

SA1D: Analog Distance Detection Sensors

Key features of the SA1D include:

- Triangulation ensures high-precision when sensing the presence or position of objects
- Wide sensing range: 7.87" to 19.69" (200 to 500mm)
- Select analog output (20 to 4mA) for continuous values; use digital output (on/off); or use both together
- Far and near limits can be dened for detecting objects within a specied zone
- A ten-dot LED level meter provides a dynamic display of detected positions and also shows near and far settings
- Alarm output indicates when sensing conditions may result in inaccurate results



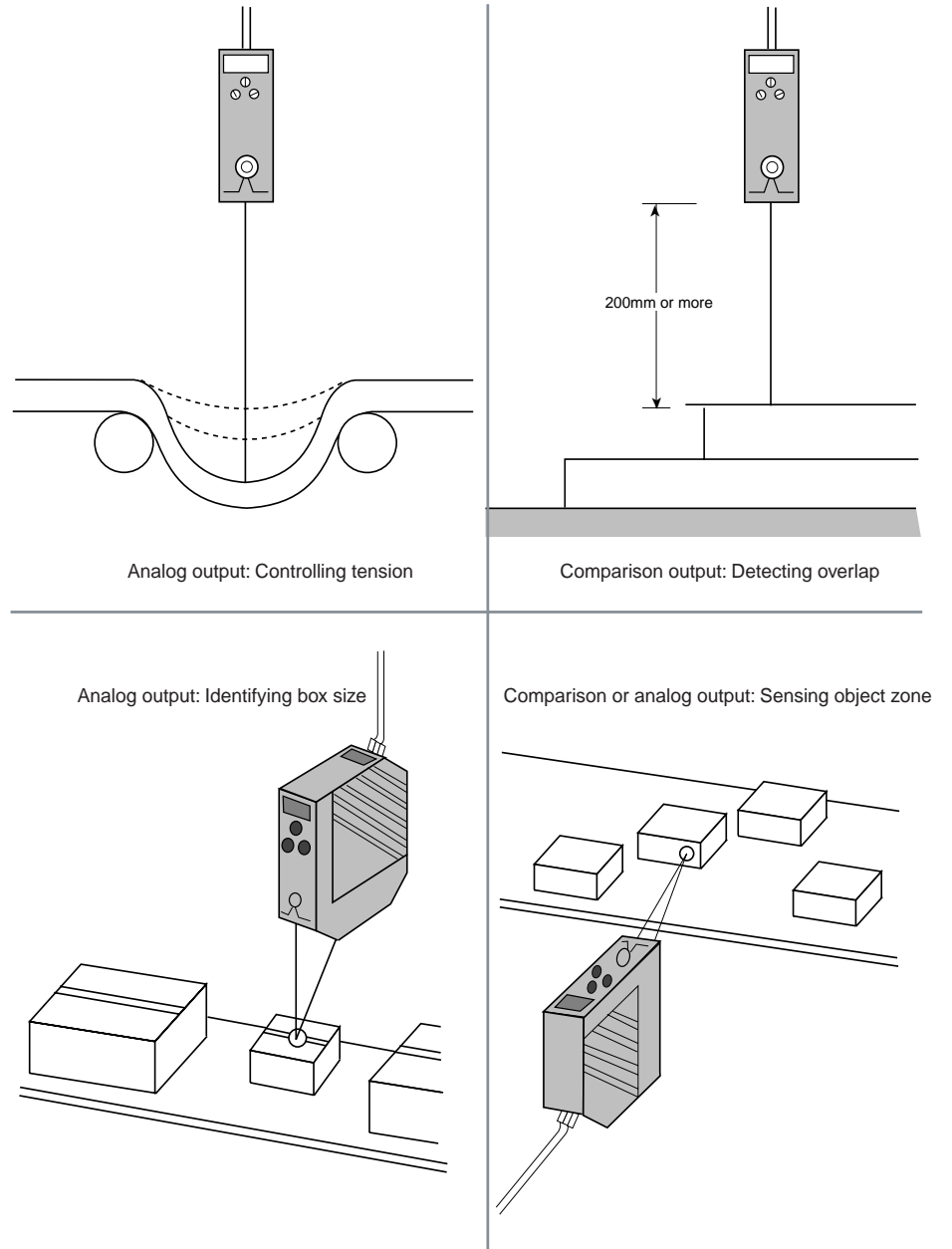
General Specifications	Power Voltage	12 to 24V DC \pm 10% (ripple 10% maximum)
	Current Draw	100mA (maximum)
	Dielectric Strength	Not specied due to capacitor grounding
	Insulation Resistance	Not specied due to capacitor grounding
	Operating Temperature	0 to +55C (performance will be adversely affected if the sensor becomes coated with ice)
	Operating Humidity	35 to 85% RH (avoid condensation)
	Storage Temperature	-20 to +70C
	Vibration Resistance	Damage limits: 10 to 55Hz, amplitude 1.5mm p-p, 2 hours in each of 3 axes (power off)
	Shock Resistance	Damage limits: 500m/sec ² (approximately 50G), 5 shocks in each of 3 axes
	Extraneous Light Immunity	Sunlight: 10,000 lux; Incandescent light: 3,000 lux (maximum) — dened as the incident or unwanted light received by a sensor , unrelated to the presence or absence of the intended object
	Material	Housing: Diecast zinc; Filter and lens: Acrylic
	Degree of Protection	IP65 — IEC Pub 529; sensors rated IP65 are dust-tight, water-resistant, and perform best when not subjected to heavy particle or water blasts
	Cable	Cable type: 5-core cabtyre cable 0.2mm ² , 6'-6-3/4" (2m) long
	Weight	Approximately 350g
Dimensions	2.68"H x 0.83"W x 1.97"D (68mm H x 21mm W x 50mm D)	

Function Specifications	Analog Output	20 to 4mA, 5V (maximum), xed range
	Digital Output	NPN or PNP transistor open collector, 30V DC, 100mA (maximum), Residual: 1V (NPN), 2V (PNP)
	Alarm Output	NPN or PNP transistor open collector, 30V DC, 100mA (maximum), Residual: 1V (NPN), 2V (PNP)
	Level Meter (10-dot LED display)	Analog: Represents object distance corresponding to analog output on a 10-dot LED display Digital: Indicates near or far limit settings
	Out LED	On: When digital output is on
	Power LED	On: When power is on
	Alarm LED	On: When reected light is excessive or insufcient
	Digital Output	Digital output and OUT LED turns on when object is within near and far limits
	Digital Output Setting	14-turn control for far/near setting (far and near limits can be set separately)
	Response Time	High-speed (F): 5ms (maximum) Normal speed (S): 50ms (maximum)
	Repeat Error	High-speed: 4% (maximum) Normal speed: 2% (maximum)
	Hysteresis	10% (maximum), dened as the difference between the operating point and the release point
	Light Source Element	Infrared LED (modulation mode)
	Wavelength	880 nm (infrared LED)
	Receiver Element	Position sensitive device (PSD)
	Detectable Object	Opaque

Part Numbers: SA1D Sensors

Part Number	Output	Sensing Range	Reference Object
SA1D-LK4	NPN	7.87" to 19.69" (200mm to 500mm)	White: 2.95" x 2.95" (75mm x 75mm)
SA1D-LL4	PNP	7.87" to 19.69" (200mm to 500mm)	

Applications



Operation Principle

The analog distance sensor projects a beam from the infrared LED, through the projection lens, to the object. The diffuse-reflect light from the object surface is received as a spot image. This spot image moves from position A to B on the position sensitive device (PSD). The optical triangle is used to determine the distance between the sensor and the object, depending on the displacement.

