Date:2005.10.26

Scanning Laser Range Finder
URG-04LX

Specifications

Symbol	Amended Reason	Pages	Date	Corrector	Amendment No
⑦ x 1	Correction of errors	3	2017.12.8	Shibuya	RS-01023
⑥ x 1	Correction of errors	4	2017.10.10	Shibuya	RS-00995
⑤ x 2	Revision history of firmware added	5	2008.4.25	Yamamoto	PR-5451
④ x 1	Scanning area	5	2007.4.16	Maeda	PR-5269
③ x 2	Com. Protocol added, revision history of firmware added	4,5	2007.1.18	Maeda	PR-5225
② x 3	Changes in resolution, revision history of firmware added	3,5	2006.9.21	Maeda	PR-5160
① x 5	Changes in cable color	4	2006.6.14	Maeda	PR-5111

Approved by	Checked by	Drawn by	Designed by		Scanning Laser Range Finder URG-04LX Specifications	
M.Hino	M.Maeda	M.Shibuya	MAEDA	Drawing No.	C-42-3389	1/5

1. General

URG-04LX is a laser sensor for area scanning. The light source of the sensor is infrared laser of wavelength 785nm with laser class 1 safety. Scan area is 240º semicircle with maximum radius 4000mm. Pitch angle is 0.36º and sensor outputs the distance measured at every point (683 steps). Laser beam diameter is less than 20mm at 2000mm with maximum divergence 40mm at 4000mm.

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.

URG-04LX is designed under JISC8201-5-2 and IEC60947-5-2 standards for industrial applications.

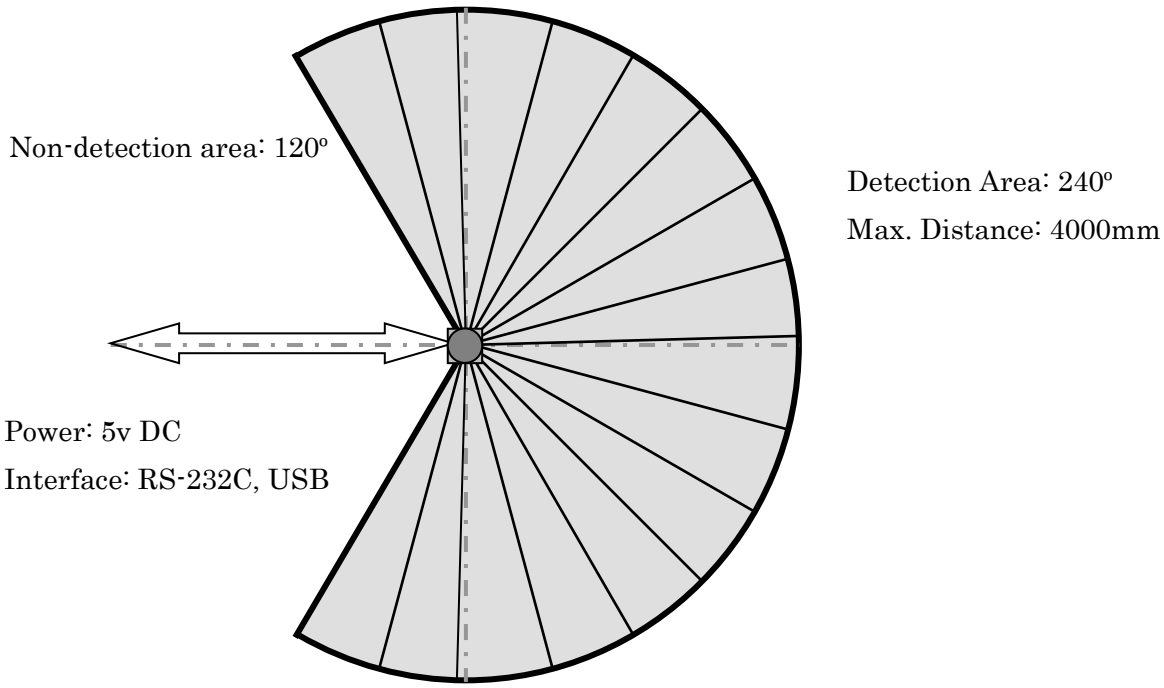

Figure 1

Note
Figure 1 shows the detectable area for white Kent sheet (70mm×70mm). Detection distance may vary with size and object.

2. Important Notice

This sensor is designed for indoor use only.
This sensor is not a safety device/tool
This sensor is not for use in military applications
Read specifications carefully before use.

3. Specifications

Product name	Scanning Laser Range Finder
Model	URG-04LX
Light source	Semiconductor laser diode (λ=785nm), Laser power : less than 0.8mW Laser safety Class 1 (IEC60825-1)
Power voltage	5VDC ±5%
Power consumption	500mA or less (Start-up current 800mA)
Detection	60 mm ~ 4,095 mm (Guaranteed accuracy distance) 20mm ~ 5,600mm (Distance)* 4
Accuracy	Distance 7 ~~20~~ 60 ~ 1000mm: ±10mm* 2 Distance 1000 ~ 4000mm: ±1% of measurement* 2
Resolution	1 mm
Scan angle	240°
Angular resolution	0.36° (360° /1024)
Scanning speed	100msec/scan
Interface	RS-232C (19.2, 57.6, 115.2 ,500 ,750 kbps) USB Version 2.0 FS mode (12Mbps)
Ambient (Temperature/Humidity)	-10 ~ 50ºC / 85%RH or less (without dew and frost)
Storage temperature	-25 ~ 75ºC
Ambient light resistance	10000Lx or less
Vibration resistance	1.5mm double amplitude, 10 ~ 55Hz, X, Y and Z direction (2 hours), 98m/s² 55Hz ~ 150Hz in 2 minutes sweep, 1 hour each in X, Y and Z direction
Shock resistance	196 m/s², 10 times each in X, Y and Z direction
Protective structure	Optics : IP64 Case : IP40
Insulation	10MΩ for DC 500Vmegger
Weight	Approx. 160 g
Casing	Polycarbonate
Dimension (W×D×H)	50×50×70mm (Refer to design sheet No. C-40-3362)

*Under standard test conditions with white Kent sheet 70mm×70mm

4. Quality reference value

Operating vibration resistance	19.6m/s², 10Hz ~ 150Hz with 2 minutes sweep, 0.5 hours each in X, Y and Z direction
Operating impact resistance	49 m/s², 10 times each in X, Y and Z direction
Angular speed	360 deg/s
Angular acceleration	π/2 rad/s²
Lifespan	5 years (Vary on the operating conditions)
Noise level	25db or less (at 300mm)
FDA	This product complies with 21 CFR parts 1040.10 and 1040.11. (Registration Number 0521258)

5. Interface

- CN1 (8 Pins)

	URG-04LX	Lead Color
1	N.C.	RED △1▽
2	N.C.	WHITE △1▽
3	OUTPUT (SYNCHRONOUS)	BLACK
4	GND (9pin Dsub 5p)	PURPLE △1▽
5	RxD (9pin Dsub 3p)	YELLOW △1▽
6	TxD (9pin Dsub 2p)	GREEN △1▽
7	0V	BLUE
8	DC 5V	BROWN

Note
GND and 0V are internally connected
A standard unit consists of power supply cable and 9-pin D-sub communication connector

- CN2 USB-mini (5 Pin)
  Cable is not included. Use commercially available compatible unit.

- Communication protocol △3▽
  Please refer to the respective document for details on communication protocol
  a) SCIP 1.0 : C-42-3320~~A~~ △6▽
  b) SCIP 2.0 : C-42-3320B

- 1 Sync signal (approx. 12.5 ms) is outputted at each scan. Figure 2 shows the timing of the sync signal.

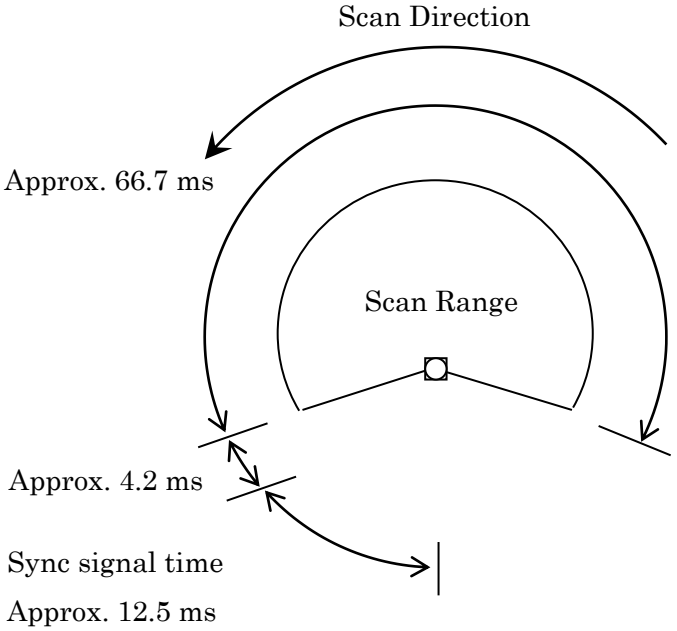

Figure 2

6. Output circuit:

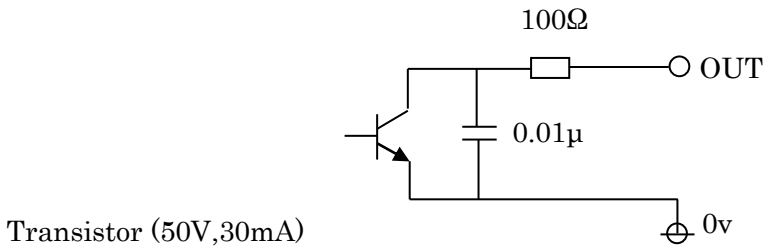

Figure 3

7. Additional notes:

- This sensor only needs 5VDC as power supply. Excessive power supply could cause damage to the sensor.
- Maximum data step is 683 steps. Since the angular resolution is 0.3515625º (360º /1024 steps), angular range is 239.765625º ((683-1)×360/1024).
- Angular resolution is configurable by the host. Read communication protocol specification (No C-42-3320) for details.
- Scan direction of the sensor is counterclockwise.
- In RS-232C communication, communication problems could happen if baud rate above 500 Kbps is set.
- USB driver used is the communication device class (CDC) supported by standard operating system. Sensor will be treated as COM port under the same utility when connected to the standard operating system.
- Plug and play function of the USB driver is not supported.

8. Firmware revision history △2

Firmware version	Changes
Ver. 2.91a	Laser is not radiated and LED will continue to blink until the connection is established.
Ver. 3.1.00 △3	Fixed for SCIP 2.0. Function in ver. 2.91a is disabled. LED indicating the power supply will turn ON before communication is establish and start laser radiation.
Ver. 3.1.04 △5	Corrections on MD/MS of SCIP
Ver. 3.3.00 △5	HS command is added. Corrections on MD/MS of SCIP 2.0 Enhancement on error handling