

CL86-C/OL86-C  
CANopen Bus-Type Step Drive

User Manual

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## Chapter I Product Introduction

### 1.1 Product Introduction

Each step drive of this series is manufactured based on a new generation 32-bit DSP technology, which is provided with the CANopen bus control function, supports the CIA301 protocol and CIA402.V2 sub-protocol and can carry up to 32 axes for multi-axis high-speed bus synchronization control. The drive supports the position mode, speed mode and homing mode. The standardized protocols make the entire control system more stable and reliable. The simple on-site wiring can help to effectively avoid the pulse loss problem of traditional drives under interference.

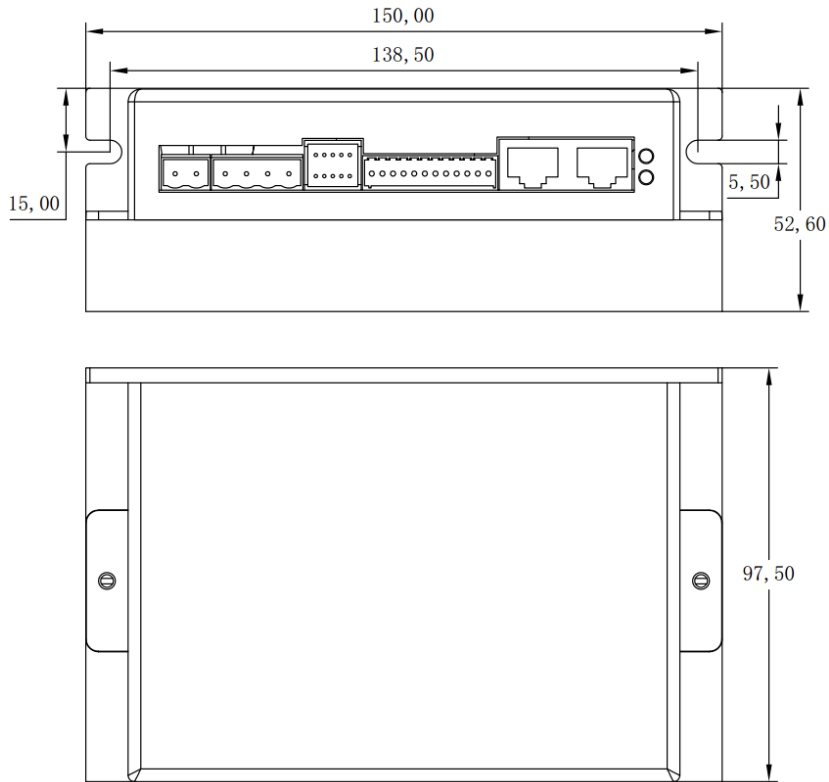
### 1.2 Communication specifications

Communication specifications	Physical layer	Meeting the ISO 11898-2 physical layer standard
	Communication connector	RJ45 ×2
	Network architecture	Serial connection
	Transmission rate	2 x 1 Mbps (half-duplex)
	Application layer protocol	CiA301 protocol and CiA402 sub-protocol
	Number of slave stations	Max.: 32 axes
	Communication object	SDO: aperiodic data object PDO: periodic data object EMCY: emergency object
	Supported control modes	Profile Position Mode Profile Velocity Mode Homing Mode

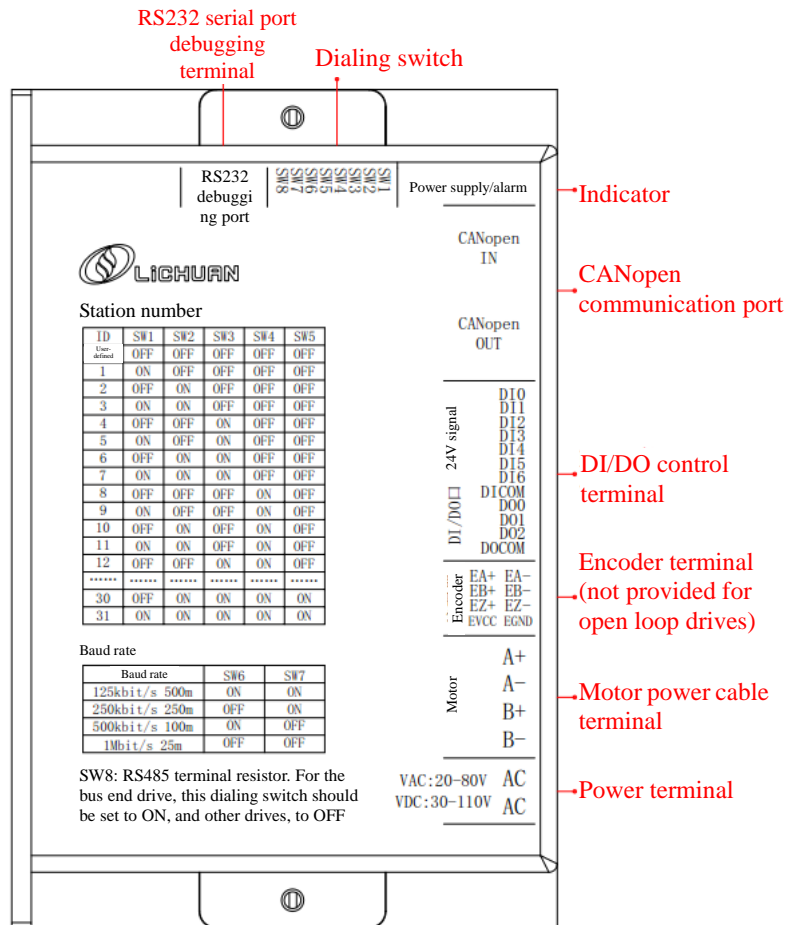
### 1.3 Product specifications

Drive model Parameter	CL86-C	OL86-C
Matched motor	60/86	
Supply voltage	18~80VAC 36~110VDC	
Maximum output current	8A	
DI port input current	10~50mA	
DI port input voltage	24V DC	
Encoder	1000-line incremental	N/A
Serial port debugging	RS232 interface	
Insulation resistance	100MΩ	
Operating environment	Temp.: 0 °C~ 45°C. Humidity: ≤ 90% RH, without condensation. Altitude: ≤1000m. Installation environment: without corrosive and flammable gases, without oil mist or dust, etc. Vibration: < 0.5G (4.9m/s <sup>2</sup> ), 10~60 Hz (non-continuous operation).	
Storage environment	-20~65°C (without frost), < 90% RH (without condensation)	
Drive size	150*97.5*52.6	
Drive weight		

### 1.4 Drive mounting dimensions



### 1.5 Description of each drive part

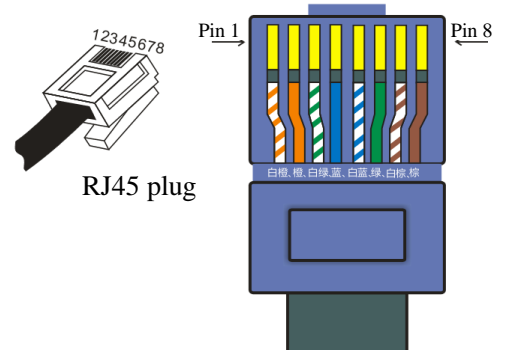


## Chapter II Drive Port and Wiring

### 2.1 Definition of drive port

#### 2.1.1 CANopen communication port

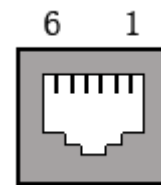
Pin	Network cable color	Signal definition
1	White/orange	CAN+
2	Orange	CAN-
3	White/green	GND
4	Blue	NC
5	White/blue	NC
6	Green	NC
7	White/brown	NC
8	Brown	NC



Registered jack pin order

#### 2.1.2 RS232 communication port

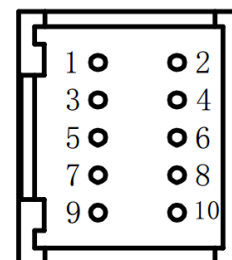
Pin	Signal definition	Description
1	GND	Signal ground
2	GND	Signal ground
3	TXD	Communication transmitting
4	RXD	Communication receiving
5	GND	Signal ground
6	GND	Signal ground



RS232 debugging port

#### 2.1.3 Encoder port

Pin	Definition	Description
1	EA+	Positive / negative terminal of encoder A-phase
2	EA-	
3	EB+	Positive / negative terminal of encoder B-phase
4	EB-	
5	EZ+	Positive / negative terminal of encoder Z-phase
6	EZ-	
7	EVCC	Positive terminal of encoder power supply (5V)
8	EGND	Negative terminal of encoder power supply (5V)
9	NC	Not connected
10	NC	Not connected



Encoder wire terminal

**2.1.4 Motor power line port**

Pin	Definition	Description
1	A+	Motor A phase coil
2	A-	
3	B+	Motor B phase coil
4	B-	

**2.1.5 Power supply port**

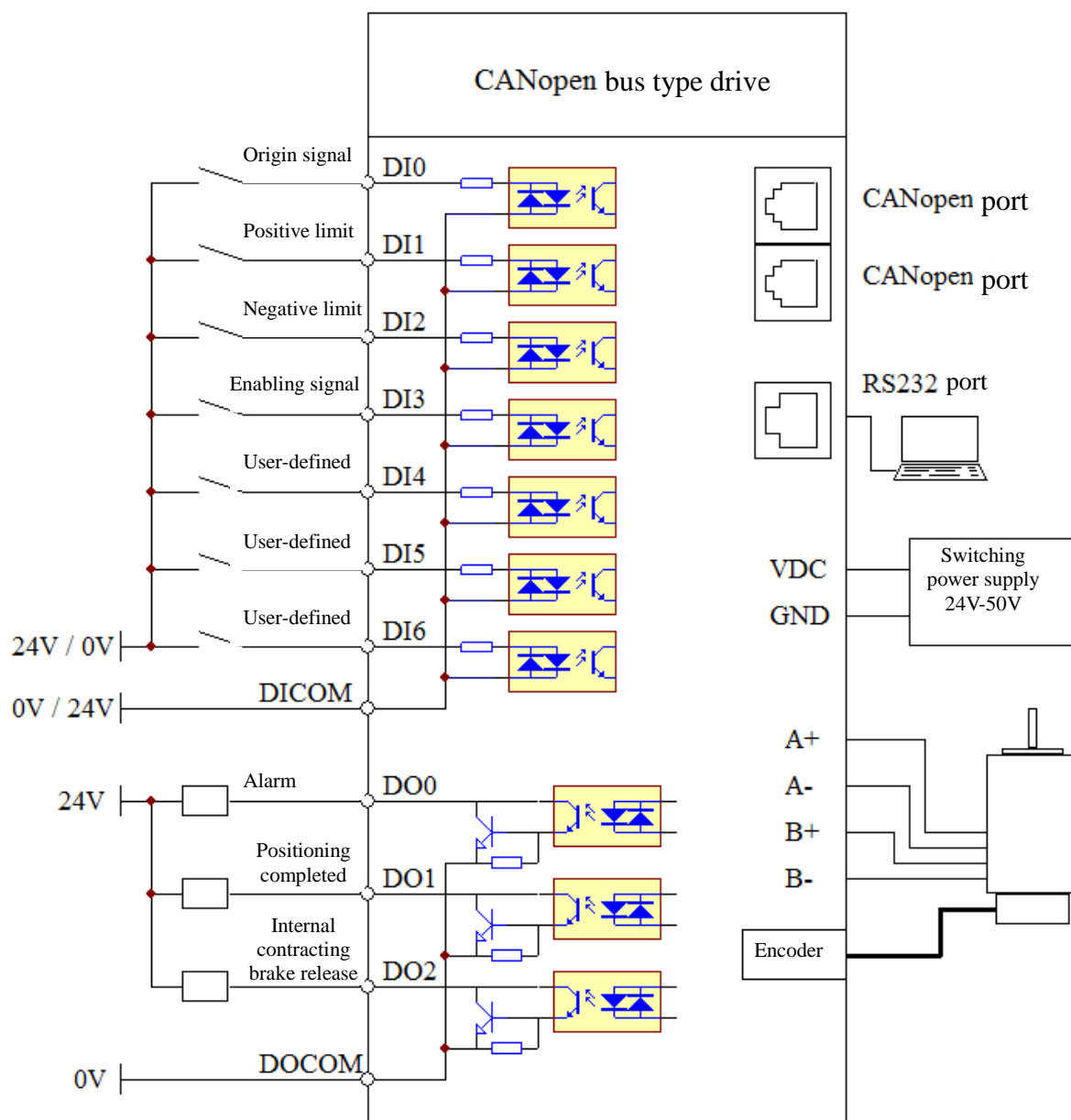
Pin	Definition	Description
1	VDC	Positive terminal of DC power supply (24V-50V)
2	GND	Negative terminal of DC power supply

**2.1.6 DI/DO port**

Pin	Definition	Description
1	DI0	Single-end input port; Effective operating voltage 24V
2	DI1	
3	DI2	
4	DI3	
5	DI4	
6	DI5	
7	DI6	
8	DICOM	Common terminal of input port; Compatible for common anode/common cathode connection
9	DO0	Single-end output port
10	DO1	
11	DO2	
12	DOCOM	Common terminal of output port; Only connecting to the negative terminal of the power supply is allowed

## 2.2 Wiring

### 2.2.1 Drive wiring diagram



- Note: 1. The DI input voltage is 24V. If the voltage exceeds 24V, a current limiting resistor shall be used;
2. The wiring of the DI input port supports common anode/common cathode connection. When DICOM is 24V, the connection of the DI port to 0V is effective, and when DICOM is 0V, the connection of the DI port to 24V is effective.
3. The common terminal DOCOM of the DO port is only allowed to be connected to 0V rather than 24V.

## 2.2.2 Description of DI/DO interface

Each drive of this series has 7 programmable input interfaces and 3 programmable output interfaces. The corresponding functions of each DI/DO can be configured through the CANopen bus or the upper computer debugging software. The relevant configuration parameters are shown in the following table:

No.	MODBUS address (decimal)	Index No.	Subindex	Description	Default value
PA_020	32	2400	01	Effective level of DI terminal	0
PA_021	33	2400	02	DI0 terminal function selection	1
PA_022	34	2400	03	DI1 terminal function selection	2
PA_023	35	2400	04	DI2 terminal function selection	3
PA_024	36	2400	05	DI3 terminal function selection	0
PA_025	37	2400	06	DI4 terminal function selection	0
PA_026	38	2400	07	DI5 terminal function selection	0
PA_027	39	2400	08	DI6 terminal function selection	0
PA_02A	42	2400	0A	DI terminal filtering coefficient	0
PA_02B	43	2400	0B	Effective level of DO terminal	0
PA_02C	44	2400	0C	DO0 terminal function selection	1
PA_02D	45	2400	0D	DO1 terminal function selection	0
PA_02E	46	2400	0E	DO2 terminal function selection	0
PA_030	48	2401	00	DI0 filtering coefficient	2
PA_031	49	2402	00	DI1 filtering coefficient	2
PA_032	50	2403	00	DI2 filtering coefficient	2
PA_033	51	2404	00	DI3 filtering coefficient	2
PA_034	52	2405	00	DI4 filtering coefficient	2
PA_035	53	2406	00	DI5 filtering coefficient	2
PA_036	54	2407	00	DI6 filtering coefficient	2

Function command table of DI port:

Command value	Function description	Command value	Function description
0	Undefined	7	User Definition 0
1	Origin signal	8	User Definition 1
2	Positive limit signal	9	User Definition 2
3	Negative limit signal	10	User Definition 3
4	Motor enabling signal	11	User Definition 4
5	Signal stop	12	User Definition 5
6	Emergency stop signal	13	User Definition 6

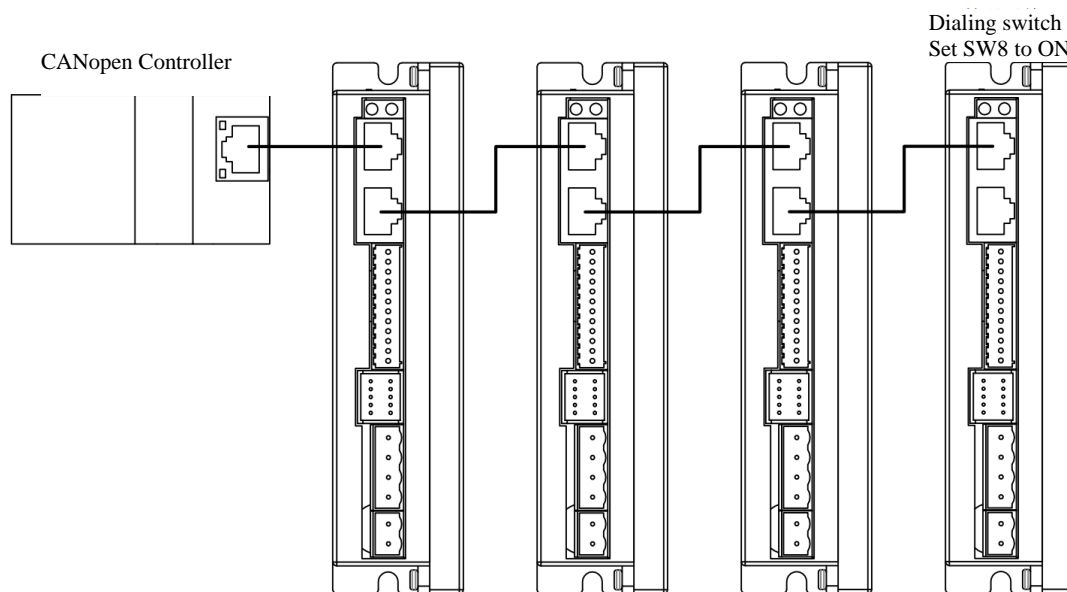
Function command table of DO port:

Command value	Function description	Command value	Function description
0	Undefined	5	Release signal of internal contracting brake
1	Alarm signal	9	User Definition 0
2	Motor running signal	10	User Definition 1
3	Homing completion signal	11	User Definition 2
4	In-place signal		



### 2.2.3 Description of CANopen installation and wiring

Each CANopen bus drive of this series has 2 standard RJ45 network interfaces, in which Pins 1 and 2 correspond to CAN\_H and CAN\_L signal wires, respectively, and Pin 3, to GND. It is recommended to use a shielded twisted-pair or network cable as the transmission medium for communication. All nodes shall be directly connected to this pair of public transmission medium and arranged in parallel for receiving or sending data information. For the drive at the end of the bus, the dial switch SW8 shall be set to ON, indicating that a terminating resistance shall be connected for termination in order to prevent the signal sent by the node on the network from being reflected when reaching the end of the cable.



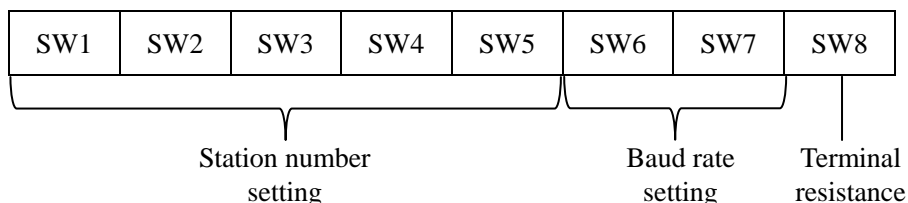
Wiring diagram

For common wiring lengths, see the following table:

Baud rate	Recommended max. length
1Mbps	25m
500Kbps	100m
250Kbps	250m
125Kbps	500m

### 2.2.4 Setting of dial switch

Each CANopen bus drive of this series has 8 dial switch bits for setting the CANopen station number, communication baud rate, and terminal resistance. The distribution is shown in the following figure:



Baud rate setting:

Baud rate	SW6	SW7
125Kbps	ON	ON
250Kbps	OFF	ON
500Kbps	ON	OFF
1Mbps	OFF	OFF

Drive station number setting:

Station number	SW1	SW2	SW3	SW4	SW5	Station number	SW1	SW2	SW3	SW4	SW5
User-defined	OFF	OFF	OFF	OFF	OFF	16	OFF	OFF	OFF	OFF	ON
1	ON	OFF	OFF	OFF	OFF	17	ON	OFF	OFF	OFF	ON
2	OFF	ON	OFF	OFF	OFF	18	OFF	ON	OFF	OFF	ON
3	ON	ON	OFF	OFF	OFF	19	ON	ON	OFF	OFF	ON
4	OFF	OFF	ON	OFF	OFF	20	OFF	OFF	ON	OFF	ON
5	ON	OFF	ON	OFF	OFF	21	ON	OFF	ON	OFF	ON
6	OFF	ON	ON	OFF	OFF	22	OFF	ON	ON	OFF	ON
7	ON	ON	ON	OFF	OFF	23	ON	ON	ON	OFF	ON
8	OFF	OFF	OFF	ON	OFF	24	OFF	OFF	OFF	ON	ON
9	ON	OFF	OFF	ON	OFF	25	ON	OFF	OFF	ON	ON
10	OFF	ON	OFF	ON	OFF	26	OFF	ON	OFF	ON	ON
11	ON	ON	OFF	ON	OFF	27	ON	ON	OFF	ON	ON
12	OFF	OFF	ON	ON	OFF	28	OFF	OFF	ON	ON	ON
13	ON	OFF	ON	ON	OFF	29	ON	OFF	ON	ON	ON
14	OFF	ON	ON	ON	OFF	30	OFF	ON	ON	ON	ON
15	ON	ON	ON	ON	OFF	31	ON	ON	ON	ON	ON

Terminal resistance setting

When SW8 is set to ON, a terminal resistance of 120Ω will be connected between the signal wires to prevent the signal sent by the node on the network from reflecting when reaching the end of the cable.

## Chapter III Description of Communication Control

### 3.1 Control mode

Each drive of this series supports 3 control modes, which can be set through Object 6060h. The current control mode the drive can be monitored through Object 6061h.

Index	Subindex	Name	Parameter value	Data Type	Property
6060h	00	Operating mode	0: Undefined 1: Position mode 3: Velocity mode 6: Homing mode	INTEGER8	RW

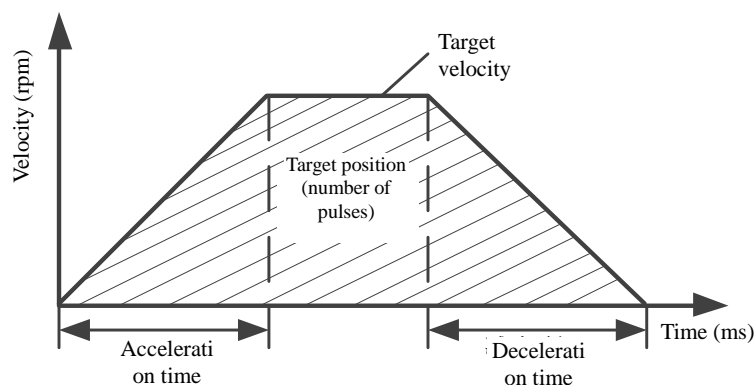
### 3.2 Profile position mode

#### 3.2.1 Related parameters

Index	Subindex	Name	Setting range	Data Type	Property
6040h	00	Control command word	0 ~ 65535	UNSIGNED16	RW
6060h	00	Operating mode setting	0,1,3,6	INTEGER8	RW
607Ah	00	Target position	-1000000 ~ +1000000	INTEGER32	RW
6081h	00	Target velocity (rpm)	0 ~ 3000	UNSIGNED32	RW
6083h	00	Acceleration time (ms)	0 ~ 2000	UNSIGNED32	RW
6084h	00	Deceleration time (ms)	0 ~ 2000	UNSIGNED32	RW
2201h	00	Subdivision	0 ~ 65535	UNSIGNED16	RW
6041h	00	Status word		UNSIGNED16	RO
6061h	00	Operating mode monitoring		INTEGER8	RO
6064h	00	Current position		INTEGER32	RO

#### 3.2.2 Description of position mode

The motion parameters can be given by the CANopen bus position mode through the master station, which are: target position (607Ah-00), target velocity (6081h-00), acceleration time (6083h-00), deceleration time (6084h-00), and then the motion path can be established by the drive according to these parameters to achieve accurate position control. The motion curve is shown in the following figure:



### 3.2.3 Description of control steps

1. First, set the operating mode (6060h-00) to 1, and then set the monitoring operating mode (6061h-00) to 1, indicating that it is in the position mode;
2. Write 6, 7 and 15 into the control word in turn at an interval of about 10ms. After writing, the motor can be enabled;
3. Write the motion parameters into the target position (607Ah-00), target velocity (6081h-00), acceleration time (6083h-00) and deceleration time (6084h-00);
4. Enable motor running through Bit4-Bit6 of the control word (6040h-00). See the following for the description of the control word:

Control bit of the command word	Function description
Bit4	1: Enabling a new target position (rising edge triggered)
Bit5	0: Updating motion parameters after completing the current position curve; 1: Updating motion parameters immediately.
Bit6	0: Absolute positioning mode; 1: Relative positioning mode.

Table of control word values:

Command word (6040h-00) setting value (decimal)	Description
6->7->15	Yes
15->31	Enabling absolute positioning
15->95	Enabling relative positioning
15->63	Performing absolute positioning immediately according to the new motion parameters.
15->127	Performing relative positioning immediately according to the new motion parameters.
15->11	Emergency stop

5. The current status of the drive can be monitored through the status word (6041h-00), see the following table:

Corresponding bits of the status word	Description
Bit0~Bit2	When 6040=0, the corresponding bit of 6041 is 000 When 6040=6, the corresponding bit of 6041 is 001 When 6040=7, the corresponding bit of 6041 is 011 When 6040=15, the corresponding bit of 6041 is 111
Bit7	0: Drive ready 1: Drive alarm
Bit8	0: Homing not completed 1: Homing completed
Bit10	0: Motor in operating 1: Motor velocity: 0
Bit12	0: Target position to be effective 1: Target position, effective
Bit15	0: Position mode not in place 1: Position mode positioning completed

### 3.3 Profile velocity mode

#### 3.3.1 Related parameters

Index	Subindex	Name	Setting range	Data Type	Property
6040h	00	Control command word	0 ~ 65535	UNSIGNED16	RW
6060h	00	Operating mode setting	0,1,3,6	INTEGER8	RW
60FFh	00	Target velocity (rpm)	0 ~ 3000	UNSIGNED32	RW
6083h	00	Acceleration time (ms)	0 ~ 2000	UNSIGNED32	RW
6084h	00	Deceleration time (ms)	0 ~ 2000	UNSIGNED32	RW
6041h	00	Status word		UNSIGNED16	RO
6061h	00	Operating mode monitoring		INTEGER8	RO

#### 3.3.2 Description of control steps

1. First, set the operating mode (6060h-00) to 3, and then set the monitoring operating mode (6061h-00) to 3, indicating that it is in the velocity mode;
2. Write 6, 7 and 15 into the control word in turn at an interval of about 10ms. After writing, the motor can be enabled;
3. Write the motion parameters into the target velocity (60FFh-00), acceleration time (6083h-00) and deceleration time (6084h-00);
4. Enable motor running through Bit4-Bit6 of the control word (6040h-00). See Section 3.1.2:

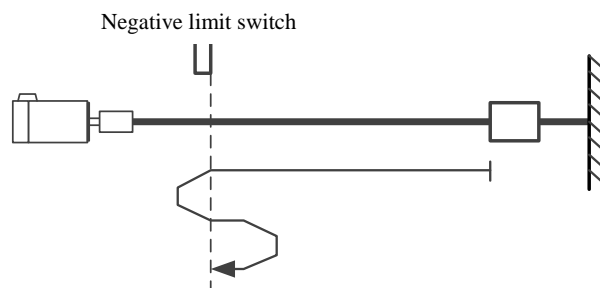
### 3.4 Homing mode

#### 3.4.1 Related parameters

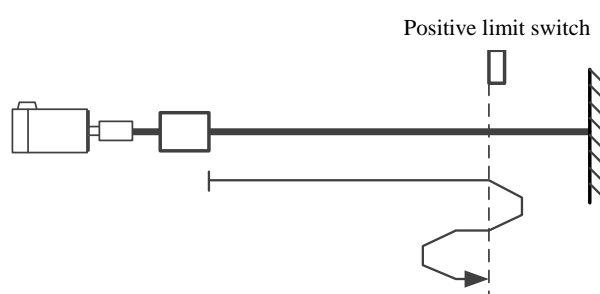
Index	Subindex	Name	Setting range	Data Type	Property
6040h	00	Control command word	0 ~ 65535	UNSIGNED16	RW
6060h	00	Operating mode setting	0,1,3,6	INTEGER8	RW
6098h	00	Homing mode	17: Negative limit mode; 18: Positive limit mode; 24: Positive origin mode; 29: Negative origin mode;	UNSIGNED8	RW
6099h	01	Homing velocity (rpm)	0 ~ 3000	UNSIGNED32	RW
6099h	02	Homing creep time (rpm)	0 ~ 3000	UNSIGNED32	RW
609Ah	00	Acceleration / deceleration time (ms)	0 ~ 2000	UNSIGNED32	RW
607Ch	00	Homing offset	-1000000 ~ +1000000	INTEGER32	RW
6041h	00	Status word		UNSIGNED16	RO
6061h	00	Operating mode monitoring		INTEGER8	RO

#### 3.4.2 Description of homing mode

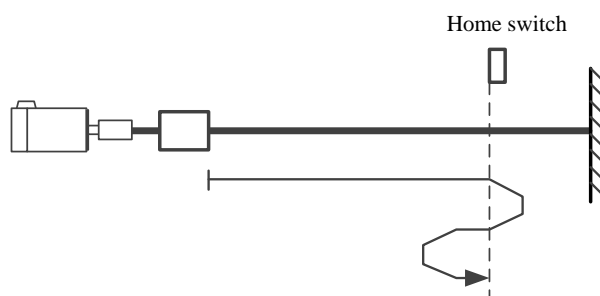
1. **Negative limit mode** (6098h=17): After homing is allowed, the motor will run in the negative direction at the homing velocity (6099h-01). It will decelerate and stop when the negative limit switch is sensed, then it will run in the positive direction at the homing velocity (6099h-01) for a certain distance and decelerate and stop. Then it will run in the negative direction at a homing creep velocity (6099h-02). When the negative limit switch is sensed, the motor will stop, indicating that the homing operation is completed.



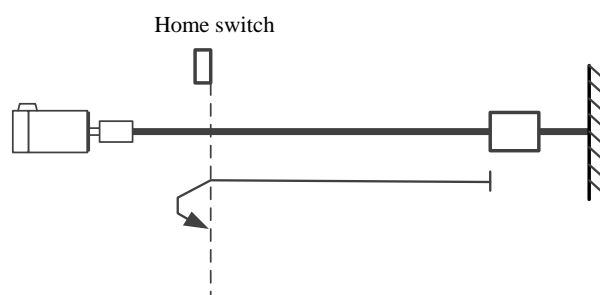
**2. Positive limit mode** (6098h=18): After homing is allowed, the motor will run in the positive direction at the homing velocity (6099h-01). It will decelerate and stop when the positive limit switch is sensed, then it will run in the negative direction at the homing velocity (6099h-01) for a certain distance and decelerate and stop. Then it will run in the positive direction at a homing creep velocity (6099h-02). When the positive limit switch is sensed, the motor will stop, indicating that the homing operation is completed.



**3. Positive origin mode** (6098h=24): After homing is allowed, the motor will run in the positive direction at the homing velocity (6099h-01). It will decelerate and stop when the origin switch is sensed, then it will run in the negative direction at the homing velocity (6099h-01) for a certain distance and decelerate and stop. Then it will run in the positive direction at a homing creep velocity (6099h-02). When the origin switch is sensed, the motor will stop, indicating that the homing operation is completed.



**4. Negative origin mode** (6098h=29): After homing is allowed, the motor will run in the negative direction at the homing velocity (6099h-01). It will decelerate and stop when the origin switch is sensed. Then it will run in the positive direction at a homing creep velocity (6099h-02). When leaving the origin switch is sensed, the motor will stop, indicating that the homing operation is completed.



### 3.4.3 Description of control steps

1. First, set the operating mode (6060h-00) to 6, and then set the monitoring operating mode (6061h-00) to 6, indicating that it is in the homing mode;
2. Write 6, 7 and 15 into the control word in turn at an interval of about 10ms. After writing, the motor can be enabled;
3. Write the homing parameters into the homing mode (6098h-00), homing velocity (6099h-01), homing creep velocity (6099h-02), acceleration / deceleration time (609Ah-00);
4. Enable homing through Bit4 of the control word (6040h-00). See the following:

Control bit of the command word	Function description
Bit4	0->1: Starting homing; 1->0: Stopping homing;

5. The current status of the drive can be monitored through the status word (6041h-00), see the following table:

Corresponding bits of the status word	Name	Description
Bit8	Homing status	0: Homing not completed 1: Homing completed
Bit10	Motion status	0: Motor in operating 1: Motor velocity: 0

## 3.5 Other common functions

### 3.5.1 Clearing current position

When the value in Index 2302h-00 changes from 0 to 1, the current position value will be cleared to zero, which should be manually set to 0. This operation can be performed through the SDO-command.

### 3.5.2 Saving parameters

When 2 is written into Index 2300h-00 through SDO, the current parameters of the drive will be saved. This operation is often used to save parameters such as homing velocity, acceleration/deceleration and homing mode.

### 3.5.2 Alarm reset

Set Bit7 of Control Word 6040h-00 to 1 to reset the drive alarm. It should be set to 0 manually.

## 3.6 Object dictionary

### 3.6.1 1000h group objects

Index	Subindex	Register address	Item	Description	Property	Data Type
1000	00	0x0200	Device type	This device supports CIA301 and CIA402 protocols	(RO)	U32
1009	00	0x0202	Hardware version	Hardware version	(RO)	U16
100A	00	0x0203	Software version	Software version	(RO)	U16
1600	00	0x0204	Receive PDO 1 Mapping	Receive PDO 1 Mapping	(RW)	U8
	01	0x0205			(RW)	U32
	02	0x0207			(RW)	U32
	03	0x0209			(RW)	U32
	04	0x020B			(RW)	U32

1601	00	0x020D	Receive PDO 2 Mapping	Receive PDO 2 Mapping	(RW)	U8
	01	0x020E			(RW)	U32
	02	0x0210			(RW)	U32
	03	0x0212			(RW)	U32
	04	0x0214			(RW)	U32
1602	00	0x0216	Receive PDO 3 Mapping	Receive PDO 3 Mapping	(RW)	U8
	01	0x0217			(RW)	U32
	02	0x0219			(RW)	U32
	03	0x021B			(RW)	U32
	04	0x021D			(RW)	U32
1603	00	0x021F	Receive PDO 4 Mapping	Receive PDO 4 Mapping	(RW)	U8
	01	0x0220			(RW)	U32
	02	0x0222			(RW)	U32
	03	0x0224			(RW)	U32
	04	0x0226			(RW)	U32
1A00	00	0x0228	Transmit PDO 1 Mapping	Transmit PDO 1 Mapping	(RW)	U8
	01	0x0229			(RW)	U32
	02	0x022B			(RW)	U32
	03	0x022D			(RW)	U32
	04	0x022F			(RW)	U32
1A01	00	0x0231	Transmit PDO 2 Mapping	Transmit PDO 2 Mapping	(RW)	U8
	01	0x0232			(RW)	U32
	02	0x0234			(RW)	U32
	03	0x0236			(RW)	U32
	04	0x0238			(RW)	U32
1A02	00	0x023A	Transmit PDO 3 Mapping	Transmit PDO 3 Mapping	(RW)	U8
	01	0x023B			(RW)	U32
	02	0x023D			(RW)	U32
	03	0x023F			(RW)	U32
	04	0x0241			(RW)	U32
1A03	00	0x0243	Transmit PDO 4 Mapping	Transmit PDO 4 Mapping	(RW)	U8
	01	0x0244			(RW)	U32
	02	0x0246			(RW)	U32
	03	0x0248			(RW)	U32
	04	0x024A			(RW)	U32

### 3.6.2 6000h group objects

Index	Subindex	Register address	Item	Description	Property	Data Type
603F	00	0x024C	Error Code	Error Code Alarm Code FF00~FFFF FF01 refers to overcurrent alarm FF05 refers to too high position deviation	(RW)	U16
6040	00	0x024D	Control word	Control word	(RW)	U16
6041	00	0x024E	Status word	Status word	(RO)	U16
605D	00	0x24F	Halt option code	Halt option code	(RW)	I16
6060	00	0x250	Mode of operation	Mode of operation	(RW)	I8
6061	00	0x251	Mode of operation display	Mode of operation display	(RW)	I8
6064	00	0x252	actual position	actual position	(RO)	I32
606C	00	0x254	Velocity actual value	Velocity actual value	(RO)	I32
607A	00	0x256	Target Position	Target Position	(RW)	I3C
607C	00	0x258	Home offset	Home offset	(RW)	I32
607D	01	0x25A	Min Position Limit	Min Position Limit	(RW)	I32



607D	02	0x25C	Max Position Limit	Max Position Limit	(RW)	I32
6081	00	0x25E	Profile velocity	Profile velocity	(RW)	U32
6083	00	0x260	Profile acceleration	Profile acceleration	(RW)	U32
6084	00	0x262	Profile deceleration	Profile deceleration	(RW)	U32
6098	00	0x264	Homing method	Homing method 17: Negative limit mode; 18: Positive limit mode; 24: Positive origin mode; 29: Negative origin mode;	(RW)	I8
6099	01	0x265	Homing Research speeds	Homing Research speeds for switch	(RW)	U32
6099	02	0x267	Homing Research speeds	Homing Research speeds for zero	(RW)	U32
609A	00	0x269	Homing acceleration	Homing acceleration	(RW)	U32
60FD	00	0x26B	Digital inputs	Digital inputs	(RO)	U32
60FE	01	0x26D	Digital outputs	Physical Outputs	(RW)	U32
60FE	02	0x26F	Digital outputs	Bit mask	(RW)	U32
60FF	00	0x271	Target Velocity	Target Velocity	(RW)	I32

### 3.6.3 Factory defined 2000h parameters

Index	Subindex	Register address	Item	Description	Property	Data Type
<b>Status parameter group (read-only)</b>						
2000	00	0x0000	Drive model	Drive model code	(RO)	U16
2001	00	0x0001	Drive version	Drive version	(RO)	U16
2100	00	0x0005	Motion status bits	Bit0: In place flag bit, 0: Not in place, 1: In place; Bit1: Homing bit, 0: Not completed, 1: Completed; Bit2: Motor running bit, 0: Sleep, 1: Running; Bit3: Alarm bit, 0: Normal, 1: Alarm; Bit4: Motor enabling bit, 0: Enable, 1: Release; Bit5: Positive software limit status, 0: Noneffective; 1: Effective; Bit6: Negative software limit status, 0: Noneffective; 1: Effective;	(RO)	U16
2101	00	0x0006	Flag bits of input terminal status	Bit0: Input status of X0 terminal; Bit1: Input status of X1 terminal; Bit2: Input status of X2 terminal; Bit3: Input status of X3 terminal; Bit4: Input status of X4 terminal; Bit5: Input status of X5 terminal; Bit6: Input status of X6 terminal;  0: Noneffective input level; 1: Effective input level;	(RO)	U16
2102	00	0x0007	Flag bits of output terminal status	Bit0: Output status of Y0 terminal; Bit1: Output status of Y1 terminal; Bit2: Output status of Y2 terminal;  0: Noneffective output level; 1: Effective output level;	(RO)	U16

Basic drive control parameter group						
2200	00	0x0010	Default direction	0: Pulse Sign; 1: Pulse /Sign;	(RW)	U16
2201	00	0x0011	Subdivision setting	400~51200	(RW)	U16
2202	00	0x0012	Effective bit of software limit	0: Noneffective; 1: Effective after homing	(RW)	U16
2203	00	0x0013	CAN ID	0~127	(RW)	U16
2300	00	0x0018	Parameter operation	0: Noneffective; 1: Restoring factory settings; 2: Saving current parameters	(RW)	U16
2301	00	0x0019	Alarm reset	0: Noneffective; 1: Effective	(RW)	U16
2302	00	0x001A	Current position clearing	0: Noneffective; 1: Effective	(RW)	U16
Input/output terminal parameter group						
2400	01	0x0020	Effective level of input terminal	Bit0: Input Terminal X0 control bit; Bit1: Input Terminal X1 control bit; Bit2: Input Terminal X2 control bit; Bit3: Input Terminal X3 control bit; Bit4: Input Terminal X4 control bit; Bit5: Input Terminal X5 control bit; Bit6: Input Terminal X6 control bit; 0: Default; 1: Level reversal;	(RW)	U16
2400	02	0x0021	X0 terminal function selection	0: Undefined; 1: Origin signal;	(RW)	U16
2400	03	0x0022	X1 terminal function selection	2: Positive limit signal; 3: Negative limit signal;	(RW)	U16
2400	04	0x0023	X2 terminal function selection	4: Motor MF signal; 5: Stop signal;	(RW)	U16
2400	05	0x0024	X3 terminal function selection	6: Emergency stop signal; 7: User Definition 0;	(RW)	U16
2400	06	0x0025	X4 terminal function selection	8: User Definition 1; 9: User Definition 2;	(RW)	U16
2400	07	0x0026	X5 terminal function selection	10: User Definition 3; 11: User Definition 4;	(RW)	U16
2400	08	0x0027	X6 terminal function selection	12: User Definition 5; 13: User Definition 6;	(RW)	U16
2400	0A	0x002A	Input terminal filtering coefficient	Input terminal filtering coefficient	(RW)	U16
2400	0B	0x002B	Effective level of output terminal	Bit0: Output Terminal Y0 control bit; Bit1: Output Terminal Y1 control bit; 0: Default; 1: Level reversal;	(RW)	U16
2400	0C	0x002C	Y0 terminal function selection	0: Undefined 1: Alarm signal;	(RW)	U16
2400	0D	0x002D	Y1 terminal function selection	2: Homing completion signal; 3: Drive status signal; 4: In place signal;	(RW)	U16
2400	0E	0x002E	Y2 terminal function selection	5: Internal contracting brake signal; 9: User Definition 0; 10: User Definition 1; 11: User Definition 2;	(RW)	U16
2401	00	0x0030	X0 filtering coefficient	X0 filtering coefficient	(RW)	U16
2402	00	0x0031	X1 filtering coefficient	X1 filtering coefficient	(RW)	U16

2403	00	0x0032	X2 filtering coefficient	X2 filtering coefficient	(RW)	U16
2404	00	0x0033	X3 filtering coefficient	X3 filtering coefficient	(RW)	U16
2405	00	0x0034	X4 filtering coefficient	X4 filtering coefficient	(RW)	U16
2406	00	0x0035	X5 filtering coefficient	X5 filtering coefficient	(RW)	U16
2407	00	0x0036	X6 filtering coefficient	X6 filtering coefficient	(RW)	U16
<b>Performance parameter group</b>						
2500	00	0x0050	Drive operation mode	0: Noneffective; 1: Open loop mode; 2: Closed loop mode;	(RW)	U16
2501	00	0x0051	Encoder resolution	Encoder resolution	(RW)	U16
2502	00	0x0052	Max. peak current	Unit: mA	(RW)	U16
2503	00	0x0053	Maximum current ratio under closed loop	Unit: %	(RW)	U16
2504	00	0x0054	Basic current ratio under closed loop	Unit: %	(RW)	U16
2505	00	0x0055	Maximum current ratio under open loop	Unit: %	(RW)	U16
2506	00	0x0056	Current ratio for locking	Unit: %	(RW)	U16
2507	00	0x0057	Locking current time	Unit: ms	(RW)	U16
2508	00	0x0058	Low-pass filtering enabling	Factory default setting, adjustment not required generally	(RW)	U16
2509	00	0x0059	Low-pass filtering coefficient	Factory default setting, adjustment not required generally	(RW)	U16
250A	00	0x005A	Out-of-tolerance alarm threshold	Factory default setting, adjustment not required generally	(RW)	U16
250B	00	0x005B	Positioning completion threshold	Factory default setting, adjustment not required generally	(RW)	U16
250C	00	0x005C	Positioning completion time	Factory default setting, adjustment not required generally	(RW)	U16
250D	00	0x005D	Mean filtering coefficient	Factory default setting, adjustment not required generally	(RW)	U16
250E	00	0x005E	Current loop ratio	Factory default setting, adjustment not required generally	(RW)	U16
250F	00	0x005F	Current loop ratio K <sub>p</sub>	Factory default setting, adjustment not required generally	(RW)	U16
2510	00	0x0060	Current loop integral K <sub>i</sub>	Factory default setting, adjustment not required generally	(RW)	U16
2511	00	0x0061	Current loop differential K <sub>c</sub>	Factory default setting, adjustment not required generally	(RW)	U16
2512	00	0x0062	LA Velocity K <sub>p1</sub>	Factory default setting, adjustment not required generally	(RW)	U16
2513	00	0x0063	LA Velocity K <sub>v1</sub>	Factory default setting, adjustment not required generally	(RW)	U16
2514	00	0x0064	Velocity node 1	Factory default setting, adjustment not required generally	(RW)	U16
2515	00	0x0065	LA Velocity K <sub>p2</sub>	Factory default setting, adjustment not required generally	(RW)	U16
2516	00	0x0066	LA Velocity K <sub>v2</sub>	Factory default setting, adjustment not required generally	(RW)	U16

2517	00	0x0067	Velocity node 2	Factory default setting, adjustment not required generally	(RW)	U16
2518	00	0x0068	Velocity feedforward Kvf	Factory default setting, adjustment not required generally	(RW)	U16
2519	00	0x0069	Position loop Ki gain	Factory default setting, adjustment not required generally	(RW)	U16

### 3.7 Alarm processing

The alarm information of this drive series is identified by the number of flashes of the indicator. See the specific alarm information shown in the following table:

Number of indicator flashes	Alarm description	Troubleshooting	Reset
Flashing once every 5 seconds	Overcurrent alarm	<ol style="list-style-type: none"> <li>1. Short circuit of motor power line, check the motor for correct wiring;</li> <li>2. Motor damaged, measure the winding resistance values of Phases A and B of the motor;</li> <li>3. Drive damaged, replace the drive.</li> </ol>	Restart reset
Flashing twice every 5 seconds	Overvoltage alarm	<ol style="list-style-type: none"> <li>1. Too high voltage, measure the power supply voltage or replace the power supply;</li> <li>2. Drive damaged, replace the drive.</li> </ol>	Restart reset
Flashing thrice every 5 seconds	Undervoltage alarm	<ol style="list-style-type: none"> <li>1. Too low voltage, measure the power supply voltage or replace the power supply;</li> <li>2. Drive damaged, replace the drive.</li> </ol>	Restart reset
Flashing four times every 5 seconds	Read/write error of memory	Drive damaged, replace the drive.	Resettable
Flashing five times every 5 seconds	Position out-of-tolerance alarm	<ol style="list-style-type: none"> <li>1. Incorrect phase sequence of motor power line, check the phase sequence;</li> <li>2. Phase loss of motor power line, check the line for being disconnected or loose;</li> <li>3. Encoder disconnected;</li> <li>4. Load blocked;</li> <li>5. Too fast.</li> </ol>	Resettable