

**Autonics**

ABSOLUTE WIRE LINEAR SCALE

**EWLS50 SERIES**

INSTRUCTION MANUAL



Thank you for choosing our Autonics product.  
Please read the following safety considerations before use.

**■ Safety Considerations**

⚠ Please observe all safety considerations for safe and proper product operation to avoid hazards.

⚠ ⚠ symbol represents caution due to special circumstances in which hazards may occur.

**⚠ Warning** Failure to follow these instructions may result in serious injury or death.  
**⚠ Caution** Failure to follow these instructions may result in personal injury or product damage.

**⚠ Warning**

- Fail-safe device must be installed when using the unit with machinery that may cause serious injury or substantial economic loss.** (e.g. nuclear power control, medical equipment, ships, vehicles, railways, aircraft, combustion apparatus, safety equipment, crime/disaster prevention devices, etc.)  
Failure to follow this instruction may result in fire, personal injury, or economic loss.
- Install on a device panel to use.**  
Failure to follow this instruction may result in fire.
- Do not connect, repair, or inspect the unit while connected to a power source.**  
Failure to follow this instruction may result in fire.
- Check 'Connections' before wiring.**  
Failure to follow this instruction may result in fire.
- Do not disassemble or modify the unit.**  
Failure to follow this instruction may result in fire.

**⚠ Caution**

- Use the unit within the rated specifications.**  
Failure to follow this instruction may result in fire or product damage.
- Do not short the load.**  
Failure to follow this instruction may result in product damage by fire.
- Do not use the unit in the place where flammable/explosive/corrosive gas, humidity, direct sunlight, radiant heat, vibration, impact, or salinity may be present.**  
Failure to follow this instruction may result in fire or explosion.
- Do not use the unit near the place where there is the equipment which generates strong magnetic force or high frequency noise and strong alkaline, strong acidic exists.**  
Failure to follow this instruction may result in product damage.

**■ Ordering Information**

EWLS	50	512	B	PN	24	
Item	Power supply	Control output	Output code	Measuring range	Body size	
	24	PN	B	512	50	
	12-24VDC ±5%	Parallel NPN open collector output	Binary Code	512mm	50mm×50mm	
			Gray Code			
						EWLS Series

⚠ The above specifications are subject to change and some models may be discontinued without notice.  
⚠ Be sure to follow cautions written in the instruction manual, and the technical descriptions (catalog, homepage).

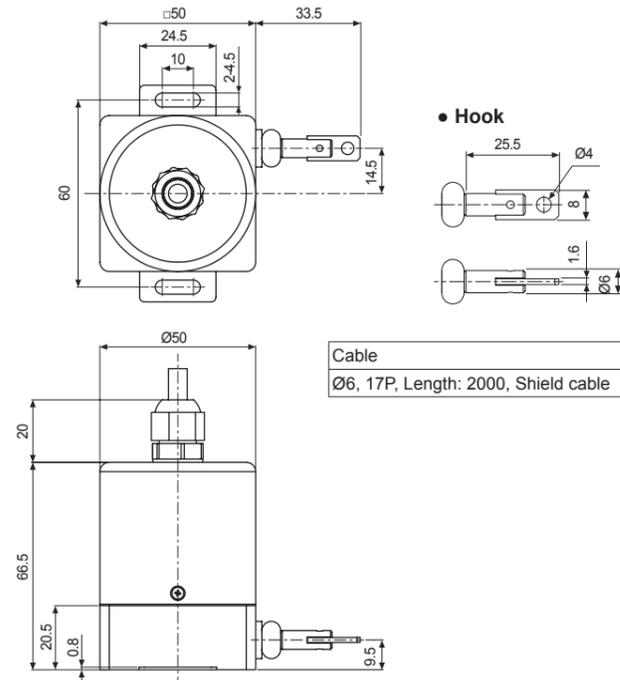
**■ Specifications**

Item	ABSOLUTE WIRE LINEAR SCALE			
Model	EWLS50-512-B-PN-24	EWLS50-512-G-PN-24		
Measuring range	512mm			
Max. output pulse/mm	5,120 division/512mm			
Min. resolution	0.1mm			
Accuracy	±0.1/100mm			
Response speed	Max. 500mm/sec.			
Wire movement limit when power is off	Max. ±20mm*1			
Electrical specification	Output	Output code	Binary	Gray
		Output signal	Data, Overflow alarm	
		Output type	NPN open collector output	
		Output capacity	Load current: Max. 32mA, Residual voltage: Max. 1VDC≡	
		Logic	Negative logic output	
	Input	Response time (Up/Down)	Max. 1μs(Cable length: 2m, I sink=32mA)	
		Input signal	Reset	
		Input level	High: 5-24VDC≡, Low: 0-1.2VDC≡	
		Input logic	Low Active, OPEN or HIGH for common use	
		Input time	Min. 100ms	
Max. Response frequency	50kHz			
Power supply	12-24VDC≡ ±5%(Ripple P-P: Max. 5%)			
Current consumption	Max. 150mA(disconnection of the load)			
Insulation resistance	Min. 100MΩ (at 500VDC megger)			
Dielectric strength	750VAC 50/60Hz for 1minute			
Connection	Axial cable type (cable gland)			
Wire tensile force	0.5N to 4N(50g-f to 400g-f)			
Vibration	1.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each X, Y, Z direction for 2 hours			
Shock	Max. 50G			
Environment	Ambient temp.	-10 to 70°C, storage: -25 to 85°C		
	Ambient humi.	35 to 85%RH, storage: 35 to 90%RH		
Cable	Ø6mm, 17P, Length: 2m, Shield cable (AWG 28, Core wire diameter: 0.08mm, No. of core wire: 19, Insulator out diameter: Ø0.8mm)			
Material	Cap: SPCD, Body: A2024, Wire: SUS303			
Accessories	Hexagon wrench screw(M4×8)			
Approval	CE			
Unit weight	Approx. 450g			

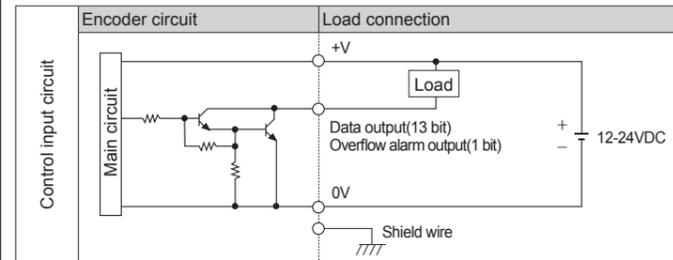
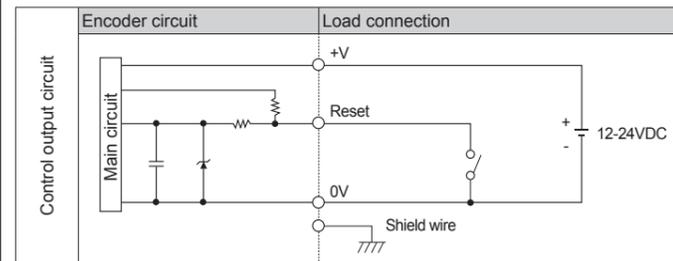
\*1: The product cannot process data when the power is OFF. It calibrates the data comparing values of before and after power ON status. It shall be used on the condition that wire movement limit because proper data may not be available if any wire movement occurred over ±20mm from the position when power is off.  
\*Environment resistance is rated at no freezing or condensation.

**■ Dimension**

(unit: mm)



**■ Control I/O Circuit**



⚠ Output of each bit is the same circuit.  
⚠ Overload or short may cause circuit break.

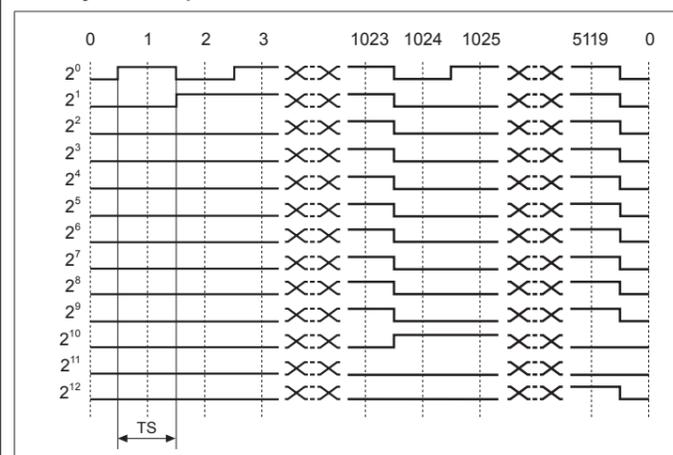
**■ Connections**

Cable color	Description
Brown	2 <sup>0</sup>
Red	2 <sup>1</sup>
Orange	2 <sup>2</sup>
Yellow	2 <sup>3</sup>
Green	2 <sup>4</sup>
Blue	2 <sup>5</sup>
Purple	2 <sup>6</sup>
Gray	2 <sup>7</sup>
Pink	2 <sup>8</sup>
Clear	2 <sup>9</sup>
Light brown	2 <sup>10</sup>
Light yellow	2 <sup>11</sup>
Light green	2 <sup>12</sup>
Light blue	Overflow alarm signal output
Light Purple	Reset signal input
White	+V(12-24VDC)
Black	GND(0V)
Shield wire	Signal shield cable(F.G.)

⚠ Do not apply tensile strength over 10N to the cable.

**■ Output Waveform**

• Binary Code output



⚠ TS=0.3515±15'  
⚠ Above waveform is based on the positive logic.  
(The output waveform of negative logic is opposed to above waveform.)

**■ Function**

- Reset function**  
Data will be initialized as 0 when reset signal is inputted over 100ms. For initialization, short reset signal line (light violet) and GND line (black). If this function will not be used then connect the reset signal line to +V line or leave it OPEN.
- Overflow alarm function**  
It is an alarm function providing output when counting data is out of range (0 to 5,119 revolutions). Overflow alarm (OVF) will be initialized when a reset signal applied while OVF output is ON.

**■ Installation**

- Install the body and pull-out wire direction in a straight line of measuring direction.
- Be sure that measuring range is within pull-out wire range.
- Measuring range setting should not be over max. measuring range of this product.
- It may cause wire break or bad accuracy due to over max. measuring range.
- Do not wound the wire or pull-out max. wire length. It may cause bad accuracy because wire consists of nylon coated stainless steel wire.
- Be careful not to enter water, oil, or dust caused bad accuracy of the body and wire.
- Fix the wire hook to opposite side.  
For changing pull-out direction, a pully shall be used at the inflection point.
- Please designate either the product or the wire hook as fixed side, the other as moving side.
- Spring tension around 50g-f to 400g-f is good for improving measuring repeat accuracy. Do not pull out the wire before installing the body.

**■ Cautions during Use**

- Follow instructions in 'Cautions during Use'. Otherwise, It may cause unexpected accidents.
- 12-24VDC power supply should be insulated and limited voltage/current or Class 2, SELV power supply device.
- Wire linear scale consists of encoder, spring, and wire.  
Be sure to install with care to prevent bad accuracy or breakdown due to taking down after drawing out, wounding, bending, or big impact to wire.  
Failure to follow this instruction may result in product damage or degradation of accuracy.
- While rewinding wire, it is possible to stop in the middle. Pull the wire out wire slowly and try to rewind again.
- For using the unit with the equipment which generates noise (switching regulator, inverter, servo motor, etc.), ground the shield wire to the F.G. terminal.
- Ground the shield wire to the F.G. terminal.
- When using switching mode power supply, frame ground (F.G.) terminal of power supply should be grounded.
- Wire as short as possible and keep away from high voltage lines or power lines, to prevent inductive noise.
- Check the wire type and response frequency when extending wire because of distortion of waveform or residual voltage increment etc by line resistance or capacity between lines.
- This unit may be used in the following environments.
  - ① Indoors (in the environment condition rated in 'Specifications')
  - ② Altitude max. 2,000m
  - ③ Pollution degree 2
  - ④ Installation category II

**■ Major Products**

- Photoelectric Sensors
- Fiber Optic Sensors
- Door Sensors
- Door Side Sensors
- Area Sensors
- Proximity Sensors
- Pressure Sensors
- Rotary Encoders
- Connector/Sockets
- Switching Mode Power Supplies
- Control Switches/Lamps/Buzzers
- I/O Terminal Blocks & Cables
- Stepper Motors/Drivers/Motion Controllers
- Graphic/Logic Panels
- Field Network Devices
- Laser Marking System (Fiber, CO<sub>2</sub>, Nd: YAG)
- Laser Welding/Cutting System
- Temperature Controllers
- Temperature/Humidity Transducers
- SSRs/Power Controllers
- Counters
- Timers
- Panel Meters
- Tachometer/Pulse (Rate) Meters
- Display Units
- Sensor Controllers

**Autonics Corporation**  
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