roughest environments. P14 P15

GL-R GL-S IP65/IP67 | GL-R GL-S HIGH POWER | GL-R GL-S BUILT-IN GUARDING

MAINTENANCE

Lack of support from product manufacturer

- Delayed responses cause increased downtime
- Long lead times prolong periods of equipment stoppage

With the GL Series

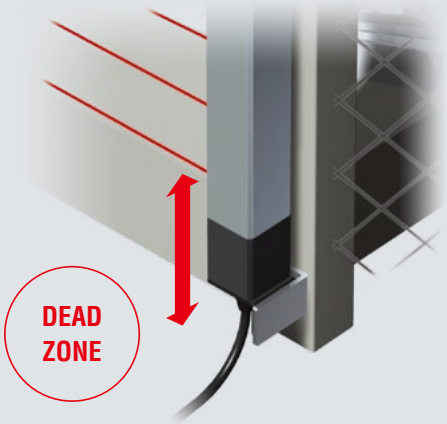
- KEYENCE'S sales engineers provide knowledgeable and in-depth support immediately! P4 P5
- Same-day shipping is standard for KEYENCE products, including safety light curtains! P4 P5

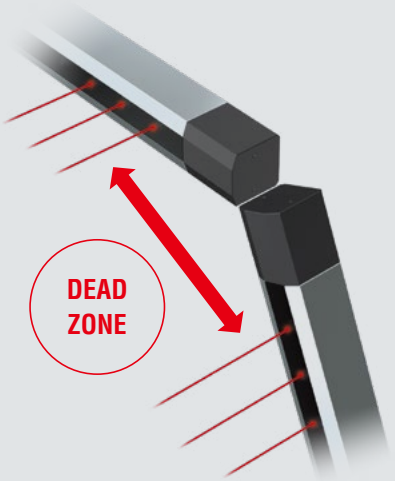
GL-R GL-S SAME-DAY SHIPPING | GL-R GL-S TECHNICAL SUPPORT

PROBLEM

Increased design time required to create additional mounting brackets or guarding

Conventional light curtains generate “Dead Zones” when they lack full length protection capabilities, feature bottom-exit cables, and/or require large top and bottom mounting brackets.



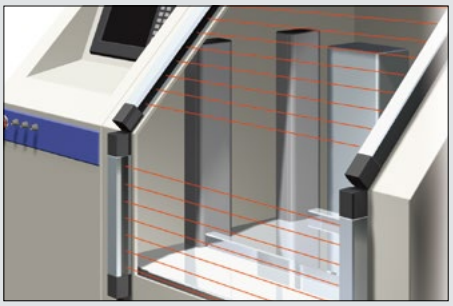


DETAILED EXAMPLES

The existence of “Dead Zones” forces designers to take additional steps to ensure that an area is completely protected. This could require adding additional components or changing the orientation / mounting of the entire setup.

Additional guarding may be required to protect dead zones

Installing light curtains in an upside-down orientation may be necessary to shift the dead zone position



Dead zones created during series connection create difficult design issues

REASON

With conventional models, beam axes could not be installed near the tops and/or bottoms of the light curtains due to structural design reasons, such as circuit board arrangement or display positioning. This prevented conventional models from providing full-length protection over the entire curtain.

* The KEYENCE SL-C Series was the world’s first light curtain to provide true full-length protection, and eliminate dead zones.

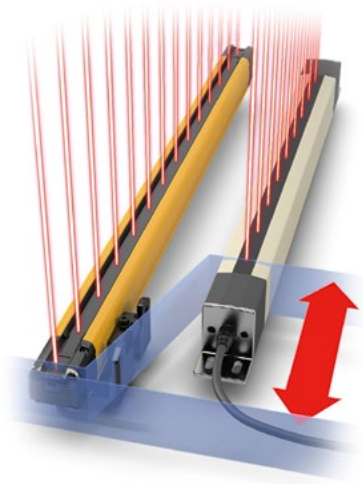
SOLUTION

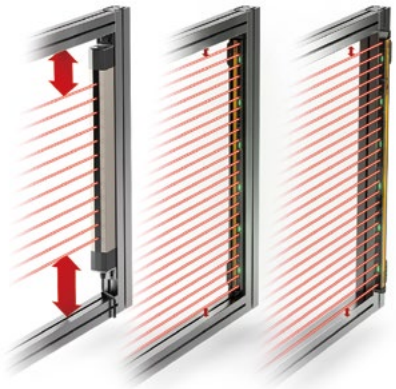
GL-R GL-S FULL LENGTH PROTECTION

GL-R GL-S SEAMLESS INTEGRATION

Full length protection and innovative designs eliminate additional design work

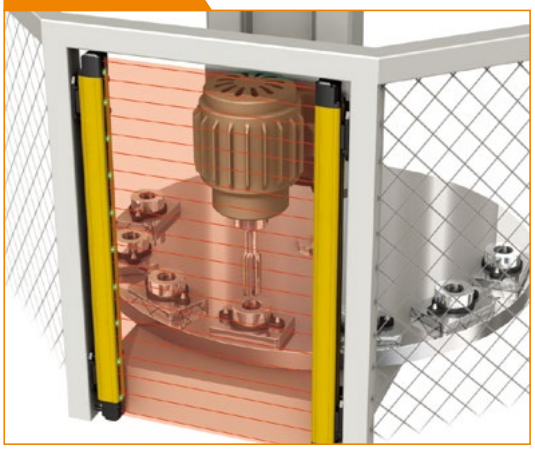
GL Series light curtains can be seamlessly integrated into equipment while providing full length protection of the entire opening without the need for additional guarding.





SIDE-EXIT CABLES

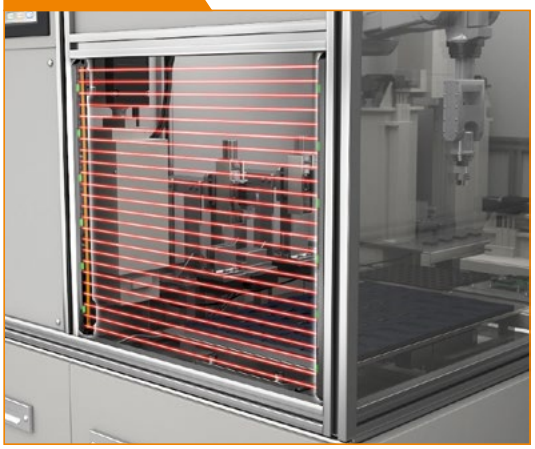
GL-R Series



Construction that that provides full length protection of an opening

With edge to edge detection, no additional guarding is required.

GL-S Series



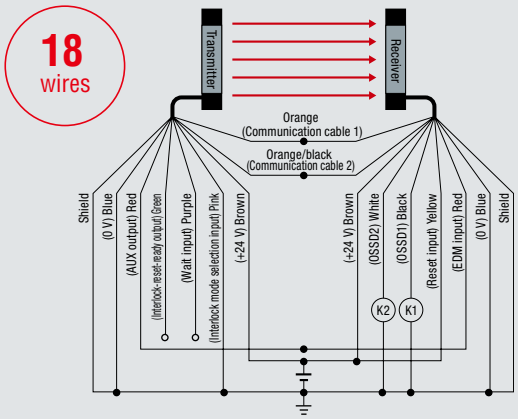
Compact and space-saving designs

The full width of the machine opening can still be utilized.

PROBLEM

Complicated and time-consuming installation (wiring)

Conventional light curtains do not provide users with different wiring options and contain a large number of wires that may not be necessary for all configurations. This makes installation and wiring more difficult and time consuming.

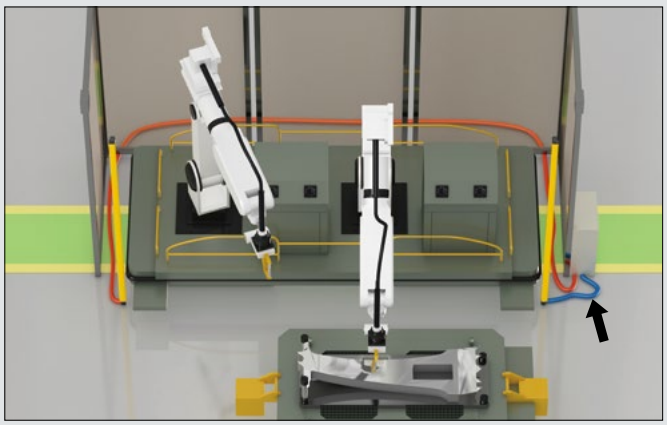


- Too many wires cause confusion.
- Routing cables through the machine is difficult.

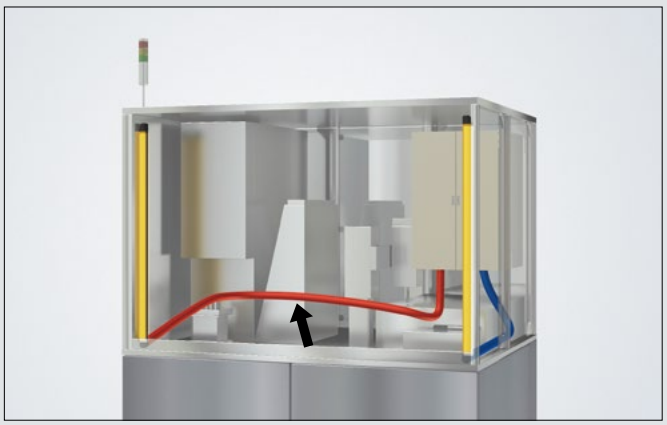
Increased time to perform wiring checks.

Problems related to wiring mistakes and noise are more likely.

DETAILED EXAMPLE



The transmitter and receiver must be connected by a synchronization wire.



The transmitter and receiver cables must be routed through the machine and wired into the control panel.

REASON

To ensure that the receiver only detects light from its paired transmitter and does not receive any other light (ex. stray ambient light), the receiver must know the timing with which light is sent from the transmitter. This mechanism is known as the “synchronization” of the transmitter and receiver Conventionally, this “synchronization” has been performed by way of wiring the transmitter and receiver units together with a synchronization wire.

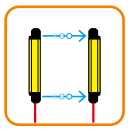
GL-R GL-S MINIMAL WIRING

SOLUTION

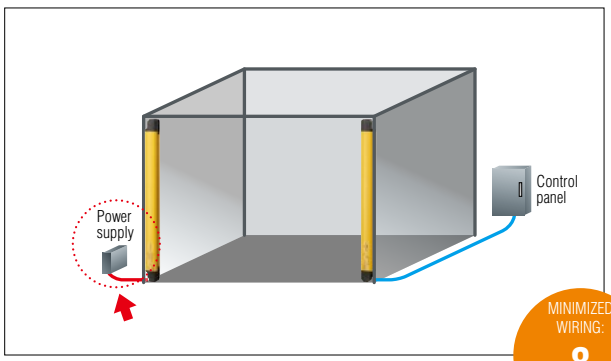
Innovative options that minimize wiring and simplify installation

It is now possible to select the optimal wiring system that best meets the requirements of your application.

OPTICAL SYNCHRONIZATION SYSTEM

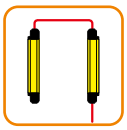


- There is no longer a need to connect the transmitter and receiver together.
- The transmitter can now be powered off of a separate power supply.

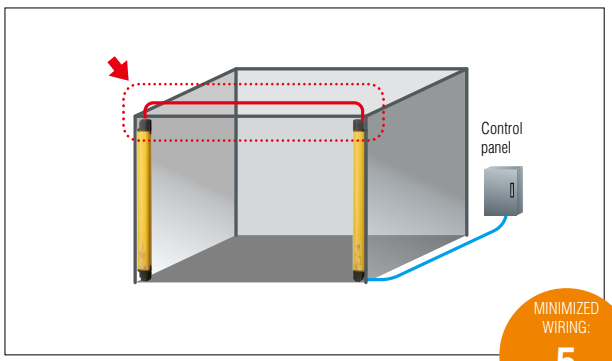


MINIMIZED WIRING: 8 wires

ONE-LINE SYSTEM



- The number of wires can be reduced to a simple 5 wires, drastically reducing installation time.
- Only the receiver needs to be wired to the control panel.

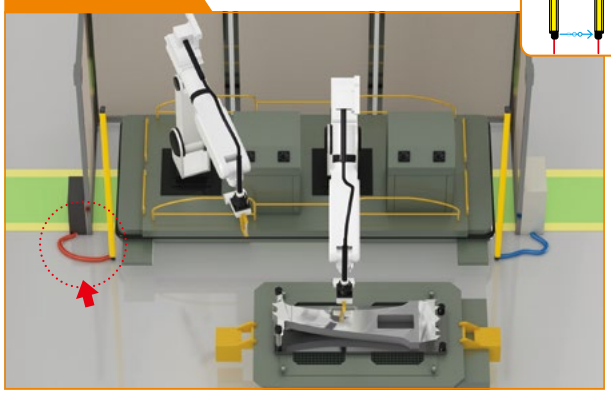


MINIMIZED WIRING: 5 wires

Equipment with a LARGE MACHINE OPENING

GL-R Series

Optical synchronization



1. Cables no longer need to be routed across the machine opening.
2. The potential for cable damage is greatly reduced.
3. Troubleshooting and replacement are both quicker and easier.

Equipment with a NARROW MACHINE OPENING

GL-S Series

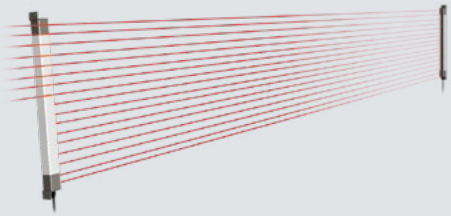
One-line

1. Simplified wiring decreases the potential for mistakes.
2. Only a single cable needs to be wired into the control box.

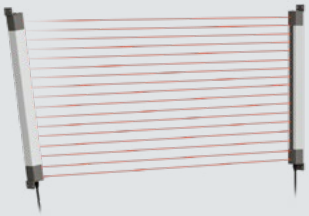
PROBLEM

Complicated and time-consuming installation (beam alignment)

Beam axis alignment is vital to stable detection; however it is typically difficult to achieve over long distances or with tall units when using conventional models.



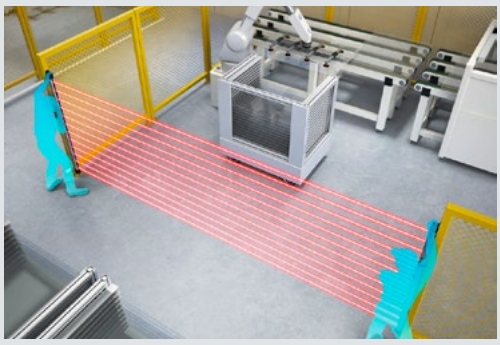
Alignment can be difficult over long distances



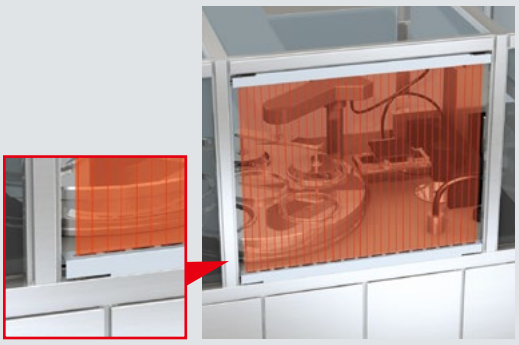
Beam axis alignment is more difficult for taller light curtains.

The light curtain cannot be easily adjusted.

DETAILED EXAMPLE

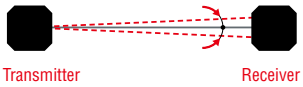


At times, it required two people to adjust the beam axis together.

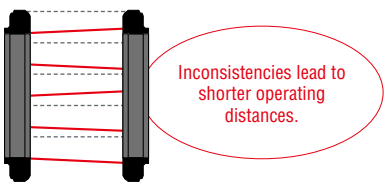


Protective covers and rigid mounting brackets made beam axis alignment even more difficult.

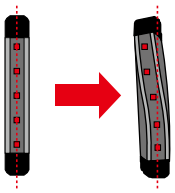
REASON



The aperture angle for the transmitted light must be ±2.5° when the devices are separated by 3 m 9.8' or more.



Individual differences between internal transmitter modules led to inconsistencies in the amount of light received by each beam axis.



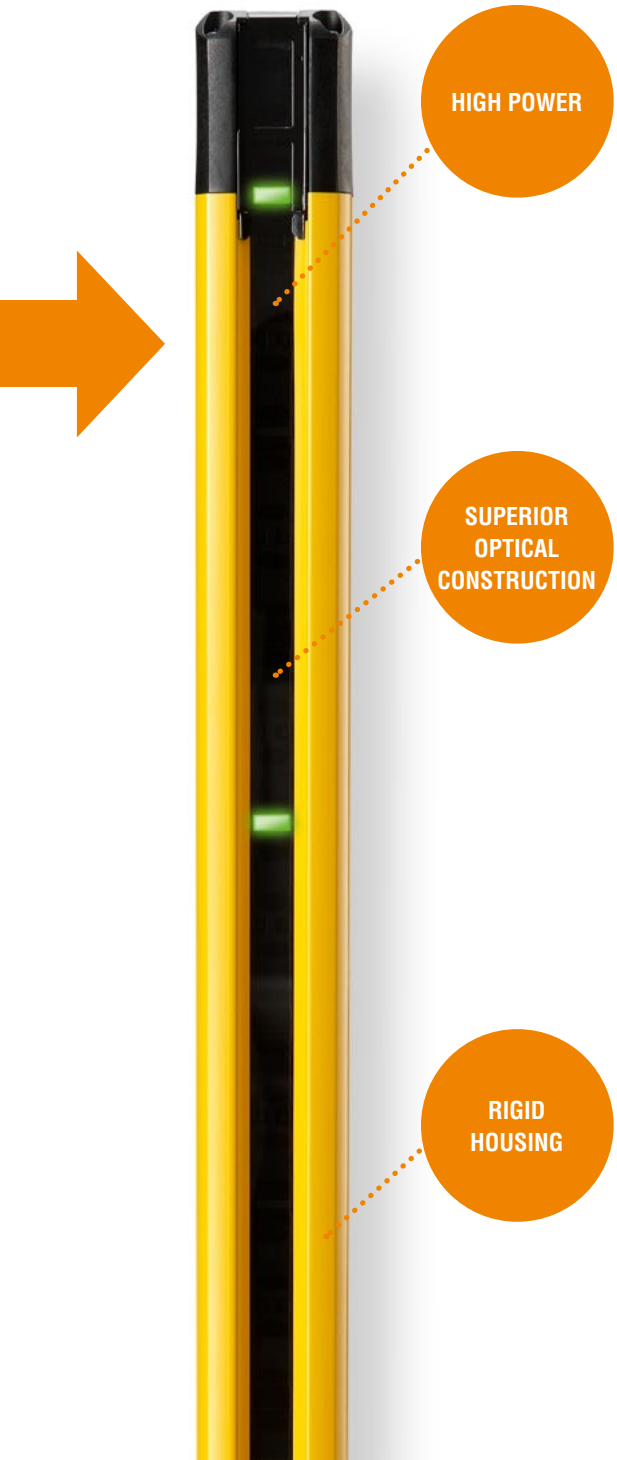
Weak light curtain frames allow twisting and bending to occur when installing light curtains.

GL-R GL-S HIGH POWER | GL-R GL-S METAL CASE

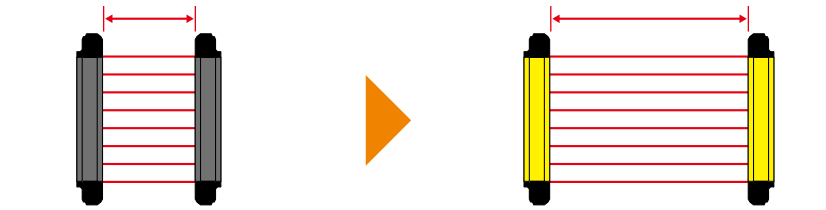
SOLUTION

Beam axis alignment is quick and easy

High powered light sources, a rigid frame, and advanced internal construction make alignment easier than ever before.



The utilization of large lenses and powerful LED's not only increases the operating range to 15 m 49.2', but also improves alignment



Operating distance: 9 m 29.5'

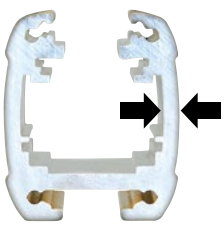
Operating distance: 15 m 49.2'

Achievement of an ideal optical construction

- Inconsistencies existed between the transmitter and receiver modules for each beam axis.
- Light quantity distribution is poor and inconsistent

- Inconsistencies between the transmitter and receiver modules are eliminated.
- Uniform light quantity distribution

Robust housing prevents misalignment due to twisting or bending



Thinnest point: 3 mm 0.12"

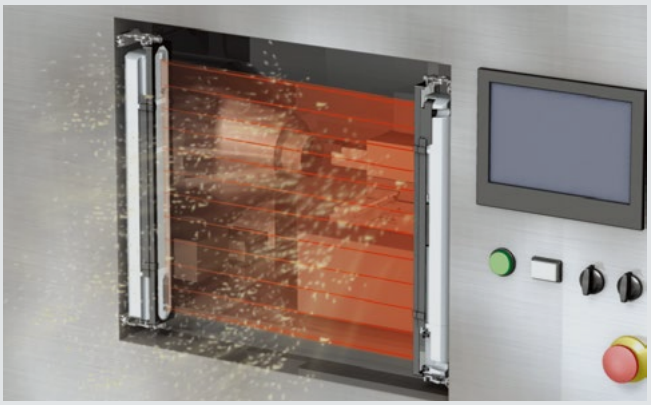
5× More robust than conventional light curtains

PROBLEM

Environmental factors cause unnecessary equipment stoppages

Constant preventative maintenance and caution was necessary to minimize equipment stoppage due to environmental hazards or equipment damage.

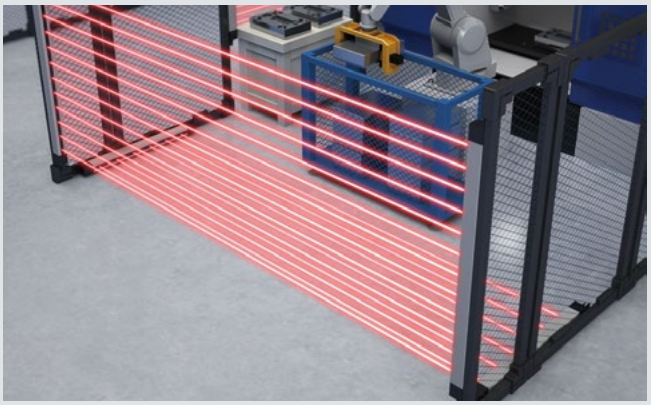
Impact from workpieces and tools can potentially damage the light curtains or cause misalignment. In either case, the result is costly equipment downtime.



Substances such as oil mist and dust adhere to the lens surface and cause the light curtain to shut down the machine due to buildup.

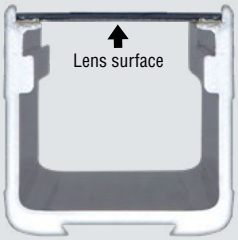
DETAILED EXAMPLE

Light curtain breakdowns and damage were typically caused by the environment they were used in. Therefore, countermeasures, such as additional guarding or repetitive cleaning, were required.



Damage occurs when objects collide with the light curtains during extraction from the hazardous zone.

The bottom part of the vertical installation may be damaged by or may malfunction due to the dirt or liquids in the air.



REASON

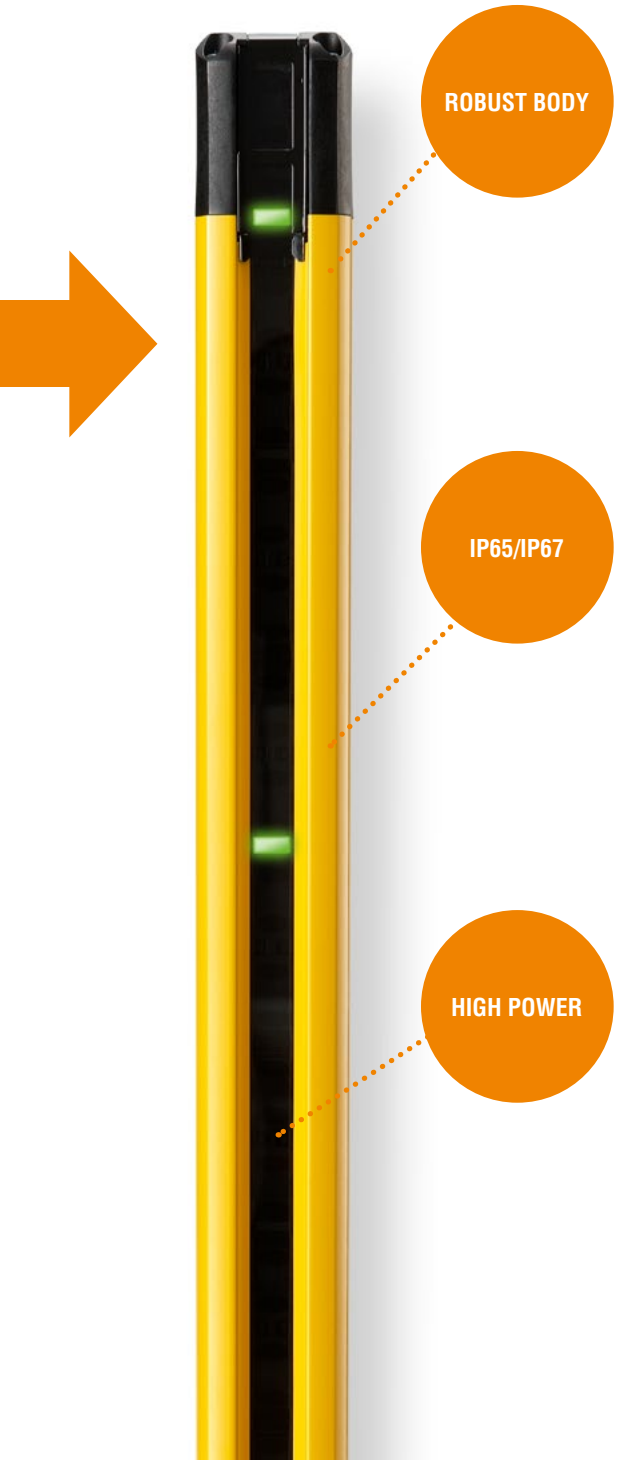
The lens surfaces of conventional light curtains were not sufficiently protected.
Also, conventional light curtains feature enclosure ratings that are insufficient for certain environments.
Therefore, it was possible for breakdowns or malfunctions to occur because of physical impact, dirt in the environment, or water intrusion.

SOLUTION

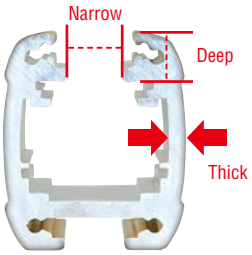
GL-R GL-S IP65/IP67 | GL-R GL-S HIGH POWER | GL-R GL-S BUILT-IN GUARDING

Stable detection in any environment

The GL Series light curtains are ideal for any type of environment due to their high power, superior enclosure ratings, and robust frame.



Rigid body construction and a recessed lens prevent damage due to impact



Thick and robust body with a minimum wall thickness of 3 mm 0.12" + Recessed Lens

Best-In-Class Shock Resistance

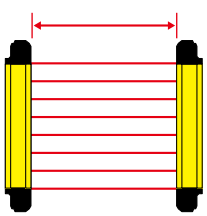
IP65 and IP67 enclosure ratings

Compliance with IEC standards

IP65 Dustproof and water-jet resistant + IP67 Dustproof and watertight

Superior Environment Resistance

Best-in-class signal strength ensures consistently stable operation



Operating distance: 15 m 49.2'

Approximately twice the operating distance of conventional models + Uniform optical construction

Stable Operation in Harsh Environments

ROBUST & SLIM

GL-R

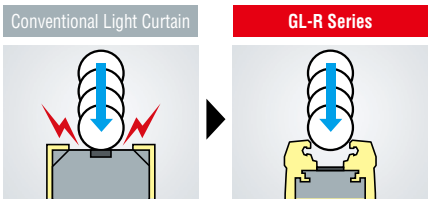
Series

ROBUST, YET SLIM

- The recessed lens protects the detection surface from damage
- Robust extruded aluminum construction
- Built to withstand harsh environments

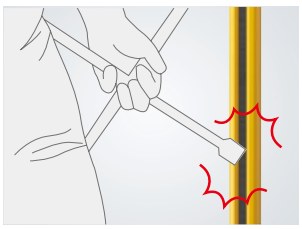
SECURELY PROTECTS THE DETECTION AREA

Built-in guarding will completely prevent impact to the lens surface by parts or tools of ø17 mm ø0.67" or more.*

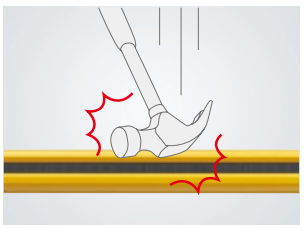


THICK AND ROBUST HOUSING THAT RESISTS IMPACT

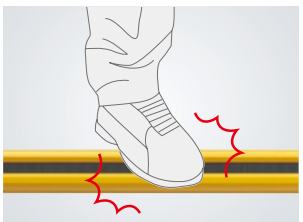
The GL-R Series employs a robust aluminum frame that has a minimum wall thickness of 3 mm 0.12", which protects the light curtain body from various forms of impact, such as dropping equipment or hitting it with tools.



Hitting



Dropping

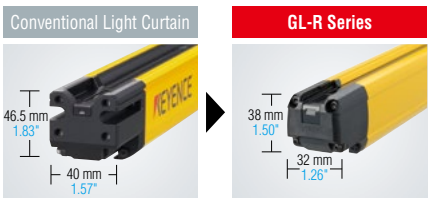


Stepping, Kicking

ROBUST, YET SLIM

The overall size of the GL-R Series has been reduced to save space on equipment while maintaining a very high level of durability.

33% REDUCTION in size compared to the conventional model



NO NEED FOR ADDITIONAL GUARDING

The GL-R Series can be installed and remain protected WITHOUT the use of additional U-channel type guarding, which reduces cost and simplifies installation.

IP65/IP67 ENCLOSURE RATING

The GL-R Series housing meets IP65/IP67 enclosure ratings based on IEC and JIS standards, enabling its use in washdown environments without fear of damage to the light curtain.

IP65 Dustproof and water-jet resistant

IP67 Dustproof and watertight

* The actual appearance of the product may not match the illustrations and photographs contained in this catalog.

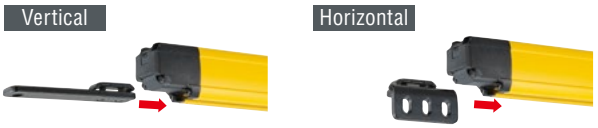
LINEUP/SPECIFICATIONS ▶ P.26
DIMENSIONS ▶ P.46

QUICK FIT BRACKETS

No assembly required; direct installation on extruded aluminum framework

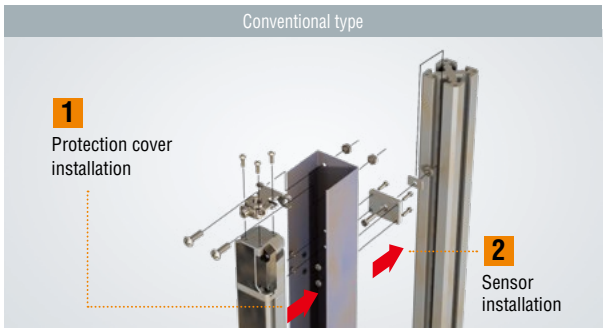
ADJUSTABLE ANGLE MOUNTING BRACKET

STRAIGHT/L-SHAPED MOUNTING BRACKET



GREATLY REDUCES INSTALLATION WORK

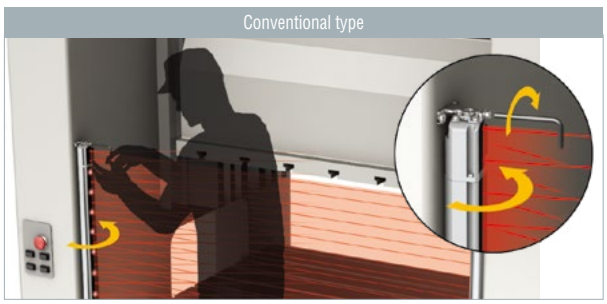
Simple one-point installation; no protective covers or mounting bracket assembly necessary



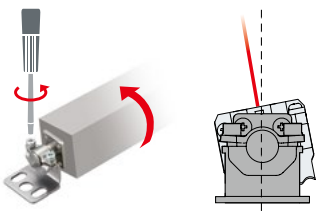
NO DEAD ZONE MOUNTING BRACKET

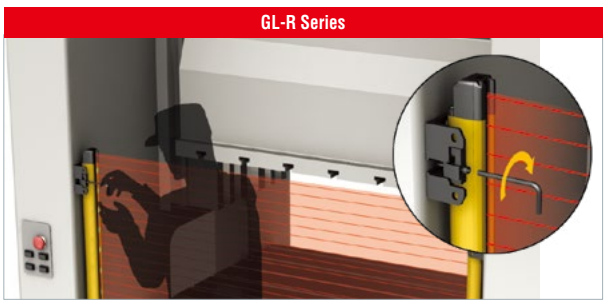
ELIMINATES BEAM AXIS OFFSET CONCERNS

Easy to adjust no dead zone brackets reduce misalignment and decrease set-up time

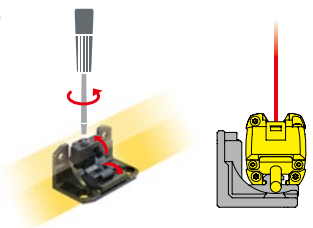


Poor bracket design can cause light curtains to become misaligned.





Improved bracket design helps to eliminate beam misalignment



ROBUST & SLIM
GL-R
Series

BUILT-IN FUNCTIONALITY OFFERS INCREASED EASE OF USE AND VERSATILITY

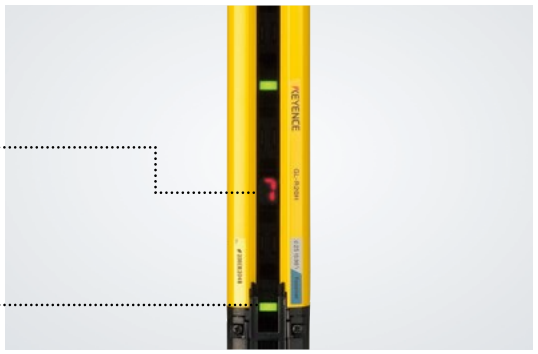
7-SEGMENT DISPLAY & CENTER INDICATORS

7-SEGMENT DISPLAY

Errors are displayed as numeric codes, which reduces the amount of time spent identifying and correcting problems detected by the GL-R Series.

CENTER INDICATORS

These indicators highlight the operational status of the GL-R Series to the operator. The indicators change color to identify if the light curtain is clear, interrupted, or in a lockout condition.



BUILT-IN FUNCTIONALITY

1 MUTUAL INTERFERENCE PREVENTION

Mutual interference between 2 units is easily prevented.

2 REDUCED RESOLUTION FUNCTION*

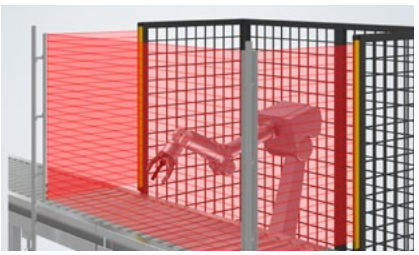
This function expands the size of the detection capability.
Up to 2 axes can be disabled.

3 CENTER INDICATOR FUNCTION CONTROL

The center indicators can be turned off to reduce current consumption.

CORNER MIRRORS SIMPLIFY SETUP

Corner mirrors are available to allow 1 set of curtains to cover up to 4 sides of a machine and reduce the amount of wiring required.



ADDITIONAL FUNCTIONALITY TO MEET THE DEMANDS OF ALL APPLICATIONS

The following functions can be used to customize the functions of the light curtain to meet the needs of any application.

MUTING FUNCTION

Allow necessary component to pass through the light curtains, while preventing operators or incorrect parts from passing through.

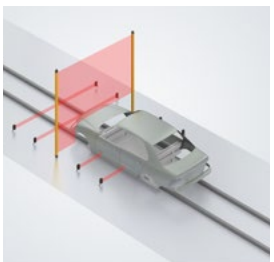
FIXED BLANKING FUNCTION

This function prevents the OSSD from turning off due to fixed obstructions within the detection area.

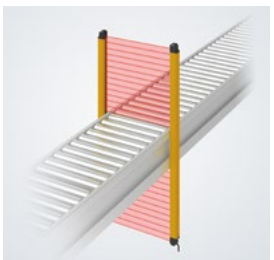
REDUCED RESOLUTION FUNCTION

False trips are eliminated with the ability to adjust detectable object size.*

Muting function



Fixed blanking function



* The safe distance must be recalculated according to the size of the detection capability.

LINEUP/SPECIFICATIONS ▶ P.26
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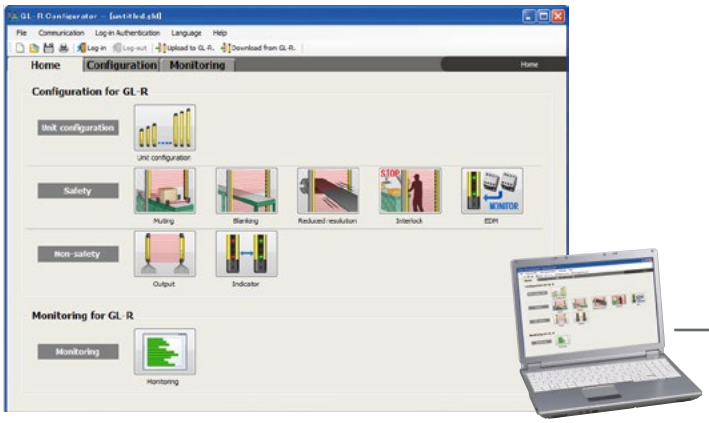
EASILY CONFIGURE SETTINGS AND MONITOR THE LIGHT CURTAIN STATUS DURING STANDARD OPERATION



PC configuration software
Safety device configurator
(free download)

DOWNLOAD SITE
www.keyence.com/safety_soft

Interface unit
GL-R1UB*
* USB cable sold separately
2 m 6.6': OP-51580, 5 m 16.4': OP-86941

EASY-TO-UNDERSTAND SOFTWARE DESIGN

The intuitive layout allows for quick and easy modifications.
Even first-time users can easily navigate and utilize the software.

SIMPLE CONNECTION USING THE DEDICATED INTERFACE UNIT AND A USB CABLE

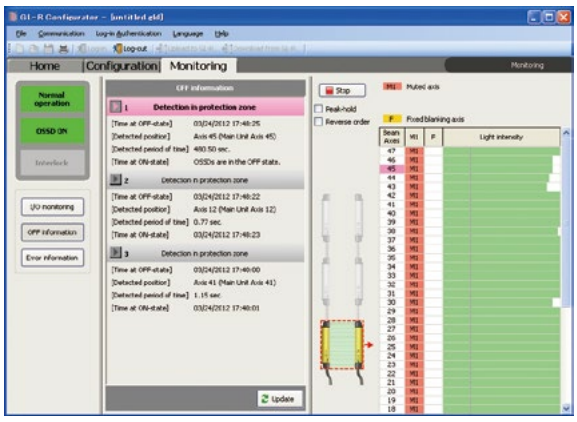
Direct connections can be made without turning the power off.

MONITORING FUNCTION

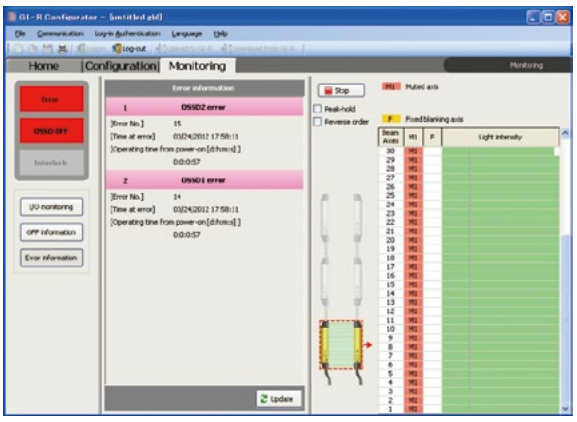
The operation of the GL-R Series can be monitored with a PC. The status of I/O signals including the OSSD outputs, override inputs, and error conditions can be checked along with the received light intensity on each beam. In addition, the muting function can be monitored to easily identify causes of abnormal operation during the muting setup or operation.

OSSD OFF INFORMATION, ERROR INFORMATION, ERROR HISTORY

OSSD output OFF time, location, and duration can be easily checked by accessing the OFF information. The Error code, time of occurrence, and conditions can be checked by accessing the Error Information. All Error codes and order of occurrence are saved as Error history records, allowing the past history to be checked. This all allows for easier troubleshooting and analysis.



OFF information



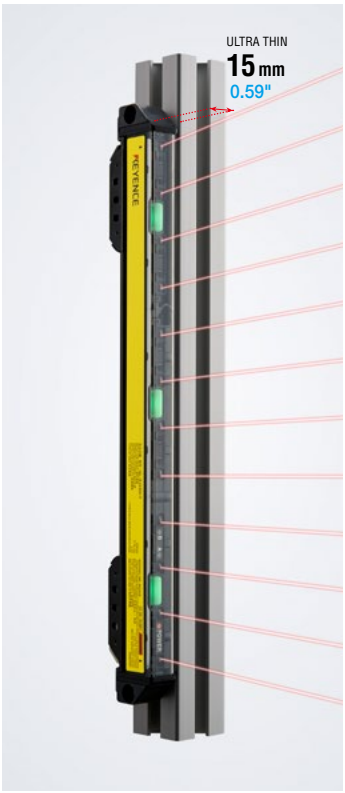
Error information

SLIM/FLAT

GL-S Series

SEAMLESS INTEGRATION INTO EQUIPMENT

Compact design featuring two different mounting options

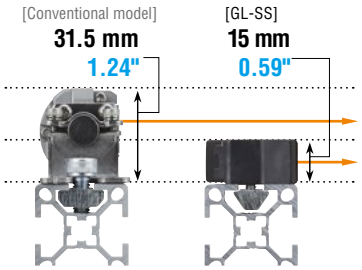


SLIM

The slim type GL-SS models are designed to be installed in front of or behind a machine opening.

The slim type models occupy minimal space while maintaining full functionality.

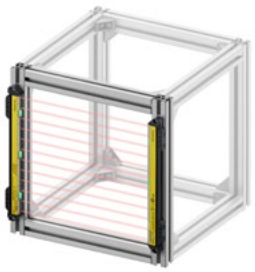
The depth is a mere 15 mm 0.59" compared to the 31.5 mm 1.24" of the conventional model.



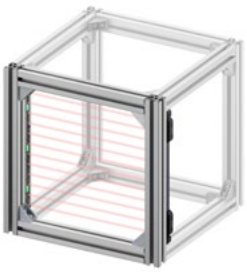
52% LESS

OCCUPIED SPACE

Compared to conventional models



In front of a machine opening



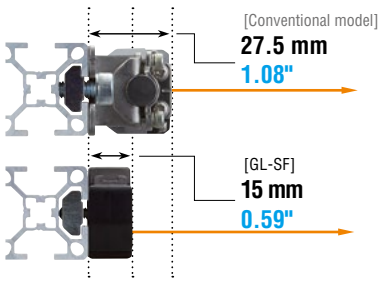
Behind a machine opening

FLAT

The flat type GL-SF models are designed to be installed inside a machine opening.

The flat type models allow unobtrusive mounting without obstructing the machine opening.

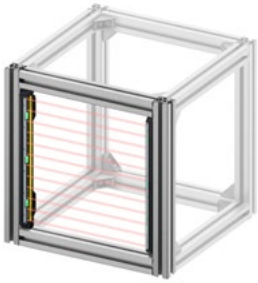
When this type is installed inside a machine opening, the full width of the opening can still be used!



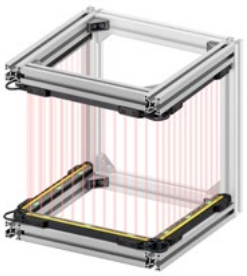
45% LESS

OCCUPIED SPACE

Compared to conventional models



Inside a machine opening



Multiple side protection with no dead zone

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SIGNIFICANT REDUCTION IN INSTALLATION TIME

Direct installation and tool-free cable connection

DIRECT MOUNTING BRACKETS

Simple two-step installation

The light curtain can be installed with only two screws; no bracket assembly is required.

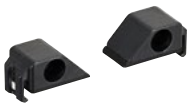
Direct mounting brackets (GL-SB01) come pre-attached on the light curtain

When no angle adjustment is required

Direct mounting bracket

Included with the light curtains and can be reordered if needed

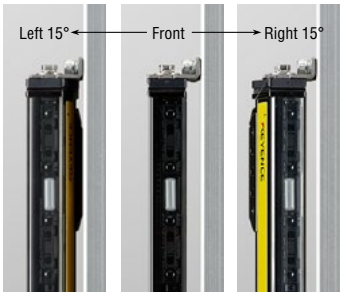
Quantity: 1 pair
Model: **GL-SB01**



When angle adjustment is required

Adjustable angle mounting bracket
(adjustment range: ±15°)

Quantity: 2 pairs
Model: **GL-SB04**



SIMPLE-INSTALLATION CABLE

Simply connect the cable to the curtain and use the slide mechanism to fix the cable in place. No tools are required to securely fix the cable to the light curtain. This significantly reduces the amount of installation time necessary.

Simple two-step installation

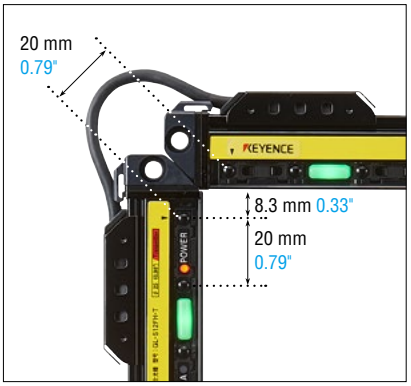
Connect the cable to the curtain.

Use the slide mechanism to secure the cable in place.

BUILT-IN SERIES CONNECTION AND INTERFERENCE PREVENTION

Up to three GL-S Series light curtains can be connected together in-line without the concern of interference between the curtains. When not using series connection, interference prevention is available for up to two units with no additional wiring*.
This makes it possible to mount light curtains based on equipment needs and not on light curtain restrictions.

* By switching the channels, the GL-S Series will not interfere with the next unit.



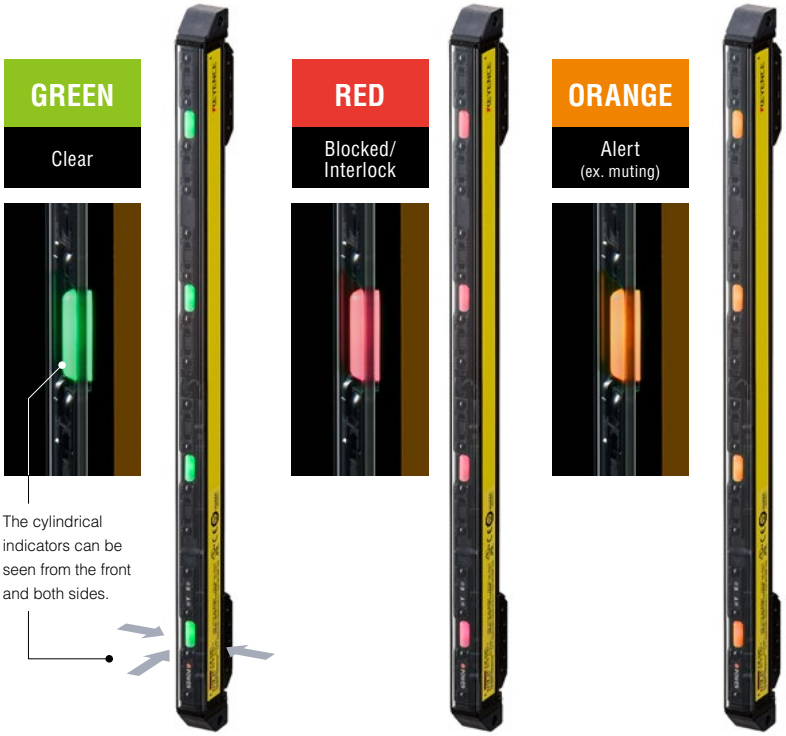
SLIM/FLAT
GL-S
Series

UNIQUE FUNCTIONS THAT INCREASE USABILITY IN ALL SITUATIONS

THREE-COLOR STATUS INDICATORS

OPERATION INDICATORS THAT CAN BE USED FOR A VARIETY OF APPLICATIONS

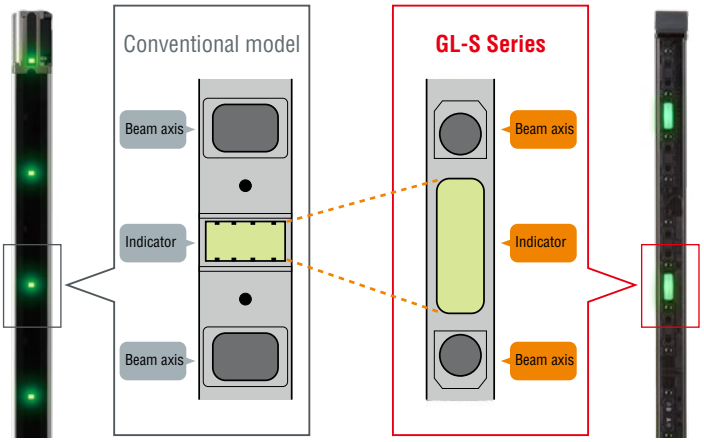
The status indicators can be illuminated in three colors — green, red, and orange — by activating an external input, making it possible to use them as work instruction lights. Additionally, the indicators can be used to simply indicate the blocked or unblocked status of the curtains.



HIGHLY VISIBLE STATUS INDICATORS

CYLINDRICAL INDICATORS CAN BE SEEN FROM MULTIPLE ANGLES

High luminance LED indicators between beam spots are extremely visible, yet are seamlessly integrated into the face of the light curtain. Additionally, the indicators are visible at a wide viewing angle, allowing for easy recognition of the curtain's status.

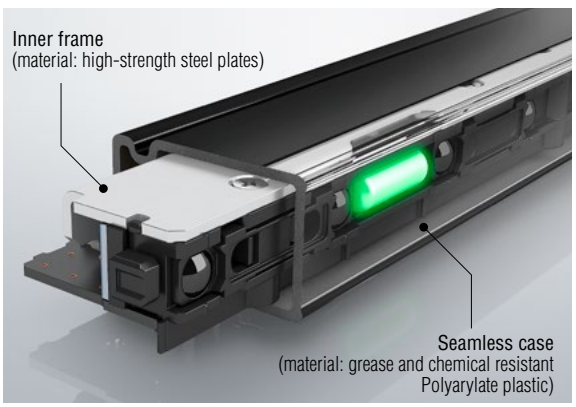


IP65/IP67 ENCLOSURE RATING

SUPERIOR RESISTANCE TO WATER AND DUST INTRUSION

Seamless construction enables the GL-S Series to maintain an IP65/IP67 enclosure rating.
The high-strength steel inner frame provides additional stability while maintaining a slim and compact size.

Cross-section
(seamless construction)



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GL-S SERIES PROTECTION COVERS

Tough and durable covers protect the light curtains from impact

For use with
SLIM TYPE

For use with
FLAT TYPE

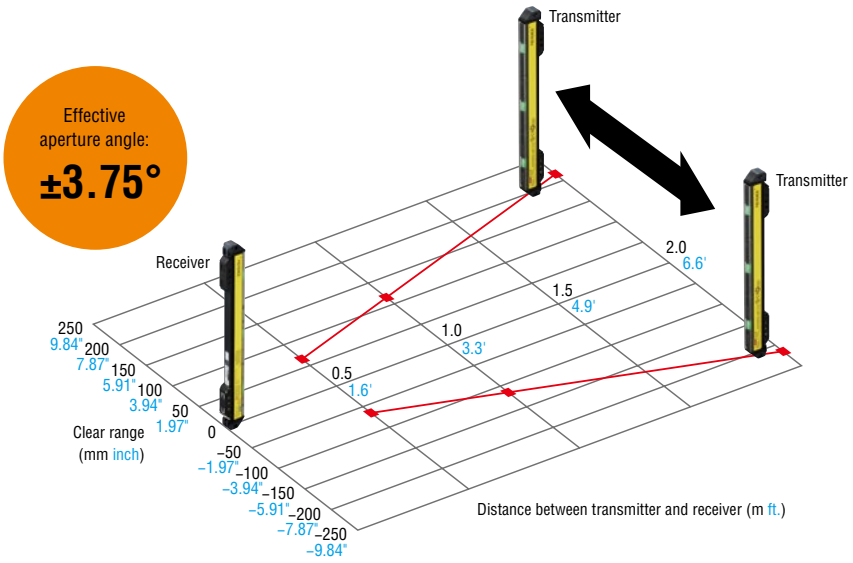
The protection cover is designed to maintain a space of 0.5 mm 0.02" between it and the light curtain. This space is used to absorb impacts.

Protection covers can be quickly and easily installed. Simple replacement of the mounting screws is all that is required.

Protection covers can also be installed when using series connections.

SIMPLE BEAM AXIS ADJUSTMENT

The maximum effective aperture angle of ±3.75° fully complies with Type 4 safety requirements and makes beam axis alignment easier than ever.



BUILT-IN SAFETY FUNCTIONS

The GL-S Series provides added safety functionality without the need for additional components.

* When the muting function is selected, the interlock and EDM functions cannot be used. For details on the safety functions, see the "GL-S Series User's Manual."

Interlock function

External device monitoring (EDM function)

Muting function*

CLASSIC

SL-V

Series

CLASSIC MODEL WITH TWO AVAILABLE TYPES

Standard and Heavy Duty types are offered for maximum versatility

STANDARD TYPE

• Detection capability: ø14 mm ø0.55"

Total length: 230 to 1270 mm
9.06" to 50.00"

• Detection capability: ø25 mm ø0.98"

Total length: 150 to 2390 mm
5.91" to 94.09"

HEAVY DUTY TYPE

• Detection capability: ø14 mm ø0.55"

Total length: 246 to 1286 mm
9.69" to 50.63"

• Detection capability: ø25 mm ø0.98"

Total length: 246 to 1926 mm
9.69" to 75.83"

* The robust and waterproof type is often used in heavy equipment industries. This type is constructed to withstand impact from large workpieces and other objects.

BUILT-IN SAFETY FUNCTIONS CAN BE CUSTOMIZED USING THE SOFTWARE

MUTING

The muting input time difference settings, muting input order, muting continuation time, and muting lamp error can be configured separately.

BLANKING

The fixed blanking function and reduced resolution function can be set.

INTERLOCK

Automatic start and manual start can be selected separately for use when starting and restarting the product.

EXTERNAL DEVICE MONITORING

The settings can be changed to enable or disable this function. Also, the allowed EDM input time can be changed.

Muting settings screen

Built-in series connection for system extension

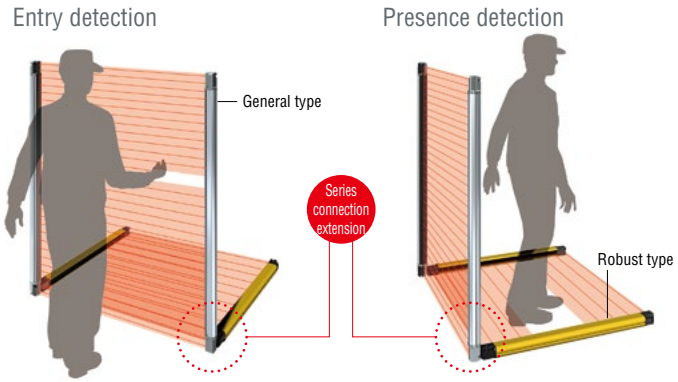
Built-in series connection | Design freedom

Light curtains can be extended in combinations to meet application requirements

It is possible to extend light curtain systems with series connections even when using light curtains that have different beam axis spacings or designs (i.e. Standard and Heavy Duty types).

Example

When it is desirable to perform both entry detection and presence detection for an equipment hazard



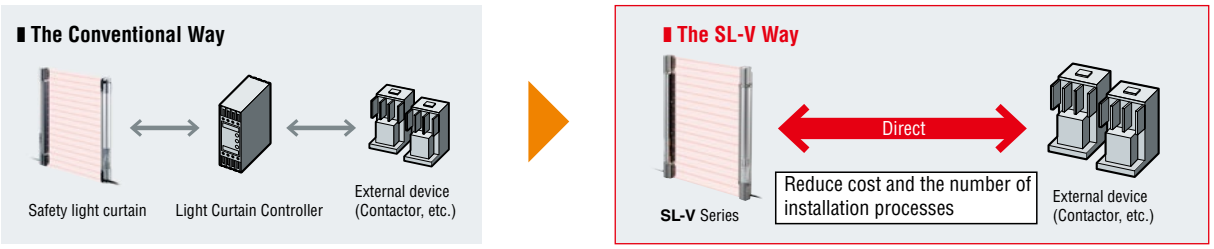
Direct connections to external devices

Reduce cost | Reduce installation time

Compliance with Category 4 Requirements without an additional component

With built-in external device monitoring (EDM), a Category 4 system can still be achieved without the need for an additional device.

* External devices cannot be used if the current during input exceeds 500 mA.



ADDITIONAL FUNCTIONS

INDUSTRY LEADING ALIGNMENT TOOL

The amount of light received from each beam axis of the connected SL-V can be viewed on a PC. This is especially useful when adjusting beam axes.

INTERFERENCE PREVENTION

By switching between A and B beam axis frequencies, it is possible to further reduce mutual interference.

STATE INFORMATION OUTPUT FUNCTION

For the state information output, signals can be sent to HMI units to display the curtain status.

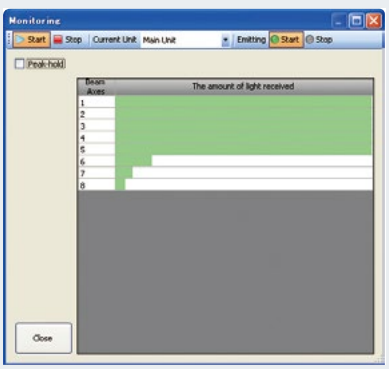
ALARM OUTPUT SETTINGS FUNCTION

It is possible to change the time that must elapse before the alarm output is turned on when the threshold is exceeded.

CENTER INDICATOR CUSTOMIZATION

Illumination of the center indicator can be customized to meet application requirements.

Received light amount monitor screen



GL-R Series

Selecting a Safety Light Curtain

Use the following steps to select the optimum GL-R Series components for your application.

Step 1 Select the light curtain type → Step 2 Select the light curtain length → Step 3 Select the mounting bracket → Step 4 Select the cables → Step 5 Select the optional accessories*

*Optional accessories are not required for normal operation.

Step 1 / Step 2

Select the light curtain type

Select the light curtain length

GL-RF
(Detection capability: ø14 mm ø0.55")

GL-RH
(Detection capability: ø25 mm ø0.98")

GL-RL
(Detection capability: ø45 mm ø1.77")

Step 3

Select the brackets

Adjustable angle mounting bracket
GL-RB01

Adjustable angle mounting bracket
GL-RB02

No dead zone mounting bracket
GL-RB21

Straight mounting bracket
GL-RB11

L-shaped mounting bracket
GL-RB12

Step 4

Select the cables

Cables

Step 5

Select options if necessary.

Front protection cover

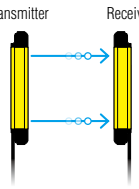
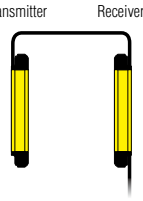
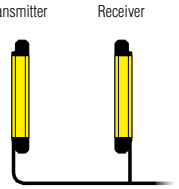
Interface unit

Corner mirror
SL-M

Dedicated safety relay for the GL-R Series
GL-T11R

GL-R Series functions and features

Wiring system

Wiring system		Optical synchronization system	One-line system	Wire synchronization system
Wiring diagram				
Advantage		• Wiring is not needed between the transmitter and receiver. • The Transmitter and the receiver can operate on different power supplies.	• Simplified wiring. • The unit connection cable is not needed for the transmitter.	• All functions of the GL-R are available.
Limitation		• The input and output functions on the transmitter are not available. • All indicators other than "Power" are not available on the transmitter.	• The input and output functions on the transmitter are not available. • There is a maximum limit for the total length of cables.	• Wiring is needed between the transmitter and the receiver.
Applicable Cables	Transmitter	5-core cable	Series connection cable	7-core cable 11-core cable
	Receiver	5-core cable 11-core cable	5-core cable 11-core cable	7-core cable 11-core cable

Wiring system		Optical synchronization system		One-line system		Wire synchronization system			
Cable combination	Transmitter cable	5-core		Series connection		7-core		11-core	
	Receiver cable	5-core	11-core	5-core	11-core	7-core	11-core	7-core	11-core
Usable functions	OSSD output	✓	✓	✓	✓	✓	✓	✓	✓
	AUX (auxiliary) output		✓		✓	💻	✓	💻	✓
	Error output		💻		💻	✓	✓	✓	✓
	Muting		💻		💻		💻	✓	✓
	Partial muting function		💻		💻		💻	💻	💻
	Muting bank function								💻
	Muted condition output		💻		💻		💻	💻	💻
	Muting lamp output							✓(💻)	✓(💻)
	Override function							✓(💻)	✓(💻)
	Interlock function		✓(💻)		✓(💻)		✓(💻)		✓(💻)
	Interlock-reset-ready output		💻		💻		💻		💻
	EDM function		✓(💻)		✓(💻)		✓(💻)		✓(💻)
	Wait input					✓	✓	✓	✓
	Alert output		💻		💻	💻	💻	💻	💻
	Clear/Block output		💻		💻	💻	💻	💻	💻
	Reset input (for error)		✓		✓		✓		✓
	Reduced resolution function	✓(💻)	✓(💻)	✓(💻)	✓(💻)	✓(💻)	✓(💻)	✓(💻)	✓(💻)
	Fixed blanking function	💻	💻	💻	💻	💻	💻	💻	💻
	Channel configuration (Light interference prevention function)	✓	✓	✓	✓	✓	✓	✓	✓
	Center indicator configuration	✓(💻)	✓(💻)	✓(💻)	✓(💻)	✓(💻)	✓(💻)	✓(💻)	✓(💻)
	Monitoring function	💻	💻	💻	💻	💻	💻	💻	💻

✓ Available without the configuration software　💻 Available with the configuration software　✓(💻) Available without the configuration software. Functionality can be expanded when using the configuration software.

Series connection

Up to three GL-R units can be serially connected and used as a single light curtain.

OSSD

The OSSD is a safety-related control output. It connects to an external device (load), such as an FSD or MPCE. The GL-R generates self-diagnosis signals on its internal control circuit to perform diagnostics on the output circuit (OSSD). These signals periodically force the OSSD into a temporary OFF state when no interruption exists in the detection zone.

Interlock function

Interlock is a function that prevents the OSSD from automatically going to the ON state from an OFF state. You can prevent the unintended start-up and/or the unintended restart of the machine if an interlock is applied to the GL-R.

External device breakdown detection (EDM function)

EDM (External Device Monitoring) is a function of the GL-R that monitors the state of the control devices which are externally connected to the GL-R. The GL-R can detect a fault, such as welded contacts on external devices, as long as the EDM function is activated. This function is available only when connecting the 11-core cable to the receiver.

Step 1

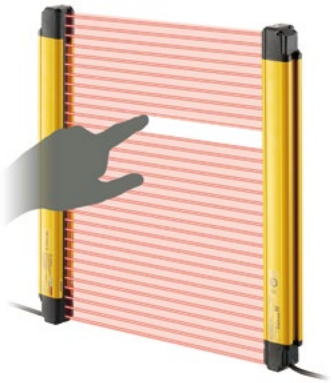
Select the light curtain type

Select a model according to the necessary detection capabilities.

Detection capability: ø14 mm ø0.55"

Beam axis pitch of ø10 mm ø0.39".

Entry detection

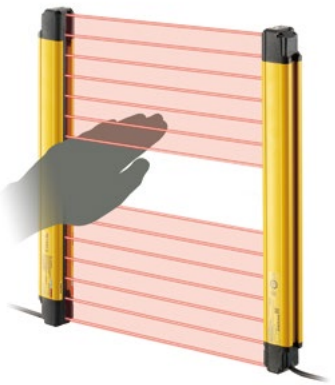


To step2 GL-RF

Detection capability: ø25 mm ø0.98"

Beam axis pitch of ø20 mm ø0.79".

Entry detection

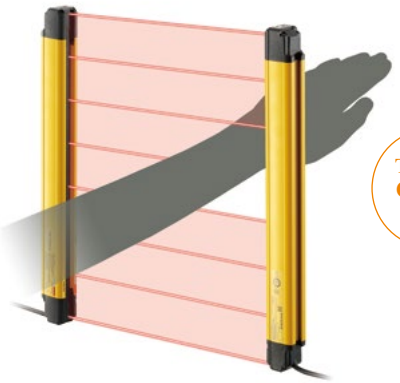


To step2 GL-RH

Detection capability: ø45 mm ø1.77"

Beam axis pitch of ø40 mm ø1.57".

Entry/presence detection



To step2 GL-RL

The required mounting distance from the hazard is determined by the response time and detection capability for the light curtain that has been selected. Though the ø25 mm ø0.98" model is used most frequently, if the distance to the hazard is short, select the ø14 mm ø0.55" model. If the distance to the hazard is long, you can use the ø45 mm ø1.77" model.

Step 2

Select the light curtain length

If [Detection capability: ø14 mm ø0.55"] was selected in Step 1

GL-RF

Model	No. of beam axes	Total length (mm inch)	Detection height (mm inch)	Protection height (mm inch)	Operating distance (m ft.)
GL-R23F	23	240 9.45"	220 8.66"	244 9.61"	0.2 to 10 0.66' to 32.81'
GL-R31F	31	320 12.60"	300 11.81"	324 12.76"	
GL-R39F	39	400 15.75"	380 14.96"	404 15.91"	
GL-R47F	47	480 18.90"	460 18.11"	484 19.06"	
GL-R55F	55	560 22.05"	540 21.26"	564 22.20"	
GL-R63F	63	640 25.20"	620 24.41"	644 25.35"	
GL-R71F	71	720 28.35"	700 27.56"	724 28.50"	
GL-R79F	79	800 31.50"	780 30.71"	804 31.65"	
GL-R87F	87	880 34.65"	860 33.86"	884 34.80"	
GL-R95F	95	960 37.80"	940 37.01"	964 37.95"	
GL-R103F	103	1040 40.94"	1020 40.16"	1044 41.10"	
GL-R111F	111	1120 44.09"	1100 43.31"	1124 44.25"	
GL-R119F	119	1200 47.24"	1180 46.46"	1204 47.40"	
GL-R127F	127	1280 50.39"	1260 49.61"	1284 50.55"	

If [Detection capability: ø25 mm ø0.98"] was selected in Step 1

GL-RH

Model	No. of beam axes	Total length (mm inch)	Detection height (mm inch)	Protection height (mm inch)	Operating distance (m ft.)
GL-R08H	8	160 6.30"	140 5.51"	185 7.28"	0.2 to 15 0.66' to 49.21'
GL-R12H	12	240 9.45"	220 8.66"	265 10.43"	
GL-R16H	16	320 12.60"	300 11.81"	345 13.58"	
GL-R20H	20	400 15.75"	380 14.96"	425 16.73"	
GL-R24H	24	480 18.90"	460 18.11"	505 19.88"	
GL-R28H	28	560 22.05"	540 21.26"	585 23.03"	
GL-R32H	32	640 25.20"	620 24.41"	665 26.18"	
GL-R36H	36	720 28.35"	700 27.56"	745 29.33"	
GL-R40H	40	800 31.50"	780 30.71"	825 32.48"	
GL-R44H	44	880 34.65"	860 33.86"	905 35.63"	
GL-R48H	48	960 37.80"	940 37.01"	985 38.78"	
GL-R52H	52	1040 40.94"	1020 40.16"	1065 41.93"	
GL-R56H	56	1120 44.09"	1100 43.31"	1145 45.08"	
GL-R60H	60	1200 47.24"	1180 46.46"	1225 48.23"	
GL-R64H	64	1280 50.39"	1260 49.61"	1305 51.38"	
GL-R72H	72	1440 56.69"	1420 55.91"	1465 57.68"	
GL-R80H	80	1600 62.99"	1580 62.20"	1625 63.98"	
GL-R88H	88	1760 69.29"	1740 68.50"	1785 70.28"	
GL-R96H	96	1920 75.59"	1900 74.80"	1945 76.57"	

If [Detection capability: ø45 mm ø1.77"] was selected in Step 1

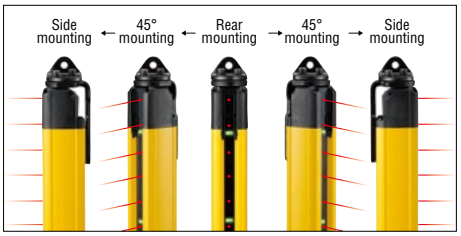
GL-RL

Model	No. of beam axes	Total length (mm inch)	Detection height (mm inch)	Protection height (mm inch)	Operating distance (m ft.)
GL-R04L	4	160 6.30"	120 4.72"	205 8.07"	0.2 to 15 0.66' to 49.21'
GL-R06L	6	240 9.45"	200 7.87"	285 11.22"	
GL-R08L	8	320 12.60"	280 11.02"	365 14.37"	
GL-R10L	10	400 15.75"	360 14.17"	445 17.52"	
GL-R12L	12	480 18.90"	440 17.32"	525 20.67"	
GL-R14L	14	560 22.05"	520 20.47"	605 23.82"	
GL-R16L	16	640 25.20"	600 23.62"	685 26.97"	
GL-R18L	18	720 28.35"	680 26.77"	765 30.12"	
GL-R20L	20	800 31.50"	760 29.92"	845 33.27"	
GL-R22L	22	880 34.65"	840 33.07"	925 36.42"	
GL-R24L	24	960 37.80"	920 36.22"	1005 39.57"	
GL-R26L	26	1040 40.94"	1000 39.37"	1085 42.72"	
GL-R28L	28	1120 44.09"	1080 42.52"	1165 45.87"	
GL-R30L	30	1200 47.24"	1160 45.67"	1245 49.02"	
GL-R32L	32	1280 50.39"	1240 48.82"	1325 52.17"	

Step 3

Select the mounting bracket

Adjustable angle mounting bracket GL-RB01 (incl. 2 pieces)



*The GL-RB01 is shown in the photograph.

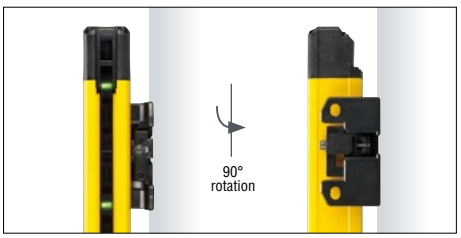
- By changing the screw positions, it is possible to adjust the angle of the light curtain by 180°.

If the total length of the GL-R main unit is 1280 mm 50.39" or longer, and if mounting it using the Adjustable angle mounting bracket, also use the antivibration bracket [GL-RB32 (2 pieces/pack)] to prevent vibration.

Model
GL-RB01

Model
GL-RB02

No dead zone mounting bracket GL-RB21 (incl. 2 pieces)

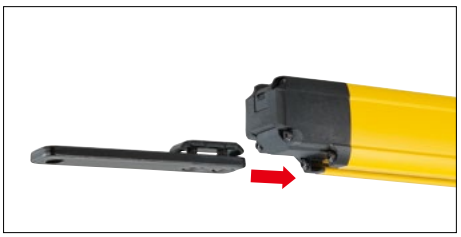


- Allows you to rotate the light curtain 90° by changing the mounting hole. It is also possible to perform fine-tuning of ±15° from this position.

If the total length of the GL-R main unit is 1280 mm 50.39" or longer and if mounting it using the no dead zone mounting bracket, also use the antivibration bracket [GL-RB32 (2 pieces/pack)] to prevent vibration.

Model
GL-RB21

Straight mounting bracket GL-RB11 (incl. 2 pieces)

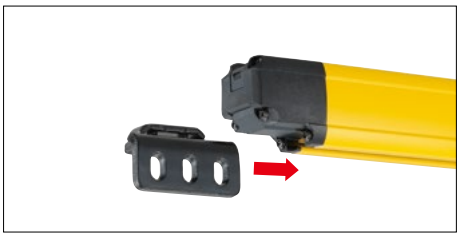


- Simple attachment to standard machine framework.

If the total length of the GL-R main unit is 1280 mm 50.39" or longer, and if mounting it using the straight mounting bracket, also use the antivibration bracket [GL-RB31 (2 pieces/pack)] to prevent vibration.

Model
GL-RB11

L-shaped mounting bracket GL-RB12 (incl. 2 pieces)



- Simple attachment to standard machine framework.

If the total length of the GL-R main unit is 1280 mm 50.39" or longer, and if mounting it using the L-shaped mounting bracket, additional L-shaped mounting brackets can be used [GL-RB12 (2 pieces/pack)] to prevent vibration.

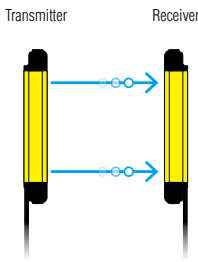
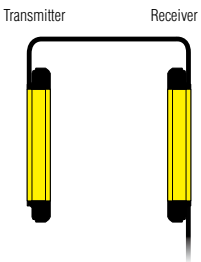
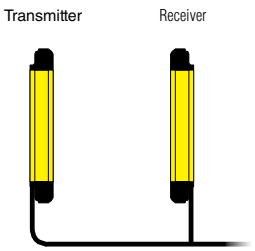
Model
GL-RB12

Step 4

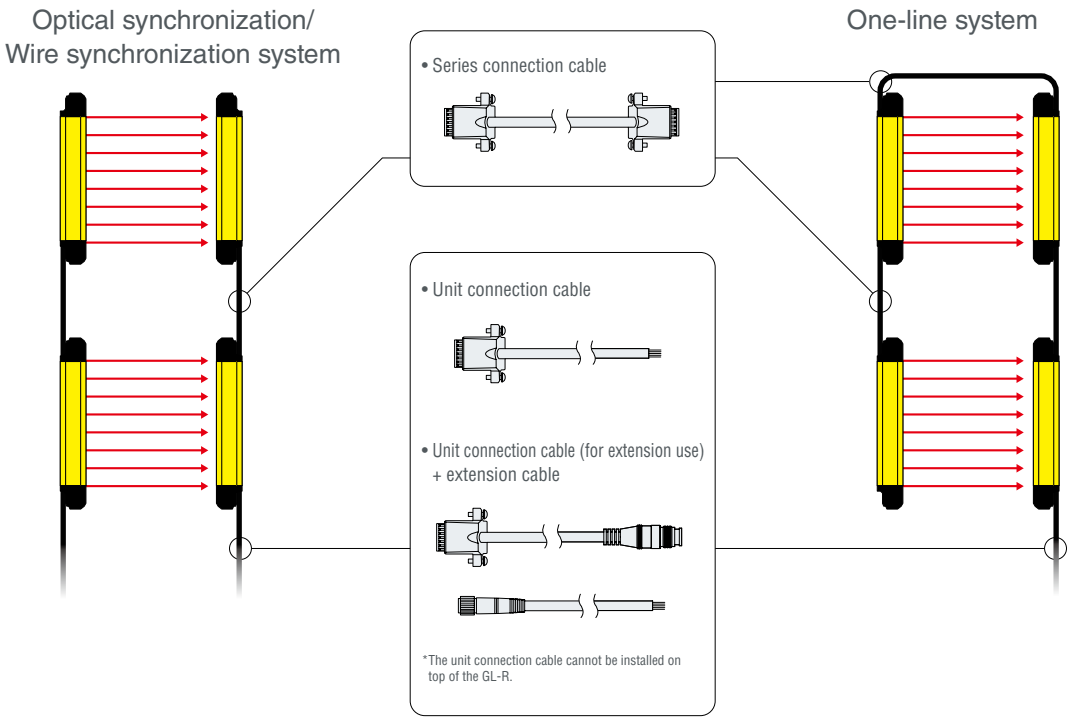
Select the cables

It is possible to select from the following 3 types of wiring systems according to the application.
Select the applicable cables according to the wiring systems listed below.

Select 1 cable for each transmitter/receiver according to the optimal wiring system.
If multiple functions are necessary, select an 11-core cable.

Wiring system		Optical synchronization system	One-line system	Wire synchronization system
Wiring diagram				
Applicable cables	Transmitter	5-core cable	Series connection cable	7-core cable 11-core cable
	Receiver	5-core cable 11-core cable	5-core cable 11-core cable	7-core cable 11-core cable

Installation schematic



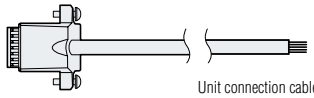
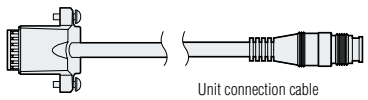
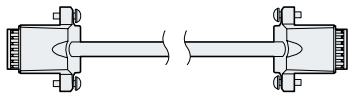
Step 4

Select the cables

Cables

- Each model is connected to one cable. Therefore, at least two cables are needed as a system, one for the transmitter and another for the receiver.
- All cables can be used for both the transmitter and receiver.
- The combination of the wiring system and cable determines the functions that can be used. Different types of cables can be used for the transmitter and receiver.
- Make sure that the length of the main unit connection cable and extension cable will be 30 m 98.43' or less regarding the transmitter and receiver, respectively, when using the optical/wire synchronization system.
- Make sure that the total length for all cables, which includes the unit connection cable, extension cable, and series connection cable, is 30 m 98.43' or less when using the one-line system.

Select a unit connection cable or one-line system series connection cable.
If extending the cable, select a connector type.

Shape	No. of conductors	PNP/NPN	Connector	Length (m ft.)	Model
 Unit connection cable	5-core	PNP	—	5 16.4'	GL-RP5P
			—	10 32.8'	GL-RP10P
		NPN	—	5 16.4'	GL-RP5N
			—	10 32.8'	GL-RP10N
	7-core	PNP	—	5 16.4'	GL-RP5PS
			—	10 32.8'	GL-RP10PS
		NPN	—	5 16.4'	GL-RP5NS
			—	10 32.8'	GL-RP10NS
	11-core	PNP	—	5 16.4'	GL-RP5PM
			—	10 32.8'	GL-RP10PM
		NPN	—	5 16.4'	GL-RP5NM
			—	10 32.8'	GL-RP10NM
 Unit connection cable (for extension use)	5-core	PNP	M12 (5-pin male)	0.3 1.0'	GL-RPC03P
		NPN			GL-RPC03N
	7-core	PNP	M12 (8-pin male)		GL-RPC03PS
		NPN			GL-RPC03NS
	11-core	PNP	M14 (12-pin male)		GL-RPC03PM
		NPN			GL-RPC03NM
 The connector shape for both sides is the same.	Series connection cable	PNP/NPN shared	—	0.08 0.3'	GL-RS008
				0.15 0.5'	GL-RS015
				0.5 1.6'	GL-RS05
				1 3.3'	GL-RS1
				3 9.8'	GL-RS3
				5 16.4'	GL-RS5
				10 32.8'	GL-RS10

For extension

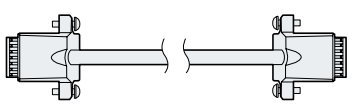
- If using a combination of the unit connection cable (for extension use) and the extension cable, make sure that they share the same amount of conductors.

Shape	No. of conductors	PNP/NPN	Length (m ft.)	Model
 Extension cable	5-core M12 connector (5-pin female)	PNP/NPN shared	5 16.4'	GL-RC5
			10 32.8'	GL-RC10
			20 65.6'	GL-RC20
	7-core M12 connector (8-pin female)		5 16.4'	GL-RC5S
			10 32.8'	GL-RC10S
			20 65.6'	GL-RC20S
	11-core M14 connector (12-pin female)		5 16.4'	GL-RC5M
			10 32.8'	GL-RC10M
			20 65.6'	GL-RC20M

For series connection

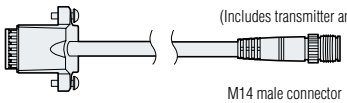
By connecting up to 3 GL-R units in a series, they can function as a single set of light curtains.

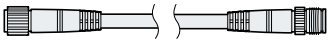
- Use a series connection cable to perform series connection.

Shape	PNP/NPN	Length (m ft.)	Model
 * The connector shape for both sides is the same. There are no regulations for the direction in which connection is performed.	PNP/NPN shared	0.08 0.3'	GL-RS008
		0.15 0.5'	GL-RS015
		0.5 1.6'	GL-RS05
		1 3.3'	GL-RS1
		3 9.8'	GL-RS3
		5 16.4'	GL-RS5
		10 32.8'	GL-RS10

GL-T11R connection cable

• The following cable must be used for connection between the GL-R and GL-T11R.
The system will not operate if other GL-R cables are used to connect the GL-R and GL-T11R.

Shape	Length (m ft.)	Model
 (Includes transmitter and receiver cables) M14 male connector	0.3 1.0'	**GL-RPT03PM**
	3 9.8'	**GL-RPT3PM**
	5 16.4'	**GL-RPT5PM**

Shape	Length (m ft.)	Model
 (Includes transmitter and receiver cables) M14 female connector M14 male connector	10 32.8'	**GL-RCT10PM**

Step 5

Select the optional accessories

Select the front protection cover, interface unit, corner mirror, and safety controller as necessary

Select a front protection cover to protect the detection surface as necessary.

Front protection cover

Two sets are required to install protection on both the transmitter and receiver. Refer to the detection distances in the chart when using the front protection cover.

Front protection cover	Operating distance		
	GL-RF	GL-RH	GL-RL
Single side (Transmitter or receiver only)	9.5 m 31.2'	14.5 m 47.6'	
Both sides (Transmitter and receiver)	9 m 29.5'	14 m 45.9'	

Model	Applicable **GL-R** model		
GL-RA160	—	GL-R08H	GL-R04L
GL-RA240	GL-R23F	GL-R12H	GL-R06L
GL-RA320	GL-R31F	GL-R16H	GL-R08L
GL-RA400	GL-R39F	GL-R20H	GL-R10L
GL-RA480	GL-R47F	GL-R24H	GL-R12L
GL-RA560	GL-R55F	GL-R28H	GL-R14L
GL-RA640	GL-R63F	GL-R32H	GL-R16L
GL-RA720	GL-R71F	GL-R36H	GL-R18L
GL-RA800	GL-R79F	GL-R40H	GL-R20L
GL-RA880	GL-R87F	GL-R44H	GL-R22L
GL-RA960	GL-R95F	GL-R48H	GL-R24L
GL-RA1040	GL-R103F	GL-R52H	GL-R26L
GL-RA1120	GL-R111F	GL-R56H	GL-R28L
GL-RA1200	GL-R119F	GL-R60H	GL-R30L
GL-RA1280	GL-R127F	GL-R64H	GL-R32L
GL-RA1440	—	GL-R72H	—
GL-RA1600	—	GL-R80H	—
GL-RA1760	—	GL-R88H	—
GL-RA1920	—	GL-R96H	—

Optional accessory required to perform configuration and monitoring of the GL-R on a PC.

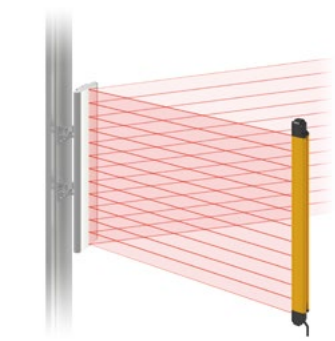
Interface unit

Model	Name
GL-R1UB	Interface unit
OP-51580	USB cable 2 m 6.6'
OP-86941	USB cable 5 m 16.4'

By using a corner mirror, it is possible to reduce costs and save time on wiring.

Corner mirror SL-M

- This is a mirror that reflects light from the transmitter within a range of 45° to 95°. Up to 4 mirrors can be used. For details, see the “SL-M Series instruction manual”.



For each single corner mirror, the detection distance will decrease by approximately 10%.

Model	Applicable **GL-R** model		
SL-M12H	GL-R23F	GL-R08H/GL-R12H	GL-R04L/GL-R06L
SL-M16H	GL-R31F	GL-R16H	GL-R08L
SL-M20H	GL-R39F	GL-R20H	GL-R10L
SL-M24H	GL-R47F	GL-R24H	GL-R12L
SL-M28H	GL-R55F	GL-R28H	GL-R14L
SL-M32H	GL-R63F	GL-R32H	GL-R16L
SL-M36H	GL-R71F	GL-R36H	GL-R18L
SL-M40H	GL-R79F	GL-R40H	GL-R20L
SL-M44H	GL-R87F	GL-R44H	GL-R22L
SL-M48H	GL-R95F	GL-R48H	GL-R24L
SL-M52H	GL-R103F	GL-R52H	GL-R26L
SL-M56H	GL-R111F	GL-R56H	GL-R28L
SL-M60H	GL-R119F	GL-R60H	GL-R30L
SL-M64H	GL-R127F	GL-R64H	GL-R32L
SL-M80H*	—	GL-R72H/GL-R80H	—
SL-M96H*	—	GL-R88H/GL-R96H	—

* Newly added to the lineup

GL-T11R dedicated relay for the GL Series

SL-U2 dedicated power supply for KEYENCE light curtains (Class 2 output)

Dedicated relay for the GL Series

Type	Model	Safety input	Safety output	Other I/O
		Light curtain		
Safety relay	GL-T11R	1 ch (2 inputs) (Dedicated for GL)	1 channel (2 outputs)	EDM input, Muting input, AUX output, Muting lamp output, etc.

Dedicated power supply for KEYENCE light curtains

Type	Model	Input power supply voltage	Output voltage	Output capacity	Power consumption
Switching type power supply	SL-U2	100 to 240 VAC ±10% (50/60 Hz)	24 VDC ±10% Class 2	1.8 A	135 VA

Test piece for detection test

Model	Detail
OP-88865	Diameter of 14 mm 0.55", Length of 200 mm 7.87"
OP-88866	Diameter of 25 mm 0.98", Length of 200 mm 7.87"

When you need a test piece larger than 25 mm 0.98" in diameter, please acquire on your own.

Common specifications

Model			GL-RxxF	GL-RxxH	GL-RxxL
Beam axis spacing/Lens diameter			10 mm 0.39" / ø4 ø0.16"	20 mm 0.79" / ø5 ø0.20"	40 mm 1.57" / ø5 ø0.20"
Detection capability			ø14 mm ø0.55"	ø25 mm ø0.98"	ø45 mm ø1.77"
Operating distance			0.2 to 10 m 0.7' to 32.8'*1	0.2 to 15 m 0.7' to 49.2'*1	
Effective aperture angle			Max. ±2.5° (When operating distance is 3 m 9.8' or more)		
Light source			Infrared LED (870 nm)		
Response time			Optical synchronization (Channel 0) or Wire synchronization: 6.6 to 18.1 ms Optical synchronization (Channel A or B): 6.9 to 27.4 ms		
OSSD operation			Turns on when no interruptions are present in the detection zone		
Synchronization between the transmitter and receiver			Optical synchronization or Wire synchronization (Determined by wiring)		
Light interference prevention function			Prevents mutual interference in up to two GL-R systems. Optical synchronization: prevented by Channel A and B with setting switch Wire synchronization: prevented automatically		
Control output (OSSD output)	Output		2 transistor outputs. (PNP or NPN is determined by the cable type)		
	Max. load current		500 mA*2		
	Residual voltage (during ON)		Max. 2.5 V (with a cable length of 5 m 16.4')		
	OFF state voltage		Max. 2.0 V (with a cable length of 5 m 16.4')		
	Leakage current		Max. 200 µA		
	Max. capacitive load		2.2 µF		
	Load wiring resistance		Max. 2.5 Ω		
Supplemental output (Non-safety-related output)	AUX Error output		Transistor outputs (Compatible with both PNP and NPN) Load current: Max. 50 mA, Residual voltage: Max. 2.5 V (with a cable length of 5 m 16.4')		
	Muting lamp output		Incandescent lamp (24 VDC, 1 to 5.5 W) LED lamp (load current: 10 to 230 mA) can be connected		
External input	EDM input Wait input Reset input Muting input 1, 2 Override input		[When using a PNP output cable] ON voltage: 10 to 30 V OFF voltage: Open or 0 to 3 V Short circuit current: Approx. 2.5 mA (Approx. 10 mA with EDM input only)	[When using an NPN output cable] ON voltage: 0 to 3 V OFF voltage: Open or 10 V or more Up to the power voltage Short circuit current: Approx. 2.5 mA (Approx. 10 mA with EDM input only)	
Power supply	Voltage		24 VDC ±20%, ripple (P-P) 10% or less, Class 2		
	Current consumption		Transmitter : 37 to 81 mA, Receiver : 66 to 91 mA		
Protection circuit			Reverse current protection, short-circuit protection for each output, surge protection for each output		
Environmental resistance	Enclosure rating		IP65/IP67 (IEC60529)		
	Overvoltage category		II		
	Ambient temperature		-10 to +55°C 14 to +131°F (No freezing)		
	Storage ambient temperature		-25 to +60°C -13 to +140°F (No freezing)		
	Relative humidity		15 to 85% RH (No condensation)		
	Storage relative humidity		15 to 95% RH		
	Ambient light		Incandescent lamp: 3000 lux or less. Sunlight: 20000 lux or less		
	Vibration		10 to 55 Hz, 0.7 mm 0.03" compound amplitude, 20 sweeps each in the X, Y and Z directions		
	Shock		100m/s^2 (approx. 10G), 16 ms pulse in X, Y and Z directions, 1000 times each axis		
Material	Main unit case		Aluminum		
	Upper case/lower case		Nylon (GF 30%)		
	Front cover		Polycarbonate, SUS304		
Approved standards	EMC	EMS	IEC61496-1, EN61496-1, UL61496-1		
		EMI	EN55011 ClassA, FCC Part15B ClassA, ICES-003 ClassA		
	Safety		IEC61496-1, EN61496-1, UL61496-1 (Type 4 ESPE)		
			IEC61496-2, EN61496-2, UL61496-2 (Type 4 AOPD)		
			IEC61508, EN61508 (SIL3)		
			EN ISO13849-1:2008 (Category 4, PLe)		
			UL508		
			UL1998		

*1 When the option front protection cover is installed on the one of transmitter or receiver, the Operating distance is shorten by 0.5 m 1.6'. When the front covers are installed on both of the transmitter and receiver, the Operating distance is shorten by 1.0 m 3.3'.
*2 When the GL-R is used under surrounding air temperatures between 50 to 55°C 122°F to 131°F, the Maximum load current should not exceed 350 mA.

Response time (OSSD)

Units: ms

Model	Response time (OSSD)					
	Wire synchronization, One-line or Optical synchronization system (Channel 0)			Optical synchronization system (Channel A or B)		
	ON→OFF	OFF→ON*1	All blocked→ON*2	ON→OFF	OFF→ON*1	All blocked→ON*2
GL-R23F	6.9	49.2	64.4	9.3	52.7	74.0
GL-R31F	7.8	50.5	67.9	10.7	54.8	79.5
GL-R39F	8.6	51.8	71.3	12.1	56.9	85.1
GL-R47F	9.5	53.1	74.8	13.5	59.0	90.7
GL-R55F	10.4	54.3	78.3	14.9	61.1	96.3
GL-R63F	11.2	55.6	81.7	16.3	63.2	101.8
GL-R71F	12.1	56.9	85.2	17.6	65.3	107.4
GL-R79F	13.0	58.2	88.6	19.0	67.4	113.0
GL-R87F	13.8	59.5	92.1	20.4	69.4	118.5
GL-R95F	14.7	60.8	95.5	21.8	71.5	124.1
GL-R103F	15.5	62.1	99.0	23.2	73.6	129.7
GL-R111F	16.4	63.4	102.4	24.6	75.7	135.2
GL-R119F	17.3	64.7	105.9	26.0	77.8	140.8
GL-R127F	18.1	66.0	109.4	27.4	79.9	146.4
GL-R08H	6.6	48.7	63.1	6.9	49.1	64.2
GL-R12H	6.6	48.7	63.1	7.4	49.9	66.3
GL-R16H	6.6	48.7	63.1	8.1	50.9	69.1
GL-R20H	6.6	48.7	63.1	8.8	52.0	71.9
GL-R24H	7.0	49.3	64.9	9.5	53.0	74.7
GL-R28H	7.4	50.0	66.6	10.2	54.0	77.5
GL-R32H	7.9	50.6	68.3	10.9	55.1	80.2
GL-R36H	8.3	51.3	70.0	11.6	56.1	83.0
GL-R40H	8.7	51.9	71.8	12.3	57.2	85.8
GL-R44H	9.2	52.6	73.5	12.9	58.2	88.6
GL-R48H	9.6	53.2	75.2	13.6	59.3	91.4
GL-R52H	10.0	53.9	77.0	14.3	60.3	94.2
GL-R56H	10.5	54.5	78.7	15.0	61.4	96.9
GL-R60H	10.9	55.2	80.4	15.7	62.4	99.7
GL-R64H	11.3	55.8	82.1	16.4	63.4	102.5
GL-R72H	12.2	57.1	85.6	17.8	65.5	108.1
GL-R80H	13.1	58.4	89.1	19.2	67.6	113.7
GL-R88H	13.9	59.7	92.5	20.6	69.7	119.2
GL-R96H	14.8	61.0	96.0	22.0	71.8	124.8

Model	Response time (OSSD)					
	Wire synchronization, One-line or Optical synchronization system (Channel 0)			Optical synchronization system (Channel A or B)		
	ON→OFF	OFF→ON*1	All blocked→ON*2	ON→OFF	OFF→ON*1	All blocked→ON*2
GL-R04L	6.6	48.7	63.1	6.9	49.1	64.2
GL-R06L	6.6	48.7	63.1	6.9	49.1	64.2
GL-R08L	6.6	48.7	63.1	6.9	49.1	64.2
GL-R10L	6.6	48.7	63.1	7.0	49.3	64.9
GL-R12L	6.6	48.7	63.1	7.4	49.9	66.3
GL-R14L	6.6	48.7	63.1	7.7	50.4	67.7
GL-R16L	6.6	48.7	63.1	8.1	50.9	69.1
GL-R18L	6.6	48.7	63.1	8.4	51.4	70.5
GL-R20L	6.6	48.7	63.1	8.8	52.0	71.9
GL-R22L	6.8	49.0	64.0	9.1	52.5	73.3
GL-R24L	7.0	49.3	64.9	9.5	53.0	74.7
GL-R26L	7.2	49.6	65.7	9.8	53.5	76.1
GL-R28L	7.4	50.0	66.6	10.2	54.0	77.5
GL-R30L	7.7	50.3	67.5	10.5	54.6	78.9
GL-R32L	7.9	50.6	68.3	10.9	55.1	80.2

*1 If the interruption is present in the detection zone for less than 80 ms, the response time (OFF to ON) will be 80 ms or more to ensure that the OSSD maintains the OFF state for more than 80 ms.
*2 "All blocked" means the situation where the GL-R operates in optical synchronization system and the transmitter and receiver is not synchronized (top and bottom beam axes are both blocked). In this situation, the response time is longer because the GL-R synchronizes the transmitter and receiver first and then determines the clear or blocked.

Point

- When the GL-R units are connected in series, the response time is calculated according to the following steps;
  1. Sum up the response time of all unit.
  2. Subtract the following time from the result of previous step.
  - ■ ON → OFF
    One sub unit : 2 ms
    Two sub unit : 4.2 ms
    (When Optical synchronization system and Channel A or B)
    One sub unit : 2.7 ms
    Two sub unit : 5.7 ms
  - ■ OFF → ON
    One sub unit : 42 ms
    Two sub unit : 84 ms
- 2.0 ms is the maximum object detection speed of the GL-R series.

NOTICE

- Unused I/O cables should be individually insulated.
- The functions assigned to the input and output may differ according to the configuration when configuring through the configuration software. For more information, see the "GL-R Series user's Manual".
- The Gray cable (FE) is electrically connected to the main unit case.
- The main unit case and a power-supply line are connected by a capacitors 3 kV 100 pF.

Signal meaning

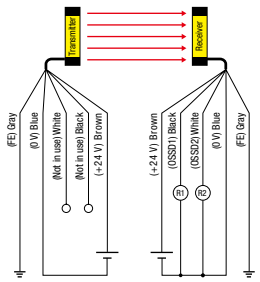
R1, R2 ..... External device (safety PLC, safety relay unit, etc.)
K1, K2 ..... External device (Force guided relay, magnet connector, etc.)
K3 ..... Solid state connector*1
S1 ..... Switch used for reset input
S2 ..... Switch used for wait input*1
M ..... 3-phase motor
PLC ..... For NON SAFETY-RELATED system control use*1

*1 These are NON SAFETY-RELATED components.

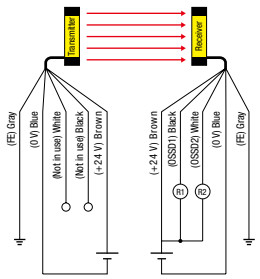
Optical synchronization system

Transmitter : 5-core cable, Receiver:5-core cable

(1) PNP output cable

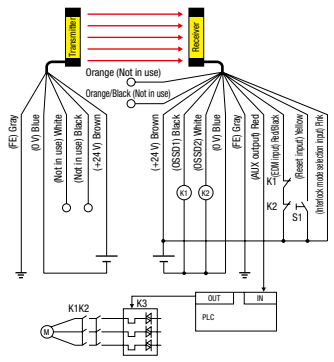


(2) NPN output cable

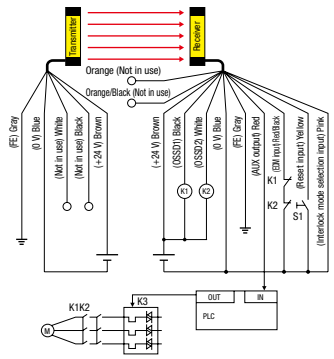


Transmitter : 5-core cable, Receiver:11-core cable Uses EDM input and the interlock function

(1) PNP output cable



(2) NPN output cable

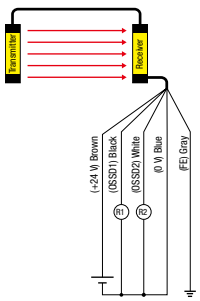


One-line system

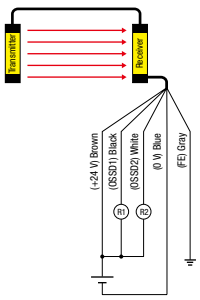
- The series connection cable must be used to connect the transmitter and receiver.
- The unit connection cable is not needed for the transmitter.
- The wiring when using an 11-core cable with the receiver is the same as the optical synchronization system wiring.

Transmitter : Series connection cable, Receiver:5-core cable

(1) PNP output cable



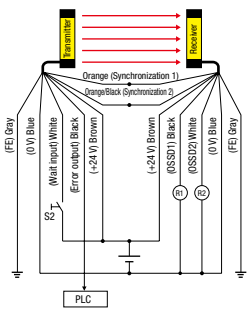
(2) NPN output cable



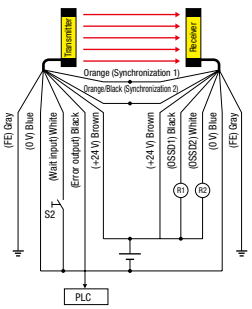
Wire synchronization system

Transmitter : 7-core cable, Receiver:7-core cable

(1) PNP output cable



(2) NPN output cable



GL-S Series

Selecting a Safety Light Curtain

Use the following steps to select the optimum GL-S Series for a given application.

Step 1 Select the light curtain type → Step 2 Select the light curtain length → Step 3 Select the cables → Step 4 Select the optional accessories

• Select options in step 4 as necessary.

Step 1
Step 2

Select the light curtain type
Select the light curtain length

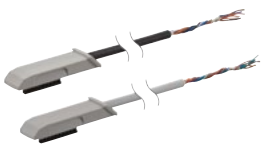
Slim type
GL-SS
(Detection capability: ø25 mm ø0.98")

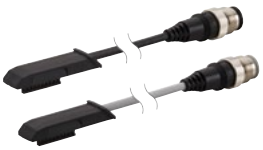
Flat type
GL-SF
(Detection capability: ø25 mm ø0.98")

Step 3

Select the cables

Cables





Step 4

Select options if necessary.

Adjustable angle mounting bracket
GL-SB04

Intermediate support brackets for mounting to a flat surface
GL-SB02

Intermediate support brackets for mounting to an extruded aluminum frame
GL-SB03

Adjustable angle intermediate support brackets
GL-SB05

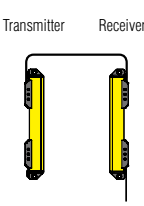
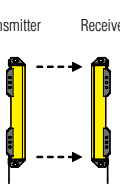
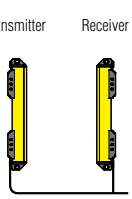
Direct mounting bracket
GL-SB01

Main unit protection cover
For use with the slim type

Main unit protection cover
For use with the flat type

Dedicated safety relay terminal for the GL-R Series
GL-T11R

GL-S Series functions and features

Wiring system		One-line system	Optical synchronization system	Wire synchronization system
Wiring diagram				
Advantage		Minimal wiring	Minimal wiring	All functions can be used
Disadvantage		Functions are limited	Functions are limited	Synchronization wire must be connected between the transmitter and receiver
Applicable cables	Transmitter	Series connection cable	Standard cable	Standard cable
	Receiver	Cable dedicated for use with one-line systems	Standard cable	Standard cable

Wiring system		One-line system	Optical synchronization system	Wire synchronization system
Usable functions	OSSD output	●	●	●
	Muting function			●*
	Interlock function			●
	EDM function			●
	Highly visible, three-color status indicators	●	○ Receiver only	●
	External control mode	●		●
	Fixed mode	●	○ Receiver only	●
	Mutual interference prevention function	●	●	●
	Series connection	Up to 3 units and 120 beam axes	Up to 3 units and 120 beam axes	Up to 3 units and 120 beam axes

* When the muting function is in use, the interlock and EDM functions cannot be used.

Step 1 Select the light curtain type

Select the system according to the installation location.

Slim type (Detection capability: ø25 mm ø0.98")

To step2 GL-SS

Flat type (Detection capability: ø25 mm ø0.98")

To step2 GL-SF

Step 2 Select the light curtain length

Select the length based on the equipment to be guarded.

Select the model according to the type selected in STEP 1.

GL-SS

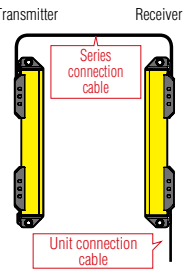
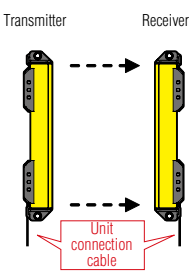
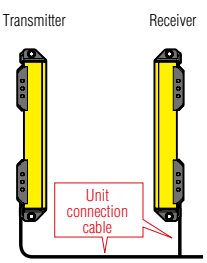
Model	No. of beam axes	Total length (mm inch)	Detection height (mm inch)	Protection height (mm inch)	Detection capability (Beam axis spacing)	Operating distance
GL-S08SH	8	179.5 7.07"	140 5.51"	186 7.32"	ø25 mm ø0.98" (20 mm 0.79" spacing)	0.1 to 2 m 0.3' to 6.6'
GL-S12SH	12	259.5 10.22"	220 8.66"	266 10.47"		
GL-S16SH	16	339.5 13.37"	300 11.81"	346 13.62"		
GL-S20SH	20	419.5 16.52"	380 14.96"	426 16.77"		
GL-S24SH	24	499.5 19.67"	460 18.11"	506 19.92"		
GL-S28SH	28	579.5 22.81"	540 21.26"	586 23.07"		
GL-S32SH	32	659.5 25.96"	620 24.41"	666 26.22"		
GL-S36SH	36	739.5 29.11"	700 27.56"	746 29.37"		
GL-S40SH	40	819.5 32.26"	780 30.71"	826 32.52"		

GL-SF

Model	No. of beam axes	Total length (mm inch)	Detection height (mm inch)	Protection height (mm inch)	Detection capability (Beam axis spacing)	Operating distance
GL-S08FH	8	179.5 7.07"	140 5.51"	186 7.32"	ø25 mm ø0.98" (20 mm 0.79" spacing)	0.1 to 2 m 0.3' to 6.6'
GL-S12FH	12	259.5 10.22"	220 8.66"	266 10.47"		
GL-S16FH	16	339.5 13.37"	300 11.81"	346 13.62"		
GL-S20FH	20	419.5 16.52"	380 14.96"	426 16.77"		
GL-S24FH	24	499.5 19.67"	460 18.11"	506 19.92"		
GL-S28FH	28	579.5 22.81"	540 21.26"	586 23.07"		
GL-S32FH	32	659.5 25.96"	620 24.41"	666 26.22"		
GL-S36FH	36	739.5 29.11"	700 27.56"	746 29.37"		
GL-S40FH	40	819.5 32.26"	780 30.71"	826 32.52"		

Step 3

Select cables according to the required functions

Wiring system		a One-line system	b Optical synchronization system	c Wire synchronization system
Diagram				
List of functions	Light interference prevention	○	○	○
	Series connection	Up to 3 units and 120 beam axes	Up to 3 units and 120 beam axes	Up to 3 units and 120 beam axes
	Muting	–	–	○*1
	Interlock	–	–	○
	EDM	–	–	○
	Center indicator	○	–*3	○
	External control of center indicator	○	–	○*2

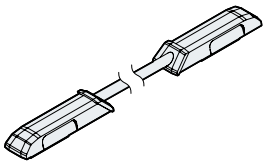
*1 When the muting function is in use, the interlock and EDM functions cannot be used.
*2 When the center indicator is used in "external control mode", the muting, interlock, and EDM functions cannot be used.
*3 When using the optical synchronization system, the center indicator only operates on the receiver.

a One-line system

Select the length of the series connection cable for use between the transmitter and receiver

Series connection cable (This cable is also used for series connections.)

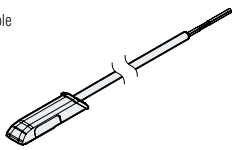
Quantity: 1

Shape	Length	Model
	0.07 m 0.2'	GL-SS007
	0.15 m 0.5'	GL-SS015
	0.5 m 1.6'	GL-SS05
	1 m 3.3'	GL-SS1
	2 m 6.6'	GL-SS2
	3 m 9.8'	GL-SS3
	5 m 16.4'	GL-SS5

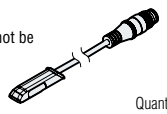
Select the unit connection cable

Standard cable

Quantity: 1

Shape	Output type	Length	Model
One-line system dedicated cable 	PNP	2 m 6.6'	GL-SP2P1
		5 m 16.4'	GL-SP5P1
		10 m 32.8'	GL-SP10P1
	NPN	2 m 6.6'	GL-SP2N1
		5 m 16.4'	GL-SP5N1
		10 m 32.8'	GL-SP10N1

M12 connector cable

Unit connection cable
Center indicators cannot be controlled externally when using the M12 connector cable.


Quantity: 1

Output type	Length	Model
PNP	0.3 m 1.0'	GL-SPC03P
NPN		GL-SPC03N

Extension cable
(M12 to bare leads)


Quantity: 1

Length	Model
2 m 6.6'	OP-75721
5 m 16.4'	OP-87272
10 m 32.8'	OP-85502

Extension cable
(M12 to M12)


Quantity: 1

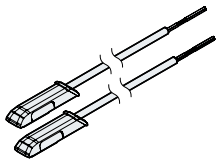
Length	Model
2 m 6.6'	OP-85503
5 m 16.4'	OP-85504

b Optical synchronization system

Select the unit connection cable

Standard cable

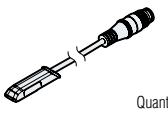
Quantity: 1
(set includes transmitter and receiver)

Shape	Output type	Length	Model
	PNP	2 m 6.6'	**GL-SP2P**
		5 m 16.4'	**GL-SP5P**
		10 m 32.8'	**GL-SP10P**
	NPN	2 m 6.6'	**GL-SP2N**
		5 m 16.4'	**GL-SP5N**
		10 m 32.8'	**GL-SP10N**

M12 connector cable

Unit connection cable

Two cables required

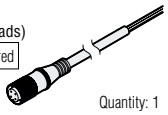


Quantity: 1

Output type	Length	Model
PNP	0.3 m 1.0'	**GL-SPC03P**
NPN		**GL-SPC03N**

Extension cable
(M12 to bare leads)

Two cables required



Quantity: 1

Length	Model
2 m 6.6'	**OP-75721**
5 m 16.4'	**OP-87272**
10 m 32.8'	**OP-85502**

Extension cable
(M12 to M12)

Two cables required

Quantity: 1

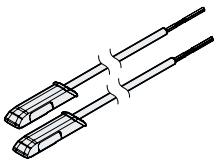
Length	Model
2 m 6.6'	**OP-85503**
5 m 16.4'	**OP-85504**

c Wire synchronization system

Select the unit connection cable

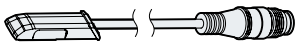
Standard cable

Quantity: 1
(set includes transmitter and receiver)

Shape	Output type	Length	Model
	PNP	2 m 6.6'	**GL-SP2P**
		5 m 16.4'	**GL-SP5P**
		10 m 32.8'	**GL-SP10P**
	NPN	2 m 6.6'	**GL-SP2N**
		5 m 16.4'	**GL-SP5N**
		10 m 32.8'	**GL-SP10N**

When connected to the GL-T11R*

M14 connector cable



Quantity: 1
(set includes transmitter and receiver)

Output type	Length	Model
PNP	3 m 9.8'	**GL-SPT3P**
	5 m 16.4'	**GL-SPT5P**
	10 m 32.8'	**GL-SPT10P**

Extension cable

To extend the cable, the following is a required

Quantity: 1
(set includes transmitter and receiver)

Output type	Length	Model
PNP	10 m 32.8'	**GL-RCT10PM**

Dedicated Safety Relay
for the GL Series

GL-T11R Safety Relay

Type	Safety input Light curtain	Safety output (relay)	Other I/O
Standalone type	1 channel (2 OSSD inputs)	1 channel (2 relay outputs)	EDM input

SL-U2 Dedicated Light Curtain Power Supply

Type	Input power supply voltage	Output voltage	Output capacity	Power consumption
Switching type power supply	100 to 240 VAC ±10% (50/60 Hz)	24 VDC ±10% Class 2	1.8 A	135 VA

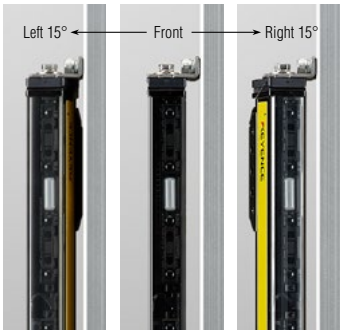
* When using the GL-T11R, the wire synchronization system is applied.

Step 4

Select the optional accessories

When angle adjustment is required (±15°)

Adjustable angle mounting bracket



Quantity: 2 pairs

Model
GL-SB04

When no angle adjustment is required

Direct mounting bracket

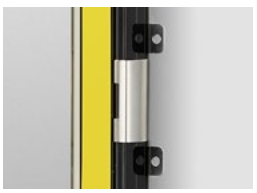
Included with all GL-S models

Quantity: 1 pair

Model
GL-SB01

When using a GL-S Series unit with 32 beam axes or more in an environment subject to vibration

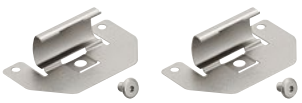
Intermediate support brackets for mounting to a flat surface



Quantity: 2

Model
GL-SB02

Intermediate support brackets for mounting to an extruded aluminum frame*



Quantity: 2

Model
GL-SB03

* There are limits to the extruded aluminum to which the brackets can be mounted.

Adjustable angle intermediate support brackets

Quantity: 2

Model
GL-SB05

GL-S protection cover

For use with the slim type

Quantity: 1

Corresponding light curtain model	Model
GL-S08SH	GL-SA08S
GL-S12SH	GL-SA12S
GL-S16SH	GL-SA16S
GL-S20SH	GL-SA20S
GL-S24SH	GL-SA24S
GL-S28SH	GL-SA28S
GL-S32SH	GL-SA32S
GL-S36SH	GL-SA36S
GL-S40SH	GL-SA40S

For use with the flat type

Quantity: 1

Corresponding light curtain model	Model
GL-S08FH	GL-SA08F
GL-S12FH	GL-SA12F
GL-S16FH	GL-SA16F
GL-S20FH	GL-SA20F
GL-S24FH	GL-SA24F
GL-S28FH	GL-SA28F
GL-S32FH	GL-SA32F
GL-S36FH	GL-SA36F
GL-S40FH	GL-SA40F

Test piece for detection test

Model	Detail
OP-88866	Diameter of 25 mm 0.98", Length of 200 mm 7.87"

Common specifications

Model			GL-SxH
Beam axis spacing			20 mm 0.79"
Detection capability			ø25 mm ø0.98"
Operating distance			0.1 to 2 m 0.3' to 6.6'
Effective aperture angle			Max. ±3.75° (when the operating distance is 2 m 6.6')
Light source			Infrared LED (870 nm)
Response time			Optical synchronization (Channel 0), One-line, Wire synchronization: 6.6 to 8.7 ms Optical synchronization (Channel A or B): 6.9 to 12.3 ms
OSSD operation			Turns on when no interruptions are present in the detection zone
Synchronization between the transmitter and receiver			Optical synchronization or wire synchronization (determined by the wiring)
Light interference prevention function			Prevents mutual interference in up to two GL-S systems. Optical synchronization: prevented by Channel A and B with setting switch Wire synchronization: prevented automatically
Control output (OSSD output)	Output type		2 transistor outputs (PNP or NPN output is determined by the cable type.)
	Max. load current		300 mA
	Residual voltage (when ON)		Max. 2.5 V (with a cable length of 5 m 16.4')
	OFF state voltage		Max. 2.0 V (with a cable length of 5 m 16.4')
	Leakage current		Max. 200 µA
	Max. load capacitance		2.2 µF
	Load wiring resistance		Max. 2.5 Ω
Inputs 1 and 2			Short-circuit current: approx. 1 mA
Power supply	Power supply voltage		24 VDC ±20%, ripple (P-P) 10% or less, Class 2
	Current consumption		Transmitter: 31 to 50 mA Receiver: 52 to 76 mA
Protection circuit			Reverse current protection, short-circuit protection and surge protection for each output
Environmental resistance	Enclosure rating		IP65/IP67 (IEC60529)
	Overvoltage category		II
	Ambient operating temperature		-10 to +50°C 14 to 122°F (no freezing)
	Ambient storage temperature		-25 to +60°C -13 to 140°F (no freezing)
	Ambient operating humidity		15 to 85% RH (no condensation)
	Ambient storage humidity		15 to 95% RH
	Ambient operating light		Incandescent lamp: 3000 lux or less Sunlight: 20000 lux or less
	Vibration resistance		10 to 55 Hz, 0.7 mm 0.03" compound amplitude, 20 sweeps in each of the X, Y, and Z directions
	Shock resistance		100 m 328.1'/s^2 (approx. 10G), 16 ms pulse 1000 times in each of the X, Y, and Z directions
Material	Main unit case		Polyarylate
Approved standards	EMC	EMS	IEC61496-1, EN61496-1, UL61496-1
		EMI	EN55011 Class A, FCC Part 15B Class A, ICES-003 Class A
	Safety		IEC61496-1, EN61496-1, UL61496-1 (Type 4 ESPE)
			IEC61496-2, EN61496-2, UL61496-2 (Type 4 AOPD)
			IEC61508, EN61508 (SIL3), IEC62061, EN62061 (SIL CL3)
			EN ISO 13849-1:2008 (Category 4, PLe)
			UL508, UL1998
			GB/T4584

Response time

Model		OSSD Response time (ms)					
		Wire synchronization, one-line, or optical synchronization system (channel 0)			Optical synchronization system (channel A or B)		
Slim type	Flat type	ON → OFF	OFF → ON*1	All blocked → ON*2	ON → OFF	OFF → ON*1	All blocked → ON*2
GL-S08SH	GL-S08FH	6.6	48.7	63.1	6.9	49.1	64.2
GL-S12SH	GL-S12FH	6.6	48.7	63.1	7.4	49.9	66.3
GL-S16SH	GL-S16FH	6.6	48.7	63.1	8.1	50.9	69.1
GL-S20SH	GL-S20FH	6.6	48.7	63.1	8.8	52.0	71.9
GL-S24SH	GL-S24FH	7.0	49.3	64.9	9.5	53.0	74.7
GL-S28SH	GL-S28FH	7.4	50.0	66.6	10.2	54.0	77.5
GL-S32SH	GL-S32FH	7.9	50.6	68.3	10.9	55.1	80.2
GL-S36SH	GL-S36FH	8.3	51.3	70.0	11.6	56.1	83.0
GL-S40SH	GL-S40FH	8.7	51.9	71.8	12.3	57.2	85.8

*1 If the interruption is present in the detection zone for less than 80 ms, the response time (OFF to ON) will be 80 ms or more to ensure that the OSSD maintains the OFF state for more than 80 ms.

*2 "All blocked" means the situation where the GL-S operates in optical synchronization system and the transmitter and receiver is not synchronized (top and bottom beam axes are both blocked). In this situation, the response time is longer because the GL-S synchronizes the transmitter and receiver first and then determines the clear or blocked.

* If the response time (ON to OFF) exceeds 18 ms, this unit cannot be used as a certified product based on the Chinese standard GB/T4584 "压力机用光电保护装置技术条件". In the case of series connection, if the total number of beam axes exceeds 100, the response time must be limited to 30 ms or less.

* When the GL-S units are connected in series, the response time is calculated according to the following steps;

1. Sum up the response time of all unit.
2. Subtract the following time from the result of previous step.

▮ ON → OFF

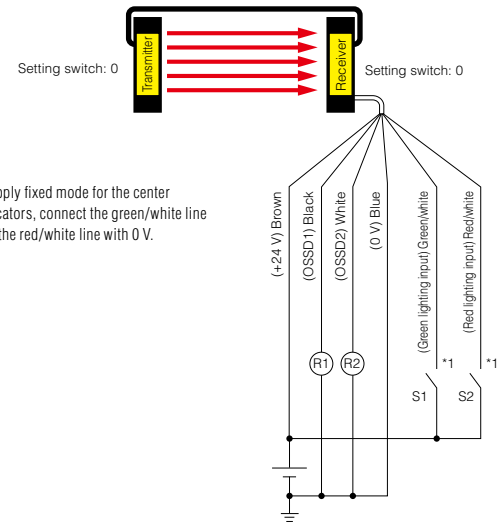
One sub unit connected: 2 ms
Two sub units connected: 4.2 ms
(When using Optical synchronization system and Channel A or B)
One sub unit connected: 2.7 ms
Two sub units connected: 5.7 ms

▮ OFF → ON

One sub unit connected: 42 ms
Two sub units connected: 84 ms

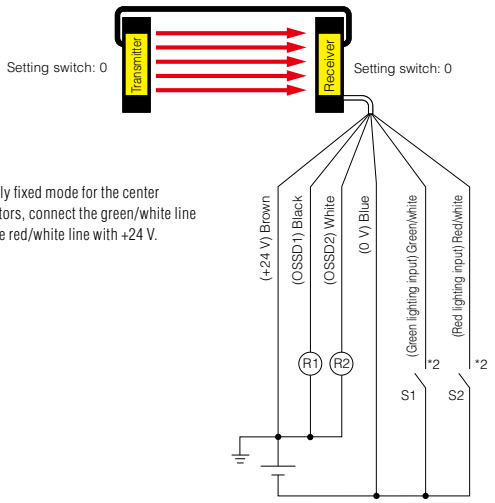
When using the one-line system

(1) PNP output cable



*1 To apply fixed mode for the center indicators, connect the green/white line and the red/white line with 0 V.

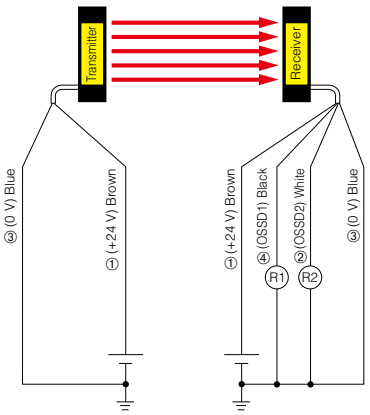
(2) NPN output cable



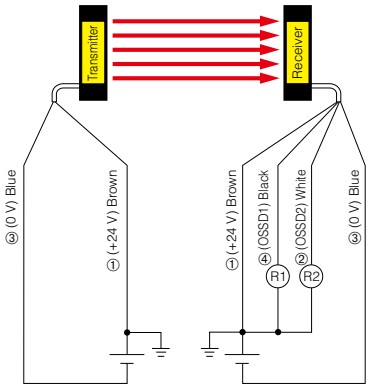
*2 To apply fixed mode for the center indicators, connect the green/white line and the red/white line with +24 V.

When using the optical synchronization system

(1) PNP output cable



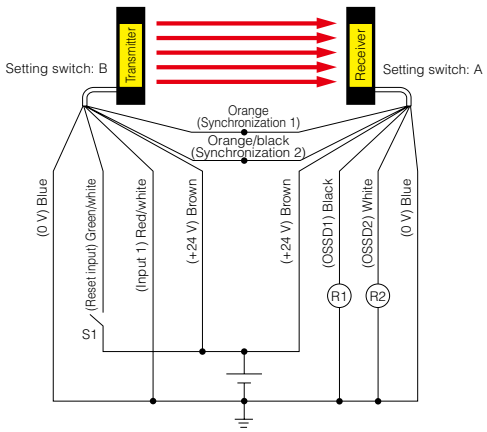
(2) NPN output cable



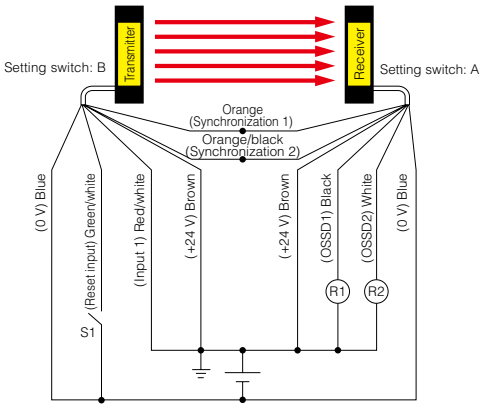
When using the wire synchronization system

▮ When the interlock function is used

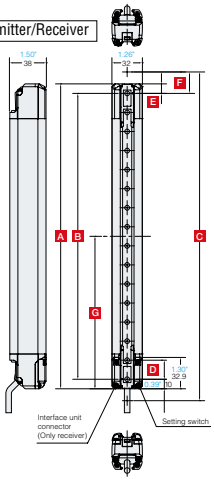
(1) PNP output cable



(2) NPN output cable



GL-R (GL-RF/RH/RL) Main unit



Unit: mm inch

Note
When the total length of the GL-R main unit becomes 1280 mm 50.39" or longer, attach an antivibration bracket to the center of the length of the GL-R (Distance G in the figure).

Mounting bracket being used	Antivibration bracket to use
Adjustable angle mounting bracket	Antivibration bracket for adjustable angle mounting bracket
No dead zone mounting bracket	
Straight mounting bracket	Antivibration bracket for straight mounting bracket
L-shaped mounting bracket	L-shaped mounting bracket

Unit: mm inch

Model	No. of axes	A Length	B Detection height	C Protection height	D Beam axis pitch	E	F	G
GL-R23F	23	240 9.45"	220 8.66"	244 9.61"	10 0.39"	10 0.39"	12 0.47"	120 4.72"
GL-R31F	31	320 12.60"	300 11.81"	324 12.76"				160 6.30"
GL-R39F	39	400 15.75"	380 14.96"	404 15.91"				200 7.87"
GL-R47F	47	480 18.90"	460 18.11"	484 19.06"				240 9.45"
GL-R55F	55	560 22.05"	540 21.26"	564 22.20"				280 11.02"
GL-R63F	63	640 25.20"	620 24.41"	644 25.35"				320 12.60"
GL-R71F	71	720 28.35"	700 27.56"	724 28.50"				360 14.17"
GL-R79F	79	800 31.50"	780 30.71"	804 31.65"				400 15.75"
GL-R87F	87	880 34.65"	860 33.86"	884 34.80"				440 17.32"
GL-R95F	95	960 37.80"	940 37.01"	964 37.95"				480 18.90"
GL-R103F	103	1040 40.94"	1020 40.16"	1044 41.10"				520 20.47"
GL-R111F	111	1120 44.09"	1100 43.31"	1124 44.25"				560 22.05"
GL-R119F	119	1200 47.24"	1180 46.46"	1204 47.40"				600 23.62"
GL-R127F	127	1280 50.39"	1260 49.61"	1284 50.55"				640 25.20"

Unit: mm inch

Model	No. of axes	A Length	B Detection height	C Protection height	D Beam axis pitch	E	F	G
GL-R08H	8	160 6.30"	140 5.51"	185 7.28"	20 0.79"	10 0.39"	22.5 0.89"	80 3.15"
GL-R12H	12	240 9.45"	220 8.66"	265 10.43"				120 4.72"
GL-R16H	16	320 12.60"	300 11.81"	345 13.58"				160 6.30"
GL-R20H	20	400 15.75"	380 14.96"	425 16.73"				200 7.87"
GL-R24H	24	480 18.90"	460 18.11"	505 19.88"				240 9.45"
GL-R28H	28	560 22.05"	540 21.26"	585 23.03"				280 11.02"
GL-R32H	32	640 25.20"	620 24.41"	665 26.18"				320 12.60"
GL-R36H	36	720 28.35"	700 27.56"	745 29.33"				360 14.17"
GL-R40H	40	800 31.50"	780 30.71"	825 32.48"				400 15.75"
GL-R44H	44	880 34.65"	860 33.86"	905 35.63"				440 17.32"
GL-R48H	48	960 37.80"	940 37.01"	985 38.78"				480 18.90"
GL-R52H	52	1040 40.94"	1020 40.16"	1065 41.93"				520 20.47"
GL-R56H	56	1120 44.09"	1100 43.31"	1145 45.08"				560 22.05"
GL-R60H	60	1200 47.24"	1180 46.46"	1225 48.23"				600 23.62"
GL-R64H	64	1280 50.39"	1260 49.61"	1305 51.38"				640 25.20"
GL-R72H	72	1440 56.69"	1420 55.91"	1465 57.68"				720 28,35"
GL-R80H	80	1600 62.99"	1580 62.20"	1625 63.98"				800 31.50"
GL-R88H	88	1760 69.29"	1740 68.50"	1785 70.28"				880 34.65"
GL-R96H	96	1920 75.59"	1900 74.80"	1945 76.57"				960 37.80"

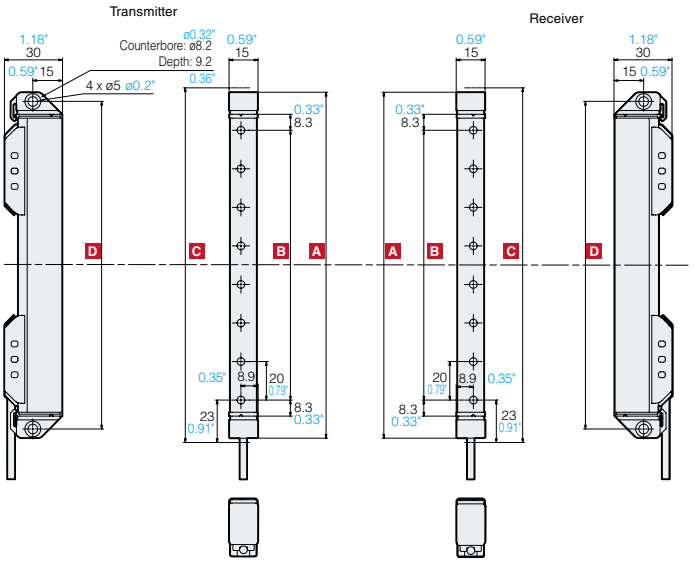
Unit: mm inch

Model	No. of axes	A Length	B Detection height	C Protection height	D Beam axis pitch	E	F	G
GL-R04L	4	160 6.30"	120 4.72"	205 8.07"	40 1.57"	30 1.18"	42.5 1.67"	80 3.15"
GL-R06L	6	240 9.45"	200 7.87"	285 11.22"				120 4.72"
GL-R08L	8	320 12.60"	280 11.02"	365 14.37"				160 6.30"
GL-R10L	10	400 15.75"	360 14.17"	445 17.52"				200 7.87"
GL-R12L	12	480 18.90"	440 17.32"	525 20.67"				240 9.45"
GL-R14L	14	560 22.05"	520 20.47"	605 23.82"				280 11.02"
GL-R16L	16	640 25.20"	600 23.62"	685 26.97"				320 12.60"
GL-R18L	18	720 28.35"	680 26.77"	765 30.12"				360 14.17"
GL-R20L	20	800 31.50"	760 29.92"	845 33.27"				400 15.75"
GL-R22L	22	880 34.65"	840 33.07"	925 36.42"				440 17.32"
GL-R24L	24	960 37.80"	920 36.22"	1005 39.57"				480 18.90"
GL-R26L	26	1040 40.94"	1000 39.37"	1085 42.72"				520 20.47"
GL-R28L	28	1120 44.09"	1080 42.52"	1165 45.87"				560 22.05"
GL-R30L	30	1200 47.24"	1160 45.67"	1245 49.02"				600 23.62"
GL-R32L	32	1280 50.39"	1240 48.82"	1325 52.17"				640 25.20"

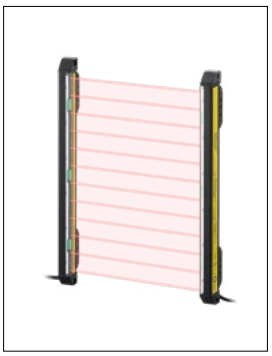
GL-S main unit

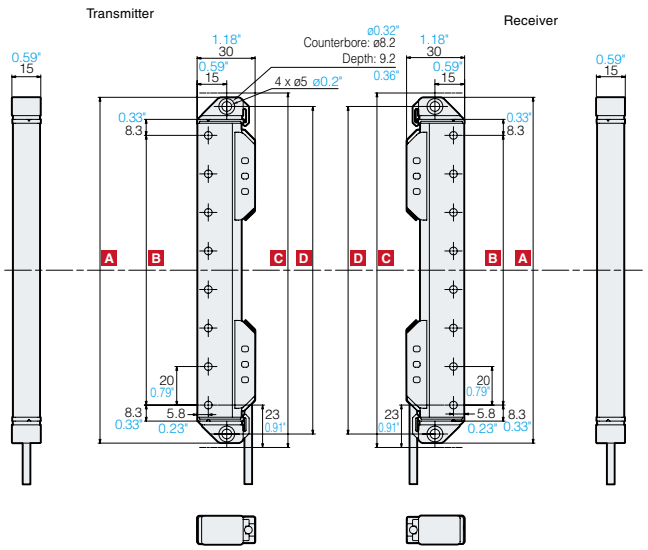
Unit: mm inch

Slim type



Flat type





Model		No. of beam axes	A Total Length	B Detection height	C Protection height	D Mounting hole spacing
Slim type	Flat type					
GL-S08SH	GL-S08FH	8	179.5 7.07"	140 5.51"	186 7.32"	170 6.69"
GL-S12SH	GL-S12FH	12	259.5 10.22"	220 8.66"	266 10.47"	250 9.84"
GL-S16SH	GL-S16FH	16	339.5 13.37"	300 11.81"	346 13.62"	330 12.99"
GL-S20SH	GL-S20FH	20	419.5 16.52"	380 14.96"	426 16.77"	410 16.14"
GL-S24SH	GL-S24FH	24	499.5 19.67"	460 18.11"	506 19.92"	490 19.29"
GL-S28SH	GL-S28FH	28	579.5 22.81"	540 21.26"	586 23.07"	570 22.44"
GL-S32SH	GL-S32FH	32	659.5 25.96"	620 24.41"	666 26.22"	650 25.59"
GL-S36SH	GL-S36FH	36	739.5 29.11"	700 27.56"	746 29.37"	730 28.74"
GL-S40SH	GL-S40FH	40	819.5 32.26"	780 30.71"	826 32.52"	810 31.89"

Note	When using a GL-S Series unit with 32 or more beam axes in an environment subject to vibration, attach optional intermediate support brackets near the center of the GL-S Series unit.

For detailed specifications, see the KEYENCE website.

CAD data download: www.keyence.com/CADG

Type 3 Safety Laser Scanner

SZ Series

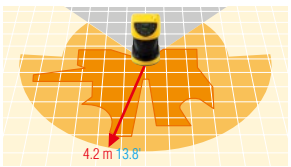
Advanced safety laser scanner functionality in a space-saving, compact design

Compact size

The SZ Series is compact and lightweight (weighing approximately 1.6 kg), which means that it takes up space and can be installed almost anywhere.

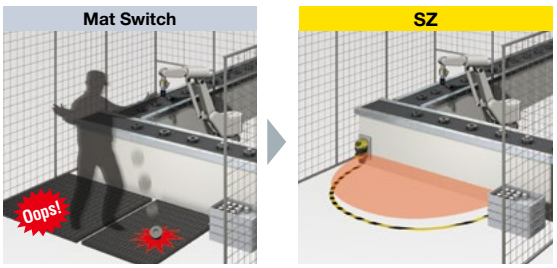
Maximum protection zone: 4.2 m 13.8'

Even though the scanner is compact, it provides long-distance detection with a 4.2 m 13.8' protection zone. Objects can be detected up to 10 m 32.8' away in the warning zone in order to alert the operator or equipment that something may be nearing the protection zone.



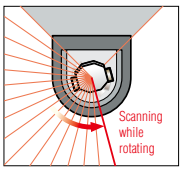
Customizable, non-contact protection

Safety laser scanners are configured to guard a user defined area according to the equipment to be protected. Because the zone is user defined, the protection zone can be easily reconfigured at any time to account for modifications to the machinery. Furthermore, its optical, non-contact detection ability allows the scanner to be mounted out of the way, thereby eliminating any concerns about damage by falling objects, operators, or mobile equipment.



Detection principle

A laser scanner detects objects by measuring the time between the laser beam striking an object and returning to the scanner. A safety laser scanner helps to prevent accidents by stopping hazardous equipment whenever an operator is detected within its wide coverage area. The scanner rotates its internal mirror, which enables the detection area to cover a range of 270°.



Variations

Main unit

Appearance	Type	# of zone sets (# of banks)	Model
	Simple function type 	1	SZ-01S
	Multi-function type 	4	SZ-04M
	Multi-zone sets (banks) type 	16	SZ-16V
	Measurement data output type 	16	SZ-16D

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