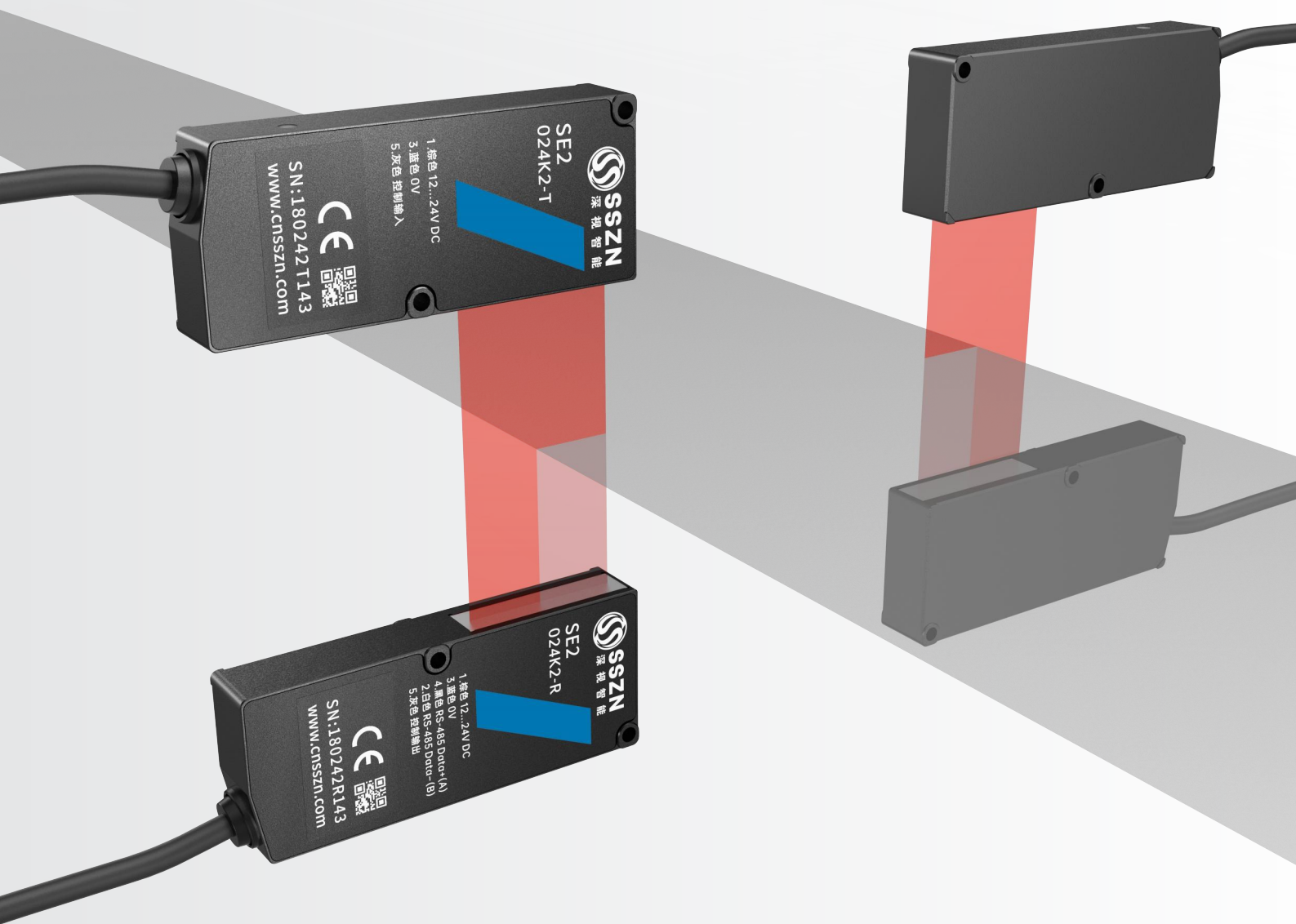


**NEW!**

# Through-beam Edge Sensor

SE1 High-precision Through-beam Edge Sensor | SE2 Wide Range Through-beam Edge Sensor



SE1 Series | SE2 Series



**Brand-new**  
**24mm**  
Wide-range measurement



## About SinceVision

Since its establishment, SinceVision has focused on 3D industrial sensors, launching products such as 3D Laser Profile, Spectral Confocal Displacement Sensor, Laser Displacement Sensors, and Through-Beam Edge Sensor. In 2021, SinceVision expanded into research and development and the defense market, introducing High-Speed Cameras and multiple product lines, with dozens of series now in mass production. Furthermore, our mature products, particularly 3D Laser Profile, have achieved some world-leading performance parameters, gradually becoming a new benchmark in the industry.

Today, SinceVision is increasingly recognized in automation. We have served hundreds of customers, with our products reaching major domestic and international brands in consumer electronics, lithium batteries, and photovoltaics. We are tirelessly promoting refined product solutions tailored to specific fields, empowering various industries with our products and services. From semiconductors and panels to automotive and rail transit, and from plastics and films to food and textiles, we contribute to cost reduction and efficiency enhancement across multiple sectors.

As labor costs rise and product quality upgrades, the future of industrial automation is unstoppable. With years of experience in 3D industrial sensor research and development, SinceVision has developed a comprehensive R&D platform encompassing optics, mechanics, electronics, and software, along with a mature production control system. In the future, we will relentlessly improve our R&D platform and build a world-class industrial product development team. With the craftsmanship of SinceVision's people, we will continue to tackle high-end sensors, ensuring that Chinese automation has reliable domestic products and trusted national brands.

In order to provide our customers with fast and convenient services, we have set up many offices in China and overseas.

### China

Shenzhen, Suzhou (Kunshan), Shanghai, Wuxi, Beijing, Chengdu, Ningde, Taiwan, Wuhan, Xi'an, Hefei, Dongguan

### Overseas

South Korea, Vietnam, Thailand, Malaysia, Singapore

# MILESTONE

2014

## April

Shenzhen SinceVision Technology Co.,Ltd. was officially established

2016

## March

Released the first generation of 3D Laser Profiler the SR7000 series.

2017

## March

Obtained the titles of "National High-tech Enterprise" and "Shenzhen Industrial Stable Growth Enterprise."

2018

## March

Released 3D laser profile the SR8000 series

## August

SinceVision completed Round A financing

2021

## March

Released 3D Laser Profiler the SR9000 series

## September

SinceVision completed Round B financing

## December

Released Laser Displacement Sensor - the SD series

2020

## March

Released 3D Laser Profiler the SR5000 series

## June

Released Spectral Confocal Displacement Sensor - the SC series

## December

Established offices in Chengdu and Beijing, expanding services to the Southwest and North China regions.

2019

## March

The East China office was officially established in Kunshan to serve the Yangtze River Delta region.

## November

SinceVision completed Round A+ financing

## December

Released Laser Displacement Sensor the SG series and the SGI series

2022

## April

SinceVision completed Round B+ financing, co-led by MPC and GL Ventures. SinceVision entered the scientific research and defense markets, launching the first generation of High-Speed Camera - the SH6 series.

## September

SinceVision obtained "CE Certification," "FCC Certification," "KC Certification," "Precision Certification," "ISO9001 Certification," "ISO14001 Certification," and "Social Accountability Management System Certification."

## December

Released Through-Beam Edge Sensor - the SE1 series  
Established offices in Dongguan, Hefei, Xi'an, and other regions, covering nationwide services.

2023

## June

Released High-Speed Camera the SH3 series and Through-Beam Edge Sensor- the SE2 series

## September

SinceVision completed Round C financing, led by the Advanced Manufacturing Fund managed by SDIC Fund Management Co., Ltd., with follow-on investment from GL Ventures. SinceVision was awarded the title of "National new special 'Small Giant' Enterprise."

## October

Formally established the International Department, developing markets in Southeast Asia and Europe, with a service network covering the globe.

2024

## February

Released 3D Laser Profiler the SRI series

## March

Released white light spot photoelectric sensor - the SS1series and Laser Displacement Sensor - the SDC series

## June

Released High-Speed Camera-the SH2 series and Spectral Confocal Displacement Sensor- the SCI series

## SE1 High-precision Through-beam Edge Sensor



Compact design allows for installation in limited space.





# 01

## Easy to adjust optical axis

When installing sensors and conducting regular maintenance, in the sensing head position adjustment mode, the indicator light flashes when the optical axis tilts.

# 02

## Multiple interfaces

No worry about the connection to the upper computer.  
Multiple interfaces are available for connection with users system  
EtherCAT/Analog output (current · voltage)/Digital input/output (NPN/PNP)

# 03

## Chinese menu display

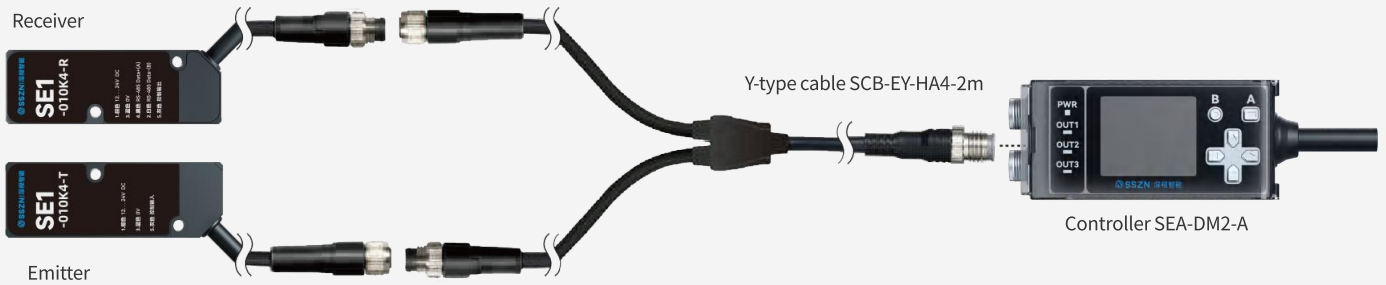
The SEA-DM2 equipped with a TFL screen for measurement value calculation simultaneously with two sets of SE1 series.

## Controller SEA series

SEA-DM2  
SEA-DM2-A  
SEA-DM2-V

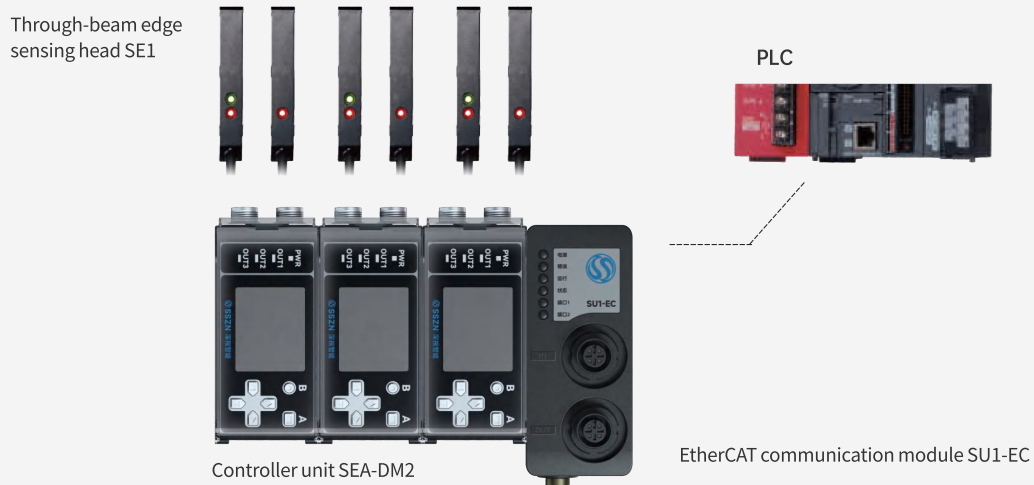


# 01 System Configuration - Analog Communication



# 02 System Configuration - EtherCAT bus communication

The communication unit SU1-EC can connect the SEA series (and SE1 series) to the EtherCAT network. Traditional methods manually configure parameters through controller buttons. It is now possible to remotely batch configure parameters through the EtherCAT communication unit.



## Main Technical Specifications of Sensors

Main Technical Specifications of Sensors		
Model	SE1-010K4	
Measurement range	Edge: $\pm 5\text{mm}$ ; Width: 10mm	
Receiver/Transmitter head distance	300mm Max.	
Light source	Semiconductor red laser	
Linearity	Receiver/Transmitter head distance 100mm: $\pm 0.4\%\text{F.S.}(\pm 40\mu\text{m})$	
Repeatability	5 $\mu\text{m}$	
Response time	250 $\mu\text{s}$	
Interface	RS485 (Cable length up to 10m)	
Environmental resistance	Working ambient temperature/humidity	-10°C~+50°C/35~85%RH(No condensation or freezing)
	Storing ambient temperature/humidity	-20°C~+70°C/35~85%RH (No condensation or freezing)
	Protection Level	IP67
Material	Aluminium alloy	
Dimension	21mm×61mm×10.6mm	

## Main Technical Specifications of the Controller

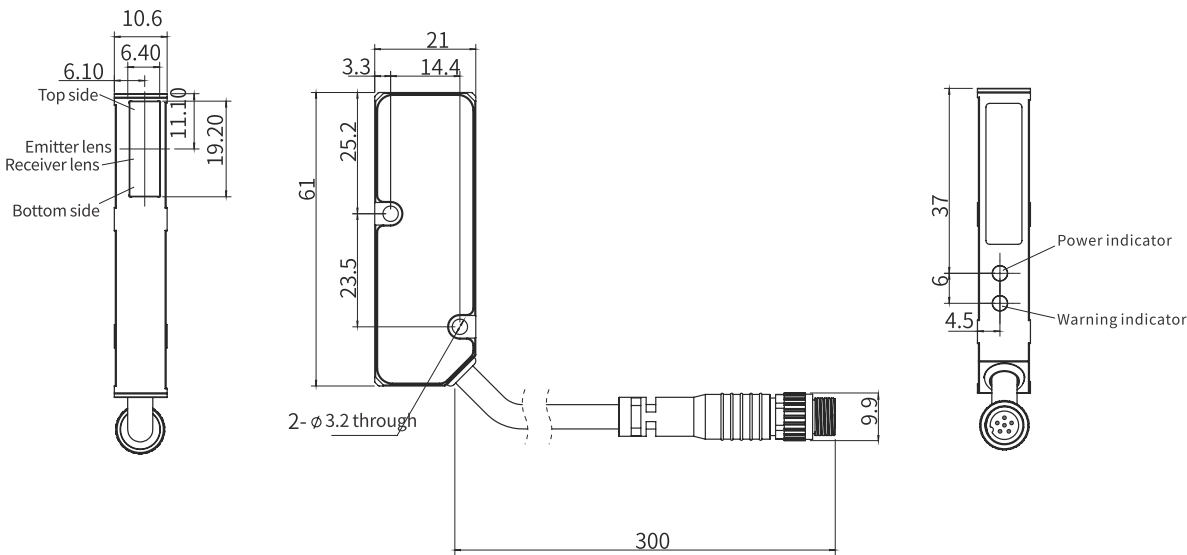
Main Technical Specifications of the Controller			
Model	SEA-DM2-A/V		SEA-DM2
Sensor head	Number of Connections	2 pairs of sensor heads at Max.	
	Connection Method	M8 6-pin connector	
	Communication Method	RS-485 (cable, 10m in length at Max.)	
Display	Measured Value	TFT screen	
	Indicator Light	Power indicator: Green. Output indicator: Red	
I/O	External Input	1 channel (simultaneously effective for sensor head Channel 1/Channel 2)	
	Digital Output	Optional 2-way output (PNP/NPN) Open Collector, 100mA/DC 24V Residual voltage below 1.8V	
	Analog Output	2-way output analog current/voltage. Current: 4~20mA (maximum load 300 $\Omega$ ) or voltage: 0~10V (output resistance 100 $\Omega$ )	
Environment resistance	Working ambient temperature/humidity	-20~+50°C/35~85%RH (No condensation or freezing)	
	Storing ambient temperature/humidity	-20~+70°C/35~85%RH (No condensation or freezing)	
	Protection Level	IP50	
Installation Method		35mm DIN rail (conductive)	
Material		PC+Fiberglass	

## Technical Specifications of the EtherCAT Communication Unit

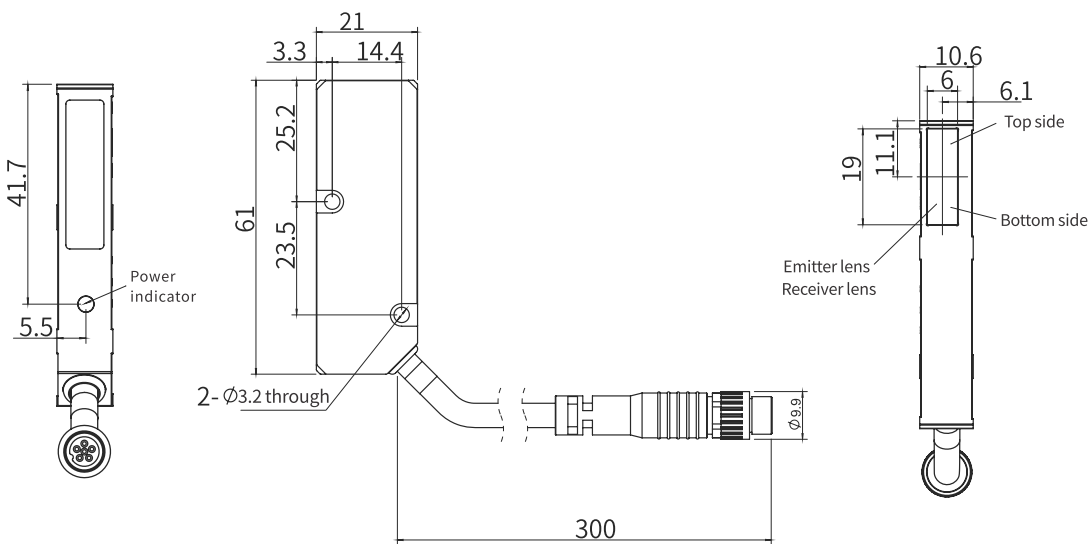
Technical Specifications of the EtherCAT Communication Unit		
model		SU1-EC
EtherCAT Specifications	Distance between nodes	100m Max.
	Transmission speed	100Mbps
	Corresponding function	Process data communication, mailbox communication
Connect sensor	Connectable models	Controller SEA-DM2
	Number of connections	Up to 8 controllers (16 pairs of sensor heads)
	Connection type	10-pin connector
Data transmission	PDO communication	Supported
	SDO communication	Supported
Environmental resistance	Working ambient temperature/humidity	-20~+50°C/35~85%RH(No condensation or freezing)
	Storing ambient temperature/humidity	-40~+70°C/35~85%RH(No condensation or freezing)
	Protection Level	IP50
Installation Method		35 mm DIN rail (conductive)
Material		PC + Fiberglass

# Drawing Specifications of SE1

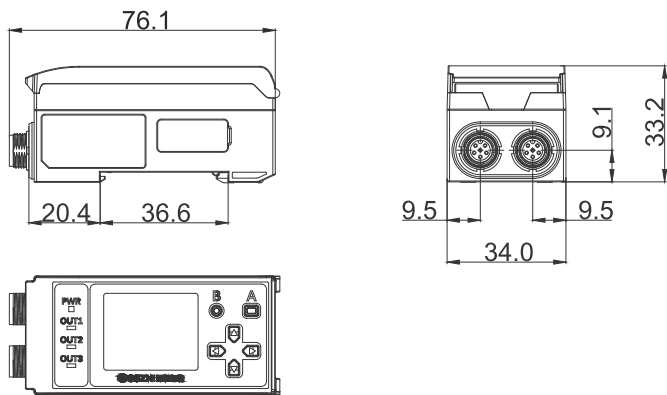
Receiver sensor head SE1-010K4-R



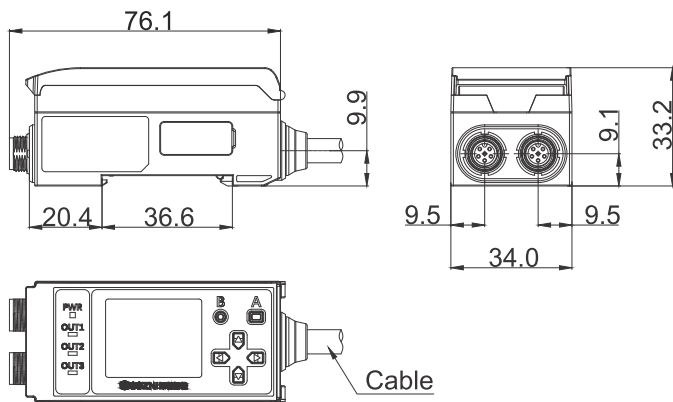
Emitter sensor head SE1-010K4-T



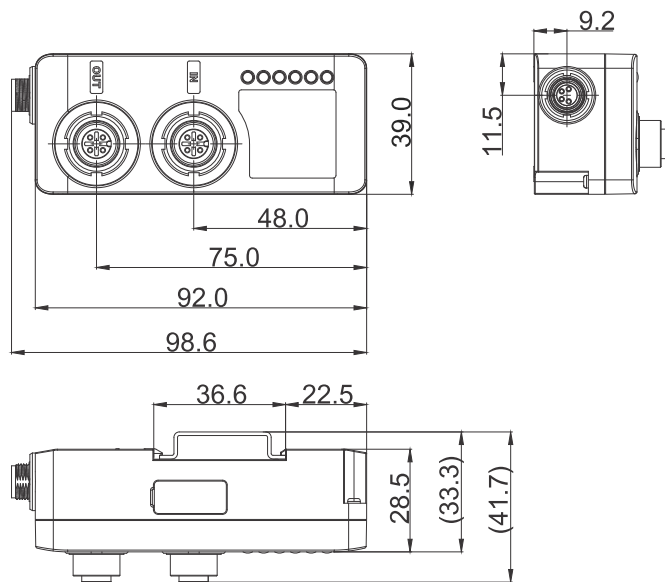
Controller SEA-DM2



Controller SEA-DM2-A/V

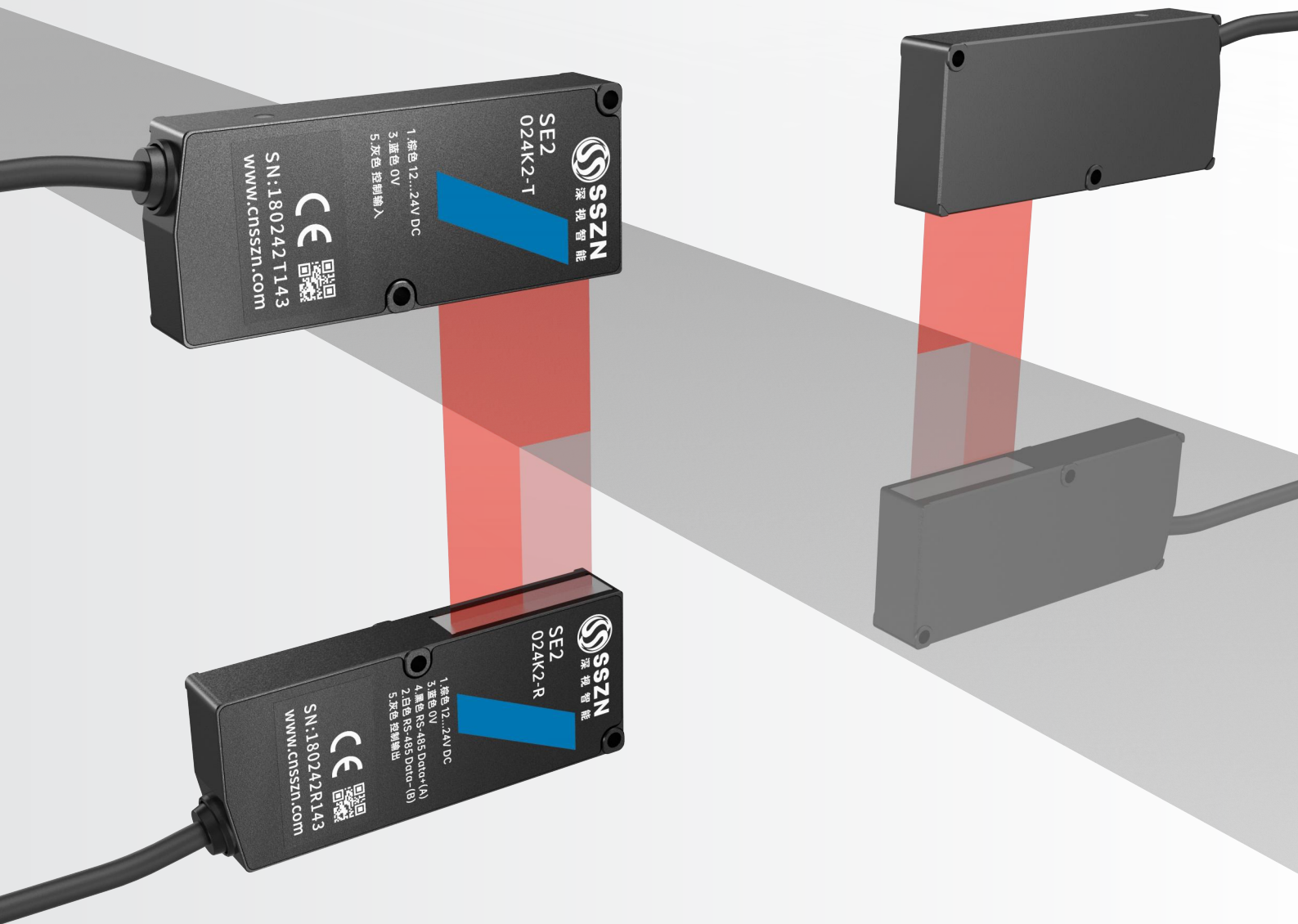


EtherCAT unit communication SU1-EC





# SE2 Wide Range Through-beam Edge Sensor



Brand-new  
**24mm**

Wide-range measurement



01

### Measurement range 24mm

Available for wide  
range measurement

02

### Through-beam laser

More flexible and accurate

03

### One-to-more design

One-to-four design with EtherCAT  
bus communication reduces cost

04

### EtherCAT bus communication

Stable communication and  
strong real-time performance

05

### Wide range and high precision

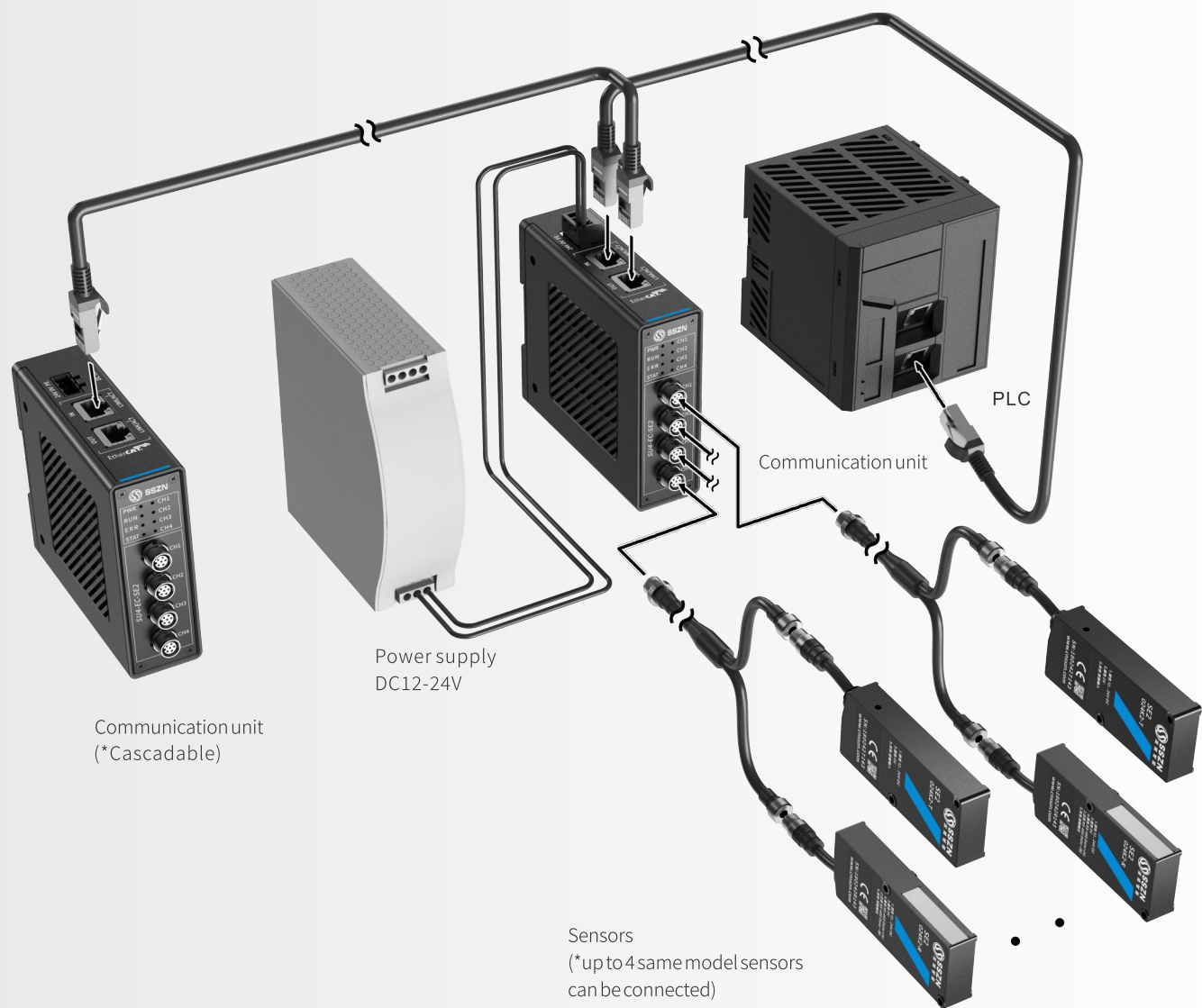
Linearity 0.4% F.S

06

### Better electromagnetic compatibility

Design for stronger electromagnetic  
interference resistance

SE2 series  
Wiring Diagram of Wide Range Edge Measurement Sensor System



## SE2-024K2 Wide Range Edge Measurement Sensor



Model		SE2-024K2
Measurement range		Edge: $\pm 12\text{mm}$ Width: 24mm
Installation distance of sensing head		Max.200mm
Light source		Red semiconductor laser $\cdot 660\text{nm}$
Laser class		Class I (IEC)
Spot size		$5 \times 29\text{mm}$
Linearity		$\pm 0.4\% \text{F.S.}$
Repeatability		$50\mu\text{m}$
Sampling frequency		0.5ms
Temperature characteristics		$\pm 0.02\% \text{F.S./}^{\circ}\text{C}$
Indicator light		Emitter power indicator: Green. Receiver power indicator: Green. Alarm indicator: Red
Communication method		RS-485
Power supply voltage		$\text{DC}12 \sim 24\text{V} \pm 10\%$
Connection method		6-pin connector
Environmental resistance	Protection Level	IP67
	Working ambient temperature/humidity	$-10^{\circ}\text{C} \sim +50^{\circ}\text{C}/35 \sim 85\% \text{RH}$ (No condensation or freezing)
	Storing ambient temperature/humidity	$-20^{\circ}\text{C} \sim +60^{\circ}\text{C}/35 \sim 85\% \text{RH}$ (No condensation or freezing)
Applicable laws and regulations	EMC	EMC Directive (2014/30/EU)
	Environment	RoHS Directive (2011/65/EU)
Dimension(mm)		$80 \times 33 \times 15$
Material		Aluminium alloy

# Technical specifications for four channel EtherCAT communication unit

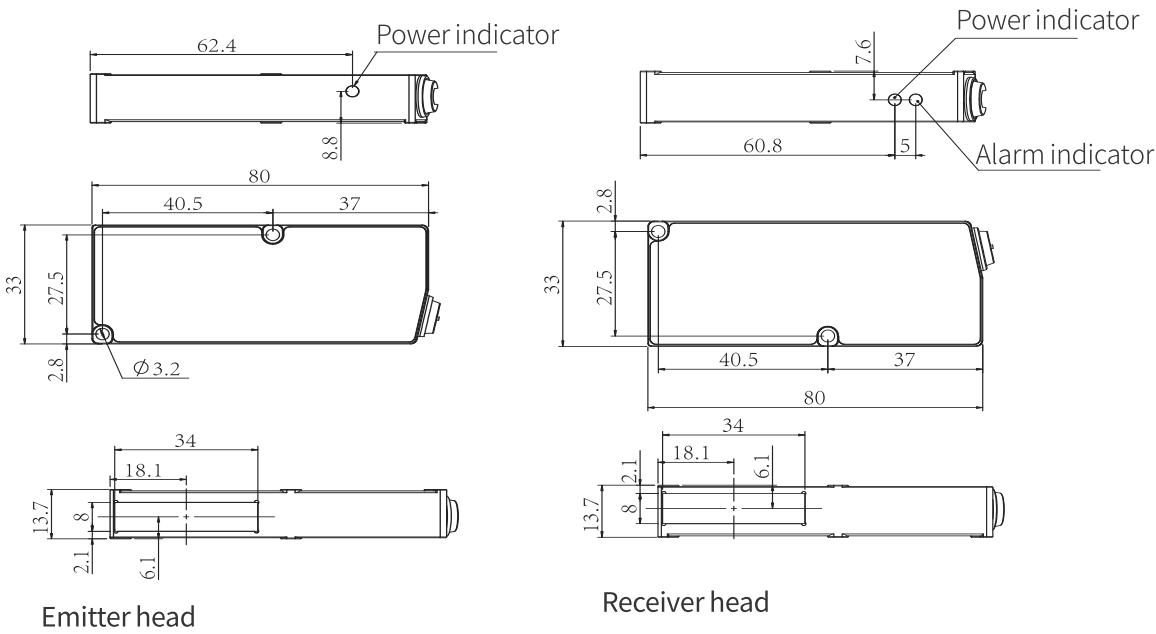


## Technical specifications for four channel EtherCAT communication unit

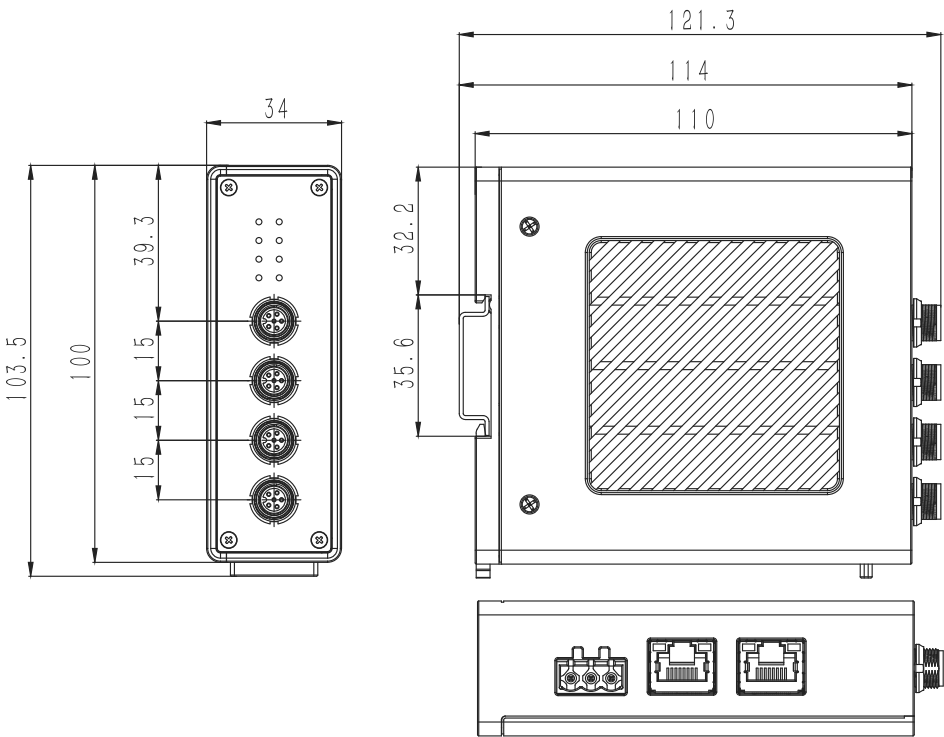
Model		SU4-EC-SE2
Sensor head	Number of channels	Four channels
	Communication method	RS-485 (cable, 20m in length at Max.)
	Communication protocol	EtherCAT protocol
	Support performance	PDO: Maximum refresh rate of 2kHz SDO: Supports sensor parameter settings
Ethercat	Version	EtherCAT Slave
	Standard protocol	IEEE802.3u(100Base-TX)
	Transmission speed	100Mbps
	Communication cycle	0.5ms
	Transmission distance	100m Max.
	Communication cable	STP CAT.5E or above
	Number of ports	2个, IN/OUT
Support external power supply	Physical interface	RJ45
	Output voltage	DC24V
Power supply	Output current	Maximum 300mA per channel
	Input voltage	DC24V
Environmental resistance	Protection level	IP50
	Working ambient temperature/humidity	-10°C~+50°C/35~85%RH (No condensation or freezing)
	Storing ambient temperature/humidity	-20°C~+60°C/35~85%RH(No condensation or freezing)
Applicable laws and regulations	EMC	EMC Directive (2014/30/EU)
	Environment	RoHS Directive (2011/65/EU)
Installation method		DIN rail installation



Sensor SE2-024K2



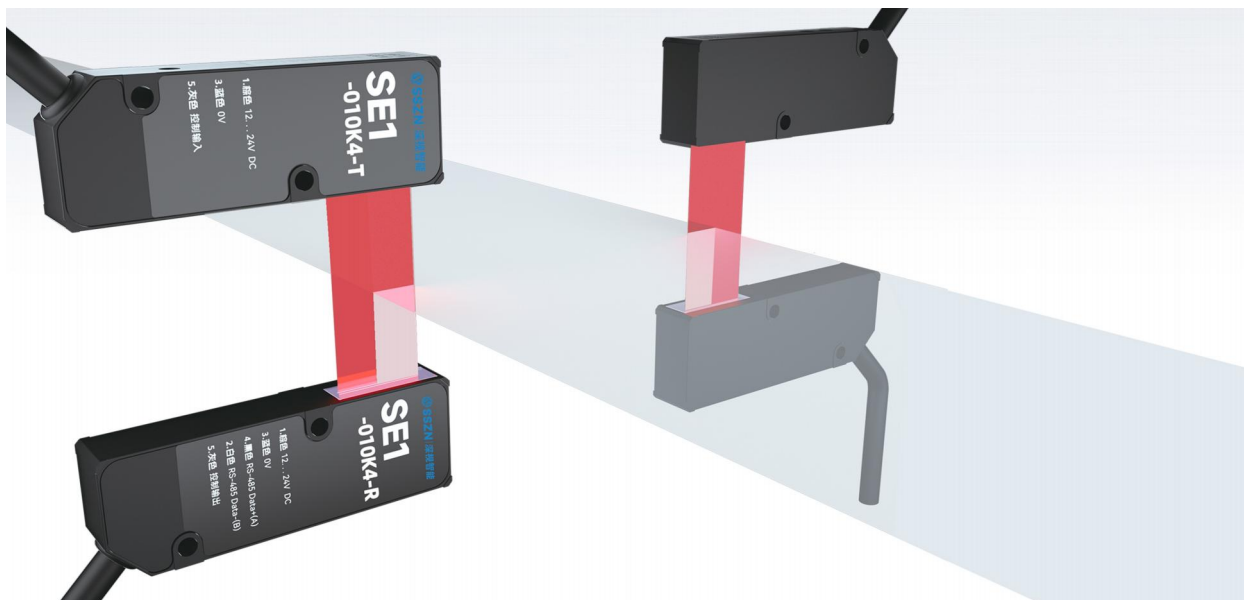
EtherCAT Communication Unit SU4-EC-SE2



## 01 | Electrode Rolled Deviation Detection and Damage Detection

Application scenario: In the winding process of battery cell production, as the final detection station, the winding correction requires real-time detection of the edge position and damage of the electrode. To avoid quality issues caused by misaligned or damaged edges of the electrode plates, it is necessary to have a deviation sensor with extremely high response speed and detection accuracy.

Use the high-precision edge measurement sensor SE1 series of SinceVision, installed them opposite for through-beam measurement at the winding station, with a sampling frequency of 4kHz, a response time of 250  $\mu$ s and repeatability 5  $\mu$ m. Use EtherCAT bus communication, which has a high speed of communication and strong anti-interference ability. It's able to perfectly solve the problems of winding correction and electrode edge damage detection.



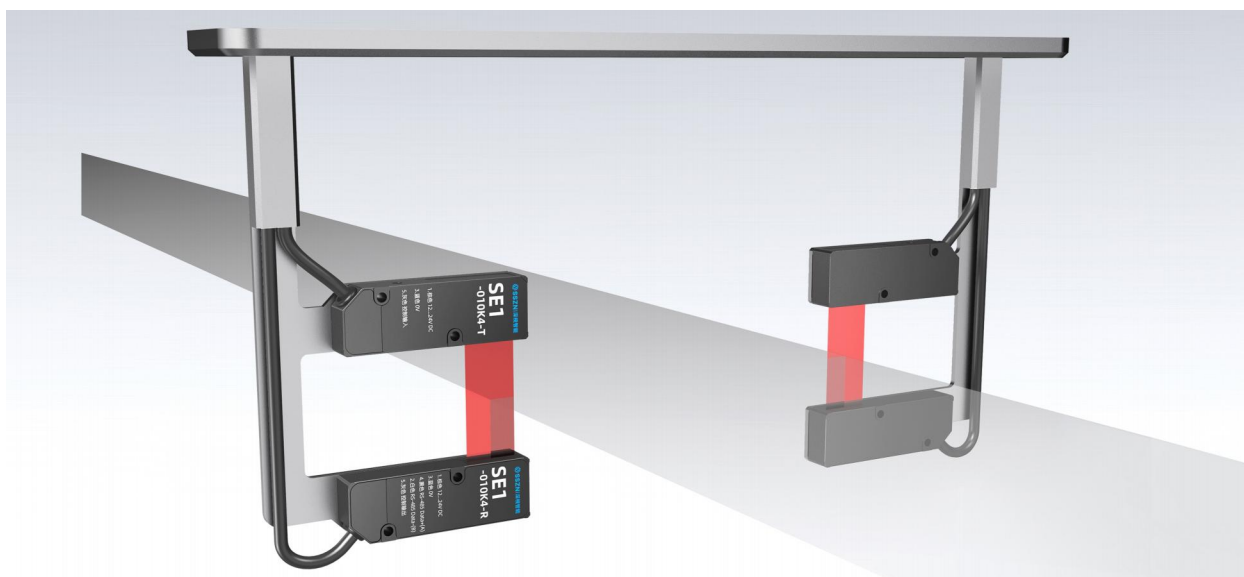
## 02 | Separator deviation measurement, Separator width detection

Application scenario: In the winding process of battery cell production, it is necessary to detect the edge positions of the upper and lower separators in real-time to ensure the alignment of the Separator edges during battery cell winding.

There are two types of separator materials: dry Separator and wet Separator, with different light transmittance. It is required that the deviation sensor can adapt to the light transmittance of the two types of separator materials and ensure the correction accuracy.

At the same time, the customer has requirements for measuring the width of the separator, and needs to use an edge measurement sensor to measure the width of the separator.

**Solution:** Use the high-precision edge measurement sensor SE1 series, installed them opposite for through-beam measurement at the winding station, which can adapt to the different light transmittance of dry and wet separators, ensuring correction accuracy. For the requirement of separator width measurement, use a bracket that can calibrate the installation distance to install 2 pairs of sensors on both sides of the bracket to complete the separator width measurement.



### 03 | Wafer Concentricity and Notch Detection

Application scenario: In the chip packaging testing phase, it is necessary to perform concentricity and notch detection on the wafer to locate the center and direction of the wafer. Accurate positioning of the wafer center and notch position can improve the accuracy of wafer cutting, thereby increasing the yield of chip production.

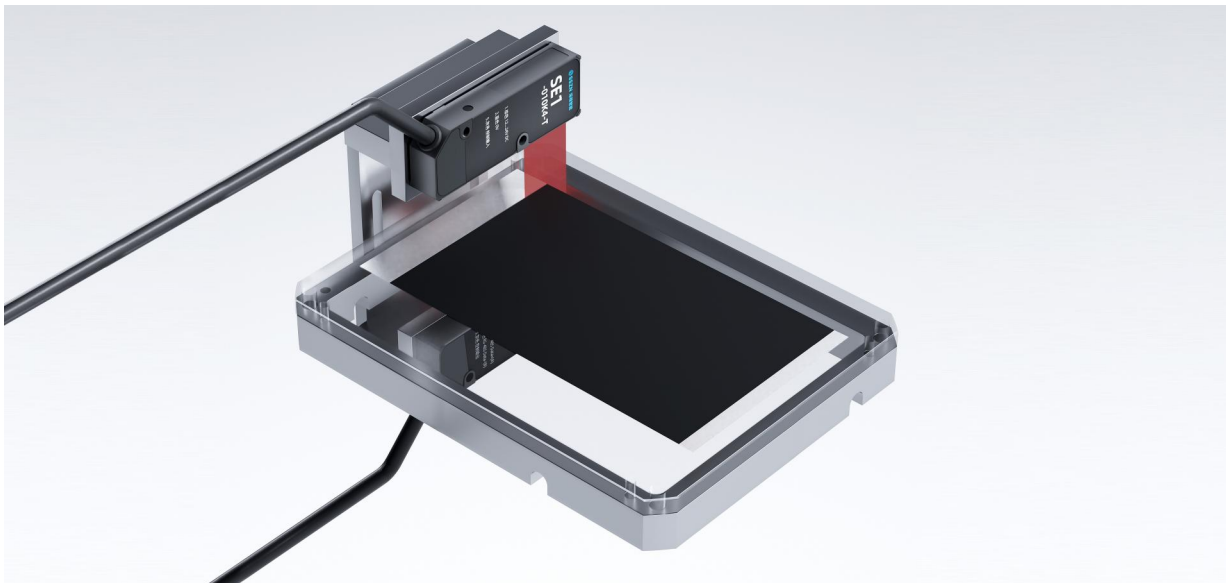
Solution: Use the high-precision edge measurement sensor SE1 series, installed them opposite for through-beam measurement at the edge of the wafer. When the wafer rotates, the correction sensor calculates the center position of the circle through measurement data, and then moves the center of the wafer to the center of the rotation axis through a robotic arm or actuator; After aligning the center of the wafer, rotate it again, and the correction sensor locates the wafer gap. After positioning the gap position, the actuator rotates the gap to the specified angle.



### 04 | Stacking machine separator deviation detection, electrode damage detection, electrode positioning detection

Application scenario: Stacked batteries represent a high level of production technology for lithium batteries, with complex processes. In the production of stacked batteries, according to the different production process requirements of customers, it is necessary to perform deviation detection on the separator, damage of the electrode edge, and locate the electrode to improve the production efficiency and yield of stacked batteries.

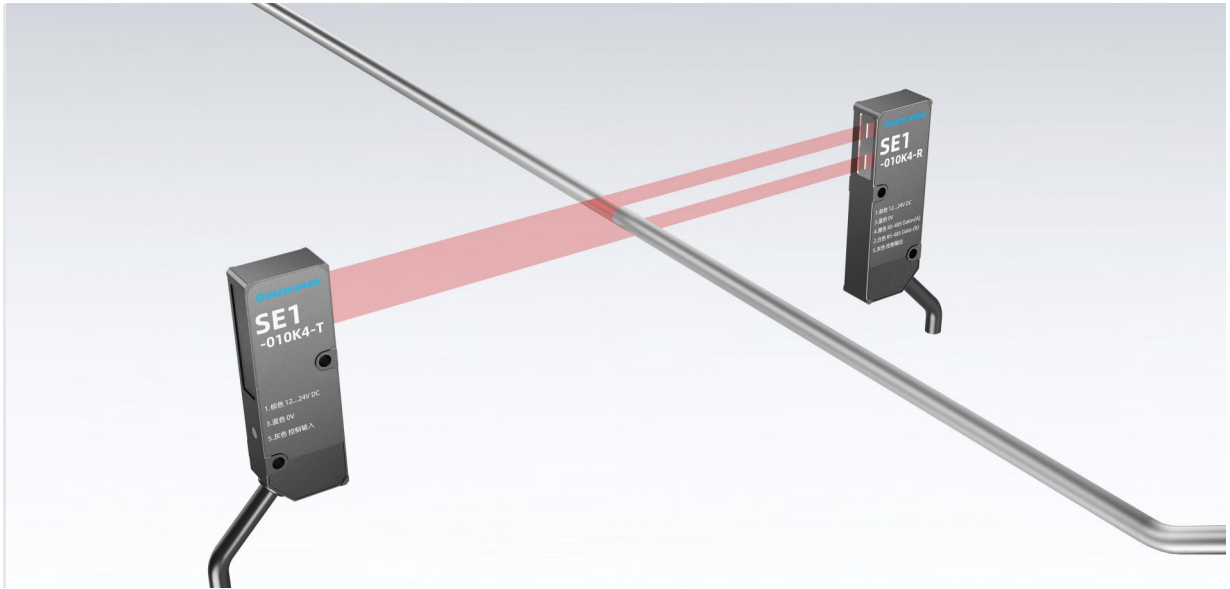
Solution: Install SE1 series high-precision edge measurement sensors at different workstations of the stacking machine according to customer inspection requirements, with a sampling frequency of 4kHz and a response time of 250  $\mu$ s. There are obvious advantages in detecting electrode damage, with good correction effect for separator with different light transmittance, and fully meeting the detection requirements for electrode positioning.



### 05 | Outer Diameter Inspection of Small Components

Application scenario: In the precision manufacturing industry, some customers need to measure the outer diameter of some small components to determine whether the processing accuracy meets the process requirements.

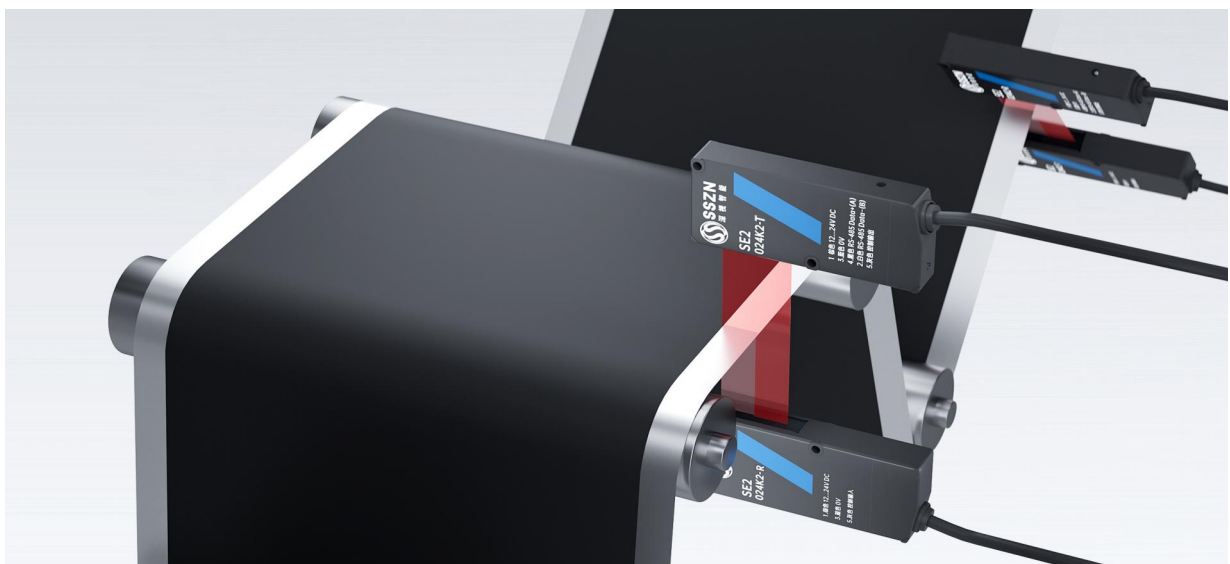
Solution: Using SE1 series high-precision edge measurement sensors by SinceVision, using the width measurement mode, place small components in the measurement area of the laser beam, and accurately measure the outer diameter of the small components.



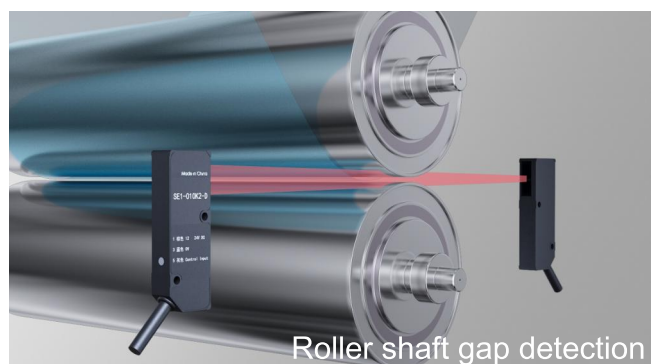
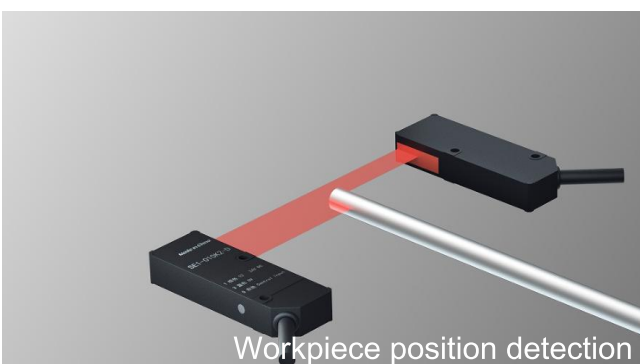
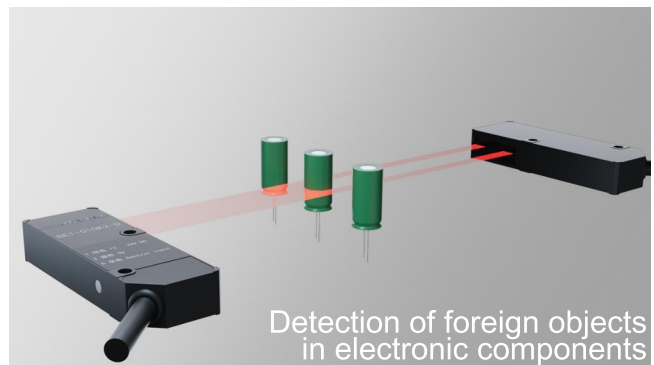
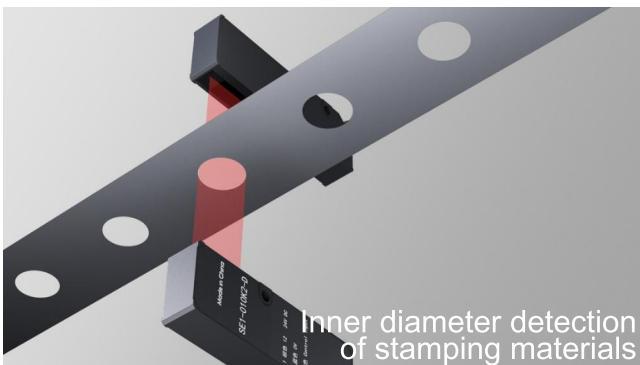
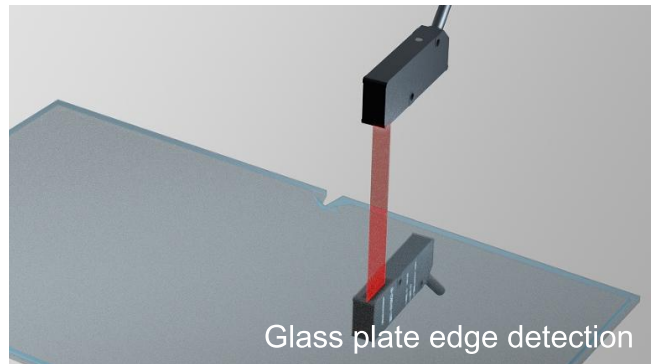
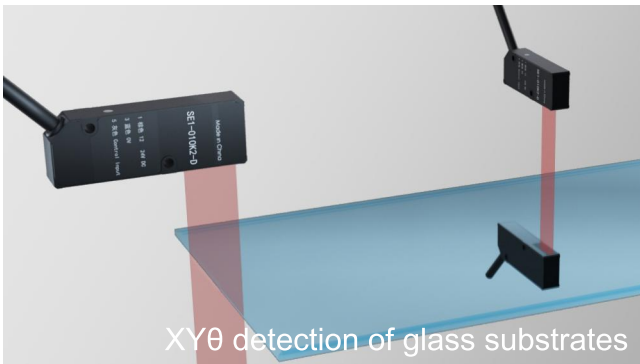
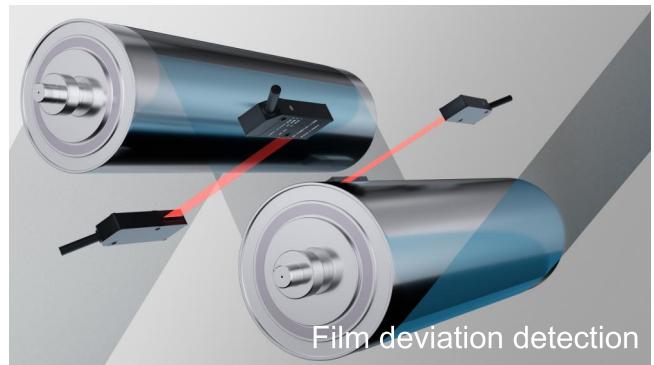
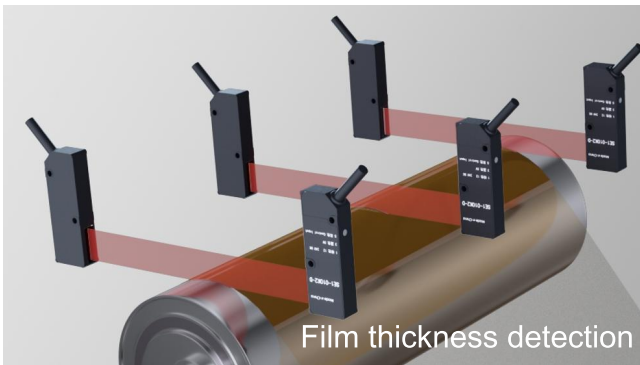
### 06 | Electrode plate, separator deviation detection in processing (roughly detection)

Application scenario: In the winding process of battery cell production, a large number of process deviation sensors are required for positive and negative electrode plates and separator in the winding and transmission process. Currently, in the lithium battery industry, process deviation sensors generally use analog communication, which is easy to interfere with signals and requires a large wiring workload. The sensors and controllers adopt a one-to-one configuration, and customers need to purchase an additional AD conversion module for signal conversion, resulting in high purchase cost.

Solution: SinceVision has launched a brand new SE2 wide range edge measurement sensor, which uses EtherCAT bus communication with a sensing head range of 24mm and RS485 communication. It is directly connected to the EtherCAT communication module without a controller and adopts a 1-to-4 configuration. One EtherCAT communication module can connect to 4 sensor heads, using aviation plug-in wiring, which is convenient and reliable. The signal communication is stable and not disturbed, without AD conversion module, which reduces cost for customers at most.



# 07 | Other Cases







SE1 High-precision Through-beam Edge Sensor      SE2 Wide Range Through-beam Edge Sensor

● Service covering:

China: Shenzhen, Suzhou (Kunshan), Shanghai, Wuxi, Beijing, Chengdu, Ningde, Taiwan, Wuhan, Xi'an, Hefei, Dongguan  
Overseas: South Korea, Vietnam, Thailand, Malaysia, Singapore

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Northwest China Office:  
Room 601, Chuangke Building, Cuihua Road, Yanta District, Xi'an City, Shaanxi Province, China  
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Linked in Account



SinceVision's  
YouTube Account