

# Scanning Laser Range Finder

## URG-04LX FDA approval

### Realtime output of angular data/distance data!

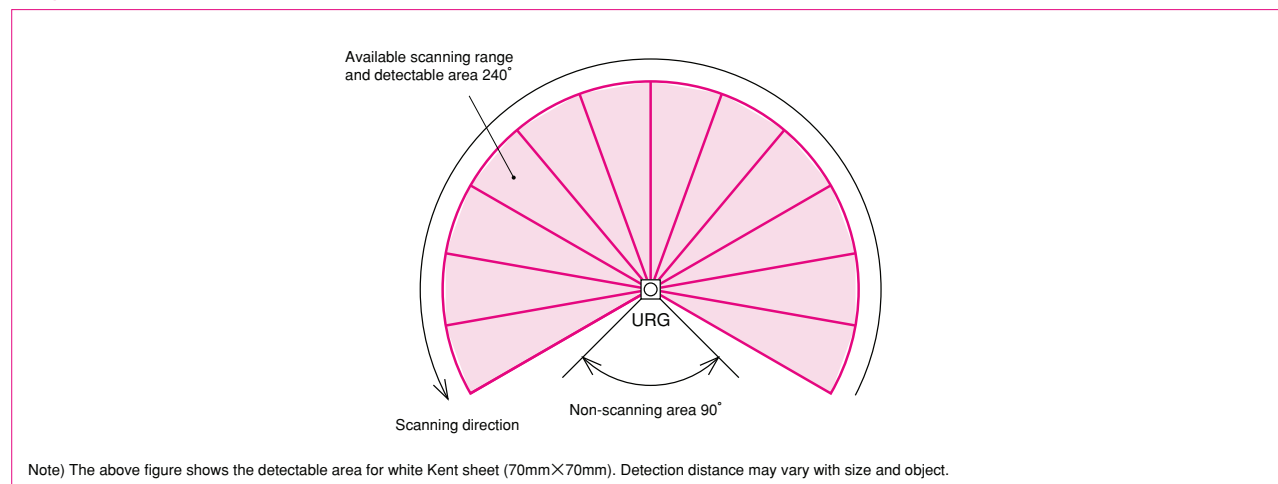
URG-04LX is a 2-dimensional laser sensor for measuring the distance to the objects.

It is possible to detect the side, the position or the moving direction of objects because of outputting the flat data in the specific area.

- Wide scanning range with 4m and 240°.
- High accuracy  $\pm 1\%$ , angular resolution 0.36°.
- Principle of distance measurement is based on calculation of the phase difference, due to which it is possible to obtain stable measurement with minimum influence from object's color and reflectance.
- Compact design, light weight, low power consumption.
- It is possible to output the serial data directly.



### System structure



### Functions

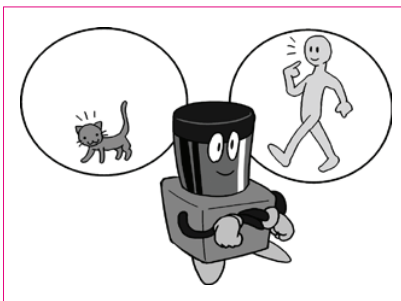
#### Position detection

It is possible to detect the exact position of the objects. It is possible to map with the human positional information.



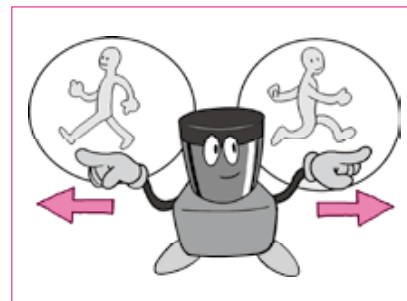
#### Size detection

It is possible to detect the exact size of the objects. It is possible to distinguish between human and small animals.



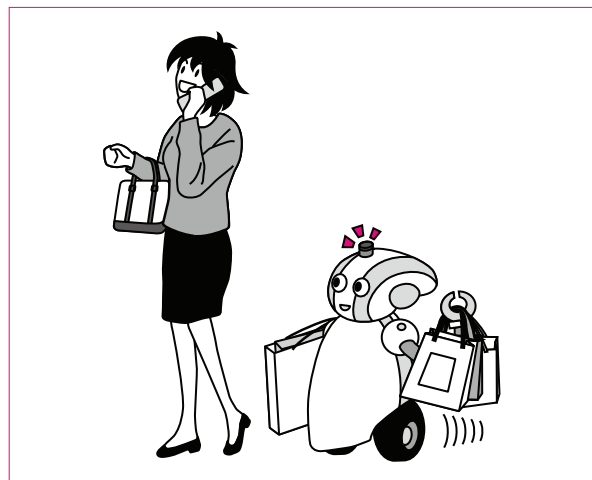
#### Moving directional detection

It is possible to detect the moving direction of the objects with high speed scanning, 100msec/scan. It is possible to discover the loiterers etc.

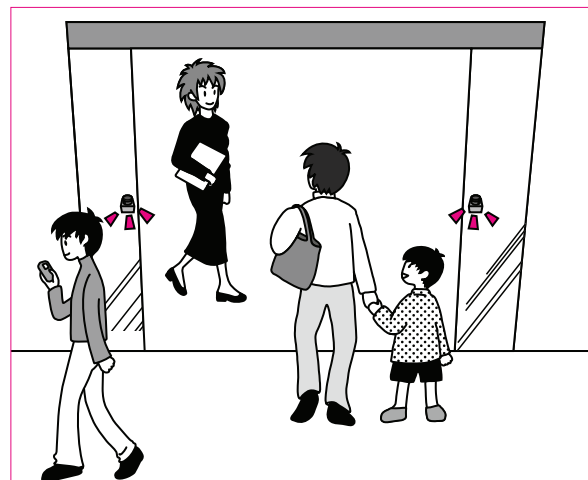


## ■ Applications

Environmental recognition by autonomic robot



Automatic doors/Analyzing of human behavioral characteristic



## ■ Specifications

| Kinds                                | Data output type (serial type)  |
|--------------------------------------|---|
| Model No.                            | URG-04LX  |
| Power source                         | 5VDC $\pm 5\%$ *1   |
| Current consumption                  | 500mA or less (rush current approx.800mA)   |
| Light source                         | Semiconductor laser diode $\lambda = 785\text{nm}$ (FDA approval, Laser safety class 1) |
| Detectable object                    | 70×70mm white sheet   |
| Scanning range                       | 0.06 to 4m  |
| Scanning accuracy                    | 0.06 to 1m: $\pm 10\text{mm}$ , 1 to 4m: 1% of measuring distance                       |
| Repeatability                        | 0.06 to 1m: $\pm 10\text{mm}$ , 1 to 4m: 1% of measuring distance                       |
| Scanning angle                       | 240°  |
| Resolution                           | Approx.1mm  |
| Angular Resolution                   | Step angle: approx.0.36° (360° /1,024 steps)  |
| Beam diameter                        | Approx. $\phi 40\text{mm}$ (at 4m)  |
| Scanning time                        | 100msec/scan  |
| Interface                            | USB2.0 (Full Speed)<br>RS-232C (19.2k, 57.6k, 115.2k, 250k, 500k, 750kbps)              |
| Communicating specifications         | Exclusive command (SCIP Ver.1.1/Ver.2.0)*2  |
| Output                               | NPN open-collector output (synchronous output: 1 pce)                                   |
| Indication lamps                     | Power lamp (orange)   |
| Connection                           | Exclusive cable (attached)  |
| Ambient illuminance <sup>note)</sup> | Halogen/mercury lamp: 10,000lux or less, incandescent lamp: 6,000lux or less            |
| Ambient temperature                  | -10 to +50°C (-25 to +75°C when stored)   |
| Ambient humidity                     | 85%RH or less, not icing, not condensing  |
| Insulation resistance                | 10M $\Omega$ 500VDC megger  |
| Vibration resistance                 | Double amplitude 1.5mm, 10 to 55Hz, each 2 hour in X, Y and Z directions                |
| Impact resistance                    | 196m/s <sup>2</sup> , each 3 time in X, Y and Z directions                              |
| Protective structure                 | Optical surface: IP64 (IEC standard), case: IP40 (IEC standard)                         |
| Life                                 | 5 years (motor life, vary depending on use conditions)                                  |
| Noise                                | 25dB or less (at 300mm)   |
| Case materials                       | ABS resin   |
| Weight                               | Approx.160g   |
| Accessories                          | Cable for power/communciation (1.5m) 1 pce, D-sub 9 pins connector 1 pce*3              |

\*1. Sensor will not operate with USB bus power. Prepare power source separately.

\*2. Version when shipment is 1.1.

\*3. USB cable and fitting metal don't provide.

Note) It may malfunction when receiving strong light like sunlight etc. directly.

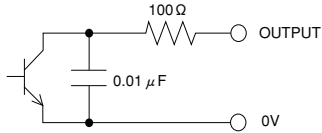
**Note** This sensor is not a safety device/tool.

**Note** This sensor is designed for indoor use only.

**Note** This sensor is not for use in military applications.

## Connection

### Output circuit



Transistor 50V, 30mA

### Wiring table

#### ● CN1

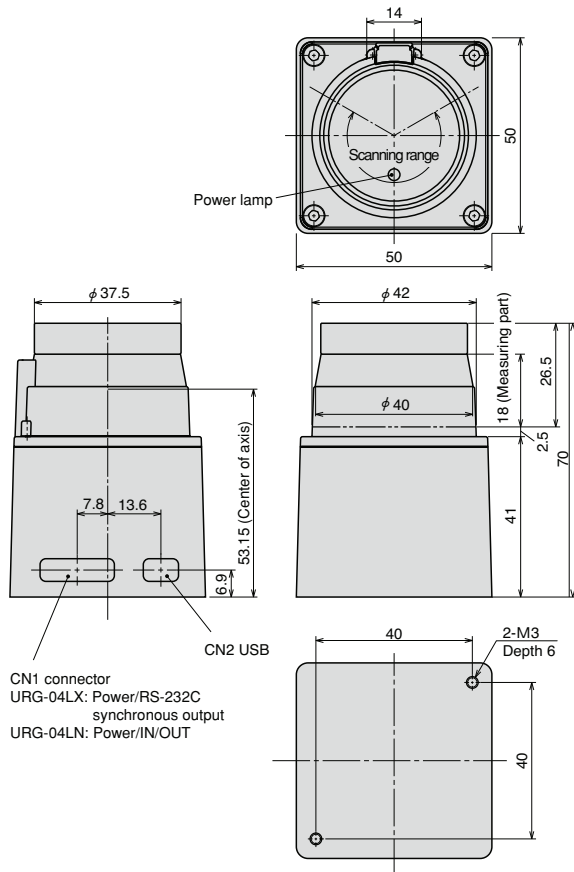
| Pin No. | Cable colors | Signals                           |
|---------|--------------|-----------------------------------|
| 1       | Red          | N.C.                              |
| 2       | White        |                                   |
| 3       | Black        | Synchronous output                |
| 4       | Purple       | GND (5P of 9-pin D-sub connector) |
| 5       | Yellow       | RxD (3P of 9-pin D-sub connector) |
| 6       | Green        | TxD (2P of 9-pin D-sub connector) |
| 7       | Blue         | 0V                                |
| 8       | Brown        | 5VDC                              |

Note) GND and 0V are connected inside the sensor.

**Note** I/O direction is on the basis of URG.

#### ● CN2 USB-miniB (5P)

## External dimension

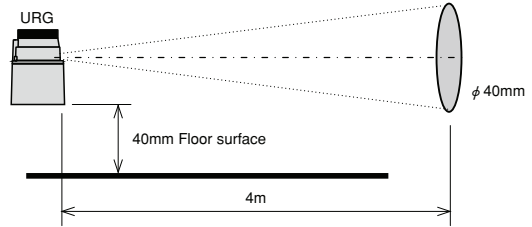


## Caution for installation

- (1) In case that mutual interference would occur, tilt it downward/upward with 2° or more.



- (2) Spread of optical axis is  $\pm 0.3^\circ$  and min.detectable object is a size for 3 steps. However, min.detectable object may vary depending on the distance.
- (3) When installation, don't close light-projection/reception window or interrupt area.
- (4) Install it 40mm or more away from floor. If 40mm or less, install it 1° upward. Spread of sensor beam is  $\phi 40\text{mm}$  (Reference value) at 4m.



## Supplement

- (1) Power source is 5VDC. Pay attention to the overvoltage. It may be broken.
- (2) Scanning step numbers are 683 steps max. and so scanning angular range is  $(683) \cdot 360/1024^\circ$  because of angular resolution is  $360/1024^\circ$ .
- (3) It can specify measuring angular range or angular resolution from host. Ask us in details.
- (4) Scanning direction is counterclockwise from topview.
- (5) About RS-232C connection  
It may not communication correctly if buad rate is 500kbps or more because of the compatibility between host and URG.
- (6) About USB driver  
It is connected as software COM port through CDC (Communication Device Class). It can be handled as well as COM port from applicatoin program of host. But this doesn't provide plug & play function.