




VER 1.0 **Technical Manual**

DS-OL42-IPD / DS-OL42-IRS4



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1. Features



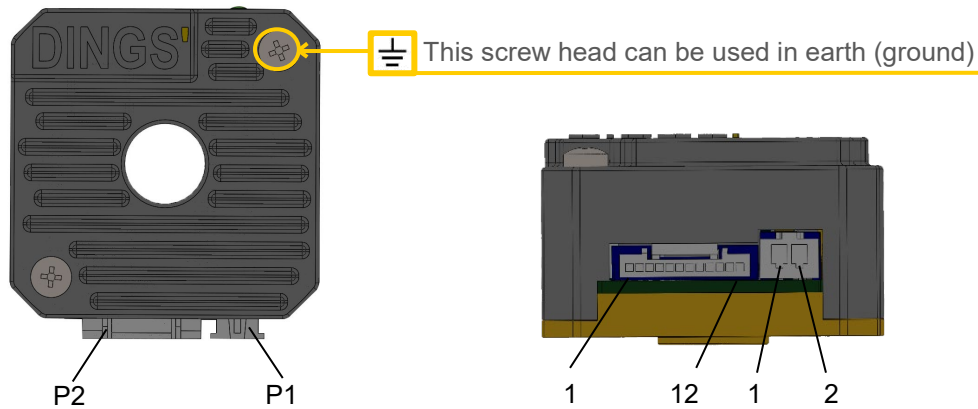
- Input power : DC 24-36V
- Output rated current (peak value) : 0.5~3.0A/Phase
- Pulse, RS485 control, support MODBUS RTU communication protocol, Max site 31
- Hollow integral drive, Compatible with E, C, K, N and Shaft Diameter < 11mm Stepper motor
- 4 Input signals
- 1 output signals
- Protection function : Current over, Voltage over, Under voltage, Power protection against reverse connection
- 2 High speed input ports, Maximum response frequency: 500KHz (Duty ratio 50%)

2. Technical Parameters



| Drive model | | DS-OL42-IPD / DS-OL42-IRS4 |
|----------------------------|----------------------------|---|
| Adapted motor | | Suitable for two-phase hybrid stepping motor, the maximum adaptation is 3.0A(peak) |
| Power supply | | DC 24V~36V |
| Output current | | 0.5A~3.0A/phase (peak) |
| Drive way | | Full-bridge bipolar PWM drive |
| Device initialization time | | 2s |
| Input signal | 2 high-speed input signals | Optocoupler input voltage: H = 3.5-26V, L = 0-0.8V On current 5~8mA |
| | 2 universal input signals | Optocoupler input voltage: H = 5, L = 0-0.8V On current 5~8mA |
| Output signal | 1 common output signal | Photoelectric isolated output, withstand voltage up to 30VDC, maximum saturation current 10mA |
| Size | | 42.2x42.2x25.2mm |
| Weight | | 60g |
| Working Environment | Precaution | Avoid dust, oil mist and corrosive gases |
| | Humidity | < 85 % RH, Non-condensing |
| | Temperature | 0°C - +40°C |
| | Cooling | Installation in a ventilated environment |

3. Schematic and Interface Definition



P1. Power input (in the order from left to right as shown)

Pin 1 ---V+ / Pin 2 ---V-

P2. Signal input/output (as shown, arranged from left to right)

(1) DS-OL42-IPD Pulse control :

Pin 1--- STEP+, Pin 2---STEP-, Pin 3---DIR+, Pin 4--- DIR-, Pin 5--- COMIN,
 Pin 6 --- IN3, Pin 7 --- IN4, Pin 8 --- OUT+, Pin 9 --- OUT-, Pin 10 --- 485GND,
 Pin 11 feet --- 485-A, Pin 12 --- 485-B



Notes

STEP, DIR input voltage is 5~24Vdc, IN1, IN2 input voltage is 5Vdc, if the voltage is 12Vdc or 24Vdc, 1K, 2.2K resistor current limiting need to be connected in series

(2) DS-OL42-IRS4 MODBUS RTU control:

Pin 1--- IN1+, Pin 2--- IN1-, Pin 3--- IN2+, Pin 4--- IN2-, Pin 5--- COMIN,
 Pin 6 --- IN3, Pin 7 --- IN4, Pin 8 --- OUT+, Pin 9 --- OUT-, Pin 10 --- 485GND,
 Pin 11 feet--- 485-A, Pin 12 --- 485-B

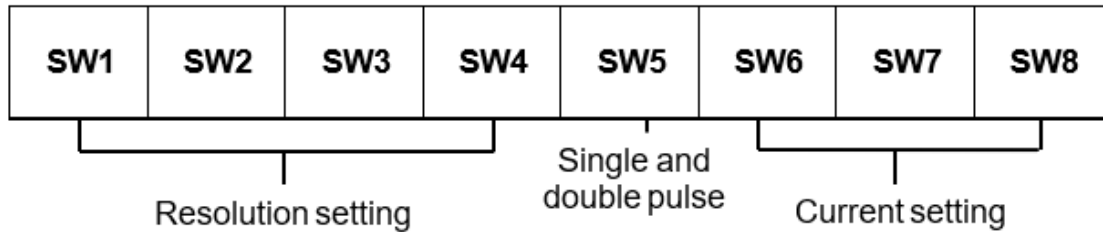


Notes

STEP, DIR input voltage is 5~24Vdc, IN1, IN2 input voltage is 5Vdc, if the voltage is 12Vdc or 24Vdc, 1K, 2.2K resistor current limiting need to be connected in series

4. Setting Switch

(The DIP switch function can be via communication : on / off ; after the DIP switch is disabled, the subdivision, current, and pulse mode parameters are set via communication)



4.1 Resolution Setting



| DIP Switch | | | | PPR |
|------------|-----|-----|-----|-------|
| SW1 | SW2 | SW3 | SW4 | |
| ON | ON | ON | ON | 400 |
| ON | ON | ON | OFF | 800 |
| ON | ON | OFF | ON | 1600 |
| ON | ON | OFF | OFF | 3200 |
| ON | OFF | ON | ON | 6400 |
| ON | OFF | ON | OFF | 12800 |
| ON | OFF | OFF | ON | 25600 |
| ON | OFF | OFF | OFF | 51200 |
| OFF | ON | ON | ON | 1000 |
| OFF | ON | ON | OFF | 2000 |
| OFF | ON | OFF | ON | 4000 |
| OFF | ON | OFF | OFF | 5000 |
| OFF | OFF | ON | ON | 8000 |
| OFF | OFF | ON | OFF | 10000 |
| OFF | OFF | OFF | ON | 20000 |
| OFF | OFF | OFF | OFF | 25000 |

4.2 Current Setting



| DIP switch | | | DS-OL42-IPD/DS-OL42-IRS4 Phase current (peak) |
|------------|-----|-----|--|
| SW6 | SW7 | SW8 | |
| ON | ON | ON | 0.5 A |
| ON | ON | OFF | 1.0 A |
| ON | OFF | ON | 1.2 A |
| ON | OFF | OFF | 1.5 A |
| OFF | ON | ON | 2.0 A |
| OFF | ON | OFF | 2.5 A |
| OFF | OFF | ON | 2.8 A |
| OFF | OFF | OFF | 3.0 A |

4.3 Operating Mode



| SW5 | Operation mode | Remark |
|-----|-------------------|--------|
| ON | Double pulse | |
| OFF | Pulse + direction | |

Pulse + direction mode: pulse is added to the pulse input terminal, the motor rotates in one direction when the directional input is not optically coupled, and the motor rotates in the other direction when the directional input is optically conductive

Double pulse mode: When a pulse is applied to the pulse input terminal, the motor rotates in one direction, and when a pulse is applied to the direction input terminal, the motor rotates in the other direction

4.4 Indicator Function



This product has 2 red and green LEDs to indicate the light display status:

4.4.1 Status Indication :

| Status function | Green light | Communication code | Description |
|--------------------------|-------------|--------------------|--|
| Stopping | flicker | 2 | On, the motor is phase locked but the motor is not running |
| In operation | Chang Liang | 3 | Drive is running |
| Enable disconnect | flicker | 1 | Enable disconnect, motor can be free |

4.4.2 Error Indication :

| Alarm function | red light | Communication code | Description |
|--------------------------|----------------|--------------------|--|
| Motor overcurrent | 1 green +1 red | 10 | Motor phase current overcurrent or drive failure |
| Motor phase loss | 1 green +2 red | 11 | Motor is not connected |
| Over pressure | 1 green +3 red | 14 | Power input is greater than 42V |
| Undervoltage | 1 green +4 red | 13 | Power input is less than 18V |
| Other alarms | 1 green +5 red | other | |

5. Power Supply

5.1 Voltage

The chopper driver continuously changes the size and direction of the motor winding voltage and detects the current to obtain accurate phase current. If both high efficiency and low noise are to be ensured, the driver supply voltage shall be at least 5 times the motor rated phase voltage (that is, the motor rated phase current \times phase resistance).

If you need the motor to get better high speed performance, you need to increase the driver supply voltage. If power is supplied from a regulated power supply, the supply voltage shall not exceed 36V.

If non-stabilized power supply is used, the voltage shall not exceed 25V.

Because the rated current of non-stabilized power supply is full load current; When the load is light, such as when the motor is not running, the actual voltage is up to 1.4 times the rated voltage of the power supply. For smooth and quiet operation of the motor, choose low voltage.

5.2 Current

The maximum supply current shall be the sum of the two phase currents. Usually, the amount of current you need depends on the type of motor, voltage, speed, and load conditions.

The actual supply current value is much lower than this maximum value, because the driver USES a switching amplifier that converts high voltage and low voltage current into low voltage and high current. The more the supply voltage exceeds the motor voltage, the less supply current is required. When the motor is connected to a 48V power supply, the output current of the power supply is half of that of the 24V power supply.

5.3 Regeneration of Discharge

When the motor slows down, it ACTS like a generator, converting the kinetic energy of the load into electricity. Some energy is consumed by the driver and motor.

If your application has a large load running at high speed, a considerable amount of kinetic energy can be converted into electricity. Easy to cause the drive alarm (overvoltage) may even cause damage to the drive.

6. Signal Input

6.1 Pulse Signal : STEP

The driver port has a built-in optocoupler, which can accept 5-24VDC single-ended or differential signals, and the highest voltage can reach 26V. Its change from off to on is understood as accepting a valid pulse edge command. For the common anode, the low level is valid (the common negative is valid for the high level).

At this time, the driver will drive the motor to run one step according to the corresponding timing. For the normal operation of the driver, the duty cycle of the effective level signal should be below 50%. In order to ensure the reliable response of the pulse signal, the duration of the pulse effective level of the subdivided driver should not be less than 1us. The signal response frequency of the subdivision driver is 500KHz, and an excessively high input frequency may get an incorrect response.

6.2 Direction Signal : DIR

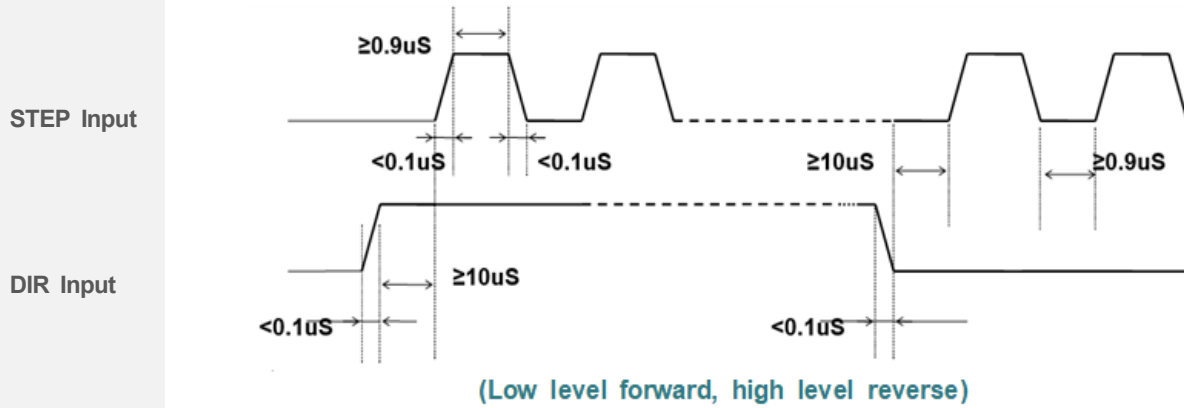
Can accept 5-24VDC single-ended or differential signals, the highest voltage can reach 26V. The on / off of the internal photocoupler at this end is interpreted as two directions of motor operation. The change of the direction signal will change the direction of motor operation. The floating of this end is equivalent to the input high level. It should be noted that the subdivision driver should ensure that the direction signal is established at least 10us ahead of the pulse signal input to avoid the driver s incorrect response to the pulse signal.

When the motor is commutated, it must be switched after the motor decelerates and stops to the starting frequency. The commutation signal must be changed after the last STEP pulse of the previous direction signal and before the first STEP pulse of the next direction. When no commutation is required, the direction signal terminal can be left floating.

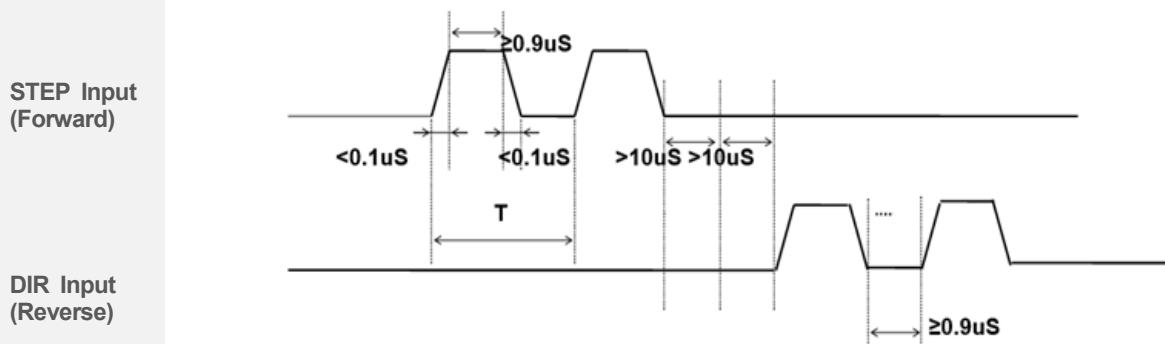
6.3 Pulse / Direction Input Timing Diagram



Input signal waveform and timing (single pulse method)

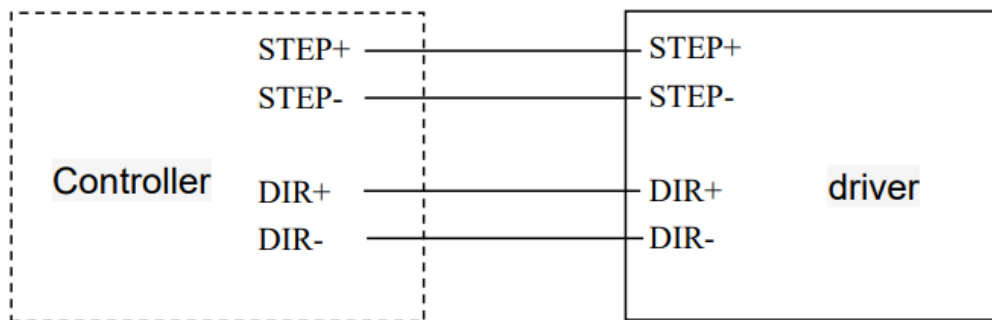


Input signal waveform and timing (double pulse method)

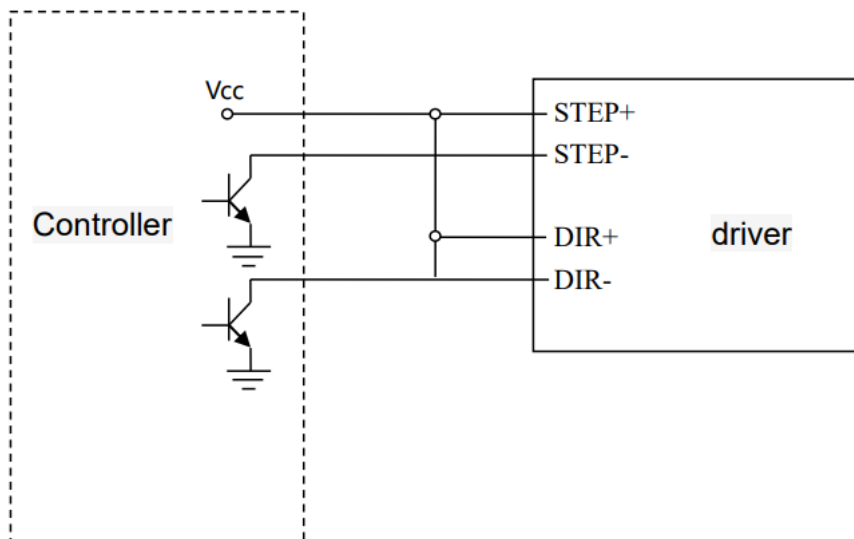


7. Typical Connection of High-Speed Input Port

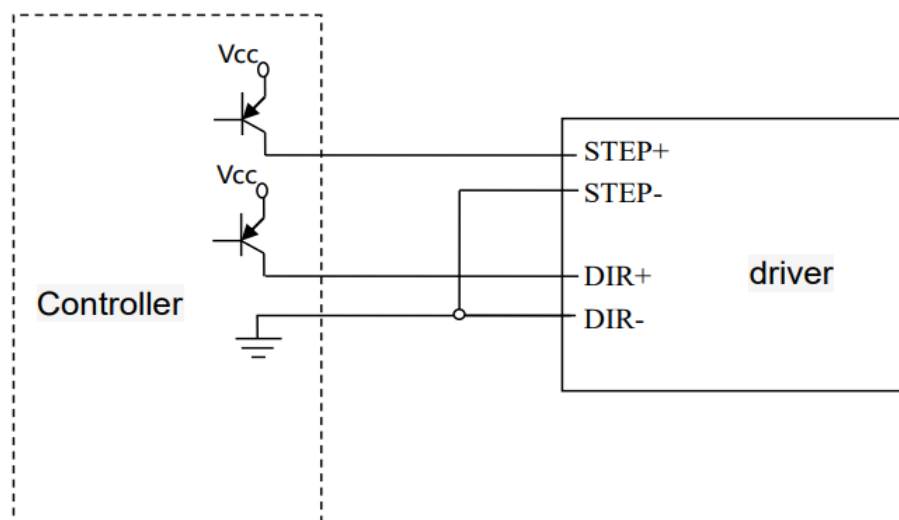
7.1 Differential Connection



7.2 Common Positive Connection



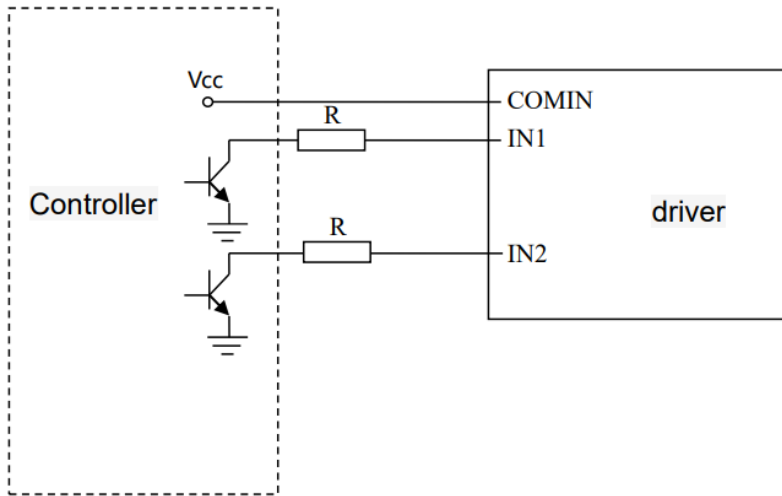
7.3 Common Female Connection



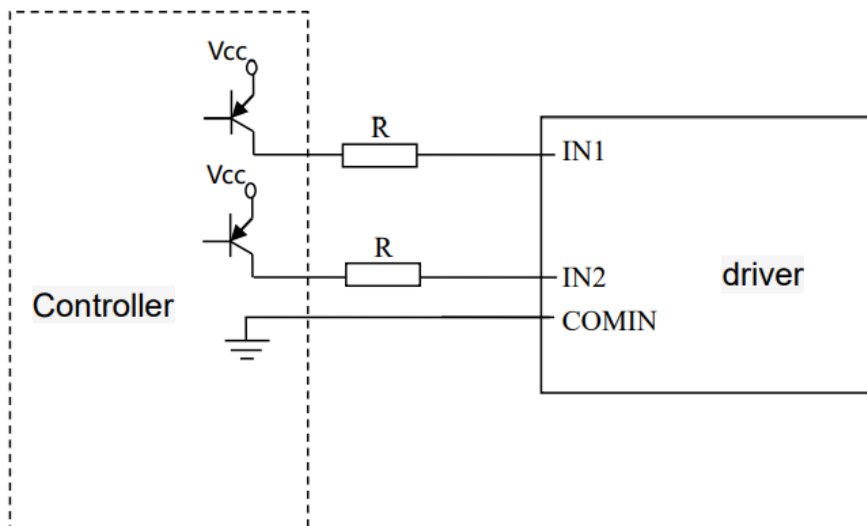
8. Typical Connection of Universal Input Port



8.1 Common Positive Connection



8.2 Common Female Connection

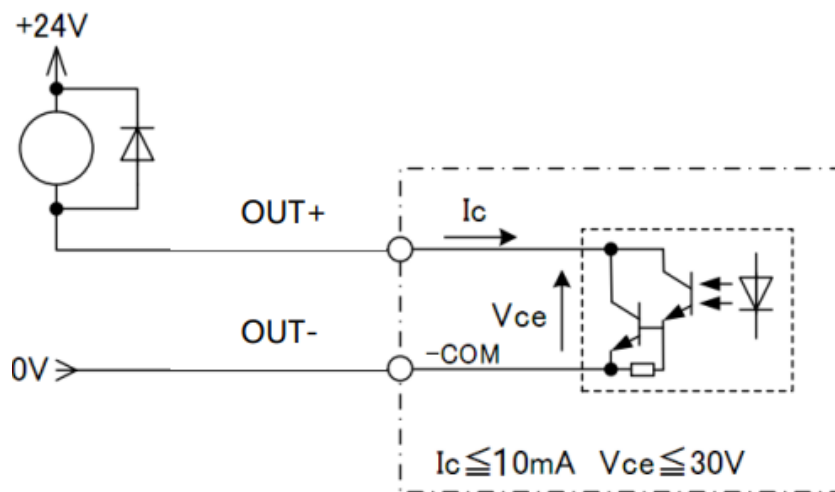


Notes

VCC 3.5-5VDC R=0 Ω;
 VCC 12VDC R=1K Ω;
 VCC 24VDC R=2.2k Ω;

9. Typical Connection of Signal Output

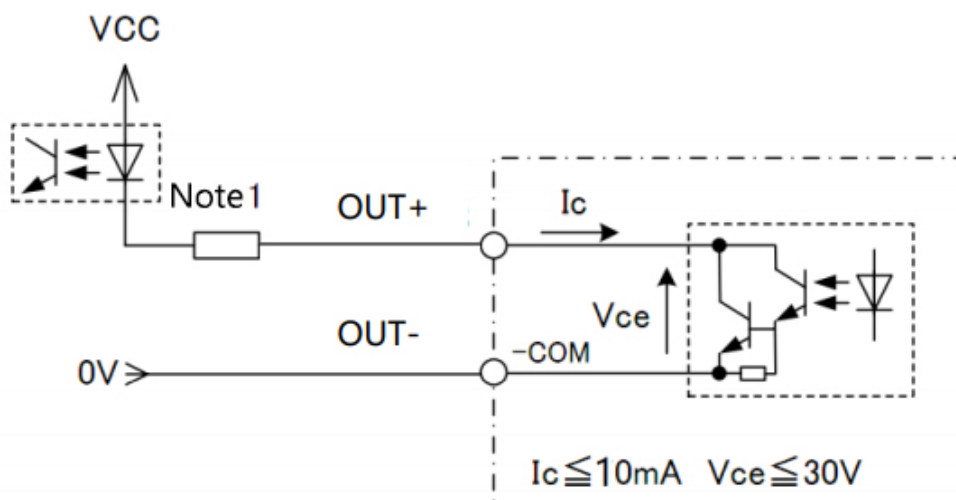
9.1 Relay Connection



Notes

When the relay is connected, it is required to connect diodes at both ends of the relay (such as IN4000 series)

9.2 Optocoupler Connection



- The alarm output is optically isolated, with a maximum voltage of 30VDC and a maximum saturation current of 10mA.
- When the driver is working normally, the output is closed.
- When the drive fails, the output is left floating.

10. Control Parameter

10.1 Controller Basic Status (Class 01)



| adr | word | content | Elaborate | Range / unit |
|------|------|-----------------------------------|--|--------------|
| 0100 | 1 | Motor current | Motor real-time current value | 0.1%A |
| 0101 | 1 | Input voltage | Current input voltage | 1%V |
| 0104 | 2 | Set up segmentation | Set segmentation value | ppr |
| 0106 | 1 | Pulse mode | 1 is pulse + direction mode, 2 is double pulse mode | 1-2 |
| 0108 | 1 | error code | Code at the time of alarm, see 1-2 for content, and display "0" for no fault | - |
| 0109 | 1 | Operating status | Drive running status, see 1-1 | - |
| 0110 | 1 | hardware version | Drive hardware version | - |
| 0111 | 1 | Software version | Drive software version | - |
| 0117 | 2 | current position | target location | pulse |
| 0119 | 1 | Actual speed display | - | 0.01rps |
| 0126 | 1 | Actual location | Run real-time location | pulse |
| 0174 | 1 | IO select multiple run paragraphs | - | - |
| 0176 | 1 | Multi-segment writing error No | - | - |
| 0178 | 1 | Multi-stage operation | - | - |

10.2 Basic Parameter Setting (Class 02)



| adr | word | content | Elaborate | Range / unit |
|------|------|-----------------------------|---|------------------------|
| 0201 | 1 | Motor direction switching | Select the motor running direction | 0 ~ 1 |
| 0213 | 1 | Half-flow ratio | Stop current ratio (effective in open loop mode) | 10%~120% |
| 0224 | 1 | Angular filtering | The smaller the value, the smoother the motor runs, but the higher the delay | 1~700 |
| 0234 | 1 | Digital filtering | Filter coefficient of input pulse. The larger the value, the lower the input frequency response. | 1~15 |
| 0241 | 1 | Input Current | Set current | 400~3000 0.4A~-3.0A |
| 0242 | 2 | Set up segmentation | Pulses per revolution | 200~102400 ppr |
| 0244 | 1 | Pulse mode | 1: Pulse + direction mode 2: double pulse mode | 1~2 |
| 0245 | 1 | Half-flow time | Delay time when the motor stops running and enters half flow state (open loop mode is valid) | 1~32767 ms |
| 0296 | 1 | Selection of operating mode | 0: external pulse 1: internal pulse Default: 0 Note: After the function is modified, you need to power off and restart | 0~1 |
| 0298 | 1 | mailing address | Default: 1 | 1~255 |
| 0299 | 2 | Communication baud rate | Default: 19200 | 1600~115200 |

10.3 Control Parameter (Class 05)



| adr | word | content | Elaborate | Range / unit |
|------|------|----------------------------|---|-------------------------------------|
| 0301 | 1 | Starting frequency | Default:100 | 1~2000 0.01~20rps |
| 0302 | 1 | Stop frequency | Default:100 | 1~2000 0.01~20rps |
| 0303 | 1 | Acceleration | Default:100 | 5~10000 rps ² |
| 0304 | 1 | deceleration | Default:100 | 5~10000 rps ² |
| 0305 | 1 | Return to origin mode | Return to origin mode, 0: Return to origin clockwise 1: Return to the origin counterclockwise | 0~1 |
| 0306 | 1 | Fixed-length running speed | Default: 1000 | 1~5000 0.01~50rps |
| 0307 | 1 | Speed mode running speed | In speed mode, the running direction is consistent with the speed direction Default: 1000 | -5000~5000 -50~50rps |
| 0308 | 1 | Jog running speed | Default: 1000 | 1~5000 0.01~50rps |
| 0309 | 1 | Home speed | Default: 1000 | 1~5000 0.01~50rps |
| 0310 | 1 | Creeping speed | Running speed after hitting the origin Default: 1000 | 1~5000 0.01~50rps |
| 0311 | 2 | Home offset | Default: 0 | -2000000000~ 2000000000 pulse |
| 0313 | 2 | Output pulse | Running stroke Absolute position mode: run to the specified position Relative position mode: travel setting offset stroke Default: 0 | -2000000000~ 2000000000 pulse |
| 0317 | 2 | Positive soft limit | Default: 2000000000 Note: It is invalid during return to origin | -2000000000~ 2000000000 pulse |
| 0319 | 2 | Negative soft limit | Default: -2000000000 Note: It is invalid during return to origin | -2000000000~ 2000000000 pulse |
| 0321 | 2 | Set current position | Default: 0 | -2000000000~ 2000000000 pulse |
| 0323 | 1 | control commands | 0. empty 1. Absolute running, running to the set distance, running direction is determined by distance plus or minus, speed plus or minus value is invalid, it is effective to modify target position during running 2. Relative running, running at a set distance and running speed. The running direction is | 0~29 |

determined by the distance plus or minus. The speed plus or minus value is invalid. Modifying the movement distance during running is invalid

3. Speed mode
 4. Jog forward
 5. Reverse jog
 6. deceleration and stop
 7. Emergency stop
 8. Set the current position, which can only be set when the motor is stopped
 12. Back to origin
 13. Alarm clear
 14. Multi-segment data verification
 15. Multi-segment data storage
 16. Multi-segment data starts
 17. Multiple data pauses
 18. End of multiple segments of data
- Default: 0

| 0324 | 1 | Internal control switch | | 0-65535 | | | | | | | | | | |
|---|--------------------|-------------------------|---------------------|-------------------------|----------|-------|------------|------|------|----------|--------------------|---------------|---------------------|-------------------------|
| <table border="1"> <thead> <tr> <th>Data bit</th> <th>bit15</th> <th>Bit14~bit2</th> <th>Bit1</th> <th>Bit0</th> </tr> </thead> <tbody> <tr> <td>Features</td> <td>Dip switch invalid</td> <td>Factory spare</td> <td>Negative soft limit</td> <td>Positive software limit</td> </tr> </tbody> </table> | | | | | Data bit | bit15 | Bit14~bit2 | Bit1 | Bit0 | Features | Dip switch invalid | Factory spare | Negative soft limit | Positive software limit |
| Data bit | bit15 | Bit14~bit2 | Bit1 | Bit0 | | | | | | | | | | |
| Features | Dip switch invalid | Factory spare | Negative soft limit | Positive software limit | | | | | | | | | | |
| 1: open function, 0: close function | | | | | | | | | | | | | | |
| Default: 0 | | | | | | | | | | | | | | |
| 0327 | 1 | Number of paragraphs | Default: 1 | 1~32 | | | | | | | | | | |
| 0328 | 1 | Multiple selection | Default: 0 | 0~31 | | | | | | | | | | |
| Note: If IO port is configured with multi-segment selection function, IO configuration multi-segment selection is preferred | | | | | | | | | | | | | | |

10.4 Input Block Designation (Class 06)



| adr | word | content | Elaborate | Range / unit |
|-------------|------|------------------------|--|--------------|
| 0400 | 1 | IN1 function selection | 0. empty 1. Absolute running, running to the set distance, running direction is determined by distance plus or minus, speed plus or minus value is invalid, it is effective to modify target position during running 2. Relative running, running at a set distance and running speed. The running direction is determined by the distance plus or minus. The speed plus or minus value is invalid. Modifying the movement distance during running is invalid 3. Speed mode 4. Jog forward 5. Reverse jog | 0~30 |

6. deceleration and stop
 7. Emergency stop
 8. Set the current position, which can only be set when the motor is stopped
 9. positive limit
 10. Negative limit
 11. Origin signal
 12. Back to origin
 13. Alarm clear
 14. Multi-segment data verification
 15. Multi-segment data storage
 16. Multi-segment data starts
 17. Multiple data pauses
 18. End of multiple segments of data
 20. Enable
 25. IO port configuration multi-stage selection Bit0
 26. IO port configuration multi-stage selection Bit1
 27. IO port configuration multi-stage selection Bit2
 28. IO port configuration multi-stage selection Bit3
 29. IO port configuration multi-stage selection Bit4
 Default: 0

| | | | | |
|-------------|---|---------------------------------|---|------|
| 0401 | 1 | IN2 function selection | The setting content is the same as IN1 (default value: 0) | 0~30 |
| 0402 | 1 | IN3 function selection | The setting content is the same as IN1 (default value: 0) | 0~30 |
| 0403 | 1 | IN4 function selection | The setting content is the same as IN1 (default value: 0) | 0~30 |
| 0429 | 1 | Universal digital input logic | | |
| 0410 | 1 | Pseudo communication settingIN1 | 0: OFF (initial value 0) 1: ON (trigger the action of IN1 configuration) | 0~1 |
| 0411 | 1 | Pseudo communication settingIN2 | 0: OFF (initial value 0) 1: ON (trigger the action of IN2 configuration) | 0~1 |
| 0412 | 1 | Pseudo communication settingIN3 | 0: OFF (initial value 0) 1: ON (trigger the action of IN3 configuration) | 0~1 |
| 0413 | 1 | Pseudo communication settingIN4 | 0: OFF (initial value 0) 1: ON (trigger the action of IN4 configuration) | 0~1 |

10.5 Output Block Specification (Class 07)



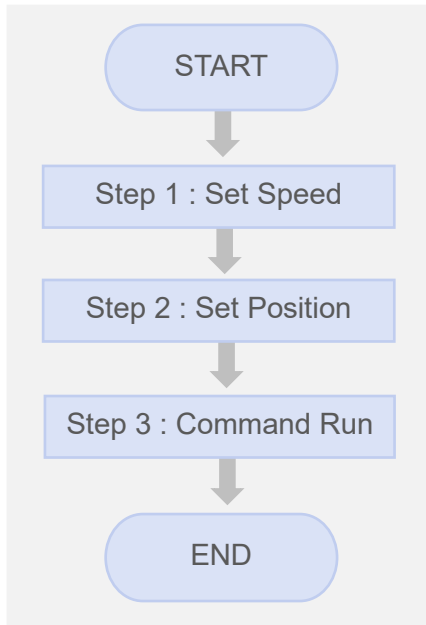
| adr | word | content | Elaborate | Range / unit | | | | | | | | | | |
|-------------|------|----------------------------------|--|--------------|------|------|------|------|-------------|------|------|------|------|--|
| 0420 | 1 | OUT1 function selection | 100: universal port 101: Alarm output function: There is an output signal when there is no alarm, and there is no output signal when there is an alarm. 102: In place signal 103: Enable control output: There is an output signal when offline, and no output signal when enabled. (Default: 101) | 100~104 | | | | | | | | | | |
| 0428 | 1 | Universal digital output control | Output port function selection <table border="1"> <thead> <tr> <th>Data bit</th> <th>Bit3</th> <th>Bit2</th> <th>Bit1</th> <th>Bit0</th> </tr> </thead> <tbody> <tr> <td>Output port</td> <td>OUT4</td> <td>OUT3</td> <td>OUT2</td> <td>OUT1</td> </tr> </tbody> </table> | Data bit | Bit3 | Bit2 | Bit1 | Bit0 | Output port | OUT4 | OUT3 | OUT2 | OUT1 | |
| Data bit | Bit3 | Bit2 | Bit1 | Bit0 | | | | | | | | | | |
| Output port | OUT4 | OUT3 | OUT2 | OUT1 | | | | | | | | | | |
| 0430 | 1 | Digital output logic | Corresponding output port logic <table border="1"> <thead> <tr> <th>Data bit</th> <th>Bit3</th> <th>Bit2</th> <th>Bit1</th> <th>Bit0</th> </tr> </thead> <tbody> <tr> <td>Output port</td> <td>OUT4</td> <td>OUT3</td> <td>OUT2</td> <td>OUT1</td> </tr> </tbody> </table> | Data bit | Bit3 | Bit2 | Bit1 | Bit0 | Output port | OUT4 | OUT3 | OUT2 | OUT1 | |
| Data bit | Bit3 | Bit2 | Bit1 | Bit0 | | | | | | | | | | |
| Output port | OUT4 | OUT3 | OUT2 | OUT1 | | | | | | | | | | |

11. Modbus-RTU Example



11.1 Running Motor

11.1.1 Absolute Position Mode



| Step | Add. | Word | Content | Range | Unit |
|------|------|------|-----------------|--------------------------------|----------|
| 1 | 0306 | 1 | Running Speed | 1 ~ 5000 | 0.01 rps |
| 2 | 0313 | 2 | Target Position | -2,000,000,000 ~ 2,000,000,000 | pulse |
| 3 | 0323 | 1 | Control Command | 0 ~ 18 | - |

● Example. 1

Step 1 : Set Speed

| Slave ID | 1 (0x01) | Driver ID |
|----------|---------------|-------------------------|
| Function | 6 (0x06) | Write Single Register |
| Address | 306 (0x0132) | Running Speed |
| Data | 1200 (0x04B0) | 1200 = 12 RPS = 720 RPM |
| CRC | 0x8D2A | CRC-16 |

| Request | | | | | | | |
|----------|----------|------------------|------|------|------|--------|------|
| Slave ID | Function | Starting Address | | Data | | CRC 16 | |
| | | Hi | Lo | Hi | Lo | Lo | Hi |
| 0x01 | 0x06 | 0x01 | 0x32 | 0x04 | 0xB0 | 0x2A | 0x8D |
| CRC 16 | | | | | | | |

| Response | | | | | | | |
|----------|----------|------------------|------|------|------|--------|------|
| Slave ID | Function | Starting Address | | Data | | CRC 16 | |
| | | Hi | Lo | Hi | Lo | Lo | Hi |
| 0x01 | 0x06 | 0x01 | 0x32 | 0x04 | 0xB0 | 0x2A | 0x8D |
| CRC 16 | | | | | | | |

● Example. 2

Step 2 : Set Position

| Slave ID | 1 (0x01) | Driver ID |
|----------|---|---------------------------|
| Function | 16 (0x10) | Write Multi Register |
| Address | 313 (0x0139) | Target Position |
| Quantity | 2 (0x02) | Quantity of Registers |
| Data | 5000 (0x00001388) -5000 (0xFFFFEC78) | 5000 pulse -5000 pulse |

| Request | | | | | | | | | | | | |
|----------|----------|------------------|------|-----------------------|------|------------|--------|------|--------|------|--------|------|
| Slave ID | Function | Starting Address | | Quantity of Registers | | Byte Count | Data 1 | | Data 2 | | CRC 16 | |
| | | Hi | Lo | Hi | Lo | | Hi | Lo | Hi | Lo | Lo | Hi |
| 0x01 | 0x10 | 0x01 | 0x39 | 0x00 | 0x02 | 0x04 | 0xEC | 0x78 | 0xFF | 0xFF | 0x88 | 0x78 |
| CRC 16 | | | | | | | | | | | | |

| Response | | | | | | | | |
|----------|----------|------------------|------|-----------------------|------|--------|------|--|
| Slave ID | Function | Starting Address | | Quantity of Registers | | CRC 16 | | |
| | | Hi | Lo | Hi | Lo | Lo | Hi | |
| 0x01 | 0x10 | 0x01 | 0x39 | 0x00 | 0x02 | 0x90 | 0x39 | |
| CRC 16 | | | | | | | | |

● Example. 3

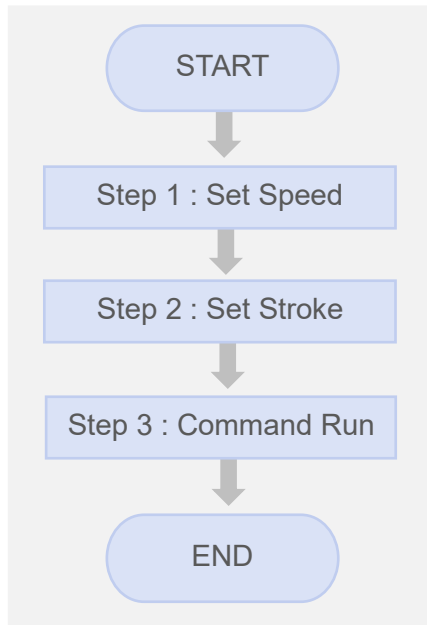
Step 3 : Command Run

| Slave ID | 1 (0x01) | Driver ID |
|----------|--------------|-----------------------|
| Function | 6 (0x06) | Write Single Register |
| Address | 323 (0x0143) | Command Run |
| Data | 01 (0x0001) | 1 : Absolute running |
| CRC | 0x23F8 | CRC-16 |

| Request | | | | | | | | |
|----------|----------|------------------|------|------|------|--------|------|--|
| Slave ID | Function | Starting Address | | Data | | CRC 16 | | |
| | | Hi | Lo | Hi | Lo | Lo | Hi | |
| 0x01 | 0x06 | 0x01 | 0x43 | 0x00 | 0x01 | 0xB8 | 0x22 | |
| CRC 16 | | | | | | | | |

| Response | | | | | | | | |
|----------|----------|------------------|------|------|------|--------|------|--|
| Slave ID | Function | Starting Address | | Data | | CRC 16 | | |
| | | Hi | Lo | Hi | Lo | Lo | Hi | |
| 0x01 | 0x06 | 0x01 | 0x43 | 0x00 | 0x01 | 0xB8 | 0x22 | |
| CRC 16 | | | | | | | | |

11.1.2 Relative Position Mode



| Step | Add. | Word | Content | Range | Unit |
|------|------|------|-----------------|--------------------------------|----------|
| 1 | 0306 | 1 | Running Speed | 1 ~ 5000 | 0.01 rps |
| 2 | 0313 | 2 | Running Stroke | -2,000,000,000 ~ 2,000,000,000 | pulse |
| 3 | 0323 | 1 | Control Command | 0 ~ 18 | - |

● Example. 1

Step 1 : Set Speed

| Slave ID | 1 (0x01) | Driver ID |
|----------|---------------|-------------------------|
| Function | 6 (0x06) | Write Single Register |
| Address | 306 (0x0132) | Running Speed |
| Data | 1200 (0x04B0) | 1200 = 12 RPS = 720 RPM |
| CRC | 0x8D2A | CRC-16 |

| Request | | | | | | | |
|----------|----------|------------------|------|------|------|--------|------|
| Slave ID | Function | Starting Address | | Data | | CRC 16 | |
| | | Hi | Lo | Hi | Lo | Lo | Hi |
| 0x01 | 0x06 | 0x01 | 0x32 | 0x04 | 0xB0 | 0x2A | 0x8D |
| CRC 16 | | | | | | | |

| Response | | | | | | | |
|----------|----------|------------------|------|------|------|--------|------|
| Slave ID | Function | Starting Address | | Data | | CRC 16 | |
| | | Hi | Lo | Hi | Lo | Lo | Hi |
| 0x01 | 0x06 | 0x01 | 0x32 | 0x04 | 0xB0 | 0x2A | 0x8D |
| CRC 16 | | | | | | | |

● Example. 2

Step 2 : Set Stroke

| Slave ID | 1 (0x01) | Driver ID |
|----------|---|---------------------------|
| Function | 16 (0x10) | Write Multi Register |
| Address | 313 (0x0139) | Running Stroke |
| Quantity | 2 (0x02) | Quantity of Registers |
| Data | 5000 (0x00001388) -5000 (0xFFFFEC78) | 5000 pulse -5000 pulse |

| Request | | | | | | | | | | | | |
|----------|----------|------------------|------|-----------------------|------|------------|--------|------|--------|------|--------|------|
| Slave ID | Function | Starting Address | | Quantity of Registers | | Byte Count | Data 1 | | Data 2 | | CRC 16 | |
| | | Hi | Lo | Hi | Lo | | Hi | Lo | Hi | Lo | | |
| 0x01 | 0x10 | 0x01 | 0x39 | 0x00 | 0x02 | 0x04 | 0x13 | 0x88 | 0x00 | 0x00 | 0xB9 | 0xEF |
| CRC 16 | | | | | | | | | | | | |

| Response | | | | | | | | |
|----------|----------|------------------|------|-----------------------|------|--------|------|--|
| Slave ID | Function | Starting Address | | Quantity of Registers | | CRC 16 | | |
| | | Hi | Lo | Hi | Lo | Lo | Hi | |
| 0x01 | 0x10 | 0x01 | 0x39 | 0x00 | 0x02 | 0x90 | 0x39 | |
| CRC 16 | | | | | | | | |

● Example. 3

Step 3 : Command Run

| Slave ID | 1 (0x01) | Driver ID |
|----------|--------------|-----------------------|
| Function | 6 (0x06) | Write Single Register |
| Address | 323 (0x0143) | Command Run |
| Data | 02 (0x0002) | 2 : Relative running |
| CRC | 0x23F8 | CRC-16 |

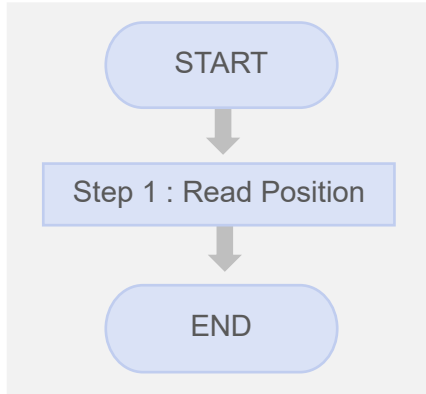
| Request | | | | | | | | |
|----------|----------|------------------|------|------|------|--------|------|--|
| Slave ID | Function | Starting Address | | Data | | CRC 16 | | |
| | | Hi | Lo | Hi | Lo | Lo | Hi | |
| 0x01 | 0x06 | 0x01 | 0x43 | 0x00 | 0x02 | 0xF8 | 0x23 | |
| CRC 16 | | | | | | | | |

| Response | | | | | | | | |
|----------|----------|------------------|------|------|------|--------|------|--|
| Slave ID | Function | Starting Address | | Data | | CRC 16 | | |
| | | Hi | Lo | Hi | Lo | Lo | Hi | |
| 0x01 | 0x06 | 0x01 | 0x43 | 0x00 | 0x02 | 0xF8 | 0x23 | |
| CRC 16 | | | | | | | | |



11.2 Read Motor Status

11.2.1 Read Current Position



| Step | Add. | Word | Content | Range | Unit |
|------|------|------|------------------|-----------------------------------|-------|
| 1 | 0117 | 2 | Current Position | -2,000,000,000 ~ 2,000,000,000 | pulse |

● Example

Step 1 : Read Current Position

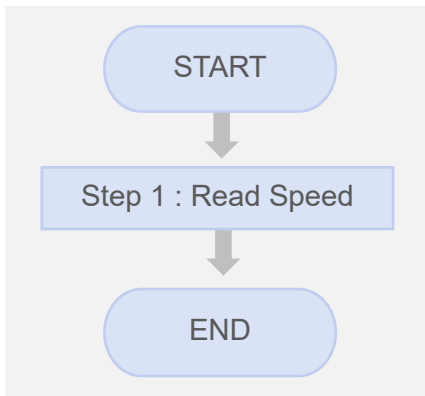
| Slave ID | 1 (0x01) | Driver ID |
|----------|--------------|-----------------------|
| Function | 3 (0x03) | Read Register |
| Address | 117 (0x0075) | Current Position |
| Quantity | 2 (0x02) | Quantity of Registers |

| Request | | | | | | | |
|----------|----------|------------------|------|-----------------------|------|--------|------|
| Slave ID | Function | Starting Address | | Quantity of Registers | | CRC 16 | |
| | | Hi | Lo | Hi | Lo | Lo | Hi |
| 0x01 | 0x03 | 0x00 | 0x75 | 0x00 | 0x02 | 0xD5 | 0xD1 |
| CRC 16 | | | | | | | |

| Response IF : current position = 5000 (0 x 00001388) | | | | | | | | |
|--|----------|------------|--------------------|------|--------------------|------|--------|------|
| Slave ID | Function | Byte Count | Read Registers 126 | | Read Registers 127 | | CRC 16 | |
| | | | Hi | Lo | Hi | Lo | Lo | Hi |
| 0x01 | 0x03 | 0x04 | 0x13 | 0x88 | 0x00 | 0x00 | 0x7E | 0x9D |
| CRC 16 | | | | | | | | |



11.2.2 Read Current Speed



| Step | Add. | Word | Content | Range | Unit |
|------|------|------|---------------|----------|----------|
| 1 | 0119 | 1 | Current Speed | 1 ~ 5000 | 0.01 RPS |

● **Example**

Step 1 : Read Current Speed

| Slave ID | 1 (0x01) | Driver ID |
|----------|--------------|-----------------------|
| Function | 3 (0x03) | Read Register |
| Address | 119 (0x0077) | Current Speed |
| Quantity | 1 (0x01) | Quantity of Registers |

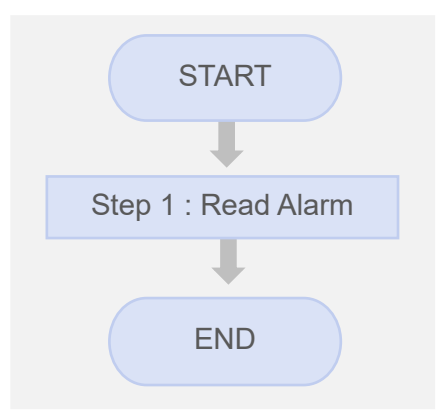
| Request | | | | | | | |
|----------|----------|------------------|------|-----------------------|------|--------|------|
| Slave ID | Function | Starting Address | | Quantity of Registers | | CRC 16 | |
| | | Hi | Lo | Hi | Lo | Lo | Hi |
| 0x01 | 0x03 | 0x00 | 0x77 | 0x00 | 0x01 | 0x34 | 0x10 |
| CRC 16 | | | | | | | |

| Response IF : current speed = 1200 (0x04B0) | | | | | | | |
|---|----------|------------|--------------------|------|--------|------|--|
| Slave ID | Function | Byte Count | Read Registers 119 | | CRC 16 | | |
| | | | Hi | Lo | Lo | Hi | |
| 0x01 | 0x03 | 0x02 | 0x04 | 0xB0 | 0xBB | 0x30 | |
| CRC 16 | | | | | | | |



11.3 Read Alarm Status

11.3.1 Alarm Status



| Step | Add. | Word | Content | Range | Unit |
|------|------|------|--------------|-------|------|
| 1 | 0108 | 1 | Alarm Status | - | - |

● Example

Step 1 : Read Alarm Status

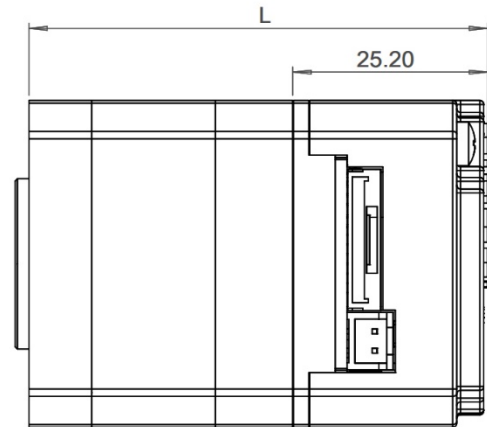
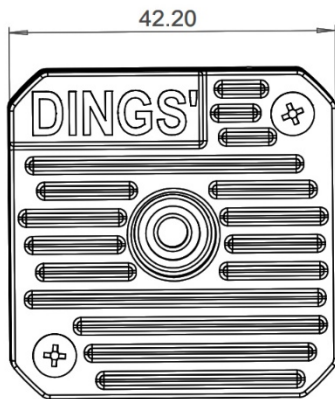
| Slave ID | 1 (0x01) | Driver ID |
|----------|--------------|-----------------------|
| Function | 3 (0x03) | Read Register |
| Address | 108 (0x006C) | Alarm Status |
| Quantity | 1 (0x01) | Quantity of Registers |

| Request | | | | | | | |
|----------|----------|------------------|------|-----------------------|------|--------|------|
| Slave ID | Function | Starting Address | | Quantity of Registers | | CRC 16 | |
| | | Hi | Lo | Hi | Lo | Lo | Hi |
| 0x01 | 0x03 | 0x00 | 0x6C | 0x00 | 0x01 | 0x44 | 0x17 |
| CRC 16 | | | | | | | |

| Response IF : alarm status = 11 (0x000E) = Motor phase loss | | | | | | | |
|---|----------|------------|--------------------|------|--------|------|--|
| Slave ID | Function | Byte Count | Read Registers 176 | | CRC 16 | | |
| | | | Hi | Lo | Lo | Hi | |
| 0x01 | 0x03 | 0x02 | 0x00 | 0x0E | 0xF9 | 0x83 | |
| CRC 16 | | | | | | | |

● Overall Dimension

Unit : mm



* For the convenience of viewing, the above is non-standard projection view

* If the driver works continuously under high input voltage and power, the effective cooling area should be expanded or forced cooling should be adopted.

Dont use it in the place with no air circulation or the ambient temperature over 40 °C ; dont install the driver in the humid or exposed environment.

● Accessories

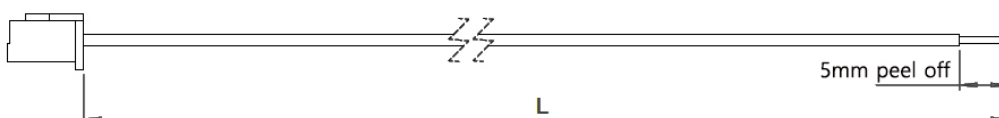
1. Motor Extension Cable 2P

| Ordering Code | L(mm) | Part Number |
|----------------|-------|-------------|
| PEC-0.5-14.551 | 500 | 09-504 |
| PEC-1.0-14.551 | 1000 | 09-504-1 |
| PEC-2.0-14.551 | 2000 | 09-504-2 |

Connector Part Number: XHP-2 Supplier: JST

Terminal Part Number: SXH-001T-P0.6 Supplier: JST

Harness: UL1061 AWG 26#



Interface Definition

| PIN | Description | Color |
|-----|-------------|-------|
| 1 | +Vdc | Red |
| 2 | GND | Black |

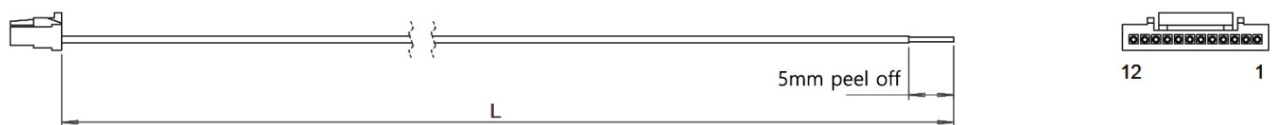
2. I/O Control Cable 12P

| Ordering Code | L(mm) | Part Number |
|------------------|-------|-------------|
| I/OEC-0.5-14.551 | 500 | 09-505 |
| I/OEC-1.5-14.551 | 1000 | 09-505-1 |
| I/OEC-2.0-14.551 | 2000 | 09-505-2 |

Connector Part Number: GHR-12V-S JST

Terminal Part Number: SSSL-002T-P0.2 Supplier: JST

Harness: UL1571 AWG 30#

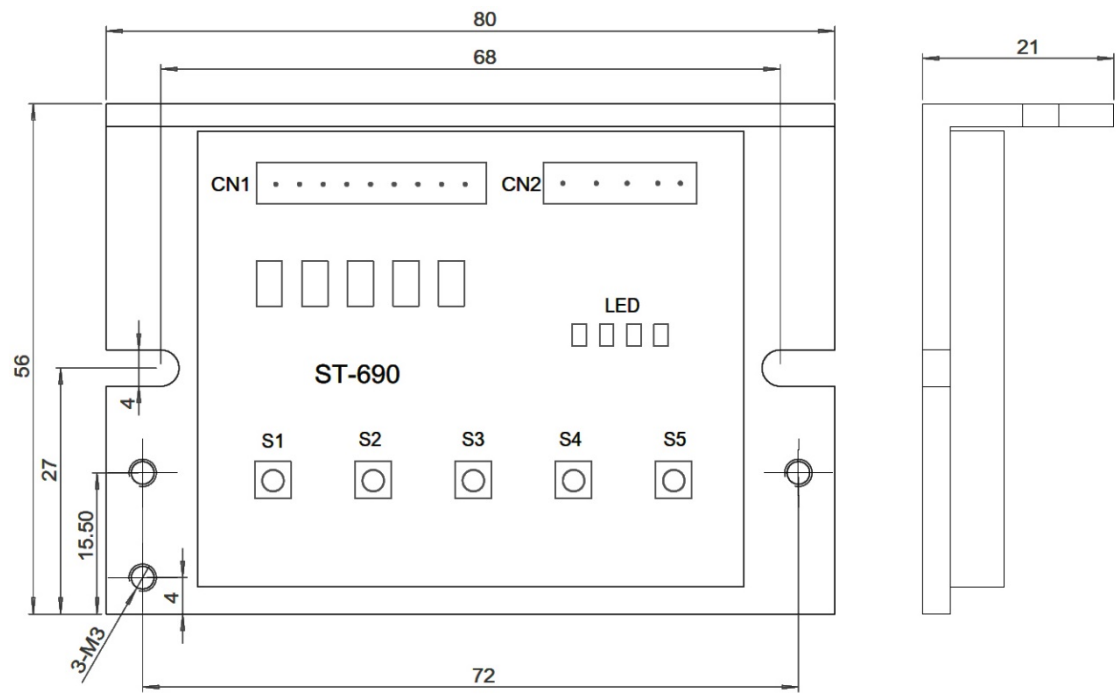


Interface Definition

| PIN | DS-OL42-IPD | DS-OL42-IRS4 | Color |
|-----|-------------|--------------|--------------|
| 1 | STEP+ | IN1+ | Red |
| 2 | STEP- | IN1- | Orange |
| 3 | DIR+ | IN2+ | Yellow |
| 4 | DIR- | IN2- | Green |
| 5 | COMIN | COMIN | Black |
| 6 | IN3 | IN3 | Blue |
| 7 | IN4 | IN4 | Purple |
| 8 | OUT+ | OUT+ | Brown |
| 9 | OUT- | OUT- | Gray |
| 10 | RS485 GND | RS485 GND | Light Orange |
| 11 | RS485+ | RS485+ | White |
| 12 | RS485- | RS485- | Transparent |

3. I/O Debugging Module

| Ordering Code | Size(mm) | Part Number |
|---------------|----------|---------------|
| ST-690 | 80x56x21 | 14-554 |



*S1, S2, S3 and S4 correspond to input1, input2, input3 and input4 respectively. This accessory is used to test the I / O input and output functions of driver. It needs to be used with debugging software. Please consult the sales personnel of DINGS or local distributor before purchasing.





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+86-0519-8517 7807



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