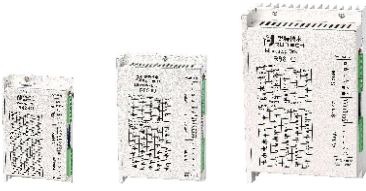
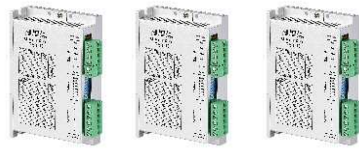



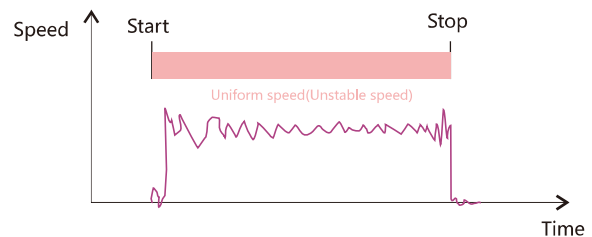
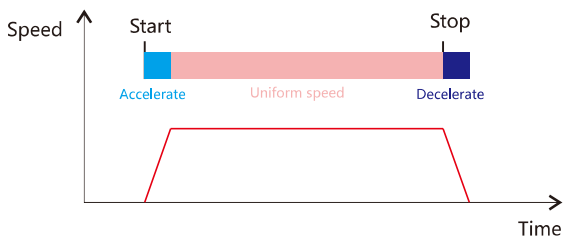
Functional Stepper Driver

In order to adapt to the flexible application, Simtach has customized several drivers with special functions for customers. Simtach provides three functional stepper drivers.

Switch driver	Switch-potentiometer speed-control driver	Multi-axis control driver
		
<ul style="list-style-type: none"> ● Switch signal level 3.3-24V ● Switch mode 0 and 1 ● Speed level 10-800rpm ● Optional closed loop 	<ul style="list-style-type: none"> ● Switch signal level 3.3-24V ● Switch mode 0 and 1 ● 10-800rpm continuously viable ● Only support R42, R60, R86 	<ul style="list-style-type: none"> ● One-pull-two potentiometer speed control dual axis ● Two-in-one dual pulse control dual axis ● Three-in-one three pulse control three axis ● Non-standard models can be customized

Switch stepper and ordinary AC speed-control motor

IO speed-control stepper	Ordinary AC speed-control motor
<p>The switch speed-control stepper comes with S-type acceleration and deceleration, stable start and stop, low noise, and precise adjustable speed.</p> <p>The motor self-locks when the IO speed stepper stops.</p>	<p>Ordinary AC speed-control motors have no acceleration/deceleration, large start-stop jitter, loud noise, and adjustable speed but inaccurate.</p> <p>Ordinary speed-control motors have no self-locking force, and the stopping state is unstable.</p>



Technical specification

	Model	Peak current	Weight	Input voltage range	Size	Matching motor	
Single axis control	Switch speed control	R42-IO	2.2A	100g	24-48VDC	92.6X56X21mm	20, 28, 35, 39, 45
		R60-IO	5.6A	250g	24-50VDC	118X76X33mm	57, 60
		R86-IO	7.2A	650g	18-80VAC	151X97X52mm	86
		R110PLUS-IO	8.0A	1000g	110-230VAC	178X97X52mm	86, 110
		R130-IO	8.0A	1400g	110-240VAC	203X147X78mm	110, 130
Single axis control	Potentiometer speed-control type	R42-IR	2.2A	100g	24-48VDC	92.6X56X21mm	20, 28, 35, 39, 45
		R60-IR	5.6A	250g	24-50VDC	118X76X33mm	57, 60
		R86-IR	7.2A	650g	18-80VAC	151X97X52mm	86
Multi-axis control	Speed control	R42-D	2.2A	200g	24-48VDC	118X76X25mm	Two axis20/28/35/39/42
		R60-D	5.6A	300g	24-50VDC	118X76X33mm	Two axis57/60
	Pulse type	R42X2	2.2A	200g	24-48VDC	118X76X25mm	Two axis20/28/35/39/42
		R60X3	5.6A	500g	24-50VDC	175X97X31	Triaxial axis20/28/35/39/42/57/60

Remarks: For other function customization, please contact Simtach

Switch Stepper Driver

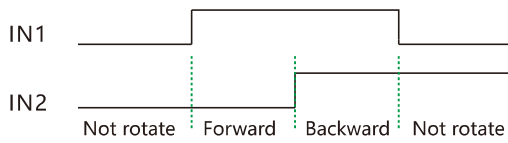
Simtach-IO type switch stepper driver is provided with the pulse train with S-shape acceleration/deceleration, and triggers the motor start-stop only by normal switching value.

Compared with the speed-control motor, IO-type switch stepper motor is featured with stable start-stop and uniform speed, which can simplify the engineer's electrical design.

- Control mode: start-stop and reversing controlled by IN1 and IN2.
- Speed level: set by the DIP switched SW5-SW8
- Signal level: 3.3-24V compatible
- Typical application: conveying equipment, inspection conveyor, PCB pallet conveyor

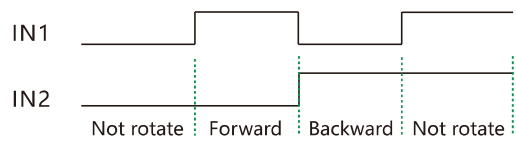


Switch driver control timing diagram



0 Mode (Mode 0 by default)

At IN1 on and IN2 off, the motor is triggered to rotate forward.
 At IN1 on and IN2 on, the motor is triggered to rotate backward.
 At IN1 off, the motor stops.



1 Mode (Mode 1 optional)

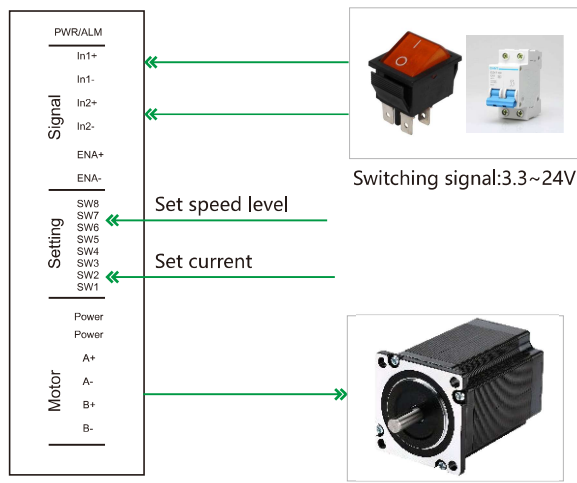
At IN1 on and IN2 off, the motor is triggered to rotate forward.
 At IN1 off and IN2 on, the motor is triggered to rotate backward.
 At both IN1 and IN2 on, the motor stops.

Speed level setting

Note: IO driver defaults Mode 0; Please contact Simtach if the mode needs to be adjusted.

Schematic connection diagram				
Speed level RPM	SW5	SW6	SW7	SW8
10	on	on	on	on
20	off	on	on	on
30	on	off	on	on
50	off	off	on	on
60	on	on	off	on
80	off	on	off	on
100	on	off	off	on
150	off	off	off	on
200	on	on	on	off
250	off	on	on	off
300	on	on	on	off
400	off	off	on	off
500	on	on	off	off
600	off	on	off	off
700	on	off	off	off
800	off	off	off	off

Acceleration level setting		SW4
Acceleration level 1	Low acceleration/deceleration	off
Acceleration level 2	High acceleration/deceleration	on



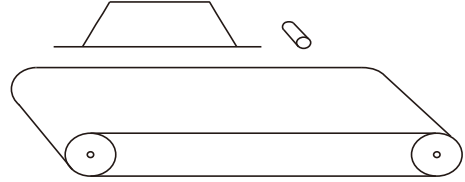
Switch--Potentiometer Speed-control

Model: R42-IR R60-IR R86-IR

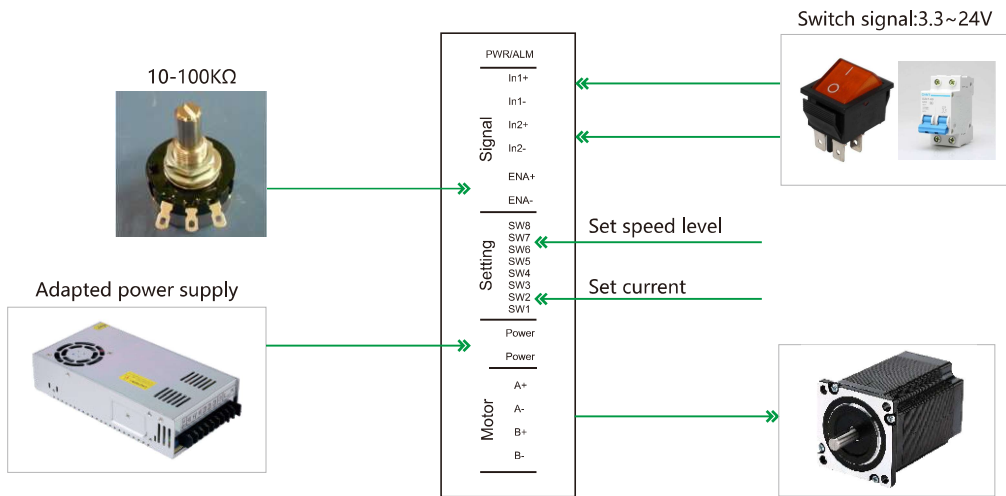
R42/60/86-IR refers to the potentiometer speed-control switch driver.

The potentiometer can regulate the rotation speed of the motor and switch speed at any time.

- Control mode: IN1 and IN2 are connected to the starting and reversing signals, ENA connected to the potentiometer speed controller.
- Signal level: The switch is 3.3-24V effective.
- Specification of potentiometer: 10-100KΩ



Schematic connection diagram



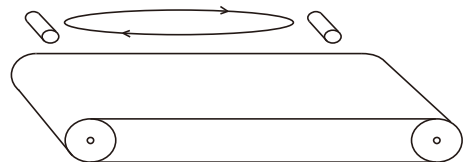
Switch--Sensor Triggering

Model: R60-AL-IOB

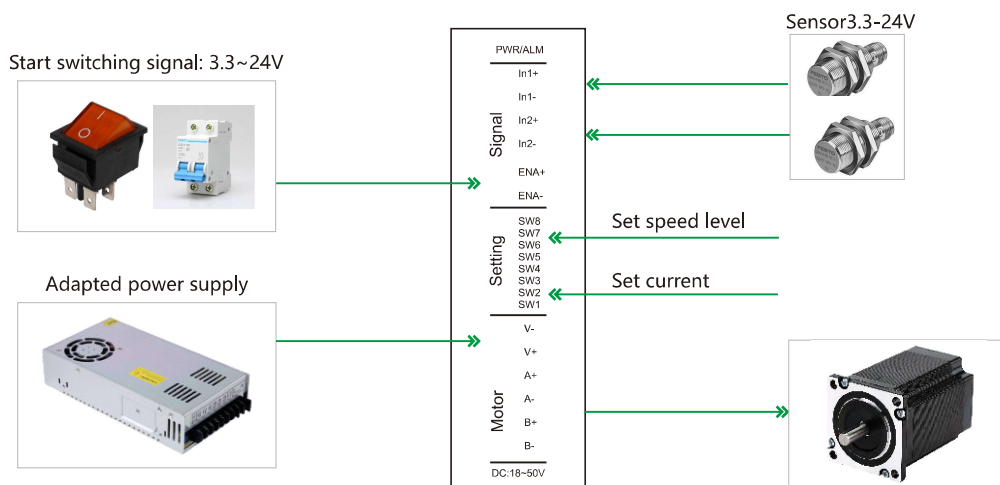
R60-AL-IOB is the itinerant control driver between the left and right limit sensors

When the ENA is on state, the stepper motor moves to and fro between the two limits IN1 and IN2, which applies to glue spray, painting and so on.

- Control mode: IN1 and IN2 are connected to limit sensors, ENA connected to the start-stop control switch
- Signal level: 3.3-24V effective



Schematic connection diagram

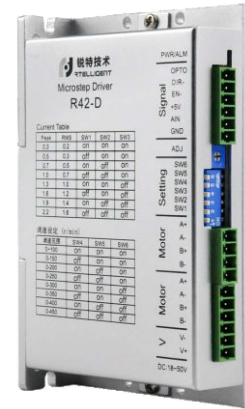


One-pull-two Driver R42-D

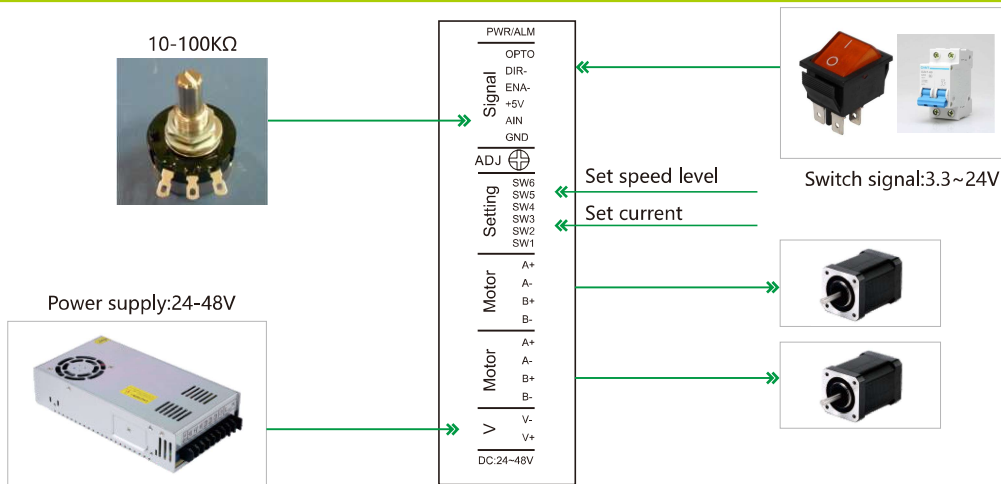
Two-axis synchronization application is often required on the conveying equipment. R42-D is the two-axis synchronization specific driver customized by Simtach.

R42-D comes with a potentiometer. If need an external potentiometer please set the internal potentiometer ADJ first, and then connect the external potentiometer to the (+5V/AIN/GND) pin.

- Speed control mode: the ENA switching signal controls the start-stop, and the potentiometer controls speed.
- Signal level: IO signals are connected to 24V externally, and power supply inside the potentiometer is 5V.
- Power supply voltage: 24-48V DC
- Typical applications: conveying equipment, inspection conveyor, PCB pallet conveyor.



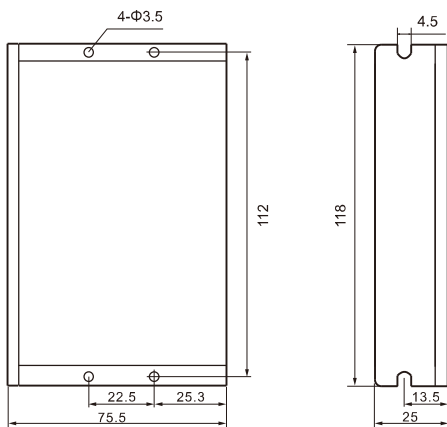
Schematic connection diagram



Driver working status LED indication

LED status	Driver status	
●	Green indicator is on for a long time	Driver not enabled
●●	Green indicator is flickering	Driver working normally
●●●	One green indicator and one red indicator	Driver overcurrent
●●●●	One green indicator and two red indicators	Driver input power overvoltage
●●●●●	One green indicator and three red indicators	The internal voltage of the driver is wrong

Installation dimension



Front installation

Side installation

Operating current setting

Output current peak	Output current RMS	SW1	SW2	SW3
0.3A	0.2A	on	on	on
0.5A	0.3A	off	on	on
0.7A	0.5A	on	off	on
1.0A	0.7A	off	off	on
1.3A	1.0A	on	on	off
1.6A	1.2A	off	on	off
1.9A	1.4A	on	off	off
2.2A	1.6A	off	off	off

Speed level setting

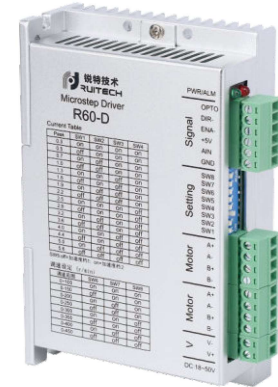
Speed regulation range	SW4	SW5	SW6
0~100	on	on	on
0~150	off	on	on
0~200	on	off	on
0~250	off	off	on
0~300	on	on	off
0~350	off	on	off
0~400	on	off	off
0~450	off	off	off

One-pull-two Driver R60-D

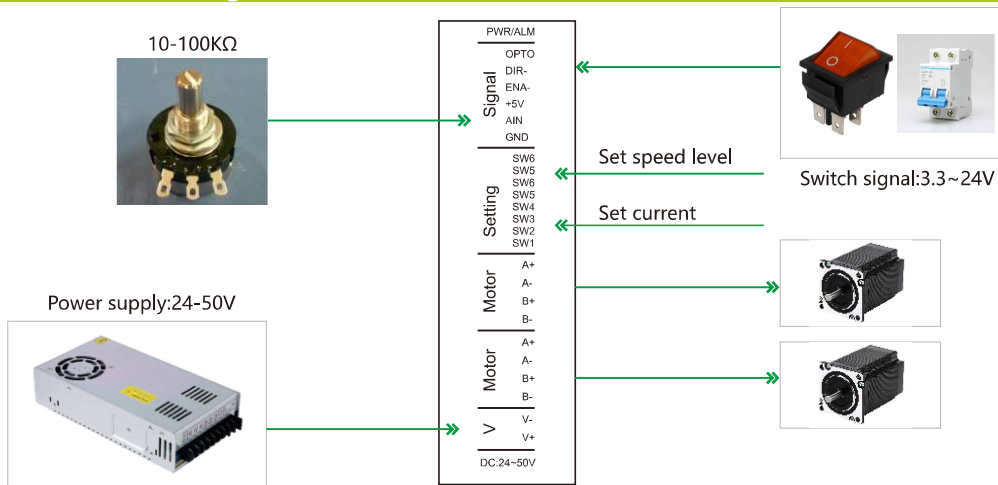
Two-axis synchronization application is often required on the conveying equipment. R60-D is the two-axis synchronization specific drive customized by Simtach.

Using the TI's delicate dual-core DSP chip, R60-D drives the two-axis motor independently to avoid the interference within the back electromotive force and achieve independent operation and synchronized movement.

- Speed control mode: The ENA switching signal controls the start-stop, and the potentiometer controls speed.
- Signal level: IO signals are connected to 24V externally, and power supply inside the potentiometer is 5V.
- Power supply voltage: 24-50V DC
- Typical applications: Conveying equipment, inspection conveyor, PCB pallet conveyor.



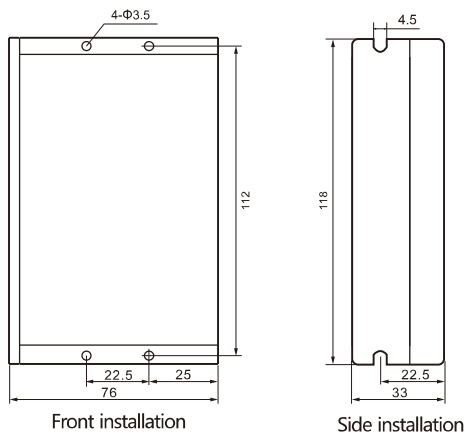
Schematic connection diagram



Driver working status LED indication

LED status	Driver status
●	Driver not enabled
●●	Driver working normally
●●●	Driver overcurrent
●●●●	Driver input power overvoltage
●●●●●	The internal voltage of the driver is wrong

Installation dimension



Acceleration level setting

Acceleration level	Description	SW5
Acceleration level 1	Low acceleration/deceleration	off
Acceleration level 2	High acceleration/deceleration	on

Speed level setting

Speed regulation range	SW6	SW7	SW8
0~100	on	on	on
0~150	off	on	on
0~200	on	off	on
0~250	off	off	on
0~300	on	on	off
0~350	off	on	off
0~400	on	off	off
0~450	off	off	off

Operating current setting (single motor current)

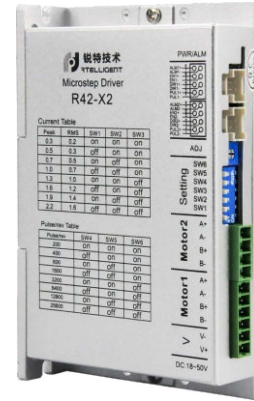
Peak	SW1	SW2	SW3	SW4
0.3	on	on	on	on
0.5	off	on	on	on
0.7	on	off	on	on
1.0	off	off	on	on
1.3	on	on	off	on
1.6	off	on	off	on
1.9	on	off	off	on
2.2	off	off	off	on
2.5	on	on	on	off
2.8	off	on	on	off
3.2	on	off	on	off
3.6	off	off	on	off
4.0	on	on	off	off
4.4	off	on	off	off
5.0	on	off	off	off
5.6	off	off	off	off

Two-in-one Driver R42X2

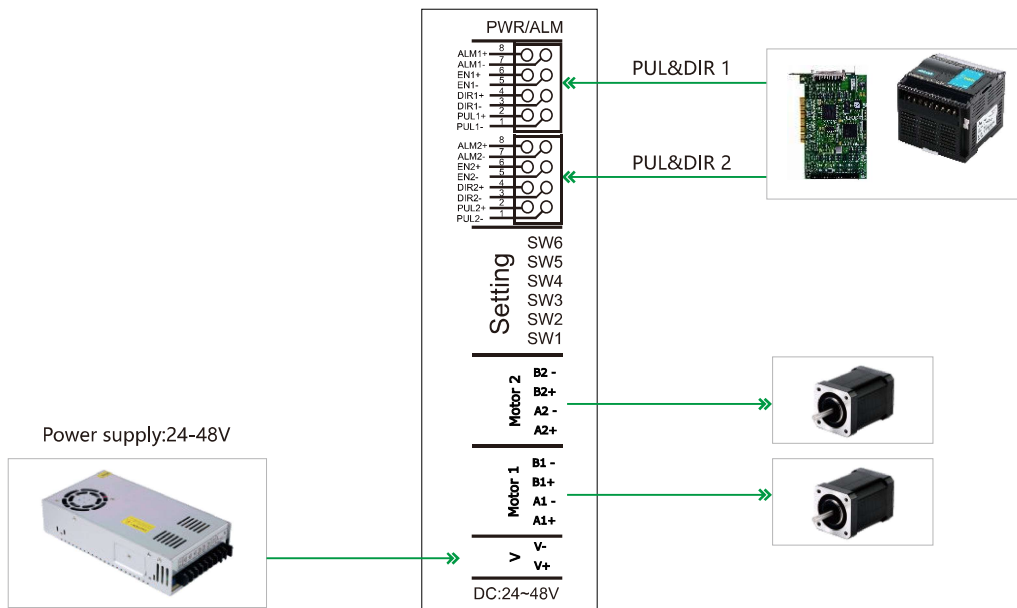
Multi-axis automation equipment is often required to reduce space and save the cost. R42X2 is the national first two-axis specific driver developed by Simtacht.

R42X2 can drive independently two 2-phase stepper motors bases below 42mm. The two-axis micro-stepping and current must be set to the same.

- Pulse mode: monopulse PUL&DIR or double-pulse CW&CCW
- Signal level: 24V default
- Typical application: dispenser, soldering machine, multi-axis test equipment



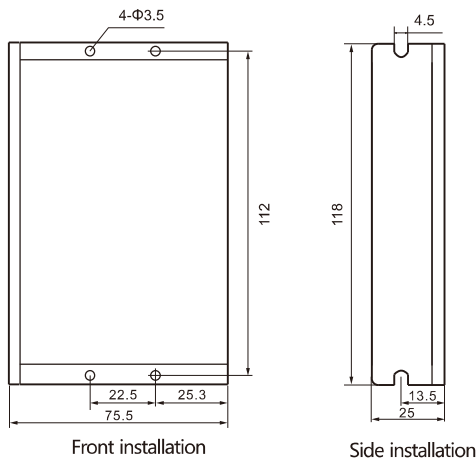
Schematic connection diagram



Driver working status LED indication

LED status	Driver status
● Green indicator is on for a long time	Driver not enabled
●● Green indicator is flickering	Driver working normally
●●● One green indicator and one red indicator	Driver overcurrent
●●●● One green indicator and two red indicators	Driver input power overvoltage
●●●●● One green indicator and three red indicators	The internal voltage of the driver is wrong

Installation dimension



Operating current setting

Output current peak	Output current RMS	SW1	SW2	SW3
0.3A	0.2A	on	on	on
0.5A	0.3A	off	on	on
0.7A	0.5A	on	off	on
1.0A	0.7A	off	off	on
1.3A	1.0A	on	on	off
1.6A	1.2A	off	on	off
1.9A	1.4A	on	off	off
2.2A	1.6A	off	off	off

Micro-stepping level setting

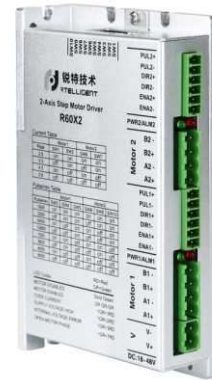
steps/revolution	SW4	SW5	SW6
200	on	on	on
400	off	on	on
800	on	off	on
1600	off	off	on
3200	on	on	off
6400	off	on	off
12800	on	off	off
25600	off	off	off

Two-in-one Driver R60X2

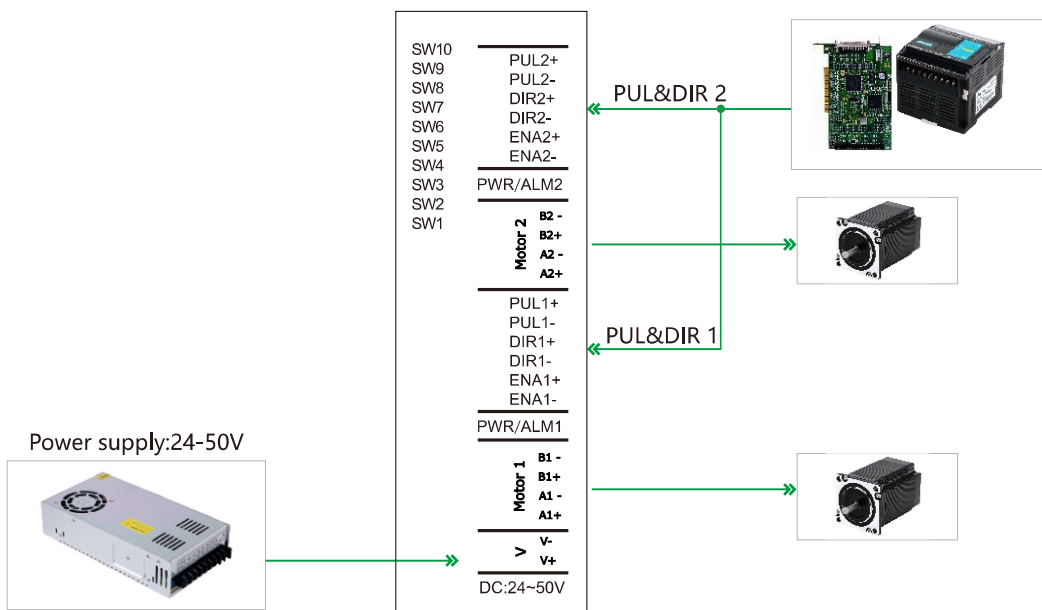
Multi-axis automation equipment is often required to reduce space and save the cost. R60X2 is the national first two-axis specific driver developed by Simtach.

R60X2 can drive independently two 2-phase stepper motors bases below 60mm. The two-axis micro-stepping and current must be set to the same.

- Pulse mode: monopulse PUL&DIR or double-pulse CW&CCW
- Signal level: 5V/24V requires string resistor
- Typical application: dispenser, soldering machine, two-axis platform equipment



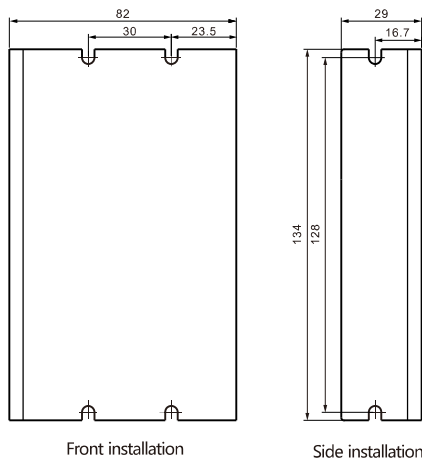
Schematic connection diagram



Driver working status LED indication

LED status	Driver status
● Green indicator is on for a long time	Driver not enabled
●● Green indicator is flickering	Driver working normally
●●● One green indicator and one red indicator	Driver overcurrent
●●●● One green indicator and two red indicators	Driver input power overvoltage
●●●●● One green indicator and three red indicators	The internal voltage of the driver is wrong

Installation dimension



Operating current setting

Output current peak	motor1		motor2	
	SW1	SW2	SW3	SW4
2.5A	on	on	on	on
3.5A	off	on	off	on
4.5A	on	off	on	off
5.6A	off	off	off	off

Micro-stepping level setting

steps/revolution	motor1 (motor2)		
	SW3(8)	SW4(9)	SW5(10)
1600	on	on	on
3200	off	on	on
6400	on	off	on
12800	off	off	on
1000	on	on	off
3600	off	on	off
4000	on	off	off
8000	off	off	off

Three-in-one Driver R60X3

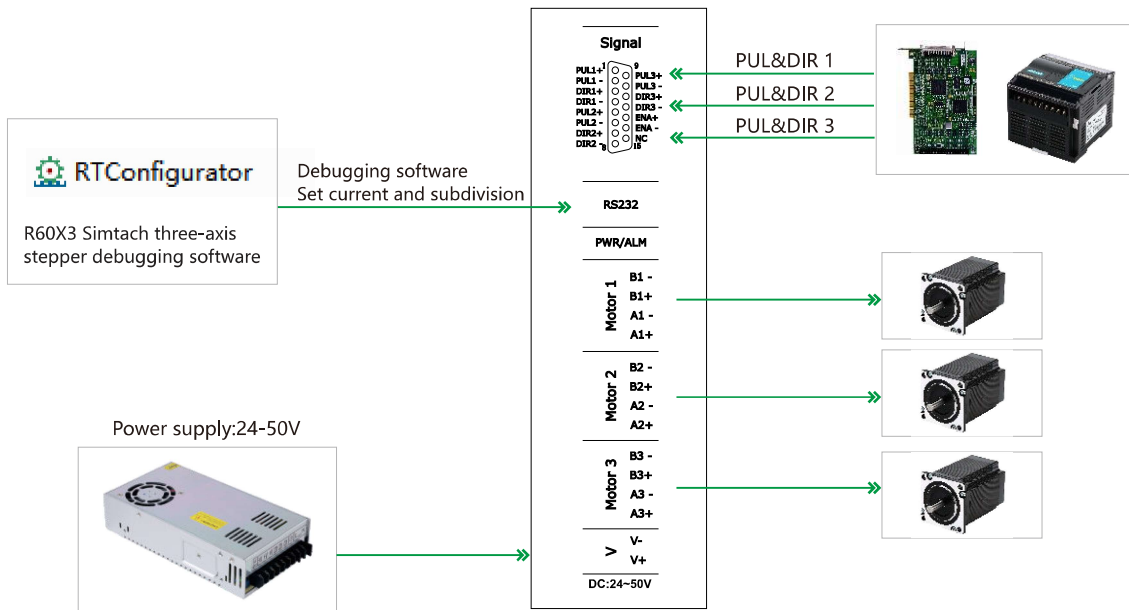
Three-axis platform equipment is often required to reduce space and save the cost. R60X3/3R60X3 is the national first three-axis specific driver developed by Simtach.

R60X3/3R60X3 can drive independently three 2-phase/3-phase stepper motors bases below 60mm. The three-axis micro-stepping and current are independently adjustable.

- Pulse mode: monopulse PUL&DIR
- Signal level: 3.3~24V compatible; serial resistance not necessary for the application of PLC.
- Typical application: dispensing system, floating machine, carving machine and three-axis test equipment.



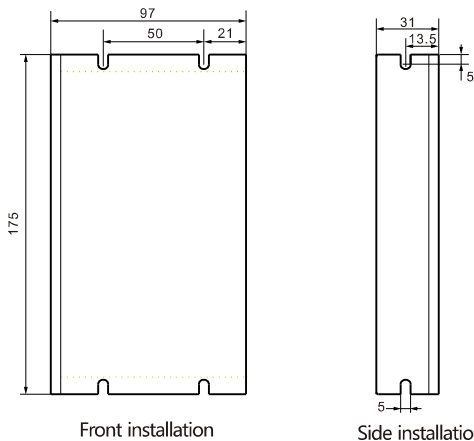
Schematic connection diagram



Driver working status LED indication

LED status	Driver status
● Green indicator is on for a long time	Driver not enabled
●● Green indicator is flickering	Driver working normally
●● One green indicator and one red indicator	Driver overcurrent
●●● One green indicator and two red indicators	Driver input power overvoltage
●●●● One green indicator and three red indicators	The internal voltage of the driver is wrong

Installation dimension



The testing interface of the driver parameters

RegisterAddr	Function	Parameter	Default	Unit	MinValue	MaxValue	BitAttribution
13	Current 1	1800	3000	mA	0	65535	BF
33	Current 2	1800	3000	mA	0	65535	BF
53	Current 3	1800	3000	mA	0	65535	BF
32	Subdivision 1	200	200	Pul/rev	0	65535	BF
32	Subdivision 2	200	200	Pul/rev	0	65535	BF
52	Subdivision 3	200	200	Pul/rev	0	65535	BF
14	Standby time 1	500	500	ms	0	65535	BF
34	Standby time 2	500	500	ms	0	65535	BF
54	Standby time 3	500	500	ms	0	65535	BF
38	Power-on lock set...	1000	1000	-	-3000	3000	BF
38	Power-on lock set...	1000	1000	-	0	100	BF
58	Power-on lock set...	1000	1000	-	0	65535	BF
16	S curve time 1	128	128	-	0	65535	BF
36	S curve time 2	128	128	-	0	1	BF
56	S curve time 3	128	128	-	0	1	BF
17	Pulse load/dth 1...	10	10	-	0	6	BF
37	Pulse load/dth 2...	10	10	-	0	3	BF
57	Pulse load/dth 3...	10	10	-	0	65535	BF
10	Pulse multi edge 1	0-Rising edge	0	-	0	1	BF

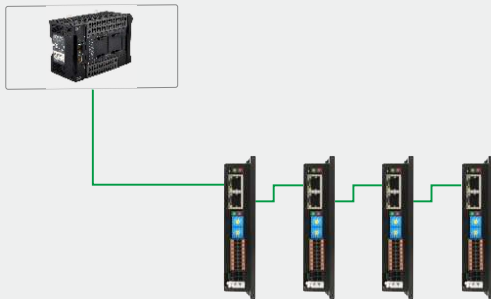
FieldBus Communication Driver Solution

Overview of fieldbus control

FieldBus communication:

The control command is sent to the driver through the fieldbus communication, and the driver executes the corresponding command action

Simple/efficient wiring flexible control function/positioning, fixed speed, torque control, etc.
Easy to build multi-axis control system/convenient debugging
All interfaces require a unified fieldbus protocol type



Overview

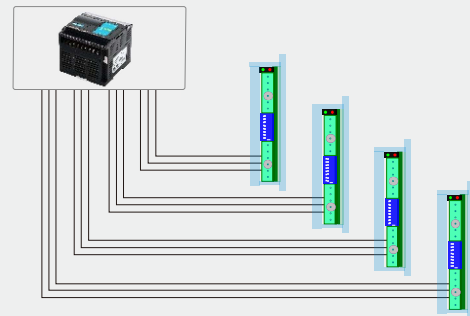
Pulse control:

The control commands are converted to pulses and sent to the driver.
The driver counts the pulses.
The motor is driven by pulses to complete the command action.

Features

Wiring alignment is relatively more/ Prone to signal interference
Single control function / Pulse positioning
Suitable for small control systems
Simple and intuitive, low stand-alone cost

Diagram

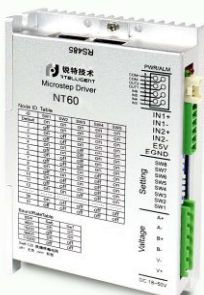


Simtach fieldbus stepper products series

NT Series - 485 Communication

EP Series - TCP Communication

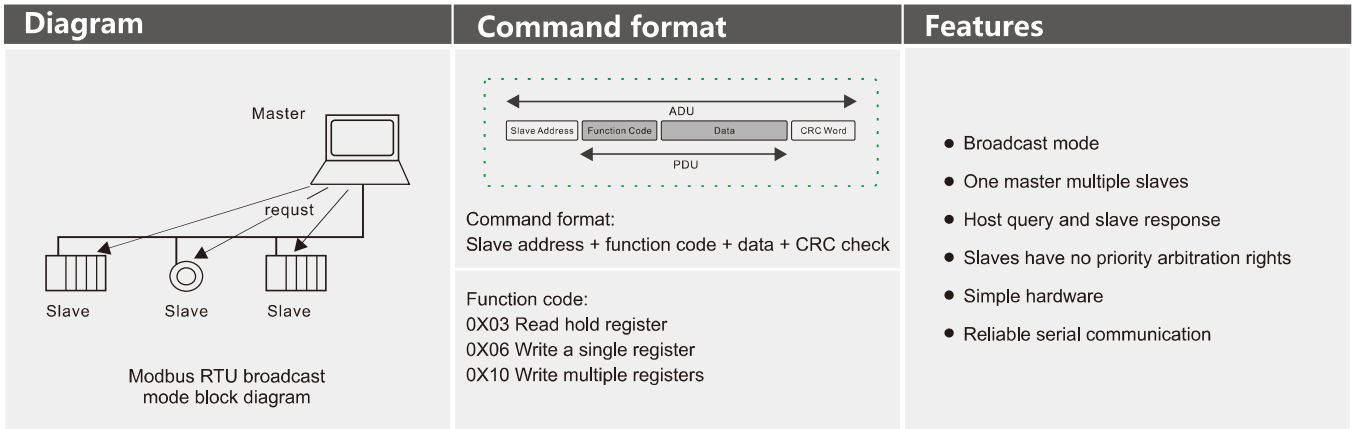
EC Series - EtherCAT Communication



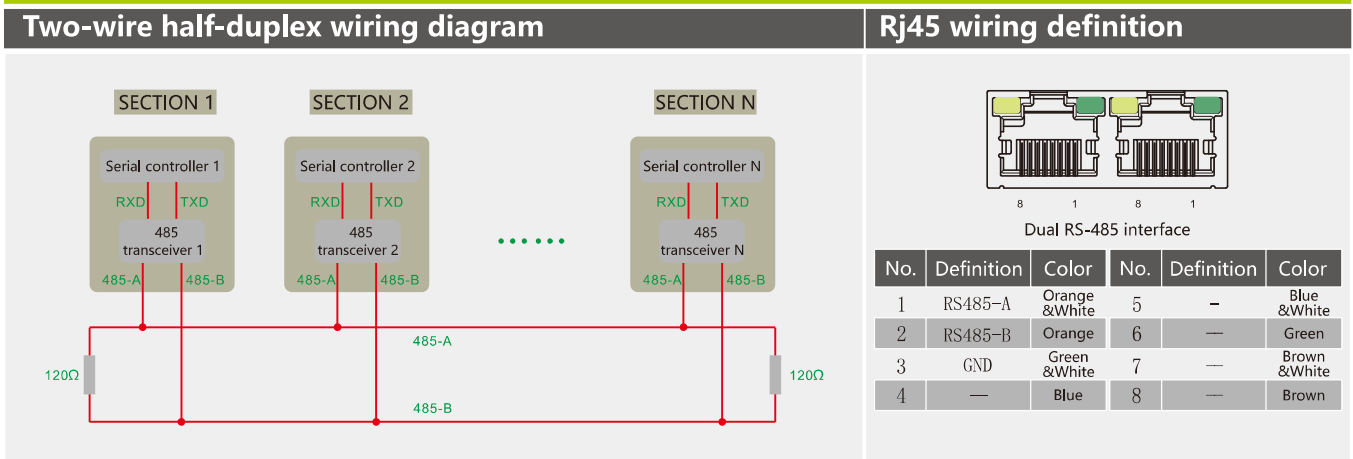
Modbus RTU

Serial communication protocol based on 485 interface

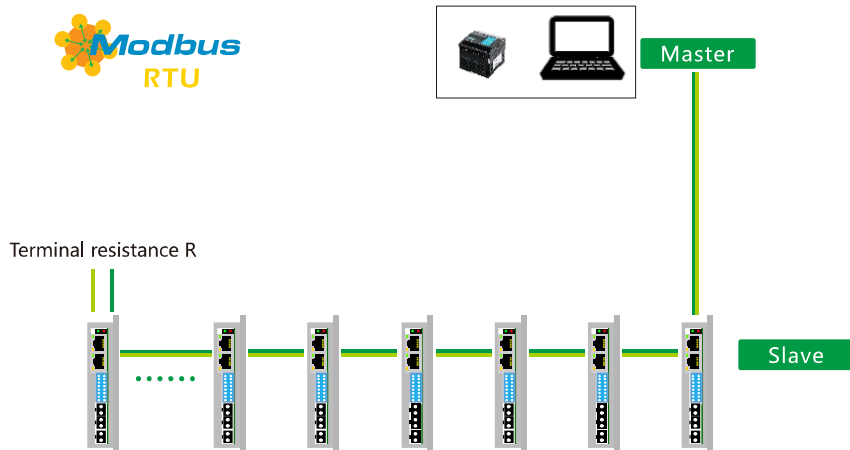
Overview of Modbus RTU protocol



485 grids

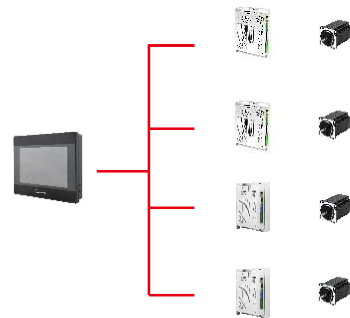
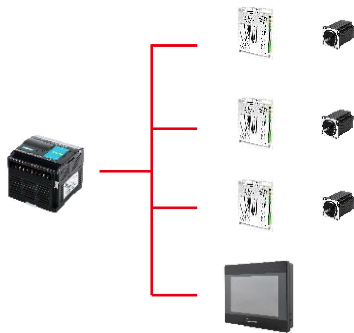


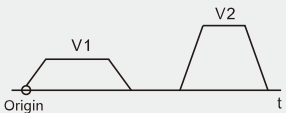
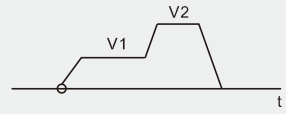
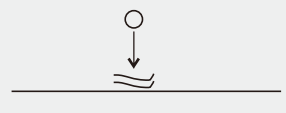

NT series 485 networking diagram

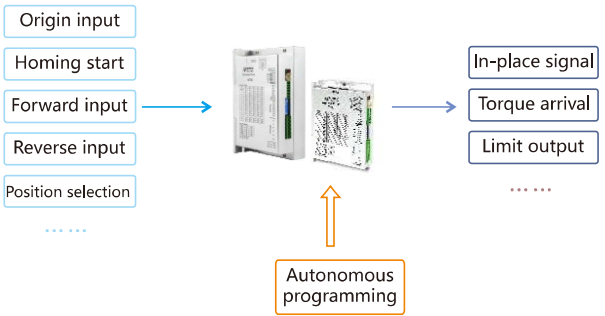


Three Applications of NT Series Stepper Driver

PLC master + NT driver slave	Touch screen master + NT driver slave
Master+Slave: PLC+NT driver Easy networking PLC with 485 communication Support up to 31 slave stations Optional touch screen for slave station, quick interaction	Master + Slave: Touch screen + NT driver Easy networking Streamline cost control Commonly used macro instruction programming mode For simple logic loop control



NT driver automatic programming mode	Function in self-programming mode
Driver automatic programming mode No networking required Use the integrated motion control instructions inside the driver With external IO control Fixed speed/positioning/multi-stage position/auto-homing etc functions.	IO positioning operation IO forward and backward One or more target position With homing function 
	IO speed control operation IO forward and backward One or more target speeds 
	IO torque mode IO forward and backward Target torque switching With homing function 
	Torque-position mode IO forward and backward Target torque and position switching With homing function 



NT series specifications

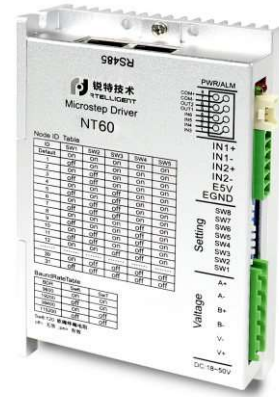
Model	Peak current	Weight	Power voltage	Dimension	Communication mode	Maximum baud rate	Matched motor
NT60	6A	300g	24-50VDC	118×76×33mm	485	115200	Below 60mm open/closed loop
NT86	8A	700g	18-80VAC	151×97×52mm	485	115200	86mm open/closed loop
NT110	8A	1400g	110-230VAC	151×141×58mm	485	115200	110mm open/closed loop

NT60

485 fieldbus stepper driver NT60, based on RS-485 network to run Modbus RTU protocol, integrated intelligent motion control function.

NT60 matches open loop or closed loop stepper motors base below 60mm.

- Control mode: fixed length/fixed speed/homing/multi-speed/multi-position
- Debugging software: RTConfigurator (multiplexed RS485 interface)
- Power voltage: 24-50V DC
- Typical applications: single axis electric cylinder, assembly line, connection table, multi-axis positioning platform, etc.



Driver function description

ID setting
on=0, off=1
ID=sw1+sw2*2+sw3*4+sw4*8+sw5*16
Make sure the ID number is set correctly before powering on

BDR	SW6	SW7
9600	on	on
19200	off	on
38400	on	off
115200	off	off

The baud rate of the slave station must correspond to the baud rate of the master station
When adjusting the dial code, need to power off and restart the driver to take effect

Driver working status LED indication

LED status	Driver status
Green indicator is on for a long time	Driver not enabled
Green indicator is flickering	Driver working normally
One green indicator and one red indicator	Driver overcurrent
One green indicator and two red indicators	Driver input power overvoltage
One green indicator and three red indicators	Driver internal voltage error
One green indicator and four red indicators	Tracking error exceeds limits
One green indicator and five red indicators	Encoder phase is abnormal
One green indicator and six red indicators	Parameter check error
One green indicator and seven red indicators	Motor phase failure alarm

RS485
COM+
COM-
OUT2
OUT1
IN6
IN5
IN4
IN3

IO interface
IN1+
IN1-
IN2+
IN2-
E5V
EGND

Encoder wiring (optional)
SW8
SW7
SW6
SW5
SW4
SW3
SW2
SW1

Voltage
A+
A-
B+
B-
V-
V+
DC:24~50V

Input interface

Input 1	IN1+ IN1- IN2+ IN2-	Differential input or encoder input interface
Input 3	IN3	Single-ended common anode input
Input 4	IN4	
Input 5	IN5	Common input
Input 6	IN6	
	COM+	

Output interface

Output 1	OUT1	Common output
Output 2	OUT2	
	COM-	

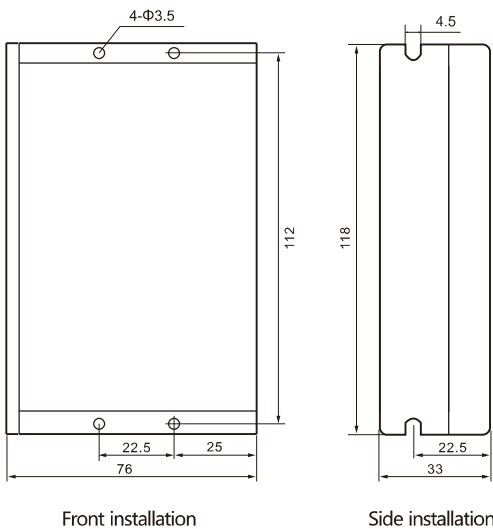
Motor interface

A+	Motor Phase A	Arbitrarily change the phase A or B winding sequence, the motor will be reversed
A-	Phase A	
B+	Motor Phase B	
B-	Phase B	

Power supply interface

V+	Power positive	24~50V
V-	Power negative	Power over 150V

Installation size



Debugging software interface

MotionTest

Pulse command source: 0-Internal pulse gen
Motor operation mode: 0-Open loop
Motor type: 0-2 phase
Running direction: 0-Normal
Internal pulse application mode: 0-Communication cont
Operation mode: 0-Incremental

Acc: 200, Deceleration (g/s^2): 200, Speed: 600, Position: 200
JOG acceleration: 100, JOG deceleration: 100, JOG speed: 500, Emergency stop decel: 500

IO input and output: General parameters, Servo mode setting, Current loop parameters, Homing mode setting

IN1: 0-Pulse input, IN2: 0-Pulse input, IN3: 0-Pulse input, IN4: 0-Pulse input, IN5: 0-Pulse input, IN6: 0-Pulse input
OUT1: 0-Normal output, OUT2: 0-Normal output, OUT3: 0-Normal output, OUT4: 0-Normal output, OUT5: 0-Normal output, OUT6: 0-Normal output

NT86

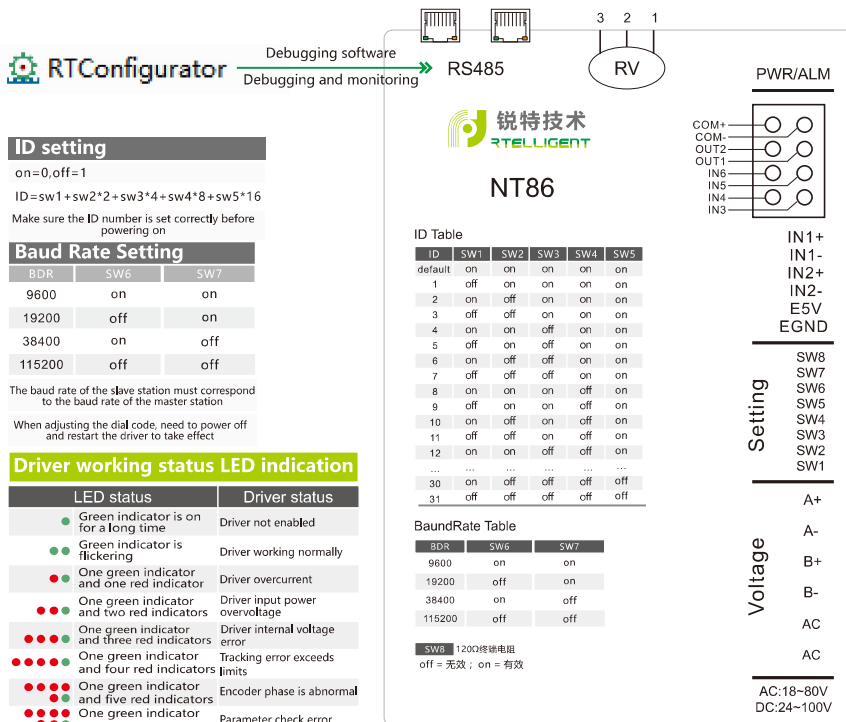
485 fieldbus stepper driver NT86, based on RS-485 network to run Modbus RTU protocol, integrated intelligent motion control function.

NT86 matches open loop or closed loop 86mm stepper motors.

- Control mode: fixed length/fixed speed/homing/multi-speed/multi-position/potentiometer speed regulation
- Debugging software: RTConfigurator (multiplexed RS485 interface)
- Power voltage: 24-100V DC, 18-80V AC
- Typical applications: single axis electric cylinder, assembly line, connection table, multi-axis positioning platform, etc.



Driver function description



Input interface

Input 1	IN1+ IN1-	Differential input or encoder input interface
Input 2	IN2+ IN2-	
Input 3	IN3	Single-ended common anode input
Input 4	IN4	
Input 5	IN5	Common input
Input 6	IN6	
	COM+	

Output interface

Output 1	OUT1	Common output
Output 2	OUT2	
	COM-	

Motor interface

A+	Motor Phase A	Arbitrarily change the phase A or B winding sequence, the motor will be reversed
A-	Phase A	
B+	Motor Phase B	
B-	Phase B	

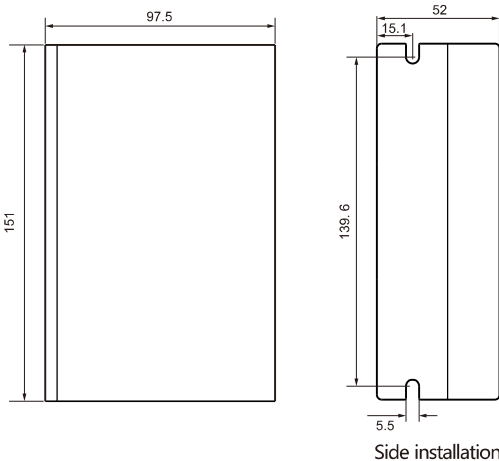
Power supply interface

AC	AC input	18-80VAC /24-100VDC
AC		Power over 150W

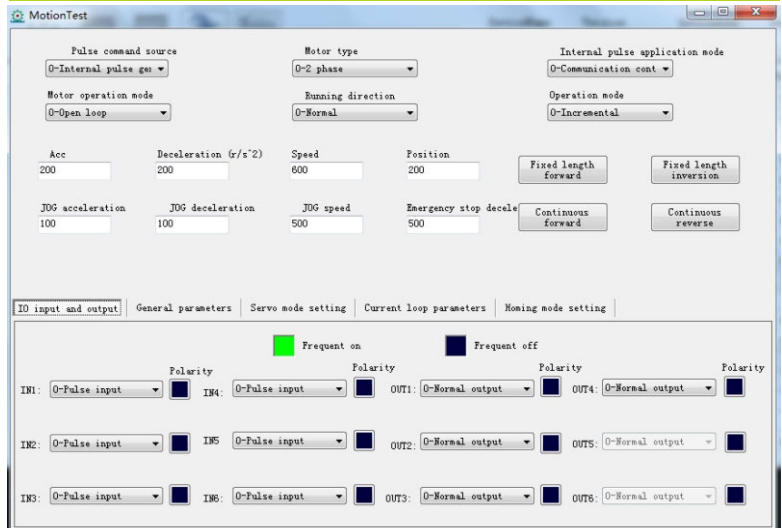
Potentiometer interface RV

RV1/RV2/RV3	Three-terminal of potentiometer
-------------	---------------------------------

Installation size



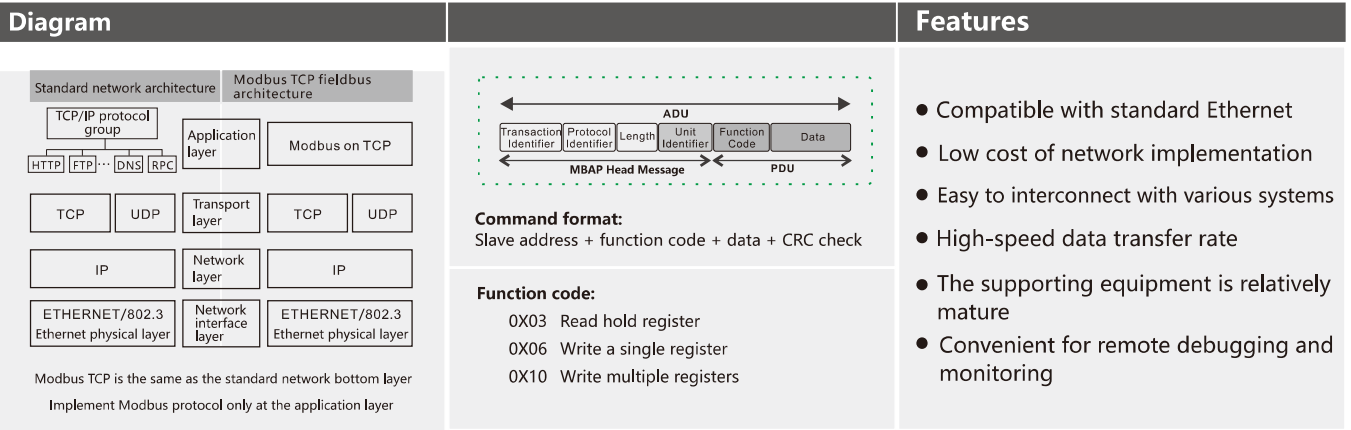
Debugging software interface



Modbus TCP

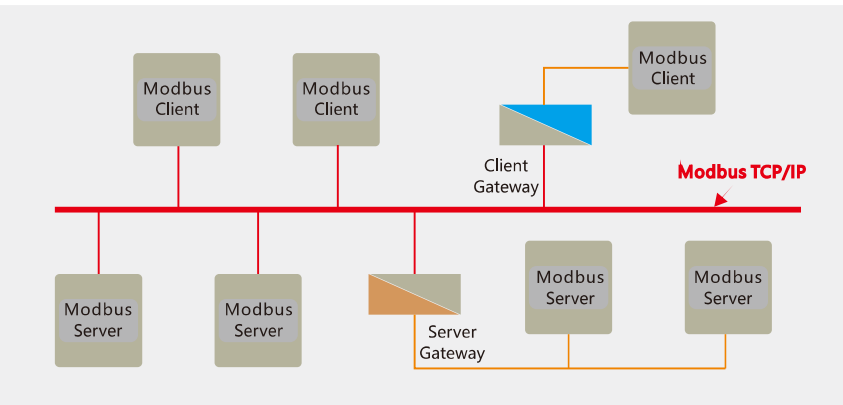
Industrial Ethernet FieldBus communication protocol based on TCP/IP

Overview of Modbus TCP protocol

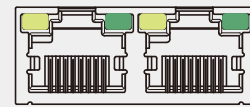


TCP network interface

TCP network wiring diagram



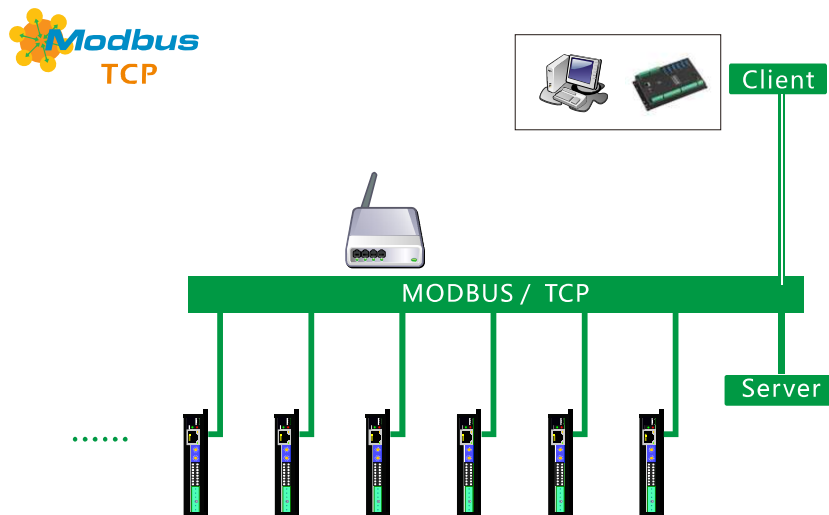
Rj45 wiring definition



Standard 100Base-TX interface

No.	Definition	Color	No.	Definition	Color
1	TX+	Orange & White	5	-	Blue & White
2	TX-	Orange	6	RX-	Green
3	RX+	Green & White	7	-	Brown & White
4	--	Blue	8	-	Brown

EP series network diagram



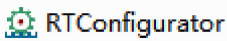
EPR60

The Ethernet fieldbus-controlled stepper driver EPR60 runs on the Modbus TCP protocol based on standard Ethernet interface and integrates a rich set of motion control functions.

- The EPR60 is compatible with open-loop stepper motors base below 60mm.
- Control mode: fixed length/fixed speed/homing/multi-speed/multi-position
- Debugging software: RTConfigurator (USB interface)
- Power voltage: 24-50V DC
- Typical applications: assembly lines, warehousing logistics equipment, multi-axis positioning platforms, etc.



Driver function description



Debugging software
Debugging and monitoring

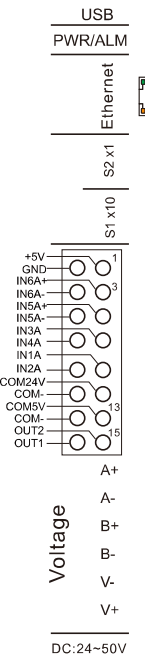


IP Address Table

IP Address	S1x10+S2x10
0	10.10.10.10
1	192.168.0.11
2	192.168.0.12
3	192.168.0.13
4	192.168.0.14
5	192.168.0.15
...	192.168.0.
99	192.168.0.109

LED Codes

MOTOR DISABLED	Solid Green	RD=Red	GR=Green
MOTOR ENABLED	GR-GR-GR		
OVER CURRENT	1GR+1RD		
SUPPLY VOLTAGE HIGH	1GR+2RD		
INTERNAL VOLTAGE ERROR	1GR+3RD		



Input interface

3	IN6+	Differential input or encoder input interface
4	IN6-	
5	IN5+	
6	IN5-	
7	IN3	Single-ended common anode input
8	IN4	
9	IN1	
10	IN2	Common input
11	COM+	

Output interface

16	OUT1	Single-ended common cathode input
15	OUT2	Common output
12/14	COM-	Common output

Motor interface

A+	Motor	Arbitrarily change the phase A or B winding sequence, the motor will be reversed
A-	Phase A	
B+	Motor	Arbitrarily change the phase A or B winding sequence, the motor will be reversed
B-	Phase B	

Power supply interface

V+	Power positive	24-48V
V-	Power negative	Power over 150W

IP setting

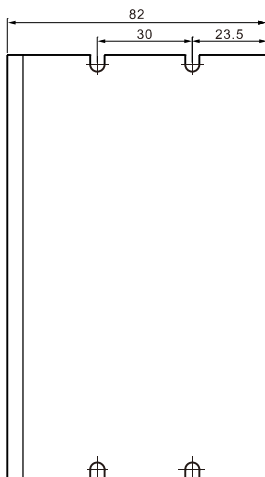
IP Add = S1*10 + S2 + 10

Make sure the IP number is set correctly before powering on

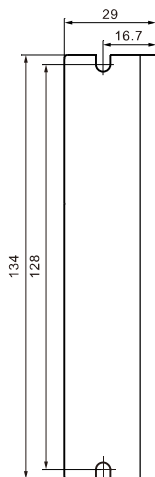
Driver working status LED indication

LED status	Driver status
Green indicator is on for a long time	Driver not enabled
Green indicator is flickering	Driver working normally
One green indicator and one red indicator	Driver overcurrent
One green indicator and two red indicators	Driver input power overvoltage
One green indicator and three red indicators	Driver internal voltage error
One green indicator and four red indicators	Tracking error exceeds limits
One green indicator and five red indicators	Encoder phase is abnormal
One green indicator and six red indicators	Parameter check error
One green indicator and seven red indicators	Motor phase failure alarm

Installation size

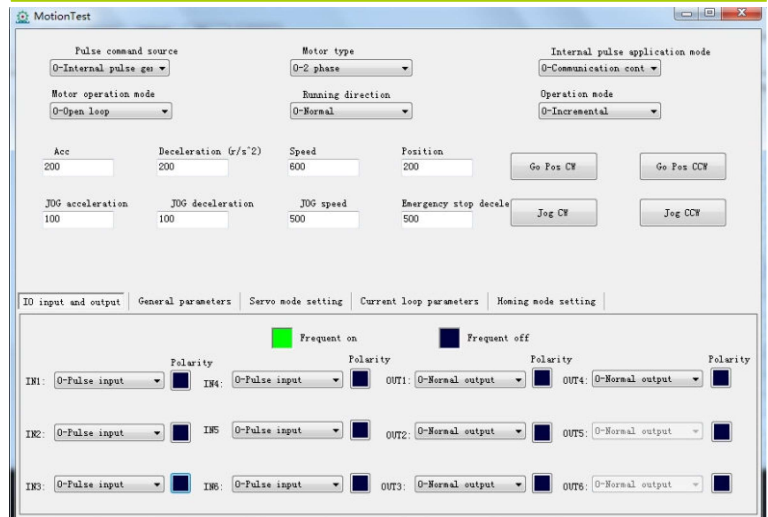


Front installation



Side installation

Debugging software interface

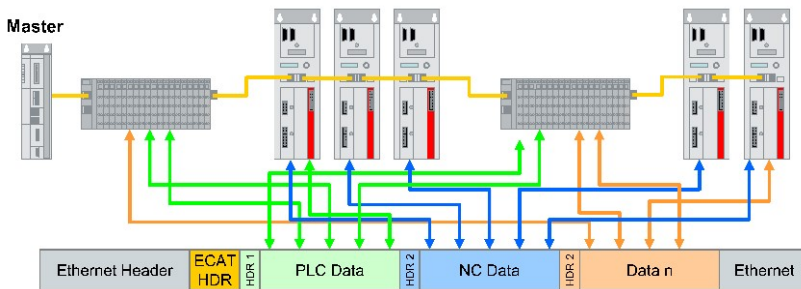


EtherCAT

Real-time FieldBus communication protocol based on industrial Ethernet

EtherCAT overview

ECAT principle

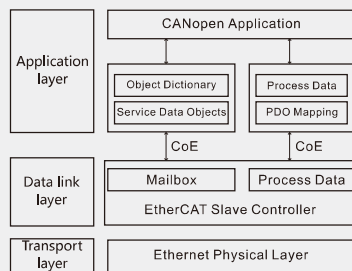


Features

- Efficient transmission mechanism and speed
- Flexible network topology
- Automatic node address configuration for easy maintenance
- Open technology
- Simple hardware, high cost performance
- Suitable for modular collaborative development

CANopen over EtherCAT protocol overview

CoE diagram



EtherCAT modifies the communication mechanism of Ethernet to ensure the real-time performance of the network

CiA402 control mode

Profile Position Mode (PP):
Set position, speed, acceleration and deceleration parameters, and execute relative or absolute position commands from the internal buffer of the driver

Profile Velocity Mode (PV):
Set speed, acceleration and deceleration parameters, and execute the speed command by the internal buffer of the driver on commands from the internal buffer of the driver

Cyclic Synchronous Position Mode (CSP)
The main controller generates a position trajectory and sends the target position (0x607A) to the driver in each PDO update cycle.

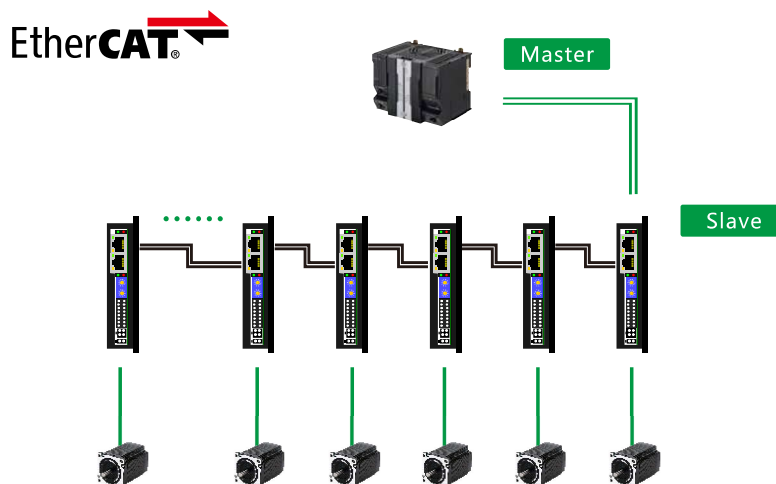
Homing Mode (HM)
The relevant parameters need to be set according to the format

PDO and SDO parameters

Process Data Object (PDO):
Process data object
Used to transmit real-time data
Configure the relevant parameters of the driver as PDO parameters, and realize real-time reading and writing of status and commands between the master station and the slave station in each synchronization cycle
For example, parameters such as target position in CSP mode

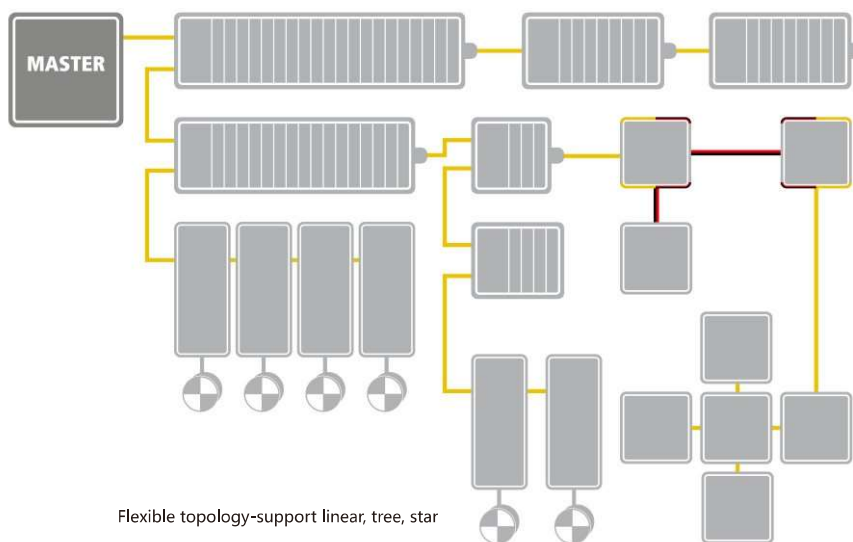
Service Data Object (SDO):
Service Data Objects
Used to configure static parameters,
Configure the driver parameters that do not need to be changed in real time as SDO parameters, and set the relevant parameters of the slave driver on the master station.
For example, working current and other parameters.

EtherCAT network diagram



EtherCAT Slave Stepper Driver

EtherCAT topology



Simtach ECAT FieldBus stepper technical specifications

Model	Peak current	Weight	Input voltage range	Dimension	Input and output	Matching motor
ECR42	2A	400g	24-50VDC	134×82×29mm	Six inputs, two outputs	Open loop 20、28、35、39、42
ECR60	6A	400g	24-80VDC	134×82×29mm	Six inputs, two outputs	Open loop 50、60
ECR86	7A	550g	18-80VAC	151×97×35mm	Six inputs, two outputs	Open loop 86
ECT42	2A	400g	24-50VDC	134×82×29mm	Four inputs, two outputs	Closed loop 20、28、42
ECT60	6A	400g	24-80VDC	134×82×29mm	Four inputs, two outputs	Closed loop 57、60
ECT86	7A	550g	18-80VAC	151×97×35mm	Four inputs, two outputs	Closed loop 86

Regularly supported master station brands

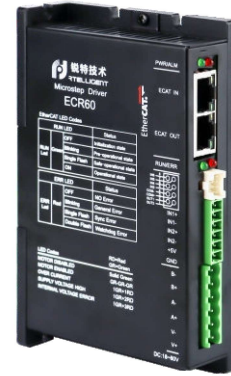
BECKHOFF	OMRON	KEYENCE 基恩士	 CODESYS	...
Zmotion [®] 正运动技术	INOVANCE	DELTA 台达	XINJE	...

ECR60

The EtherCAT fieldbus stepper driver ECR60 is based on the CoE standard framework and complies with the CiA402 standard. The data transmission rate can reach 100Mb/s, and supports linear, ring and other network topologies.

ECR60 matches open loop stepper motors base below 60mm

- Control mode: PP, PV, CSP, HM, etc.
- Power supply voltage: 24-80V DC
- Input and output: 2-channel differential inputs/4-channel 24V common anode inputs; 2-channel optocoupler isolated outputs
- Typical applications: assembly lines, lithium battery equipment, solar equipment, 3C electronic equipment, etc.



Driver function description

Working status LED indication-PWR/ALM

LED status	Driver status
Green indicator is on for a long time	Driver not enabled
Green indicator is flickering	The driver is working normally
One green indicator and one red indicator	Driver overcurrent
One green indicator and two red indicators	Driver input power overvoltage
One green indicator and three red indicators	Driver internal voltage error
One green indicator and six red indicators	Parameter check error
One green indicator and seven red indicators	Motor phase failure alarm

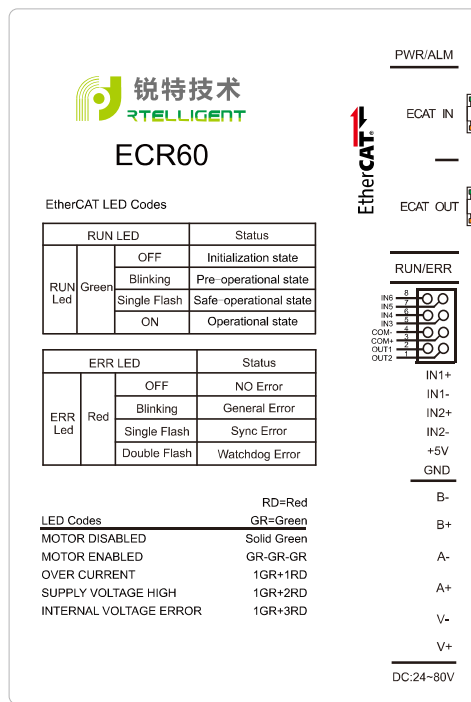
Communication status LED indication-RUN/ERR

LED status	Communication status
RUN GREEN ● Not bright	Initialization
● Slow flash	Pre-operational
● Single flash	Safe-operational
● Constant bright	Operational
ERR RED ● Not bright	No error
● Slow flash	General error
● Single flash	Sync error
● Double flash	Watchdog error

Slow flash: on for 200ms, off for 200ms; repeat
 Single flash: on for 200ms, off for 1s; repeat
 Double flash: on for 200ms, off for 200ms, then on for 200ms, off for 1s; repeat

Power supply interface

V-	Power positive	24-80V
V+	Power negative	Power over 150W



Input interface

Input 1	IN1+	Differential input signal
	IN1-	
Input 2	IN2+	5V level input
	IN2-	
Input 3	IN3	Single-ended common anode input
Input 4	IN4	
Input 5	IN5	
Input 6	IN6	
	COM+	24V common input

Internal power output interface

+5V	Internal 5V power output
GND	Supply current 80mA

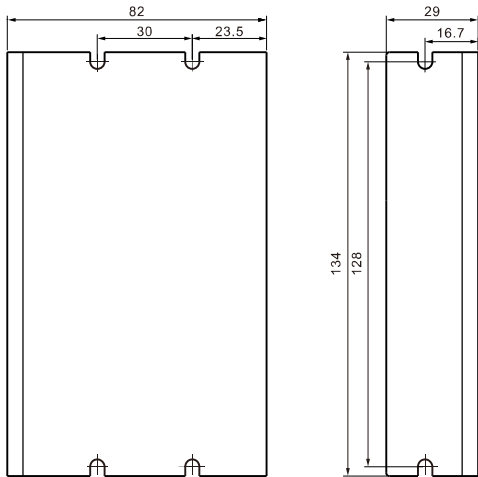
Output interface

Output 1	OUT1	Single-ended common cathode output
Output 2	OUT2	
	COM-	Common output

Motor interface

A+	Motor Phase A	Arbitrarily change the phase A or B winding sequence, the motor will be reversed
A-	Motor Phase A	
B+	Motor Phase B	
B-	Motor Phase B	

Installation size



Main parameters and address

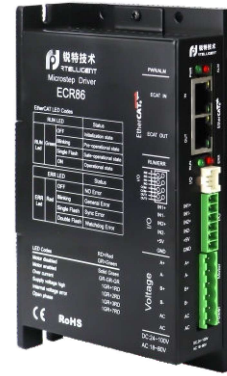
Index	Name	Flags	Value
2000	Peak Current	RW P	0x08B8 (3000)
2001	Motor Resolution	RW P	0x2710 (10000)
2002	Idle Time	RW P	0x03E8 (1000)
2003	Idle Current Percentage	RW P	0x0032 (50)
2005:0	Outputs Function	RW P	> 2 <
2006	Outputs Polarity	RW P	0x0003 (3)
2007:0	Inputs Function	RW P	> 6 <
2008	Inputs Polarity	RW P	0x003F (63)
2009	Filter Time	RW P	0x6400 (25600)
200A	Soft lock Time	RW P	0x03E8 (1000)
200B:0	Current loop parameters	RW P	> 4 <
200B:01	AutoPI enable	RW P	0x0001 (1)
200B:02	lloop_Kp	RW P	0x03E8 (1000)
200B:03	lloop_Ki	RW P	0x00C8 (200)
200B:04	lloop_Kc	RW P	0x0100 (256)
200C:0	Motor parameters	RW P	> 6 <
200D	Invert motor direction	RW P	0x0000 (0)
200E	Alarm Code	RO P	0x0000 (0)
200F	Status Code	RO P	0x0000 (0)
2010	Zero Position	RW P	0x0000 (0)
2011	Control mode	RW P	0x0000 (0)
2020	Encoder Resolution	RW P	0x0FA0 (4000)
2021	Encoder Counter in one rev	RO P	0x0000 (0)

ECR86

The EtherCAT fieldbus stepper driver ECR86 is based on the CoE standard framework and complies with the CiA402 standard. The data transmission rate can reach 100Mb/s, and supports linear, ring and other network topologies.

ECR86 matches open loop stepper motors base below 86mm

- Control mode: PP, PV, CSP, HM, etc.
- Power supply voltage: 24-100V DC / 18-80V AC
- Input and output: 2-channel differential inputs/4-channel 24V common anode inputs; 2-channel optocoupler isolated outputs
- Typical applications: assembly lines, lithium battery equipment, solar equipment, 3C electronic equipment, etc.



Driver function description

Working status LED indication-PWR/ALM

LED status	Driver status
Green indicator is on for a long time	Driver not enabled
Green indicator is flickering	The driver is working normally
One green indicator and one red indicator	Driver overcurrent
One green indicator and two red indicators	Driver input power overvoltage
One green indicator and three red indicators	Driver internal voltage error
One green indicator and six red indicators	Parameter check error
One green indicator and seven red indicators	Motor phase failure alarm

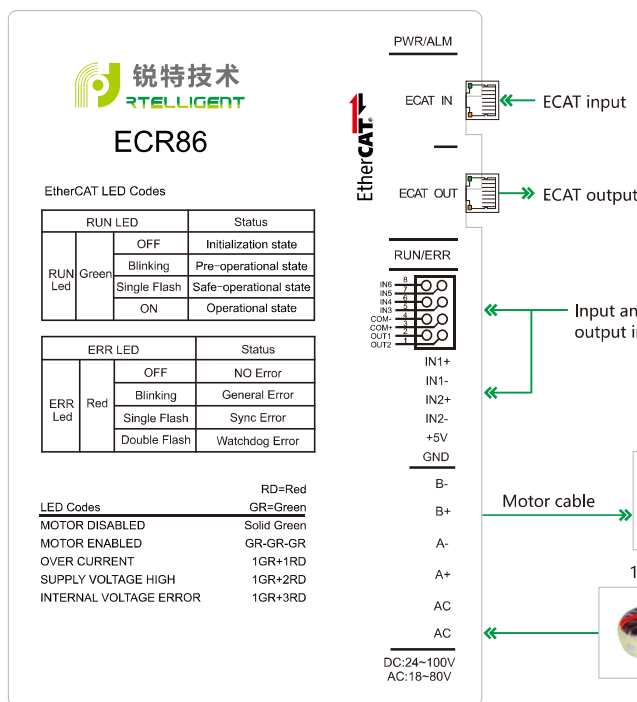
Communication status LED indication-RUN/ERR

LED status	Communication status
RUN GREEN ● Not bright	Initialization
● Slow flash	Pre-operational
● Single flash	Safe-operational
● Constant bright	Operational
ERR RED ● Not bright	No error
● Slow flash	General error
● Single flash	Sync error
● Double flash	Watchdog error

Slow flash: on for 200ms, off for 200ms; repeat
 Single flash: on for 200ms, off for 1s; repeat
 Double flash: on for 200ms, off for 200ms, then on for 200ms, off for 1s; repeat

Power supply interface

AC	24-100VDC/18-80VAC
AC	Power over 150W



EtherCAT LED Codes

RUN LED	Status
Green OFF	Initialization state
Blinking	Pre-operational state
Single Flash	Safe-operational state
ON	Operational state

ERR LED	Status
Red OFF	NO Error
Blinking	General Error
Single Flash	Sync Error
Double Flash	Watchdog Error

LED Codes

Code	Color	Meaning
MOTOR DISABLED	RD=Red	Solid Green
MOTOR ENABLED	GR=Green	MOTOR-GR
OVER CURRENT	1GR+1RD	
SUPPLY VOLTAGE HIGH	1GR+2RD	
INTERNAL VOLTAGE ERROR	1GR+3RD	

Input interface

Input 1	IN1+ / IN1-	Differential input signal	
Input 2	IN2+ / IN2-	5V level input	
Input 3	IN3	Single-ended common anode input	
Input 4	IN4		
Input 5	IN5		
Input 6	IN6	COM+	24V common input

Internal power output interface

+5V	Internal 5V power output
GND	Supply current 80mA

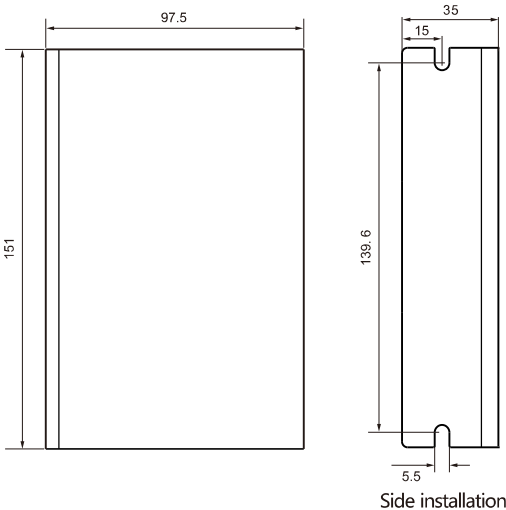
Output interface

Output 1	OUT1	Single-ended common cathode output
Output 2	OUT2	Common output

Motor interface

A+	A-	B+	B-
Phase A winding		Phase B winding	

Installation size



Main parameters and address

Index	Name	Flags	Value
2000	Peak Current	RW P	0x0BB8 (3000)
2001	Motor Resolution	RW P	0x2710 (10000)
2002	Idle Time	RW P	0x03E8 (1000)
2003	Idle Current Percentage	RW P	0x0032 (50)
2005:0	Outputs Function	RW P	> 2 <
2006	Outputs Polarity	RW P	0x0003 (3)
2007:0	Inputs Function	RW P	> 6 <
2008	Inputs Polarity	RW P	0x003F (63)
2009	Filter Time	RW P	0x6400 (25600)
200A	Soft lock Time	RW P	0x03E8 (1000)
200B:0	Current loop parameters	RW P	> 4 <
200B:01	AutoPI enable	RW P	0x0001 (1)
200B:02	iloop_Kp	RW P	0x03E8 (1000)
200B:03	iloop_Ki	RW P	0x00C8 (200)
200B:04	iloop_Kc	RW P	0x0100 (256)
200C:0	Motor parameters	RW P	> 6 <
200D	Invert motor direction	RW P	0x0000 (0)
200E	Alarm Code	RO P	0x0000 (0)
200F	Status Code	RO P	0x0000 (0)
2010	Zero Position	RW P	0x0000 (0)
2011	Control mode	RW P	0x0000 (0)
2020	Encoder Resolution	RW P	0x0FA0 (4000)
2021	Encoder Counter in one rev	RO P	0x0000 (0)

ECT60

The EtherCAT fieldbus closed loop stepper driver ECT60 is based on the CoE standard framework and complies with the CiA402 standard. The data transmission rate can reach 100Mb/s, and supports linear, ring and other network topologies.

ECT60 matches closed loop stepper motors base below 60mm

- Control mode: PP, PV, CSP, HM, etc.
- Power supply voltage: 24-80V DC
- Input and output: 4 channels 24V common anode input; 2 channels optocoupler isolated output
- Typical applications: assembly lines, lithium battery equipment, solar equipment, 3C electronic equipment, etc.



Driver function description

Working status LED indication-PWR/ALM

LED status	Driver status
Green indicator is on for a long time	Driver not enabled
Green indicator is flickering	The driver is working normally
One green indicator and one red indicator	Driver overcurrent
One green indicator and two red indicators	Driver input power overvoltage
One green indicator and three red indicators	Driver internal voltage error
One green indicator and four red indicators	Tracking error exceeds limits
One green indicator and six red indicators	Parameter check error
One green indicator and seven red indicators	Motor phase failure alarm

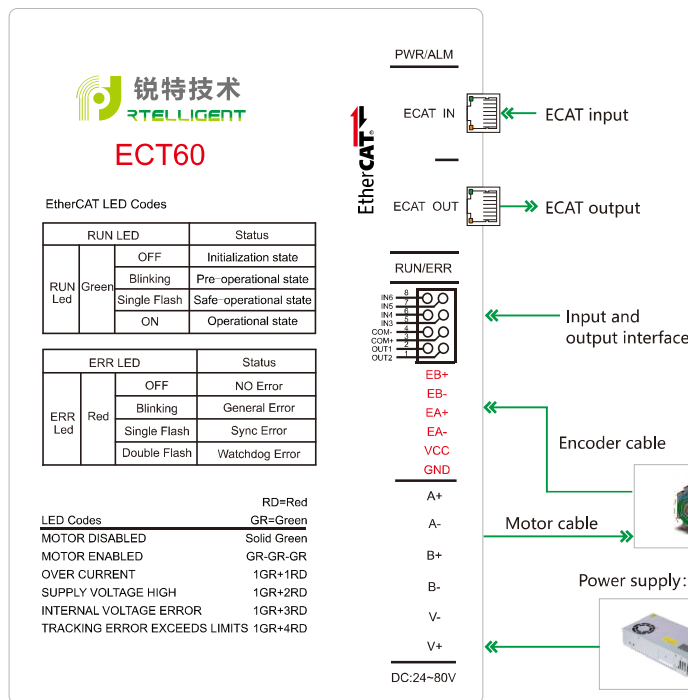
Communication status LED indication-RUN/ERR

LED status	Communication status
RUN GREEN ● Not bright	Initialization
● Slow flash	Pre-operational
● Single flash	Safe-operational
● Constant bright	Operational
ERR RED ● Not bright	No error
● Slow flash	General error
● Single flash	Sync error
● Double flash	Watchdog error

Slow flash: on for 200ms, off for 200ms; repeat
 Single flash: on for 200ms, off for 1s; repeat
 Double flash: on for 200ms, off for 200ms, then on for 200ms, off for 1s; repeat

Power supply interface

V-	Power positive	24-80VDC
V+	Power negative	Power over 150W



Encoder interface

EB+		
EB-		
EA+		Encoder phase A/B signal
EA-		
VCC		Encoder 5V power supply Provided internally by the driver
GND		

Input interface

Input 3	IN3	
Input 4	IN4	Single-ended common anode input
Input 5	IN5	
Input 6	IN6	
COM+		24V common input

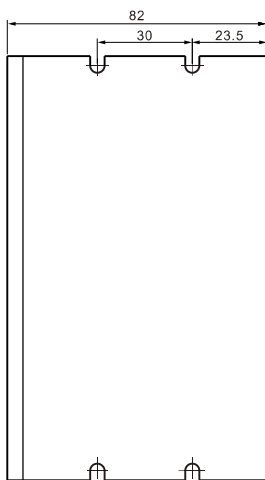
Output interface

Output 1	OUT1	Single-ended common cathode output
Output 2	OUT2	
COM-		Common output

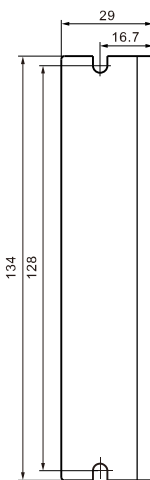
Motor interface

A+		Closed loop motor cable phase sequence fixed
A-		
B+		Need to connect according to the motor identification
B-		

Installation size



Front installation



Side installation

Main parameters and address

Index	Name	Flags	Value
200D	Invert motor direction	RW P	0x0000 (0)
200E	Alarm Code	RO P	0x0000 (0)
200F	Status Code	RO P	0x0084 (132)
2010	Zero Position	RW P	0x0000 (0)
2011	Control mode	RW P	0x0000 (0)
2020	Encoder Resolution	RW P	0x0FA0 (4000)
2021	Encoder Counter in one rev	RO P	0x0000 (0)
2022	Position Trae Error Limit	RW P	0x00000FA0 (4000)
2023:0	Position loop parameters	RW P	> 5 <
2024:0	InPosition parameters	RW P	> 3 <
2025:0	Servo Filters	RW P	> 3 <
2025:01	FV1_HZ	RW P	0x00C8 (200)
2025:02	FV2_HZ	RW P	0x0258 (600)
2025:03	FPOUT_HZ	RW P	0x07D0 (2000)
2026:0	Servo mode2 parameters	RW P	> 5 <
2026:01	PVIA_Kp	RW P	0x07D0 (2000)
2026:02	PVIA_Ki	RW P	0x03E8 (1000)
2026:03	PVIA_Kv1	RW P	0x00C8 (200)
2026:04	PVIA_Kv2	RW P	0x0190 (400)
2026:05	PVIA_Kvff	RW P	0x0000 (0)
2043	Speed Reference	RO P	0
2044	Speed Feedback	RO P	0
2048	Bus Voltage	RO P	0x60D1 (24785)

ECT86

The EtherCAT fieldbus closed loop stepper driver ECT86 is based on the CoE standard framework and complies with the CiA402 standard. The data transmission rate can reach 100Mb/s, and supports linear, ring and other network topologies.

ECT86 matches closed loop stepper motors base below 86mm

- Control mode: PP, PV, CSP, HM, etc.
- Power supply voltage: 24-100V DC/18-80V AC
- Input and output: 4 channels 24V common anode input; 2 channels optocoupler isolated output
- Typical applications: assembly lines, lithium battery equipment, solar equipment, 3C electronic equipment, etc.



Driver function description

Working status LED indication-PWR/ALM

LED status	Driver status
Green indicator is on for a long time	Driver not enabled
Green indicator is flickering	The driver is working normally
One green indicator and one red indicator	Driver overcurrent
One green indicator and two red indicators	Driver input power overvoltage
One green indicator and three red indicators	Driver internal voltage error
One green indicator and four red indicators	Tracking error exceeds limits
One green indicator and six red indicators	Parameter check error
One green indicator and seven red indicators	Motor phase failure alarm

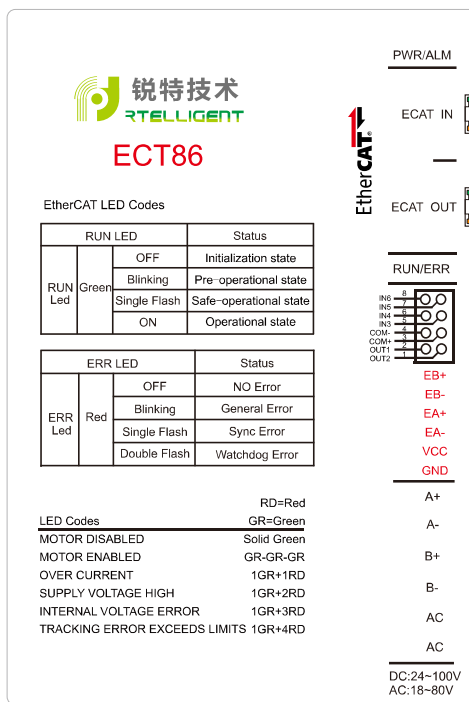
Communication status LED indication-RUN/ERR

LED status	Communication status
RUN GREEN ● Not bright	Initialization
● Slow flash	Pre-operational
● Single flash	Safe-operational
● Constant bright	Operational
ERR RED ● Not bright	No error
● Slow flash	General error
● Single flash	Sync error
● Double flash	Watchdog error

Slow flash: on for 200ms, off for 200ms; repeat
 Single flash: on for 200ms, off for 1s; repeat
 Double flash: on for 200ms, off for 200ms, then on for 200ms, off for 1s; repeat

Power supply interface

AC	24-100VDC/18-80VAC
AC	Power over 150W



Encoder interface

EB+	Encoder phase A/B signal
EB-	
EA+	
EA-	
VCC	Encoder 5V power supply
GND	Provided internally by the driver

Input interface

Input 3	IN3	
Input 4	IN4	Single-ended common anode input
Input 5	IN5	
Input 6	IN6	
COM+	24V common input	

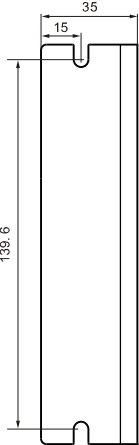
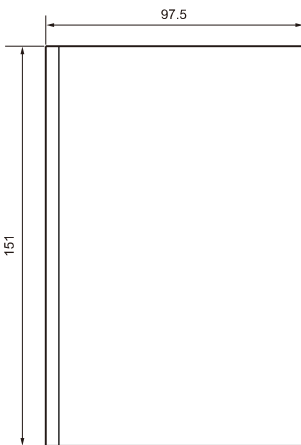
Output interface

Output 1	OUT1	Single-ended common cathode output
Output 2	OUT2	
COM-	Common output	

Motor interface

A+	Closed loop motor cable phase sequence fixed
A-	
B+	Need to connect according to the motor identification
B-	

Installation size



Side installation

Main parameters and address

Index	Name	Flags	Value
200D	Invert motor direction	RW P	0x0000 (0)
200E	Alarm Code	RO P	0x0000 (0)
200F	Status Code	RO P	0x0084 (132)
2010	Zero Position	RW P	0x0000 (0)
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2026:03	PVIA_Kv1	RW P	0x00C8 (200)
2026:04	PVIA_Kv2	RW P	0x0190 (400)
2026:05	PVIA_Kvff	RW P	0x0000 (0)
2043	Speed Reference	RO P	0
2044	Speed Feedback	RO P	0
2048	Bus Voltage	RO P	0x60D1 (24785)