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# Platform motion control card QLC-420 Hardware Wiring Manual

V241218

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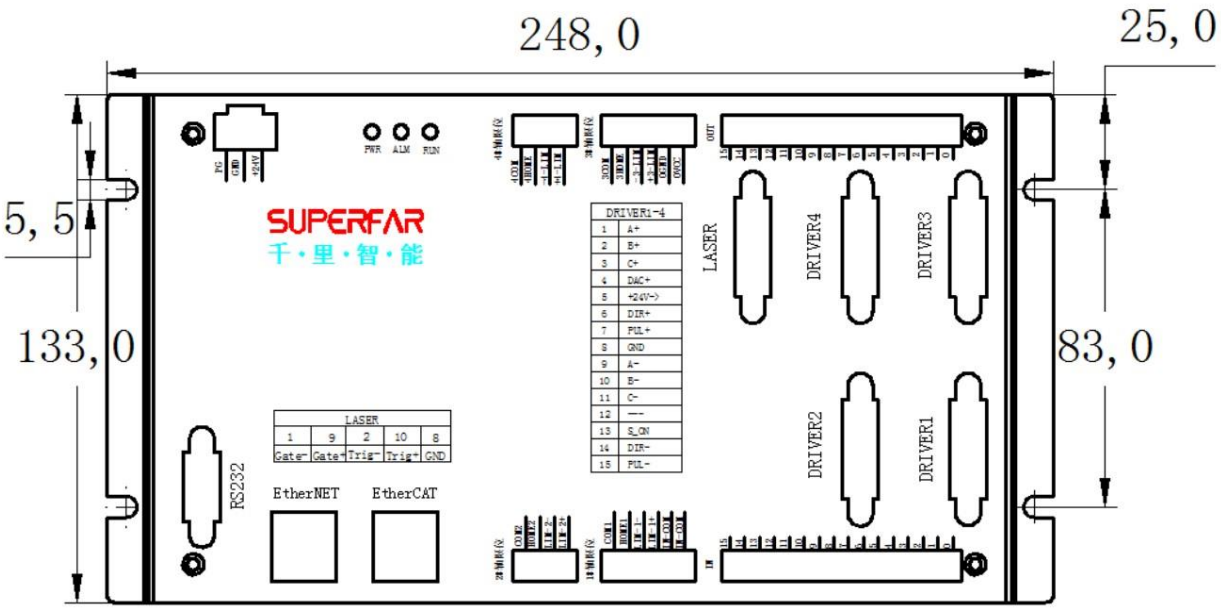
# one, Platform Control Card Introduction




The QLC-420 control card is a high-end platform control card independently developed by Qianli Intelligent . It uses powerful CPU calculation and is mainly used in multi-axis motion platforms and laser processing applications.

It uses dual-core ARM CPU computing, has super computing power, and extremely short servo cycle, which is suitable for high-speed, high-precision digital control; it is equipped with a large memory and can process a large amount of data at a time, which is very suitable for galvanometer control systems with large data throughput;

Adopting 100/1000M Ethernet, there is no need to install a driver, the control system can run independently, is not affected by the failure of the industrial computer, and the machine tool equipment system movement is more stable;
Main interface description:

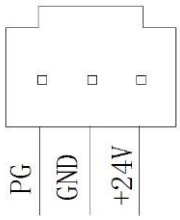
1. Power supply: 24V power supply, it is recommended to use an independent power supply to isolate it from the input and output;

2. Status indicator light: Indicates whether the controller is powered normally, whether there is an alarm, and whether the system is normal;
3. 16 -channel input /16- channel 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 Darlington tube, the low level is effective, and the load capacity is strong;
4. 1 LASER fiber laser interface: output 5V TTL Gate and Trig signals , high and low levels can be switched, and can control CO2 , ultraviolet, green light, picosecond and other general lasers;
5. 4 motion axis control and independent limit interface: support 4 encoder axes with point position, interpolation and other motion control, support linear motor, servo motor, stepper motor, etc.; 4 axes have independent positive, negative and origin limit signals, compatible with NPN and PNP photoelectric switches;
6. 1 EtherNET port: Gigabit Ethernet port, fast and stable connection with the host computer, can run offline ;
7. 1 EtherCAT port: expand axis control and IO through EtherCAT bus ;
8. 4- channel 16 -bit ± 10V analog signal input / output, which can collect analog signals such as temperature, liquid level, optical power meter, etc., and output analog signals to control lasers that require analog power control;
9. 1 RS232 serial port: supports communication expansion with touch screen or other devices .

# 2. Hardware Interface Description

**Warning: It is strictly forbidden to plug or unplug the device while it is powered on! Otherwise, the board may be damaged! The user shall bear the loss caused by this!**

## 1. 24V power input

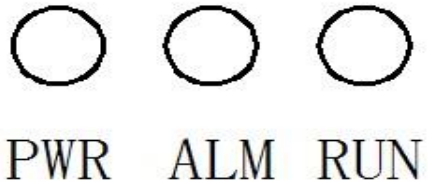



The power supply is 24V and the current is not less than 1A . Please pay attention to the direction and sequence!

Recommendation: Use a separate 24V power supply to ensure isolation of the board power supply and input and output.

| Pins | name | illustrate |
|---|---|---|
| 1 | +24V | +24V input, current greater than 2A |
| 2 | GND | +24V input ground |
| 3 | PG | Shell ground (not recommended) |

## **2.** Status Light

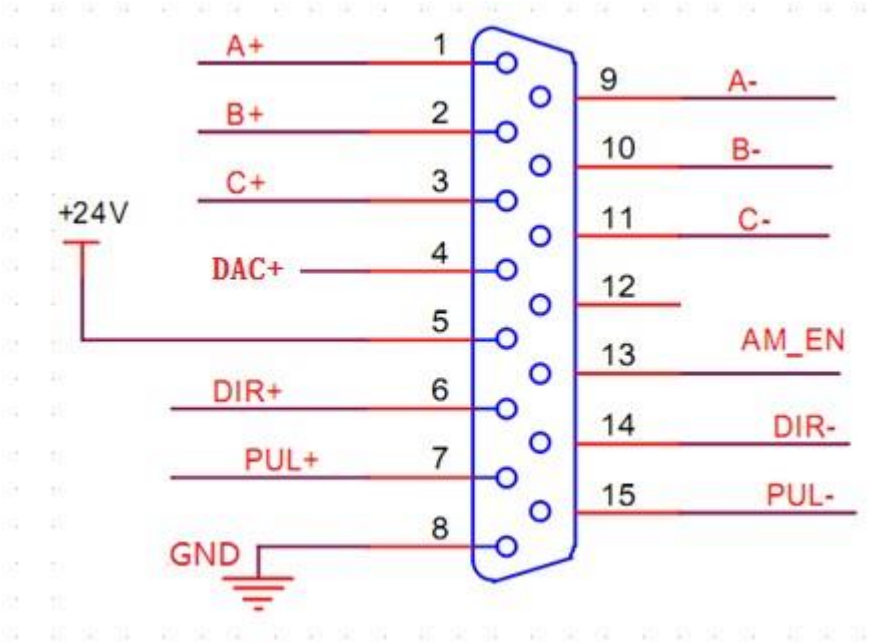



PWR : 24V power supply status, if the green light is always on, the power supply is normal, if it is not on, please check the 24V power supply signal

ALM : Alarm signal light. If this light is off, it means there is no fault. If it is on, it means there is a system fault.

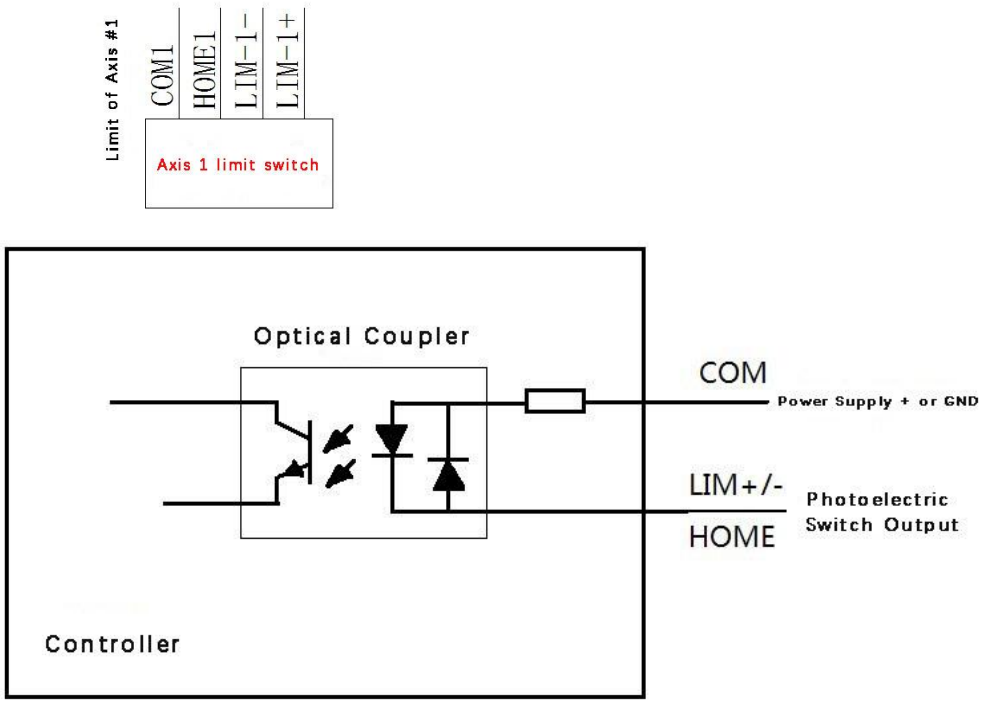
RUN : Running signal light, about 20 seconds after power-on , if the system starts normally, it will flash, otherwise there is a fault

## **3.** Motor control port (Driver1-4)




| Pins | name | illustrate |
|---|---|---|
| 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 ±10V output ( supported by models with A ) |
| 5 | +24V | 24V power output |
| 13 | AM_EN/S-ON | Driver enable signal output |
| 6, 14 | DIR+/DIR- | Pulse direction signal output |
| 7, 15 | PUL+/PUL- | Pulse signal output |
| 8 | GND | Ground pin |

# **4.** Limit signal port (1-4)

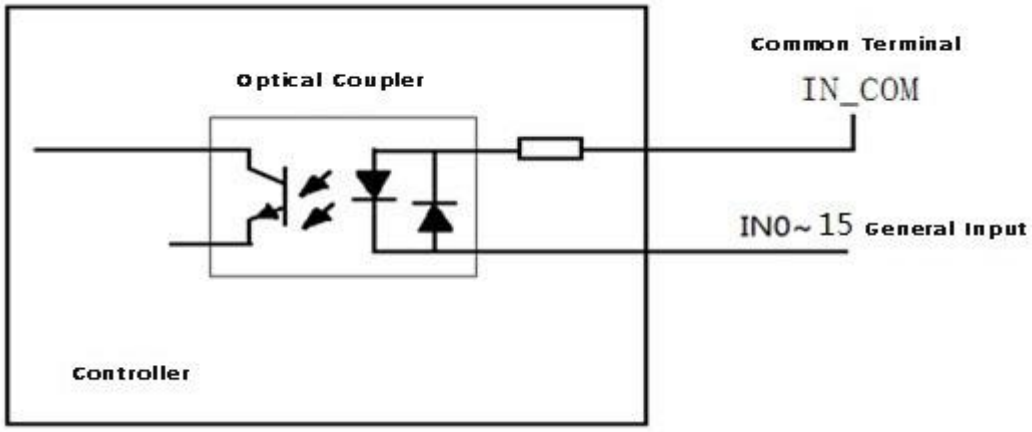


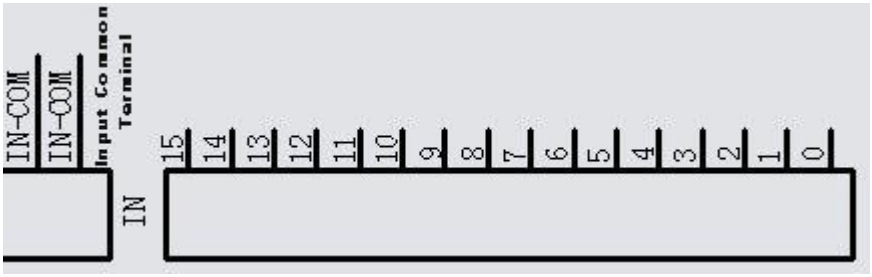

| Pins | name | illustrate |
|---|---|---|
| 1 | LIM-1+ | Positive limit signal |
| 2 | LIM-1- | Negative limit signal |
| 3 | HOME1 | Zero limit signal |
| 4 | COM1 | Public |

Note: The numbers in the names are the axis numbers;

By using the COM common terminal as a level reference, it is compatible with PNP and NPN photoelectric switches.

# **5.** Input Port

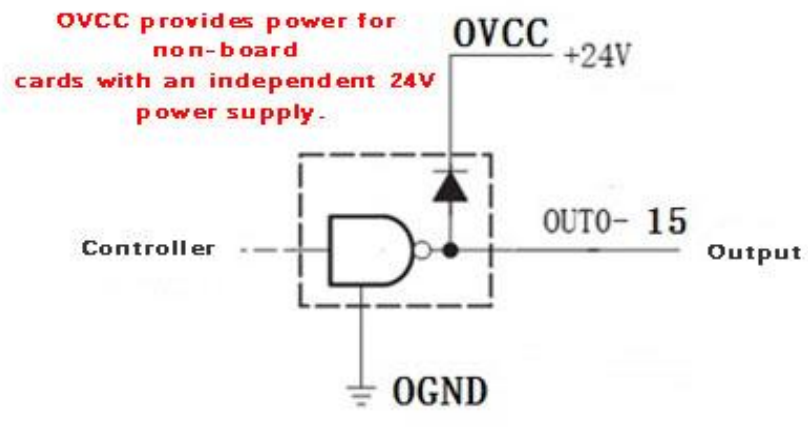


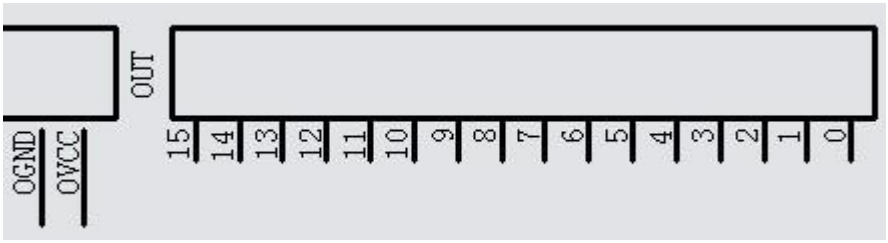

| Pins | name | illustrate |
|---|---|---|
| 0-15 | IN0-15 | Input signal 0 to signal 15 |

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

# 6. Output Port




NPN Darlington Transistor

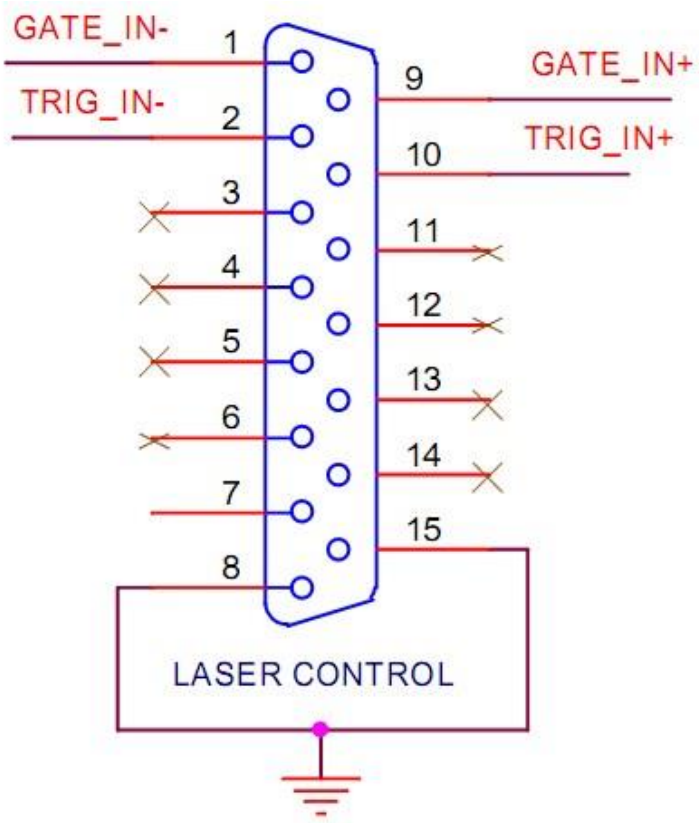



| Pins | name | illustrate |
|---|---|---|
| 0-9 | OUT0-9 | Output signal 0 to signal 9, low level is effective |
| OVCC | Power positive | P24V |
| OGND | Negative power supply | N24V |

Note: The output is NPN Darlington output, which is valid at low level. The load can directly drive three-color lamps, solenoid valves within 500mA , etc. For loads exceeding this limit, please add a relay for switching.

It is recommended that OVCC and OGND use another 24V power supply independent of the board power supply to ensure the isolation of the board power supply and output. The OVCC that supplies power to the output is calculated based on the output current. The larger the output current, the larger the OVCC supply current required .

# **7.** Laser control interface description ( LASER )

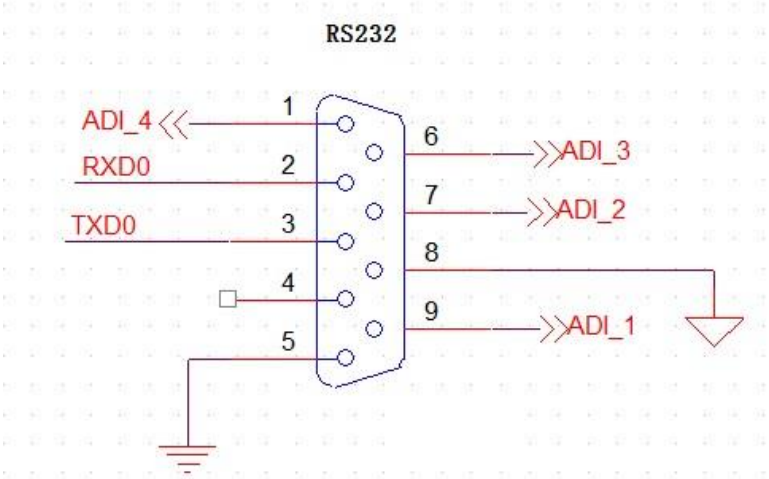



| Pinout | meaning | illustrate |
|---|---|---|
| 1 | Laser Gate- | Gate signal, low level is effective |
| 2 | Laser Trig- | Trig signal, low level is effective |
| 9 | Laser Gate+ | Gate signal, high level is effective |
| 10 | Laser Trig+ | Trig signal, high level is effective |
| 8, 15 | GND | Together with 1, 2, 9, 10, it forms a loop |

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

Connecting 8 and 9 means that Gate+ and GND form a loop, and Gate high level switching control is used . Connecting 8 and 10 means Trig+ and GND form a loop, and Trig high level switching control is used .

## **8.** RS232 and analog input port




| Pins | name | illustrate |
|---|---|---|
| 2 | RXD0 | Control card RS232 receiving signal terminal |
| 3 | TXD0 | Control card RS232 sending signal terminal |
| 5 | GND | Ground pin |
| 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 | -- | Dangling |

## **9.** EtherNET network port

According to TCP/IP protocol, it can transmit real-time data with the host computer software safely, reliably and quickly;

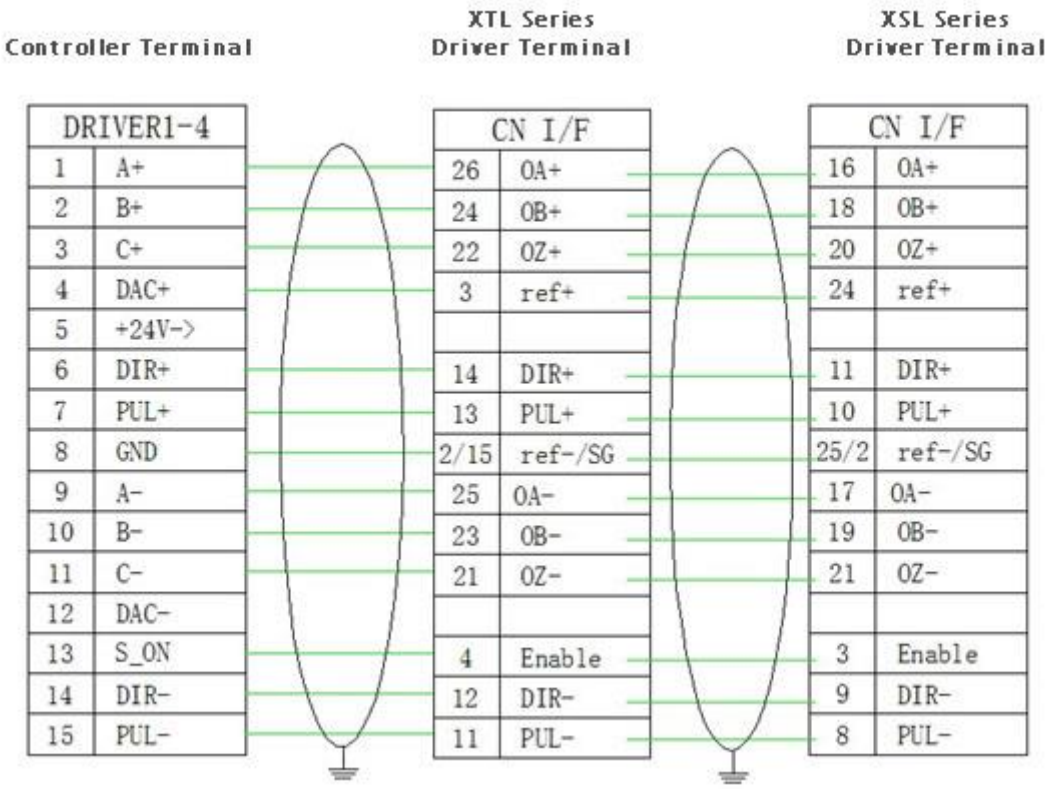
IP address of this controller is: 192.6.6.6

## **10.** EtherCAT bus expansion port

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

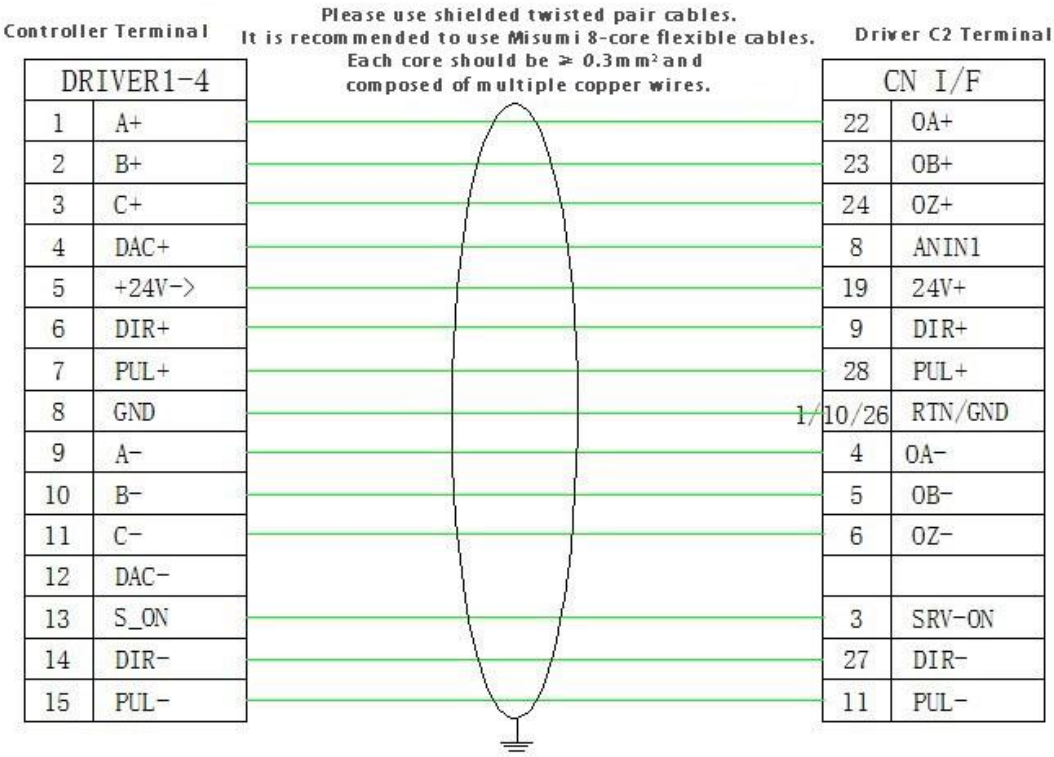
# 3. Typical wiring diagram reference

## 1. Wiring reference for Copley XTL and XSL series drivers:

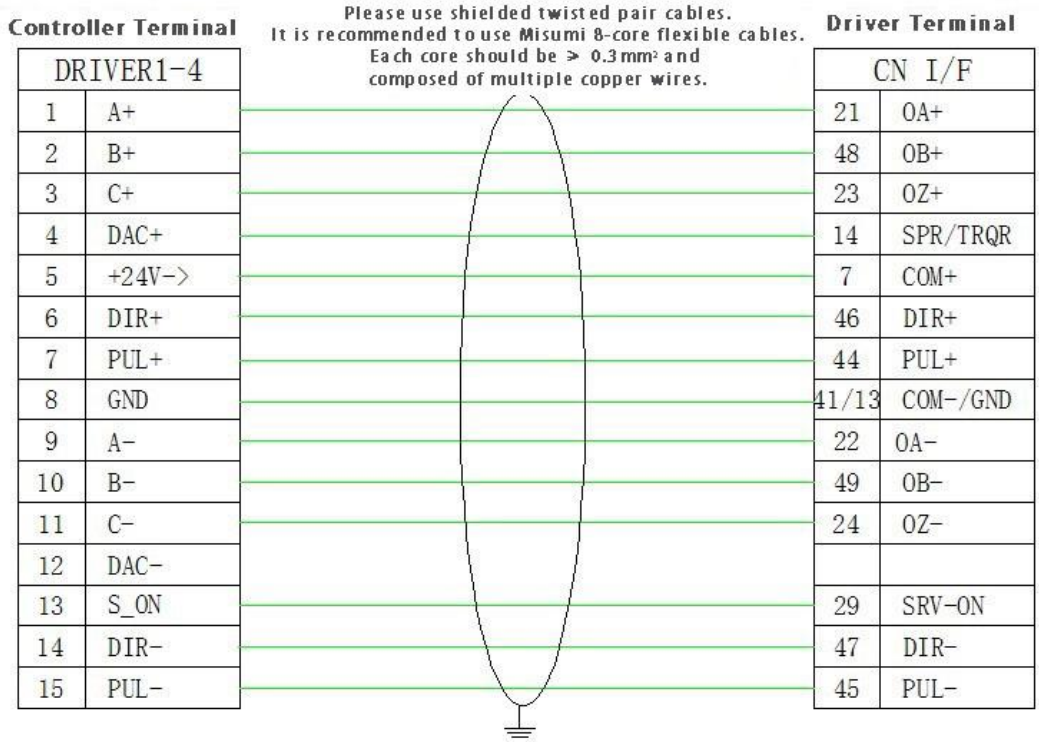



Please use shielded twisted pair cable
It is recommended to use Misumi 8-core flexible cable
Each core>=0.3mm2, each core is composed of multiple copper wires

## 2. Wiring reference with Servotronix CDHD-0062AAP1



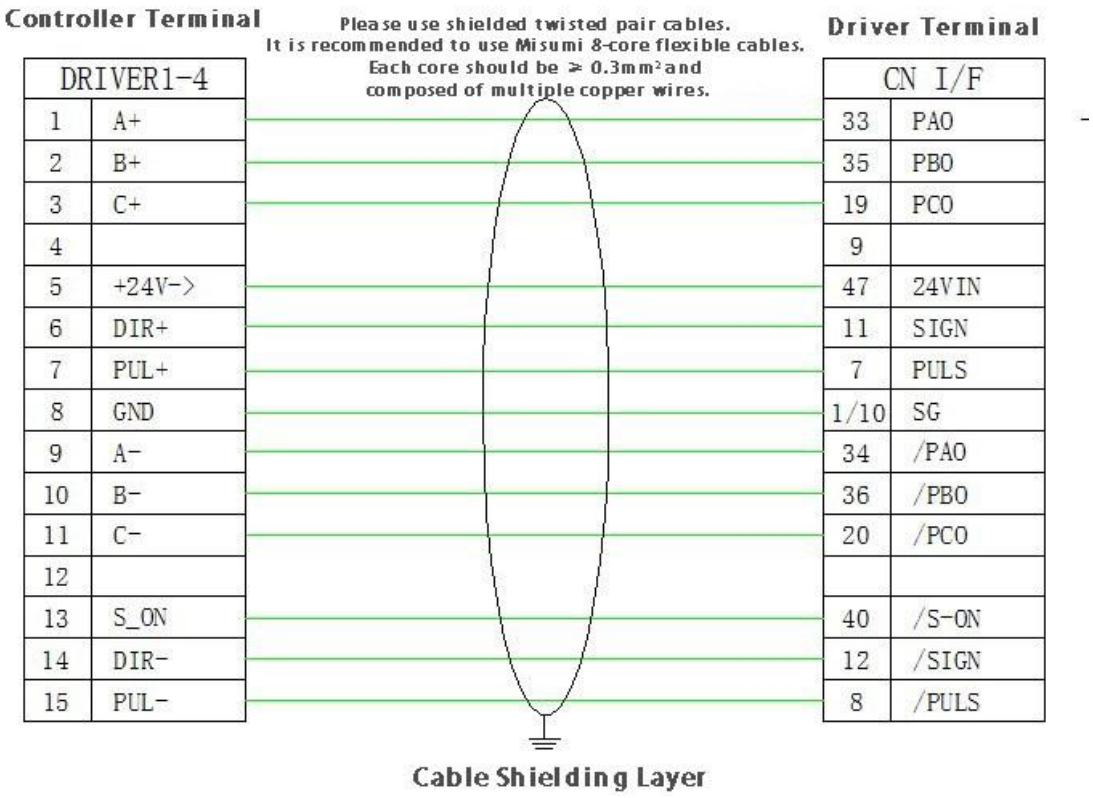
# 3. Wiring reference for Panasonic MSDA series drivers



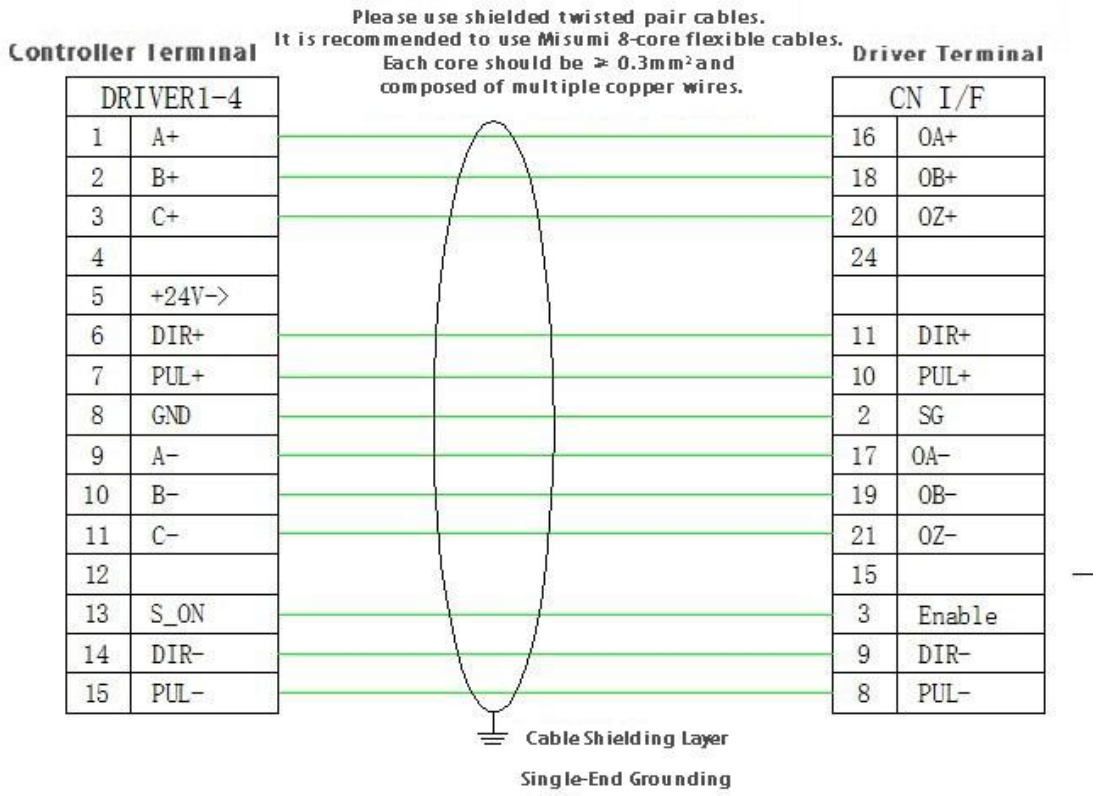

| DRIVER1-4 | |
|---|---|
| 1 | A+ |
| 2 | B+ |
| 3 | C+ |
| 4 | DAC+ |
| 5 | +24V-> |
| 6 | DIR+ |
| 7 | PUL+ |
| 8 | GND |
| 9 | A- |
| 10 | B- |
| 11 | C- |
| 12 | DAC- |
| 13 | S_ON |
| 14 | DIR- |
| 15 | PUL- |

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



# 5. Wiring reference for Hiwin D1 series drivers




## 4. Common Problems and Solutions

1、All indicator lights are off

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

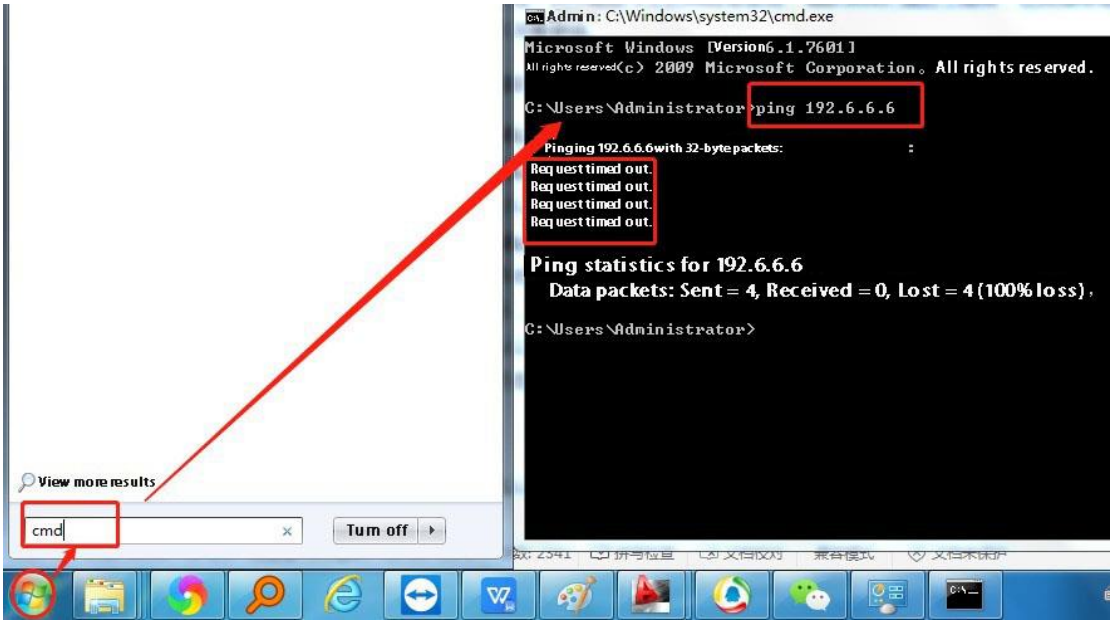
2、The computer cannot connect to the card

Please make sure that the network cable is correctly connected to the EtherNET port of the board and the network port of the computer. Please connect correctly;

Please make sure that the computer IP address is set correctly. Please set it correctly. The generally recommended settings are: IP address: 192.6.6.20 , subnet mask: 255.255.255.0, default gateway: unselected;

Confirm the board The PWR light is always on, the ALM light is off, and the RUN light is flashing. If the PWR light is off, please refer to the first step . If the ALM light is always on, there is a fault, please contact our after-sales engineer. If the RUN light is not flashing, please wait for about 20 seconds and observe again. If it is still not flashing, please contact our after-sales engineer.

After confirming that the above status is correct, if you still cannot connect, please use the ping command on your computer to test whether the network communication is normal: click Start -> Search programs and files, enter cmd , press Enter -> enter ping 192.6.6.6 , press Enter




If the network is not accessible, please contact our after-sales engineer;