

Date: 2008.04.14

# Scanning Laser Range Finder

## UTM-30LX/LN

# Specification

Symbol	Amendment Details			Amendment	Date
Amended by	Number				
Approved by	Checked by	Drawn by	Designed by	Title	<u>UTM-30LX/LN</u>
	MORI	KAMITANI	HINO		Specification
				Drawing No.	C-42-3615
					1/5

## 1. Introduction

UTM-30LX/LN use laser source ( $\lambda = 870\text{nm}$ ) to scan  $270^\circ$  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.

Sensor is divided into two types depending upon the type of output.

### 1. UTM-30LX

It outputs synchronous signal after every scan. These are mainly intended for robotic applications.

### 2. UTM-30LN

It outputs warning signal whenever there is any object in the pre-set area. These are mainly intended for area protection.

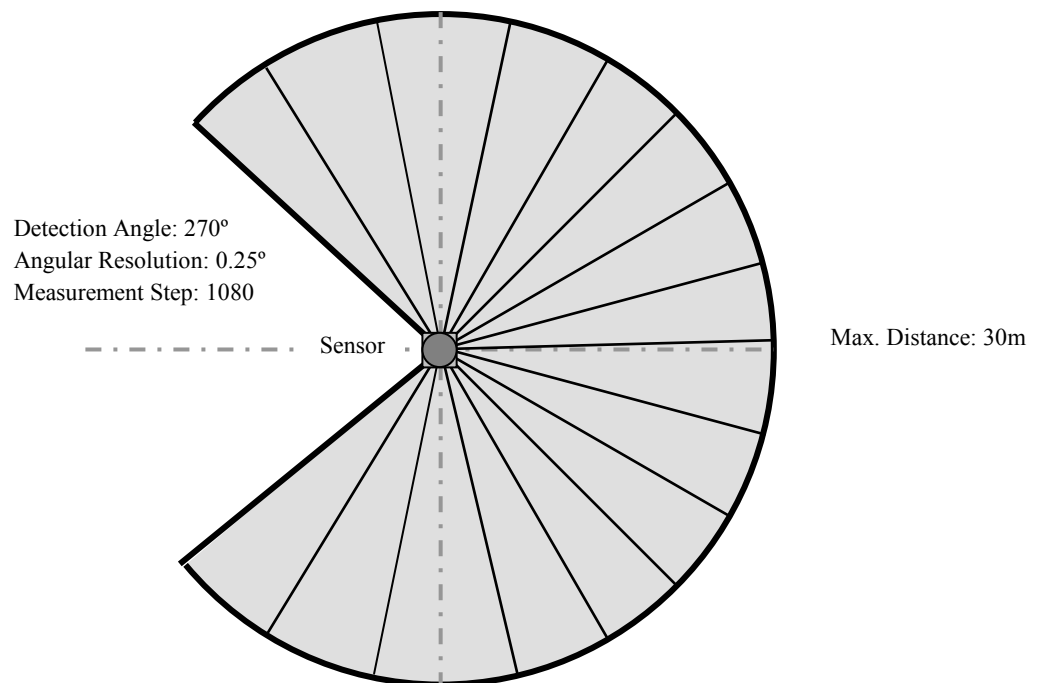


Figure 1

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## 2. Specifications

Product Name	Scanning Laser Range Finder	
Model	<b>UTM-30LX</b>	<b>UTM-30LN</b>
Light Source	Laser Semiconductor $\lambda = 870\text{nm}$ , Laser Class 1	
Supply Voltage	12VDC $\pm 10\%$	
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) Maximum Range : 0.1 ~ 60m Minimum Width detected at 10m : 130mm (Change with distance)	
Accuracy	Under 3000lx : White Kent Sheet: $\pm 30\text{mm}^{*1}$ (0.1m to 10m) Under 100000lx : White Kent Sheet: $\pm 50\text{mm}^{*1}$ (0.1m to 10m) (Also refer data sheet attached with the product.)	
Measurement Resolution and Repeated Accuracy	1mm Under 3000lx : $\sigma = 10\text{mm}^{*1}$ (White Kent Sheet up to 10m) Under 100000lx : $\sigma = 30\text{mm}^{*1}$ (White Kent Sheet up to 10m)	
Scan Angle	270°	
Angular Resolution	0.25° (360°/1440)	
Scan Speed	25ms (Motor rotation speed : 2400rpm)	
Interface	USB Ver2.0 Full Speed (12Mbps)	
Output	Synchronous Output 1- Point	Warning Output 1- Point
Ambient Condition (Temperature, Humidity)	-10°C ~ +50°C Less than 85%RH (Without Dew, Frost)	
Preservation Temperature	-25~75°C	
Environmental Effect	Measured distance will be shorter than the actual distance under rain, snow and direct sunlight <sup>*2</sup> .	
Vibration Resistance	10 ~ 55Hz Double amplitude 1.5mm in each X, Y, Z axis for 2hrs. 55 ~ 200Hz 98m/s <sup>2</sup> sweep of 2min in each X, Y, Z axis for 1hrs.	
Impact Resistance	196m/s <sup>2</sup> In each X, Y, Z axis 10 times.	
Protective Structure	Optics: IP64	
Insulation Resistance	10M $\Omega$ DC500V Megger	
Weight	210g (Without cable)	
Case	Polycarbonate	
External Dimension (W×D×H)	60mm×60mm×85mm MC-40-3127	

<sup>\*1</sup> Under Standard Test Condition (Accuracy can not be guaranteed under direct sunlight.)

<sup>\*2</sup> Confirm sensor functions under operating environment. Measures such as signal processing in LX type and ON/OFF delay in LN type should be taken if necessary to avoid measurement faults.

## 3. Quality Reference Value

Operating Vibration resistance	10~150Hz 19.6m/s <sup>2</sup> Sweep of 2min in each X,Y,Z axis for 30min
Operating Impact resistance	49m/s <sup>2</sup> X, Y,Z axis 10 times
Angular Speed	2 $\pi$ /s (1Hz)
Angular Acceleration	$\pi/2\text{rad/s}^2$
Life	5 Years (Varies with operating conditions)
Sound Level	Less than 25dB at 300 mm
Certification	FDA Approval (21 CFR part 1040.10 and 1040.11)

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## 4. Interface

### (1) Robot Cable 10Pin

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

### (2) USB Connector TYPE-A

#### Note:

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.

## 5. Control Signal

### (1) Synchronous Output (UTM-30LX)

Output is one pulse for approximately 1msec after every scan (Figure 2).

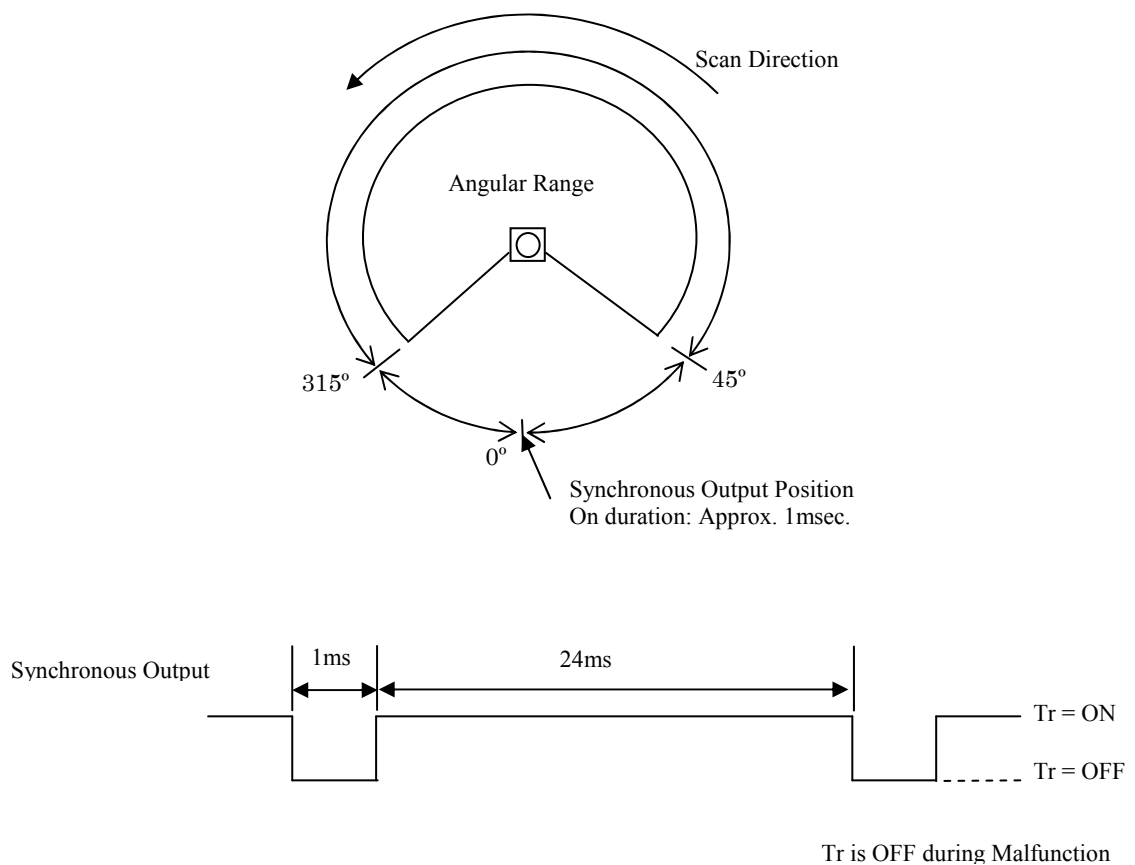


Figure 2

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(2) Warning Signal (UTM-30LN)

Protection area can be set in LN-type sensors using application software (Figure 3). Output is switched off when obstacles are detected inside the pre-set area (Output is ON when there are no obstacles).

Area is set using 3~7 co-ordinate points.

Maximum output delay can be set to 128 times (3.2 sec)

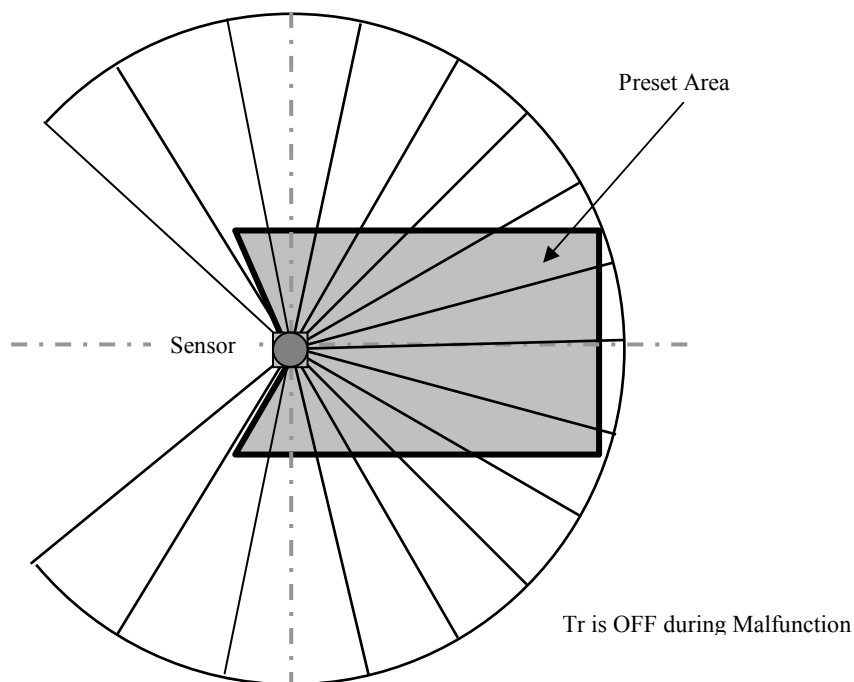


Figure 3

(3) Malfunction Output:

1. Laser Malfunction : When laser does not radiate or exceeds safety class 1.
2. Motor Malfunction : When rotation speed is not equal to preset value.

When these malfunctions are detected synchronous/Warning signal is turned to OFF state. Error analysis can be done via communication.

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