OMRON

Safety Laser Scanner

OS32C

- Compact, power-saving scanner for AGV
- EtherNet/IP to improve interoperability with standard control
- Easy zone configuration using PC

industrial.omron.eu/OS32C

EtherNet/IP™

Low profile for easy installation

Omron OS32C Safety Laser Scanner – the World's most compact and versatile safety laser scanner for easy handling and installation with low power consumption.

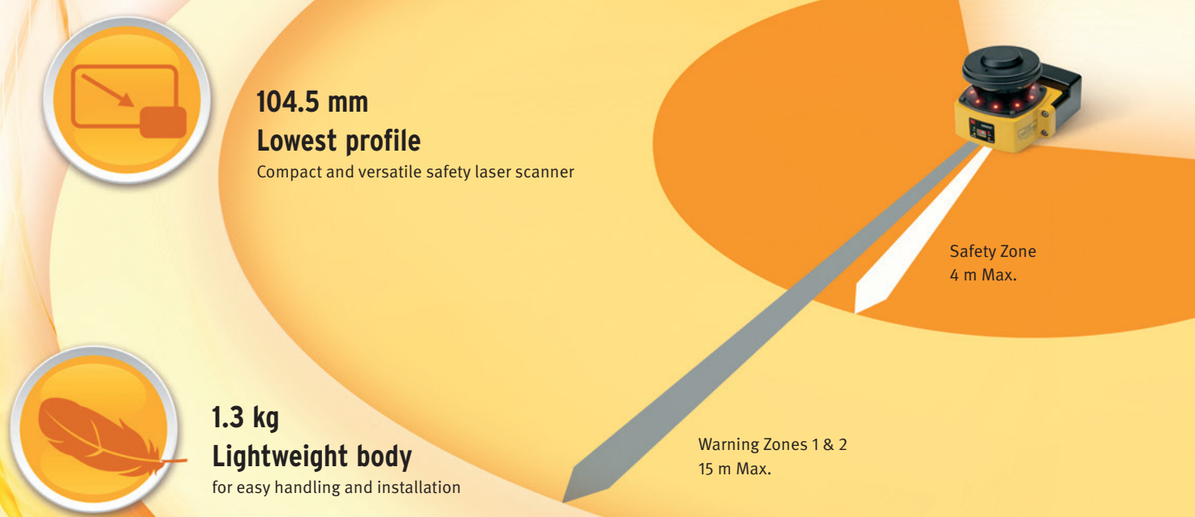
The compact body allows installation in small spaces, e.g. automated guided vehicles and the detection angle up to 270° provides coverage of two sides with just one scanner.

Versatile solutions

- For collision avoidance of AGVs (Automated Guided Vehicles)
- For intrusion detection through an entrance
- For presence detection within a machine's hazardous area

Features

- Easy configuration of complex zones
- Simplified wiring
- Replacable sensor, no reprogramming needed
- Response time can be set from 80 ms to 680 ms
- Cable access options
- Reference Boundary Monitoring function



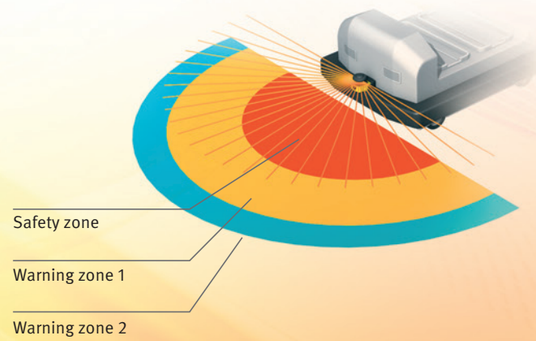
104.5 mm
Lowest profile
Compact and versatile safety laser scanner

1.3 kg
Lightweight body
for easy handling and installation

5W
Low power consumption
reduces battery load on the AGV (3.75 W in standby mode)

Flexible zone configurations

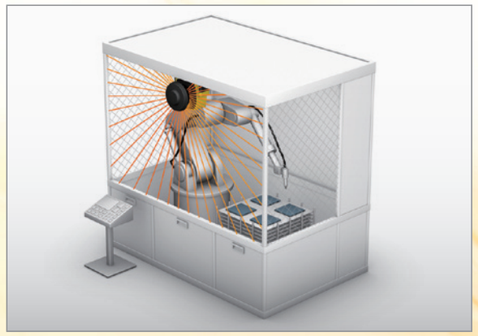
For complex AGV applications, up to 70 combinations – each with one safety zone and two warning zones – can be set. The two warning zones can be set to support various purposes such as warning sound and speed control.



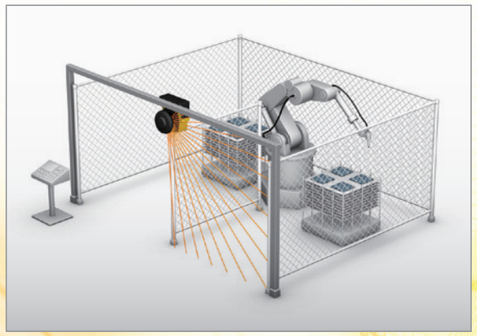
Versatile scanner solving many applications

Intrusion detection

Reference Boundary Monitoring function supports intrusion detection without physically blocking the entrance. Supports various operation patterns by switching zone sets. Arm detection can also be made possible by changing the minimum object resolution to 30, 40, 50 or 70 mm through use of the configuration tool. However, the maximum size of the safety zone varies depending on the configured minimum object resolution.



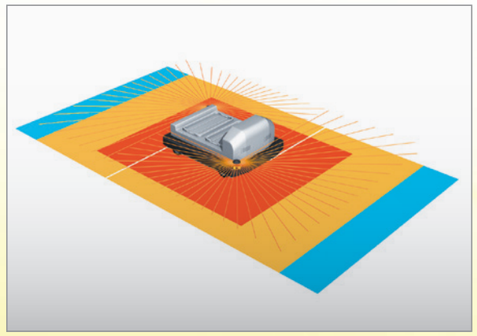
Safety zone can be selected



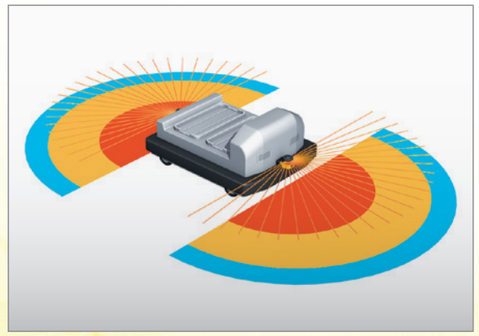
Intrusion detection with vertical installation

Collision avoidance

Small, light and compact body provides easy installation on an AGV. Low power consumption (5W) reduces battery load on the AGV. (3.75 W in standby mode) Up to 70 zone set combinations support complex AGV tracks.



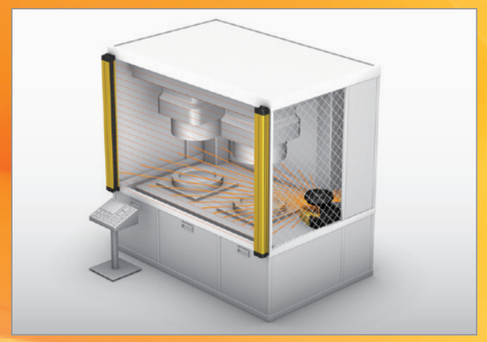
All-around monitoring



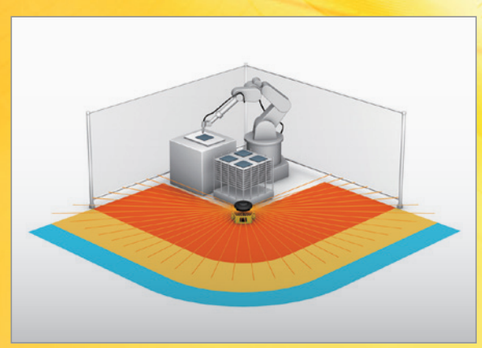
Front/Rear monitoring

Presence detection

Compact body allows for use inside the machine. Detection angle of 270° provides coverage of two sides with one scanner.



Guarding inside the machine



Presence detection of 270°

* US patent No.: US 6,753,776 B2

Operating state can be determined at a glance

Eight sector indicators show the direction of intrusion. Front display shows operating state and error codes.

Integrated management via Ethernet

Industry's first Ethernet-compliant Safety Laser Scanner allows the user to check operating status and analyse the cause of an emergency stop via LAN even in large-scale applications using multiple scanners.

New convenient and easy-to-use functions

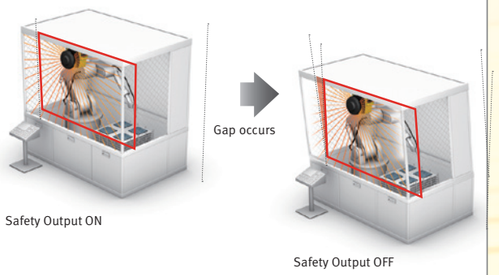
The OS32C uses time-of-flight (TOF) measurement to determine distance. The scanner emits a laser pulse, when the pulse hits an object the signal is reflected to the scanner. The OS32C then compares the distance/position of the object against the defined safety zone.

Easy configuration of complex zones

The configuration of the safety zone and warning zones can be done in real time using a PC. Configurations can also be created or modified offline.

Response time can be set from 80 ms to 680 ms

Response time adjustment can filter out erroneous detections (machine stoppage) caused by pollutants in the environment.

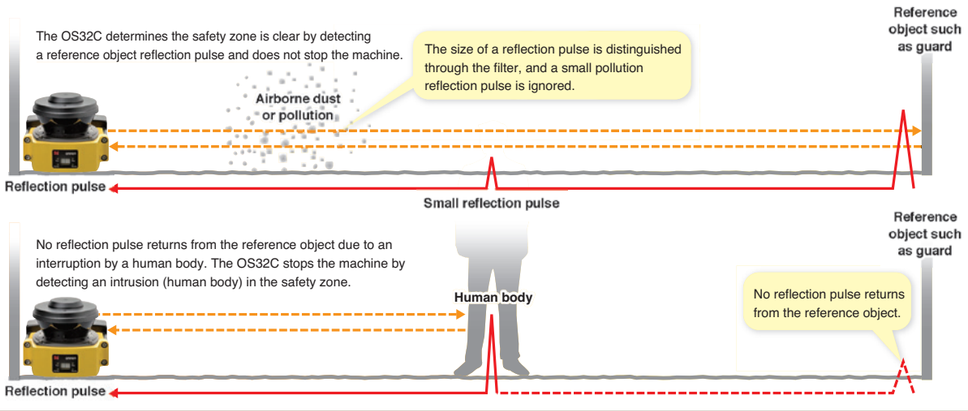


Reference Boundary Monitoring function

The OS32C constantly monitors reference points and turns OFF the safety outputs when a shift in its position is detected. (Per international standard IEC 61496-3, area scanners used in applications where the angle of approach exceeds +/- 30 degrees with respect to the detection plane, must use RBM in the detection zone.)

Reducing Erroneous Detections in Safety Zone NEW

PTM (Pollution Tolerance Mode) enables a filter that allows the OS32C to distinguish between more than one detected reflection pulses. Ignoring small reflection pulses which could be caused by airborne dust or other contaminants in the safety zone. This function prevents nuisance machine stops due to dust.



Replaceable sensor, no reprogramming needed

No reprogramming needed, the configuration is stored in the I/O block. Replacing a damaged sensor is fast and easy.

Simplified wiring

Omron STI's innovative I/O method requires fewer inputs when configuring multiple zones. Only 4 inputs are required to select from 6 zone sets. If all 8 inputs are used, up to 70 zone sets are available.

Cable access options

To tailor the OS32C to your installation, two options are available for the location of the power and ethernet connections:

- OS32C-BP (Cable access from the back)
- OS32C-SP1 (Cable access from the left side)

These can be selected according to the needs of AGV or facilities design.

Provides Safety Category 3 safety circuit without a dedicated controller

Compliant to global safety standards

ISO 13849-1 PLd

SIL2

CE

TÜVRheinland

c UL us LISTED

OS32C Safety laser scanner

- Type 3 safety laser scanner complies with IEC61496-1/-3
- 70 sets of safety zone and warning zone combinations are available, supporting complicated changes in working environments
- A safety radius up to 4 m and warning zone(s) radius up to 15 m can be set
- 8 Individual sector indicators and various LED indications allow the user to determine scanner status at a glance
- Reference boundary monitoring function prevents unauthorized changes in the scanner position
- Configurable minimum object resolution of 30, 40, 50 or 70 mm, for hand and arm detection applications

Ordering information

Description	Max. operating range	Order code
OS32C with back location cable entry	3 m	OS32C-BP
	4 m	OS32C-BP-4M
OS32C with side location cable entry*1	3 m	OS32C-SP1
	4 m	OS32C-SP1-4M
OS32C with back location cable entry EtherNet/IP capable for status measurement data reporting	3 m	OS32C-BP-DM
	4 m	OS32C-BP-DM-4M
OS32C with side location cable entry*1 EtherNet/IP capable for status measurement data reporting	3 m	OS32C-SP1-DM
	4 m	OS32C-SP1-DM-4M

*1 Each connector is located on the left as viewed from the back of the I/O block.

Description	Remarks	Order code
Configuration tool	CD-ROM OS supported: Windows 2000, XP, Vista, Windows 7	included

Specifications

Sensors

Sensor type		Type 3 safety laser scanner
Safety category		PLd/Safety Category 3 (ISO 13849-1)
Detection capability		Configurable; Non-transparent with a diameter of 30, 40, 50 or 70 mm (1.8% reflectivity or greater) (default: 70 mm)
Monitoring zone		Monitoring zone set count: (Safety zone + 2 warning zones) × 70 sets
Operating range		OS32C-_: Safety zone up to 3 m, Warning zone up to 10 m OS32C-_-4M: Safety zone up to 4 m, Warning zone up to 15 m
Detection angle		270°
Response time		Response time from ON to OFF: From 80 ms (2 scans) to 680 ms (up to 17 scans)*1 Response time from OFF to ON: Response time from ON to OFF + 100 ms to 60 s (configurable)
Line voltage		24 VDC +25%/–30% (ripple p-p 2.5 V max.)*2
Power consumption		Normal operation: 5 W max., 4 W typical (without output load)*3 Standby mode: 3.75 W (without output load)
Safety output (OSSD)		PNP transistor × 2, load current of 250mA max., residual voltage of 2 V max., load capacity of 2.2 µf max., leak current of 1 mA max.*3,*4,*5
Auxiliary output (Non-safety)		NPN/PNP transistor × 1, load current of 100 mA max., residual voltage of 2 V max., leak current of 1 mA max.*4,*5,*6
Warning output (Non-safety)		NPN/PNP transistor × 1, load current of 100 mA max., residual voltage of 2 V max., leak current of 1 mA max.*4,*5,*6
Output operation mode		Auto start, start interlock, start/restart interlock
Input	**External Device Monitoring (EDM)**	ON: 0 V short (input current of 50 mA), OFF: Open
	Start	ON: 0 V short (input current of 20 mA), OFF: Open
	Zone select	ON: 24 V short (input current of 5 mA), OFF: Open
	Stand-by	ON: 24 V short (input current of 5 mA), OFF: Open
Connection type		Power cable: 18-pin mini-connector (pigtail) Communication cable: M12, 4-pin connector
Connection with PC		Communication: EtherNet
Indicators		RUN indicator: Green, STOP indicator: Red, Interlock indicator: Yellow, Warning output indicator: Orange, Status/diagnostic display: 2 × 7-segment LEDs, Intrusion indicators: Red LED × 8
Enclosure rating		IP65 (IEC60529)
Dimensions (W × H × D)		133.0 × 104.5 × 142.7 mm (except cable)
Weight (Main Unit only)		1.3 kg
Approvals		Certified by: TÜV Rheinland, UL Major standards: IEC61496-1/-3 (Type 3), IEC61508 (SIL2), ISO13849-1:2008 (Category 3, performance level d), UL508, UL1998

*1 Pollution Tolerance will add 6 ms to each scan time.
*2 For power source specification, refer to OS32C User's manual Z296-E1...
*3 Rated current of OS32C is 1.025 A max. (OS32C 210 mA + OSSD A load + OSSD B load + auxiliary output load + warning output load + functional Inputs). Where functional inputs are: EDM input …50 mA, Start input …20 mA, Standby input …5 mA, Zone X input …5 mA × 8 (eight zone set select inputs).
*4 Output voltage is input voltage – 2.0 VDC.
*5 Total consumption current of 2 OSSDs, auxiliary output, and warning output must not exceed 700 mA.
*6 Output polarity (NPN/PNP) is configurable via the configuration tool.

Accessories (sold separately)

Power cable

Appearance	Description	Remarks	Order code
	Cable length: 3 m	One cable is required per sensor	OS32C-CBL-03M
	Cable length: 10 m		OS32C-CBL-10M
	Cable length: 20 m		OS32C-CBL-20M
	Cable length: 30 m		OS32C-CBL-30M

Ethernet cable

Appearance	Description	Remarks	Order code
	Cable length: 2 m	Required for configuration and monitoring	OS32C-ECBL-02M
	Cable length: 5 m		OS32C-ECBL-05M
	Cable length: 15 m		OS32C-ECBL-15M

Note: An ethernet cable with an M12, 4-pin connector is required.

Mounting brackets

Appearance	Description	Remarks	Order code
	Bottom/side mounting bracket	Bottom/side mounting bracket × 1, unit mounting screws × 4 sets	OS32C-BKT1
	XY axis rotation mounting bracket	XY axis rotation mounting bracket × 1, unit mounting screws × 6 sets, bracket mounting screws × 1 set (must be used with OS32C-BKT1)	OS32C-BKT2
	Simple mounting bracket	Simple mounting brackets × 2, unit mounting screws × 4 sets*1	OS32C-BKT3
	Protective cover for window		OS32C-BKT4
	Mounting stand	When using a mounting stand, use an OS32C with side location cable entry (OS32C-SP1). The OS32C with back location cable entry (OS32C-BP) cannot be mounted. Use with mounting brackets (OS32C-BKT1 and OS32C-BKT2).	OS32C-MT
	Hardware kit for mounting stand	Mounting screws × 3 sets Use this when mounting a bracket to the mounting stand.	OS32C-HDT

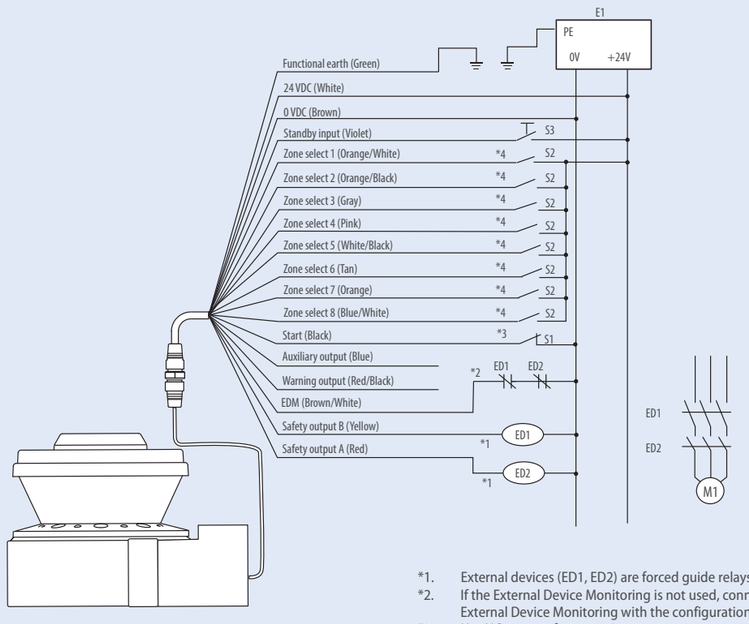
*1 There are eight OS32C mounting screws: four screws for singular use, and four screws for protective cover for window.

Miscellaneous

Appearance	Description		Remarks	Order code
	Scan window		Spare for replacement	OS32C-WIN-KT
	Sensor block without I/O block Max. operating range: 3 m		Spare for replacement	OS32C-SN
	Sensor block without I/O block Max. operating range: 4 m			OS32C-SN-4M
	Sensor block without I/O block for EtherNet/IP Max. operating range: 3 m		Spare replacement for EtherNet/IP	OS32C-SN-DM
	Sensor block without I/O block for EtherNet/IP Max. operating range: 4 m			OS32C-SN-DM-4M
	I/O block	With cable access from the back	Spare for replacement	OS32C-CBBP
		With cable access from the left side	Spare for replacement	OS32C-CBSP1
	Window cleaning kit, anti-static cleaner		Accessory	WIN-CLN-KT

Connection

Basic connection with single OS32C unit
Category 3, performance level d (ISO13849-1)



S1 : Start input
S2 : Zone select switch
S3 : Standby switch
ED1, ED2: Forced guided relay
M1 : 3-Phase motor
E1 : 24 VDC Power

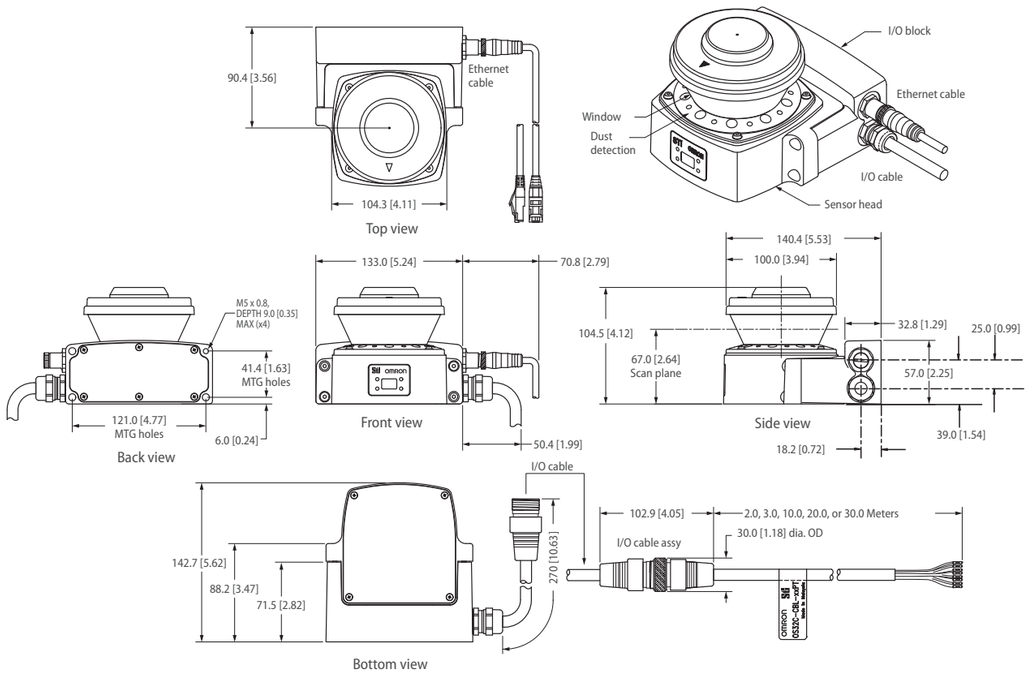
OS32C configuration
– External Device Monitoring enabled
– Start/restart interlock

*1. External devices (ED1, ED2) are forced guide relays. (G7Z, G7SA, G7S, etc)
*2. If the External Device Monitoring is not used, connect brown/white wires to 0 V, and then turn OFF the External Device Monitoring with the configuration software.
*3. Use NC-contact for a start input.
*4. For zone select switch setting, refer to OS32C Series user's manual.
Note: This wiring example is for category 3.

Dimensions

OS32C with back location cable entry - OS32C-BP/OS32C-BP-DM

OS32C with side location cable entry - OS32C-SP1/OS32C-SP1-DM



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