



HI50 Laser Ranging Module Specification

1. Product Overview

HI50 is a miniaturized Class II laser distance sensor with 635nm red visible laser and TTL serial communication. It supports distance measurement from 0.02m to 50m without reflector. Featuring compact size and low power consumption, it is widely applied in industrial ranging, automatic inspection, robot obstacle avoidance, material level detection and other scenarios.

2. Electrical & Optical Specifications

表格

Parameter	Specification	Remarks
Model	HI50	—

Parameter	Specification	Remarks
Standard		
Measurement	$\pm 1 \text{ mm}$	Under standard test environment
Accuracy		
Accuracy under harsh conditions	$\pm 2 \text{ mm} + 40 \text{ PPM}$	Strong ambient light, target with abnormal diffuse reflectance
Measuring Range		Reflector is recommended under
(Without Reflector)	$0.02 \text{ m} \sim 50 \text{ m}$	strong sunlight or low-reflection target surface
		Distinguished by slow measure
Measurement Time	$0.3 \sim 2 \text{ s}$	command D / fast measure command F
		Low-power laser safe for human eyes
Laser Safety Class	Class II	
Laser Parameter	635 nm, <1 mW	Red visible laser
Supply Voltage	DC 2.0 ~ 3.0 V (Nominal 3V)	Rated operating current: 120 mA; Peak current: 300 mA
Module Dimension	45×25×12 mm	Excluding LCD screen
Net Weight	38 g	–
Standard Operating Temperature	$0 \text{ }^{\circ}\text{C} \sim +40 \text{ }^{\circ}\text{C}$	Custom version available for $-10 \text{ }^{\circ}\text{C} \sim +50 \text{ }^{\circ}\text{C}$ wide temperature range

Parameter	Specification	Remarks
Storage Temperature	-25 °C ~ +60 °C	Long-term storage temperature range

3. Hardware Interface Definition

3.1 Pin Definition (4-pin gold finger / cable socket)

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Pin Label	Function	Wiring Rule
DC3.0	Power Positive	Connect to 3V power output of main controller
GND	Power Ground	Common ground with main controller
TX	Module Transmit Pin	Connect to RX receive pin of MCU mainboard
RX	Module Receive Pin	Connect to TX transmit pin of MCU mainboard

3.2 Wiring Notes

1. The module adopts 3V TTL logic level; DO NOT directly connect to 5V MCU IO ports, voltage divider or level shifter is required.
2. Supply voltage must be strictly limited between 2.0V and 3.0V; overvoltage will permanently damage the laser transmitter.
3. Cross connection rule for TX/RX: Module TX ↔ Mainboard RX; Module RX ↔ Mainboard TX.

4. Serial Communication Protocol

4.1 Serial Port Basic Configuration

- Communication Type: TTL asynchronous serial
- Baud Rate: 19200
- Data Bit: 8 bits

- Parity Bit: None
- Stop Bit: 1 bit (factory default)

4.2 Command Set (Send single uppercase character command)

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Downlink Command	Function Description
O	Turn on laser emitter
C	Turn off laser emitter
D	Slow ranging, return distance data
F	Fast ranging, return distance data
S	Query internal module temperature & real-time supply voltage

5. Cautions for Use

1. Measurement Environment Restrictions
 - Under strong direct sunlight or outdoor high-light environment, the effective measuring distance will be greatly reduced without reflector; special reflector is suggested.
 - Measurement error will increase when measuring pure black, transparent glass or high-gloss mirror surfaces, accuracy refers to harsh condition standard: $\pm 2 \text{ mm} + 40 \text{ PPM}$.
1. Temperature Customization Standard model works at $0 \sim 40^{\circ}\text{C}$; custom wide-temperature version ($-10^{\circ}\text{C} \sim 50^{\circ}\text{C}$) is available upon order request.
2. Laser Safety This product is Class II low-power laser. Do not stare at laser emitting window for long time to avoid eye discomfort.
3. Power Supply Requirement Peak instantaneous current can reach 300mA, power supply must have sufficient load capacity; long-term power supply with high internal resistance button battery is prohibited.

6. Mechanical Dimension

- Outline Size: 45 mm (L) $\times$ 25 mm (W) $\times$ 12 mm (T)

- Weight: 38 g
- Structure: Integrated injection molded housing, 4-pin power & communication cable socket on side edge
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