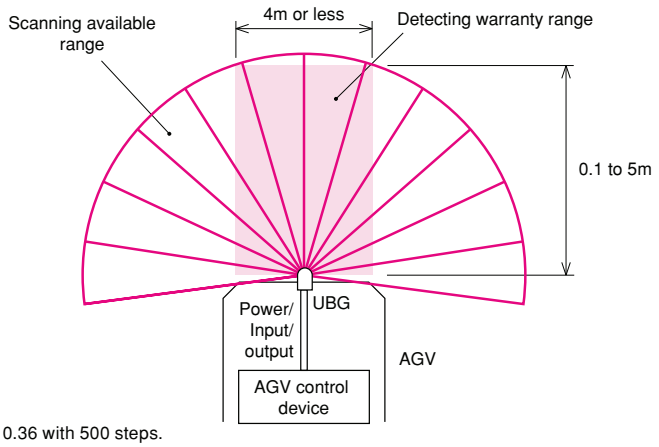
Obstacle Detection Sensor

UBG-05LN FDA approval

Higher accuracy with laser beam
Power source 24VDC type is lined-up

- UBG-05LN is an obstacle detection sensor with 785nm wavelength laser light source. It detects objects in the predefined area by scanning 180° semicircle and calculates the coordinates of the detected object by measuring its distance and angle.
- Realtime data of scanning area can be displayed on PC with RS-232C.
- 31 different area patterns and their coordinate points can be set using application software and serial communication RS-232C. 3-step outputs can be selected for each area.
- Bit input at terminal points switches the predefined area patterns (31 kinds of area).

System structure



Note) Scanning angle 180° , step angle 0.36 with 500 steps.

Specifications

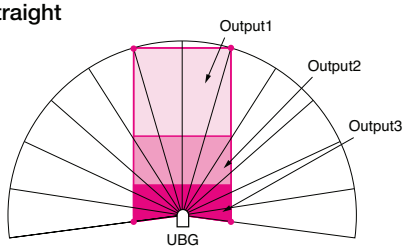
Kinds	Detection area setting type (parallel type)
Model No.	**UBG-05LN**
Power source	24VDC (Operative range 18 to 30V, ripple within 10%)
Current consumption	150mA or less (rush current approx.300mA when 24VDC)
Light source	Semiconductor laser diode λ=785nm (FDA approval, Laser safety class 1)
Detectable object	125×125mm white sheet
Scanning range	Distance 0.1 to 5m, width 4m (origin point is the scanning center position) within scanning angle 180°
Scanning accuracy*	0.1 to 1m: ±20 mm, 1 to 5m: 2% of measuring distance
Repeatability*	0.1 to 1m: ±10 mm
Angular Resolution	Step angle: approx.0.36° (360° /1,024 steps)
Beam diameter	Approx. ϕ 50mm (at 5m)
Detection area setting	Output1: free to draw with max.7 pointers (0 to 4m) Output2/3: (1) Straight (2) Fan shape (3) Percentage of Output1 area points
Hysteresis	6.25% of measuring distance
Output	Photo-coupler/NPN open-collector output(30VDC,50mA or less) OUT1/2/3: Turns OFF during detecting object in area Malfunction output: Turns ON during normal detection Note1)
Output response time	210msec ro less (Scanning speed 100msec/1 revolution) Note2)
Input	Voltage range of photo-coupler input (anode common): 18 to 30VDC Area changeover: Set area numbers with [Input1] [Input2] [Input3] [Input4] [Input5] Laser radiation stops with all inputs ON (OFF:H level input,ON:L level input)

Input response time	Input reading frequency: 1 scan time (100msec) (Input reading frequency is 1msec when Laser is switched off externally)
Start up Time	Within 10 sec after power supply. (Varies with startup conditions)
Indication lamps	Power lamp (green): Flashes during startup or sensor malfunction Output lamp 1/2/3 (orange): lights up during detecting object in area
Connection	Cable 1m
Ambient illuminance note3)	Halogen/mercury lamp: 10,000lux or less, incandescent lamp: 6,000lux or less
Ambient temperature/ humidity	-10 to +50℃ (-25 to +75℃ when stored), 85%RH or less, not icing, not condensing
Insulation resistance	10MΩ 500VDC megger
Vibration resistance	Double amplitude 1.5mm, 10 to 55Hz, each 2 hour in X, Y and Z directions
Impact resistance	196m/s², each 3 time in X, Y and Z directions
Protective structure	IP64 (IEC standard)
Life	5 years (motor life, vary depending on use conditions)
Noise	25dB or less (at 300mm)
Case materials	Front of case: Polycarbonate, back of case: ABS resin
Weight	Approx.185g (260g including cable 1m)

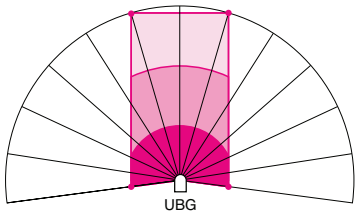
*Accuracy is a value when shipment.
Note1) Output 1/2/3 turn OFF when malfunction output operated.
Note2) If area is changed, 1 more scanning time is delay.
Note3) It may malfunction when receiving strong light like sunlight etc. directly.
★It can download the area setting software from our website.
★RS-232C cable (UZ00002) is available as an option.

■ Available detection area

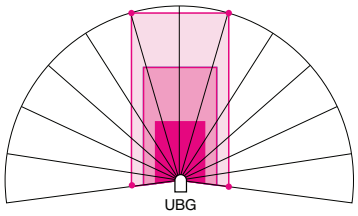
Straight



Fan shaped



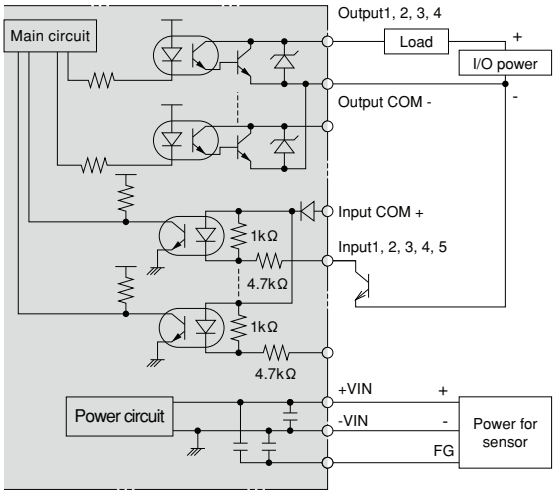
Ratio



Note) This device shows the detection area on the basis of the center position of scanning.

■ Connection

Input/output circuit



Wiring table

Cable colors	Signals
Black	Output 1
White	Output 2
White (blue)	Output 3
Orange	Malfunction output
Gray	Output common minus
Red	Input common plus
Green	Input 1
Yellow	Input 2
Purple	Input 3
White (yellow)	Input 4
White (purple)	Input 5
Brown	+VIN (24VDC)
Blue	-VIN
Yellow (red)	Serial input (RXD)
Yellow (green)	Serial output (TXD)
Yellow (black)	Serial GND

Note1) Colors inside ( ) suggest wires with colored lines on either sides.
Note2) Leave the unused input terminals open or connect to input common plus (red).
Leave the unused output terminals open or connect to input common minus (gray).
Note3) I/O direction is on the basis of UBG.

■ Caution for installation

Detection area can be changed by photo-coupler input (anode common, each input ON current 4mA)

● Detection area changeover

Set the area number with input1/2/3/4/5.

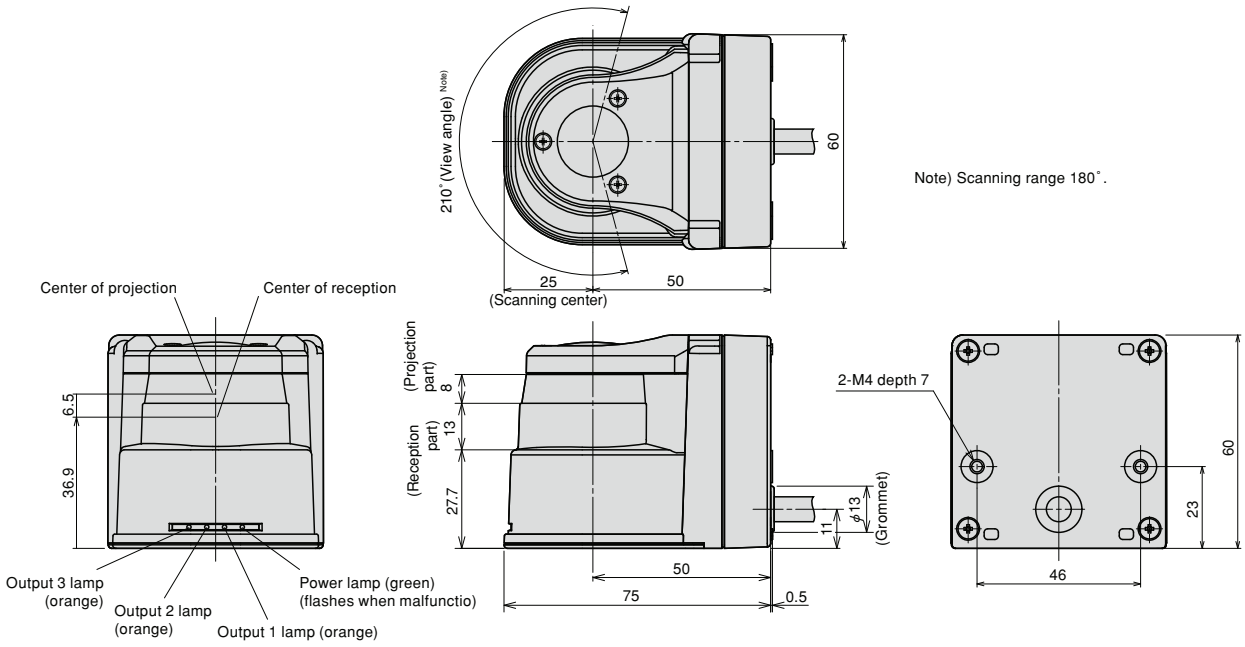
Laser radiation stops with all inputs ON.

Input1	Input2	Input3	Input4	Input5	Area patterns
ON	ON	ON	ON	ON	Laser OFF
OFF	ON	ON	ON	ON	Area 1
ON	OFF	ON	ON	ON	Area 2
OFF	OFF	ON	ON	ON	Area 3
ON	ON	OFF	ON	ON	Area 4
OFF	ON	OFF	ON	ON	Area 5
ON	OFF	OFF	ON	ON	Area 6
OFF	OFF	OFF	ON	ON	Area 7
ON	ON	ON	OFF	ON	Area 8
OFF	ON	ON	OFF	ON	Area 9
ON	OFF	ON	OFF	ON	Area 10
OFF	OFF	ON	OFF	ON	Area 11
ON	ON	OFF	OFF	ON	Area 12
OFF	ON	OFF	OFF	ON	Area 13
ON	OFF	OFF	OFF	ON	Area 14
OFF	OFF	OFF	OFF	ON	Area 15

Input1	Input2	Input3	Input4	Input5	Area patterns
ON	ON	ON	ON	OFF	Area 16
OFF	ON	ON	ON	OFF	Area 17
ON	OFF	ON	ON	OFF	Area 18
OFF	OFF	ON	ON	OFF	Area 19
ON	ON	OFF	ON	OFF	Area 20
OFF	ON	OFF	ON	OFF	Area 21
ON	OFF	OFF	ON	OFF	Area 22
OFF	OFF	OFF	ON	OFF	Area 23
ON	ON	ON	OFF	OFF	Area 24
OFF	ON	ON	OFF	OFF	Area 25
ON	OFF	ON	OFF	OFF	Area 26
OFF	OFF	ON	OFF	OFF	Area 27
ON	ON	OFF	OFF	OFF	Area 28
OFF	ON	OFF	OFF	OFF	Area 29
ON	OFF	OFF	OFF	OFF	Area 30
OFF	OFF	OFF	OFF	OFF	Area 31

Note) Connect OFF to 24VDC (H level input) and ON to 0V (L level input).

■ External dimension



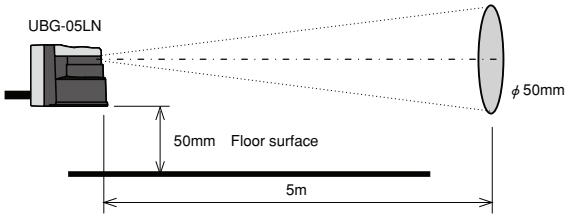
■ Caution for installation

(1) It may malfunction if there are any strong background reflections. Tilt it downward/upward.

(2) When installation, don't close light-projection/reception window or interrupt area.

(3) Don't make a wiring with high-voltage line or load line because of avoiding noise or surge induction.

(4) Install it 50mm or more away from floor. If 50mm or less, install it 1° upward. Spread of sensor beam is φ50mm (Reference value) at 5m.



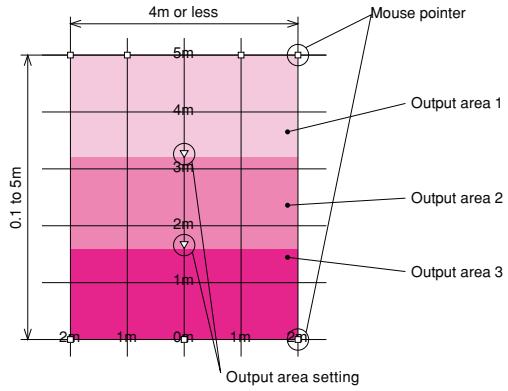
■ Supplement

(1) Area setting for output

- Realtime detecting state can be checked by PC.
  It is free to make a detection area on PC.
- It is possible to make a area with 7 points of mouse pointer as well PBS-03JN.
  Draw the detection area with drug-drop of the cursor, [□] (+ mark).
  Output area can be made between the origin point and [▽].
  Fix the ratio of detection area 1, 2 & 3 with drug-drop of [▽] (top/bottom mark).
- It is possible to detect with high precision because of applying laser beam as light source. Also, detection area is wider (4m) and bigger (5m) than PBS-03JN.

(2) Output

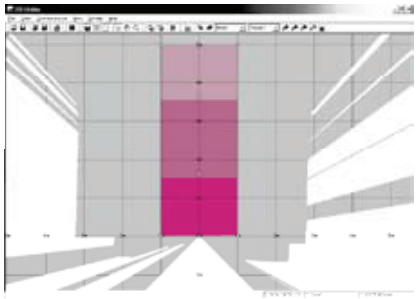
- There are 3 pcs of output.



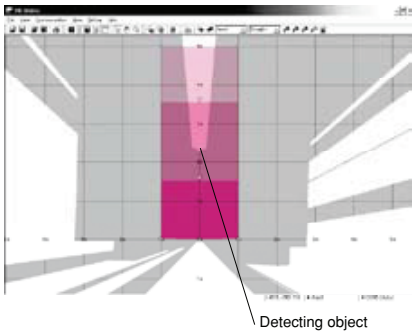
(3) Area view (typical example)

- It can save up to max.31 kinds of detection area pattern by PC and can switch each detection area with outer bit input. It is possible to make the following detection area.It is displayed on PC as per fig.2 and output executes when any objects are detected.

(Fig.1: No objects)



(Fig.2: Detecting objects)



(4) The other area setting (typical example)

- It can save up to max.31 kinds of detection area pattern by PC and can switch each detection area with outer bit input. It is possible to make the following detection area.