Smart-URG Mini

Scanning Laser Range Finder
UST-10LX

The UST-10LX is a compact, lightweight 2D LiDAR sensor used for obstacle detection and localization on autonomous mobile robots (AMR) and automated guided vehicles and carts (AGV, AGC). Equipped with an Ethernet interface, it can obtain high-speed, accurate measurement data in a 270° field-of-view up to 10 meters. Due to its low power consumption, this scanner is suitable for battery-operated platforms.
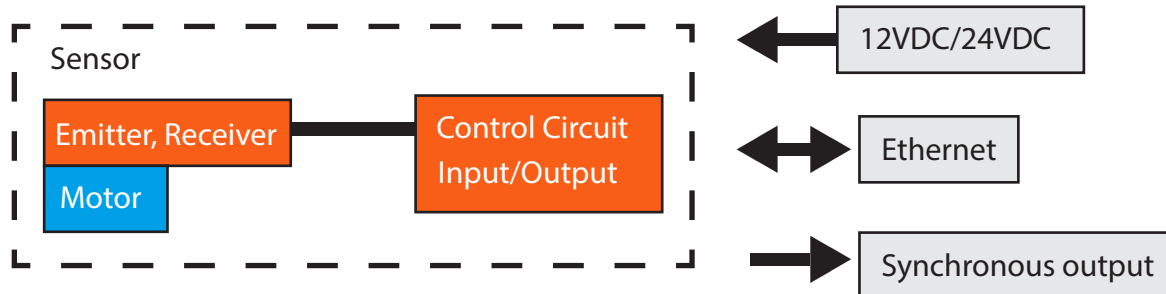
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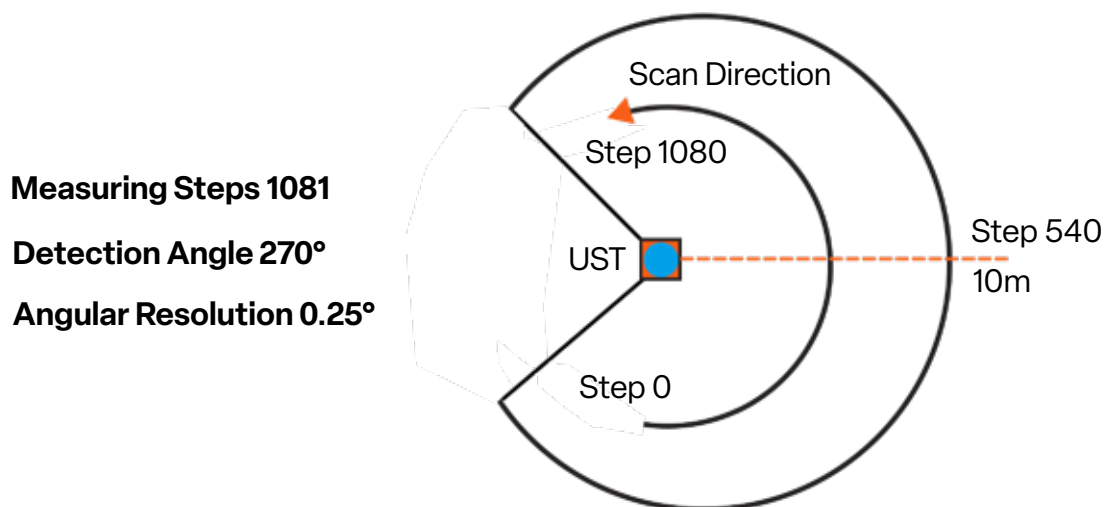Smart-URG

CE
RoHS

COMPACT, LIGHTWEIGHT 2D LIDAR SENSOR

1.Overview

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 this data through communication channel.

2.Structure

Sensor

Emitter, Receiver

Motor

Control Circuit Input/Output

12VDC/24VDC

Ethernet

Synchronous output

3.Laser Scanning Image

Measuring Steps 1081

Detection Angle 270°

Angular Resolution 0.25°

Scan Direction

Step 1080

UST

Step 540

10m

Step 0

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, equipment 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.

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4. Product Specs

Product Name	Scanning Laser Range Finder
Model	UST-10LX
Supply voltage	12VDC/24VDC (Operation range 10 to 30V ripple within 10%)
Supply current	150mA or less (When using DC24V) (during start up 450mA is necessary.)
Light source	Laser semiconductor (905nm) Laser class 1 (IEC60825-1:2007)
Detection range	0.06m to 10m (white Kent sheet) 0.06m to 4m (diffuse reflectance 10%) Max. detection distance : 30m
Accuracy	±40mm (*1)
Repeated accuracy	σ< 30mm (*1)
Scan angle	270°
Scan speed	25ms (Motor speed 2400rpm)
Angular resolution	0.25°
Start up time	Within 10 sec (start up time differs if malfunction is detected during start up)
Input	IP reset input, photo-coupler input (current 4mA at ON)
Output	Synchronous Output, photo coupler open collector output 30VDC 50mA MAX.
Interface	Ethernet 100BASE-TX
LED display	Power supply LED display (Blue): Blinks during start up and malfunction state.
Surrounding intensity	Less than 80,000lx Note : Avoid direct sunlight or other illumination sources as it may cause sensor malfunction
Ambient temperature and humidity	-10℃ to +50℃, below 85%RH (without dew, frost)
Storage temperature and humidity	-30℃ to +70℃, 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
Vibration resistance (Operating)	55 to 150Hz 19.6m / s2 sweep of 2min for 30min in each X,Y and Z direction
Shock resistance	196m/s2 (20G) X,Y and Z direction 10 times.
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
Protective Structure	IP65
Weight	130g (Excluding cable)
Material	Front case: Polycarbonate, Rear case: Aluminum
Dimensions (W×D×H)	50×50×70mm (sensor only）

(*1) Under the factory standard testing conditions using white Kent sheet.

5. Measurement Data

Distance Value (x)	Meaning
x < 21	Output numerical number "4" as Measurement error
21 ≦ x ≦ 30000	Valid distance [mm]
x > 30000	Output numerical number "65533" as Measurement error (object does not exist or object has low reflectivity)

6. Connection

6-1. Power source, I/O cable

Cable length: 1000mm Flying lead cable (AWG28)

Color	Signal
Red	COM Input +
Gray	COM Output -
Light Blue	IP Reset Input
Orange	Synchronous Output
Brown	+VIN (12VDC/24VDC)
Blue	-VIN

Note: Direction of Inputs and Outputs are mentioned from the sensor's side.

6-2. Ethernet cable

Cable length: 300mm

Color	Signal
Blue	TX+
White	TX-
Orange	RX+
Yellow	RX-

7. LED Display
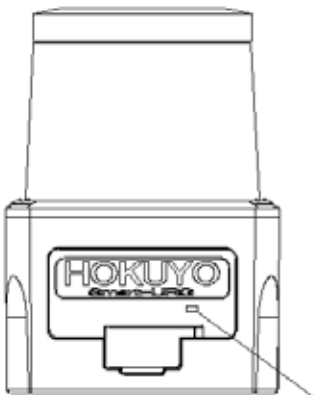
Power supply display
(Blinks during start up and malfunction state)

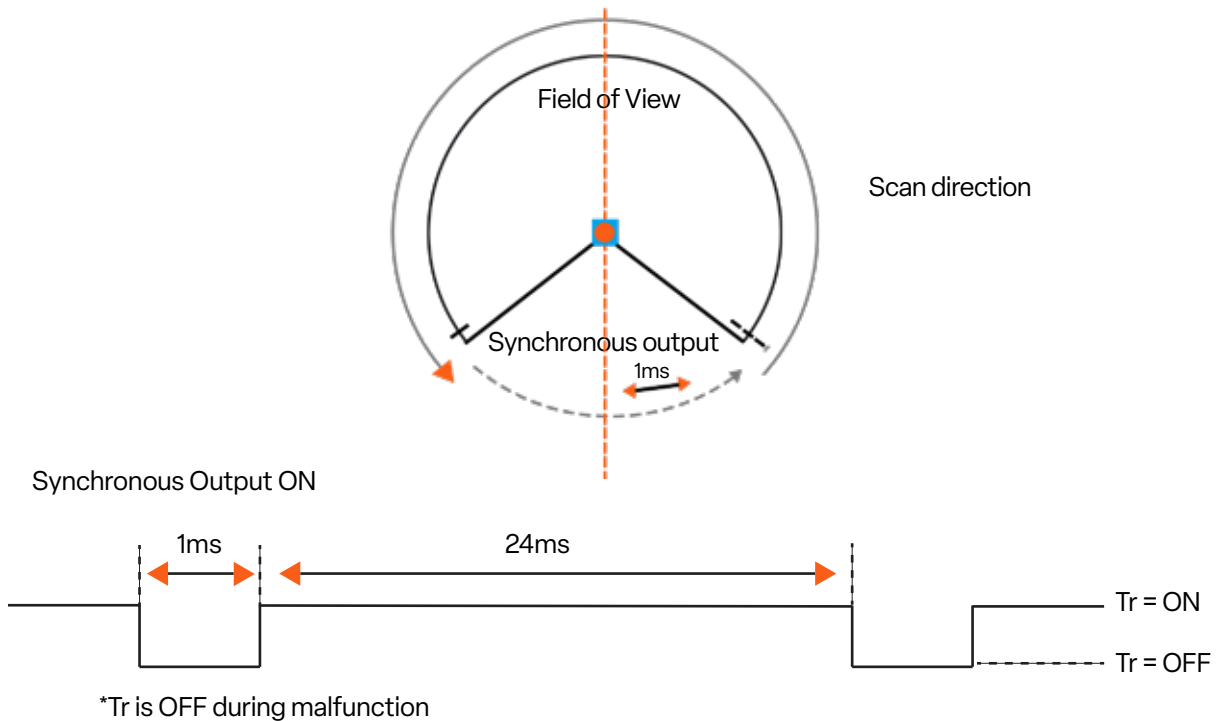# 8. Output Circuit
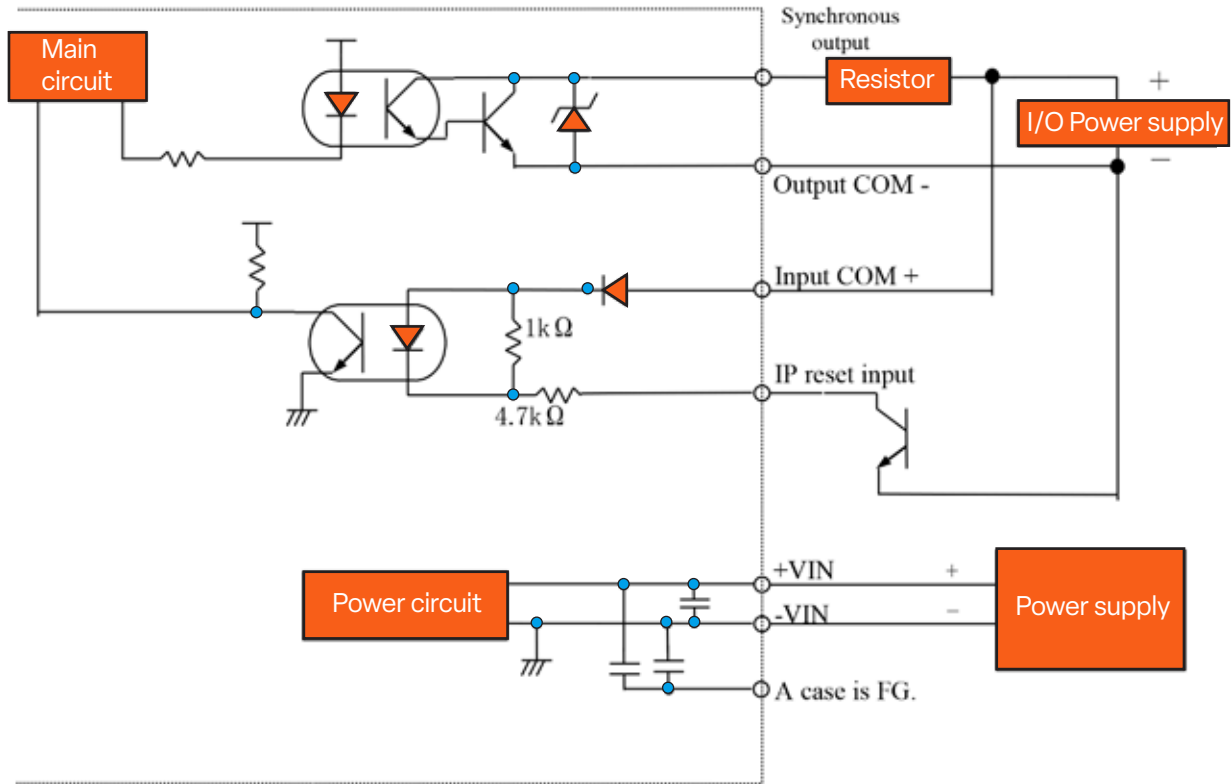
9. Control signal

9-1. Synchronous output

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

10. Ethernet Setting

1. The setting value is as below.

IP Initial value :192.168.0.10

Port number :10940

2. About Initialization of IP address

To reset IP address to the factory default value, please provide power to input circuit (see Section 8) and connect IP RESET LINE to COM- for more than 2 sec.

After IP RESET LINE is disconnected from COM- or opened, the sensor LED blinks and the sensor starts to reboot.

11. 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.

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●Read instruction manual carefully before use.

●Products published in this brochure are intended to be used under specific conditions.

●For product related questions or technical issues, please contact our offices.