UST-05LN/05LA   **SOKUIKI sensor for intelligent robots**
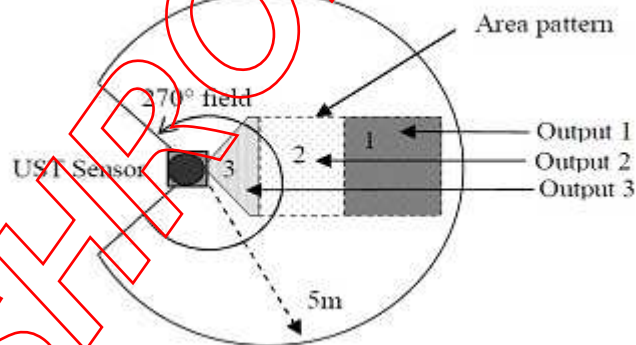

Feature

- 2D scanner for measuring distance between the sensor and its surroundings.
- Supply voltage 10 to 30V
- The smallest and lightest of its kind
- Measurement distance, 5m
- Faster response, 66msec
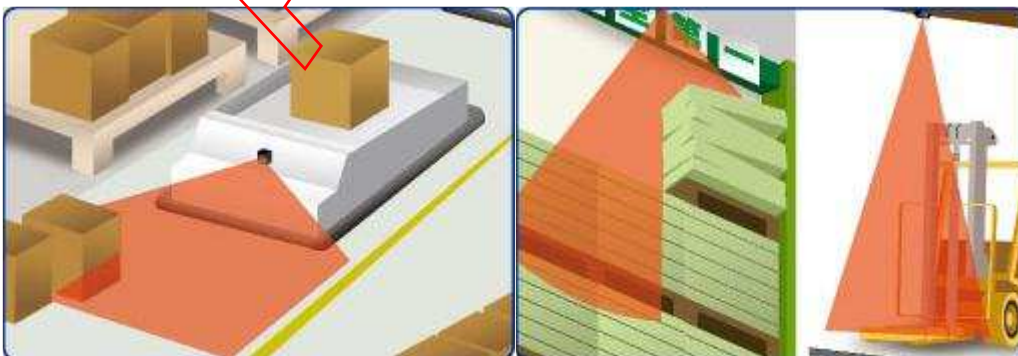- More flexible field setting available

Laser scanning image

Applications

Obstacle detection of AGVs   Load shifting detection

Specifications

| Product name	Scanning Laser Range Finder
Model	UST-05LN/UST-05LA
Supply voltage	DC 12V/DC 24V (operation range 10 to 30V, ripple within 10%)
Supply current	150mA (DC 24V) or less (during start up about 400mA is necessary.)
Light source	Laser semiconductor (905nm), Laser class 1(IEC60825-1:2007, Accession number:1420210-000)
Detection range and object	60mm to 5000mm (white Kent sheet) 60mm to 2000mm (diffuse reflectance 10%) Minimum detectable size 130mm (changes according to distance)[*1]
Accuracy	60mm to 5000mm ±40mm[*2]
Standard deviation	σ<20mm[*2]
Scan angle	270°
Scan speed	25msec25ms (motor speed 2400rpm)
Angular resolution	0.5°
Start up time	Within 10 sec (start up time differs if malfunction is detected during start up)
Outputs	Photo-coupler, open collector output Max DC 30V 50mA Output 1: Output 1 OFF during object detection Output 2: Output 2 OFF during object detection Output 3: Output 3 OFF during object detection Malfunction output: ON during normal operation, OFF during malfunction Synchronization output: Synchronization signal during Master/Slave operation. Note: Output 1 to 3 are switched OFF during malfunction state
Inputs	Photo-coupler, common anode, power supply is 4mA when input is ON Input 1 to 5: Area switching inputs (refer Table1) Synchronization input: Input synchronization signal during Slave operation.
Output response time[*3]	OFF : 66msec to 3241msec ON : 66msec to 3241msec
Hysteresis	Hysteresis high (6.25%, not less than 60mm) Hysteresis low (3.125%, not less than 30mm) No Hysteresis (Default)
Interface	USB/RS422(UST-05LA only)
LED display	Blue LED: ON during normal operation, blink during the start up, Orange LED 1: Output 1 ON during object detection Orange LED 2: Output 2 ON during object detection Orange LED 3: Output 3 ON during object detection

Synchronization function	Synchronization Master/Slave operation mode (can set by using Area Designer)[*4]
	Synchronization slave mode (0°)
	        Synchronization slave mode (90°)
	        Synchronization slave mode (180°)
	        Synchronization slave mode (270°)

Surrounding intensity	Less than 15,000lx Note : Avoid direct sunlight or other illumination sources as it may cause sensor malfunction
Ambient temperature humidity	-10°C to +50°C, below 85%RH (without dew, frost)
Storage temperature humidity	-30°C to +70°C, below 85%RH (without dew, frost)

Vibration resistance	10 to 55Hz double amplitude of 1.5mm for 2hrs in each X, Y, and Z direction 55 to 200Hz 98m / s2 sweep of 2min for 1hr in each X,Y and Z direction
Shock resistance	196m/s^2 (20G) X,Y and Z direction 10 times.
Insulation resistance	10MΩ, DC 500V
Protective structure	IP65
EMC standards	(EMI) EN61326-1 : 2013 EN55011 : 2009 + A1 : 2010 (EMS) EN61326-1:2013 EN61000-4-2:2009 EN61000-4-3:2006 + A1 : 2008 + A2 : 2010 EN61000-4-4:2012 EN61000-4-6:2009 EN61000-4-8:2010
Weight	130g
Material	Front case: Polycarbonate, Rear case: Aluminum
Dimensions (W×D×H)	50×50×70mm

*1. In the case of installing the sensor parallel to the Emitter/Receiver surface. Minimum detectable size of the object can be set by Area Designer.
*2. Under the factory standard testing condition using white Kent sheet.
*3. Initial setting is 66msec. ON/OFF delay function switching is possible by Area Designer. Response time can be further delayed by a maximum of 1scan during the area switching.
*4. Initial setting is synchronization master. When using synchronization operation, refer to section 5.3 for details about synchronization wiring. Synchronization slave setting is possible using Area Designer.

External dimension
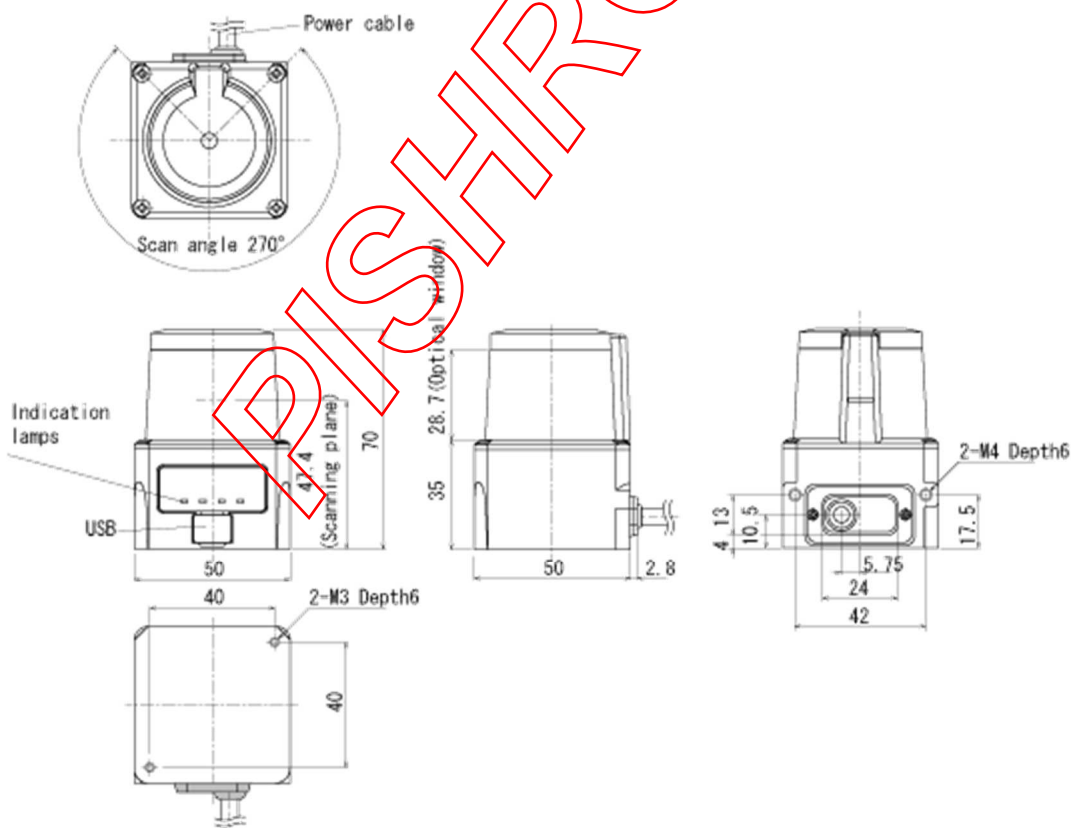
Output circuit
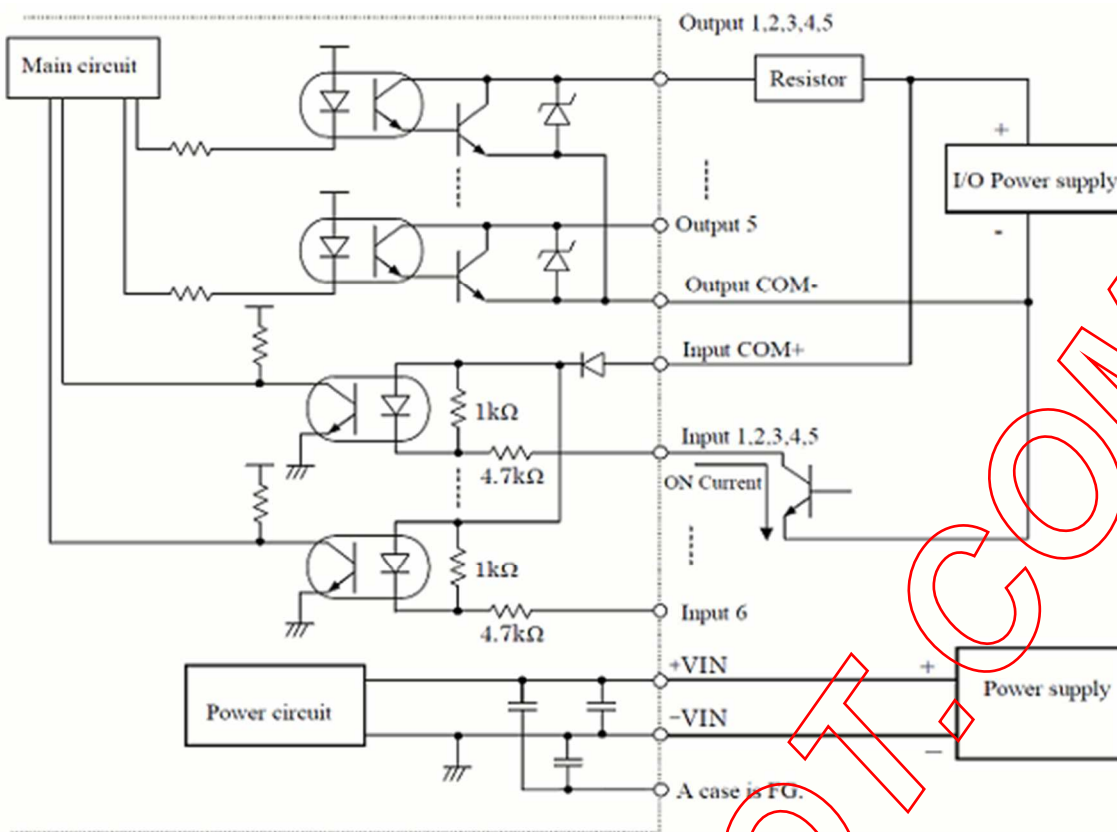
Connection

Color	Signal
Brown	+VIN(DC12V/DC24V)
Blue	-VIN
Black	Output 1
White	Output 2
White(Blue)	Output 3
Orange	Malfunction Output
Light green	Synchronous Output
Gray	COM Output -
Red	COM Input +
Green	Input 1
Yellow	Input 2
Purple	Input 3
White (Black)	Input 4
White (Red)	Input 5
Light Blue	Synchronous Input
Pink	RS422_GND
Yellow(Red)	Non Connect
Yellow(Black)	Non Connect
Yellow(Green)	Non Connect
Yellow(Blue)	Non Connect

Note1 : Input/Output direction is mentioned from the sensor's side.
Note2 : Colors inside the bracket indicates dual color cable.

Note3 : Keep the input wires open or connect to input Com+ if not in use.
Note4 : Keep the output wires open or connect to output Com- if not in use.

Input states and corresponding area number

Photo-coupler input(Common anode, Power supply is 4mA when input is ON)
Area number can be switched with inputs (1 to 5) Please refer the below table.
Laser is swiched off when all inputs (1 to 5)are ON
(OFF;H leven input、ON;L level input)
Input 6: Synchronous input

Input1	Input2	Input3	Input4	Input5	Area Number
ON	ON	ON	ON	ON	Laser off[*1]
OFF	ON	ON	ON	ON	Area1
ON	OFF	ON	ON	ON	Area2
OFF	OFF	ON	ON	ON	Area3
ON	ON	OFF	ON	ON	Area4
OFF	ON	OFF	ON	ON	Area5
ON	OFF	OFF	ON	ON	Area6
OFF	OFF	OFF	ON	ON	Area7
ON	ON	ON	OFF	ON	Area8
OFF	ON	ON	OFF	ON	Area9
ON	OFF	ON	OFF	ON	Area10
OFF	OFF	ON	OFF	ON	Area11
ON	ON	OFF	OFF	ON	Area12
OFF	ON	OFF	OFF	ON	Area13
ON	OFF	OFF	OFF	ON	Area14
OFF	OFF	OFF	OFF	ON	Area15
ON	ON	ON	ON	OFF	Area16
OFF	ON	ON	ON	OFF	Area17
ON	OFF	ON	ON	OFF	Area18
OFF	OFF	ON	ON	OFF	Area19
ON	ON	OFF	ON	OFF	Area20
OFF	ON	OFF	ON	OFF	Area21
ON	OFF	OFF	ON	OFF	Area22
OFF	OFF	OFF	ON	OFF	Area23
ON	ON	ON	OFF	OFF	Area24
OFF	ON	ON	OFF	OFF	Area25
ON	OFF	ON	OFF	OFF	Area26
OFF	OFF	ON	OFF	OFF	Area27
ON	ON	OFF	OFF	OFF	Area28
OFF	ON	OFF	OFF	OFF	Area29
ON	OFF	OFF	OFF	OFF	Area30
OFF	OFF	OFF	OFF	OFF	Area31

*1: Laser is switched off when all inputs(1 to 5) are ON.