Scanning Laser Range Finder
Smart-URG Pro
UST-30LX
Specification

C E

RoHS

| ③×3	Supports high resolution mode	P2,3,4	2023.01.12	T.Kasahara	RS-01942
②×1	Added footnote	P4	2020.12.16	T.Kasahara	RS-01591
①×3	Change cable length / Added description of multi echo	P2,4,6	2020.09.03	T.Kasahara	RS-01542
Symbol	Amended Reason	Pages	Date	Amended by	Ref.No

Approved by	Checked by	Drawn by	Designed by	Title	UST-30LX Specification	
M.Hino	a.Yamamoto	T.Kasahara	T.Kasahara	Drawing No.	C-42-04412	1/7

1. General ⚠

This sensor uses a laser source to scan 270° field of view. Positions of objects in the range are calculated with step angle and distance. Sensor outputs these data through communication channel. This sensor supports the multi echo data output.
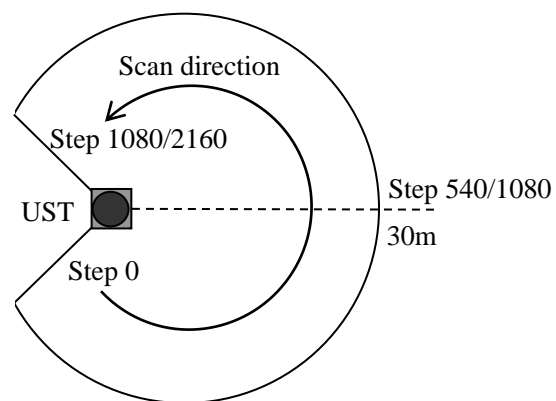
2. Structure
2-1.Strucure diagram
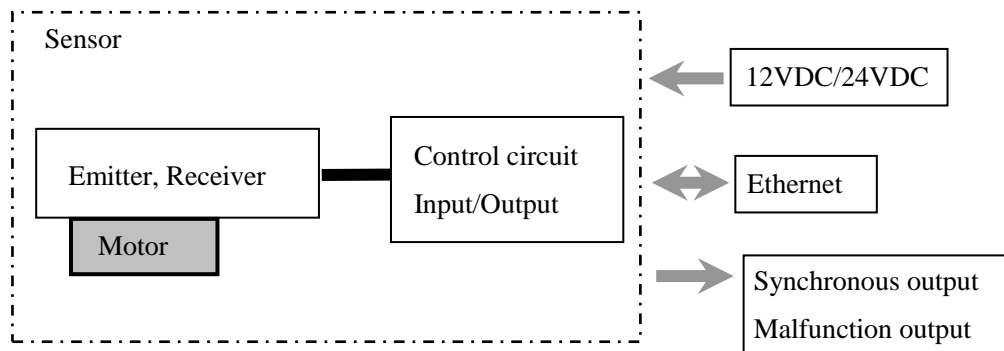
2-2. Laser scanning image ⚠

Measurement steps 1081/2161

Detection angle 270°

Angular resolution 0.25°/0.125°

3. Important notes

(1) This sensor is not a safety device/tool.

(2) This sensor cannot be used for human body detection as per the machinery directives.

(3) Hokuyo products are not developed and manufactured for the use in weapons, equipments or related technologies intended for destroying human lives or causing mass destruction. If such possibilities or usages are revealed, the sales of Hokuyo products to those customers might be halted by the laws of Japan such as Foreign Exchange Law, Foreign Trade Law or Export Trade control order. In addition, Hokuyo products are for the purpose of maintaining the global peace and security in accordance with the above law of Japan.

(4) Sensor emits laser for measurement. Sensor's operation may become unstable under the influence of strong interference light or when emitted lights are not reflected back from the object.

(5) Sensor's operation may become unstable due to rain, snow and fog or due to dust pollution on the optical window.

(6)Rules and regulations related to safety should be followed strictly when machine users and system designers operates the sensor.

(7)Before using the sensor, please read carefully and understand this specification.

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4. Specifications

Product name	Scanning Laser Range Finder
Model	UST-30LX
Supply voltage	12VDC/24VDC (operation range 10 to 30V ripple within 10%)
Supply current(*1)	150mA or less (when using DC24V) (during start up 450mA is necessary.)
Supply power	Less than 3.6 W(steady state)
Light source	Laser semiconductor (905nm)
Laser Safety	Class1 (IEC60825-1:2014)
Detection range and object	0.05m to 30m(*2) (white kent sheet) 0.05m to 12m(*2) (diffuse reflectance 10%) Max. detection distance : 60m Min. detection size：180mm(10m)、350mm(20m)、520mm(30m)
Accuracy	±40mm (*2)
Repeated accuracy	σ< 20mm (*2)
Scan angle	270°
Scan speed	25msec (motor speed 2400rpm)
Angular resolution	0.25° /0.125° (*4) ⚠3
Start up time	Within 10 sec (start up time differs if malfunction is detected during start up)
Output	Malfunction Output, Synchronous Output, photo coupler open collector output MAX DC 30V 50mA.
Interface	Ethernet 100BASE-TX
LED display	Power supply LED display (blue): Blinks during start up and malfunction state.
Surrounding intensity	Less than 100,000lx Note : Avoid direct sunlight or other illumination sources as it may cause sensor malfunction
Ambient temperature and humidity	-30°C to +50°C, below 85%RH (without dew, frost)
Storage temperature and 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 / s^2 sweep of 2min for 1hr in each X,Y and Z direction
Shock resistance	196m/s^2(20G) X,Y and Z direction each 10 times.
Insulation resistance	10MΩ
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 EN61000-4-6：2014 EN61000-4-8：2010
RoHS	(EU)2015/863
Protective Structure	IP67(*3)
Weight	130g (excluding cable)
Material	Front case: Polycarbonate, Rear case: Aluminum
Dimensions (W×D×H)	50×50×70mm (sensor only）

(*1) Please use a power supply with enough current capacity.

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(*2) Under the factory standard testing conditions using white kent sheet. △2

In the low temperature environment of -11℃ or below, the detection distance will be as below.

white kent sheet：0.05m to 25m, diffuse reflectance 10%：0.05m to 8m

(*3)The protective structure of Ethernet and Power connector is not IP67.

(*4)This sensor can be switched to the high resolution mode with LXSettingTool. (default:0.25°) △3

The above description corresponds to the product code UUST2** or later. (firmware version: 4.0.0 or later).

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5. Measurement Data

| Distance Value (x)	Meaning
x < 10	Output numerical number "4" as Measurement error
10 ≦ x ≦ 60000	Valid distance [mm]
x > 60000	Output numerical number "65533" as Measurement error (object does not exists or object has low reflectivity)

6. Connection

6-1. Power source, I/O cable

connector : DF62B-6EP-2.2C Hirose

Cable length: 1000mm ⚠

Keep the output wires open or connect to output "Com Output -" if not in use.

Pin	Color	Signal
1	Orange(red short point 1)	+VIN (12VDC/24VDC)
2	Orange(black short point 1)	-VIN
3	White(black short point 1)	Malfunction Output
4	Yellow(red short point 1)	Synchronous Output
5	Yellow(black short point 1)	COM Output -
6	NC	NC

```
3 - - -□  □  □- - - 1          |←  12mm  →|
6 - - -□  □  □- - - 4         1mm          1mm
    mating surface           Short point 1
```
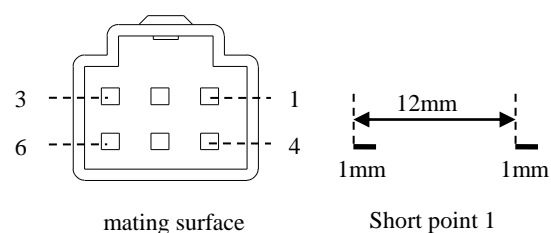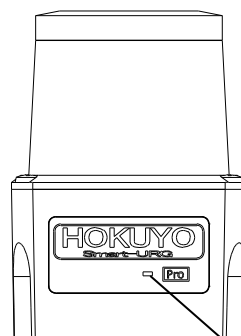
Note: Direction of Inputs and Outputs are mentioned from the sensor's side.

6-2. Ethernet cable

Cable length: 300mm

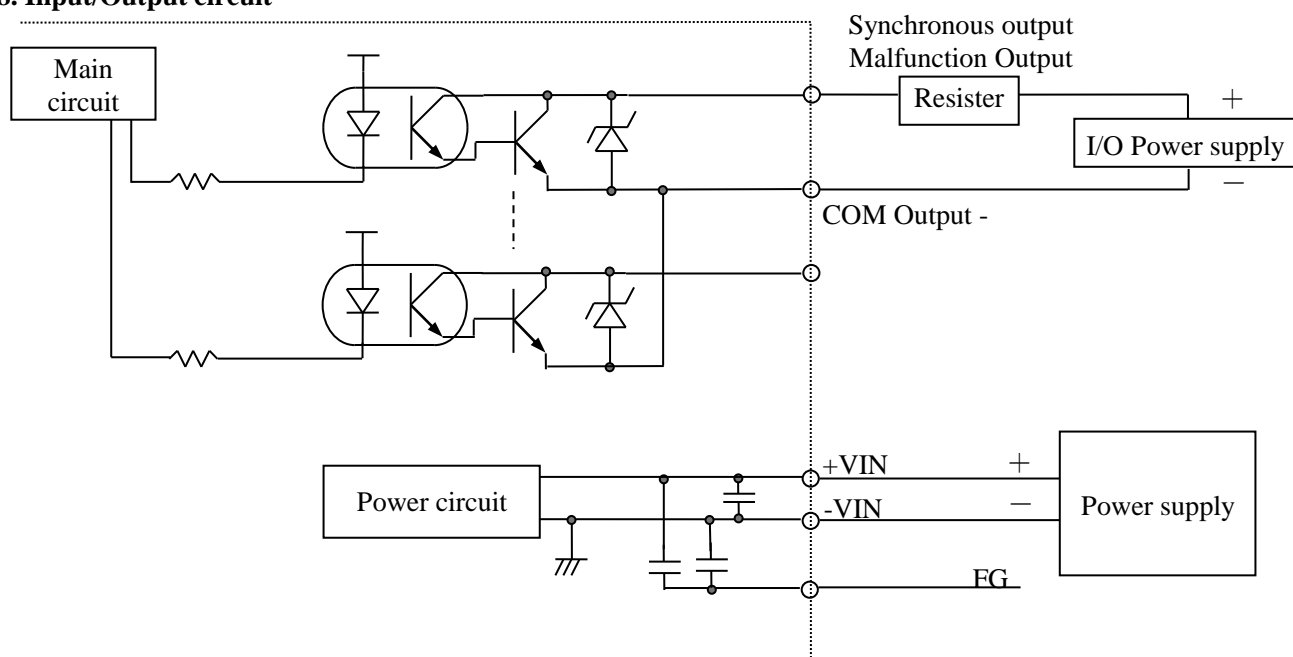| Color	Signal
White(Orange)	TX+
Orange	TX-
White(Green)	RX+
Green	RX-

7. LED display

Power supply display

(Blinks during start up and malfunction state)

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8. Input/Output circuit

Main circuit

Synchronous output
Malfunction Output

Resister

I/O Power supply

+

−

COM Output -

Power circuit
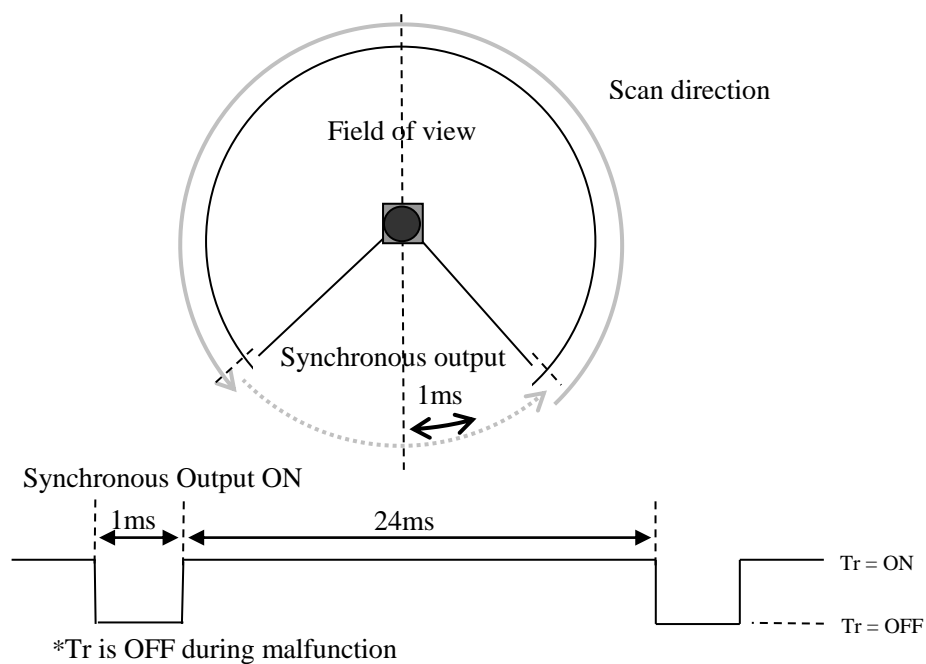
+VIN

-VIN

FG

Power supply

+

−

Note: Mounting plate is used as frame ground (FG). Mount the sensor on a stable structure..

9. Control signal

9-1. Synchronous output

1 pulse is approximately 1ms. Output signal synchronization timing chart is shown as below.

Scan direction

Field of view

Synchronous output

1ms

Synchronous Output ON

1ms

24ms

Tr = ON

Tr = OFF

*Tr is OFF during malfunction

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10. Multi-echo function ⚠

This sensor provides a maximum of three echo (1st, 2nd, last) for each step (one direction). It also provides distance value and level value for each step.

Multiple echo are generated when the laser beam is split by reflection on surface of transparent objects, reflection on object's edge and reflection from small particles such as rain, mist, dust and fog. Thus, distance and level value obtained from the multiple reflections in the same direction is called multi echo. However, if the distance between two object is too close or the object has low reflectance, the sensor may not detect it as multi echo.

11. Ethernet Setting

1. The setting value is as below.

IP Initial value   :192.168.0.10

Port number   :10940

2. About changing IP address

It is possible to change and reset the IP address using a specialized application (IP Discovery).

For details on installation and operation of IP Discovery, Please refer to IP discovery manual. (C-41-02603)

12. Cautions for operation

This sensor uses high speed processing components that generate heat during operation.

The heat is concentrated at the bottom of the unit. When mounting, please attach the bottom of the unit to a good heat sink. A 200mm x 200mm x 2mm aluminum plate is recommended as a heat sink.

If multiple sensors are installed side by side, a sensor might mistake the laser pulses of other units as its own and the detection error occurs. When it happens, usually the error lasts for one or two steps of measurement.   Please use software filters to handle this type of error.