

ELS Series

Laser Displacement Sensor

Product Selection Guide



Zhejiang ELEsenson Sensors Co., Ltd.

Add:No. 7 Xingtang Road, Tangxia Industrial Zone, Yueqing, Wenzhou, Zhejiang, China
Tel:+86-577-6283-3666
phone:+86-181-0016-5100
Web:www.elesenson.com
Email:elesenson@gmail.com

Zhejiang ELEsenson Sensors Co., Ltd.



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ELS1 Series

Laser Displacement Sensor



— Features

- **High Cost-Performance & High Stability**
Operates reliably under harsh environments including electromagnetic interference.
- **High-Performance Optical Lens**
Glass lens for both emitter and receiver windows delivers better temperature resistance, corrosion resistance, light transmittance and anti-scratch property compared with acrylic lens.
- **User-Friendly Interface**
4-digit digital display panel with 3 keys for simple multi-function configuration.
- **Rich Communication Options**
Independent selection of RS-485 serial protocol, analog current / voltage output.
Supports EtherCAT module for flexible communication solutions.
- **Large Status Indicator LED**
Oversized front-panel output indicator for intuitive status monitoring during operation.

— Product Introduction

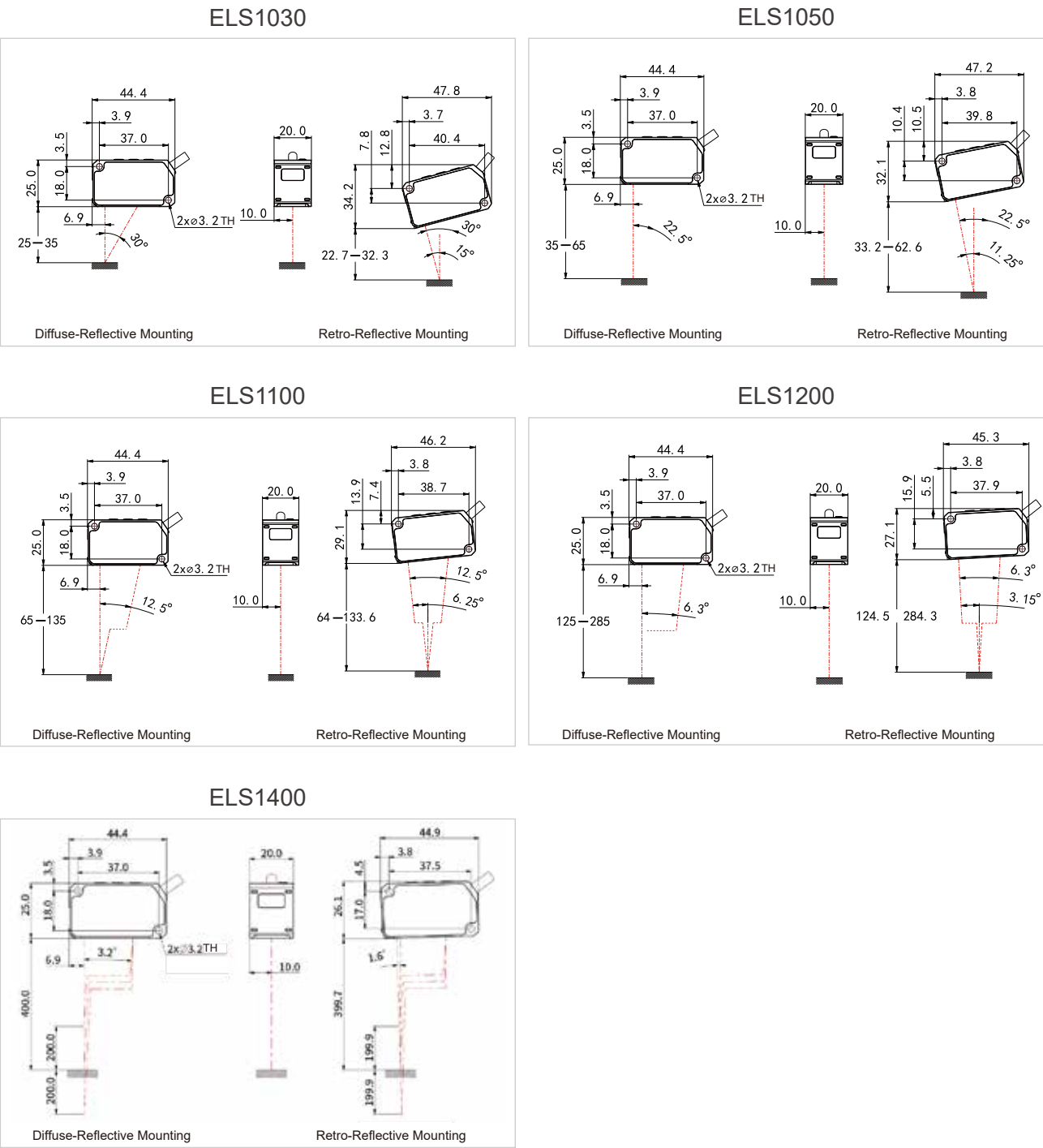
ELEsenson laser displacement sensor is a high-precision measuring instrument based on laser triangulation ranging principle. It is mainly used for non-contact measurement of object displacement, position and profile. It emits laser beam and receives reflected laser signal from target surface, and calculates displacement or distance according to spot position change on measured object.

It supports one-touch easy teach-in. Simple teach-in via panel buttons with multiple teach-in modes to satisfy diverse application requirements. Adopted glass lens features high temperature resistance, corrosion resistance, superior light transmittance and scratch-proof performance. Ultra-compact dimension fits various mounting environments. IP67 protection rating guarantees reliable performance under humid or dusty field conditions.

— Specifications

Item		Specifications				
		ELS1030	ELS1050	ELS1100	ELS1200	ELS1400
Reference Distance (CD)		30mm	50mm	100mm	200mm	400mm
Measuring Range		±5mm	±15mm	±35mm	±80mm	±200mm
Light Source	Light Source Wavelength	655nm				
	Laser Class	Class 2				
	Laser Output Power	1mW				
Spot Size	Reference Distance	Φ50μm	Φ70μm	Φ120μm	Φ300μm	Φ500μm
Repeatability		5μm	15μm	35μm	100μm	150μm @ 200~400mm 400μm @ 400~600mm
Linearity (F.S.)		±0.1%			±0.2%	±0.2%@ 200~400mm ±0.3%@ 400~600mm
Temperature Characteristic		±0.05% F.S./°C				
Sampling Frequency(Hz)		100/200/1000Hz (3 selectable levels)				
Input and Output	Communication Port	1 × RS-485 (Modbus RTU supported)				
	Analog Output	1-channel; selectable 0-5V voltage or 4-20mA current (non-switchable)				
	Digital Input	1-channel: laser off, teach-in, trigger, zero-reset etc.				
	Digital Output	1-channel judgment status output				
Supply Voltage		DC12~24V±10%				
Current Consumption		≤40mA @24V DC; ≤60mA @12V DC				
Operating Temperature		-10~50°C				
Storage Temperature		-20~60°C				
Operating Humidity		35%-85% RH, non-condensing, non-frosting				
ESD Protection		Contact discharge4kV, air discharge8kV (IEC61000-4-2)				
EFT Protection		Power port2kV; signal port1kV (IEC61000-4-4)				
Shock Resistance		500m/s ² (~50G), 3 times on X/Y/Z axis				
Vibration Resistance		10-55Hz, double amplitude1.5mm, 2h for each X/Y/Z axis				
IP Rating		IP67 (IEC60529)				
Dimensions (W×H×D)		37×25×20mm				
Weight (incl. cable)		86g				

— Dimension Drawing Labels



ELS2 Series

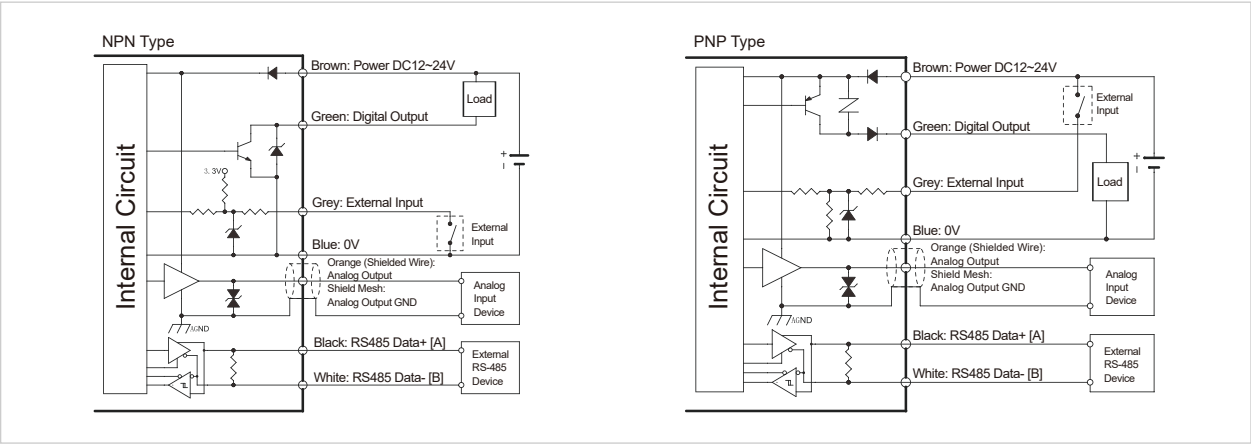
Laser Displacement Sensor



— Features

- **High-Speed Sampling**
Max sampling frequency up to 3 kHz for fast-response high-precision measurement.
- **High Repeatability & Linearity**
Repeatability down to 1 μm, linearity ±0.1% F.S. for high-accuracy measuring results.
- **High-Performance Optical Lens**
Glass lens for emitter and receiver windows; better temperature-resistance, corrosion-resistance, light transmittance and scratch-resistance vs acrylic material.
- **User-Friendly Interface**
4-digit digital display plus 4 keys for intuitive multi-function parameter setup.
- **Rich Communication Options**
Independently selectable analog voltage / current output; EtherCAT module support; RS-485 (Modbus RTU) for flexible communication solutions.

— Wiring Diagram



— Cable Pin Assignment

Wire Color	Function
Brown	12...24V DC
Blue	0V
Black	RS-485 Data+ (A)
White	RS-485 Data- (B)
Grey	Multi-function Digital Input
Green	Digital Output
Yellow (Single-core shielded)	Analog Output
Shield (Single-core shielded)	Analog Reference GND (0 V)
Green-Yellow	PE

— Product Introduction

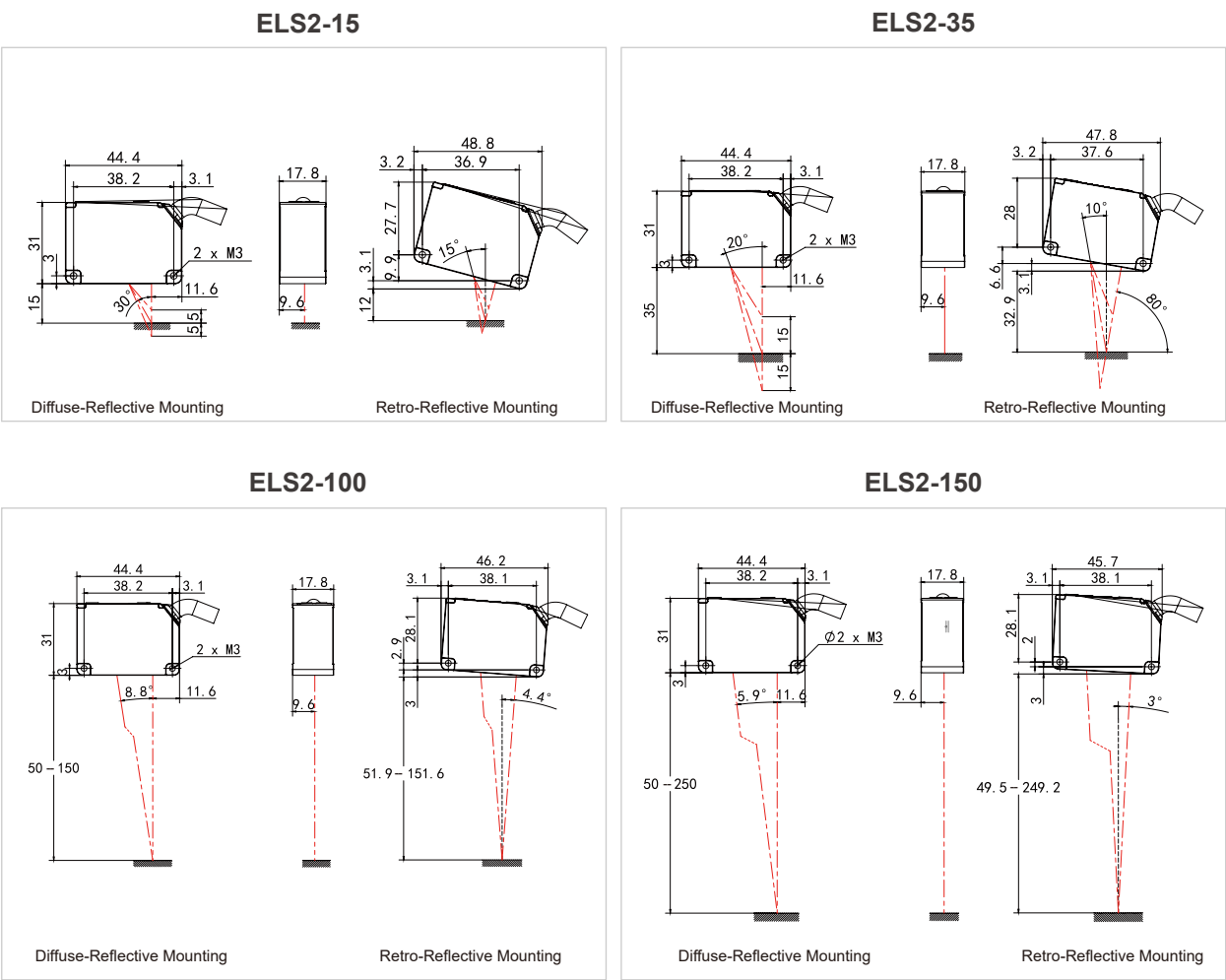
ELEsenson laser displacement sensor is high-precision measuring instrument adopting laser triangulation principle for non-contact measurement of displacement, position and profile. It emits laser beam, receives reflected light and calculates distance / displacement according to spot position shift on target surface.

One-touch easy teach-in via front-panel buttons with multiple teach-in modes for varied application requirements. Glass lens provides superior temperature resistance, corrosion resistance, light transmittance and scratch-proof performance. Ultra-compact housing fits diverse mounting conditions. IP67 rating enables stable performance under humid and dusty site environments.

— Specifications

Item		Specifications			
		ELS2-15	ELS2-35	ELS2-100	ELS2-150
Reference Distance (CD)		15mm	35mm	100mm	150mm
Measuring Range		±5mm	±15mm	±50mm	±100mm
Light Source	Light Source Wavelength	655nm			
	Laser Class	Class 2			
	Laser Output Power	1mW			
Spot Size	Spot Size (Near-end)	30*110μm	120*180μm	160*550μm	200*500μm
	Reference Distance	50*200μm	100*580μm	300*1500μm	400*2300μm
	Spot Size (Far-end)	100*400μm	220*900μm	500*2500μm	800*3500μm
Repeatability		1 μm			
Linearity (F.S.)		±0.1% F.S.			
Temperature Characteristic		±0.05% F.S./°C			
Sampling Frequency(Hz)		300 / 500 / 1000 / 2000 / 3000 Hz			
Input and Output	Communication Port	1 × RS-485 (Modbus RTU supported)			
	Analog Output	1-ch, 0-5 V / 4-20 mA non-switchable			
	Digital Input	Laser off, teach-in, trigger, zero-reset			
	Digital Output	1-ch judgment status output			
Supply Voltage		DC12~24V±10%			
Current Consumption		≤60 mA @12 V DC; ≤120 mA @24 V DC			
Operating Temperature		-10~50°C			
Storage Temperature		-20~70°C			
Operating Humidity		35-85% RH non-condensing			
ESD Protection		4 kV contact /8 kV air (IEC 61000-4-2)			
EFT Protection		Power 2 kV; Signal 1 kV (IEC 61000-4-4)			
Shock Resistance		500 m/s ² (~50 G), X/Y/Z ×3 times			
Vibration Resistance		10-55 Hz, 1.5 mm double amplitude, 2 h each axis			
IP Rating		IP67 (IEC60529)			
Dimensions (W×H×D)		44 × 31 × 18 mm			
Weight (incl. cable)		70 g			

— Dimension Drawing Labels



ELS2 Series

Laser Displacement Sensor



— Product Introduction

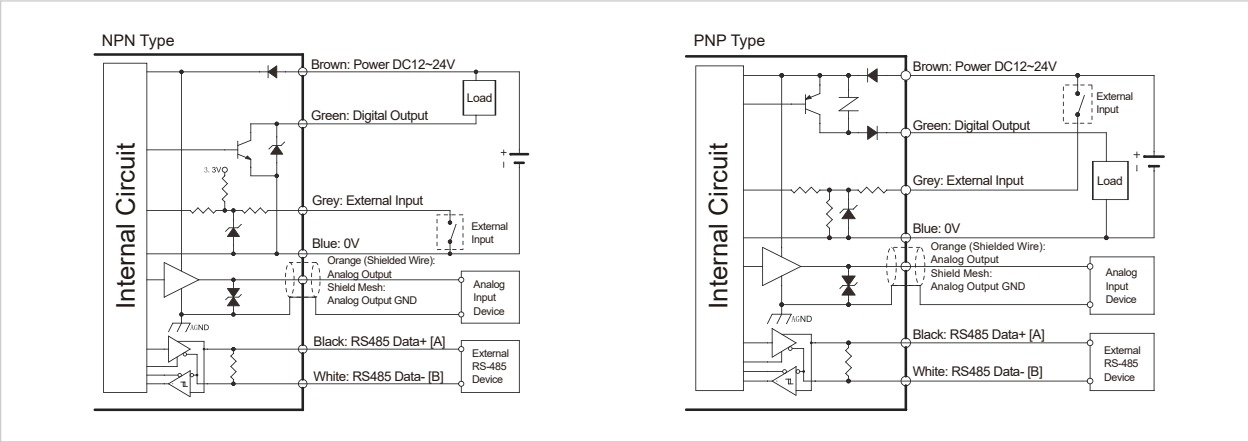
ELEsenson laser displacement sensor is a high-precision measuring instrument based on laser triangulation ranging principle. It is mainly used for non-contact measurement of object displacement, position and profile. It emits laser beam and receives reflected laser signal from target surface, and calculates displacement or distance according to spot position change on measured object.

It supports one-touch easy teach-in. Simple teach-in via panel buttons with multiple teach-in modes to satisfy diverse application requirements. Adopted glass lens features high temperature resistance, corrosion resistance, superior light transmittance and scratch-proof performance. Ultra-compact dimension fits various mounting environments. IP67 protection rating guarantees reliable performance under humid or dusty field conditions.

— Features

- **High Repeatability & Linearity**
Repeatability up to 2 μm, linearity of ±0.1% F.S., delivering high-precision measurement results.
- **Multi-function Input**
External input enables multiple functions including laser shutdown, remote teach-in, sample & hold, single-pulse trigger and zero reset.
- **High-performance Lens**
Glass lenses are used for both emitter and receiver windows. Compared with acrylic plates, they feature superior temperature resistance, corrosion resistance, light transmittance and effective scratch protection.
- **User-friendly Interface**
Equipped with a 4-digit digital display panel and four keys for simple and intuitive multi-function configuration.
- **Rich Communication Options**
Supports independent selection of analog voltage / analog current output, compatible with EtherCAT module, and provides RS485 communication (Modbus RTU supported) for flexible communication solutions.

— Wiring Diagram



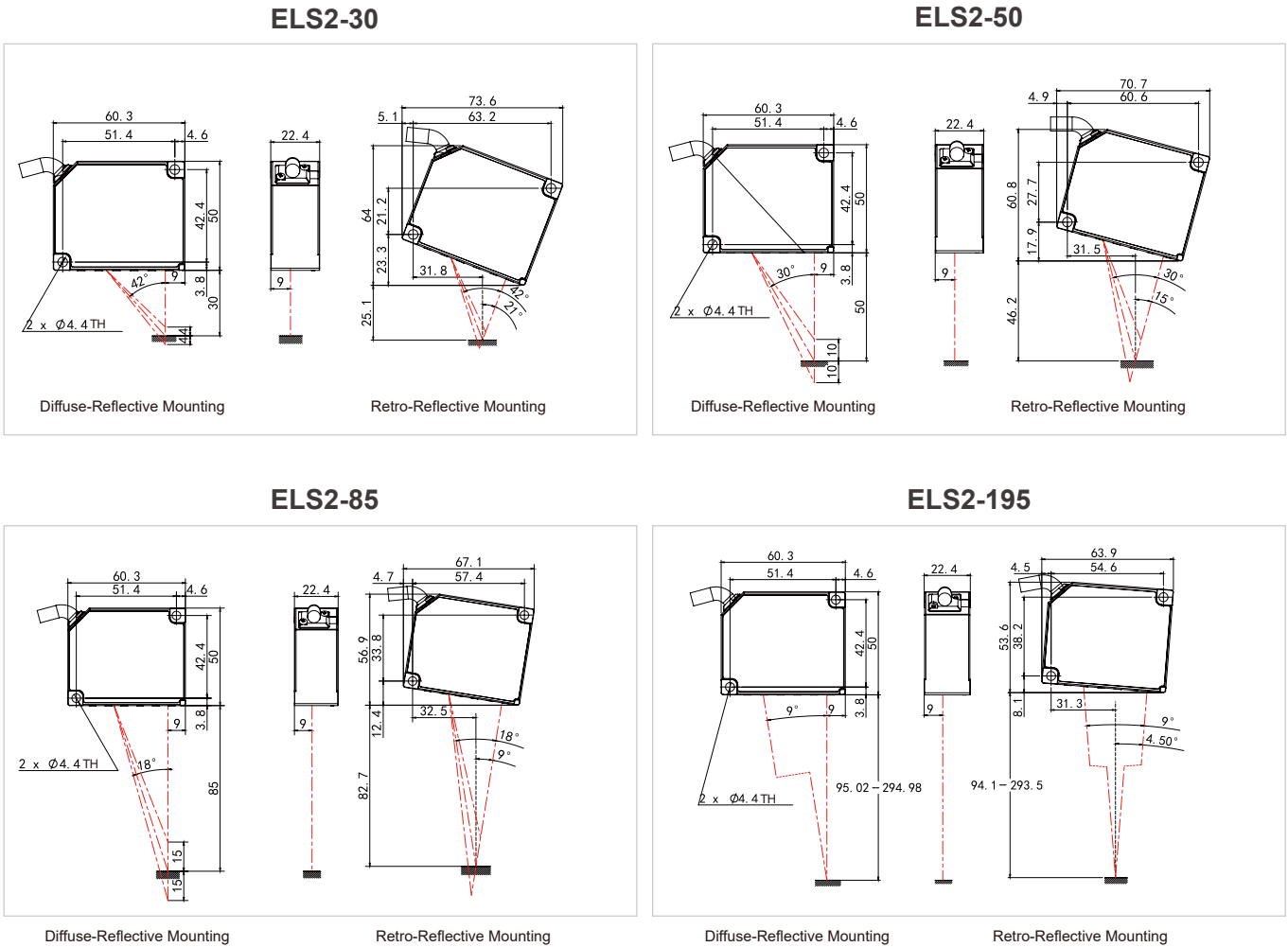
— Cable Pin Assignment

Wire Color	Function
Brown	12...24V DC
Blue	0V
Black	RS-485 Data+ (A)
White	RS-485 Data- (B)
Grey	Multi-function Digital Input
Green	Digital Output
Yellow (Single-core shielded)	Analog Output
Shield (Single-core shielded)	Analog Reference GND (0 V)
Green-Yellow	PE

— Specifications

Item		Specifications			
		ELS2-30	ELS2-50	ELS2-85	ELS2-195
Reference Distance (CD)		30mm	50mm	85mm	195mm
Measuring Range		±4mm	±10mm	±15mm	±99.98mm
Light Source	Light Source Wavelength	655nm			
	Laser Class	Class 2			
	Laser Output Power	1mW			
Spot Size	Spot Size (Near-end)	80*180μm	120*230μm	150*600μm	230*600μm
	Reference Distance	70*260μm	110*440μm	140*990μm	430*2000μm
	Spot Size (Far-end)	100*400μm	150*670μm	190*1200μm	700*3300μm
Repeatability		2μm	5μm	10μm	50μm
Linearity (F.S.)		±0.1% F.S.			
Temperature Characteristic		±0.05% F.S./°C			
Sampling Frequency(Hz)		300 / 500 / 1000 / 2000 / 3000 Hz			
Input and Output	Communication Port	1 × RS-485 (Modbus RTU supported)			
	Analog Output	1-ch, 0-5 V / 4-20 mA non-switchable			
	Digital Input	Laser off, teach-in, trigger, zero-reset			
	Digital Output	1-ch judgment status output			
Supply Voltage		DC12~24V±10%			
Current Consumption		≤60 mA @12 V DC; ≤120 mA @24 V DC			
Operating Temperature		-10~50°C			
Storage Temperature		-20~70°C			
Operating Humidity		35-85% RH non-condensing			
ESD Protection		4 kV contact /8 kV air (IEC 61000-4-2)			
EFT Protection		Power 2 kV; Signal 1 kV (IEC 61000-4-4)			
Shock Resistance		500 m/s² (~50 G), X/Y/Z ×3 times			
Vibration Resistance		10-55 Hz, 1.5 mm double amplitude, 2 h each axis			
IP Rating		IP67 (IEC60529)			
Dimensions (W×H×D)		60 × 50 × 22 mm			
Weight (incl. cable)		120 g			

— Dimension Drawing Labels



ELS3 Series

Laser Displacement Sensor



- Product Introduction

EL sensor laser displacement sensor is a high-precision measuring instrument based on laser triangulation ranging principle. It is mainly used for non-contact measurement of object displacement, position and profile. It emits laser beam and receives reflected laser signal from target surface, and calculates displacement or distance according to spot position change on measured object.

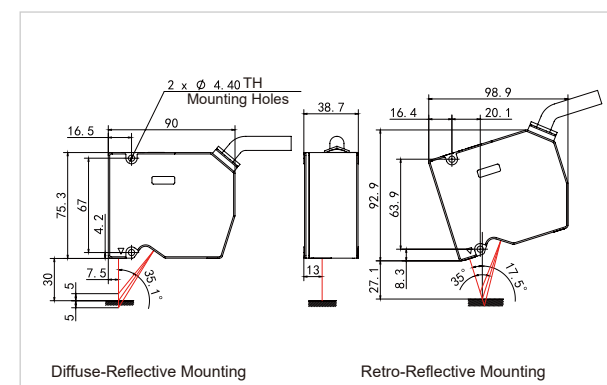
It supports one-touch easy teach-in. Simple teach-in via panel buttons with multiple teach-in modes to satisfy diverse application requirements. Adopted glass lens features high temperature resistance, corrosion resistance, superior light transmittance and scratch-proof performance. Ultra-compact dimension fits various mounting environments. IP67 protection rating guarantees reliable performance under humid or dusty field conditions.

- Features

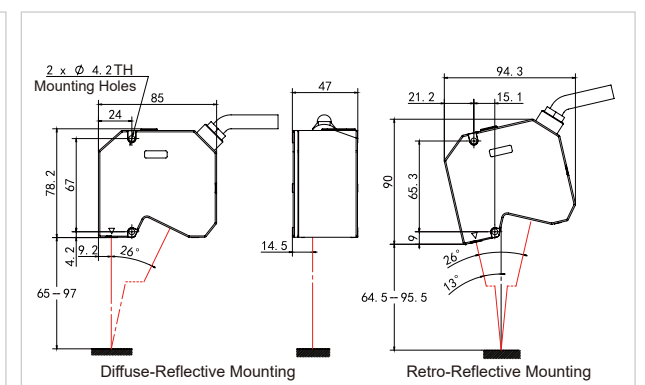
- **Fast Sampling Rate**
Up to 590 kHz sampling frequency for highly stable acquisition of displacement of moving targets.
- **Multi-Spot Options**
Wide spot & small spot versions available to satisfy diverse measuring requirements.
- **One-Controller-to-Four-Heads Function**
Single controller supports up to four sensor heads for improved system efficiency & flexibility.
- **Differential Encoder Trigger Input**
Built-in differential encoder trigger input, no external module required for simplified system setup.
- **Rich Communication Interfaces**
TCP/IP Ethernet (Modbus-TCP), RS-232 serial port, analog & digital outputs for flexible connection.

- Dimension Drawing Labels

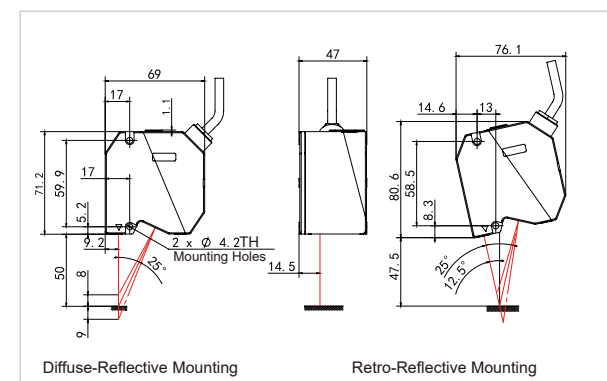
ELS33030



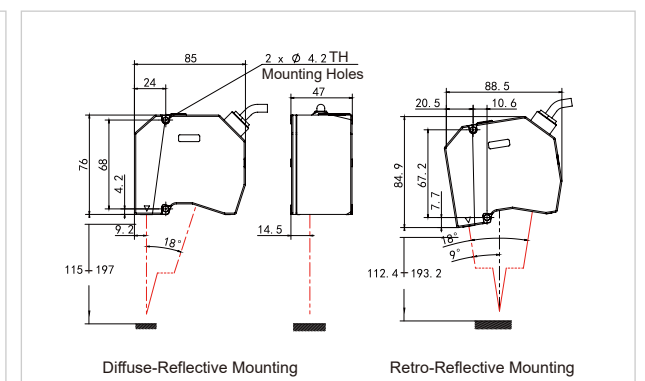
ELS33080



ELS35050



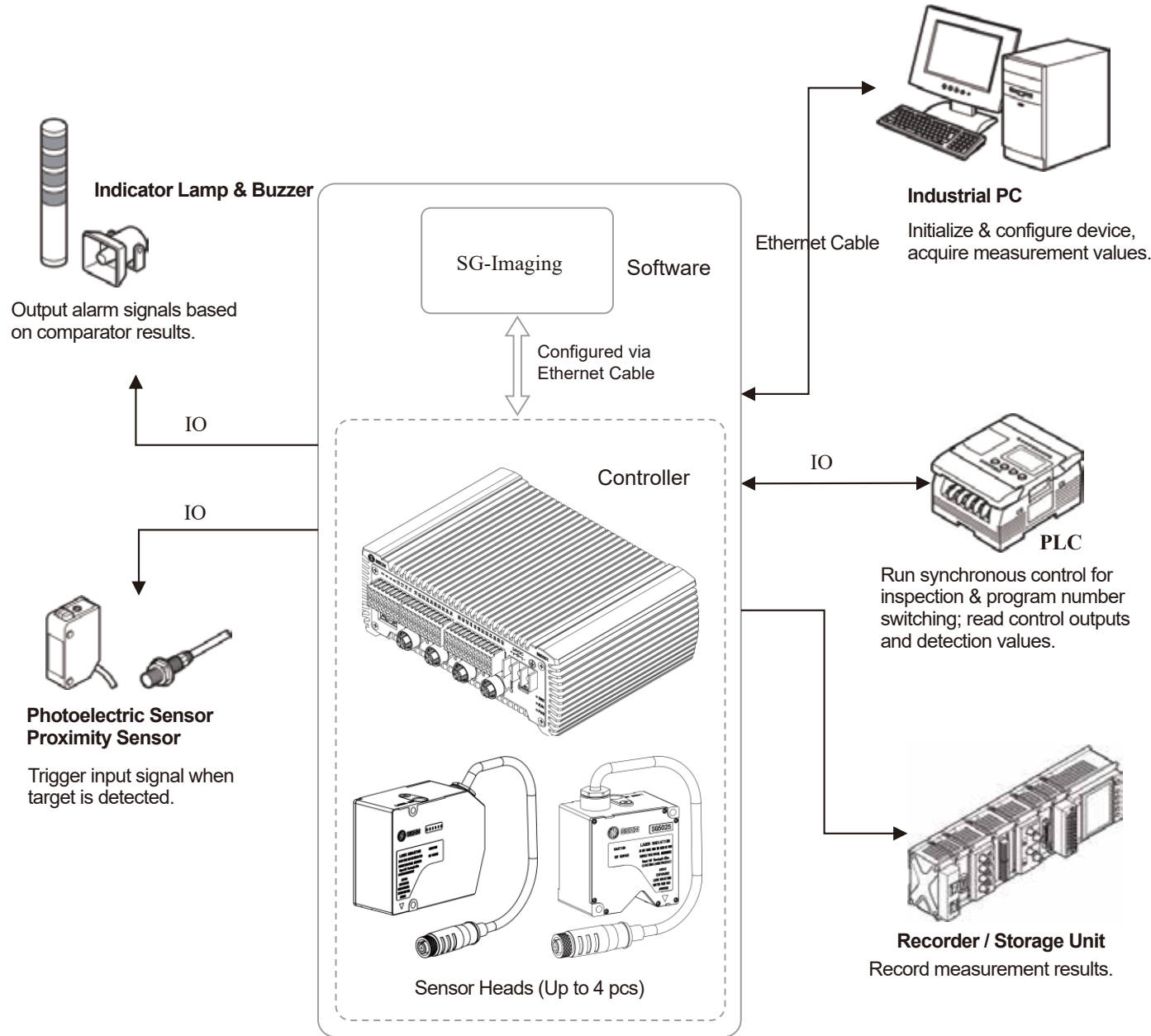
ELS35150



— Specifications

Item		Specifications			
		ELS33030	ELS33080	ELS35050	ELS35150
Reference Distance (CD)		30mm	80mm	50mm	150mm
Measuring Range		-5mm~5mm	-17mm~15mm	-9mm~8mm	-47mm~35mm
Light Source	Light Source Wavelength	655nm			
	Laser Class	Class IIIa (FDA CDRH 21 CFR Part 1040.10)			
	Laser Output Power	5mW			
Spot Size	Small Optoelectronics	Φ60μm	Φ110μm	Φ75μm	Φ190μm
	Width Optoelectronics	60*400μm	110*720μm	75*400μm	190*1300μm
Repeatability		0.05μm	0.2μm	0.025μm	0.25μm
Linearity (F.S.)		±0.5% F.S.		±0.02% F.S.	
Temperature Characteristic		±0.01% F.S./°C			
Sampling Frequency(Hz)		1/2/5/10/20/50/88kHz		1/2/5/10/20/50/88/ 200/400/590kHz	
Input and Output	Communication Port	1×100Base-TX/1000Base-T Ethernet, 1×RS232			
	Analog Output	4CH Analog Output, voltage/current switchable			
	Encoder Input	1 set Differential Encoder			
	Digital Input	14CH: timing, zero-reset, reset, laser control, recipe switch			
	Digital Output	16CH Judgment Status Output			
Operating Temperature		0~50°C			
Storage Temperature		-20~70°C			
Operating Humidity		35-85% RH non-condensing			
ESD Protection		Contact 4kV, Air 8kV (IEC 61000-4-2)			
EFT Protection		Power 2kV, Signal 1kV (IEC 61000-4-4)			
Shock Resistance		50Gs/3ms per axis (IEC 68-2-27 Ea)			
Vibration Resistance		10Gs (10–500Hz) (IEC 68-2-6 Fc)			
IP Rating		IP67 (IEC60529)			
Dimensions (W×H×D)		90x75x38mm	85x77x47mm	69x71x47mm	85x76x47mm
Data Cable (Cabling)		2-3m/5m/10m			
Weight (incl. cable)		324g	376g	323g	370g

— System Wiring Diagram



ELS3 Series

Laser Displacement Sensor



Product Introduction

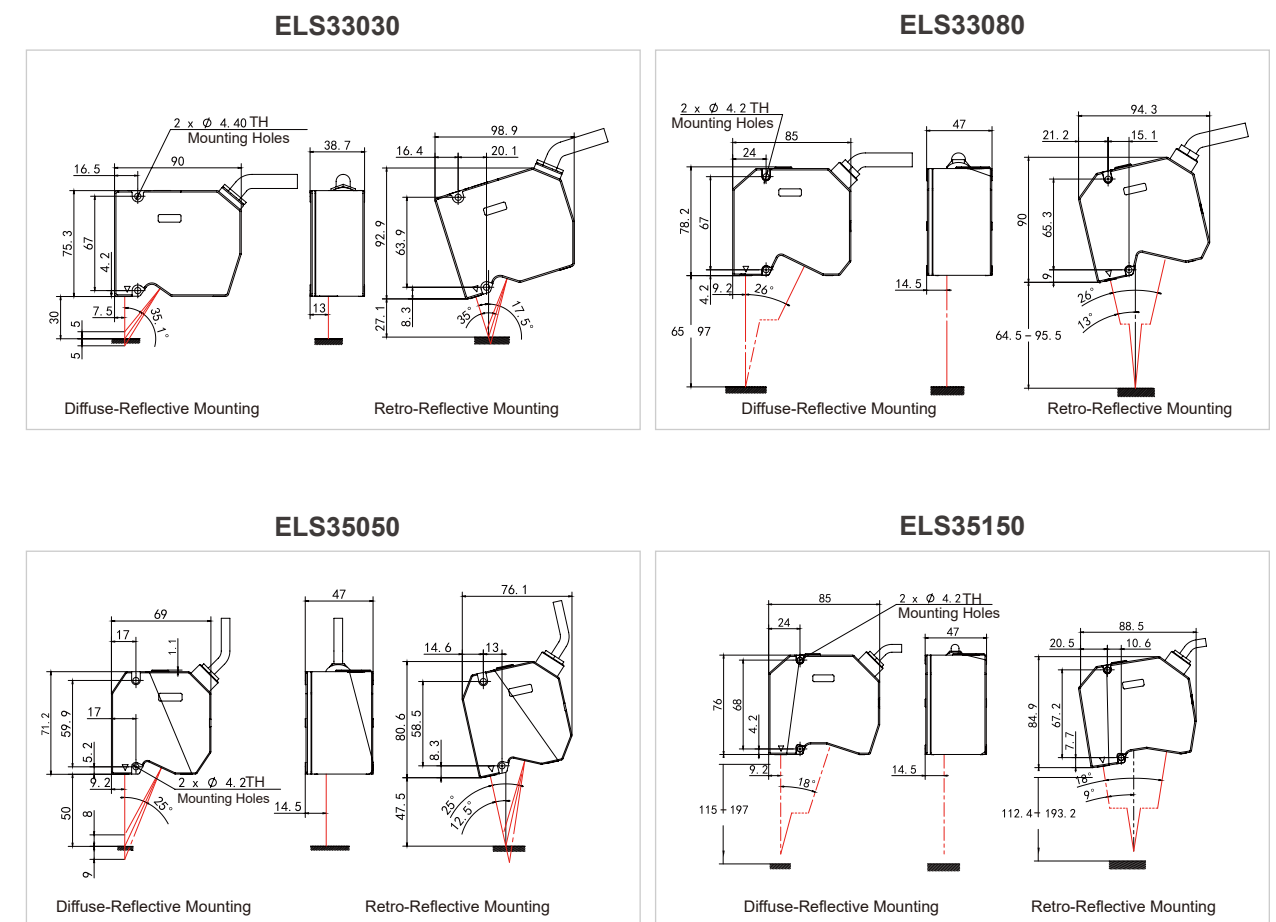
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It supports one-touch easy teach-in. Simple teach-in via panel buttons with multiple teach-in modes to satisfy diverse application requirements. Adopted glass lens features high temperature resistance, corrosion resistance, superior light transmittance and scratch-proof performance. Ultra-compact dimension fits various mounting environments. IP67 protection rating guarantees reliable performance under humid or dusty field conditions.

Features

- **High Sampling Frequency**
Max sampling frequency up to 88 kHz, delivering fast-response measurement capability.
- **Encoder Support**
Supports single-ended encoder and external timing trigger for flexible signal processing options.
- **Ultra-high Integration**
No external controller required. Compact design for easy integration into various systems.
- **Rich Communication Options**
Equipped with TCP/IP Ethernet port (Modbus TCP supported), RS485 communication and EtherCAT module. It also provides analog and digital outputs to meet diverse communication requirements.
- **High Stability**
Effectively suppresses errors caused by thermal drift to guarantee measurement accuracy.

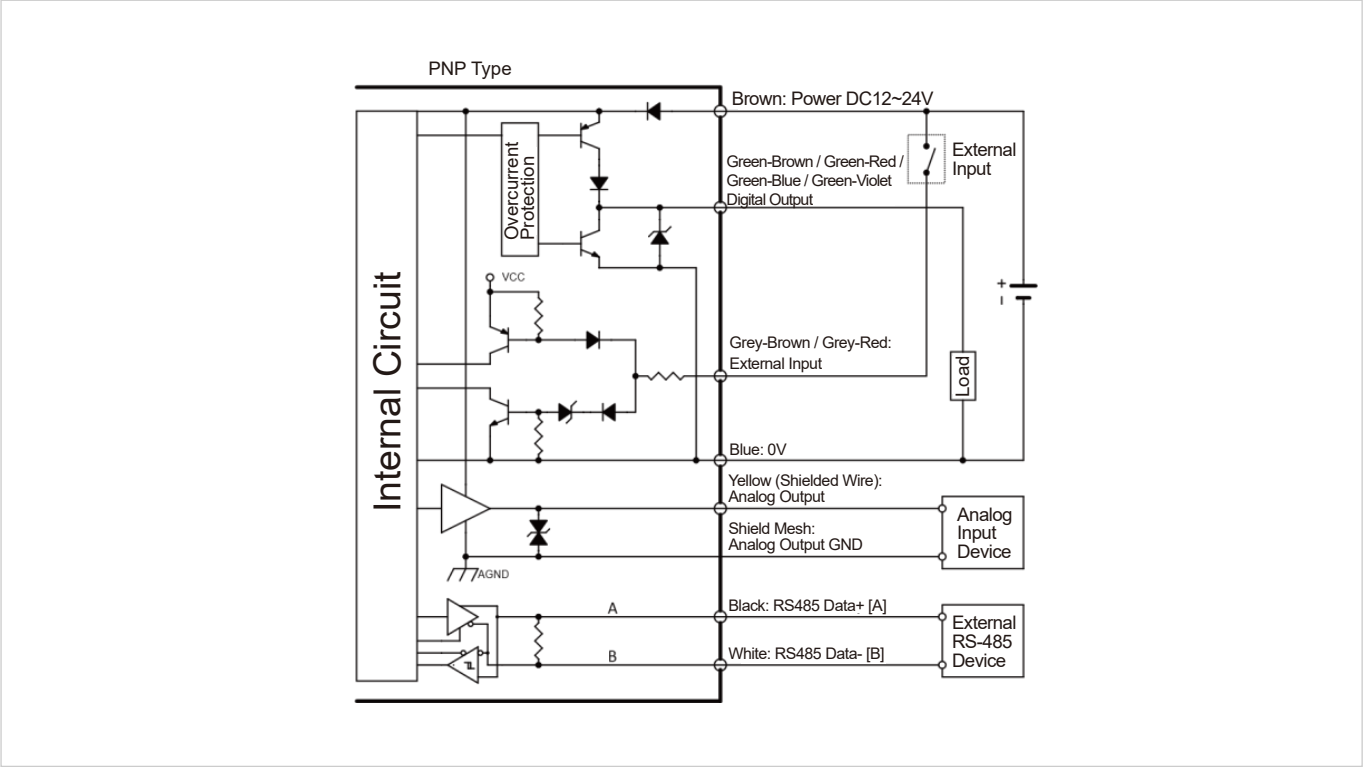
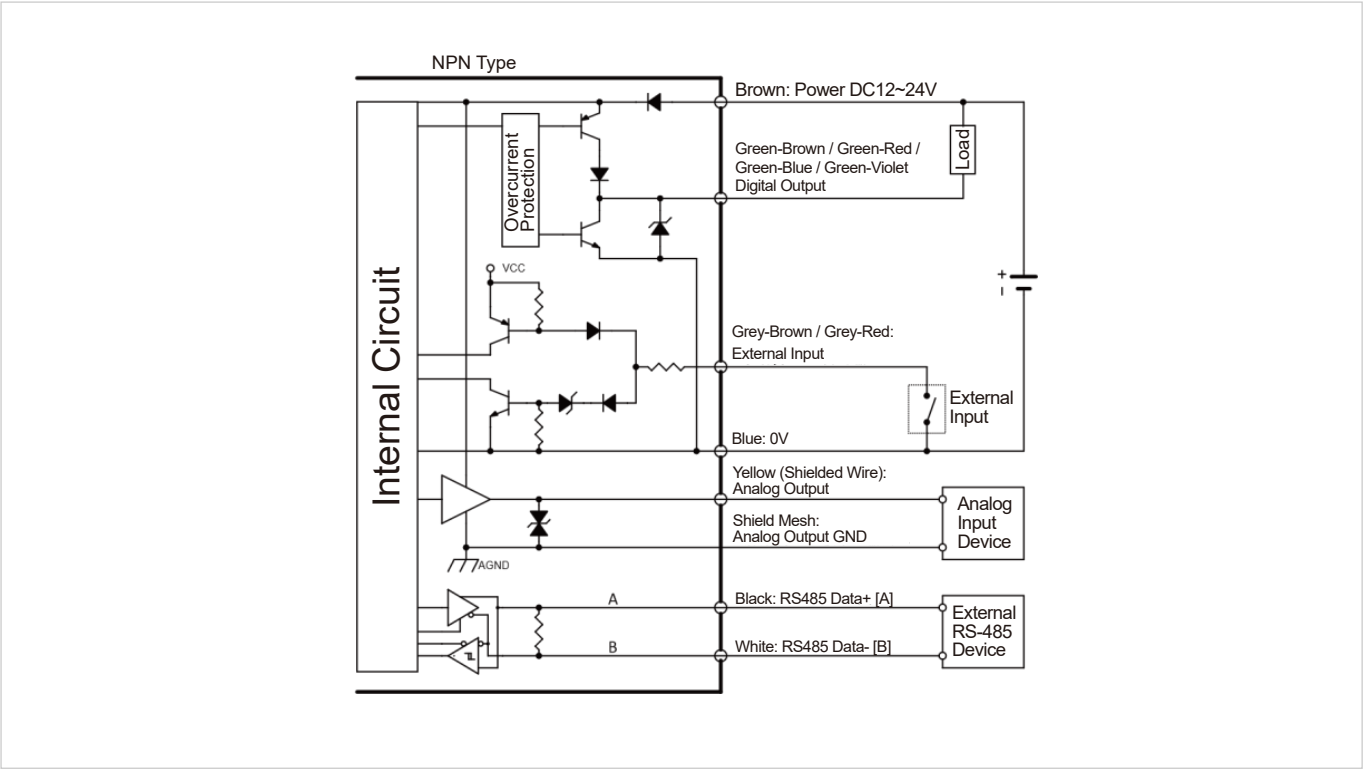
Dimension Drawing Labels



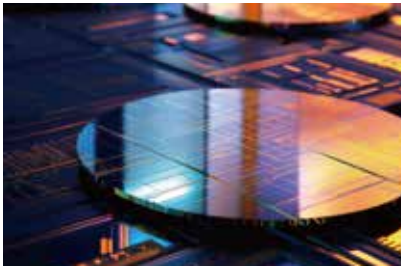
Specifications

Item		Specifications			
		ELS3030	ELS3050	ELS3080	ELS3150
Reference Distance (CD)		30mm	50mm	80mm	150mm
Measuring Range		-5mm~5mm	-9mm~8mm	-17mm~15mm	-47mm~35mm
Light Source	Light Source Wavelength	655nm			
	Laser Class	Class IIIa (FDA CDRH 21 CFR Part 1040.10)			
	Laser Output Power	5mW			
Spot Size	Small Optoelectronics	Φ60μm	Φ75μm	Φ110μm	Φ190μm
	Width Optoelectronics	60*400μm	75*480μm	110*720μm	190*1300μm
Repeatability		0.05μm	0.1μm	0.2μm	0.5μm
Linearity (F.S.)		±0.5% F.S.			
Temperature Characteristic		±0.01% F.S./°C			
Sampling Frequency(Hz)		1/2/5/10/20/50/88kHz (7 options)			
Input and Output	Communication Port	1×100Base-TX, 1×RS485			
	Analog Output	1CH Analog Output, V/I switchable			
	Digital Input	2CH: timing, zero-reset & single-ended encoder (multi-use)			
	Digital Output	4CH Judgment Status Output			
Operating Temperature		0~50°C			
Storage Temperature		-20~70°C			
Operating Humidity		35-85% RH non-condensing			
ESD Protection		Contact 4kV, Air 8kV (IEC 61000-4-2)			
EFT Protection		Power 2kV, Signal 1kV			
		(IEC 61000-4-4)			
Shock Resistance		50Gs/3ms per axis (IEC 68-2-27 Ea)			
Vibration Resistance		10Gs (10–500Hz) (IEC 68-2-6 Fc)			
IP Rating		IP67 (IEC60529)			
Dimensions (W×H×D)		90x75x41	72x71x50	88x77x50	88x79x50
Data Cable (Cabling)		2-3m/5m/10m			
Weight (incl. cable)		324	376	323	370

Wiring Diagram



— Application Fields



Semiconductor



Automotive Industry



Lithium-ion Battery



Photovoltaic

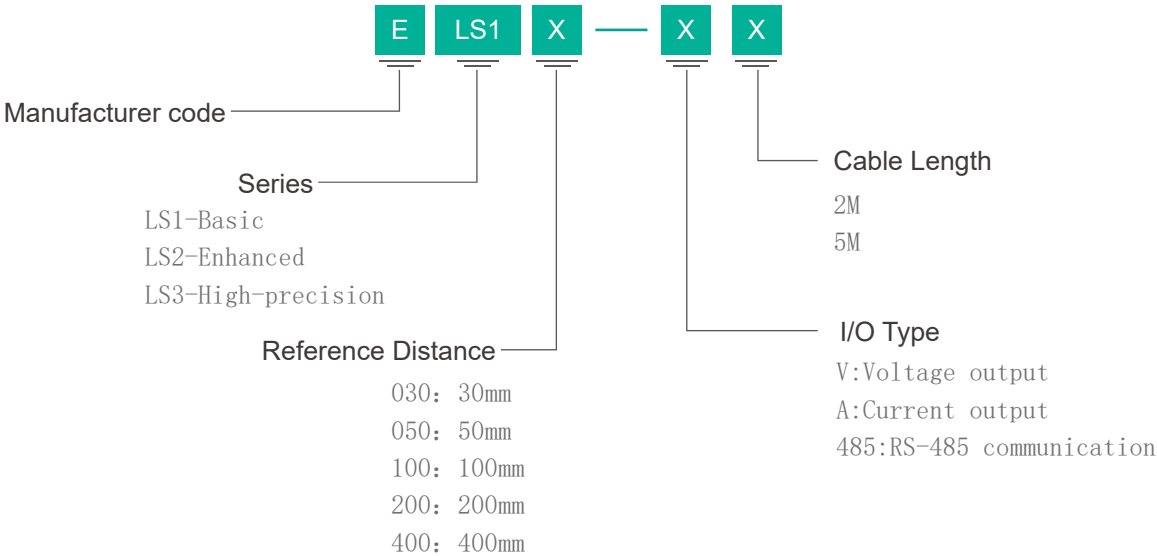


Electronic Components



Thin-film / Resin / Sheet etc.

— Model Coding Rule



APPLICATIONS CASES



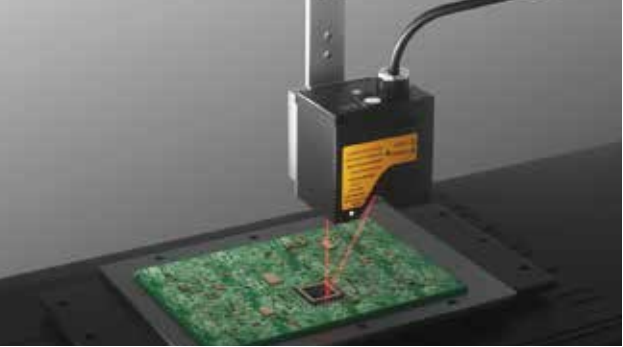
Semiconductor PCB Inspection



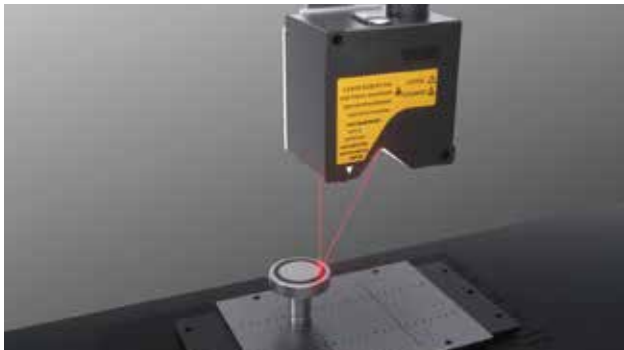
Connector pin alignment verification



Flatness measurement by analog output



PCB height & deformation detection



Seal strip position inspection



Welding distance measurement



Explosion-proof valve polarity detection



Multiple Communication Interfaces



Ultra-high Sampling Frequency



Glass Lens



Seal nail welding guidance



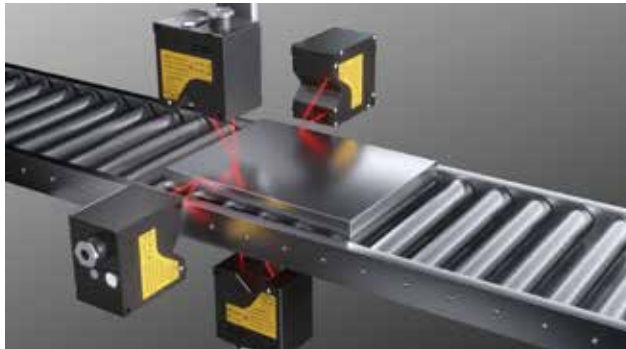
Cover plate warpage measurement



Display Screen



Gluing guidance



Steel plate thickness & width measurement



Shielded High-flex Cable

COMPANY PROFILE

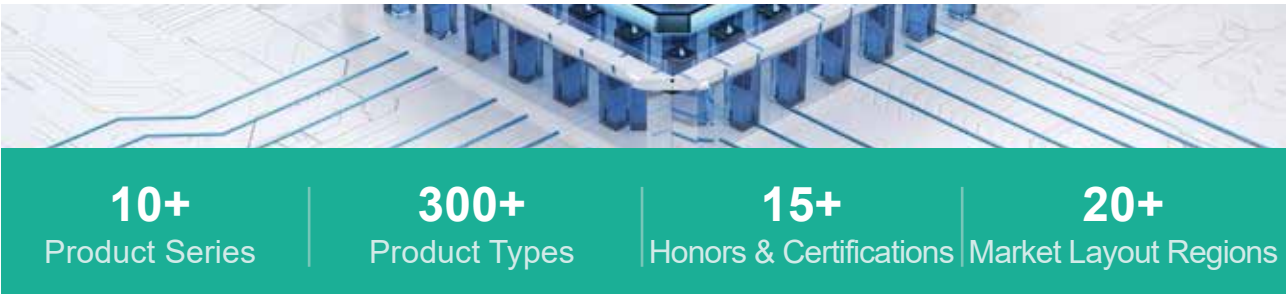


ELEsenson focuses on R&D, manufacturing and sales of sensors. We have a high-caliber, innovative technical team. Pursuing continuous technical improvement, we deliver high-performance, reliable sensor products for customers.

Our broad product portfolio covers multiple industries including industrial automation, smart home and automotive electronics. Our products are well-received for precise measurement, stable performance and outstanding durability.

During production, strict quality-control procedures guarantee premium quality for every unit leaving our factory. We maintain close cooperation with customers, deeply understanding requirements and delivering customized solutions for special-scenario demands.

ELEsenson regards innovation as core driving force. Continuous investment in R&D and product upgrades. With professional teams, premium products and thoughtful service, Zhejiang ELEsenson Sensors has built solid reputation in the industry, contributing technical strength to the advancement of multiple sectors.



■ Corporate Culture

— Vision

Uphold conviction, reach new heights of sensor-technology development.
Build a globally-leading sensor enterprise and lead industry progress through technological innovation.

— Mission

Drive development through innovation, win trust by quality.
Supply precise,stable,durable and reliable sensor products plus customized solutions for industrial automation, rail transit, automotive electronics and other industries.

— Core Values

Customer-Oriented, Integrity-Based, Innovation-Driven, Quality-First.
We are customer-demand oriented, operate with integrity, pursue innovation and strive for superior product & service quality.

CORE ADVANTAGES

- Professional & Efficient Team

Experienced and skilled personnel providing high-quality service & technical support.
- Strong R&D Capability

Advanced R&D equipment & specialist team to develop innovative, competitive products.
- Complete After-Sales Support System

Timely response to customer requests, comprehensive technical support & solutions to maximize customer satisfaction.



HONORS AND QUALIFICATIONS



Brief Product Catalog | English Version | Issue 1, 2025

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