Leadtron & DH116S Series Dexterous User Manual

1. Product Overview

The DH116S series dexterous hands are ultra-thin and lightweight dexterous small hands custom-tailored by Shenzhen Lingqiao Drive and Control Technology Co., Ltd. for small and medium-sized humanoid robots.

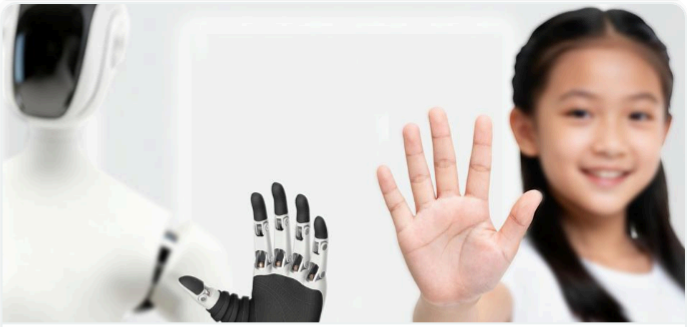
The DH116S series dexterous hand adopts a worm gear and worm drive method, accommodating a design of 11 degrees of freedom and 6 active degrees of freedom within an extremely compact space of 147.54 * 73.53 * 26.35 mm. It uses a self-developed brushless coreless motor module with high efficiency, high torque, and low temperature rise, a multi-in-one driver with high power density, a high-precision and high-response micro encoder, and multi-modal tactile sensors can be configured on the five fingers and palm.

The DH116S series dexterous hand supports Windows, Linux, and ROS2 operating systems, supports development environments under x86 and ARM, supports development languages such as C++ and Python, supports multiple communication protocols such as EtherCAT, CANFD, and RS485, provides a highly visual and user-friendly upper computer debugging tool, as well as open-source SDK and DEMO.

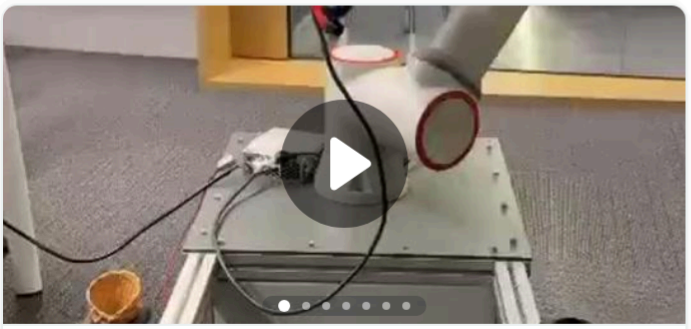
The DH116S series dexterous hand supports light load handling of 10kg and can be widely applied in scenarios such as entertainment, display, education, and scientific research.

产品视图

实物



海报



应用

2. Product Selection

2.1 Naming Rules

DH 11 6 S EC – L 1 – S

DH: Dexterous Hand

11: 11 DOF
12: 12 DOF
20: 20 DOF
24: 24 DOF

6: 6 DOA
15: 12 DOA
20: 20 DOA

缺省: 通用普及款
(Default: Universal)
S: 极致轻薄款(Lite)
H: 负载增强款(Force Enhanced)

缺省: CANFD(Default: CANFD)
EC: EtherCAT
RS: RS485

L: 左手(Left)
R: 右手(Right)

0: 样机(Prototype)
1: 第1代量产版(Gen-1 Mass Production)
2: 第2代量产版(Gen-2 Mass Production)

缺省: 基础版(Default: Standard)
S: 标准传感器版(Standard Tactile)
M: 多模态传感器版(Multi-modal Tactile)

2.2 Selection List

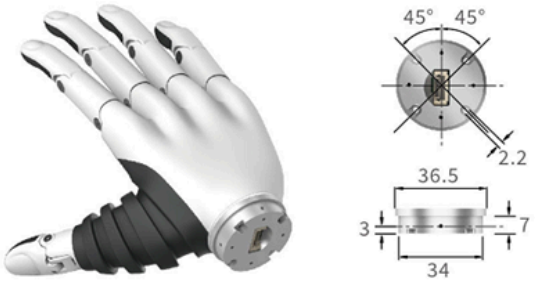
Product Model	Communication Method	Left/Right	Sensor
DH116S-L1	CANFD	Left	None
DH116S-R1		Right	None
DH116S-L1-S		Left	Standard Piezoresistive
DH116S-R1-S		Right	Standard Piezoresistive
DH116S-L1-M		Left	MultiModal Machine Learning
DH116S-R1-M		Right	MultiModal Machine Learning
DH116SEC-L1	EtherCAT	Left	None
DH116SEC-R1		Right	None
DH116SEC-L1-S		Left	Standard Piezoresistive
DH116SEC-R1-S		Right	Standard Piezoresistive
DH116SEC-L1-M		Left	MultiModal Machine Learning
DH116SEC-R1-M		Right	MultiModal Machine Learning
DH116SRS-L1	RS485	Left	None
DH116SRS-R1		Right	None
DH116SRS-L1-S		Left	Standard Piezoresistive
DH116SRS-R1-S		Right	Standard Piezoresistive
DH116SRS-L1-M		Left	MultiModal Machine Learning
DH116SRS-R1-M		Right	MultiModal Machine Learning

Accessory Model	Accessory Name	Description	Pattern
KJS-1509	3~24V@2.5A Variable Power Supply	Universal Optional Accessories	
CABLE-TX0M5-BUS(V2.0)RoHS	0.5m Network Cable	Optional Accessories for EtherCAT Debugging	

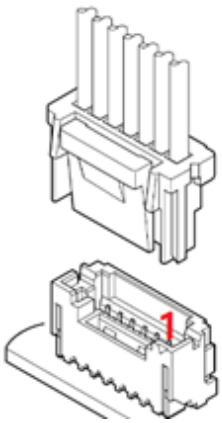
			
MINI USB-CANFD-I	USB-CANFD Debugger	CANFD Debugging Optional Accessories	
6248XL	Super Sensing Data Gloves	Optional Accessories for Data Acquisition	

3. Technical Parameters

3.1 Product Dimensions



3.2 Pin Definitions

Illustration	Pin	Signal	Input/Output	Name
	1	VDC	Input	Power input, 12(-10%)~48V (+10%)
	2	VDC	Input	
	5	GND	Output	
	6	GND	Output	
	3	CANH/485+	Input/Output	CANFD/RS485, choose one
	4	CANL/485-	Input/Output	

3.3 Performance Parameters

3.3.1 Appearance and Structure

Size	147.54 * 73.53 * 26.35 mm
Weight	359g ± 10g
Color	Ceramic White, Obsidian Black, Cloud Pattern Silver, and Black Jade Gray
Transmission Mode	worm gear and worm
Repeatability of positioning	±0.2mm
Degree of Freedom Distribution and Range of Motion Angles	

	Note: Green represents active degrees of freedom, and orange represents passive degrees of freedom. ① Thumb lateral swing [0°, 91°] ② Thumb flexion and extension [0°, 59°] ③ Index finger [0°, 72°] ④ Middle finger [0°, 72°] ⑤ Ring finger [0°, 72°] ⑥ Little finger [0°, 74°]

3.3.2 Electrical Parameters

Operating Voltage	12~48V
Static Current	0.1A
Maximum Current	2.0A

3.3.3 Load and Speed

Minimum opening and closing time	0.4s
Maximum Load (Hook Grip)	15kg
Five-Finger Grip Strength (Side Grip)	50N

3.3.4 Lifespan

No-load switching	100W times
Load-bearing opening and closing (full-load side grip)	100W times
Design service life	3 years

3.3.5 Sensor

Sensor Location	**palm**	**Five Fingers**	
Sensitivity Type	Normal force	Tangential Force	Normal force

Measurement Resolution	0.1N	0.01N	0.01N
Measurement Range	0~25N	0~360°	0~20N
Directional resolution	-	1°	-

3.3.6 Storage and Working Environment

Storage Environment	Temperature: -10°C to 70°C
Working Environment	Temperature: -10°C to 45°C Humidity: 10% - 90%RH
Protection Class	IP30

3.4 Relationship between passive angle and driving angle

DH116S被动与主动关系.7z
192.08KB

4. Download Resources

4.1 Debugging Software

LHandPro 上位机下载页 | LHandPro Host Computer Download Page

4.2 SDK & DEMO

LHandProLib SDK下载页 | LHandProLib SDK Download Page

4.3 URDF & MJCF

灵巧驱控 URDF & MJCF 下载页 | Leadtron URDF & MJCF Download Page

4.4 ROS2

lhandpro_ws_DH116S_2026_1_6.zip
7.44MB

4.5 Communication Protocol

Dexterous Drive & Control & DH116(S) Series Dexterous Hand CANFD Communication Protocol

4.6 STEP

DH116S-Model-20260325.zip
162.32MB

Appendix

Maintenance, Warranty, and After-sales Service

- Please clean the product regularly. It is recommended to wipe the product surface with alcohol, and do not let alcohol seep into the palm.
- If the product needs correction, please contact after-sales service first. Do not disassemble or assemble it by yourself.
- We provide a 12-month warranty period starting from the date of sale. During the warranty period, we offer free repairs and replacement of some parts; after the warranty period, we provide paid services and parts replacement based on evaluation.
- Damage or loss caused during transportation, product damage caused by human factors (such as impact, disassembly, etc.), damage caused by force majeure factors, etc., are not covered by the regular warranty

Revision Record

Revision Date	Reviser	Revised Content
2025.12.1	Zhang Rensu	First Release