DE-LIDAR TF01

SKU 114990991   Ⓕ Ⓣ Ⓖ Ⓟ Ⓡ

IN STOCK 6 Available

− 1 +   **ADD TO CART**

Description

Best-sellers

Technical Details

Questions and Answers

View History

Description

What is DE-LIDAR TF01.

DE-LIDAR TF01 is based on ToF (Time of Flight) principle, with unique characteristic of optics, electronics, and design. It can also achieve stable, accurate, high-sensitivity and high-speed distance measurement.

| Key Features	Sensitivity	High
	Detection range	10m max（@90% Reflection）
	Detection frequency	500Hz
	Anti – ambient light	Function under 100k Lux ambient light
	Shape	Exquisite size，light weight（< 50 g）
	Accuracy	Centimeter-level(1% Relative error)
Applications	UAV(drones) floating at fix height Terrain Followin	
	Machine control, security sensor	
	Distance measurement	

Dimension and specification

Picture below is reference design，the size is 51mm*36mm*48mm.

1: Shell 2：Assembly hole 3：Wire

DELiDAR TF01 Mechanical Dimensions（reference design）
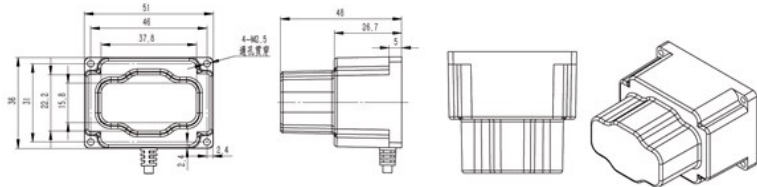
DELiDAR TF01 contour dimension（unit：mm）

Working principle

Time of Flight (ToF) is a distance measurement method. The modulated near-infrared light emitted from sensor is reflected by the object. By calculating the time difference or phase

difference between emission and reflection, the distance from the object can be deduced and so does the depth information.

Electrical characteristics

Parameter	Symbol	Typ.	Unit
Supply voltage	DC	7.4-12（±5%）	V
Power Consumption	P	≤1	W
LED peak current	I_{max}	200	mA
TTL	V_{TTL}	0～3.3	V

Optical characteristics

Parameter	Symbol	Conditions/Comments	Typ.	Unit
Operating range	L	100Klux ambient light @90% Reflection	30-1000	cm
Emitting half-angle	α	Customizable	1	Degree
Receiving half-angl	β	Customizable	1	Degree
Detection	De	Minimum detectable object size @ 5m	4 - 6	cm
Resolution	Re	Sensitivity to distance change	0.5	cm
Operating temperature	T		-10~60	°C
Peak Wavelength	λ		850	nm

Test conditions: stable working for 8 hours.

Data output and protocol

Table below is protocol for DELiDAR TF01

Protocol	UART
Baud rate	115200
Data bit	8
Checksum bit	1

Data is output in hexadecrimal format, 9 bytes per frame，including one distant info，called "Dist"；Every "Dist" has a seriel number info to it，called Sequence；Frame end bit is checksum bit.

Byte1 - 2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8	Byte9
0x59 59	Dist_L	Dist_H	Strength_L	Strength_H	Sequence_L	Sequence_H	CheckSum_L
Data coding information							
Byte1	0x59，frame head，same in every frame						
Byte2	0x59，frame head，same in every frame						
Byte3	Dist_L distance value lower eight bit Distance is shown by HEX，eg.1000cm=03 E8（HEX）						
Byte4	Dist_H distance value upper eight bit						
	Strength_L Lower eight bit ale 0-2000，indoor<3 reject, outdoor<10 reje						

|	ct
Byte6	Strength_H Uppereight bit
Byte7	Sequence _L Serial number lower eight bit Sequence scale vary from 00 00 to FF FF, stands for 0 to 65535, to mark the continuity of the data
Byte8	Sequence _H Serial number upper eight bit
Byte9	Checksum check lower eight bit, Checksum = Byte1 + Byte2 + … + Byte8, Checksum is the sum of the former eight bit, we only send the lower eight bit.

Noise Model

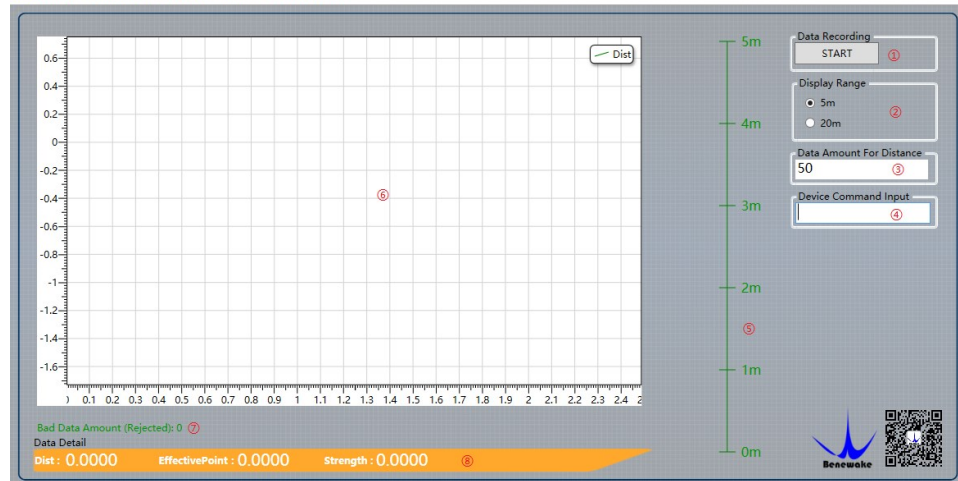| Strength	Correction Dist standard deviation/cm
>110	< 0.7
80 – 100	0.7 – 1.1
50 – 80	1.1 – 2
20 – 50	2 – 5
< 20	>5
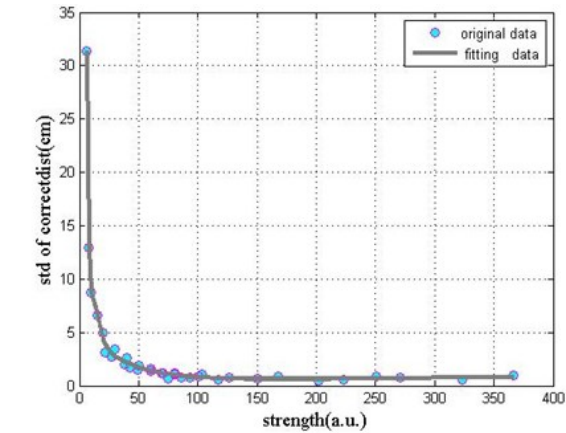
correction dist standard deviation-strength curve

Line sequence
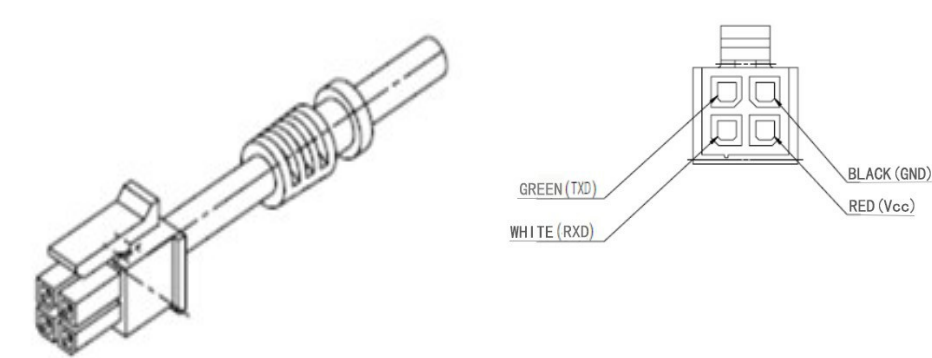
Technical requirement：

1. Connect model Molex 43025-0400
2. Cable should be 4 core shielded RVV wire, inner core diameter 0.2

GUI

Windows TF-Module Data Display Program UI

① "Start" button, press the button to record TF-01 HEX data, the data will be saved in the same directory with the GUI;

② "Display Range", click 5m or 20m to switch display scale between 5m and 20m;

③ "Data Amount for Distance", Data amount to get an average distance(DAGAD)

④ Device command input area, input HEX command in this window and press Enter to send, to change functions or setting;

⑤ Scale to display the real-time measurement;

⑥ Area to display average distance-number of measurements;

⑦ the amount of the data rejected.

⑧ Data Detail area：Dist stands for distance，unit cm；Effective Point stands for data quantity of TF-01 output；Strength stands for signal strength.

Frequently Asked Questions

(1)What is the spread of the laser beam?

At very close distance (<0.5m), the beam diameter is about the size of the aperture of the lens. For distance larger than 0.5m, the beam diameter can be estimated using the following equation:

distance / 20 = beam diameter at the this distance

The actual spread is ~52 milli-radians or ~3 degree.

(2)How do distance, target size, aspect, and reflectivity affect returned signal strength?

The device transmits a focused IR beam that reflects off a target, among which a portion of which returns to the receiver. The distance between the device and the target is determined by the difference between the moment of signal transmission to the moment of signal reception. The effective reception of a reflected signal is influenced by, but not limited to, the following factors:

- Target distance
  Returned signal strength ~ $1/D^2$
  D: distance
- Target size
  Returned signal strength ~ $1/C^4$
  C: cross section of a target
- Aspect
  The orientation of the target to the sensor influences the observable cross section.
- Reflectivity
  The reflective characteristics of the surface of the target influence the amount of returned signal.

Generally, it is difficult to detect a small target, especially when it is distant, poorly reflective, and its aspect is away from the normal. Nevertheless, the returned signal strength can be improved by attaching an IR reflector to the target, enlarging the size of the target, modifying its orientation, or reducing its distance from the sensor.

(3)How does the device work with different reflective surfaces?

Generally speaking, the reflective characteristics of the surface of an object can be dedvided into threee categories: diffuse reflective, specular and retro-reflective.

- Diffuse reflective surface
  For surfaces of materials like paper, matte walls and granite, their textured quality results in the uniform dispersion of reflected energy. Therefore the reflected energy of the dispersed laser is relaatively predictable in percentage. As a result, these materials can be read very well.
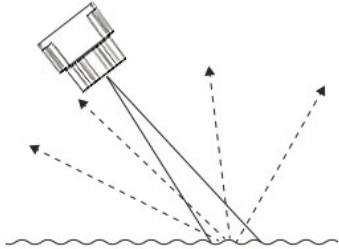
- Specular surface
  For specular surfaces, only a small amout or even none of the reflected light reaaches the receiver, depending on the smoothness of the surface and the observation angle. The suggestion is to view the object from the normal.

Cautions：

- Any technical problems please contact us since it is customized optical instrument with high precision.
- Operating temperature：-10-60℃，storage temperature：0-70℃
- The operating environment must be kept clean. Prevent dust or other stuff from getting into the lens.
- Keep away from high temperature and high humidity environment for storage, transportation or operation.
- Keep away from acid or strong sulfur environment.

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Technical Details

Weight	G.W 58.5g
Battery	Exclude

Part List

DE-LIDAR TF01	1

Questions and Answers

Have a question about this? Ask people who own it.

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Where I can find the Linux or Android driver for this LiDAR? The official Web-site (http://www.benewake.com/Download_e.html) provides the driver only for TE01 and it is not opensource.

Volodymyr Triapichko on Jan 07,2017   Reply ∣
                                                         ♡ upvote (2)

it looks(from above) to be just serial comms. no driver reqd. maybe the driver is for some other mode of comms...

Mark Schafer on Jan 07,2017 06:55 AM   Reply ∣
                                                         ♡ upvote (1)

I think the point of this device is that it is targeted to either electronics engineers wanting to integrate it into their electronic designs, or embedded programmers that have UART access from a uC. For the high-level software engineers wanting to talk to the device from a PC (whom usually expect device-drivers to allow access hardware) then I am afraid this product is not targeted to them as there is no USB port on it - instead, you will either need a serial adapter board from your PC to talk to it via UART, or for Linux devs you could use a Raspberry PI via the GPIO connectors using UART.

cook_shane on Jan 09,2017 03:39 AM   Reply ∣
                                                         ♡ upvote (1)

I checked their website. They have a program using this LiDAR. And they also provide serial and CAN protocol so that we can input the data via any program. I tested it on Matlab and Mathematica. Looks Great!

opticsly on Jan 18,2017 05:31 AM   💬 Reply |
                                                                    ♡ upvote (0)

0

Why is this called a LiDAR? Looks more like an accurate range finder. I could turn it into a LiDAR with servo scanning?

dsrc12 on Jan 07,2017   💬 Reply |
                                                                    ♡ upvote (0)

Lidar means "Light Detection and Ranging" but is generally used by devices using a TOF mechanism. This indicates it is TOF. So the term Lidar seems legit IMHO.You might mean Lidar scanner. which is what you'd have to make with this and a servo or rotating mirror assembly (faster, more stable)I too wanted a lidar scanner. This device has update rate of 500Hz which is probably its maximum sampling rate. Therefore work out how far you can rotate it and sample at 500Hz to get the field you want to scan.500Hz (500 samples per second) isnt bad.It also has a maxobject detect of 4cm at 5m and range is 30cm to 10m.So it looks like it might make a low res low speed scanning lidar but frankly its hard to tell. The question is - is it worth the gamble for the money ? Its your money...

Mark Schafer on Jan 07,2017 07:02 AM   💬 Reply |
                                                                    ♡ upvote (0)

0

How long does it take to take a measurement?

Simon Atkinson on Jan 06,2017   💬 Reply |
                                                                    ♡ upvote (0)

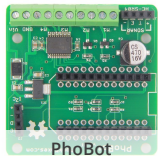sample rate indicated at 500Hz or 500 samples per second. I presume this is a max rate.

Mark Schafer on Jan 07,2017 07:04 AM   💬 Reply |
                                                                    ♡ upvote (0)

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