



Leadtron & DH116 Series Dexterous User Manual

1. Overview

The DH116 series five-fingered dexterous hand is the second-generation mass-produced version of the five-fingered dexterous hand developed by Shenzhen Lingqiao Drive and Control Technology Co., Ltd. The DH116 series dexterous hand is driven by a brushless coreless motor and adopts a worm gear and worm drive scheme, with a total of 11 degrees of freedom, weighing 545g. It can be configured with fingertip and palm tactile sensors, capable of perceiving multi-dimensional force tactile information such as normal force, tangential force, and tangential force direction.



DH116 series dexterous hands have the characteristics of "**two highs, two strengths and one light**":

- **High-speed communication**

Standard with 100MHz**EtherCAT** communication, enabling 100-fold accelerated real-time haptic feedback and motion control. It also supports**CANFD/RS485** and other conventional communication protocols.

- **High reliability**

Equipped with a brushless coreless servo motor, FOC current loop, and force-position hybrid control algorithm, it comes standard with 6 tactile sensors, has proximity sensing and soft landing capabilities, and achieves a grasping lifespan of **1 million cycles**.

- **Powerful load capacity**

The maximum load capacity of the entire hand can reach **30kg** , the maximum load capacity of a single finger is **5kg** , the lateral grip strength exceeds **50N** , and it can easily handle handling scenarios.

- **Powerful perception ability**

Standard configuration **MultiModal Machine Learning tactile sensor**, enabling accurate perception of multi-dimensional data information of objects.

- **Lightweight**

545g±10g standard sensor

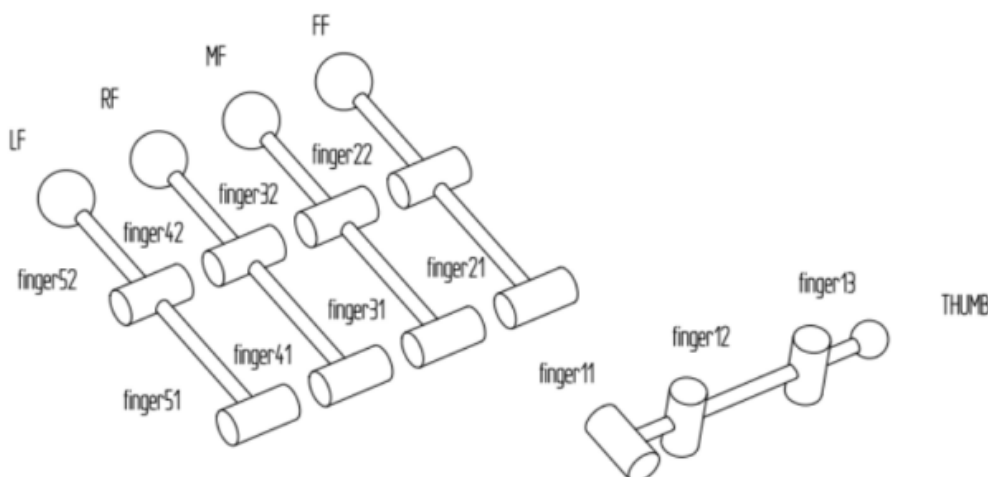
2. Product Parameters

2.1 Basic Parameters

Product Name	Product Image			
DH116 Series Popularized Dexterous Hand				
Category	Popular		MultiModal Machine Learning Perception Type	
Model	DH116-L1 DH116-R1	DH116EC-L1 DH116EC-R1	DH116-L1-M DH116-R1-M	DH116EC-L1-M DH116EC-R1-M
Degree of Freedom	11 degrees of freedom, 6 active degrees of freedom			

Communication Method	CANFD	EtherCAT	CANFD	EtherCAT
sensor	None		MultiModal Machine Learning Tactile Sensor, Normal Force, Tangential Force, Proximity Sensing	
Weight	545g±10g			
Hook Grip Load	≤30kg			
Lateral Grip Strength	≤50N			
Power Supply Specification	12~48V@2.5A			
Opening and closing speed	≥0.5s			
Repeatability of positioning accuracy	±0.2mm			
Usage Environment	-10~40°C/85%RH			
Ecosystem Support	Windows 10 and above/Linux/ROS2, C++/Python			

2.2 Degree of Freedom Distribution



Active Joint	Minimum Angle (°)	Angle Maximum (°)
Thumb Side Swing	0	60
Thumb flexion and extension	0	30
Index finger flexion and extension	0	80
Flexion and extension of the middle finger	0	80
Flexion and extension of the ring finger	0	80
Little finger flexion and extension	0	80

2.3 Relationship between Passive Angle and Driving Angle

2.3.1 Four Fingers



四指被动角与驱动角的关系-20260112.xlsx

65.07KB



2.3.2 Thumb

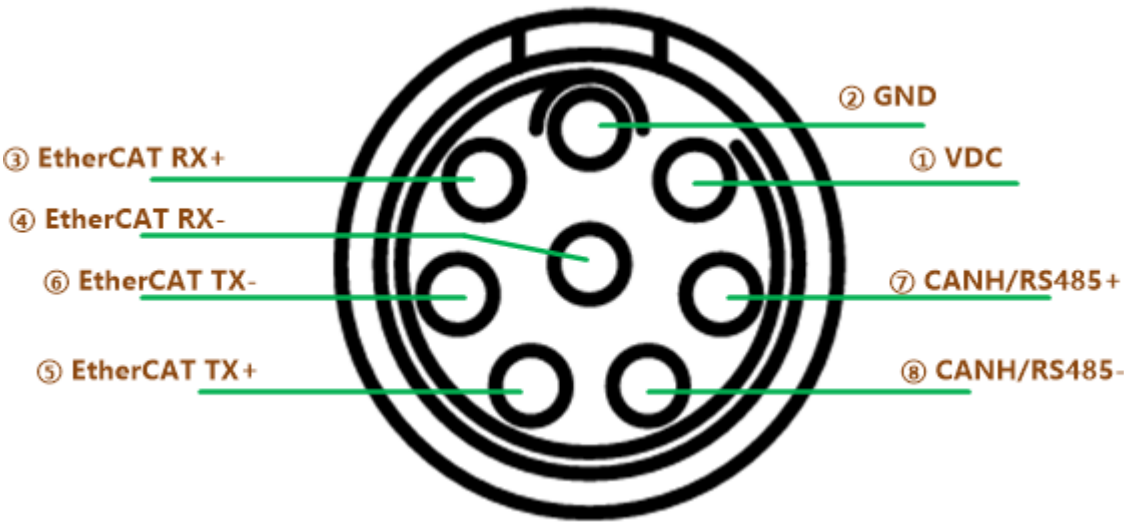
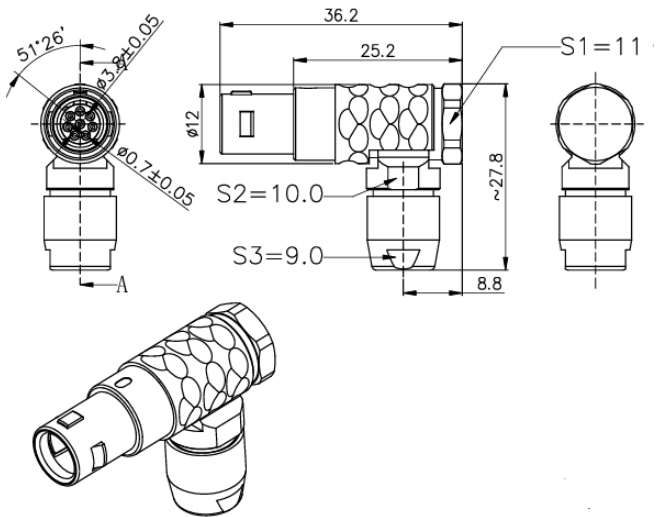


大拇指被动角与驱动角的关系-20260112.xlsx

45.92KB



2.4 Communication Interface



PIN Number	Line Color	EtherCAT Cable Pinout Definition
①	Red	VDC

②	Green	GND
③	Brown	EtherCAT RX+
④	White	EtherCAT RX-
⑤	Yellow	EtherCAT TX+
⑥	Black	EtherCAT TX-

PIN Number	Line Color	CANFD Wire Sequence Definition
①	Red	VDC
②	Green	GND
⑦	Yellow	CANH
⑧	Black	CANL

3. Download Resources

3.1 Debugging Tool

[📖 LHandPro 上位机下载页](#) | [LHandPro Host Computer Download Page](#)

3.2 SDK

[📖 LHandProLib SDK下载页](#) | [LHandProLib SDK Download Page](#)

3.3 URDF & MJCF

[📖 灵巧驱控 URDF & MJCF 下载页](#) | [Leadtron URDF & MJCF Download Page](#)

3.4 ROS2



lhandpro_ws_116_2026_02_10.zip

8.51MB



[📖 LHandPro ROS2 Example Project Description](#)

3.5 XML



LSLQ_DH116.xml

603.18KB



3.6 Communication Protocol



灵巧-EtherCAT协议(状态8btis)-CAN-FD协议-RS485协议.xlsx

362.56KB



[Dexterous Drive & Control & DH116\(S\) Series Dexterous Hand CANFD Communication Protocol](#)

3.7 STEP



DH116-Model-20251205.zip

414.54MB



3.8 Old version resources (manufactured before February 10, 2026)

3.8.1 SDK



LHandProLib-API-Linux-20260107.tar.gz

2.30MB



LHandProLib-API-Windows-20260107.7z

4.33MB



3.8.2 URDF



DH116_URDF_Files_2025_11_24.7z

z

6.94MB



3.8.3 ROS2 Demo Project



lhandpro_ws.zip

24.39MB



3.8.4 Debugging Tool (WINDOWS)



LHandPro-v1.2.0-2026-01-05-09-08-96a95ca5.zip

310.67MB



3.8.5 Communication Protocol



灵巧-EtherCAT协议(状态8btis)与
CAN-FD协议 V1.7.xlsx

57.59KB



4. Usage Instructions

4.1 Precautions

1. After opening the package, please check whether the appearance of the product is normal and the integrity of the components
2. Do not disassemble the housing and anti-tamper label without training
3. Maintain the good habit of powering off first before and after installation and commissioning
4. Please reasonably plan the path of the dexterous hand and avoid collisions unless there are special requirements
5. Under the self-locking function, it is not advisable to forcefully swing, and it will automatically reset when powered on.
6. Do not use directly in corrosive environments such as acidic, alkaline, high humidity, dusty, oily, etc.
7. The operating temperature range of the product is 0°C to 40°C. When the temperature is too high, please stop operation and let it stand for cooling.

4.2 Product Quality Assurance

The DH116 series dexterous hand has an effective warranty period of 12 months. During the service life, the company provides necessary component replacement or repair. If the equipment has defects or damage due to improper use, the Quality Assurance of this product shall be invalidated.
