Date: 2016.5.12

Scanning Laser Range Finder
UTM-30LX
Specification

CE
RoHS

Symbol	Amendment Details	Amendment	Date	Amended by	Number
1×2	Error correction, Note added	2,3,4,5	2016.5.12	Yoshimoto	RS-00728

Approved by	Checked by	Drawn by	Designed by		UTM-30LX Specification	
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1. Introduction

1.1 Operation principles

UTM-30LX use laser source (λ=905nm) to scan 270° semicircular field (Figure 1). It measures distance to objects in the range and co-ordinates of those point calculated using the step angle. Sensor's measurement data along with the angle are transmitted via communication channel. Laser safety is class 1.

2. Structure (Laser range figure)

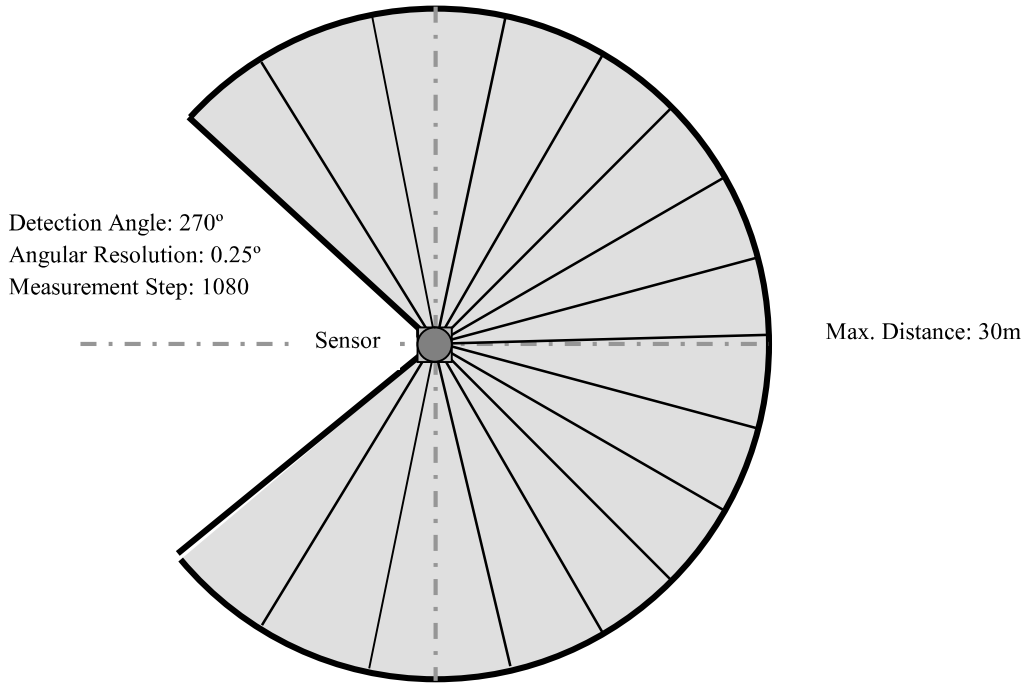


Figure 1

3. Important note ⚠

- This sensor is not certified for the functional safety.
- This sensor cannot be used for human body detection as per the machinery directives.
- 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.
- Sensor's operation may become unstable due to rain, snow and fog or due to dust pollution on the optical window.
- Rules and regulations related to safety should be strictly followed when operating the sensor.
- When there is a risk that this sensor is used for mass-destruction weapons, weapons and equipment aimed at killing human beings, and relevant technologies, etc., or when its usage for those purposes has become clear, sales may be prohibited in accordance with the Foreign Exchange and Foreign Trade Act, and the Export Trade Control Order (Japanese law). Moreover, regarding export of products, the formalities according to laws/Export Trade Control Order are implemented in order to maintain international peace and safety.
- Before using the sensor, please read this specification thoroughly.

4. Specifications ⚠1

Product Name	Scanning Laser Range Finder
Model	**UTM-30LX**
Light Source	Laser Semiconductor λ = 905nm Laser Class 1
Supply Voltage	12VDC ± 10%
Supply Current	Max: 1A, Normal : 0.7A
Power Consumption	Less than 8W
Detection Range and Detection Object	Guaranteed Range: 0.1 ~ 30m (White Kent Sheet) *2 Maximum Range : 0.1 ~ 60m Minimum detectable width at 10m : 130mm (Vary with distance)
Accuracy	Under 3000lx : White Kent Sheet: ±30mm*1 (0.1m to 10m) Under 100000lx : White Kent Sheet: ±50mm*1 (0.1m to 10m)
Measurement Resolution and Repeated Accuracy	1mm 0.1 – 10m : σ <10mm, 10 – 30m : σ <30mm (White Kent Sheet) *2 Under 3000lx : σ = 10mm*1 (White Kent Sheet up to 10m) Under 100000lx : σ = 30mm*1 (White Kent Sheet up to 10m)
Scan Angle	270°
Angular Resolution	0.25° (360°/1440)
Scan Speed	25ms (Motor speed : 2400rpm)
Interface	USB Ver2.0 Full Speed (12Mbps)
Output	Synchronous Output 1- Point
LED Display	Green: Power supply. Red: Normal Operation (Continuous), Malfunction (Blink)
Ambient Condition (Temperature, Humidity)	-10°C ~ +50°C Less than 85%RH (Without Dew, Frost)
Storage Temperature	-25~75°C
Environmental Effect	Measured distance will be shorter than the actual distance under rain, snow and direct sunlight*3.
Vibration Resistance	10 ~ 55Hz Double amplitude 1.5mm in each X, Y, Z axis for 2hrs. 55 ~ 200Hz 98m/s^2 sweep of 2min in each X, Y, Z axis for 1hrs.
Impact Resistance	196m/s^2 In each X, Y, Z axis 10 times.
Protective Structure	Optics: IP64
Insulation Resistance	10MΩ DC500V Megger
Weight	210g (Without cable)
Case	Polycarbonate
External Dimension (W×D×H)	60mm×60mm×85mm MC-40-3127

*1 Under Standard Test Condition (Accuracy can not be guaranteed under direct sunlight.)

*2 Indoor environment with less than 1000Lx.

*3Please perform the necessary tests with the actual device in the working environment.
Use data filtering techniques to reduce the effect of water droplets when detecting objects under the rain.

5. Quality Reference Value

Vibration resistance during operation	10~150Hz 19.6m/s^2 Sweep of 2min in each X,Y,Z axis for 30min
Impact resistance during operation	49m/s^2 X, Y,Z axis 10 times
Angular Speed	2π/s (1Hz)
Angular Acceleration	π/2rad/ s^2
Life-span	5 Years (Varies with operating conditions)
Noise Level	Less than 25dB at 300 mm
Certification	FDA Approval (21 CFR part 1040.10 and 1040.11)

6. Interface

6.1 Robot Cable 4 Pin

Color	Function
Brown	+12 V
Blue	0 V
Green	Synchronous Output
White	COM Output (0V: Common to Power)

Note: 0 V of the power supply and Output are not internally connected. Connect it when it is necessary.

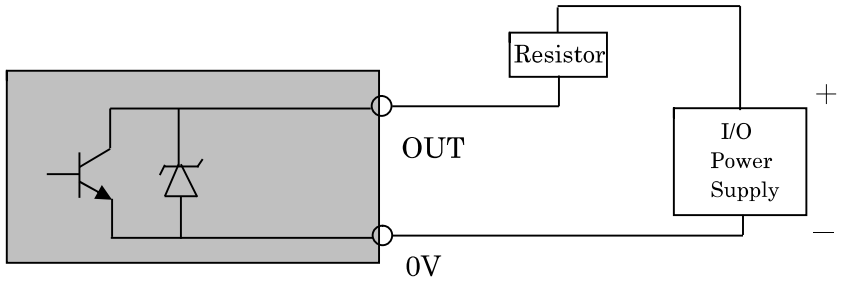
6.2 USB Connector

TYPE-A

Note:

SG for communication and GND are connected internally (Isolated with Input -VIN).
Isolate the device from any connection that generate electric noise.
This sensor is compatible with SCIP2.0 communication protocol standard.

6.3 Output circuit diagram



Rated power: 30V, 30mA (or less)

Note: Rated resistor should be used for the output.

Figure 2

7. Control Signal

Synchronous Output (UTM-30LX)

1 pulse is approximately 1 ms. Output signal Synchronization timing chart is shown below (Figure 3).

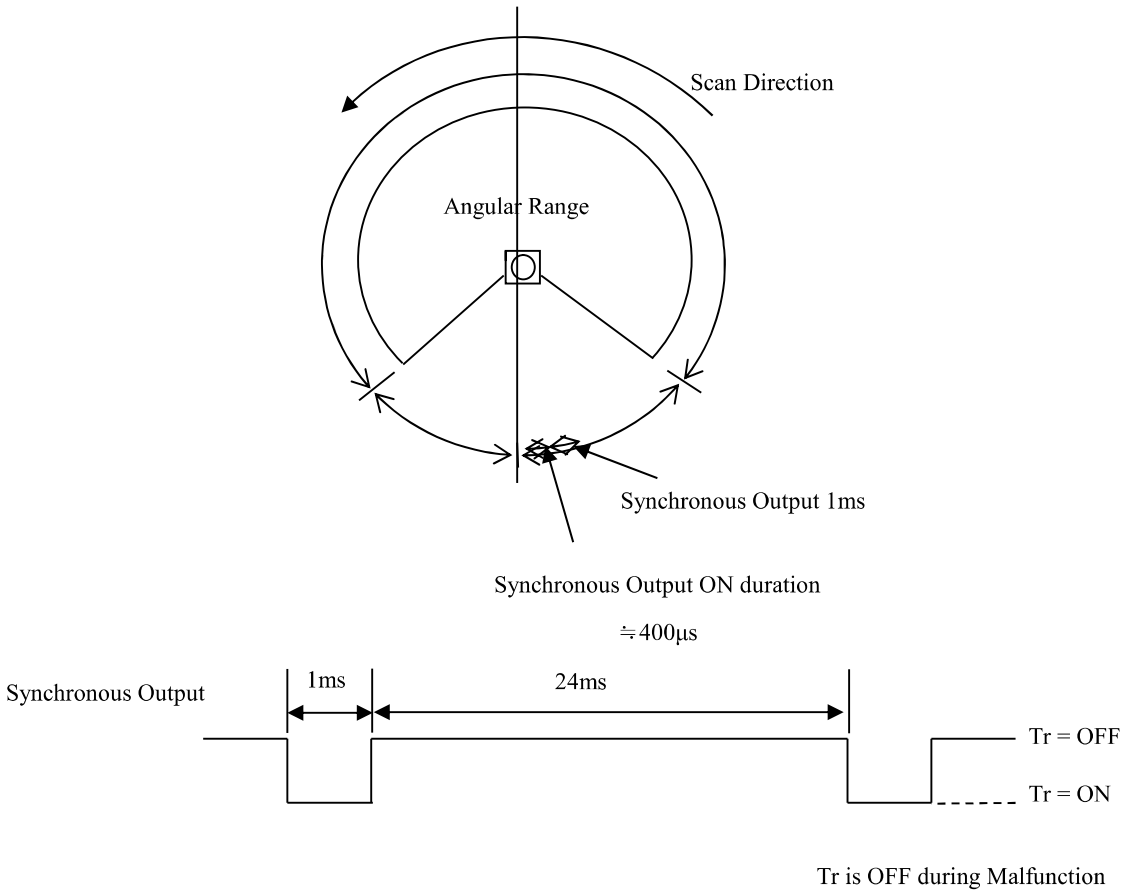


Figure 3

8. Malfunction Output:

1. Laser malfunction: When laser does not radiate or exceeds safety class 1.
2. Motor malfunction: When rotation speed is differ from the default value (> 25 ms).

Synchronous/Warning signal will be turned OFF when these malfunctions are detected. Error details can be obtained via communication.

9. Cautions

Heat is generated as the sensor runs at a very high speed. The heat generated is concentrated at the bottom of the sensor. Please mount heat-sinks or any appropriate component to release the generated heat. An aluminum plate (200 x 200 x 2 mm) is recommended as the heat-sinks.

Mutual Interference could occur when 2 or more identical sensors are mounted at the same detection plane. This is because the sensor could not identify the origin of the received laser pulses and cause measurement error in 1 -2 steps. Performing data filtering could overcome this problem.