OPTIONS

Introduction to SUNX sensors that can be used as muting sensors

Compact Photoelectric Sensor
CX-400 SERIES

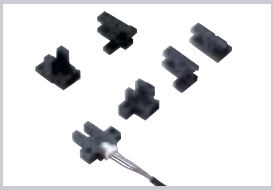
- World standard size
- 116 types for a wide variation

Ultra-slim Photoelectric Sensor
EX-10 SERIES

- 3.5 mm 0.138 in thickness
- Long sensing range: 1 m 3.281 ft (thru-beam type: **EX-19**)

* The **EX-20** series that is compatible with M3 mounting screws is also available.

U-shaped Micro Photoelectric Sensor
PM-64 SERIES



- Extremely compact and space saving
- A lineup of quick fitting-up connector type

Rectangular-shaped Inductive Proximity Sensor
GX-F/H SERIES

- Industry longest in stable sensing range
- 10 times the durability (Compared to previous models)
- IP68g protective construction

* Check the specifications for the muting sensors before making a selection.

SPECIFICATIONS

Sensor heads

Item \ Type		Cable length 0.2 m 0.656 ft		Cable length 1 m 3.281 ft	
			With emission amount adjuster		With emission amount adjuster
Model No.		**ST4-A1-J02**	**ST4-A1-J02V**	**ST4-A1-J1**	**ST4-A1-J1V**
Applicable standard (Note 2)		IEC 61496-1/2 (JIS B 9704-1/2 / UL 61496-1/2) (Type 4), ISO 13849-1 (Category 4, PLe), JIS B 9705-1 (Category 4), IEC 61508-1~7 (SIL3), IEC 62061 (SIL3), JIS C 0508-1~7 (SIL3), UL 1998, OSHA 1910.212, OSHA 1910.217 (C), ANSI B11.1~B11.19, ANSI/RIA R15.06, ANSI/ISA S84.01 (SIL3)			
Operating range		0.1 to 15 m 0.328 to 49.213 ft (Note 3)			
Sensing object		ø9 mm ø0.354 in or more opaque object			
Effective aperture angle (EAA)		±2.5° or less for operating range exceeding 3 m 9.843 ft			
Supply voltage		Supplied from controller			
Current consumption		Emitter: 11 mA or less, Receiver: 9 mA or less			
Beam interruption indicator (Note 4)		Red LED (lights up when the beam is interrupted or lock out, lights off during reception)			
Beam emission indicator		Green LED (lights up during beam emission, lights off during emission halt)			
Stable incident beam indicator		Green LED (lights up under stable light received condition, lights off under unstable light received condition)			
Environmental resistance	Degree of protection	IP67 (IEC)			
	Ambient temperature	−10 to +55 °C +14 to +131 °F (No dew condensation or icing allowed), Storage: −25 to +70°C −13 to +158 °F			
	Ambient humidity	30 to 85 % RH, Storage: 30 to 95 % RH			
	Ambient illuminance	Incandescent lamp: 3,500 ℓx at the light-receiving face			
	Voltage withstandability	1,000 V AC for one min. between all supply terminals connected together and enclosure			
	Insulation resistance	20 MΩ or more with 500V DC megger between all supply terminals connected together and enclosure			
	Vibration resistance	10 to 55 Hz frequency, 0.75 mm 0.030 in amplitude in X, Y and Z directions for two hours each			
	Shock resistance	300 m/s^2 acceleration in X, Y and Z directions for three times each			
Emitting element		Infrared LED (Peak emission wavelength: 870 nm 0.034 mil)			
Material		Enclosure: PBT (Polybutylene terephthalate), Lens: Acrylic, Indicator cover: Acrylic			
Cable		Shielded cable with connector, 0.2 m 0.656 ft long		Shielded cable with connector, 1 m 3.281 ft long	
Cable extension		Extention up to total 50 m 164.042 ft is possible for both emitter and receiver with exclusive cable.			
Weight		Net weight: 45 g approx., Gross weight: 60 g approx.		Net weight: 100 g approx., Gross weight: 140 g approx.	

Notes: 1) Where measurement conditions have not been specified precisely, the conditions used were an ambient temperature of +20 °C +68 °F.
2) Complies with those standards only when the sensor head is used in combination with the controller **ST4-C11 / ST4-C12EX**.
3) The operating range is the possible setting distance between the emitter and the receiver. It can detect sensing object of less than 0.1 m 0.328 ft away.
4) Shows light interruption information between the emitter and the receiver with the same address. It does not show OSSD output. For details on addresses, refer to "**Address allocations of sensor head ST4-A□**" (p.11).

SPECIFICATIONS

Controllers

Item \ Type		Controller	High-functional controller
Model No.		**ST4-C11**	**ST4-C12EX**
Applicable sensor head		**ST4-A□**	
	No. of series connections	Interference prevention possible when up to a maximum of 6 sets are connected (When the maximum of 3 controllers are connected together, interference prevention is possible for up to 18 sets)	
Applicable standards (Note 2)		IEC 61496-1/2 (JIS B 9704-1/2 / UL 61496-1/2) (Type 4), ISO 13849-1 (Category 4, PLe), JIS B 9705-1 (Category 4), IEC 61508-1~7 (SIL3), IEC 62061 (SIL3), JIS C 0508-1~7 (SIL3), UL 1998, OSHA 1910.212, OSHA 1910.217 (C), ANSI B11.1~B11.19, ANSI/RIA R15.06, ANSI/ISA S84.01 (SIL3)	
Supply voltage		24 V DC $^{+10}_{-15}$ % Ripple P-P 10 % or less	
Current consumption		100 mA or less (excluding sensor head **ST4-A□**)	120 mA or less (excluding sensor head **ST4-A□**)
Control outputs (OSSD1, OSSD2) (Note 3)		PNP open-collector transistor / NPN open-collector transistor Dual output × 1 system (Set using output polarity selection switch) <PNP output> • Maximum source current: 200 mA • Applied voltage: same as the supply voltage (between control output and +V) • Residual voltage: 2.5 V or less (at 200 mA source current) • Leakage current: 200 μA or less (including power OFF condition) • Maximum load capacity: 1 μF (from no-load to max. output current) • Load wiring resistance: 3 Ω or less (between control output and load)	<NPN output> • Maximum sink current: 200 mA • Applied voltage: same as the supply voltage (between control output and 0 V) • Residual voltage: 2.0 V or less (at 200 mA sink current) • Leakage current: 200 μA or less (including power OFF condition) • Maximum load capacity: 1 μF (from no-load to max. output current) • Load wiring resistance: 3 Ω or less (between control output and load)
	Operation mode	ON when all beams of the connected **ST4-A□**s are received OFF when one or more beams of the connected **ST4-A□**s are interrupted (except during muting / override when **ST4-C12EX** is used) OFF during lockout	
	Protection circuit	Incorporated	
Response time		OFF response: 25 ms or less, ON response: 90 ms or less (auto reset) / 140 ms or less (manual reset)	
Auxiliary outputs (Note 3)		PNP open-collector transistor / NPN open-collector transistor (Set using output polarity selection switch) **ST4-C11**: one output **ST4-C12EX**: four outputs <PNP output> • Maximum source current: 100 mA • Applied voltage: same as the supply voltage (between auxiliary output and +V) • Residual voltage: 2.5 V or less (at 100 mA source current)	<NPN output> • Maximum sink current: 100 mA • Applied voltage: same as the supply voltage (between auxiliary output and 0 V) • Residual voltage: 2.0 V or less (at 100 mA sink current)
	Operation mode	OFF when all beams of the connected **ST4-A□**s are received ON when one or more beams of the connected **ST4-A□**s are interrupted	<Auxiliary output 1> ON when muting function is invalid OFF when muting function is valid <Auxiliary output 2> ON when override function is invalid OFF when override function is valid <Auxiliary output 3> ON when muting lamp is in normal condition OFF when muting lamp is in abnormal condition <Auxiliary output 4> Negative logic of the control outputs (OSSD1, OSSD2)
	Protection circuit	Incorporated	
Muting lamp output (Note 3)		———	Available muting lamp: 24 V DC, 1 to 10 W
	Protection circuit	Incorporated	
Environmental resistance	Degree of protection	Enclosure: IP40 (IEC), Terminal: IP20 (IEC)	
	Ambient temperature	−10 to +55 °C +14 to +131 °F (No dew condensation or icing allowed), Storage: −25 to +70°C −13 to +158 °F	
	Ambient humidity	30 to 85 % RH, Storage: 30 to 95 % RH	
	Voltage withstandability	1,000 V AC for one min. between all supply terminals connected together and enclosure	
	Insulation resistance	20 MΩ or more with 500 V DC mega between all supply terminals connected together and enclosure	
	Vibration resistance	10 to 55 Hz frequency, 0.75 mm 0.030 in amplitude in X, Y and Z directions for two hours each	
	Shock resistance	300 m/s^2 acceleration in X, Y and Z directions for three times each	
Connection terminal		Detachable spring gage terminal	
Wiring cable		Terminal block connector: 0.2 to 1.5 mm^2 Power supply connector (A1, A2): 0.2 to 2.5 mm^2 (only for **ST4-C12EX**)	
Material		Enclosure: ABS	
Weight		Net weight: 180 g approx., Gross weight: 390 g approx.	Net weight: 240 g approx., Gross weight: 450 g approx.

Notes: 1) Where measurement conditions have not been specified precisely, the conditions used were an ambient temperature of +20 °C +68 °F.
2) Complies with those standards only when the controller is used in combination with the sensor head **ST4-□**.
3) If the total current of the control outputs (OSSD1, OSSD2), auxiliary outputs, and muting lamp output exceeds 400 mA, the wiring resistance between the controller and the power supply should be 1 Ω or less. In addition, if the total current is 400 mA or less, the wiring resistance between the controller and the power supply should be 2 Ω or less.