Scanning laser range sensor

UTM-30LX-F

SPECIFICATIONS

Symbols	Amended reason	Pages	Date	Corrector	Amended No.

Approved by	Checkec by	Drawn by	Designed by	Title	Scanning Laser Range Sensor	
					UTM-30LX-F Specifications	
Kamitani	Kamon	F.Yamamoto	Sakamoto	Drawing No.	C-42-3844	1／5

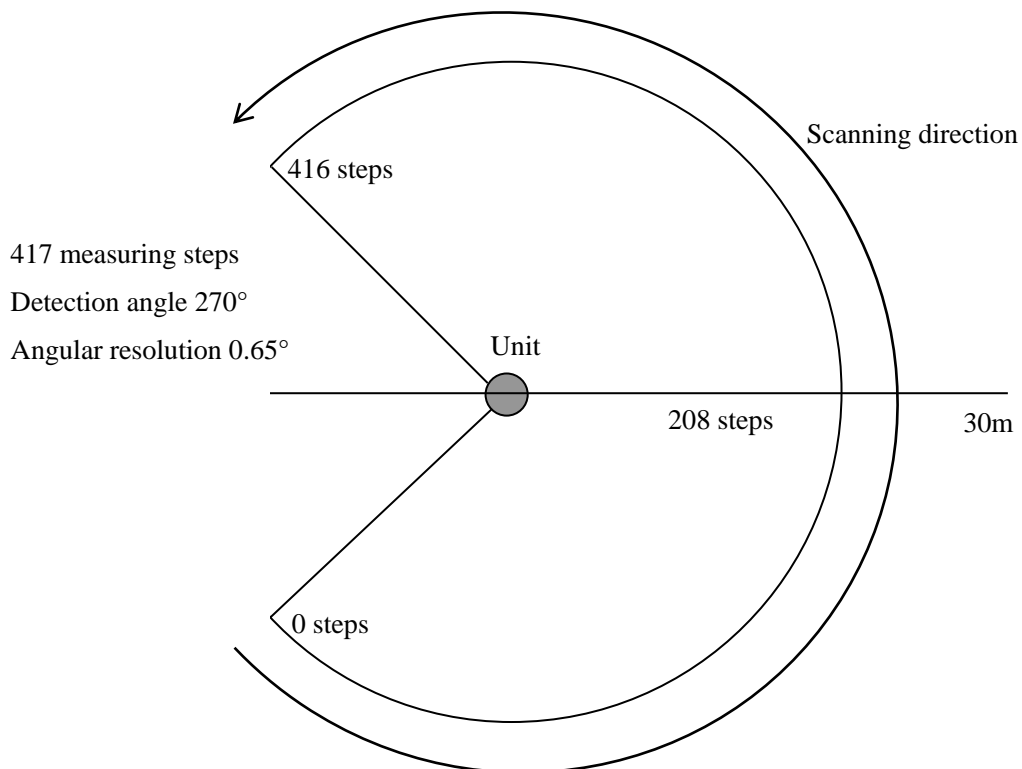## 1. Introduction

This model uses laser source ($\lambda = 905$nm) to scan a semicircular field and 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 Class 1)

2. Structure

Following is showing an image of the scanning.

416 steps

417 measuring steps

Detection angle 270°

Angular resolution 0.65°

Unit

208 steps

30m

Scanning direction

0 steps

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.

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4. Specification

Products	Scanning Laser Range Finder
Model No.	UTM-30LX-F
Light source	Laser Semiconductor λ = 905nm Laser Class 1
Supply voltage	12VDC±5%
Power consumption	8W or less, rush current : approx.1A
Detection Range and Detection Object	At 0.1 to 30m : white kent sheet*2 Min detectable object : 170mm up to 5m
Accuracy	0.1 to 10m : ±30mm, 10 to 30m : ±50mm(White Kent Sheet)*2 Under 3000lx : White Kent Sheet : ±30mm*1(0.1 to 10m) Under 100000lx : White Kent Sheet : ±50mm*1(0.1 to 10m)
Measurement Resolution and Repeated Accuracy	1mm 0.1 to 10m : σ<10mm, 10 to 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	Approx. 0.65° (270°/416 steps)
Scan Speed	10msec (motor rotation speed : 6000rpm)
Interface	USB Ver.2.0 FS mode (12Mbps)
Output	Output 1 point(synchronous output and malfunction output in common use)
LED Display	Green: Power supply. Red: Normal Operation (Continuous), Malfunction (Blink)
Ambient Condition (Temperature,Humidity)	-10℃～＋50℃ Less than 85%RH (Without Dew, Frost)
Storage Temperature	-25℃～+75℃
Environmental Effect	Measured distance will be shorter than the actual distance under rain, snow and direct sunlight*3.
Vibration resistance	10 to 55Hz, double amplitude 1.5mm Each 2 hour in X, Y and Z directions 55 to 200Hz, 98m/s², sweep 2 min. each 1 hour in X, Y and Z directions
Impact resistance	196m/s² In each X, Y, Z axis 10 times.
Protective structure	Optics: IP64
Insulation resistance	10MΩ 500VDC megger
Weight	210g (Without cable)
Case	Polycarbonate
External dimension (W×D×H)	60mm×60mm×87mm MC-40-3127

Note)   *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.

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5. Quality Reference Value

Vibration resistance during operation	10 to 150Hz 19.6m/s^2　　Sweep of 2min in each X,Y,Z axis for 30min
Impact resistance during operation	49m/s^2 each 10 times for X, Y and Z directions
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

(1) 4-core Robot cable

Color	Function
Brown	DC+12V Power
Blue	0V Power
Green	Synchronous Output
White	COM Output *

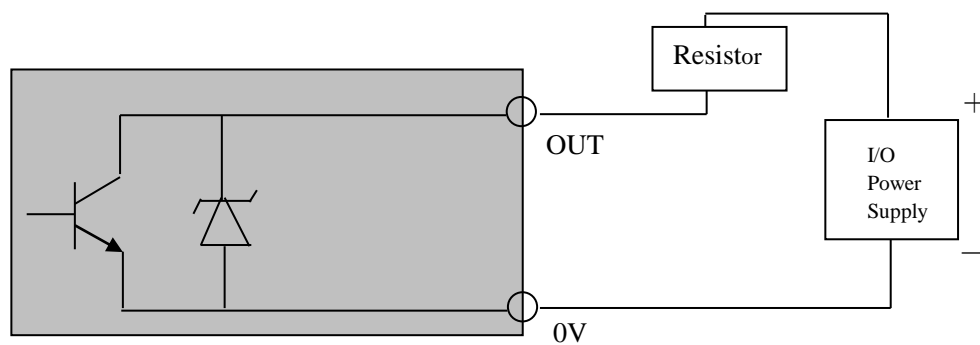　　　* Power 0V and Output COM are not connected inside.
　　　　Please short between the 0V (blue) and the output COM (0V) when wiring.

(2) USB Cable TYPE-A
   Note 1) SG for communication and GND are connected internally (Isolated with Input -VIN).
   Isolate the device form any connection that generate electric noise.

   This sensor is compatible with SCIP2.0 protocol standard.

(3) Output circuit

　　　　Rated power: 30V, 30mA (or less)

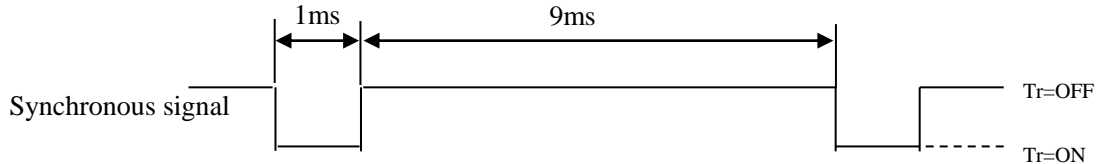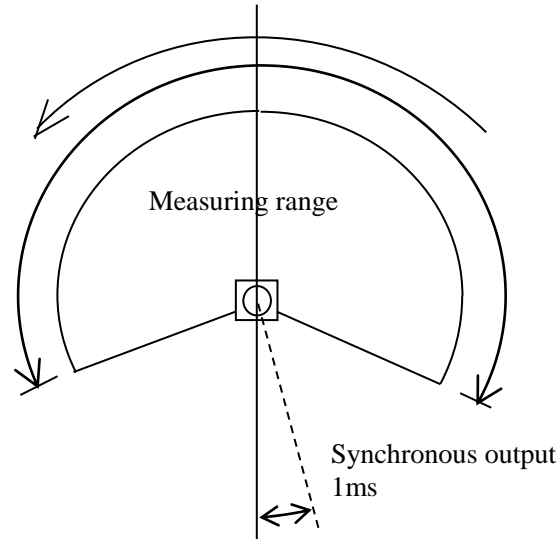　　　Note: Rated resistor should be used for the output.

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7. Control signal

Synchronous output

Output is one pulse for approximately 1msec after every scan in synchronization with scanning.

Output time is as follows :

Measuring range

Synchronous output
1ms

1ms   9ms

Synchronous signal

Tr=OFF

Tr=ON

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.

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