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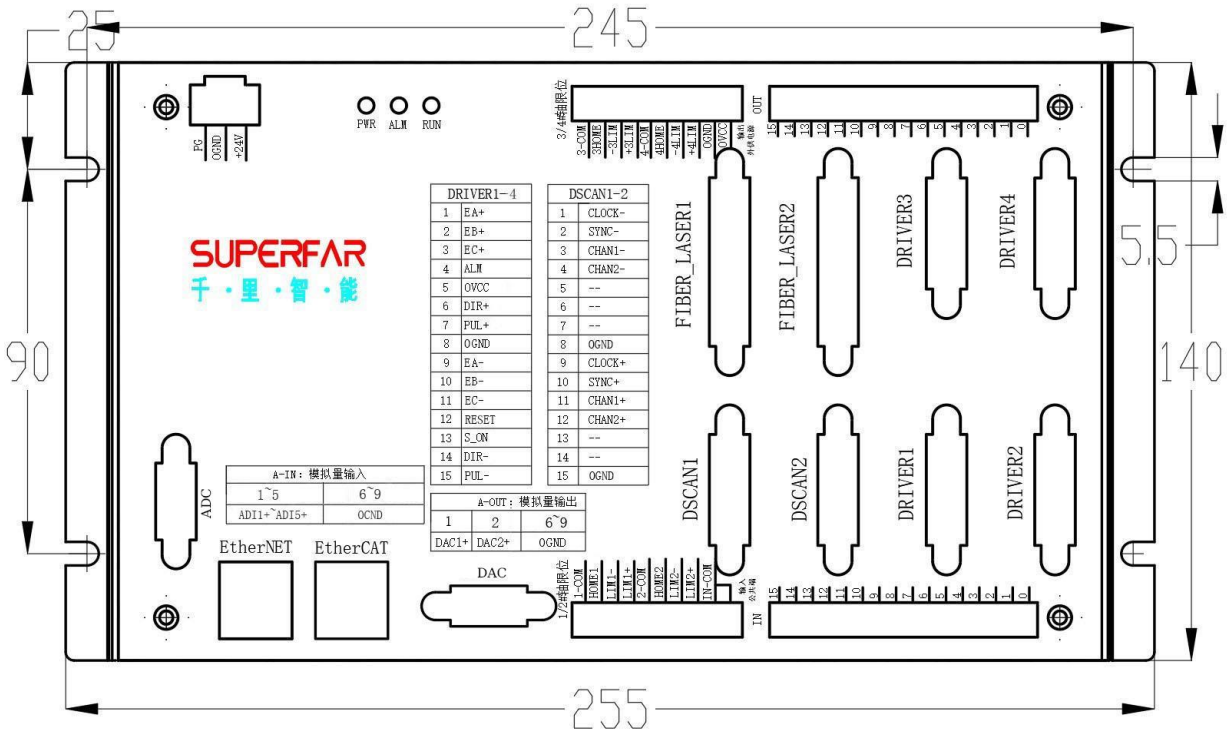
Platform galvanometer linkage card QLS-422 -V2.6

Hardware user manual V250430

catalogue

I. Introduction to the platform mirror linkage card



The QLS-422 control card is a high-end platform Zhenjing linkage card independently developed by Qianli Intelligence. It features powerful CPU computing and is primarily used in platforms with multi-axis motion, Zhenjing linkage, and laser processing applications. This card enables platform-Zhenjing linkage, significantly enhancing processing efficiency. It is particularly useful for laser precision cutting in 3D printing, PCB/FPC, fingerprint recognition chips, camera modules, and other applications, as well as for large-scale PCB marking and wafer marking.

Using dual-core ARM CPU calculation, super computing power, very short servo cycle, suitable for high speed, high precision digital control; configuration of large memory, can process a large amount of data at one time, very suitable for the vibration mirror control system with large data throughput;

Using 100/1000M Ethernet, no need to install drivers, the control system can run independently, not affected by the fault of the industrial computer, machine tool equipment system motion is more stable;

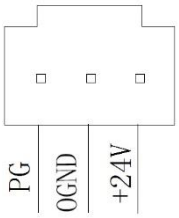
Supports the XY2-100 data transmission protocol, which uses 16-bit resolution digital signal for communication between the board and the galvanometer scanning system, so as to achieve synchronous output of laser and scanning system, realizing high precision and repeatable laser processing.

Main interface description:

1. Power supply: 24V power supply, it is recommended to use independent power supply and isolate input and output;
2. Status indicator: indicates whether the power supply of the controller is normal, whether there is an alarm, and whether the system is normal;
3. 16 16-channel input/output: the input is compatible with NPN and PNP types, the high and low levels can be switched through the common terminal, the output is a Darlington tube, the low level is effective, and the load capacity is strong;
4. 2 An independent DSCAN galvanometer control port: supports galvanometer control of XY2-100 protocol, 16bit high resolution, delay accuracy can reach 1us, support synchronous and asynchronous collaborative working mechanism;
5. 2 One FIBER_LASER fiber laser interface: standard infrared, MOPA laser interface definition, can also output 5V TTL Gate, Trig signal to control CO2, ultraviolet, green light, picosecond and other general lasers;
6. 4 One motion axis control and independent limit interface: support 4 points with encoder shaft, interpolation and other motion control, support linear motor, servo motor, stepper motor, etc.; 4 independent positive, negative, origin limit signals of the axis, compatible with NPN, PNP type photoelectric switch;
7. 1 A EtherNET network port: gigabit network port, which can be connected to the upper computer quickly and stably, and can run offline;
8. 1 One EtherCAT port: expand axis control and IO through EtherCAT bus;
9. 2 The 16-bit ±10V analog signal input/output can be used to collect temperature, liquid level, and light power

Rate The analog signal is counted and the analog output is used to control the laser which needs analog power control;

2. Hardware interface description



not plug or unplug the board with power on! Otherwise, the board may be damaged! The user shall bear the loss caused by this!

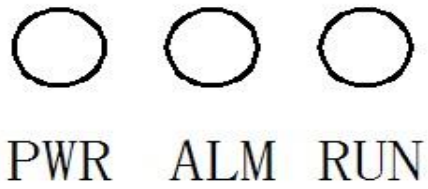
1. 24V power input

The power supply 24V current is not less than 1A, please pay attention to the direction and order!

Suggestion: Use a separate 24V power supply to ensure that the board power supply is isolated from input and output.

Pin	Name	Explain
1	+24V	+24V input, current greater than 2A
2	OGND	+24V input ground
3	PG	The shell is large (it is recommended not to connect)

2. status lamp

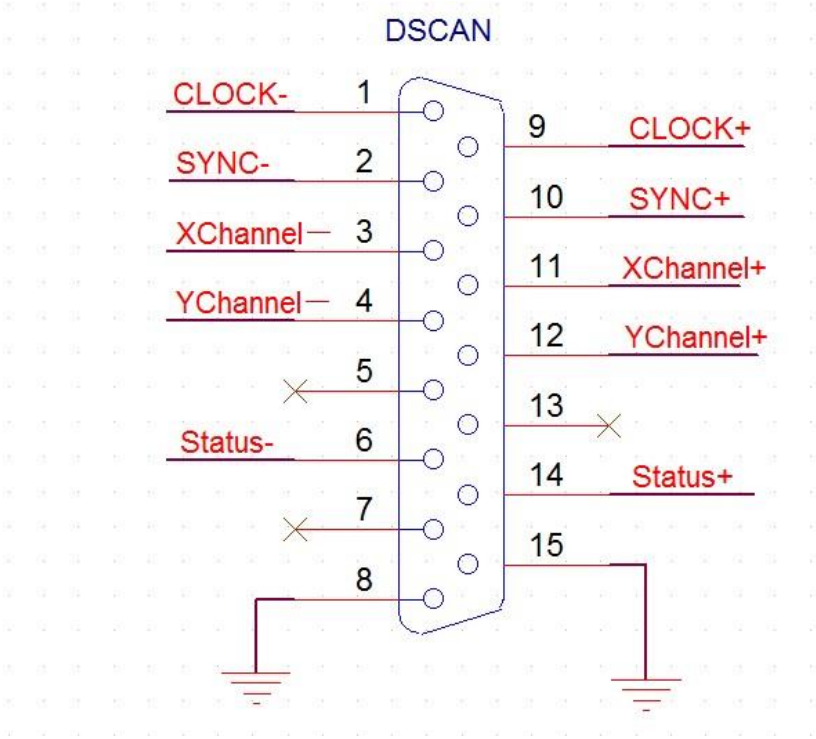


PWR: 24V power supply state, if the green light is always on, the power supply is normal, if not, please check the 24V power signal

ALM: alarm signal light, this light does not indicate no fault, but indicates system fault

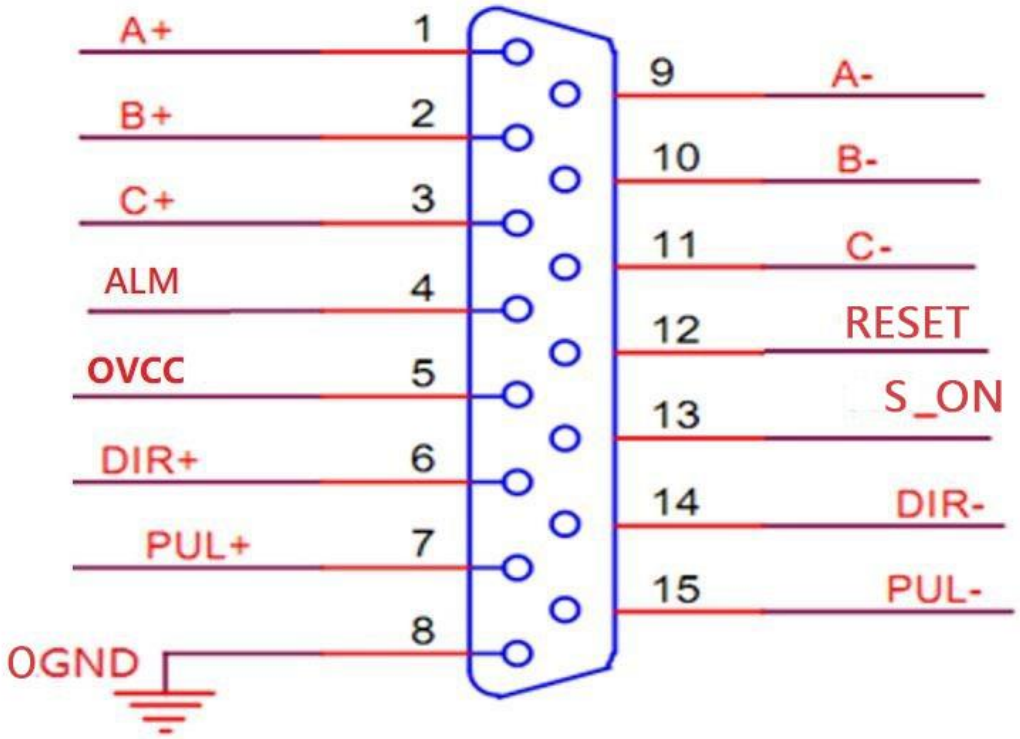
RUN: Run the signal light. After power on, it will blink for about 20s. If the system starts normally, it will blink; otherwise, there is a fault

3. Zoom control port (DSCAN1 and DSCAN2)



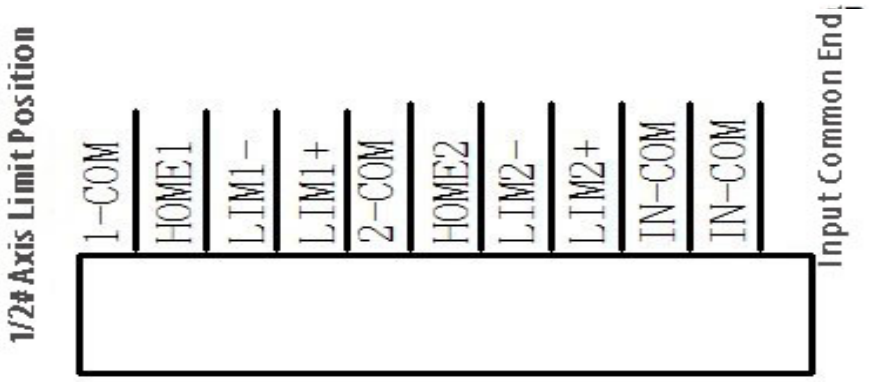
Pin	Name	Explain
1、9	CLK— / CLK+	Clock signal- / Clock signal +
2、10	SYNC— / SYNC+	Synchronization signal- / Synchronization signal +
3、11	XChannel— / XChannel+	Chimney X signal- / Chimney X signal +
4、12	YChannel— / YChannel+	Chin Y signal- / Chin Y signal +
6、14	Status- / Status+	Output in mirror state (usually not connected)
5、7、13	Continue to have	
8、15	OGND	Grounding feet
Note: Please use shielded twisted pair, and ground the shield layer at one end. Please refer to the later galvanometer wiring diagram. At the DSCAN end, the shielding layer is connected to 8 or 15 feet to enhance the anti-interference ability of the ZOOM signal.		

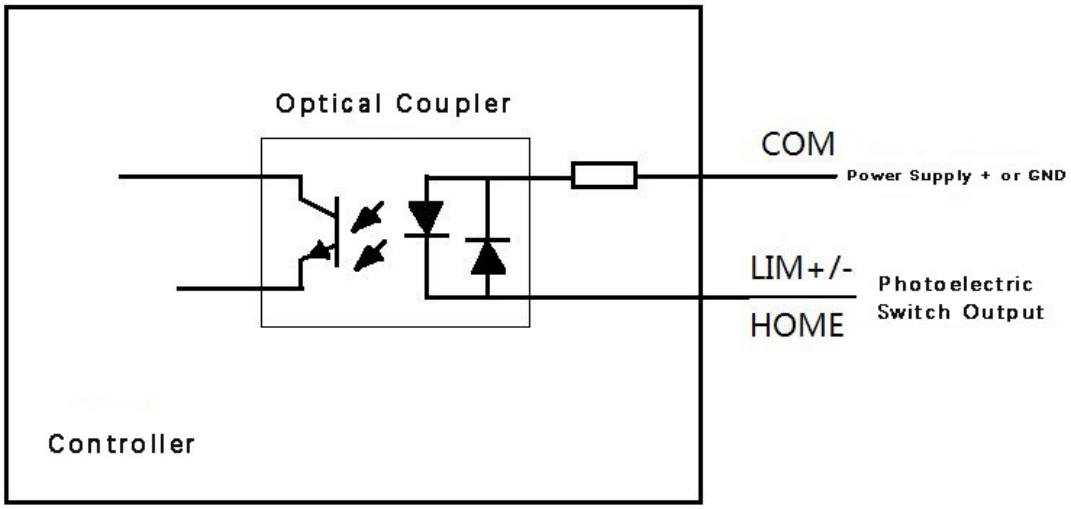
4. Motor control port (Driver1-4)



Pin	Name	Explain
1、9	A+/A-	Encoder A+/ Encoder A-
2、10	B+/B-	Encoder B+/encoder B-
3、11	C+/C-	Encoder C+/Encoder C-
4	ALM	Alarm signal input
5	OVCC	External isolation 24V power output
13	S-ON	Enable signal output
6、14	DIR+/DIR-	Pulse direction signal output
7、15	PUL+/PUL-	Pulse signal output
8	OGND	External isolation 24V, power ground
12	RESET	Reset signal

5. Extreme signal ports (1-4)



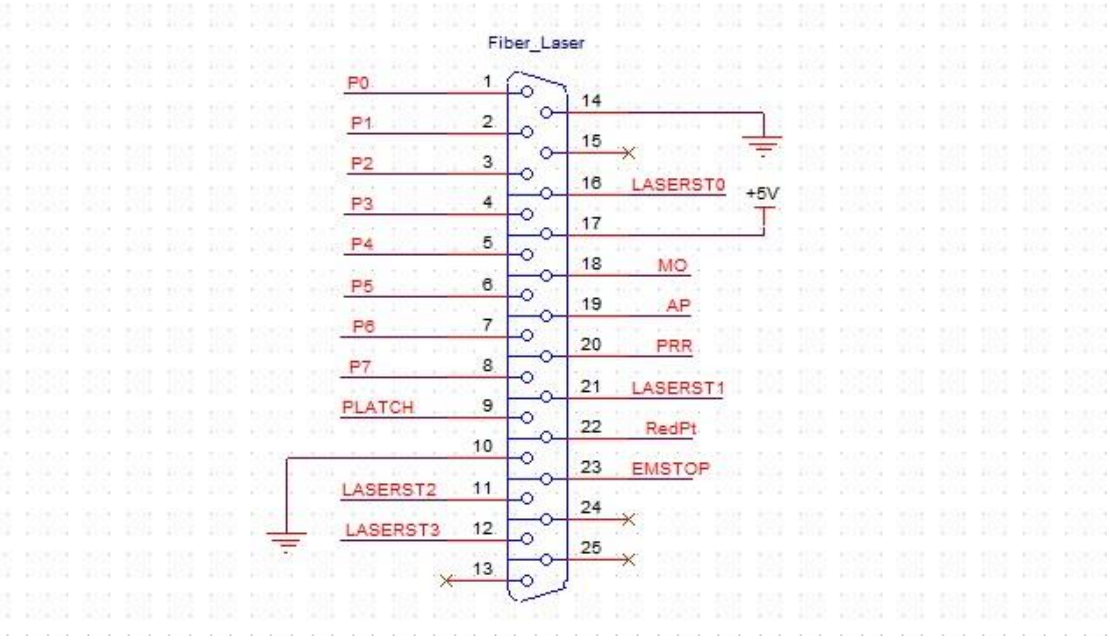


Pin	Name	Explain
1	LIM-1+	Positive limit signal
2	LIM-1-	Negative limit limit signal
3	HOME1	Zero point limit signal
4	1-COM	1 The axis limit shares a common end

Note: The number in the name is the axis number;

Compatible with PNP and NPN types of photoelectric switches by using the COM public terminal as a level reference.

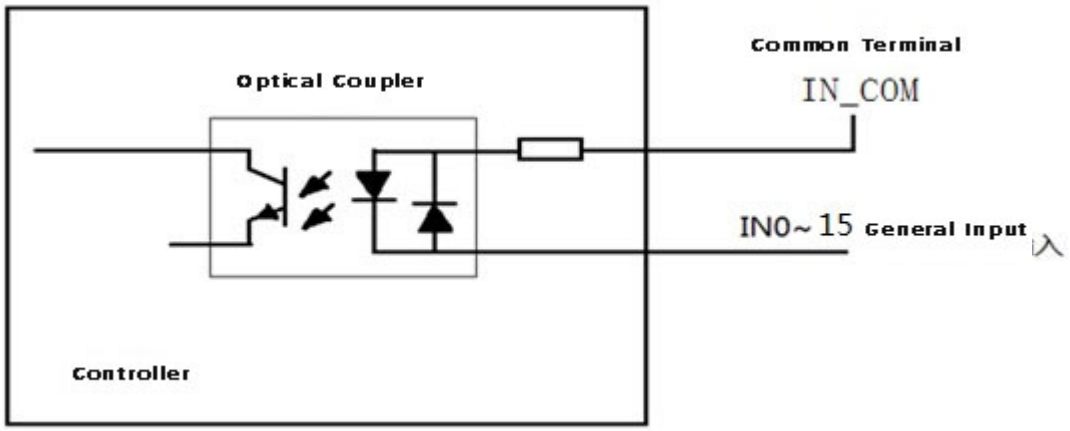
6. FIBER_LASER laser control port

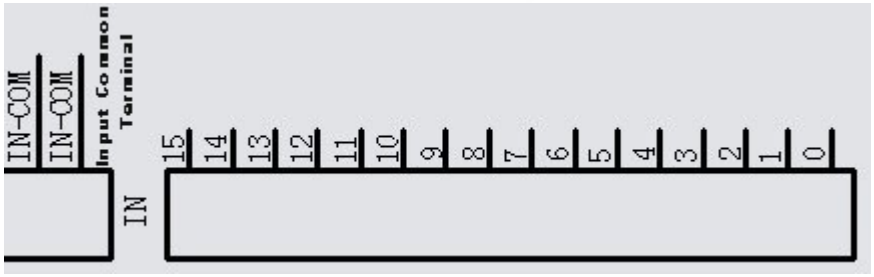


Pin	Name	Explain
1-8	PO—P7	Laser power
9	PLATCH	Power latches the signal
10、14	OGND	Grounding feet
16、 21、11、12	LASERSTO-3	Laser status input
17	+5V	Control the 5V power output of the card
18	MO	Master oscillator switch signal
19	AP	Power amplifier switch signal
20	PRR	Repeat the pulse frequency signal
22	RedPt	The red light signal of the laser
23	EMSTOP	Emergency stop switch signal
13、15、24、25		Hang in the air

Note: AP and PRR can be used as Gate and Trigger IN signals of CO2 or ultraviolet, green light and other lasers, which are 5V TTL signals.

7. Input port

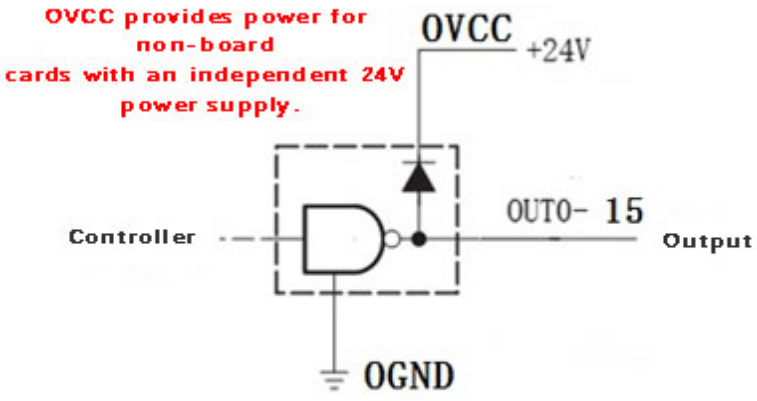




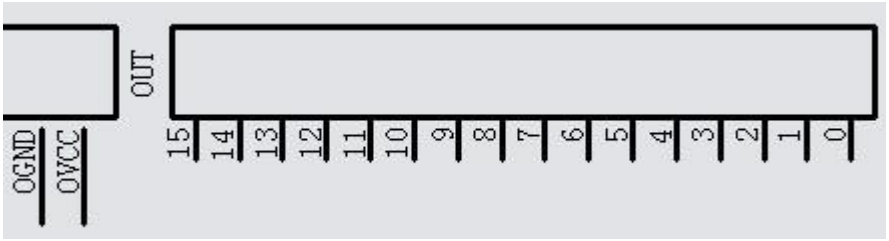
Pin	Name	Explain
0-15	IN0-15	Input signal 0 to signal 15

Note: High and low levels are switched by IN-COM to P24V or N24V as reference levels.

8. output port



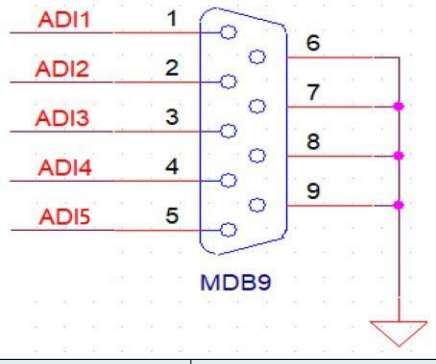
NPN Darlington Transistor



Pin	Name	Explain
0-15	OUT0-15	Output signal 0 to signal 15, low level is valid
OVCC	Power is positive	P24V
OGND	The power supply is negative	N24V

Note: The output is an NPN Darlington tube output, with low-level active. The load can directly drive three-color lights, solenoid valves up to 1A, etc. It is recommended to use a separate 24V power supply for OVCC and OGND, ensuring that the board's power supply is isolated from the output. The OVCC for the output is calculated based on the output current; the higher the output current, the greater the required OVCC supply current.

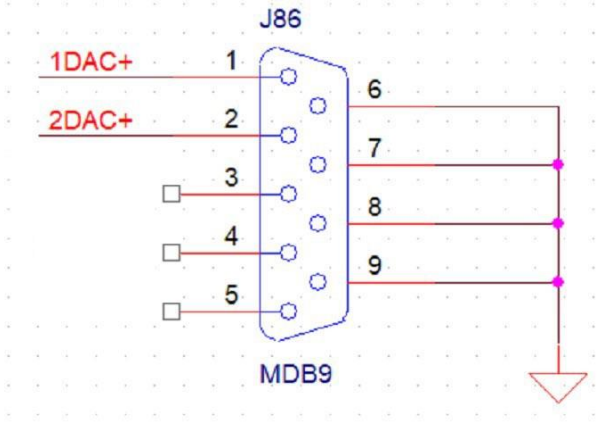
9. A D C Analog input port



Pin	Name	Explain
1	ADI_1	Analog input 1
2	ADI_2	Analog input 2
3	ADI_3	Analog input 3
4	ADI_4	Analog input 4
5	ADI_5	Analog input 5
6、7、8、9	OGND	Grounding feet

Note: The analog input function is required, which is not available by default. If you need it, please select the model with A when ordering

10. D A C Analog output port



Pin	Name	Explain
1	DAC1+	Analog output 1
2	DAC2+	Analog output 2
6、7、8、9	OGND	Grounding feet

Note: The analog output function is required, and it is not available by default. If you need it, please select the model with A when ordering

11. EtherNET Network port

According to TCP/IP protocol, the real-time data is transmitted safely, reliably and quickly with the upper computer software;

The default IP address of this controller is: 192.6.6.6 12.

EtherCAT Expansion port

Supports EtherCAT protocol to extend axis control or IO. Currently adapted to:

ServoTronix High creation: CDHD series 1st generation, CDHD2 second generation driver;

Copley Xenus Plus: XEL series;

Hiwin D1 Bus series;

Panasonic Panasonic: A6B_EtherCAT;

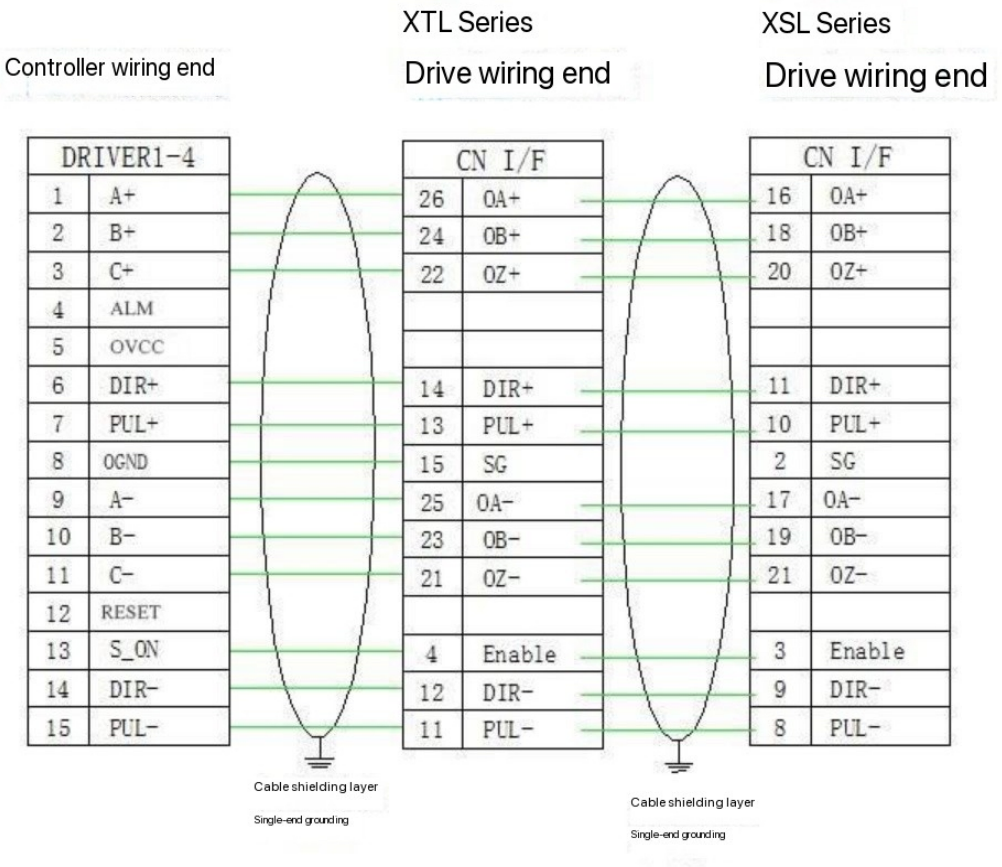
Inovance Huichuan: SV630N series; Wuhan Maixin:

EP3E series;

Note: The Ethercat function needs to be supported. If not, please order the E series when ordering. Other manufacturers that do not have suitable adapters are requested to provide adapter test in advance for confirmation;

3. Typical wiring diagram reference

1. Wiring reference for Copley XTL and XSL series drives:

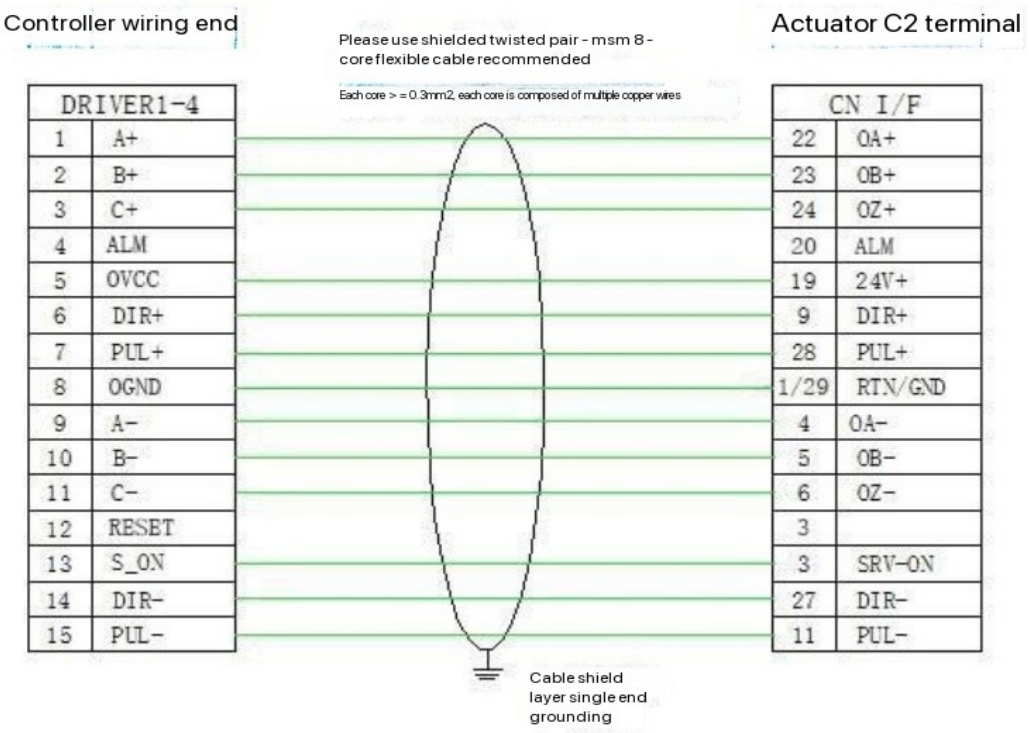


Please use shielded twisted pair

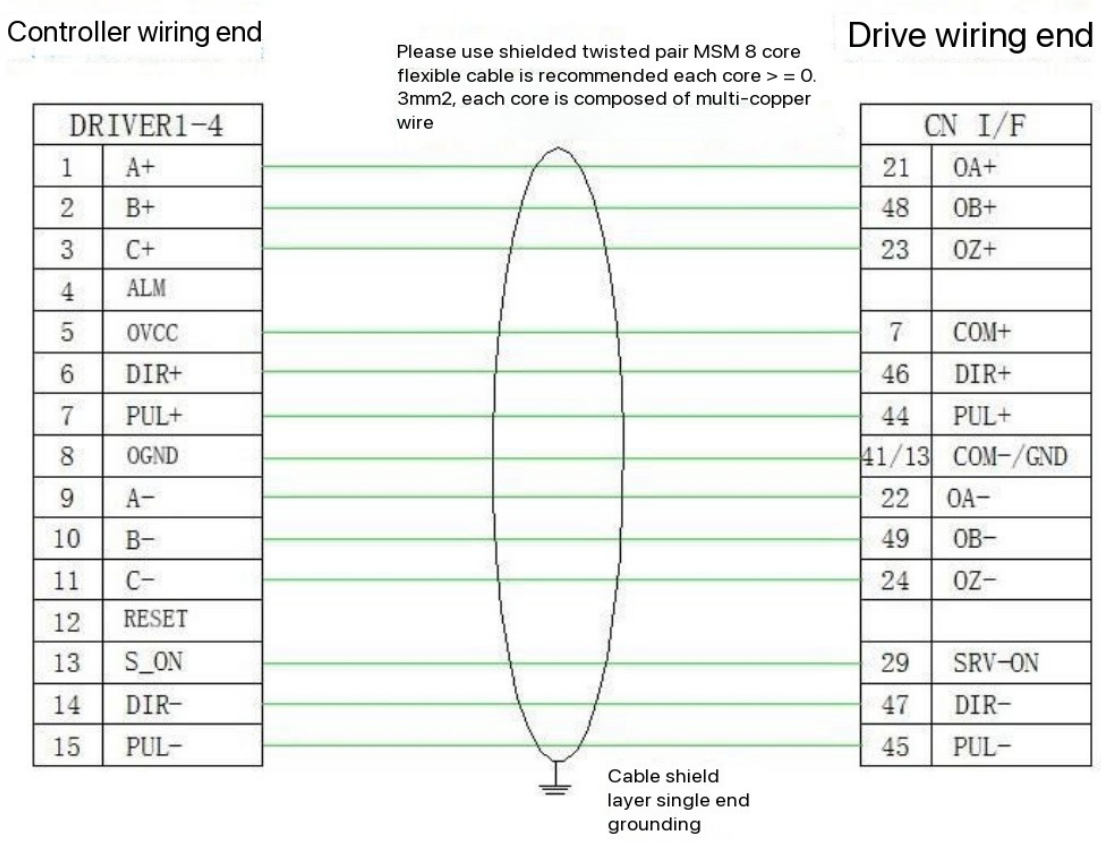
It is recommended to use Mismi 8 core flexible cable

Each core is greater than or equal to 0.3mm2, and each core is composed of multiple copper wires

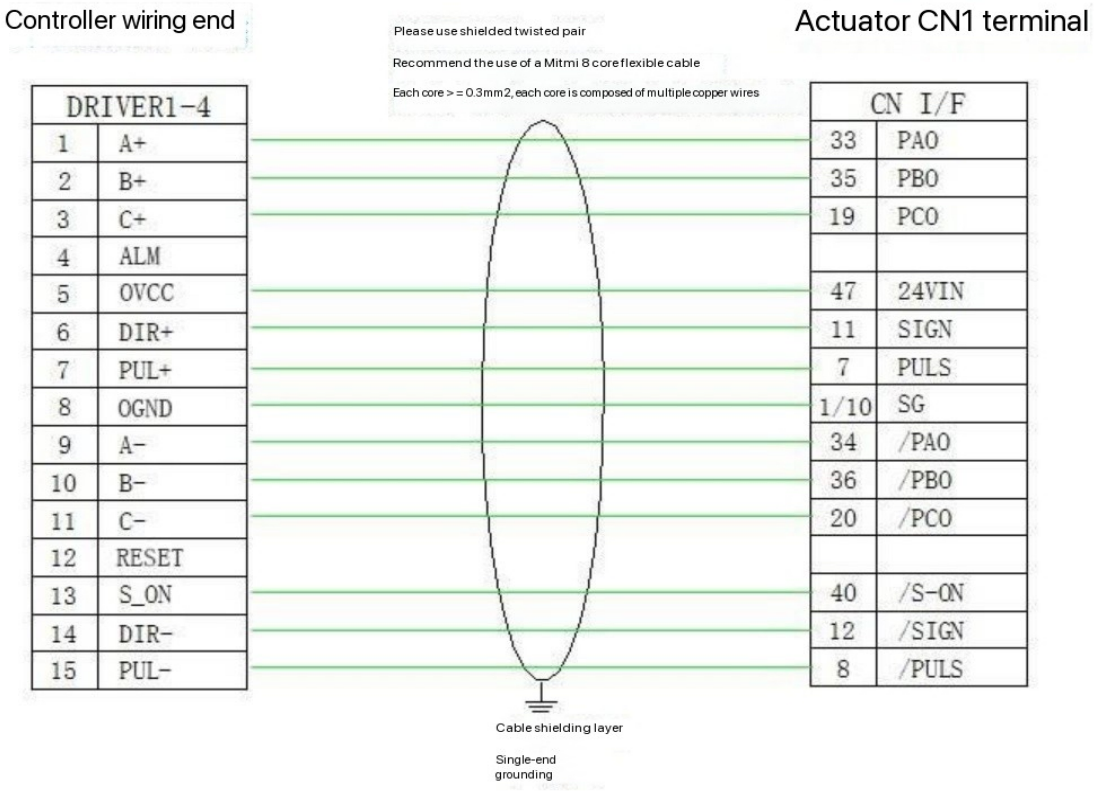
2. Connect with Gaocreat Servotronix CDHD-0062AAP1 for reference



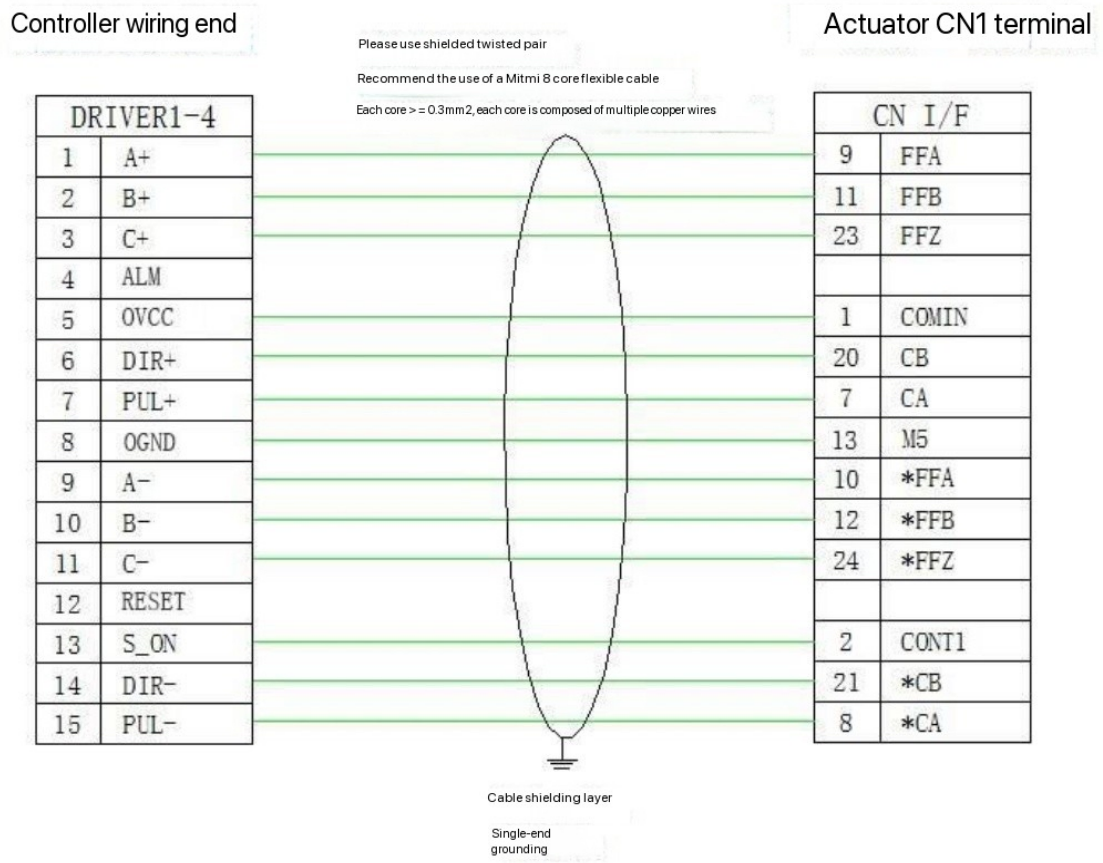
3. Wiring reference for Panasonic MSDA series drives


Controller wiring end
Please use shielded twisted pair MSM 8 core flexible cable is recommended each core > = 0.3mm2, each core is composed of multi-copper wire
Drive wiring end
DRIVER1-4
1 A+
2 B+
3 C+
4 ALM
5 OVCC
6 DIR+
7 PUL+
8 OGND
9 A-
10 B-
11 C-
12 RESET
13 S_ON
14 DIR-
15 PUL-
CN I/F
21 OA+
48 OB+
23 OZ+
7 COM+
46 DIR+
44 PUL+
41/13 COM-/GND
22 OA-
49 OB-
24 OZ-
29 SRV-ON
47 DIR-
45 PUL-
Cable shield layer single end grounding

4. Wiring reference for Yaskawa Σ-7S driver SGDS7-2 R8A



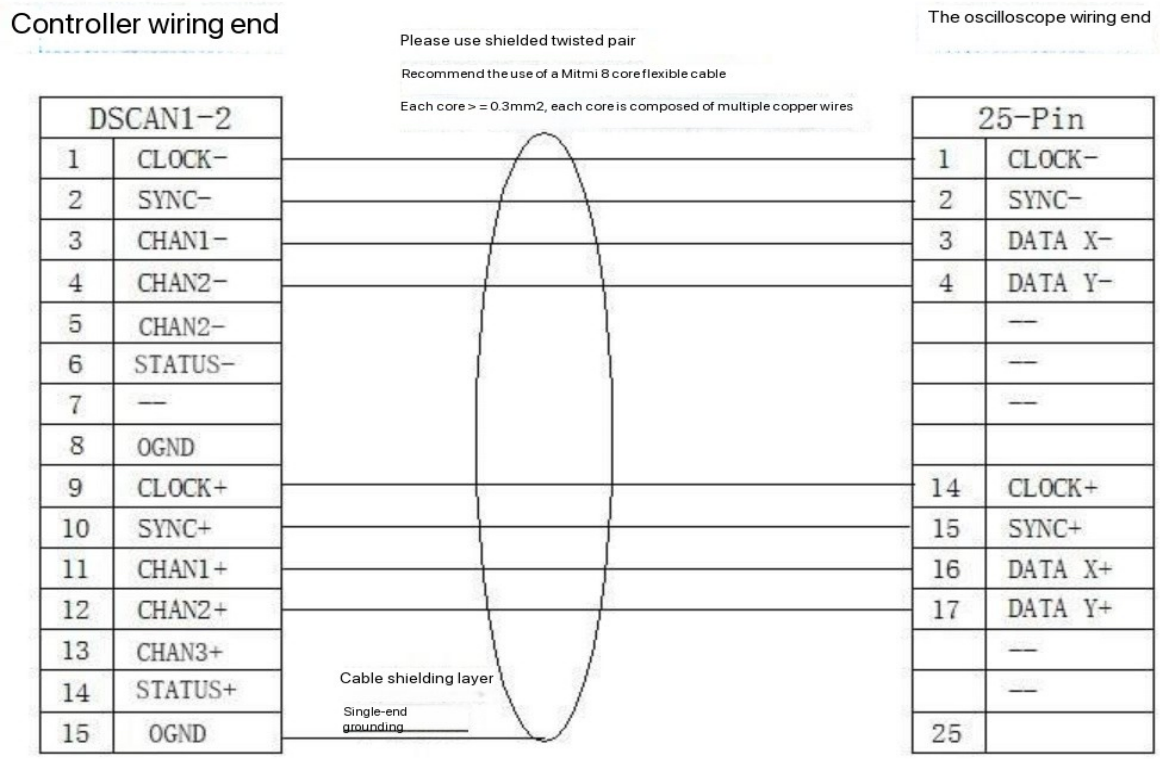
5. Wiring reference for Fuji Alpha5 Smart series drives



DRIVER1-4	
1	A+
2	B+
3	C+
4	ALM
5	OVCC
6	DIR+
7	PUL+
8	OGND
9	A-
10	B-
11	C-
12	RESET
13	S_ON
14	DIR-
15	PUL-

CN I/F	
9	FFA
11	FFB
23	FFZ
1	COMIN
20	CB
7	CA
13	M5
10	*FFA
12	*FFB
24	*FFZ
2	CONT1
21	*CB
8	*CA

6. Refer to the wiring of the oscillating mirror with SCANLAB/CTI XY2-100 protocol



Iv. Common problems and treatment

1、 All indicators are not lit

First, use the multimeter to measure the 24V plug of the board card to confirm that there is 24V voltage; after confirmation, if the PWR power indicator light is still not on, the fuse on the board card may be burned out. Please contact our after-sales engineer to open the cover and replace it under his guidance or authorization.

2、 The computer cannot connect to the board card

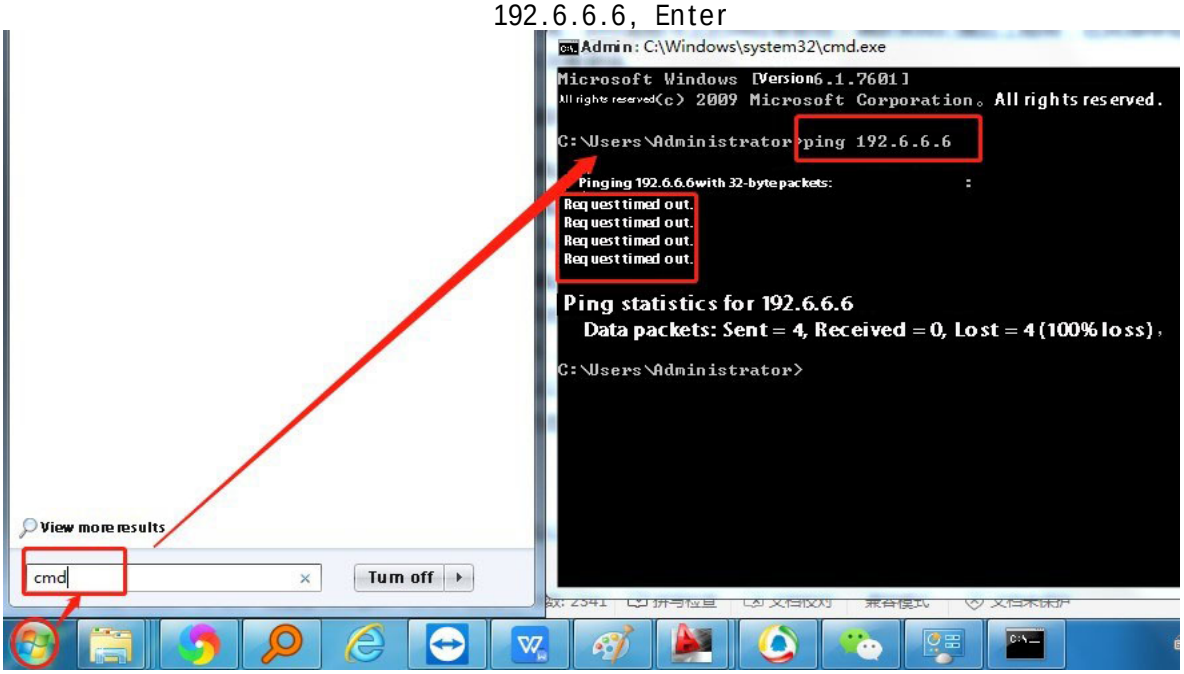
Please confirm that the network cable is correctly connected to the EtherNET port of the board and the computer network port, please connect correctly;

Please confirm that the computer IP address is set correctly. Please set it correctly. Generally, it is recommended to set: IP address: 192.6.6.20, subnet mask: 255.255.255.0, default gateway: not selected;

Reconfirm that the PWR light is on, ALM light is off, and RUN light is flashing; if PWR is not on, please refer to the first point for handling; if ALM light is on, there is a fault, please contact our after-sales engineer for handling; if RUN light is not flashing, wait for about 20s, then observe again, if it still does not flash, please contact our after-sales engineer for handling;

If the above states are correct and you still cannot connect, please use the ping command on your computer to test whether the network communication is correct

Typing Start-> Search for programs and Files, enter cmd, Enter-> Enter ping 192.6.6.6, Enter



If the network is completely down, please contact our after-sales engineer for assistance.