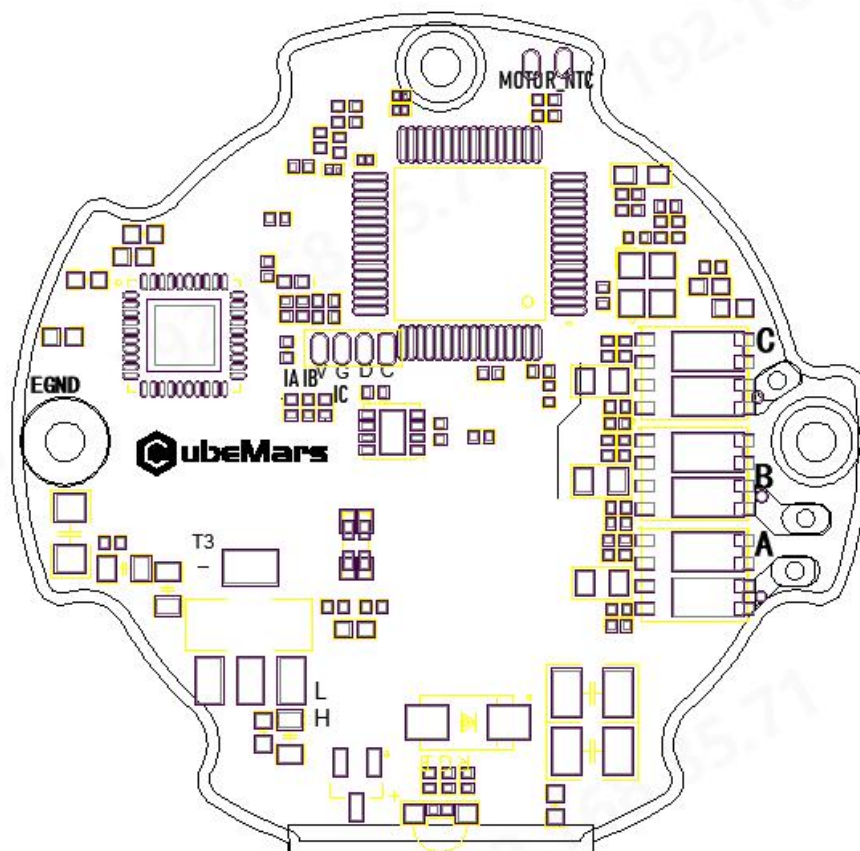


AK48-2405-2D-A2 Driver Manual

V1.0.0



Catalogue

Precautions	3
Product Features	3
Disclaimer	3
Version Changed Record	4
1. Name Rule	5
1.1 Driver Specifications	6
1.2 Appearance Overview	8
1.3 Product Dimensions and Installation Notes	9
.....	9
1.4 Interface and Definitions	10
1.4.1 Driver Interface Diagram	10
1.4.2 Driver Interface Pin Definitions	10
1.4.3 Recommended Brands and Models for Driver Interface	10
1.4 Indicator Light Definitions	11
1.5 Main Accessories and Specifications	11
2.Connection	12
2.1 R-link Appearance Overview, Product Specifications & Interface Definitions	12
2.2 R-link Indicator Light Definition	13
2.3Connection Notes	13

Precautions

1. Ensure that there are no short circuits in the circuit and that interfaces are connected correctly as required.

2.  The driver board will heat up during output; please use it carefully to avoid burns.

3.  Before use, please check if all parts are intact. If any parts are missing or aged, please stop using it and contact technical support in time.

4.  Please strictly follow the working voltage, current, temperature, and other parameters specified in this document; otherwise, it will cause permanent damage to the product!

Product Features

The AK series motor driver board adopts a mid-to-high performance driver chip of its class and uses the Field Oriented Control (FOC) algorithm, combined with advanced Active Disturbance Rejection Control (ADRC) technology to control speed and position.

It works with the CubeMars Tool tuning software for parameter configuration and firmware upgrades.

Disclaimer

Thank you for purchasing the AK series driver board. Before using it, please read this statement carefully. Once used, it is considered as recognition and acceptance of all the contents of this statement. Please strictly follow the product manual and relevant laws, regulations, policies, and guidelines for the installation and use of the product. During the use of the product, the user promises to be responsible for their own actions and all consequences arising therefrom.

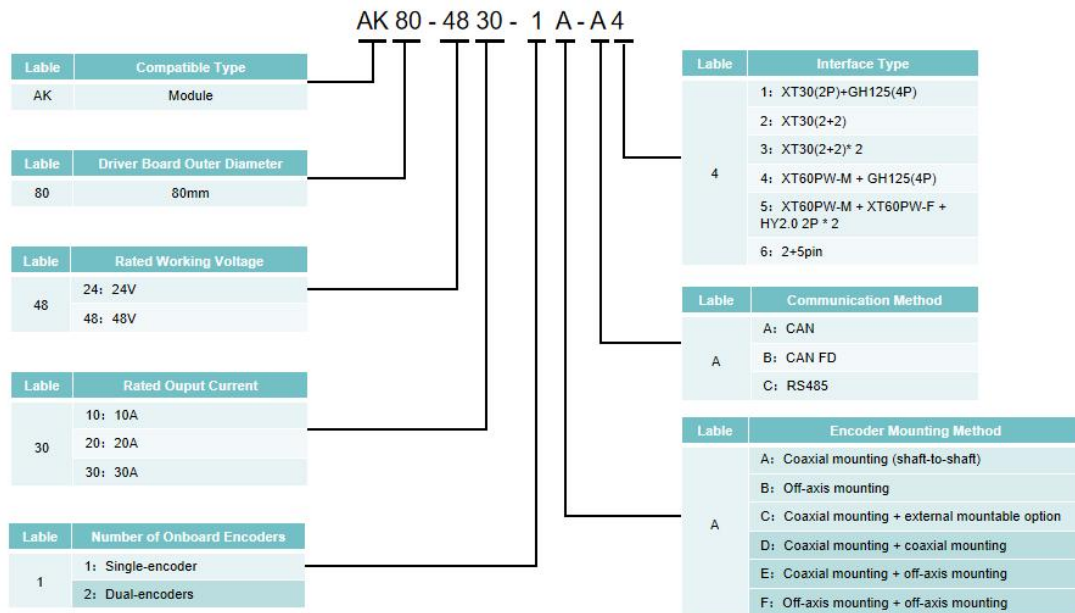
Any losses caused by improper use, installation, or modification of the product by the user, CubeMars will not assume legal responsibility.

CubeMars is a trademark of Nanchang Kude Intelligent Technology Co., Ltd. and its affiliated companies. The product names and brands mentioned in this document are trademarks of the companies. This product and manual are copyrighted by Nanchang Kude Intelligent Technology Co., Ltd. No copying or reprinting is allowed without permission. The final interpretation of the disclaimer belongs to Nanchang Kude Intelligent Technology Co., Ltd.

Version Changed Record

Date	Version	Content
2026.6.17	V1.0.0	1.First time edit

1. Name Rule

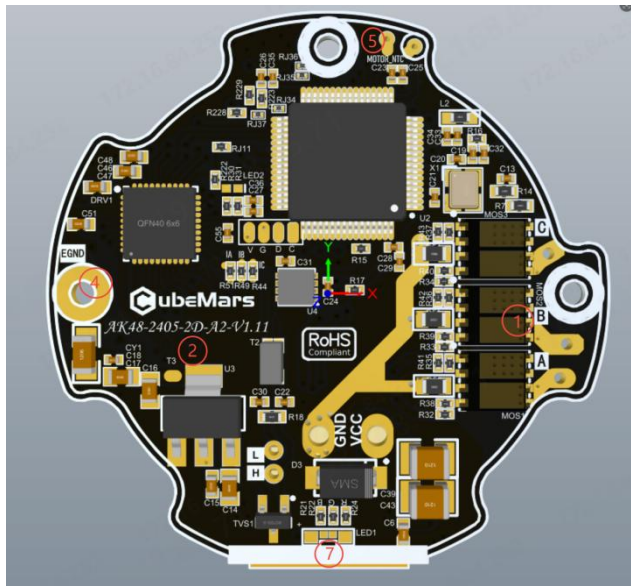


1.1 Driver Specifications

Model	AK48-2405-2D-A2
Hardware version	AK48-2405-2D-A2-V1.11
Compatible Actuator	AK40-10、AK45-10、AK45-36
Rated Input Voltage	24V
Allowable working voltage	15-28V
Rated Output Current (rms)	5A
Maximum output current (AP)	10A
Standby power consumption	≤1W
CAN bus bit rate	1Mbps
Size	48mm×48mm
Working environment temperature	-20℃to 65℃
Maximum allowable temperature for driver board	100℃

Inner loop encoder resolutions	16bit (single turn absolute)
Outer encoder resolution (Dual-Encoder Models Only)	16bit (single turn absolute)

1.2 Appearance Overview



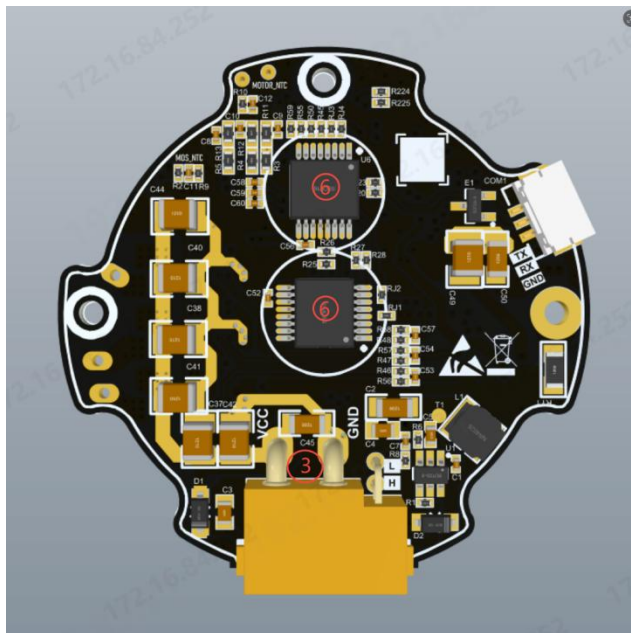
① Three-phase power

connection terminal

② Hardware version

③ Connection Port

④ Mounting hole



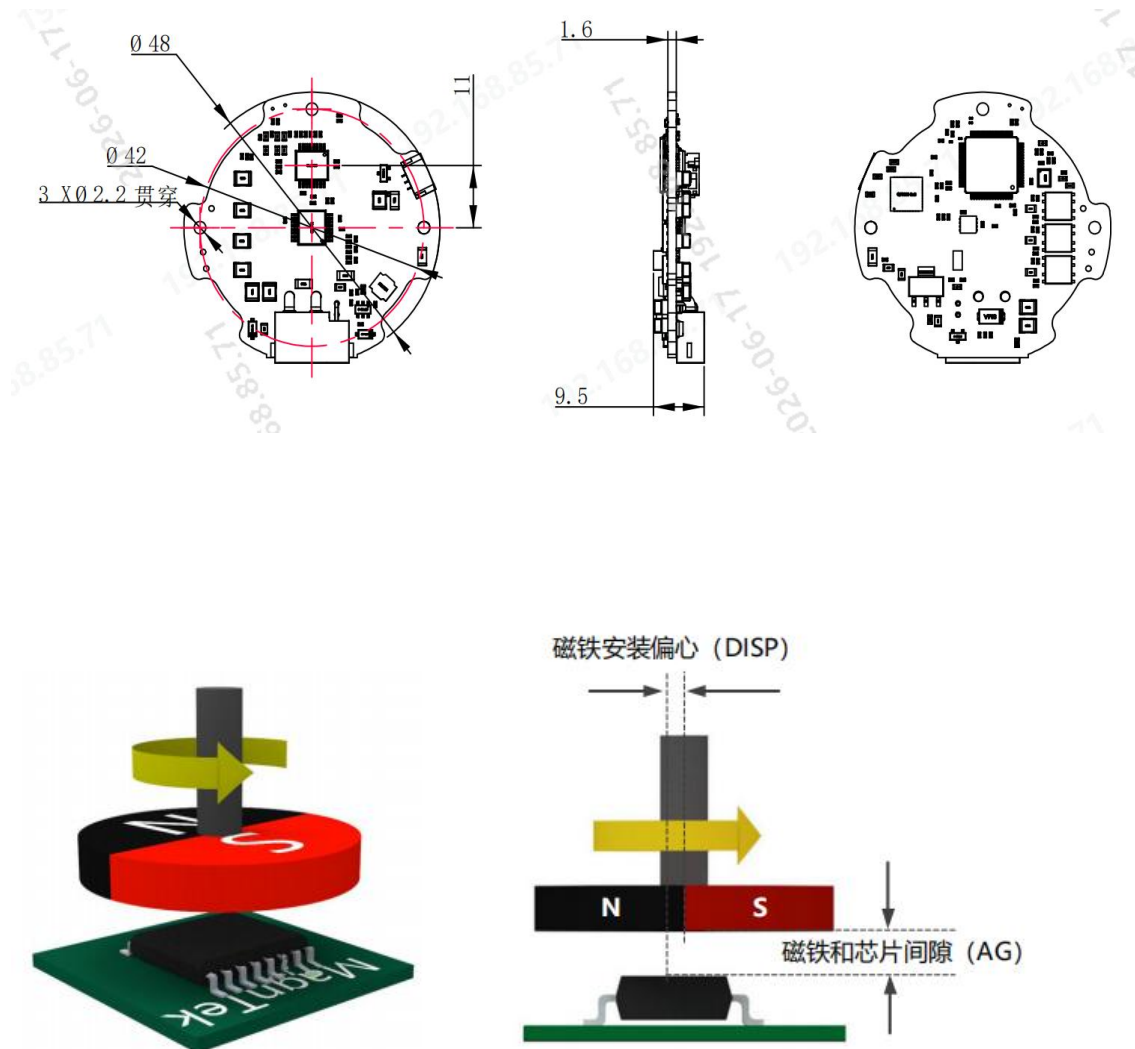
⑤ Motor Temperature

Sensor

⑥ Encoder Chip

⑦ LED Indicator

1.3 Product Dimensions and Installation Notes



Remark:

- 1、 Dimensional tolerance: ± 0.15 mm; mounting hole tolerance: $+0.1$ mm / -0 mm; PCB thickness tolerance: ± 0.16 mm.
- 2、 It is recommended to use M3 mm screws for mounting.;
- 3、 The suggested air gap (AG) between the encoder magnet and the chip is 1 mm, with a maximum not exceeding 3 mm.
- 4、 The recommended maximum eccentricity (DISP: deviation between magnet center and chip center) is 0.3 mm.
5. See the accompanying drawings for detailed installation instructions.

1.4 Interface and Definitions

1.4.1 Driver Interface Diagram



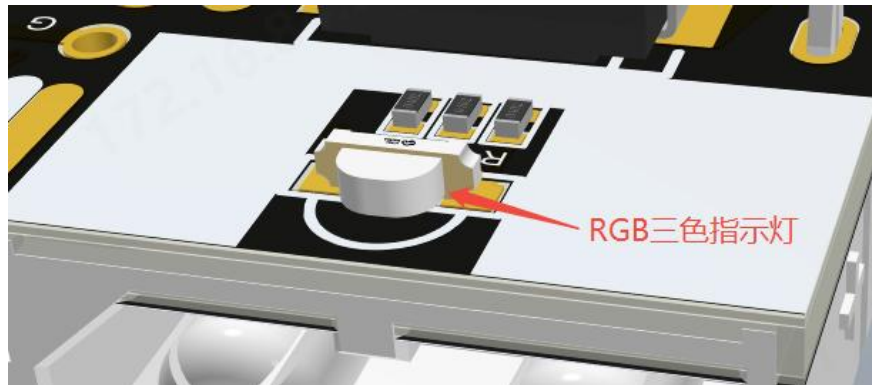
1.4.2 Driver Interface Pin Definitions

No.	Function	Pin	Clarifications	Color
1	Serial communication	1	Serial signal ground (GND)	Black
		2	Serial signal input (RX)	Yellow
		3	Serial signal output (TX)	Green
2	Power input & CAN communication	1	Positive Pole (+)	Red
		2	Negative Pole (-)	Black
		3	CAN communication low side (CAN_L)	Blue
		4	CAN communication high side (CAN_H)	White

1.4.3 Recommended Brands and Models for Driver Interface

No.	Onboard Interface model	Brand	Terminal Interface Model	Brand
1	A1257WR-S-3P	CJT	A1257H-3P	CJT
2	XT30PW(2+2)-M	AMASS	XT30(2+2)-F	AMASS

1.4 Indicator Light Definitions



Indicator Light Definitions		
Power Indicator Light (Blue)	Light on	The driver board is powered
	Light off	The driver board is not powered
Operation Indicator Light(Green)	Light on	The motor is working
	Light off	The motor is not working
Drive Fault Indicator Light (Red)	Light on	Driver board fault
	Light off	Driver board function normally

Remark:

△: After the driver board is powered, the blue light should remain on in the normal state, and the green and red lights should light up for 2 seconds before going out.

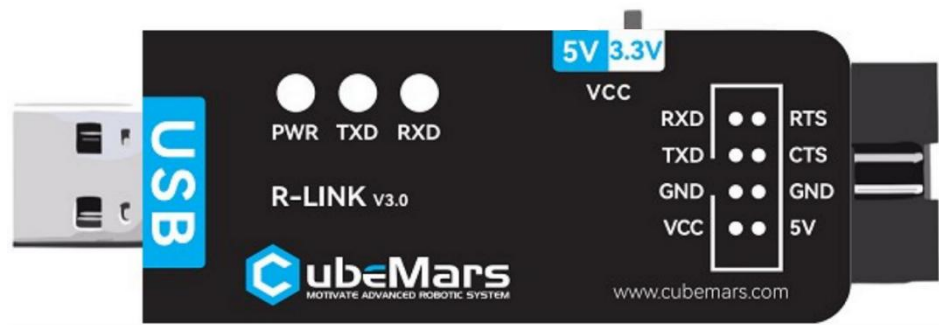
1.5 Main Accessories and Specifications

No.	Item	Specifications		Quantity	Remark
1	Power and Signal Interface	Power & CAN cables	16 AWG red/black silicone wire and white/blue PTFE 30 AWG wire, OD 0.64 mm, 100 ± 10 mm, 4 wires, XT30 (2+2)-F connector; one end fitted with an XT30 (2+2)-F connector, the other end stripped and tin-plated for 3 ± 1 mm.	Each 1PCS	±2MM

2		UART cables	30 AWG PTFE wire, OD 0.64 mm, 200 ± 10 mm, 3 wires, GH1.25-3P male connector to FC crimp terminal, 2×4-pin box header.	Each 1PCS	±2MM
---	--	-------------	--	-----------	------

2.Connection

2.1 R-link Appearance Overview, Product Specifications & Interface Definitions



Specifications	
Rated working voltage	5V
VCC Voltage Selection Switch	3.3V (default)
Standby consumption	≤30mA
Dimension	73.8x23.6x14.5MM
Working environment temperature	-20℃ to 65℃
Maximum allowable temperature for controller	85℃

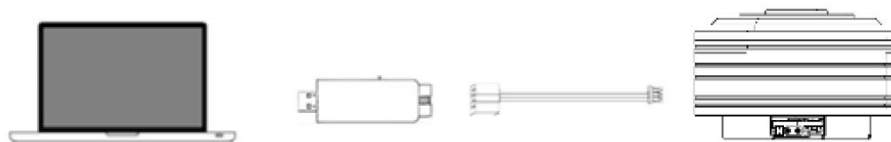
No.	Function	Pin	Clarifications
1	Serial Interface	RXD	Serial Signal Input
		TXD	Serial Signal Output
		GND	Serial Signal Ground

No.	Function	Pin	Clarifications
		VCC	VCC Power Output
		RTS	Send Data Request
		CTS	Clear Send
		GND	Power Ground
		5V	5V Power output

2.2 R-link Indicator Light Definition

No	Light	Color	Clarifications
1	PWR	Red	Power indicator LED Red light on when powered. If not lit, disconnect power immediately.
2	TXD	Red	Serial communication TX indicator LED Normally off; flashes when data is transmitted.
3	RXD	Red	Serial communication RX indicator LED Normally off; flashes when data is received.

2.3 Connection Notes



R-Link - USB -----> PC
 8Pin interface -----> RLink8P ininterface
 3Pin (UART) -----> Motor-3pin (UART)

