

## INSTRUCTION MANUAL

LED Type Wafer Alignment Sensor

Sensor head

Controller

HD-T1030

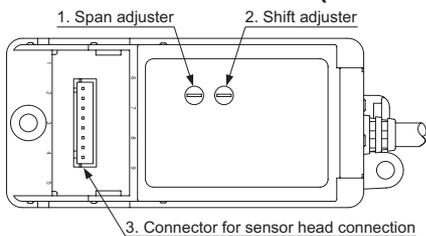
HD-T1C

Thank you very much for using SUNX products. Please read this Instruction Manual carefully and thoroughly for the correct and optimum use of this product. Kindly keep this manual in a convenient place for quick reference.

### WARNING

- Never use this product as a sensing device for personnel protection.
- In case of using sensing devices for personnel protection, use products which meet laws and standards, such as OSHA, ANSI or IEC etc., for personnel protection applicable in each region or country.

## 1 FUNCTIONAL DESCRIPTION (CONTROLLER)

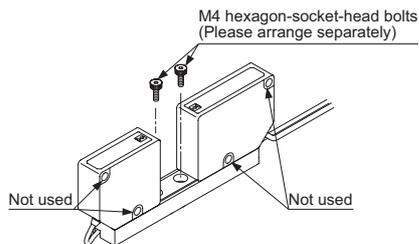


Description	Function
1 Span adjuster	This is used for adjusting the output voltage range of the analog output.
2 Shift adjuster	This is used for adjusting the offset voltage (the analog output voltage value in all light interrupted state) of the analog output.
3 Connector for sensor head connection	Connector for sensor head connection

## 2 MOUNTING

### Sensor head

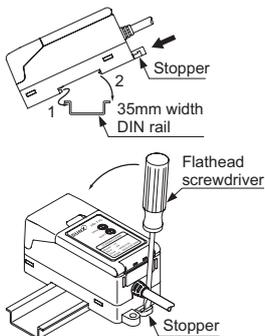
- Mount the sensor head using 2 pcs. M4 hexagon-socket-head bolts (please arrange separately) with a tightening torque of 0.5N·m or less.
- Do not remove the screws fixing the emitter / receiver and the mounting base. If removed, the output value will change.
- Do not fix with the screws, using the mounting hole on the side of emitter / receiver.



### Controller

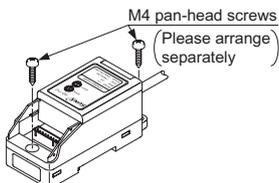
#### <In case of using DIN rail>

1. Fit the front part of the mounting section of the unit on the 35mm width DIN rail, pressing the stopper towards the arrow (the stopper is locked) shown in the right figure.
2. Press down the rear part of the mounting section of the unit on the 35mm width DIN rail to fit it.

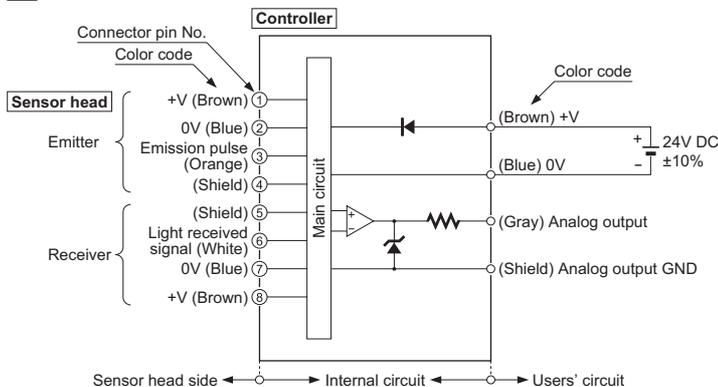


#### <In case of using screws>

1. Mount using M4 pan head screws with a tightening torque of 1.2N·m or less.



## 3 I/O CIRCUIT DIAGRAM



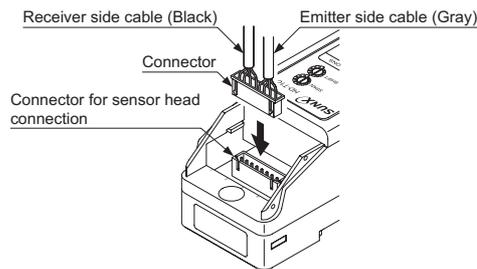
### Terminal arrangement

Terminal No.	Contents	
1	+V	Emitter side
2	0V	
3	Emission pulse	
4	Shield	Receiver side
5	Shield	
6	Light received signal	
7	0V	
8	+V	

## 4 CONNECTION BETWEEN THE SENSOR HEAD AND THE CONTROLLER

Make sure that the power supply is off when connecting the sensor head to the controller.

- When the sensor head is connected to the controller, hold the connector of sensor head, inserting it to the end of the connector for sensor head connection of the controller.



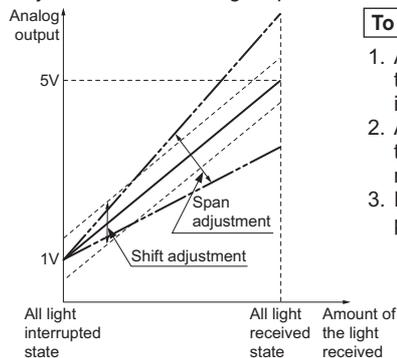
- \* For removal, hold the connector of sensor head and pull it straight.

Note: Do not pull by holding the cable, as this can cause a cable-break.

## 5 ADJUSTMENT

### Adjustment of analog output

- The following figure shows the relationship between span and shift adjustments and analog output.



### To adjust within the range of 1 to 5 V

1. Adjust the shift adjuster such that the analog output is 1V in all light interrupted state.
2. Adjust the shift adjuster such that the analog output is 5V in all light received state.
3. For more accurate adjustment, perform steps 1 and 2 again.

### Application of shift adjuster

- To set a certain analog output voltage for a light interrupted width, use the shift adjuster to adjust the analog output voltage within approx.  $\pm 0.5V$ .
- (Example) When the analog output voltage, 2.51V for a light interrupted width, is set to 3V.

	Before adjustment	After adjustment
Emitted light		
Sensing object		
Receiver		
All light interrupted state	1V	1.49V
to		to
Sensing state	2.51V	3V
to		to
All light received state	5V	5.49V

## 6 SPECIFICATIONS

### • Sensor head

Item	Model No.	HD-T1030
Applicable controller		HD-T1C
Sensing width		30mm (Linearity is specified at 28mm width.)
Sensing range		30mm (fixed) (Note)
Ambient temperature		0 to +40°C (No dew condensation), Storage: -20 to +55°C
Ambient humidity		35 to 85% RH, Storage: 35 to 85% RH
Emitting element		Red LED (Peak wavelength: 650nm)
Material		Enclosure: PEI, Front cover part: Glass, Mounting base: Aluminum
Cable		Heat resistant PVC cable, 0.5m long, with a connector at the end
Weight		Approx. 150g

Note: The value is in a state that the sensor is mounted on the mounting base at the time of factory shipment.

### • Controller

Item	Model No.	HD-T1C
Applicable sensor head		HD-T1030
Supply voltage		24V DC $\pm 10\%$ Ripple P-P 10% or less
Current consumption		70mA or less (Including sensor head)
Analog output		Analog voltage • Output voltage: 1 $\pm 0.5$ V (all light interrupted) to 5 $\pm 0.5$ V (all light received) • Output impedance: 75 $\Omega$
Response time		0.5ms (8V/ms)
Resolution		30 $\mu$ m (Note 1)
Linearity		$\pm 1.0\%$ F.S. (at 28mm sensing width of the sensing center) (Note 2)
Temperature characteristics		$\pm 0.1\%$ F.S./°C (at 24 $\pm 2$ °C) (Note 2)
Span adjustment function		Span of the analog output voltage is adjusted. 15-turn endless adjuster
Shift adjustment function		Offset of the analog output voltage is adjusted. 15-turn endless adjuster
Warming-up period		30 min. or more
Ambient temperature		0 to +40°C (No dew condensation), Storage: -20 to +70°C
Ambient humidity		35 to 85% RH, Storage: 35 to 85% RH
Material		Enclosure: Heat-resistant ABS, Connector cover: Heat-resistant ABS Potentiometer cover: Polycarbonate
Cable		0.22mm <sup>2</sup> 3-core heat-resistant PVC cable, 0.3m long
Weight		Approx. 85g

Notes: 1) Resolution refers to the peak to peak distance conversion value of analog output (in the frequency band below 20MHz).

2) This is the representative example of measurement with a combination of sensor head and controller.

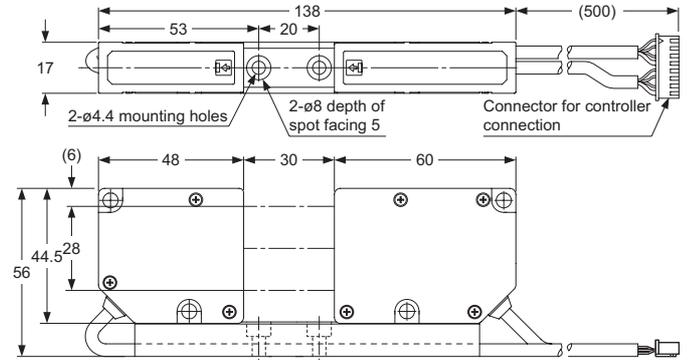
## 7 CAUTIONS

Make sure to use the sensor head and the controller as a set.

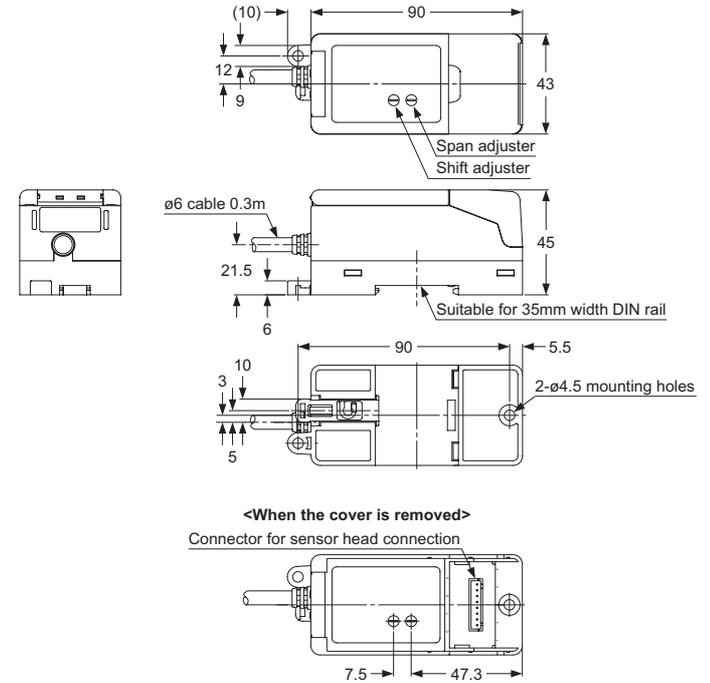
- This product has been developed / produced for industrial use only.
- Make sure that the power supply is off while wiring.
- Analog output does not incorporate a short-circuit protection circuit. Do not connect the power supply or capacity load directly.
- Care should be taken that static electricity is not applied to the connector during wiring. It may damage the product.
- Take care that wrong wiring will damage the product.
- Verify that the supply voltage variation is within the rating.
- If power is supplied from a commercial switching regulator, ensure that the frame ground (F.G.) terminal of the power supply is connected to an actual ground.
- In case noise generating equipment (switching regulator, inverter motor, etc.) is used in the vicinity of this product, connect the frame ground (F.G.) terminal of the equipment to an actual ground.
- Do not run the wires together with high-voltage lines or power lines or put them in the same raceway. This can cause malfunction due to induction.
- Do not use during the initial transient time (approx. 0.5 sec.) after the power supply is switched on.
- Cable extension is possible up to total 3m with 0.3mm<sup>2</sup>, or more, cable. Note that the cable length of the sensor head cannot be changed.
- Do not apply stress such as forced bending and pulling to the cable joint.
- Take care that the sensor is not directly exposed to fluorescent lamp from a rapid-starter lamp, a high frequency lighting device or sunlight etc., as it may affect the sensing performance.
- Make sure to use an isolation transformer for the DC power supply. If an autotransformer (single winding transformer) is used, this product or the power supply may get damaged.
- In case a surge is generated in the used power supply, connect a surge absorber to the supply and absorb the surge.
- Avoid dust, dirt, and steam.
- Take care that the product does not come in contact with water, oil, grease or organic solvents, such as, thinner, etc.
- This product outputs according to the amount of LED light received. Optical power varies between the center and the periphery of sensing range, and note that dimensional accuracy cannot be assured.
- Do not allow any water, oil, fingerprints, etc., which may refract light, or dust, dirt, etc., which may block light, to stick to the emitting / receiving surfaces of the sensor head. In case they are present, wipe them with a clean, dust-free soft cloth or lens paper.
- If the sensing object is mirror or transparent object, note that accurate measurement may not be possible.
- This sensor is suitable for indoor use only.
- Never disassemble, repair or modification etc. the product.

## 8 DIMENSIONS (Unit: mm)

### • HD-T1030 / Sensor head



### • HD-T1C / Controller



## 9 INTENDED PRODUCTS FOR CE MARKING

- The models listed under "6 SPECIFICATIONS" come with CE Marking.
- As for all other models, please contact our office.



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