TL-C
CANopen Bus Integrated Controller

User Manual

CONTENTS

Chapter I Product Introduction

1.1 Product Overview

This TL-C series stepper drive integrated controller utilize the latest generation of 32-bit DSP technology, integrating CANopen bus control functions. It supports the CiA301 protocol and CiA402.V2 sub-protocol, allowing up to 32 axes to be connected. This enables high-speed bus synchronous control of multiple axes. The drive supports Position Mode, Velocity Mode, and Homing Mode. The standardized protocol enhances the stability and reliability of the entire control system. Additionally, the simplified field wiring effectively prevents pulse loss issues commonly encountered in traditional drives within interference-prone environments.

1.2 Communication Specifications

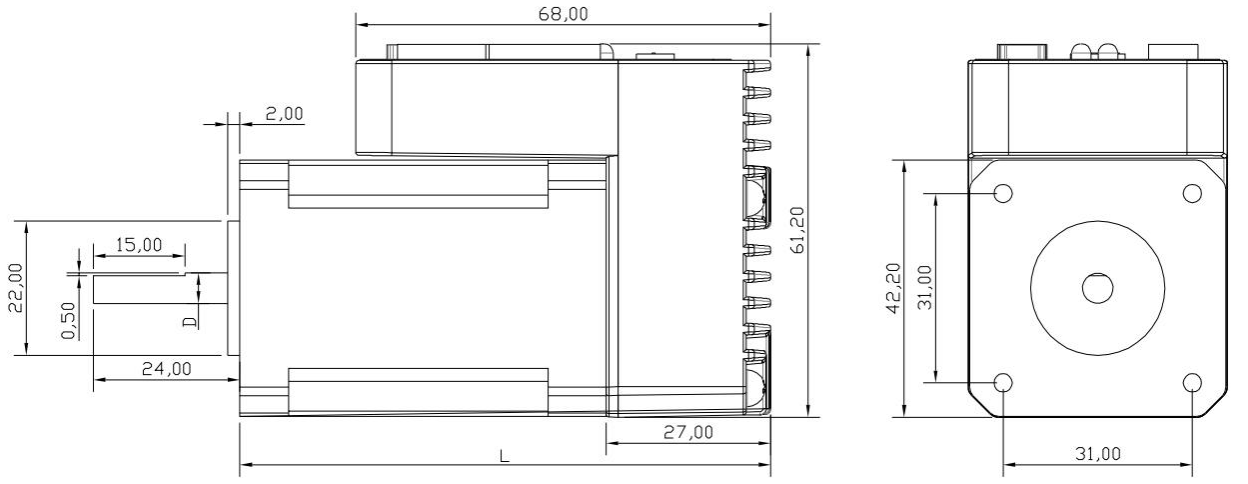
Communication Specifications	Physical Layer	Complies with ISO 11898-2 physical layer standard
	Communication Ports	5P Terminal
	Network Topology	Daisy Chain
	Transmission Speed	2 x 1 Mbps (Half-duplex)
	Application Layer Protocol	CiA301 and CiA402 sub-protocols
	Number of Slave Stations	Up to 32 axes
	Communication Objects	SDO: Service Data Object (Non-cyclic) PDO: Process Data Object (Cyclic) EMCY: Emergency Object
	Supported Control Modes	Profile Position Mode Profile Velocity Mode Homing Mode

1.3 Product Specifications

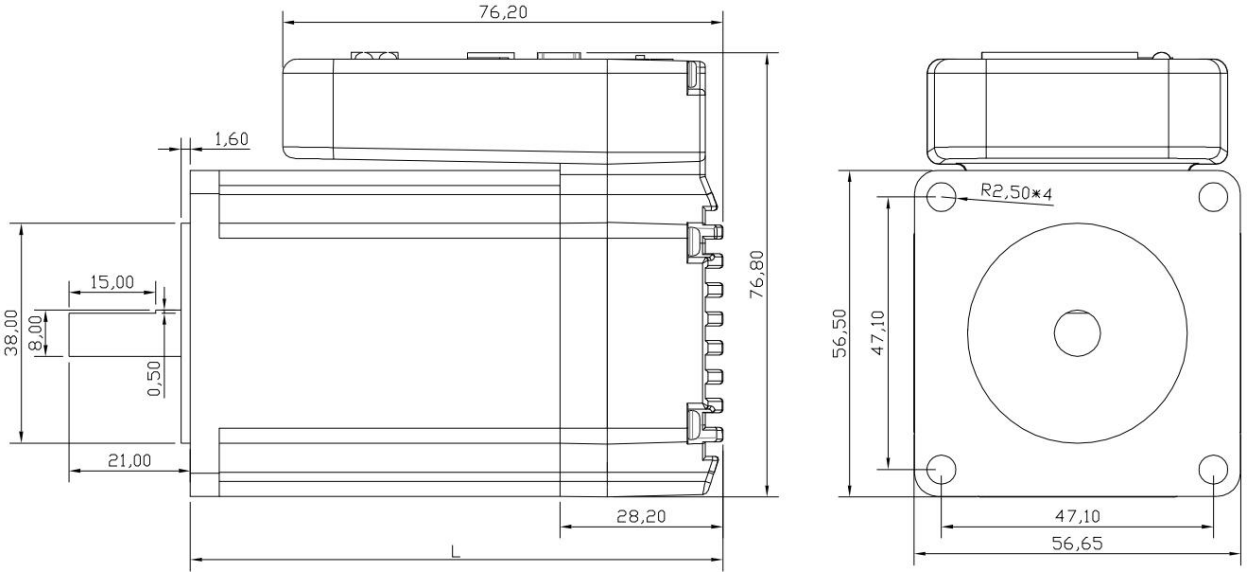
Driver Models	TLC42-C	TLO42-C	TLC57-C	TLO57-C	TLC60-C	TLO60-C	TLC86-C	TLO86-C
Compatible Motor Sizes	42		57		60		86	
Power Supply Voltage	24～36V DC		24～50V DC		24～50V DC		24～70V DC	
Maximum Output Current	2.0A		4.0A		4.0A		6.0A	
DI Port Input Current	10 ~ 50mA							
DI Port Input Voltage	24V DC							
Encoder	1000 lines	None	1000 lines	None	1000 lines	None	1000 lines	None
Insulation Resistance	100MΩ							
Operating Environment	Temperature: 0°C ~ 45°C; Humidity: ≤90% RH, non-condensing Altitude: ≤1000m.							

	Installation Conditions: Free from corrosive gases, flammable gases, oil mist, or dust. Vibration: Less than 0.5G (4.9m/s²), 10–60 Hz (non-continuous operation).
Storage Environment:	-20℃ to 65℃ (no frost), ≤90% RH, non-condensing

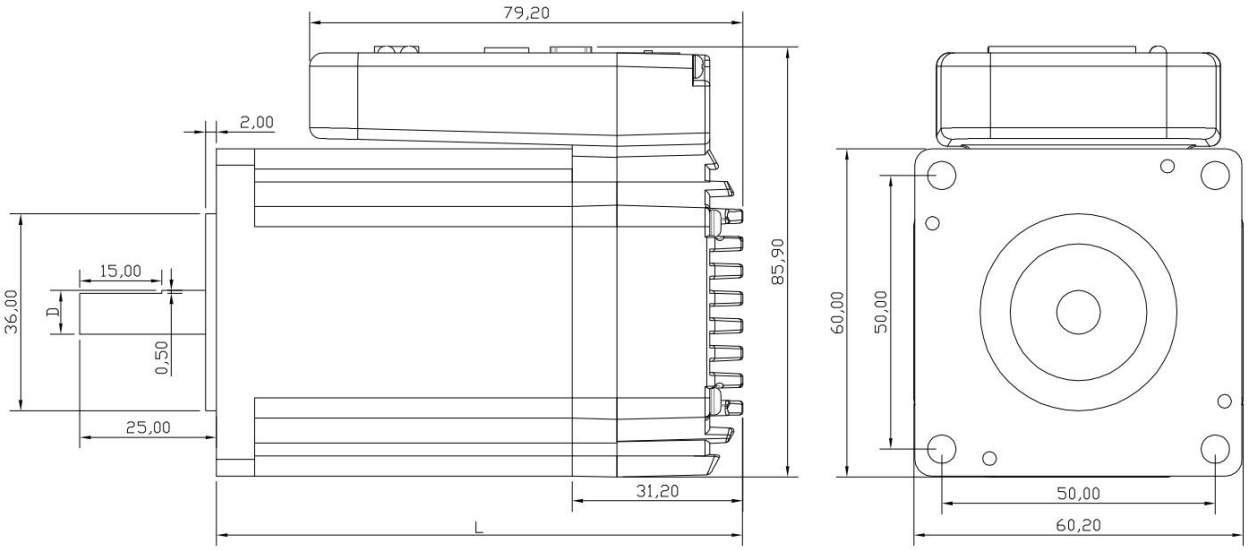
1.4 Installation Dimensions



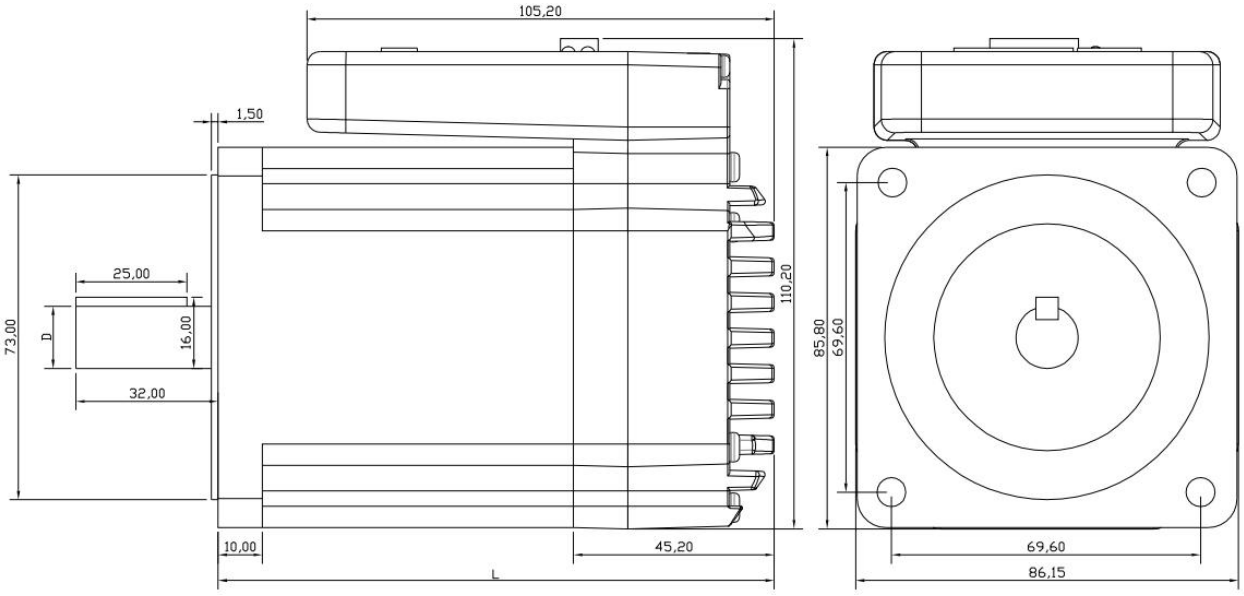
TLC42-C/TLO42-C



TLC57-C/TLO57-C



TLC60-C/TLO60-C



TLC86-C/TLO86-C

Model	D	Motor Length	Total Body Length (L)
TLC42-C, TLO42-C-04	φ5	48	75
TLC42-C, TLO42-C-08	φ5	60	87
TLC57-C, TLO57-C-1	φ6.35 or φ8	56	84.2
TLC57-C, TLO57-C-2	φ6.35 or φ8	82	110.2
TLC57-C, TLO57-C-3	φ6.35 or φ8	100	128.2
TLC60-C, TLO60-C-3	φ8	88	119.2
TLC60-C/ TLO60-C-3.5	φ8	100	131.2
TLC60-C, TLO60-C-4	φ8	112	143.2
TLC86-C/ TLO86-C-4.5	φ12.7 or φ14	80	125.2
TLC86-C/ TLO86-C-8.5	φ12.7 or φ14	114	159.2
TLC86-C, TLO86-C-10	φ12.7 or φ14	128	173.2
TLC86-C, TLO86-C-12	φ12.7 or φ14	150	195.2

Chapter 2: Drive Ports and Wiring

2.1 Drive Port Definitions

2.1.1 CANopen Communication Port

Pin	Signal Definition
1	CANL
2	CANH
3	GND
4	CANH
5	CANL

2.1.2 Power Port

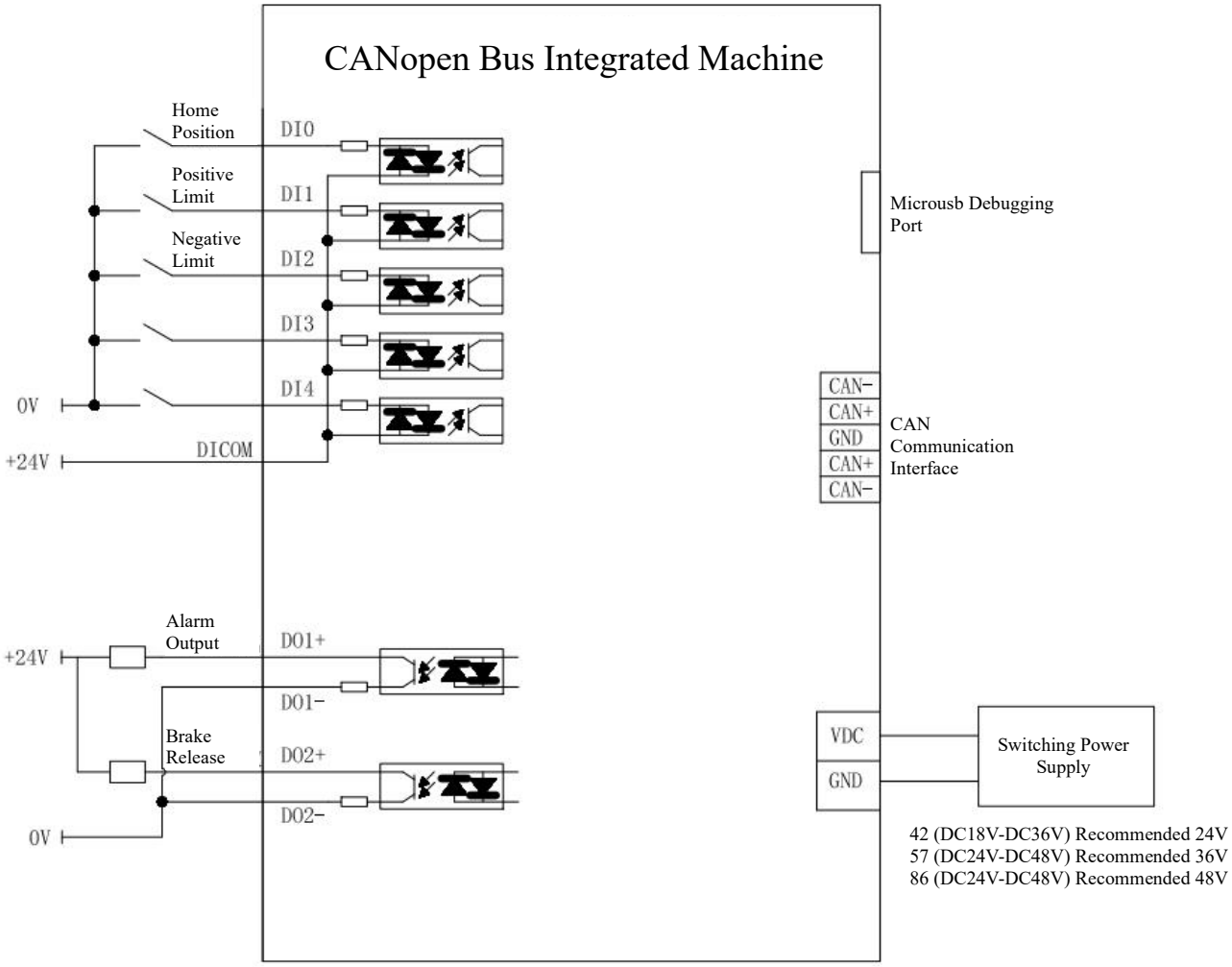
Pin	Definitions	Description
1	VDC	DC Power Negative Terminal TL42: 24～36V; TL57/TL60: 24～50V; TL86: 24V-70V
2	GND	DC Power Negative Terminal

2.1.3 DI/DO Port

Pin	Definitions	Description
1	**DI0**	Single-ended input; operating voltage 24V
2	**DI1**	
3	**DI2**	
4	**DI3**	
5	**DI4**	
6	**DICOM**	Common input; supports sinking/sourcing configurations
7	**DO0+**	Differential Output
8	**DO0-**	
9	**DO1+**	Differential Output
10	**DO1-**	

2.2 Wiring

2.2.1 Drive Wiring Diagram



Notes: 1. The DI input voltage is 24V. If it exceeds 24V, a current-limiting resistor is required.

2. The DI input wiring supports both sourcing and sinking configurations. When DICOM is 24V, DI is activated by connecting to 0V; when DICOM is 0V, DI is activated by connecting to 24V.

3. The DO common terminal DOCOM can only be connected to 0V and not to 24V.

2.2.2 DI/DO Port Usage Instructions

This series of drives provides five programmable input interfaces and two programmable output ports. The function of each DI/DO can be configured via the CANopen bus or through the upper computer debugging software. The relevant configuration parameters are shown in the table below:

Parameter No.	MODBUS Address (Decimal)	Index Number	Sub-index	Description	Default Value
PA_020	32	2400	01	DI Terminal Active Level	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_02A	42	2400	0A	DI Terminal Filter Coefficient	0
PA_02B	43	2400	0B	DO Terminal Active Level	0
PA_02C	44	2400	0C	DO0 Terminal Function Selection	1
PA_02D	45	2400	0D	DO1 Terminal Function Selection	0
PA_030	48	2401	00	DI Terminal Filter Coefficient	2

DI Port Function Command Table:

Command Value	Function Description	Command Value	Function Description
0	Undefined	7	User-defined 0
1	Homing signal	8	User-defined 1
2	Positive Limit Signal	9	User-defined 2
3	Negative Limit Signal	10	User-defined 3
4	Motor Enable Signal	11	User-defined 4
5	Stop signal	12	User-defined 5
6	Emergency Stop Signal	13	User-defined 6

DO Port Function Command Table:

Command Value	Function Description	Command Value	Function Description
0	Undefined	5	Brake release signal
1	Alarm Signal	9	User-defined 0
2	Motor Running Signal	10	User-defined 1
3	Homing Complete Signal	11	User-defined 2
4	In-position signal		

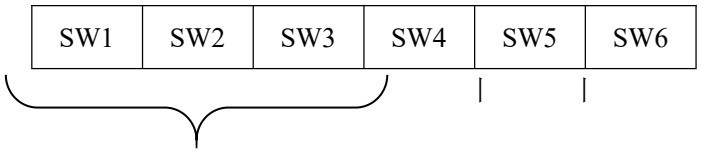
2.2.3 CANopen Installation Wiring Instructions

The commonly used wiring lengths are listed in the table below:

Baud Rate	Recommended Maximum Length
1Mbps	25m
500Kbps	100m
250Kbps	250m
125Kbps	500m

2.2.4 Switch Settings

This series of CANopen bus drives is equipped with a 6-position DIP switch, which can be used to set the CANopen station number, communication baud rate, and terminal resistance. The assignments are shown in the diagram below:



Baud Rate Setting:

Baud Rate	SW5
1Mbps	OFF
Custom	ON

When SW5 is set to ON, the baud rate can be modified via index 2407-00 (decimal address 20), with the following values: 0: 1 Mbps; 1: 500 Kbps; 2: 250 Kbps; 3: 125 Kbps

Driver Station Number Settings:

Station number	SW1	SW2	SW3	SW4
Custom	OFF	OFF	OFF	OFF
1	ON	OFF	OFF	OFF
2	OFF	ON	OFF	OFF
3	ON	ON	OFF	OFF
4	OFF	OFF	ON	OFF
5	ON	OFF	ON	OFF
6	OFF	ON	ON	OFF
7	ON	ON	ON	OFF
8	OFF	OFF	OFF	ON
9	ON	OFF	OFF	ON
10	OFF	ON	OFF	ON
11	ON	ON	OFF	ON
12	OFF	OFF	ON	ON
13	ON	OFF	ON	ON
14	OFF	ON	ON	ON
15	ON	ON	ON	ON

Terminal Resistance Setting:

When SW6 is set to ON, a 120Ω terminal resistance is connected between the signal lines to prevent signal reflection at the end of the cable.

Chapter 3: Communication Control Instructions

3.1 Control Modes

This series of drives supports three control modes, which can be set via object 6060h and monitored via object 6061h to determine the current control mode of the drive.

Index	Sub-index	Name	Parameter Value	Data Type	Attributes
6060h	00	Operating Mode	0: Undefined 1: Profile Position Mode 3: Profile Speed Mode 6: Homing Mode	INTEGER8	RW

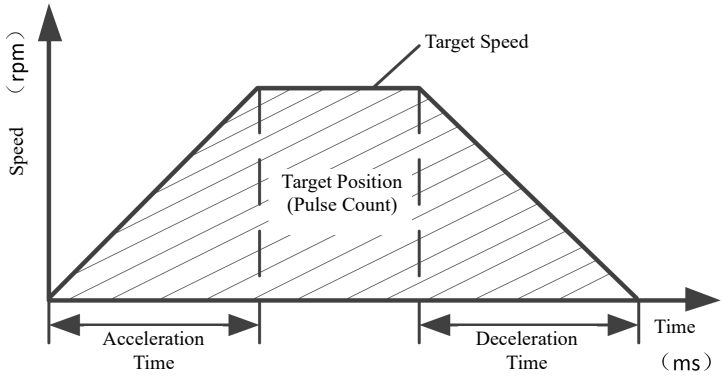
3.2 Profile Position Mode

3.2.1 Related Parameters

Index	Sub-index	Name	Setting Range	Data Type	Attributes
6040h	00	Control Word	0 ~ 65535	UNSIGNED16	RW
6060h	00	Working 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	Microstep Setting	0 ~ 65535	UNSIGNED16	RW
6041h	00	State Word		UNSIGNED16	RO
6061h	00	Operation Mode Monitoring		INTEGER8	RO
6064h	00	Current Position		INTEGER32	RO

3.2.2 Position Mode Description

In the CANopen bus Position Mode, the master provides motion parameters such as Target Position (607Ah-00), Target Velocity (6081h-00), Acceleration Time (6083h-00), and Deceleration Time (6084h-00). The drive internally constructs a motion path based on these parameters to achieve precise position control. The motion curve is illustrated in the diagram below: The motion curve is shown in the diagram below:



3.2.3 Control Step Instructions

1. Set the Operation Mode: First, set the operation mode (6060h-00) to 1. Then monitor the operation mode (6061h-00) to ensure it is also 1, indicating the drive is in position mode.

1. Enable the Motor: Sequentially write the values 6, 7, and 15 into the control word with approximately 10ms intervals between each write. After writing, the motor will be enabled.

3. Write Motion Parameters: Write the motion parameters into the target position (607Ah-00), target speed (6081h-00), acceleration time (6083h-00), and deceleration time (6084h-00).

4. Start Motor Operation: Use Bit4-Bit6 of the control word (6040h-00) to start the motor operation. The control word functionality is described as follows:

Control Word Bit	Function Description
Bit4	1: Start a new target position (triggered on the rising edge)
Bit5	0: Update motion parameters after completing the current position profile; 1: Immediately update motion parameters.
Bit6	0: Absolute positioning mode; 1: Relative positioning mode.

Control Word Value Table:

Control Word (6040h-00) Value (Decimal)	Description
6->7->15	Enable
15->31	Start absolute positioning
15->95	Start relative positioning
15->63	Immediately execute absolute positioning with new motion parameters.
15->127	Immediately execute relative positioning with new motion parameters.
15->271	Stop
15->11	Emergency Stop
15->128	Alarm reset

5. Monitor Current Status: The current status of the drive can be monitored through the status word (6041h-00) as described in the following table:

Status Word Bit	Description
Bit0 ~ Bit2	When 6040=0, the corresponding bits of 6041 are 000; When 6040=6, the corresponding bits of 6041 are 001; When 6040=7, the corresponding bits of 6041 are 011; When 6040=15, the corresponding bits of 6041 are 111;
Bit3	0: Drive ready; 1: Drive alarm
Bit8	0: Homing not completed; 1: Homing completed
Bit14	0: Motor stopped; 1: Motor running
Bit15	0: Position mode not in place; 1: Position mode positioning completed

3.3 Profile Speed Mode

3.3.1 Related Parameters

Index	Sub-index	Name	Setting Range	Data Type	Attributes
6040h	00	Control Word	0 ~ 65535	UNSIGNED16	RW
6060h	00	Working 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	State Word		UNSIGNED16	RO
6061h	00	Operation Mode Monitoring		INTEGER8	RO

3.3.2 Control Step Instructions

1. Set the Operation Mode: First, set the operation mode (6060h-00) to 3. Then monitor the operation mode (6061h-00) to ensure it is also 3, indicating the drive is in position mode.
2. Write Motion Parameters: Write the target speed (60FFh-00), acceleration time (6083h-00), and deceleration time (6084h-00).
3. Enable the Motor: Sequentially write the values 6, 7, and 15 into the control word with approximately 10ms intervals between each write. After writing, the motor will be enabled and will start writing.

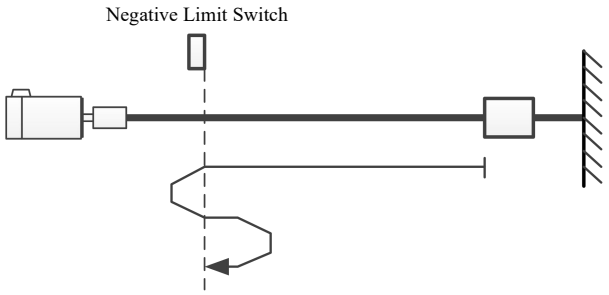
3.4 Homing Mode

3.4.1 Related Parameters

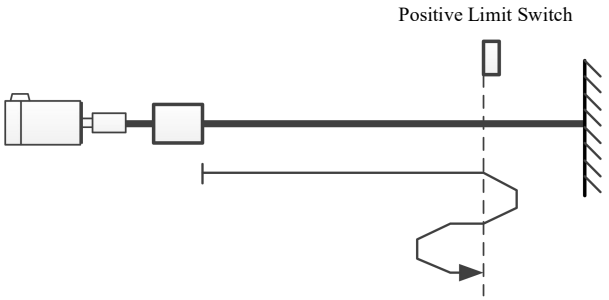
Index	Sub-index	Name	Setting Range	Data Type	Attributes
6040h	00	Control Word	0 ~ 65535	UNSIGNED16	RW
6060h	00	Working Mode Setting	0, 1, 3, 6	INTEGER8	RW
6098h	00	Homing Mode	17: Negative Limit Mode; 18: Positive Limit Mode; 24: Positive Home Mode; 29: Negative Home Mode	UNSIGNED8	RW
6099h	01	Homing Speed (rpm)	0 ~ 3000	UNSIGNED32	RW
6099h	02	Homing Creep Speed (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	State Word		UNSIGNED16	RO
6061h	00	Operation Mode Monitoring		INTEGER8	RO

3.4.2 Homing Mode Description

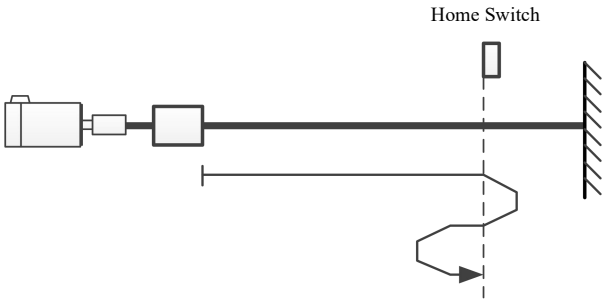
1. Negative Limit Mode (6098h=17): After initiating homing, the motor runs in the negative direction at the homing speed (6099h-01). When the negative limit switch is detected, the motor decelerates and stops. Then, the motor runs a certain distance in the positive direction at the homing speed (6099h-01) and stops after decelerating. The motor then runs in the negative direction at the homing creep speed (6099h-02). When the negative limit switch is detected again, the motor stops, completing the homing process.



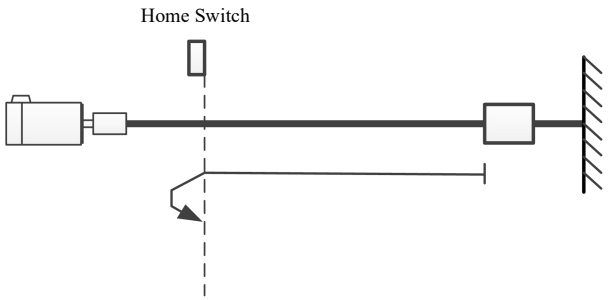
2. Positive Limit Mode (6098h=18): After initiating homing, the motor runs in the positive direction at the homing speed (6099h-01). When the positive limit switch is detected, the motor decelerates and stops. Then, the motor runs a certain distance in the negative direction at the homing speed (6099h-01) and stops after decelerating. The motor then runs in the positive direction at the homing creep speed (6099h-02). When the positive limit switch is detected again, the motor stops, completing the homing process.



3. Positive Home Mode (6098h=24): After initiating homing, the motor runs in the positive direction at the homing speed (6099h-01). When the home switch is detected, the motor decelerates and stops. Then, the motor runs a certain distance in the negative direction at the homing speed (6099h-01) and stops after decelerating. The motor then runs in the positive direction at the homing creep speed (6099h-02). When the home switch is detected again, the motor stops, completing the homing process.



4. Negative Home Mode (6098h=29): After initiating homing, the motor runs in the negative direction at the homing speed (6099h-01). When the home switch is detected, the motor decelerates and stops. The motor then runs in the positive direction at the homing creep speed (6099h-02). When the home switch is no longer detected, the motor stops, completing the homing process.



3.4.3 Control Procedure Description

1. Set the Operation Mode: First, set the operation mode (6060h-00) to 6. Then monitor the operation mode (6061h-00) to ensure it is also 6, indicating the drive is in homing mode.
1. Enable the Motor: Sequentially write the values 6, 7, and 15 into the control word with approximately 10ms intervals between each write. After writing, the motor will be enabled.
3. Write Homing Parameters: Write the homing parameters into the homing mode (6098h-00), homing speed (6099h-01), homing creep speed (6099h-02), and acceleration/deceleration time (609Ah-00).
4. Use Bit4 of the control word (6040h-00) to initiate homing, as described below:

Control Word Bit	Function Description
Bit4	0 -> 1: Start homing; 1 -> 0: Interrupt homing

5. Monitor Current Status: The current status of the drive can be monitored through the status word (6041h-00) as described in the following table:

Status Word Bit	Name	Description
Bit8	Homing Status	0: Homing not completed; 1: Homing completed
Bit14	Motion Status	0: Motor stopped; 1: Motor running

3.5 Other Common Functions

3.5.1 Clear Current Position

When the value of index 2302h-00 changes from 0 to 1, the current position value will be cleared. You need to manually set it back to 0. This operation can be performed via an SDO command.

3.5.2 Save Parameters

Writing a value of 2 to index 2300h-00 via an SDO will save the current drive parameters. This operation is commonly used to save parameters such as homing speed, acceleration/deceleration, homing mode, etc.

3.5.2 Alarm Reset

Set Bit7 of the control word 6040h-00 to 1 to reset the drive alarm. You need to manually set it back to 0.

3.6 Object Dictionary

3.6.1 1000h Group Objects

Index	Sub-index	Register Address	Item	Description	Attributes	Data Type
1000	00	0x0200	Device Type	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	Sub-index	Register Address	Item	Description	Attributes	Data Type
603F	00	0x024C	Error Code	Error Code Error code: FF00~FFFF FF01 for overcurrent FF05 for excessive 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 Home Mode; 29: Negative Home 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 2000h Manufacturer-Specific Parameters

Index	Sub-index	Register Address	Item	Description	Attributes	Data Type
Status Parameter Group (Read-Only)						
2000	00	0x0000	Driver Model	Driver Model Code	(RO)	U16
2001	00	0x0001	Drive Version	Drive Version	(RO)	U16
2100	00	0x0005	Motion Status Bit	Bit0: In-position flag, 0: Not in position, 1: In position; Bit1: Homing complete, 0: Not complete, 1: Complete; Bit2: Motor running status, 0: Stopped, 1: Running; Bit3: Alarm status, 0: Normal, 1: Alarm; Bit4: Motor enable status, 0: Enabled, 1: Disabled; Bit5: Positive soft limit status, 0: Inactive, 1: Active; Bit6: Negative soft limit status; 0: Inactive, 1: Active;	(RO)	U16
2101	00	0x0006	Input Terminal Status Bit	Bit0: X0 terminal input status; Bit1: X1 terminal input status; Bit2: X2 terminal input status; Bit3: X3 terminal input status; Bit4: X4 terminal input status; Bit5: X5 terminal input status; Bit6: X6 terminal input status; 0: Input level inactive; 1: Input level inactive;	(RO)	U16
2102	00	0x0007	Output Terminal Status Bit	Bit0: Y0 terminal output status; Bit1: Y1 terminal output status; Bit2: Y2 terminal output status; 0: Output level inactive; 1: Output level active;	(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	Soft Limit Activation	0: Inactive; 1: Active after homing;	(RW)	U16
2203	00	0x0013	CAN ID	0 ~ 127	(RW)	U16
2300	00	0x0018	Parameter Operation	0: Disabled; 1: Restore factory settings; 2: Save current parameters	(RW)	U16
2302	00	0x001A	Clear Current Position	0: Inactive; 1: Active;	(RW)	U16
Input/Output Terminal Parameter Group						
2400	01	0x0020	Input Terminal Active Level	Bit0: X0 terminal control bit; Bit1: X1 terminal control bit; Bit2: X2 terminal control bit; Bit3: X3 terminal control bit; Bit4: X4 terminal control bit; 0: Default; 1: Level inversion;	(RW)	U16
2400	02	0x0021	X0 Terminal Function Selection	0: Undefined 1: Home signal; 2: Positive limit signal; 3: Negative limit signal; 4: Motor MF signal; 5: Stop signal; 6: Emergency stop signal; 7: User-defined 0; 8: User-defined 1; 9: User-defined 2; 10: User-defined 3; 11: User-defined 4; 12: User-defined 5; 13: User-defined 6;	(RW)	U16
2400	03	0x0022	X1 Terminal Function Selection		(RW)	U16
2400	04	0x0023	X2 Terminal Function Selection		(RW)	U16
2400	05	0x0024	X3 Terminal Function Selection		(RW)	U16
2400	06	0x0025	X4 Terminal Function Selection		(RW)	U16
2400	0A	0x002A	Input Terminal Filter Coefficient	Input Terminal Filter Coefficient	(RW)	U16
2400	0B	0x002B	Output Terminal Active Level	Bit0: Y0 terminal control bit; Bit1: Y1 terminal control bit; 0: Default; 1: Level inversion;	(RW)	U16
2400	0C	0x002C	Y0 Terminal Function Selection	0: Undefined 1: Alarm Signal; 2: Homing complete signal; 3: Drive status signal; 4: In-position signal; 5: Brake signal; 9: User-defined 0; 10: User-defined 1; 11: User-defined 2;	(RW)	U16
2400	0D	0x002D	Y1 Terminal Function Selection		(RW)	U16
2400	0E	0x002E	Y2 Terminal Function Selection		(RW)	U16
2401	00	0x0030	X0 Filter Coefficient	X0 Filter Coefficient	(RW)	U16
2402	00	0x0031	X1 Filter Coefficient	X1 Filter Coefficient	(RW)	U16
2403	00	0x0032	X2 Filter	X2 Filter Coefficient	(RW)	U16

			Coefficient			
2404	00	0x0033	X3 Filter Coefficient	X3 Filter Coefficient	(RW)	U16
2405	00	0x0034	X4 Filter Coefficient	X4 Filter Coefficient	(RW)	U16
2406	00	0x0035	X5 Filter Coefficient	X5 Filter Coefficient	(RW)	U16
2407	00	0x0036	X6 Filter Coefficient	X6 Filter Coefficient	(RW)	U16
Performance Parameter Group						
2500	00	0x0050	Drive Operating Mode	0: Disabled; 1: Open-loop Mode; 2: Closed-loop Mode;	(RW)	U16
2501	00	0x0051	Encoder Resolution	Encoder Resolution	(RW)	U16
2502	00	0x0052	Maximum Peak Current	Unit: mA	(RW)	U16
2503	00	0x0053	Closed loop maximum current ratio	Unit: %	(RW)	U16
2504	00	0x0054	Closed-Loop Base Current Ratio	Unit: %	(RW)	U16
2505	00	0x0055	Open loop maximum current ratio	Unit: %	(RW)	U16
2506	00	0x0056	Lock current ratio	Unit: %	(RW)	U16
2507	00	0x0057	Locked Rotor Current Time	Unit: ms	(RW)	U16
2508	00	0x0058	Low-Pass Filter Enable	Factory default, generally not adjustable	(RW)	U16
2509	00	0x0059	Low-pass filter coefficient	Factory default, generally not adjustable	(RW)	U16
250A	00	0x005A	Deviation Alarm Threshold	Factory default, generally not adjustable	(RW)	U16
250B	00	0x005B	Positioning Completion Time	Factory default, generally not adjustable	(RW)	U16
250C	00	0x005C	Positioning completion time	Factory default, generally not adjustable	(RW)	U16
250D	00	0x005D	Average filter coefficient	Factory default, generally not adjustable	(RW)	U16
250E	00	0x005E	Current Loop Proportional	Factory default, generally not adjustable	(RW)	U16
250F	00	0x005F	Current Loop Proportional Kp	Factory default, generally not adjustable	(RW)	U16
2510	00	0x0060	Current Loop Integral Ki	Factory default, generally not adjustable	(RW)	U16
2511	00	0x0061	Current Loop Derivative Kc	Factory default, generally not adjustable	(RW)	U16
2512	00	0x0062	LA Speed Kp1	Factory default, generally not adjustable	(RW)	U16

2513	00	0x0063	LA Speed Kv1	Factory default, generally not adjustable	(RW)	U16
2514	00	0x0064	Speed node 1	Factory default, generally not adjustable	(RW)	U16
2515	00	0x0065	LA Speed Kp2	Factory default, generally not adjustable	(RW)	U16
2516	00	0x0066	LA Speed Kv2	Factory default, generally not adjustable	(RW)	U16
2517	00	0x0067	Speed node 2	Factory default, generally not adjustable	(RW)	U16
2518	00	0x0068	Speed Feedforward Kvf	Factory default, generally not adjustable	(RW)	U16
2519	00	0x0069	Position Loop Ki Gain	Factory default, generally not adjustable	(RW)	U16

3.7 Alarm Handling

The alarm information for this series of drivers can be identified by the number of times the indicator light blinks. The specific alarm information is as follows:

Indicator Light Blinking Frequency	**Alarm Description**	**Troubleshooting**	**Reset**
Blinks once every 5 seconds	Overcurrent Alarm	1. Motor wiring short circuit, check motor wiring; 2. Motor damage, measure the resistance of the motor's A-phase and B-phase windings; 3. Driver damage, replace the driver.	Restart to reset
Blinks twice every 2 seconds	Overvoltage Alarm	1. Power supply voltage is too high, measure the power supply voltage or replace the power supply; 2. Driver damage, replace the driver.	Restart to reset
Blinks three times every 5 seconds	Undervoltage Alarm	1. Power supply voltage is too low, measure the power supply voltage or replace the power supply; 2. Driver damage, replace the driver.	Restart to reset
Blinks 4 times every 5 seconds	Memory Read/Write Error	Driver damage, please replace the driver.	Can be reset
Blinks five times every 5 seconds	Position Error Alarm	1. Motor power line phase sequence error, check wiring sequence; 2. Motor line phase loss, check if the wire is broken or has poor contact; 3. Encoder line disconnection; 4. Load jam; 5. Speed too fast.	Can be reset