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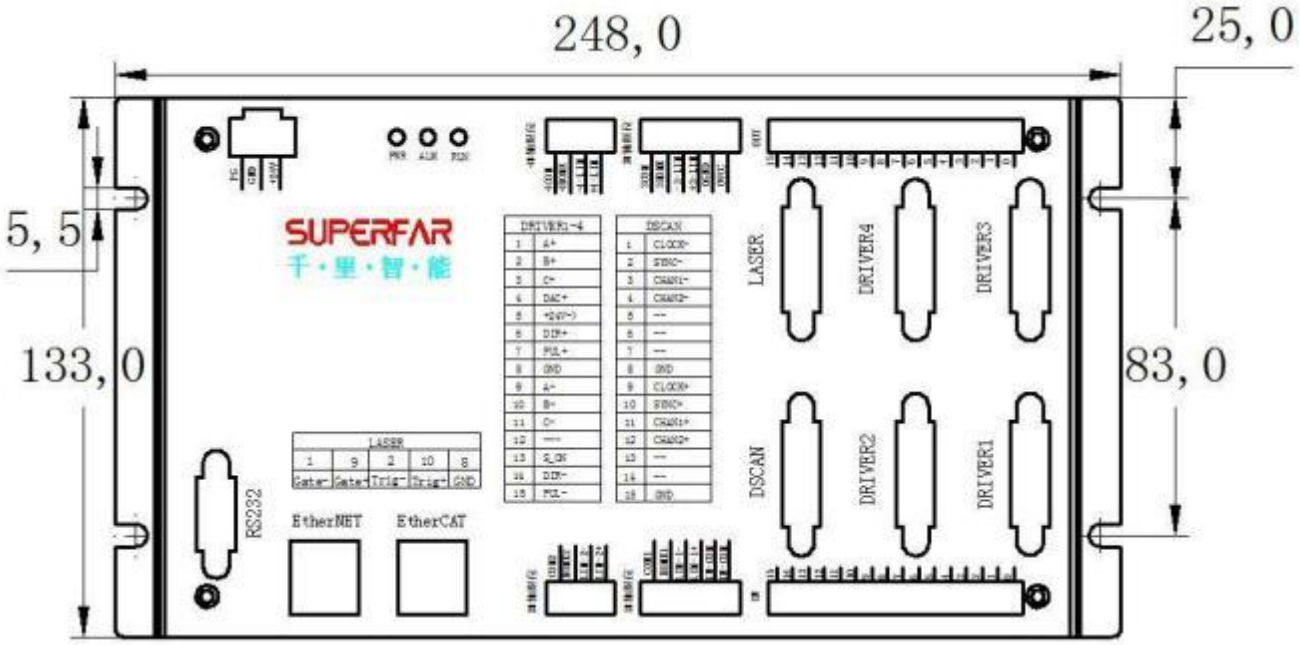
Platform galvanometer control card QLS - 421_V2.0

Hardware Wiring Manual V250411

catalogue

I. Introduction to the platform ZOOM control card



QLS-421 control card is a high-end platform of Zhenjing linkage card independently developed by Qianli Intelligence, which adopts powerful

CPU computing is mainly used in the processing applications of platforms with multi-axis motion, vibration mirrors and lasers to realize the linkage between the platform and the vibration mirror, greatly improving the processing efficiency, such as 3D printing, PCB/FPC, fingerprint identification chips, camera modules and other laser precision cutting, large-scale PCB marking, wafer marking, etc.

Using dual-core ARM CPU computing, super computing power, very short servo cycle, suitable for high speed, high precision digital control; configured with large memory, can process large 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 failure of the industrial computer, machine tool equipment system motion is more stable;

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

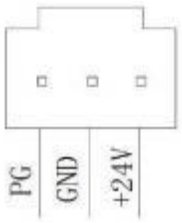
Main interface description:

1. Power supply: 24V power supply, it is recommended to be powered by independent power supply/isolated from 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 path input /16 path output: the input is compatible with NPN and PNP types, high and low levels can be switched through the common terminal, the output is a Darlington tube, low level is effective, and the load capacity is strong;
4. 1 independent DSCAN galvanometer control port: supports XY2-100, protocol galvanometer control, 16bit, high precision resolution, delay accuracy can reach 1us;
5. 1 LASER fiber laser interface: output 5V TTL Gate, Trig signal, high and low levels can be switched, can control CO2, ultraviolet, green light, picosecond and other general lasers;
6. 4 motion axis control and independent limit interface: support 4 points with encoder axis, interpolation and other motion control, support linear motor, servo motor, stepper motor, etc.; 4 axes independent positive, negative, origin limit signal, compatible with NPN, PNP type photoelectric switch;
7. 1 EtherNET network port: Gigabit network port, which can be connected to the upper computer quickly and stably, and can run offline;
8. 1 EtherCAT port: expand axis control and IO through EtherCAT bus;
9. 416-bit ±10V analog signal input/output, can collect such as temperature, liquid level, light power meter and other analog signals, output analog to control the laser that needs analog power control;
10. 1 RS232 serial port: supports communication extension to touch screen or other devices.

2. Hardware interface description

Warning: Do not plug or unplug the board with power on! Otherwise, the board may be damaged! The loss caused by this is borne by the user!

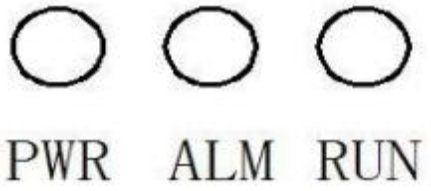
1. 24V power input



The current of the power supply 24V should not be less than 1A. Please pay attention to the direction and order! It is recommended to use a separate 24V power supply to ensure that the board power supply is isolated from the input and output.

Pin	Name	Explain
1	+24V	+24V input, current greater than 2A
2	GND	+24V input ground
3	PG	The shell is large (do not recommend connection)

2. status lamp

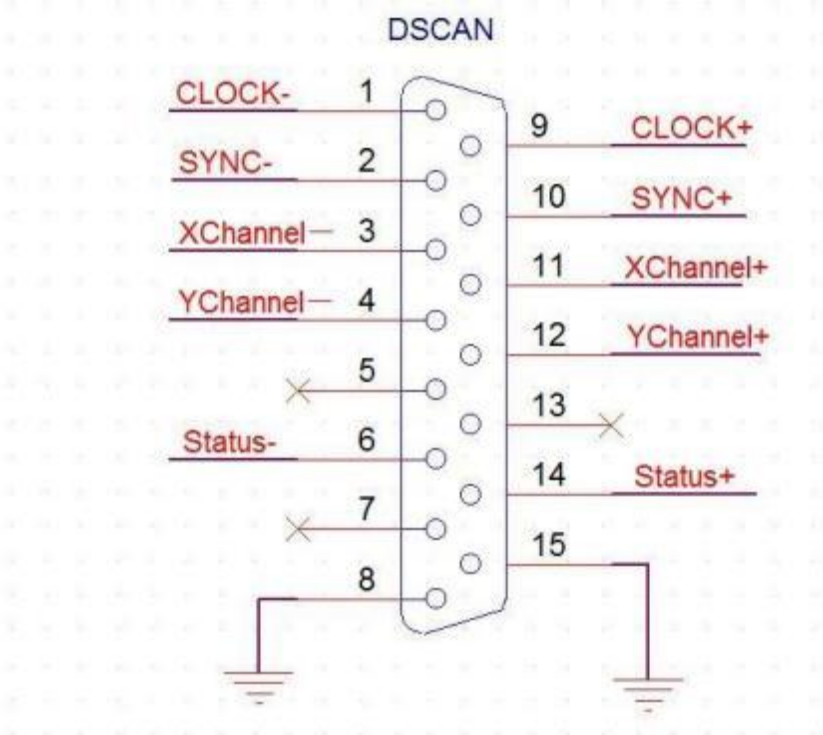


PWR: 24V power supply state, if the green light is always on, the power supply is normal, if not, please check the 24V power signal

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

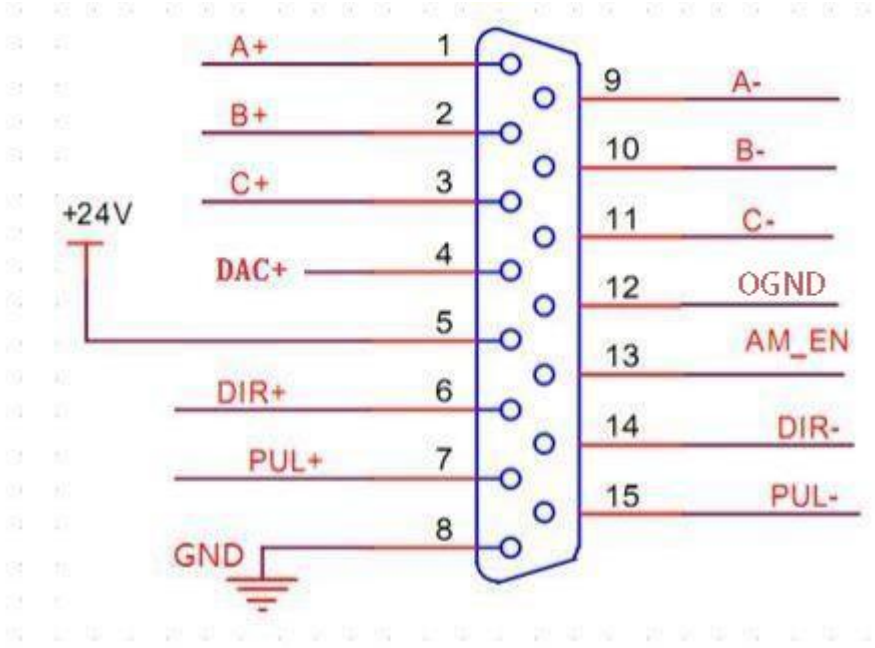
RUN: Run the signal light. After power on, it will blink for about 20s. If the system starts normally, it will blink; otherwise, there is a fault

3. Zoom control port (DSCAN)



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	GND	Grounding feet
Note: Please use shielded twisted pair, shielded layer single end grounding, please refer to the rear galvanometer wiring diagram. At the DSCAN end, connect the shielding layer to the 8 or 15 feet; the power line of the galvanometer and the control signal line should be separated to enhance the anti-interference ability of the galvanometer signal.		

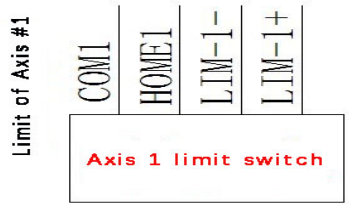
4. Motor control port (Driver1-4)

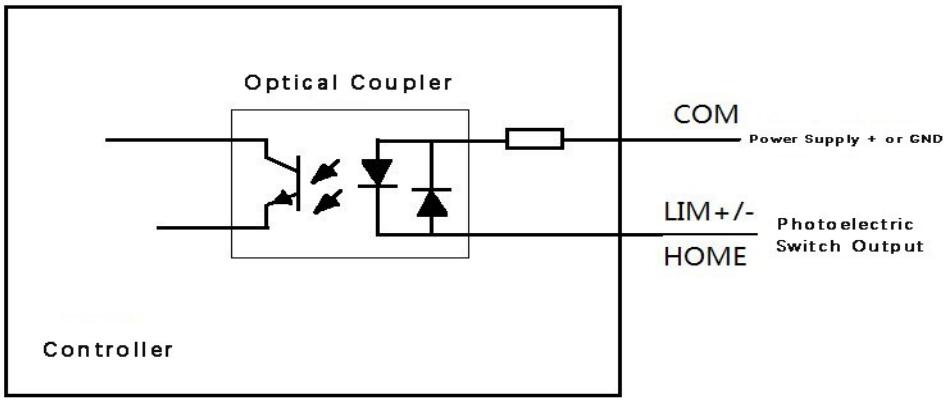


Pin	Name	Explain
1、9	A+/A-	Encoder A+/ Encoder A-
2、10	B+/B-	Encoder B+/encoder B-
3、11	C+/C-	Encoder C+/encoder C-
4	DAC+	Analog output ± 10V
5	+24V	24V power output
12	OGND	Isolate the 24V power supply from the outside
13	AM_EN/S-ON	The driver outputs the enable signal

6、14	DIR+/DIR-	Pulse direction signal output
7、15	PUL+/PUL-	Pulse signal output
8	GND	Grounding feet

5. Extreme signal ports (1-4)

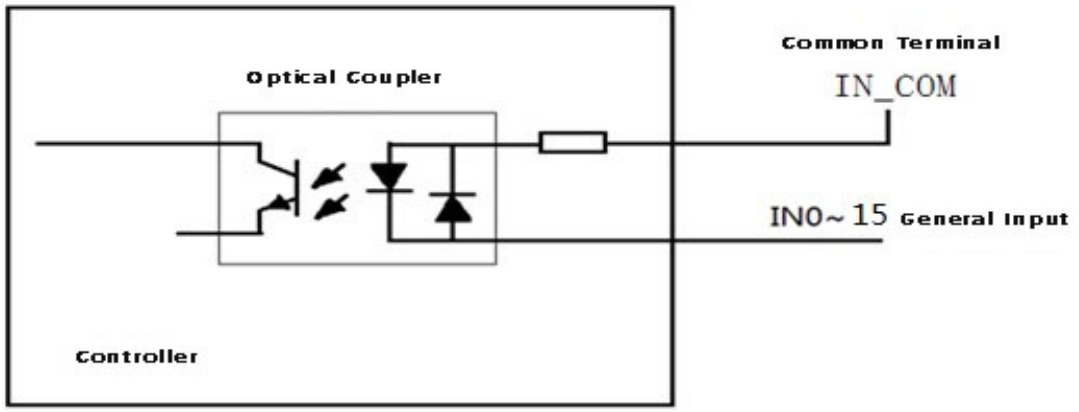


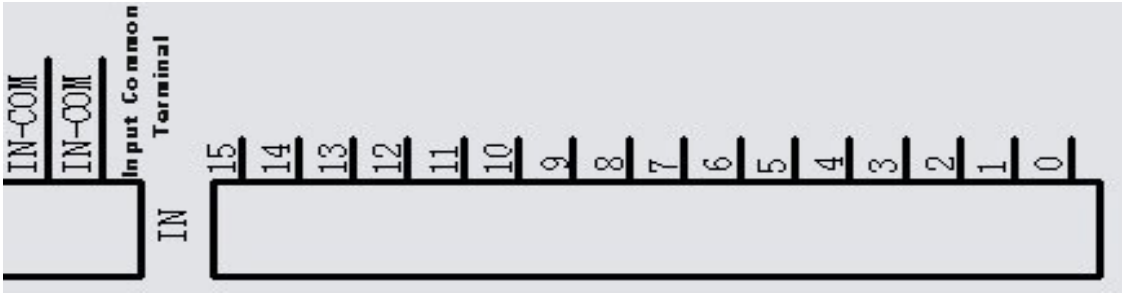


Pin	Name	Explain
1	LIM-1+	Positive limit signal
2	LIM-1-	Negative limit limit signal
3	HOME1	Zero point limit signal
4	COM1	Common port

Note: The number in the name is the axis number; it is compatible with PNP and NPN photoelectric switches by using the COM public end as a level reference.

6 Input port

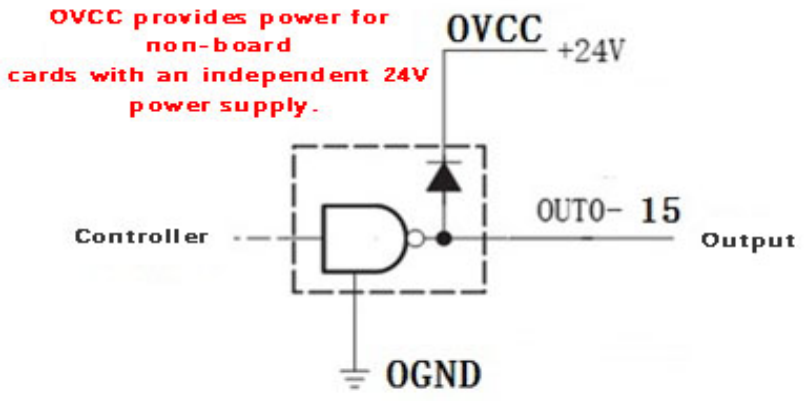




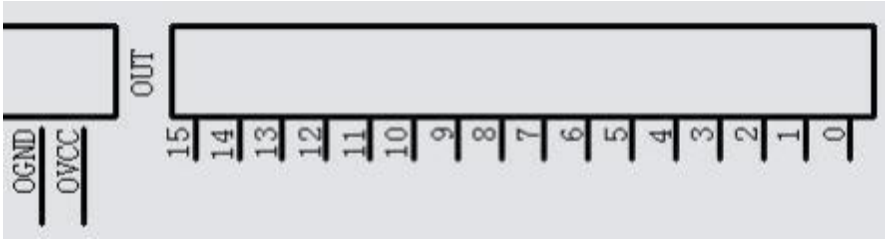
Pin	Name	Explain
0-15	IN0-15	Input signal 0 to signal 15

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

7. output port



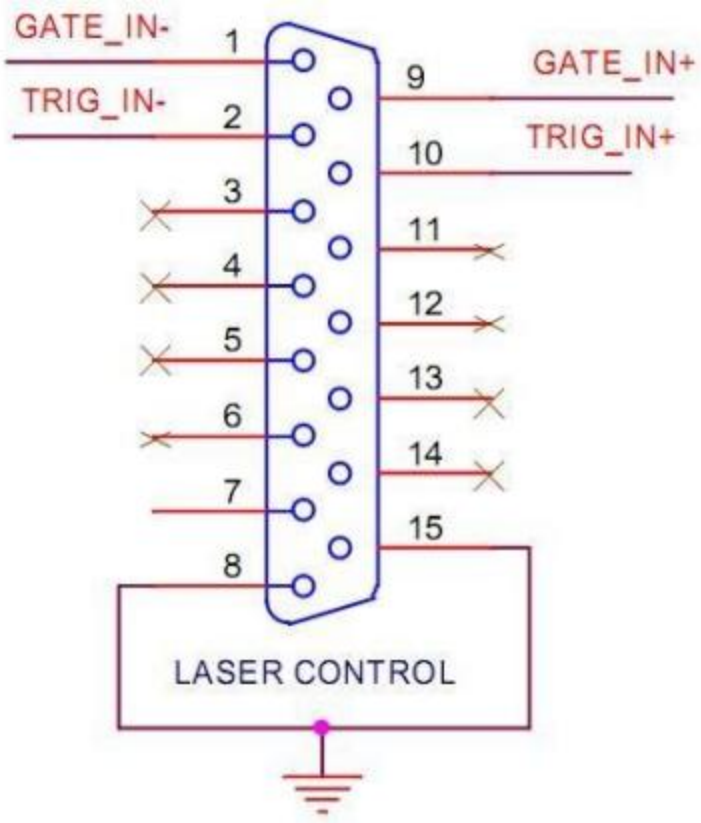
NPN Darlington Transistor



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 transistor output, with low-level active. The load can directly drive three-color lights, solenoid valves up to 500mA, etc. It is recommended to use a separate 24V power supply for the OVCC and OGND, ensuring that the board's power supply is isolated from the output. The OVCC supplying the output is calculated based on the output current; the higher the output current, the greater the required OVCC supply current.

8. Laser control interface description (LASER)



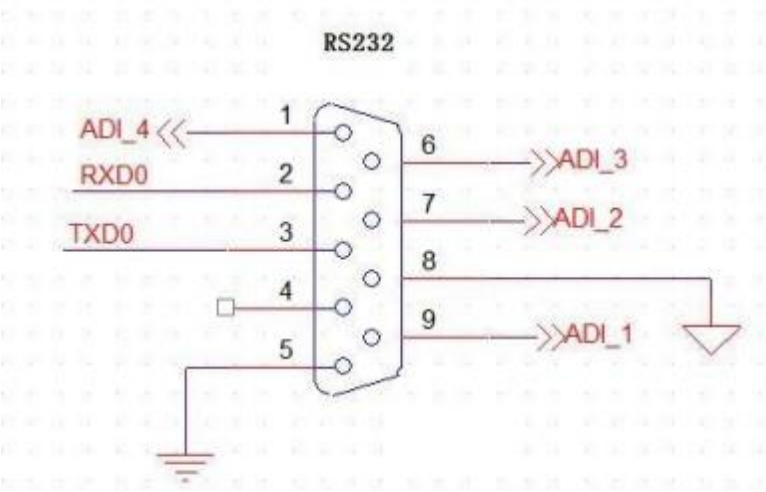
Pin	Meaning	Explain
1	Laser Gate-	Gate signal, low level effective
2	Laser Trig-	The trig signal is valid at low levels
9	Laser Gate+	Gate signal, high level effective
10	Laser Trig+	Trig signal, high level effective
8、15	GND	Form a circuit with 1, 2, 9 and 10

Note: Output 5V TTL Gate and Trig signals, high and low levels can be switched, can control CO2, ultraviolet, green light, picosecond and other general lasers;

Connect 8 and 9 to form a circuit between Gate+ and GND, and use the high level on the gate to control the light. Connect

8, 10, indicates that Trig+ and GND form a circuit, and the Trig high level switch control is used.

9RS232 and analog input ports



Pin	Name	Explain
2	RXD0	Control card RS232, receiving signal end
3	TXD0	Control card RS232, signal sending end
5	GND	Grounding feet
9	ADI_1	Analog input 1
7	ADI_2	Analog input 2
6	ADI_3	Analog input 3
1	ADI_4	Analog input 4
4、8	--	Hang in the air

10EtherNET Network port

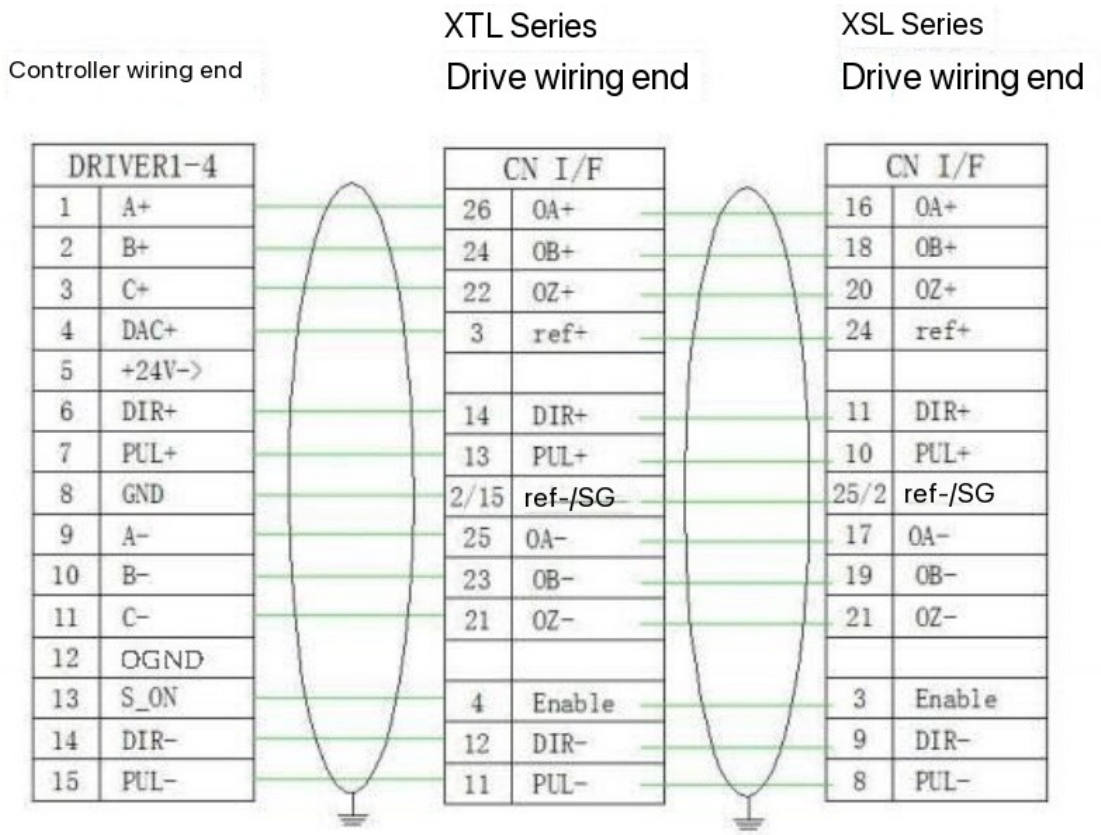
According to TCP/IP protocol, the real-time data can be transmitted safely, reliably and quickly with the upper computer software; the default IP address of this controller is 192.6.6.6

11EtherCAT Bus expansion ports

Expand I/O and axis control according to the EtherCAT bus protocol.

3. Typical wiring diagram reference

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

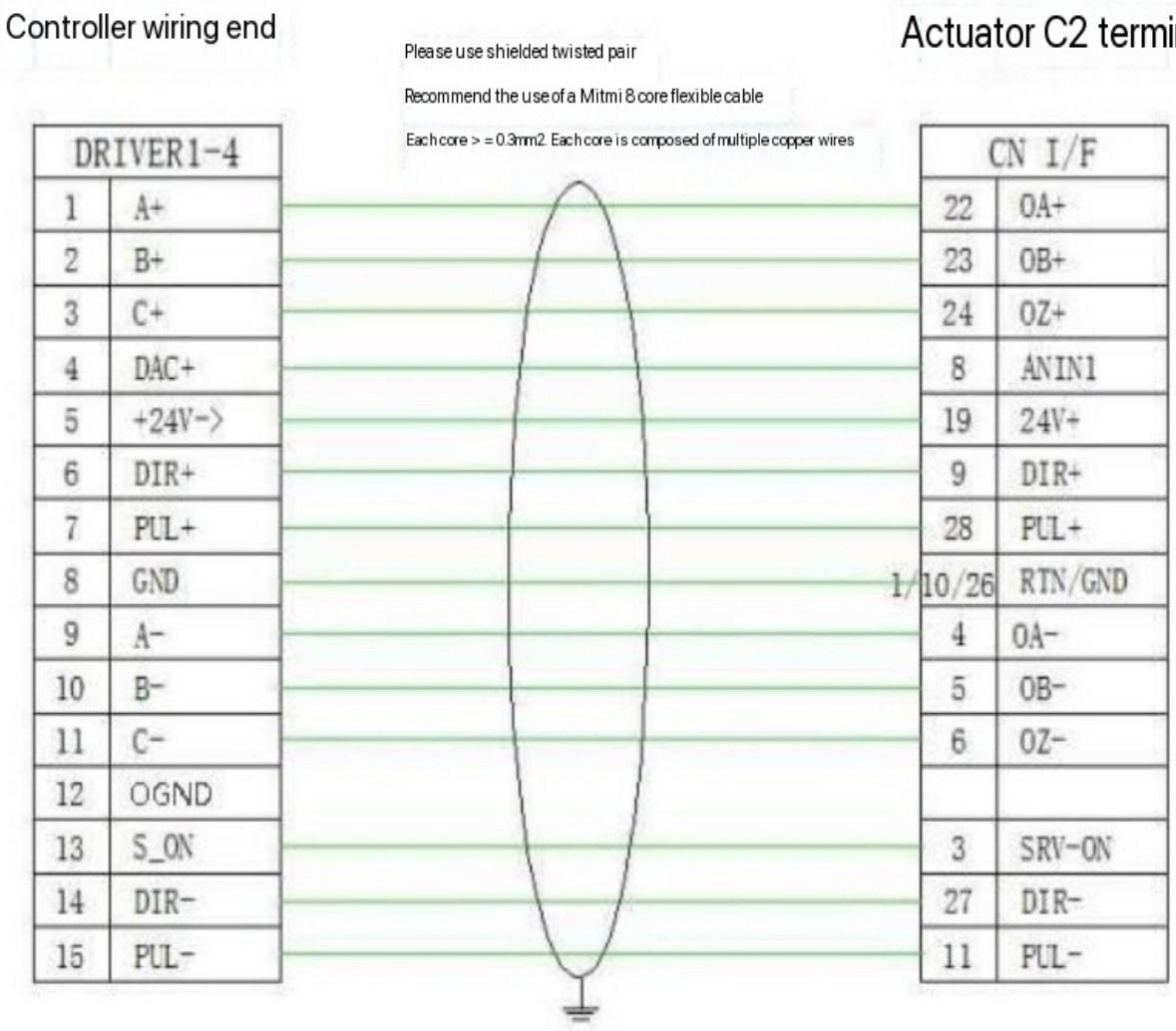


Please use shielded twisted pair

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、 Wiring reference for Servotronix CDHD - 0062AAP1 of Gauchuang.



3、 Wiring reference for Panasonic MSDA Series drives.

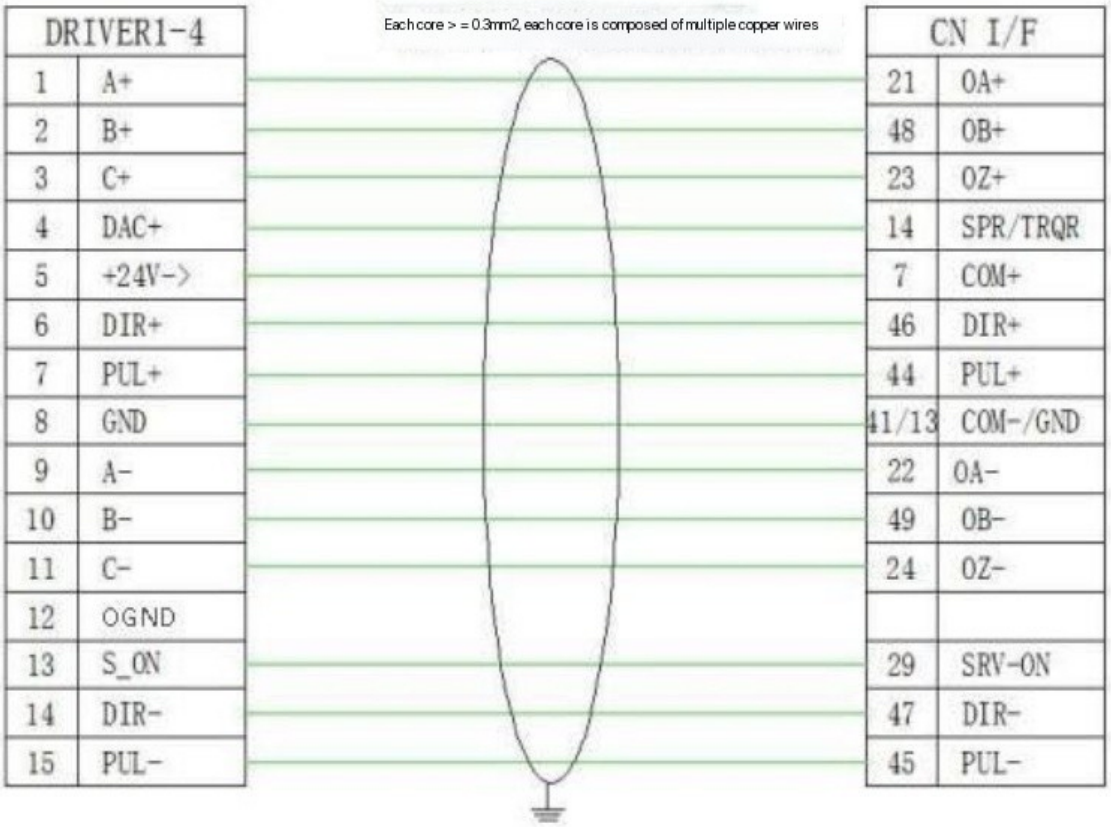
Controller wiring end

Please use shielded twisted pair

Recommend the use of a Mitmi 8 core flexible cable

Each core > = 0.3mm2, each core is composed of multiple copper wires

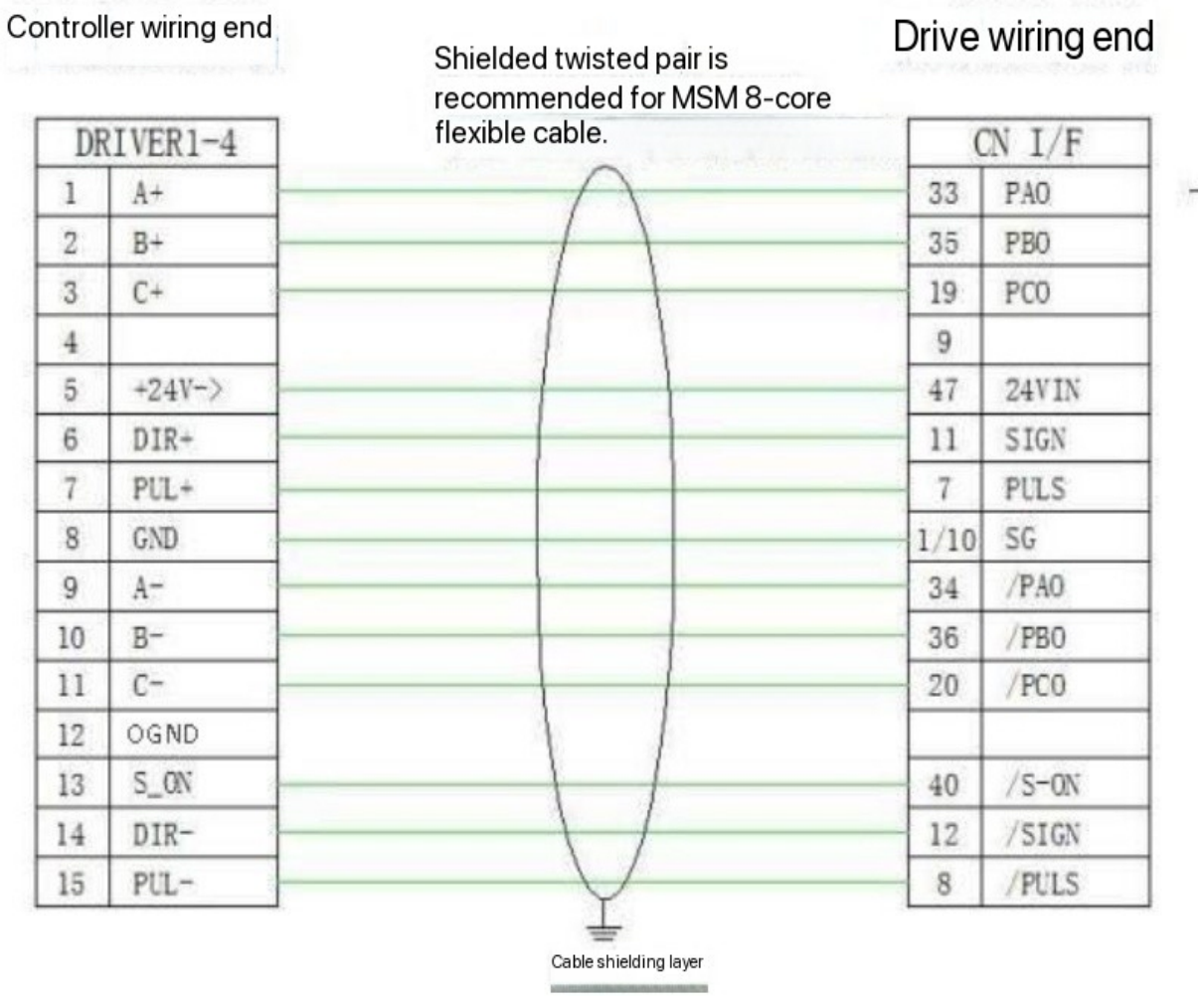
Drive wiring end



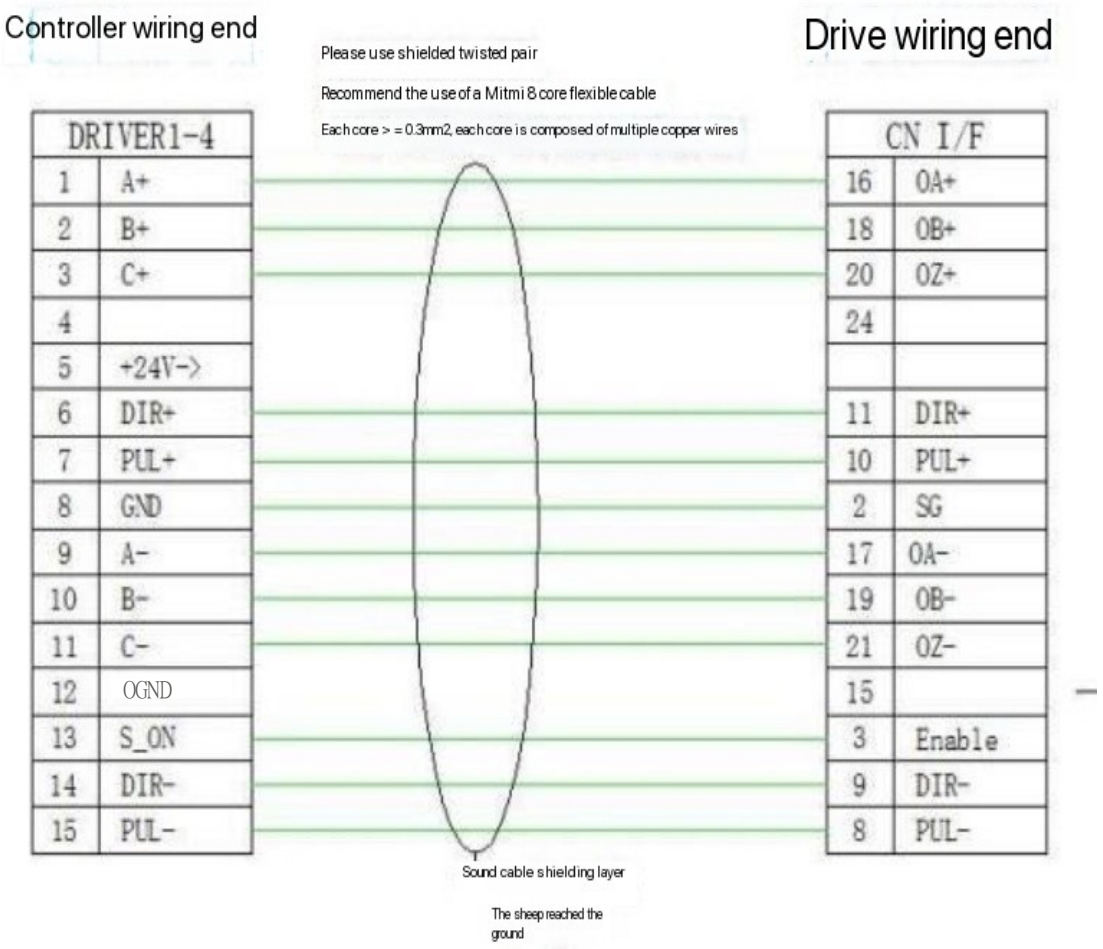
DRIVER1-4	
1	A+
2	B+
3	C+
4	DAC+
5	+24V->
6	DIR+
7	PUL+
8	GND
9	A-
10	B-
11	C-
12	OGND
13	S_ON
14	DIR-
15	PUL-

CN I/F	
21	OA+
48	OB+
23	OZ+
14	SPR/TRQR
7	COM+
46	DIR+
44	PUL+
41/13	COM-/GND
22	OA-
49	OB-
24	OZ-
29	SRV-ON
47	DIR-
45	PUL-

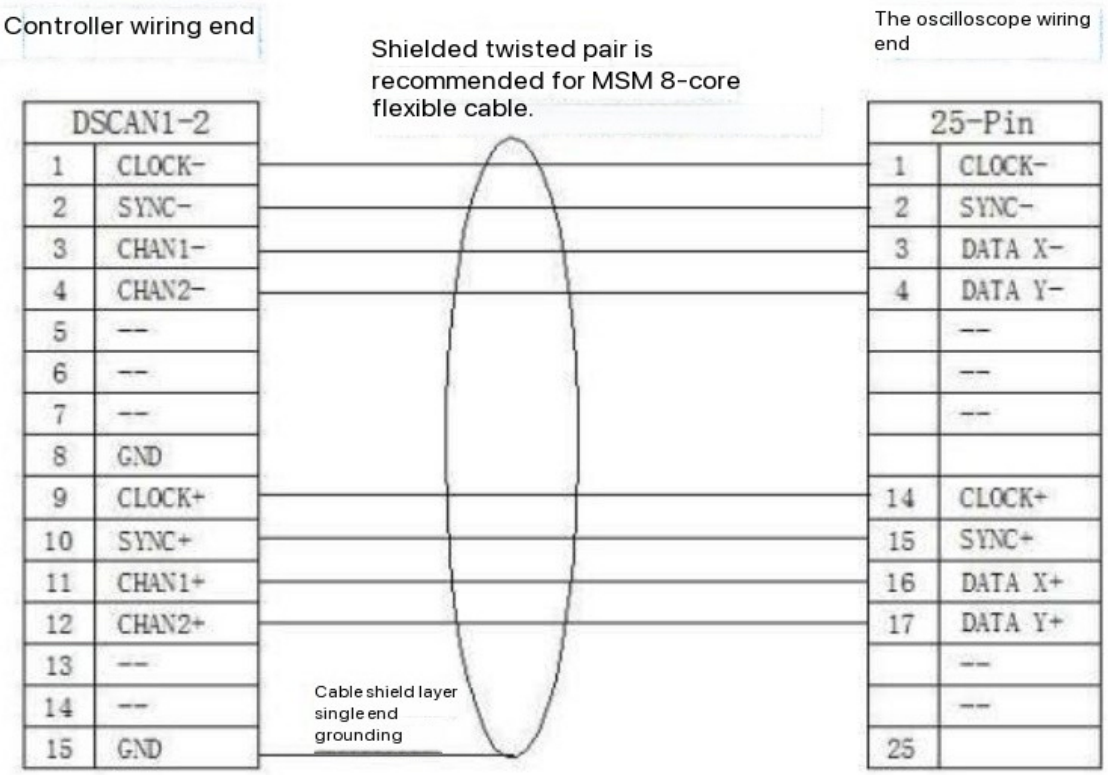
4、 Refer to wiring for Yaskawa Σ-7S driver SGDS7-2R8A



5、 Wiring reference for Hiwin D1 Series drives.



6、 Wiring reference for the galvanometer in accordance with the protocol of SCANLAB/CTIXY2-100



Four. Common problems and solutions.

1、 All the indicator lights are not on.

First, use a multimeter to measure the 24V plug of the board to confirm that there is a 24V voltage. If the voltage is confirmed to be present but the PWR power indicator light still does not light up, it is likely that the fuse tube on the board has been blown. Please contact our after-sales engineer and open the cover to replace it under their guidance or authorization.

2、 The computer cannot be connected to the board.

Please confirm that the network cable is correctly connected to the EtherNET port of the board and the network interface of the computer. Make sure the connection is correct.

Please confirm that the IP address of the computer is set correctly. Set it properly. It is generally recommended to set it as follows: IP address: 192.6. 6.20, subnet mask: 255.255.255.0, default gateway: not selected.

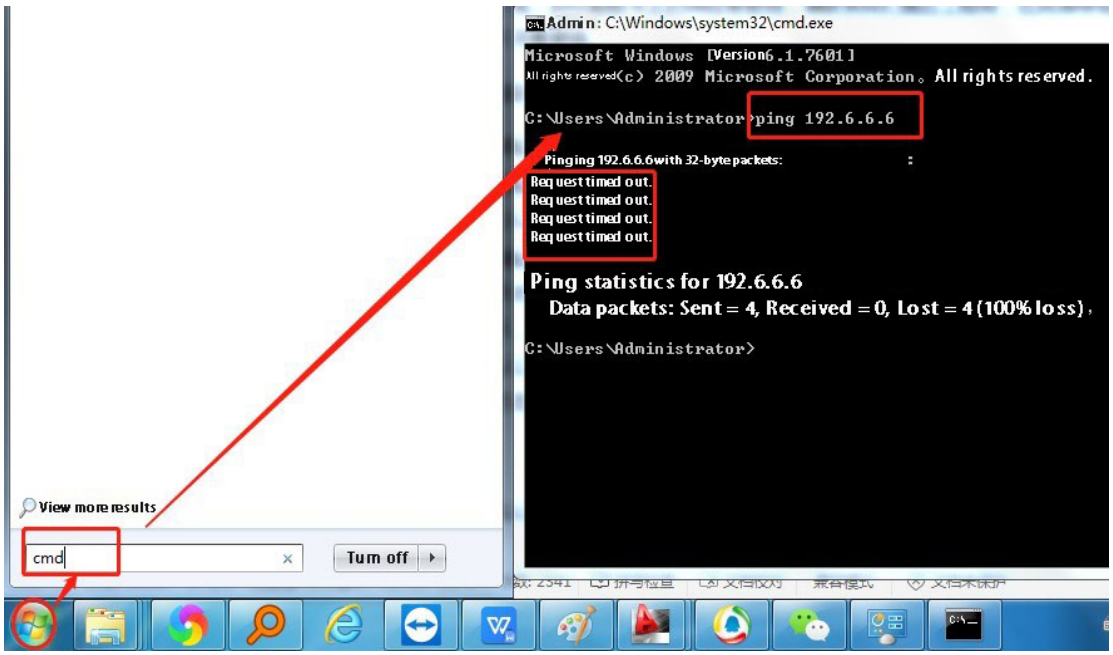
Then confirm that the PWR light on the board is constantly on, the ALM light is off, and the RUN light is flashing.

- If the PWR light is not on, please refer to item 1 for handling.

- If the ALM light is constantly on, there is a fault. Please contact our after - sales engineer for handling.

- If the RUN light is not flashing, please wait for about 20 seconds and then observe. If it still doesn't flash, please contact our after - sales engineer for handling.

After confirming that all the above statuses are correct but the connection still fails, please use the ping command on the computer to test whether the network communication is normal: Click "Start" -> Enter "cmd" in "Search programs and files" and press Enter -> Enter "ping 192.6.6.6" and press Enter.



If the network is not available, please contact our after-sales engineer for processing;