



User Manual

Electric Actuator Motor Software

TABLE OF CONTENTS

Safety Precautions	P.1
System Configuration	P.7
Basic Software Operations	P.8
Motor Parameter Setting – Electric Gripper	P.9
– Electric Slide Cylinder	P.12
– Electric Rotary Cylinder	P.15
– Electric Rotary Gripper	P.17
– Electric Rotary Table	P.18
Motor Cable Wiring Definition	P.19
Photoelectric Switch Wiring Diagram	P.21

Warranty

Warranty Period

- Warranty is valid for 12 months after installation or 2,500 operating hours, whichever comes first.
- Warranty Coverage:
Failures under normal use will be repaired free of charge.
The following are excluded:
 1. Peeling or fading of exterior paint due to natural causes.
 2. Replacement of consumables.
 3. Damage caused by earthquakes, storms, floods, lightning, fires, or other natural disasters.
 4. Improper installation or use by the operator.
 5. Unauthorized modification of the product.
 6. Use of non-specified lubricants or grease.
 7. Incomplete or incorrect maintenance.
 8. Repair by non-authorized dealers.

*The company is responsible only for the repair of the product itself, not for any consequential losses.

NOTE

● CHELIC Product Safety Precautions

Before selecting and using the product, read the “Safety Precautions” and “Operation Manual” carefully to ensure safe and correct use. The purpose of these precautions is to prevent accidents or injuries caused by improper use. Fully understand all warnings, cautions, and markings, and comply with all instructions.

A. Safety Information

Industrial products are highly programmable machines with a wide range of motion. To ensure safe and correct use, the following safety instructions must be observed. Failure to implement required safety measures or incorrect operation may result not only in product malfunction or damage, but also in serious accidents, including injury or death to personnel (including those involved in installation, operation, adjustment, and inspection).



CAUTION

Incorrect operation may cause personal injury and/or property damage.



DANGER

Incorrect operation will result in death or serious injury, posing an immediate threat to life.



NOTE

Key points and essential steps for product operation.



WARNING

Incorrect operation may result in death or serious injury.

This operation manual cannot describe every detail of all safety-related items. Therefore, users must comply with these precautions to establish appropriate safety knowledge and judgment. For product installation location, basic rules of use, and specifications, refer to the relevant sections of this manual. In addition, the warning labels and this manual are intended for domestic (Taiwan) use; when exporting overseas, the warning labels and the operation manual may need to be revised accordingly.

B. Especially Important Precautions

The following are critical notes for product operation. Additional precautions related to installation, operation, inspection, and maintenance are also provided in each chapter. These precautions must be strictly observed.

(1) Precautions During Automatic Operation

1. Install safety guarding/fencing to prevent injury from contact with moving parts when an operator enters the operating area.
2. At the entrance of the safety guard, implement an interlock system with door-open detection and emergency stop.
3. Avoid entering/exiting from locations other than the interlocked entrance as much as possible.



CAUTION

Contact with the product during operation may cause serious injury.

- ⦿ Do not enter the safety guarded area during automatic operation.
- ⦿ When entering the safety guarded area, press the emergency stop button.

(2) Beware of Pinch Hazards

When operating the product, keep hands clear of moving parts to avoid being pinched.



DANGER

Pinching may occur. Keep hands and other body parts away from the moving sections of the product. Maintain a safe distance from moving parts.

(3) Operation Manual

1. Before installation, read the operation manual and perform work and operation in accordance with the instructions.
2. After reading the manual, review “CHELIC Product Safety Precautions” again before operation.
3. Do not perform installation, adjustment, inspection, maintenance, or operation procedures that are not described in this manual.



WARNING

Incorrect installation or operation may cause serious injury. Be sure to read the operation manual thoroughly before installation and operation.

(4) Do Not Use in Areas with Possible Electromagnetic Interference

WARNING

Do not use the product in locations subject to electromagnetic interference, electrostatic discharge, or radio-wave interference. Malfunction due to interference may create a hazardous condition.

(5) Precautions for Controller Inspection

WARNING

1. When inspecting the controller, touching external terminals, or wiring to terminal blocks, shut off the controller power and the main power supply to prevent electric shock.
2. Never touch the inside of the controller.

(6) Handling Product Damage or Abnormal Conditions

WARNING

1. If the product is damaged or operates abnormally, continued use is dangerous. Stop use immediately and contact CHELIC.
2. Timing belts, timing pulleys, worm wheels, and worm shafts are consumables; replacement is recommended once per year.

(7) Precautions for High-Temperature Areas of Motor and Gearbox

WARNING

1. After automatic operation, the motor and gearbox may become hot. Contact may cause burns. Before any touch inspection, turn off the controller power. Since temperature decreases over time, do not touch until the temperature has sufficiently dropped.
2. When the product temperature rises, torque may decrease (approx. 25%) due to thermal effects.

(8) Do Not Remove, Alter, or Damage Warning Labels

DANGER

1. Unauthorized removal of warning labels may cause accidents due to missing warnings.
2. Do not block warning labels with nearby equipment.
3. Ensure that the symbols and text on warning labels are clearly visible from outside the safety guard.

(9) Protective Bonding

WARNING

To prevent static electricity, be sure to ground (earth) the product and the controller.

(10) Notes on Parameter Settings

WARNING

Considering permissible inertia and payload mass, set and maintain appropriate acceleration for the product. Improper settings may cause early deterioration of the drive section, damage, and residual vibration during positioning.

C. Product Safety Functions

(1) Overload Detection

Detects motor overload and shuts off the servo power supply.

(2) External Limit

With each axis and external limit sensors set, the motion range for manual and automatic operation is restricted after homing. The area limited by the external limit sensors is referred to as the motion range.

(3) Mechanical Stopper

Mechanical stoppers are provided to prevent travel beyond the allowable stroke. They serve as an emergency stop / safety function when the axis moves at high speed with servo power cut off. (No mechanical stopper is provided for the rotary axis.) The range limited by mechanical stoppers may also be referred to as the motion range.

WARNING

During axis motion, due to emergency stop operation or safety functions, the axis may not stop immediately even if the servo power is shut off. Exercise caution.

D. System Safety Measures

When integrating the electric slide cylinder into an automated system, hazards increase compared with using the unit alone. The system designer/manufacturer must implement safety measures appropriate to each system. Matters related to system safety measures, operation, and maintenance must be properly handled by the system manufacturer.

E. Trial Run

After installation, adjustment, inspection, maintenance, or repair of the robot/system, perform a trial run in the following order.

(1) When Safety Guarding Is Not Installed After Installation

If a rope barrier is used as a substitute for safety guarding by stretching a rope around the outside of the operating area, strictly comply with the following:

1. Posts must be rigid and not easily moved.
2. The barrier must be clearly recognizable from the surrounding area.
3. Post clear signage in visible locations indicating
“No Entry During Operation” so operators do not enter the motion range.

(2) Checks Before Turning ON Controller Power

1. Confirm the product is correctly installed.
2. Confirm electrical installation is correct.
3. Confirm grounding/earthing connections are appropriate.
4. Confirm connections to the product are correct.
5. Confirm safety measures (e.g., safety guarding) are in place.
6. Confirm the installation environment meets specified conditions.

(3) Checks After Turning ON Controller Power

1. Verify Start/Stop/Mode selection keys function normally.
2. Verify software limits can be confirmed by moving each axis.
3. Verify the intended operation can be executed as planned.
4. Verify signal exchange with peripheral equipment is normal.
5. Verify emergency stop operates properly.
6. Verify teaching pendant and demonstration functions operate normally.
7. Verify safety guarding and interlock functions operate correctly.
8. Verify proper motion during automatic operation.

F. Working Inside the Safety Guard

(1) Working Inside the Safety Guard

When working inside the safety guard, the controller power must be turned off except for the following cases. Place clear signs to prevent other personnel from operating the controller power switch or operation panel. Exceptions:

1. Setting external limit sensors.
2. Teaching.
3. When performing work, follow the precautions in the order listed below.
4. Refer to (2) below.

(2) Teaching

When teaching inside the safety guard, follow the steps below:

1. From outside the guard, confirm the following:
 - 1-1. Visually check for hazards inside the guard.
 - 1-2. Confirm the handheld programmer/teaching pendant operates normally.
 - 1-3. Confirm there is no product malfunction.
 - 1-4. Confirm the emergency stop device operates normally.
 - 1-5. Automatic operation is prohibited in teaching mode.
2. Do not enter the robot/manipulator operating envelope within the safety enclosure.

G. Automatic Operation

(1) Pre-Operation Check

Before starting operation, confirm the following:

1. No one is inside the safety guard.
2. Teaching pendant, tools, etc. are in the designated locations.
3. Abnormalities of the product and peripheral equipment are indicated by lamps/indicators as required.
4. Safety guarding is installed and interlocks are functioning.

(2) During Operation / When an Abnormality Occurs

1. After operation starts, confirm operating status during automatic operation using indicator lamps.
2. Never enter the safety guard during operation.
3. If an abnormality occurs and entry into the guard is required, follow this sequence before entering:
 - 1-1. Press the emergency stop switch to stop the product.
 - 1-2. Indicate that work is in progress (e.g., by a start/work sign) and take necessary emergency actions; implement measures to prevent anyone other than assigned personnel from operating the product.

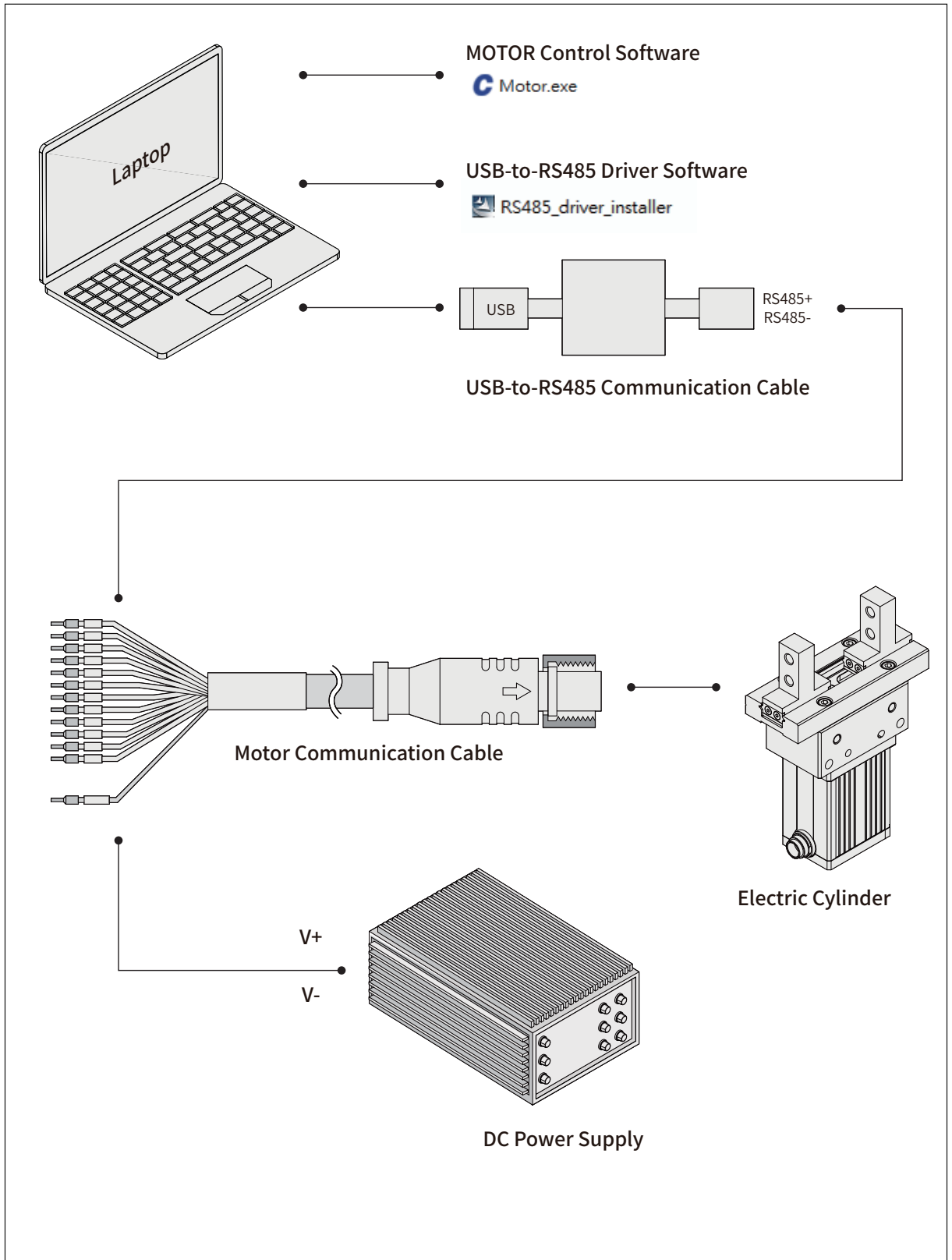
H. Adjustment/Inspection, etc.

Do not perform installation, adjustment, inspection, maintenance, or other actions not described in this operation manual.

I. Repair/Modification, etc.

This manual does not describe repairs, parts replacement, or modifications. Such work requires specialized knowledge; do not perform these actions without proper qualification, as it may create hazardous conditions.

System Configuration

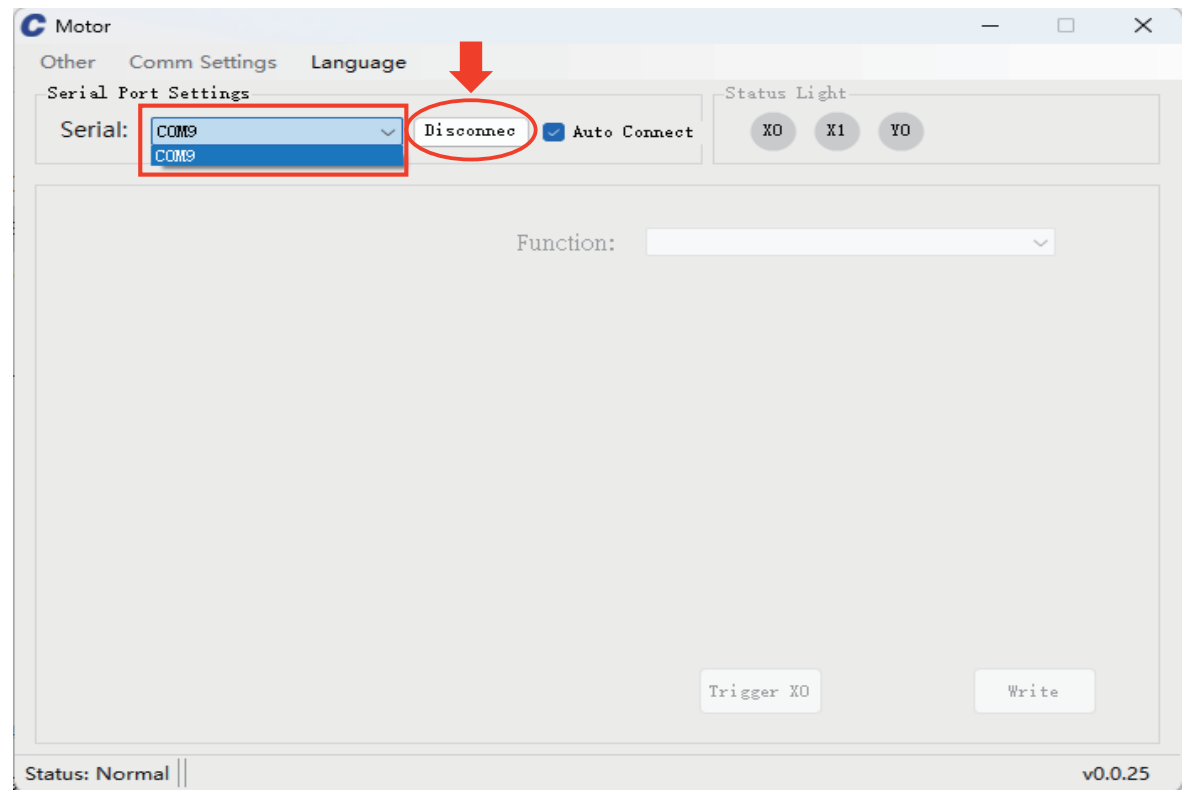


Basic Software Operations

1 Launch the Software (MOTOR)

名稱	修改日期	類型	大小
Images	2025/2/17 下午 05:14	檔案資料夾	
CH341SER	2025/2/18 下午 02:00	應用程式	806 KB
Motor	2025/2/18 下午 05:43	應用程式	172 KB
Motor.exe.config	2025/2/18 下午 05:31	CONFIG 檔案	2 KB
Motor.pdb	2025/2/18 下午 05:31	PDB 檔案	100 KB
NModbus.dll	2025/2/18 下午 05:31	應用程式擴充	112 KB
NModbus4.dll	2025/2/18 下午 05:31	應用程式擴充	74 KB

2 Motor Connection



Motor Parameter Setting – Electric Gripper

- 1 Function Selection : ◆ Inward Grip (default) ◆ Outward Grip
- 2 Grip Detection: Adjust the slider to the gripping range.
Current Position: Real-time motor position (non-adjustable).
Return Position: Adjust the open-jaw standby position.
- 3 Grip Force: Adjust the lever to the required force.
- 4 Grip Speed: Closing speed.


C Motor

Other Comm Settings Language

Serial Port Settings

Serial: COM9 Auto Connect

Status Light X0 X1 Y0



1 Function: Clamp Outward

2 Grip detection:
Current position: 0.89 mm
Return position: 0.00 mm

3 Grip force: 0%
67

4 Grip speed: 0%
240.00

Return speed: 0%
240.00

Motor Parameter Setting – Electric Gripper

5 Return Speed: Opening speed

6 Write: Save parameter settings

Additional Functions:

- 1.Trigger X1: Standby Button
2. Acceleration Time(ms) : Adjust Motor Acceleration
- 3.Deceleration Time: Adjust Motor Deceleration

Motor

Other Comm Settings Language

Serial Port Settings

Serial: COM9 Disconnect Auto Connect

Status Light

X0 X1 Y0

Function: Clamp Outward

Grip detection:

Current position: 0.89 mm

Return position: 0.00 mm

Grip force: 0% 67

Grip speed: 0% 240.00

Return speed: 0% 240.00

EDZ2

Trigger X0 Trigger X1 Write

Motor Parameter Setting – Electric Gripper

Indicator Description: X0, X1, Y0

X0: When the Trigger X0 button is pressed, the X0 indicator turns green to confirm operation in progress.

X1: When the Trigger X1 button is pressed, the X1 indicator turns green to confirm standby status and readiness for Trigger X0.

Y0: When the position or gripping function is completed, the Y0 indicator turns green and an output signal is issued.

Motor

Other Comm Settings Language

Serial Port Settings

Serial: COM9 Disconnect Auto Connect

Status Light

X0 X1 Y0

Function: Clamp Outward

Grip detection: [Slider]

Current position: [Slider] 0.89 mm

Return position: [Slider] 0.00 mm

Grip force: [Slider] 0% / 67

Grip speed: [Slider] 0% / 240.00

Return speed: [Slider] 0% / 240.00

EDZ2

Trigger X0 Trigger X1 Write

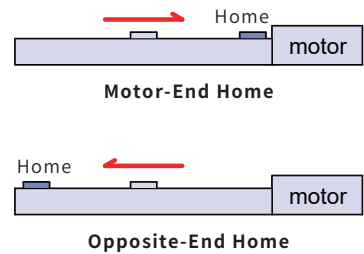
Motor Parameter Setting – Electric Slide Cylinder

1

Function Selection:

- ◆ Thrust Mode – Motor-End Home (Default)
- ◆ Thrust Mode – Opposite-End Home
- ◆ Position Mode – Motor-End Home
- ◆ Position Mode – Opposite-End Home

Slide Homing Method



2

Position Detection: When the current position reaches the specified range (or the home position), Y0 outputs a signal.

Current Position: Real-time motor position (non-adjustable)

Return Position: Adjust the slide home position.

Motor

Other Comm Settings Language

Serial Port Settings

Serial: COM9 Disconnect Auto Connect

Status Light

X0 X1 Y0

1 Function: Force Mode - Far Side

2 Grip detection:

Current position: 5.70 mm

Return position: 0.00 mm

Actuation force: 0%

Forward speed: 0%

Return speed: 0%

EQX2

Trigger X0 Trigger X1 Write

Status: Normal ID: 1, Port: 9 115200-N-8-1 v0.0.25

Motor Parameter Setting – Electric Slide Cylinder

- 3 Forward Force: Adjust the slider to the required force. (In Position Mode, the force is fixed at the default value (100%) and cannot be adjusted.)
- 4 Forward Speed: Slide travel speed.
- 5 Return Speed: Slide speed during homing.
- 6 Write: Save parameter settings.

Motor

Other Comm Settings Language

Serial Port Settings

Serial: COM9 Disconnect Auto Connect

Status Light X0 X1 Y0

Function: Force Mode - Far Side

Grip detection:

Current position: 5.70 mm

Return position: 0.00 mm

3 Actuation force: 0%

4 Forward speed: 0%

5 Return speed: 0%

EQX2

6 Write

Trigger X0 Trigger X1

Status: Normal ID: 1, Port: 9 115200-N-8-1 v0.0.25

Motor Parameter Setting – Electric Slide Cylinder

Additional Functions:

1. Trigger X1: Manual Homing Button

- If the button is hidden, homing will start automatically after parameters are written.
- If the button is shown, homing must be started manually by pressing the button after parameters are written.

2. Acceleration Time (ms): Adjust motor acceleration.

3. Deceleration Time (ms): Adjust motor deceleration.

Indicator Description: X0, X1, Y0

X0: When the Trigger X0 button is pressed, the X0 indicator turns green to confirm operation in progress.

X1: When the Trigger X1 button is pressed, the X1 indicator turns green to confirm standby status and readiness for Trigger X0.

Y0: When the position or gripping function is completed, the Y0 indicator turns green and an output signal is issued.

Motor

Other Comm Settings Language

Serial Port Settings

Serial: COM9 Disconnect Auto Connect

Status Light

X0 X1 Y0

Function: Force Mode - Far Side

Grip detection:

Current position: 5.70 mm

Return position: 0.00 mm

Actuation force: 0%

Forward speed: 0%

Return speed: 0%

EQX2

Trigger X0 Trigger X1 Write

Status: Normal ID: 1, Port: 9 115200-N-8-1 v0.0.25

Motor Parameter Setting – Electric Rotary Cylinder

Applicable to ETB2

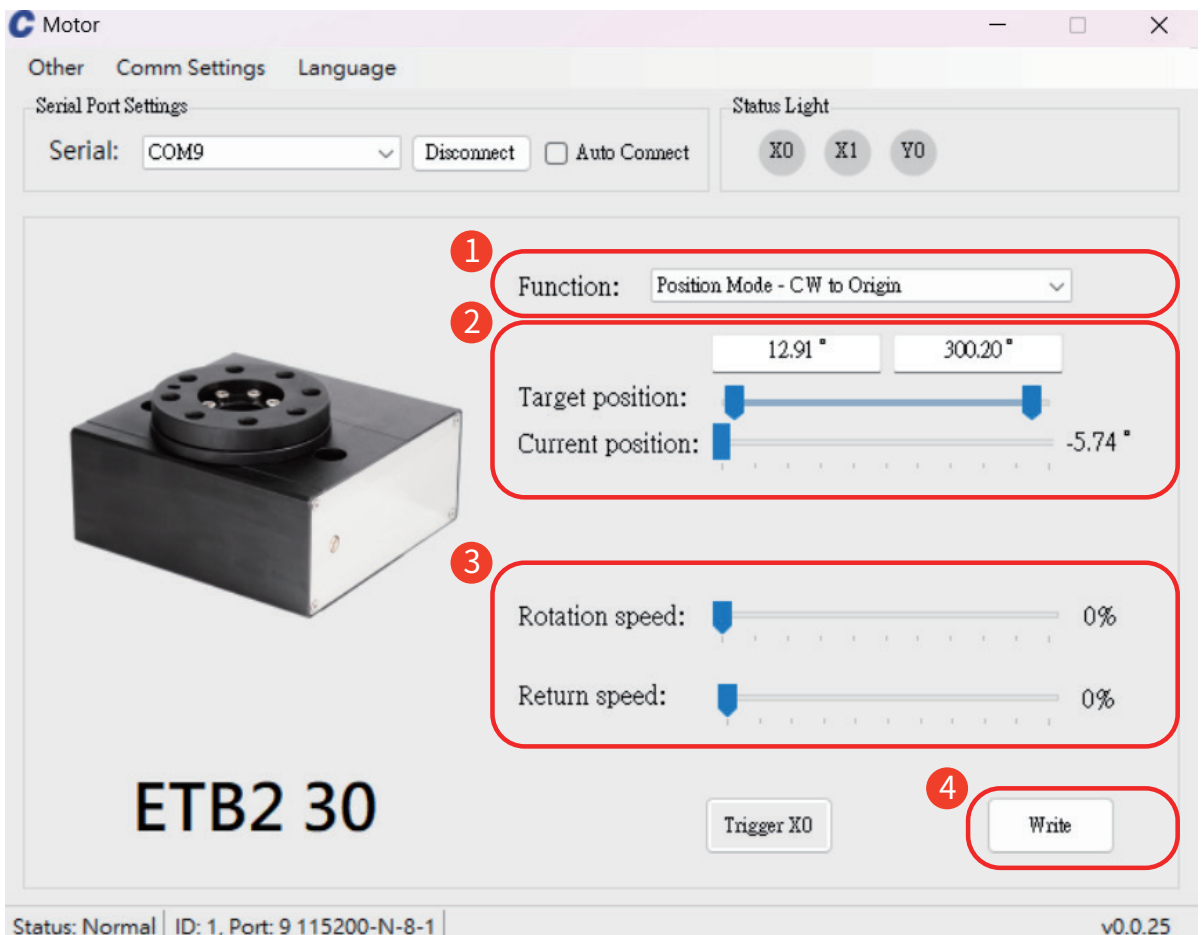
Rotary Cylinder Homing Method



- 1 Function Selection:
 - ◆ Position Mode – Clockwise Homing (0°)

- 2 Position Setting: Available rotation range of the rotary cylinder (drag the pointer and/or enter an angle).
Current Position: Real-time motor position (non-adjustable)

- 3 Rotation Speed : Forward Rotation Speed (CW)
Return Rotation Speed : Reverse Rotation Speed (CCW)



The screenshot shows the 'Motor' software interface. At the top, there are tabs for 'Other', 'Comm Settings', and 'Language'. Below these are 'Serial Port Settings' (Serial: COM9, Disconnect, Auto Connect) and 'Status Light' (X0, X1, Y0). The main area features a 3D model of the ETB2 30 motor. To the right of the model are four red-bordered boxes with numbered callouts: 1. Function: Position Mode - CW to Origin; 2. Target position: 12.91°, 300.20°; Current position: -5.74°; 3. Rotation speed: 0%; Return speed: 0%; 4. Write button. At the bottom, there is a 'Trigger X0' button and a status bar showing 'Status: Normal | ID: 1, Port: 9 115200-N-8-1' and version 'v0.0.25'.

Motor Parameter Setting – Electric Rotary Cylinder

4 Write: Save parameter settings

Additional Functions:

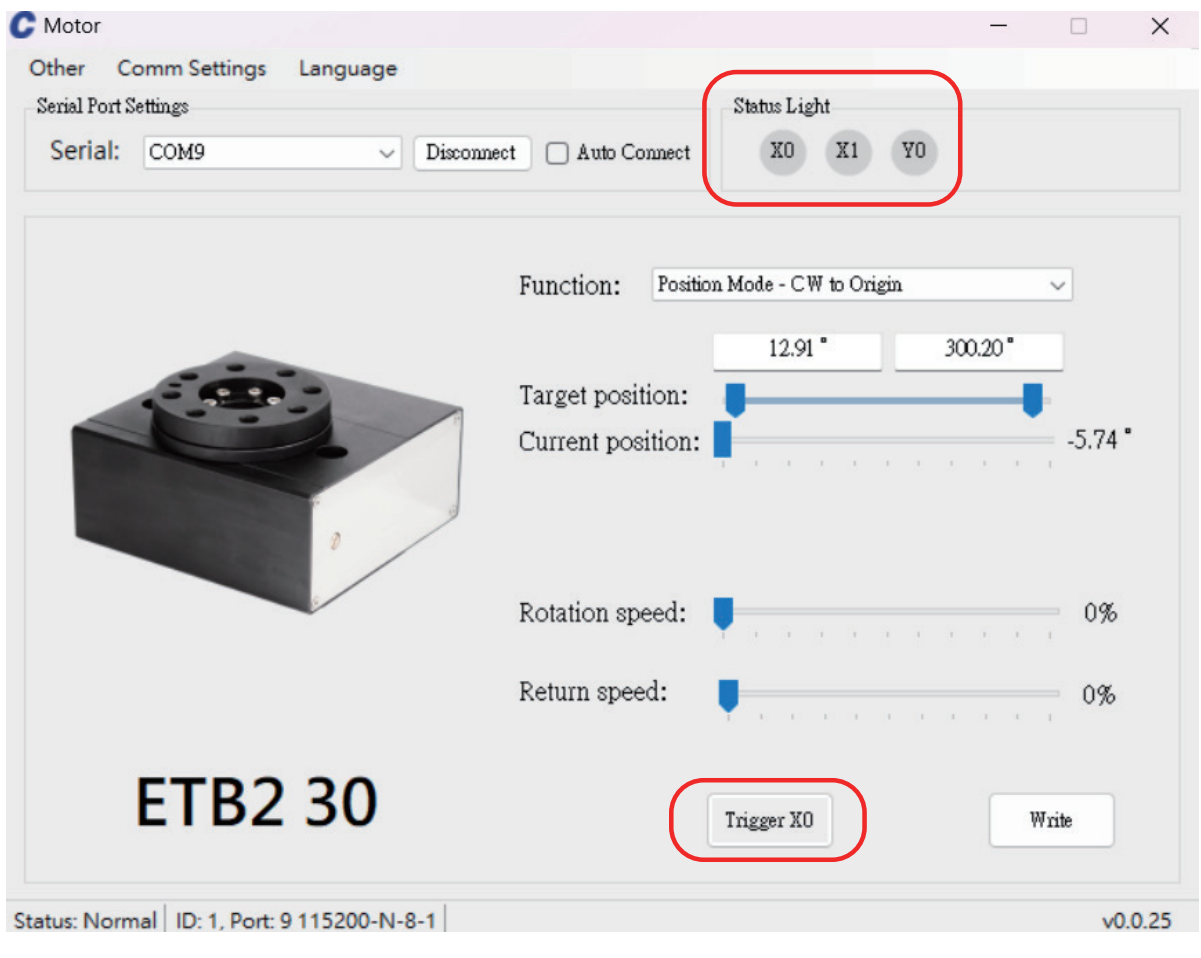
- 1.Trigger X1: Standby Button
- 2.Acceleration Time(ms) : Adjust Motor Acceleration
- 3.Deceleration Time(ms) : Adjust Motor Deceleration

Indicator Description: X0, X1, Y0

X0: When the Trigger X0 button is pressed, the X0 indicator turns green to confirm operation in progress.

X1: When the Trigger X1 button is pressed, the X1 indicator turns green to confirm standby status and readiness for Trigger X0.

Y0: When the target position is reached, the Y0 indicator turns green and an output signal is issued.

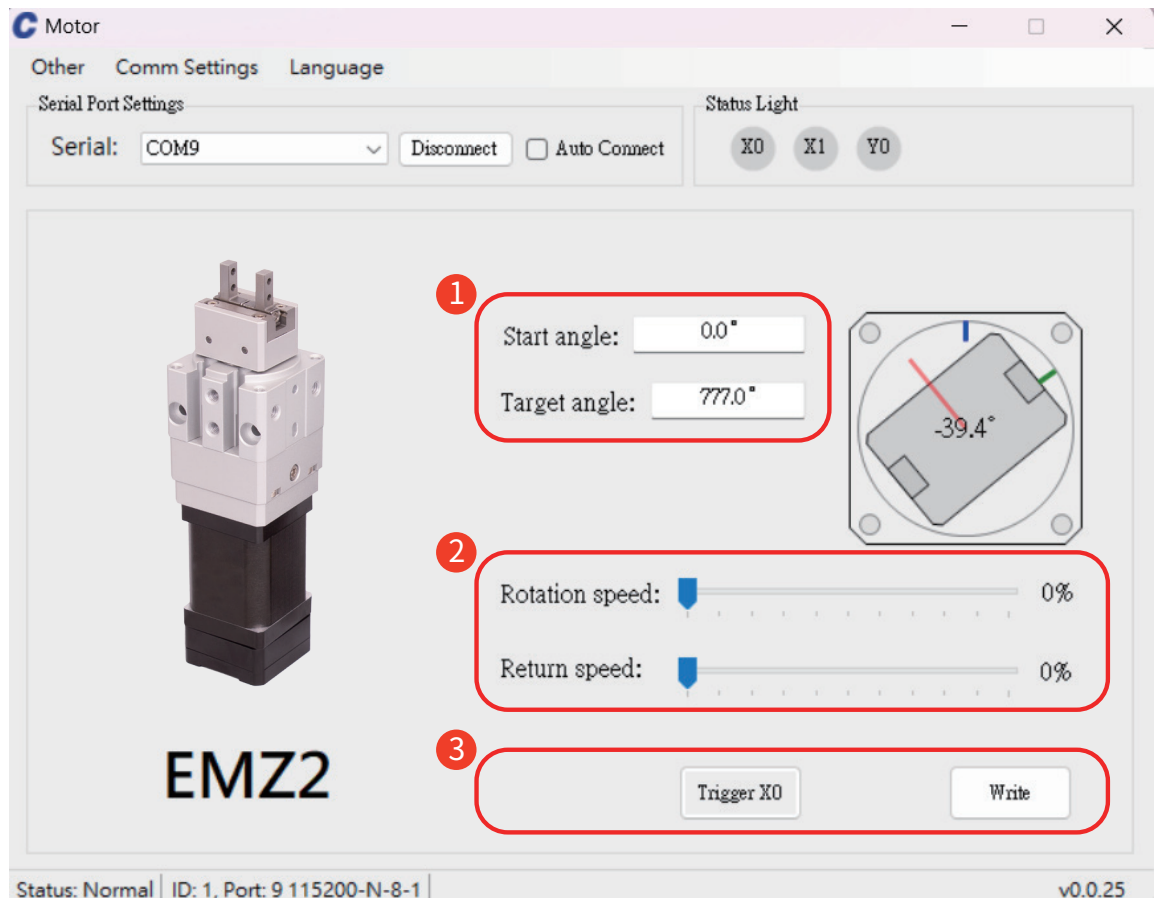


The screenshot displays the 'Motor' control software interface. At the top, there are tabs for 'Other', 'Comm Settings', and 'Language'. Below these, the 'Serial Port Settings' section shows 'Serial: COM9' and buttons for 'Disconnect' and 'Auto Connect'. A red box highlights the 'Status Light' section, which contains three indicator buttons: 'X0', 'X1', and 'Y0'. The main control area features a 'Function' dropdown set to 'Position Mode - CW to Origin'. Below this, there are two numerical input fields: '12.91 °' and '300.20 °'. A 'Target position' slider is shown with a blue bar extending from 0 to 300.20 degrees. Below that, the 'Current position' is indicated as '-5.74 °'. There are also sliders for 'Rotation speed' and 'Return speed', both currently set to 0%. A red box highlights the 'Trigger X0' button. At the bottom right, there is a 'Write' button. The model name 'ETB2 30' is prominently displayed in the lower-left corner. The status bar at the bottom shows 'Status: Normal | ID: 1, Port: 9 115200-N-8-1' and the version 'v0.0.25'.

Motor Parameter Setting – Electric Rotary Gripper

Applicable to EMZ2, EMQ2, EMW2

- 1** Position Setting: ♦ Start Angle: Home angle after power-on.
♦ Target Angle: Angle reached after Trigger X0.
- 2** Speed Setting: ♦ Rotation Speed: Speed to rotate to the target angle.
♦ Return Speed: Speed to rotate back to the start angle.
- 3** Control Keys: ♦ Trigger X0: Command rotation to the start or target angle.
(if currently at the start angle, it rotates to the target angle; and vice versa).
♦ Write: Save parameter settings.



Motor

Other Comm Settings Language

Serial Port Settings

Serial: COM9 Disconnect Auto Connect

Status Light

X0 X1 Y0

EMZ2

1 Start angle: 0.0°
Target angle: 777.0°

2 Rotation speed: 0%
Return speed: 0%

3 Trigger X0 Write

Status: Normal | ID: 1, Port: 9 115200-N-8-1 | v0.0.25

Motor Parameter Setting – Electric Rotary Table

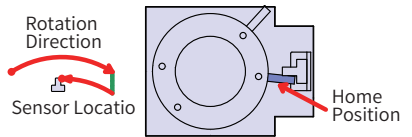


Applicable to ERF

This product must home using a photoelectric sensor before it can be controlled by this software. Refer to the wiring diagram on P.17.

- 1** Position Setting:
 - ◆ Start Angle: Home angle after power-on.
 - ◆ Target Angle: Angle reached after Trigger X0.
- 2** Speed Setting:
 - ◆ Rotation Speed: Speed to rotate to the target angle.
 - ◆ Return Speed: Speed to rotate back to the start angle.
- 3** Control Keys:
 - ◆ Trigger X0: Command rotation to the start or target angle (if currently at the start angle, it rotates to the target angle; and vice versa).
 - ◆ Write: Save parameter settings.

Electric Rotary Table Homing Method



Note: Sensor location affects home angle.

Motor

Other Comm Settings Language

Serial Port Settings

Serial: COM9 Auto Connect

Status Light

X0 X1 Y0



ERF

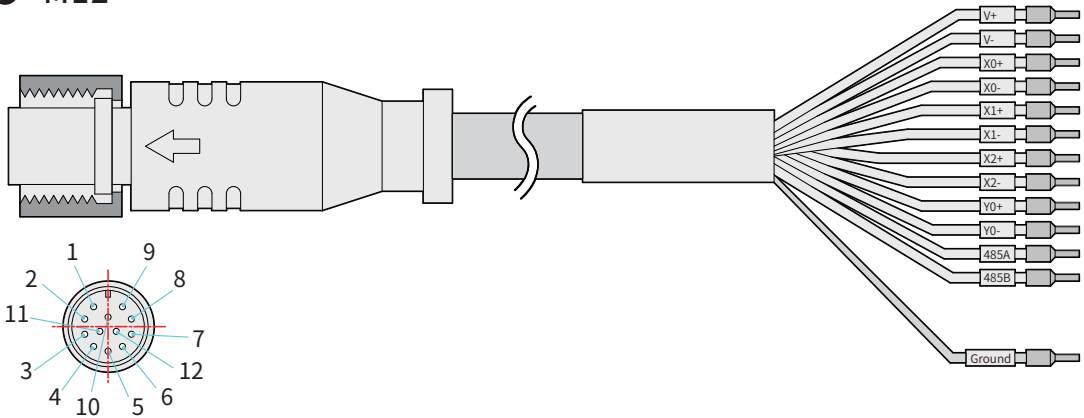
- 1** Start Angle:
Target Angle:
- 2** Rotation Speed:
Return Speed:
- 3**

Status: Normal | ID: 1, Port: 9 115200-N-8-1

v0.0.25

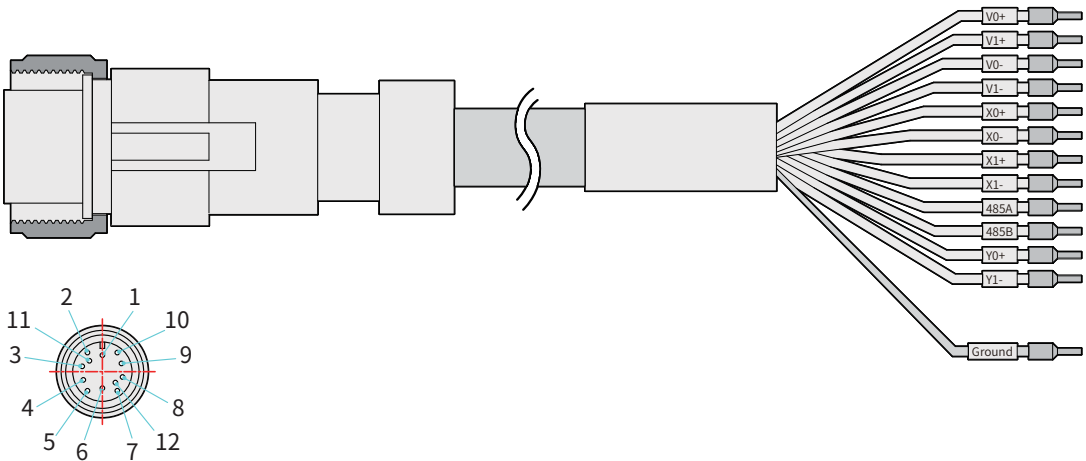
Motor Cable Wiring Definition

M12



Pin No.	Marker	Pin No.	Marker	Pin No.	Marker	Pin No.	Marker
1	V+	5	X1+	9	Y0+	—	Ground
2	V-	6	X1-	10	Y0-		
3	X0+	7	X2+	11	485A		
4	X0-	8	X2-	12	485B		

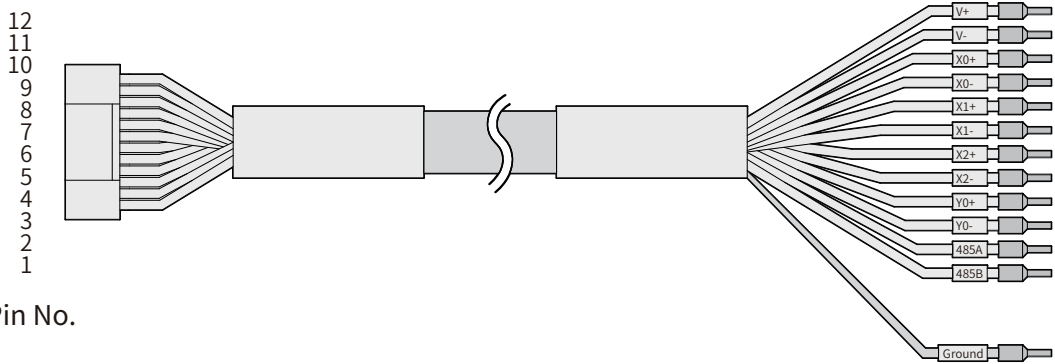
M16



Pin No.	Marker	Pin No.	Marker	Pin No.	Marker	Pin No.	Marker
1	V0+	5	X0+	9	485A	—	Ground
2	V1+	6	X0-	10	485B		
3	V0-	7	X1+	11	Y0+		
4	V1-	8	X1-	12	Y0-		

Motor Cable Wiring Definition

35

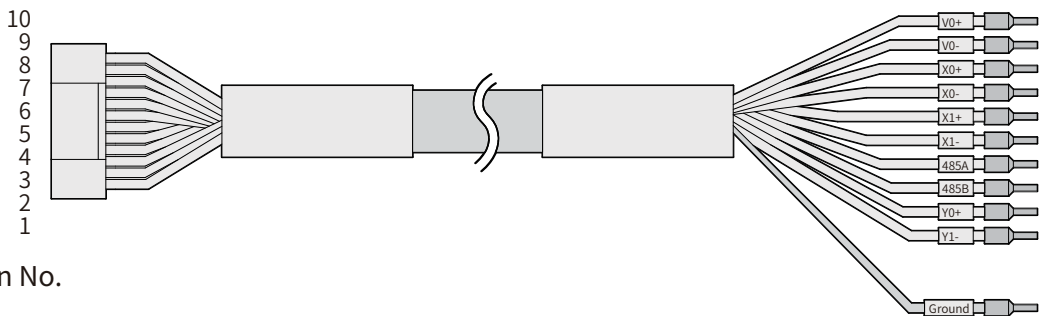


Pin No.

35 Cable Code Reference Table

Pin No.	Marker	Pin No.	Marker	Pin No.	Marker	Pin No.	Marker
1	V+	5	X1+	9	Y0+	—	Ground
2	V-	6	X1-	10	Y0-		
3	X0+	7	X2+	11	485A		
4	X0-	8	X2-	12	485B		

42



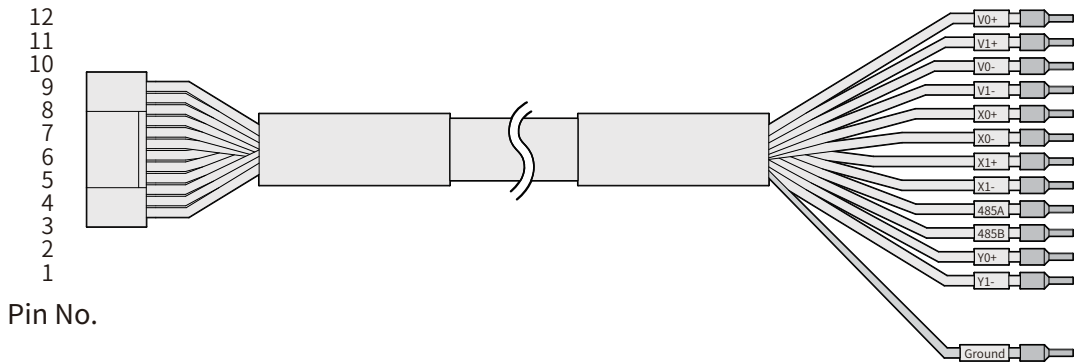
Pin No.

42 Cable Code Reference Table

Pin No.	Marker	Pin No.	Marker	Pin No.	Marker	Pin No.	Marker
1	V+	4	X0-	7	485A	10	Y0-
2	V-	5	X1+	8	485B	—	Ground
3	X0+	6	X1-	9	Y0+		

Motor Cable Wiring Definition

57

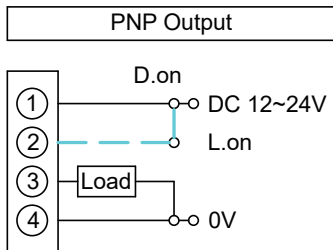
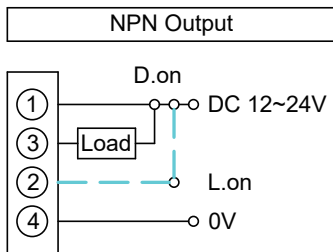
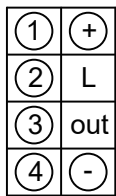


57 Cable Code Reference Table

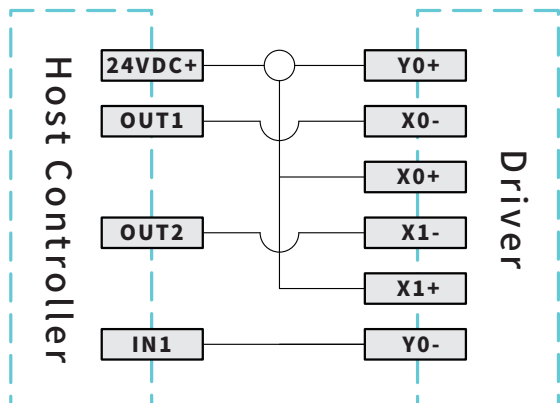
Pin No.	Marker	Pin No.	Marker	Pin No.	Marker	Pin No.	Marker
1	V0+	5	X0+	9	485A	—	Ground
2	V1+	6	X0-	10	485B		
3	V0-	7	X1+	11	Y0+		
4	V1-	8	X1-	12	Y0-		

Photoelectric Switch Wiring Diagram

Photo Sensor



I/O(NPN)



CHELIC[®]

TAIWAN CHELIC CO., LTD.
NO.21, GUIFENG ST., TAISHAN DIST,
NEW TAIPEI CITY, 24355, TAIWAN

*The company reserves the right to change the
contents of this document without prior notice.