L2DB Series Servo Hub Driver User Manual V1.2

Content

CHAPTER 1 NAMING RULE 3

1.1 NAMING RULE 3
1.2 SPECIFICATIONS 4

CHAPTER 2 DIMENSIONS 5

2.1 INSTALLATION DIMENSIONS 5

CHAPTER 3 INTERFACE 6

3.1 DRIVER INTERFACE OVERVIEW 6
3.2 INTERFACE DESCRIPTIONS 7
3.3 DIGITAL I/O INTERNAL ELECTRICAL DIAGRAM 9

CHAPTER 4 COMMUNICATION 10

4.1 UART COMMUNICATION 10
4.2 RS485 COMMUNICATION 12
4.3 CAN COMMUNICATION 14

CHAPTER 6 CONTROL MODE 18

6.1 POSITION MODE 18
6.2 SPEED MODE 21

CHAPTER 7 ALARM AND TROUBLESHOOTING 24

APPENDIX 1 COMMON OBJECT LIST 26

ATTRIBUTE DESCRIPTIONS: 26
TABLE F1-1 MOTOR PARAMETERS 26
TABLE F1-2 BASIC MODE AND CONTROL 27
TABLE F1-3 MEASUREMENT DATA 30
TABLE F1-4 IO PORT SETTING 31
TABLE F1-5 COMMUNICATION PARAMETERS 31
TABLE F1-6 PARAMETERS STORAGE 33
TABLE F1-7 DRIVER ATTRIBUTE 34
TABLE F1-8 ADDITIONAL FUNCTIONS 35

APPENDIX 2 ERROR CODE 36

Chapter 1 Naming Rule

1.1 Naming Rule

LSDB4850-CAFR-ALL3

① ② ③ ④ ⑤ ⑥

① Series

LSDB: Single axis hub servo driver
L2DB: Dual axis hub servo driver

② Input Voltage

48: Input voltage range: 20~56V
24: Input voltage range: 18~30V

③ Peak Current

30: Peak current:30Ap,continuous current:10Arms
50: Peak current:50Ap, continuous current:15Arms

④ Feedback Type

HN: Only support TTL Hall sensor
HE: Support TTL Hall sensor and Incremental AB encoder
CA: Support communication type magnetic-electric encoder

⑤ Communication

FN: UART
FR: RS485 + UART
FC: CAN + UART

⑥ Software version

Software version is used to differentiate the default values in the parameters such as motor parameters,control loop parameters,I/O functions and communication parameters.It tries to fit for different applications with default values,makes customers more convenient to adjust the parameters.

1.2 Specifications

Driver Model	**L2DB4830-CAFR-XXXX**	**L2DB4830-CAFC-XXXX**
Rated input voltage	20~56VDC	
Max. continuous output current	10 Arms per axis	
Peak current	30 Ap per axis	
DIN Function	3 DINs, DIN3 is emergency stop, others are reserved.	
DOUT1 Function	Error output	
Communication	UART+RS485	UART+CAN
UART baudrate	115200bps,selected by DIP switch	
RS485 baudrate	38400bps/115200bps selected by DIP switch	/
CAN baudrate	/	500kbps/1Mbps selected by DIP switch
Protection	Over-voltage,Low-voltage,Motor over-heat(I^2T),Short-circuit,Driver over-heat.	
Operation Temperature	-10℃～40℃（Non-freezing）	
Operation Humidity	5～95%RH（Non-condensing）	
Storage Temperature	-10℃～70℃（Non-freezing）	
Storage Humidity	Below 90%RH（Non-condensing）	

Chapter 2 Dimensions

2.1 Installation Dimensions

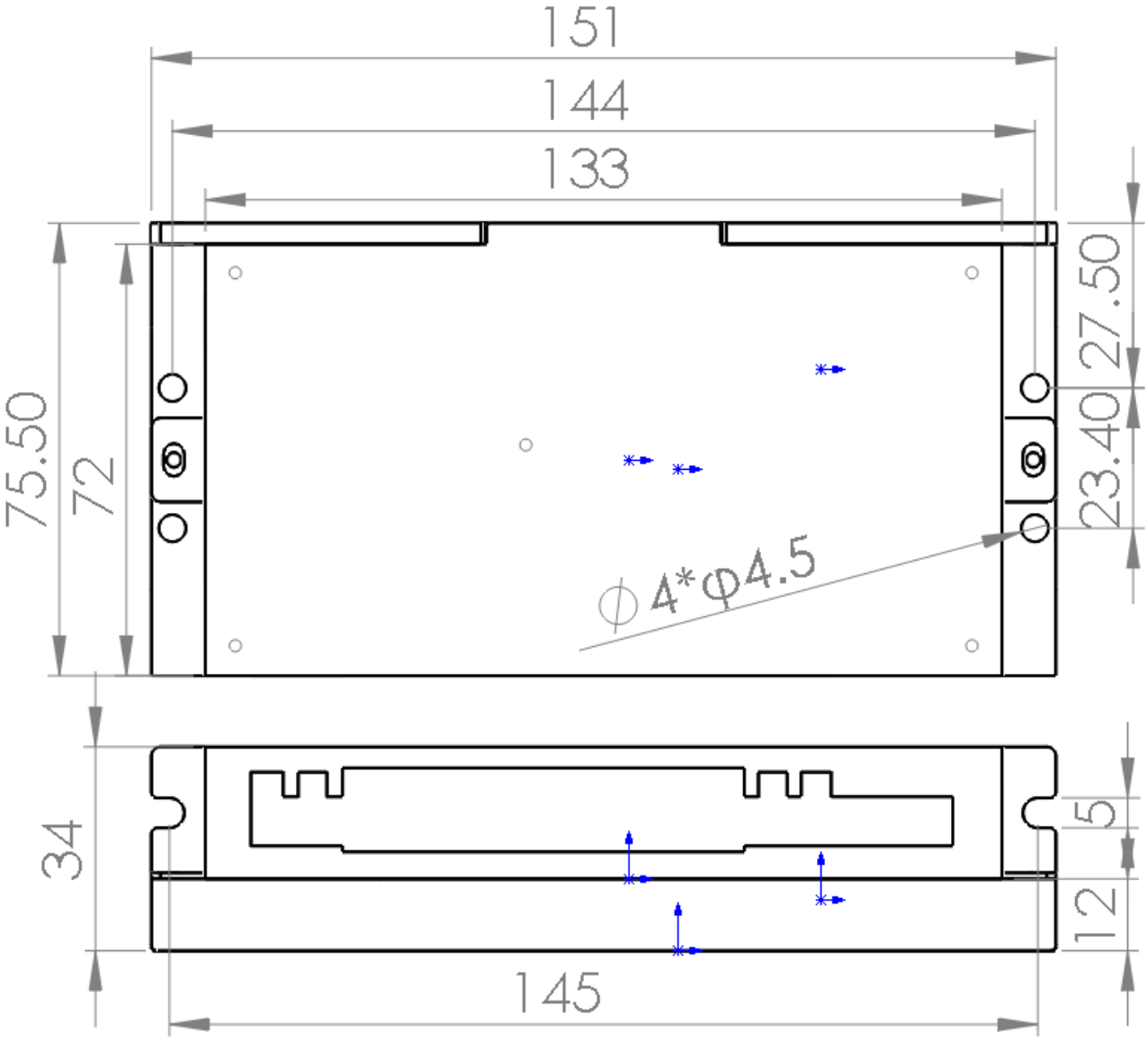


Fig.2.1 L2DB Installation Dimensions

Chapter 3 Interface

3.1 Driver Interface Overview

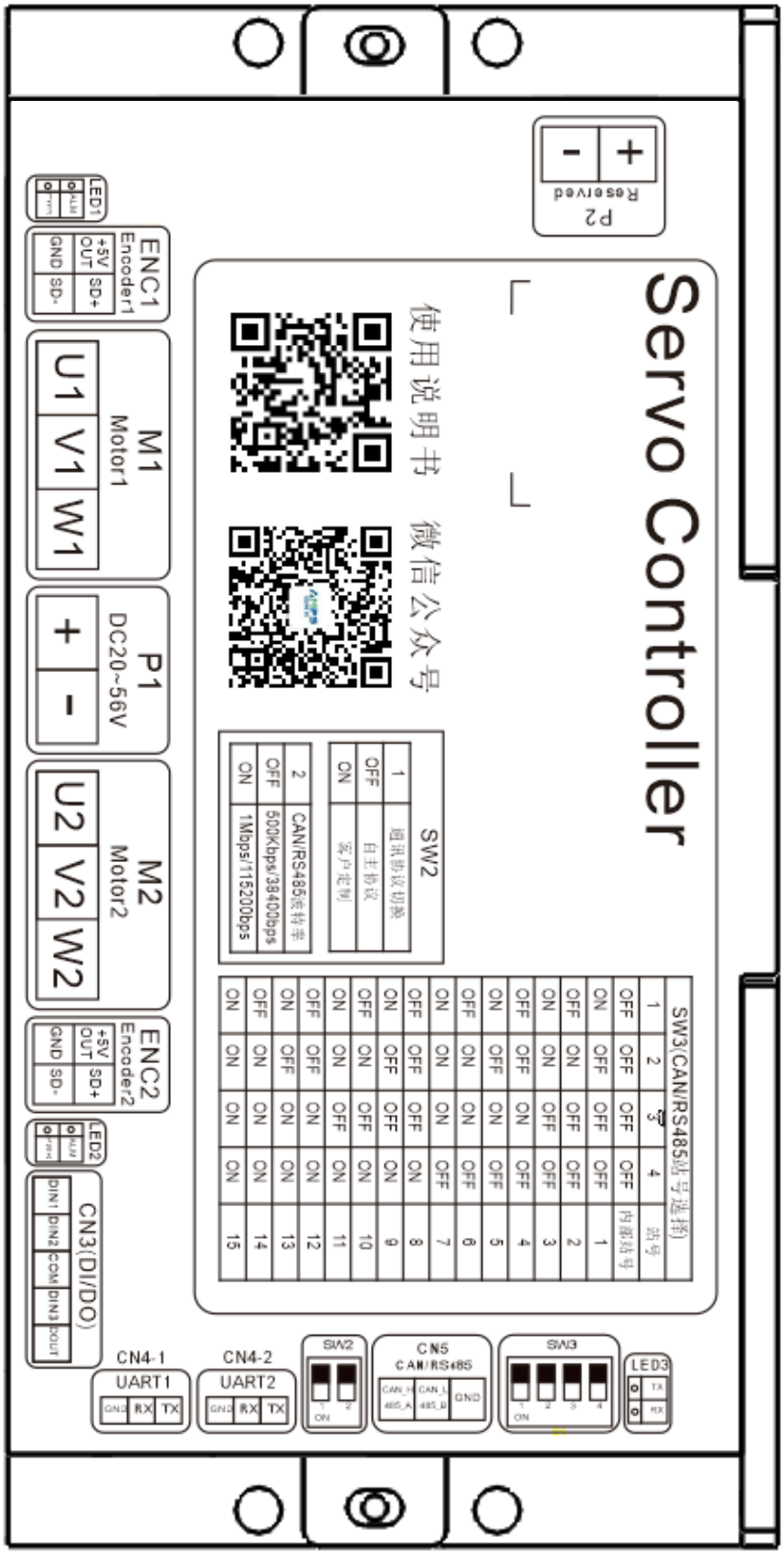
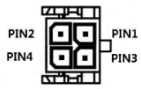
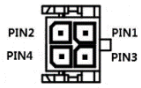
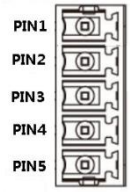
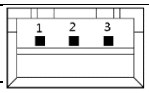
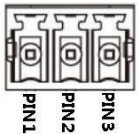
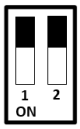
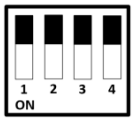
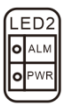


Fig.3.1 Driver Interface

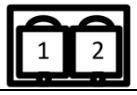
3.2 Interface Descriptions

No.	Name	Definition	Description
1	P1	P1:Power input	Power input for driver
		PIN1: DC+	Positive
		PIN2: DC-	Negative
2	M1	M1:Motor1 power port	Power cable port for Motor1
		PIN1: U1	U phase for motor1 power
		PIN2: V1	V phase for motor1 power
		PIN3: W1	W phase for motor1 power
3	M2	M2: Motor2 power port	Power cable terminal for Motor2
		PIN1: U2	U phase for motor2 power
		PIN2: V2	V phase for motor2 power
		PIN3: W2	W phase for motor2 power
4	ENC1 	ENC1:Motor1 encoder port	Encoder cable port for Motor1
		PIN1: +5Vout	+5V output,max. current is 0.2A
		PIN2: GND	Ground for 5V power
		PIN3: SD+	Positive of serial communication
		PIN4: SD-	Negative of serial communication
5	ENC2 	ENC2: Motor2 encoder port	Encoder cable port for Motor2
		PIN1: +5Vout	+5V output,max. current is 0.2A
		PIN2: GND	Ground for 5V power
		PIN3: SD+	Positive of serial communication
		PIN4: SD-	Negative of serial communication
6	CN3 	CN3: Digital I/O port	Multi-funcion digital I/O port
		PIN1:DIN1	Digital input 1: Connect to COM:valid Disconnect to COM:invalid Reserved by default
		PIN2:DIN2	Digital input 2: Connect to COM:valid Disconnect to COM:invalid Reserved by default
		PIN3:COM	Common terminal for digital I/O
		PIN4:DIN3	Digital input 3: Connect to COM:valid Disconnect to COM:invalid Emergency stop function by default
		PIN5:DOUT	Digital output for error output(NPN): Output 0 if there is error in driver.
7	CN CN4- CN4-1	CN4-1: UART1	UART port for motor1
		PIN1:GND	Ground for UART1
		PIN2:RX	Receive of UART1
		PIN3:TX	Transmit of UART1
8		CN4-2: UART2 port	UART port for motor2
		PIN1:GND	Ground for UART2

<table>
<tr><td></td><td></td><td>PIN2:RX</td><td>Receive of UART2</td></tr>
<tr><td></td><td></td><td>PIN3:TX</td><td>Transmit of UART2</td></tr>
<tr><td rowspan="4">9</td><td rowspan="4">CN5
 
</td><td>CN5:RS485/CAN port</td><td>RS485/CAN bus port</td></tr>
<tr><td>PIN1:RS485_A/CAN_H</td><td>RS485+ /CAN_H</td></tr>
<tr><td>PIN2:RS485_B/CNA_L</td><td>RS485- /CAN_L</td></tr>
<tr><td>PIN3:isoGND</td><td>Ground for RS485/CAN</td></tr>
<tr><td>10</td><td>SW2
 
</td><td>SW2:Communication parameters setting
BIT1:Protocol selection
BIT2： Baudrate setting (Must reboot driver)</td><td>BIT1:Communication protocol
<table><tr><td>OFF</td><td>Default protocol</td></tr><tr><td>ON</td><td>Customized protocol(Reserved by default)</td></tr></table>
BIT2:RS485/CAN baudrate
<table><tr><td>OFF</td><td>38400bps/500Kbps</td></tr><tr><td>ON</td><td>115200bps/1MKbps</td></tr></table></td></tr>
<tr><td>11</td><td>SW3
 
</td><td>SW3: RS485/CAN ID
Note:1.When ID is bigger than 15,it needs to set SW3 as internal,then set ID in parameter(0x100C for RS485,0x65100F for CAN)
2.After setting,it needs to reboot driver.</td><td>ID setting:（Only for CAN and RS485）
<table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>ID</td></tr><tr><td>OFF</td><td>OFF</td><td>OFF</td><td>OFF</td><td>Internal</td></tr><tr><td>ON</td><td>OFF</td><td>OFF</td><td>OFF</td><td>1</td></tr><tr><td>OFF</td><td>ON</td><td>OFF</td><td>OFF</td><td>2</td></tr><tr><td>ON</td><td>ON</td><td>OFF</td><td>OFF</td><td>3</td></tr><tr><td>OFF</td><td>OFF</td><td>ON</td><td>OFF</td><td>4</td></tr><tr><td>ON</td><td>OFF</td><td>ON</td><td>OFF</td><td>5</td></tr><tr><td>OFF</td><td>ON</td><td>ON</td><td>OFF</td><td>6</td></tr><tr><td>ON</td><td>ON</td><td>ON</td><td>OFF</td><td>7</td></tr><tr><td>OFF</td><td>OFF</td><td>OFF</td><td>ON</td><td>8</td></tr><tr><td>ON</td><td>OFF</td><td>OFF</td><td>ON</td><td>9</td></tr><tr><td>OFF</td><td>ON</td><td>OFF</td><td>ON</td><td>10</td></tr><tr><td>ON</td><td>ON</td><td>OFF</td><td>ON</td><td>11</td></tr><tr><td>OFF</td><td>OFF</td><td>ON</td><td>ON</td><td>12</td></tr><tr><td>ON</td><td>OFF</td><td>ON</td><td>ON</td><td>13</td></tr><tr><td>OFF</td><td>ON</td><td>ON</td><td>ON</td><td>14</td></tr><tr><td>ON</td><td>ON</td><td>ON</td><td>ON</td><td>15</td></tr><tr><td colspan="5">The ID above is for motor1,the ID of motor2 is [motor1 ID]+1</td></tr></table></td></tr>
<tr><td>12</td><td>LED1

</td><td>LED1:indicator for Motor1</td><td>Green LED on means driver is working.
Red LED on means driver is alarm,please check the chapter 7 for the details of alarms</td></tr>
<tr><td>13</td><td>LED2
 
</td><td>LED1:indicator for Motor2</td><td>Green LED on means driver is working.
Red LED on means driver is alarm,please check the chapter 7 for the details of alarms</td></tr>
<tr><td>14</td><td>LED3

</td><td>LED3:indicator for communication</td><td>Yellow LED blinking means driver sending data.
Green LED blinking means driver receiving data.</td></tr>
</table>

15	P2 	P2： Reserved	Reserved
		PIN1:+	
		PIN2:-	

3.3 Digital I/O internal electrical diagram

L2DB series driver adopts active isolated design,the internal electrical diagram is as shown in Fig.4.3-1

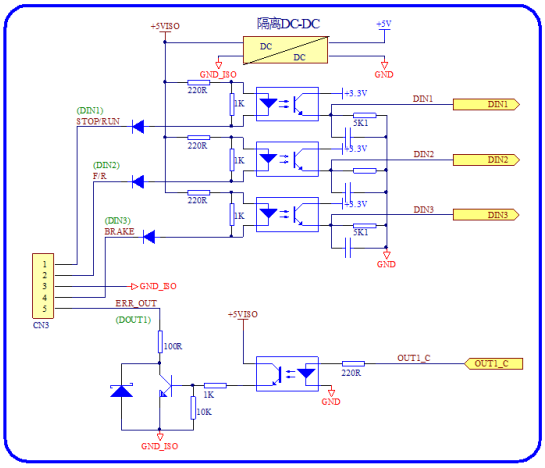


Fig.3.3-1

Chapter 4 Communication

There are UART,RS485/CAN in the driver.RS485 and CAN are optional by different models.

4.1 UART Communication

UART communication parameters

UART communication parameters is fixed as follows:

Baudrate-115200bps, data bit-8,stop bit-1, None Parity check.

UART communication protocol

UART communication follows master-slave protocol.

UART protocol format:

Device ID	Function code	Object address		Error /Clear	Data				Check
Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8	Byte9	Byte10
ID	CMD	Addr H	AddrL	ErrR	Data (MSB)	Data (N-1)	Data (N-2)	Data (LSB)	Check

ID: Address of UART. UART1 support two ID(0x01 is for motor1, 0x02 is for motor2).The ID of UART2 is fixed as 0x01(Only for motor2)

CMD:Function code.There are 4 function codes as follows:

0xA0 Read data
0x51 Write data for object of 8 bits
0x52 Write data for object of 16 bits
0x54 Write data for object of 32 bits

The details of function is as follows:

1)Read, host reads data from the object address of driver

Host sending CMD	Driver reply CMD	Description
0xA0	0xA1	Driver reply 8bits data:[Data(LSB)]
0xA0	0xA2	Driver reply 16bits data:[Data(N-2)~Data(LSB)]
0xA0	0xA4	Driver reply 32bits data:[Data(MSB)~Data(LSB)]
0xAO	0x5F	Error:object is not exist.
0xA0	0x80	Error:check is wrong

2)Write,host writes data into object address of driver

Host sending CMD	Driver reply CMD	Description
0x51	0x61	Writing 8bits data [Data4] successfully
	0x50	Error:data length is wrong.
	0x58	Error:object address is not writable
	0x5F	Error:object address is not exsit
0x52	0x62	Writing 16bits data [Data3~Data4] successfully
	0x50	Error:data length is wrong.
	0x58	Error:object address is not writable
	0x5F	Error:object address is not exsit
0x54	0x64	Writing 32bits data [Data1~Data4] successfully

	0x50	Error:data length is wrong.
	0x58	Error:object address is not writable
	0x5F	Error:object address is not exsit

AddrH,AddrL:Higher 8bits and lower 8bits of object address
ErrR:Error code and clear command
During host sending strings,if ErrR is 0xCE,it will clear error in driver.
During the reply strings,ErrR means the error status in driver.If ErrR is 0,it means no error,otherwise it means error in driver.The details of the error are as following table.

ErrR	**Decriptions**
bit0: [LSB]	Reserved
bit1:	Following error
bit2:	Encoder error
bit3:	Motor overload
bit4:	Driver over-temperature
bit5:	Bus voltage too high
bit6:	Bus voltage too low
bit7: [MSB]	Driver output short-circuit

Data(MSB)~Data(LSB):Data area.
Check: Checksum, Check=Sum[Byte1~Byte9],then only check the lower byte.

UART communication example
Example 1:Read "Actual bus voltage"in driver
The object address of "Actual bus voltage" is 0x5001,and it is 16bits signed(Refer to table F1-3)
Host send: 01 A0 50 01 00 00 00 00 00 F2
If the actual bus voltage is 36V,then the driver will reply:
01 A2 50 01 00 00 00 00 24 18
Example 2: Read "Actual position" in driver
The object address of "Actual position" is 0x7071,and it is 32bits signed(Refer to table F1-3)
Host send: 01 A0 70 71 00 00 00 00 00 82
If the actual position is -8237,convert to HEX 0xFFFFDFD3,
Then the driver will reply:
01 A4 70 71 00 FF FF DF D3 74
If there is "Following error"alarm in driver at the same time,then the driver will reply:
01 A4 70 71 02 FF FF DF D3 76
Example 3: Write "Target velocity_rpm"in driver
The object address of "Target velocity_rpm" is 0x70B1,and it is 16bits signed(Refer to table F1-1).
If we want to write 100 into the object address,convert to HEX 0064
Host send: 01 52 70 B1 00 00 00 00 64 D8
Driver reply: 01 62 70 B1 00 00 00 00 64 E8
Example 4: Write "Target velocity_DEC"in driver
The object address of "Target velocity_DEC" is 0x70B2,and it is 32bits signed(Refer to table F1-1)
If we want to write 3.21rpm,according to conversion formula([DEC]=([rpm]*512*4096)/1875,we can calculate the DEC value:

[DEC]=(3.21*512*4096)/1875=3590,convert to HEX 0E06,

Host send: 01 54 70 B2 00 00 00 0E 06 8B

Driver reply: 01 64 70 B2 00 00 00 0E 06 9B

4.2 RS485 Communication

RS485 communication parameters

RS485 communication parameters are two types:

A)38400,8,N,1 B)115200,8,N,1

Baudrate is selected by BIT2 of DIP switch SW2.

RS485 communication protocol

RS485 follows master-slave protocol,it supports one host controlling multi-slaves.

The difference between UART communication and RS485 communication is that RS485 will not reply if there is any error in check byte.

RS485 communication protocol format:

Device ID	**Function code**	**Object address**		**Error /Clear**	**Data**				**Check**
Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8	Byte9	Byte10
ID	CMD	AddrH	AddrL	ErrR	Data (MSB)	Data (N-1)	Data (N-2)	Data (LSB)	Check

ID: It is the address of RS485 communication,set by DIP switch SW3.

If ID is not exsit,driver will not reply.

CMD:Function code.There are 4 function codes as follows:

0xA0 Read data

0x51 Write data for object of 8 bits

0x52 Write data for object of 16 bits

0x54 Write data for object of 32 bits

The details of function is as follows:

1)Read, host reads data from the object address of driver

Host sending CMD	**Driver reply CMD**	**Description**
0xA0	0xA1	Driver reply 8bits data:[Data(LSB)]
0xA0	0xA2	Driver reply 16bits data:[Data(N-2)~Data(LSB)]
0xA0	0xA4	Driver reply 32bits data:[Data(MSB)~Data(LSB)]
0xAO	0x5F	Error:object is not exist.
0xA0	0x80	Error:check is wrong

2)Write,host writes data into object address of driver

Host sending CMD	**Driver reply CMD**	**Description**
0x51	0x61	Writing 8bits data [Data4] successfully
	0x50	Error:data length is wrong.
	0x58	Error:object address is not writable
	0x5F	Error:object address is not exsit
0x52	0x62	Writing 16bits data [Data3~Data4] successfully
	0x50	Error:data length is wrong.

	0x58	Error:object address is not writable
	0x5F	Error:object address is not exsit
0x54	0x64	Writing 32bits data [Data1~Data4] successfully
	0x50	Error:data length is wrong.
	0x58	Error:object address is not writable
	0x5F	Error:object address is not exsit

AddrH,AddrL:Higher 8bits and lower 8bits of object address

ErrR:Error code and clear command

During host sending strings,if ErrR is 0xCE,it will clear error in driver.

During the reply strings,ErrR means the error status in driver.If ErrR is 0,it means no error,otherwise it means error in driver.The details of the error are as following table.

ErrR	**Decriptions**
bit0: [LSB]	Reserved
bit1:	Following error
bit2:	Encoder error
bit3:	Motor overload
bit4:	Driver over-temperature
bit5:	Bus voltage too high
bit6:	Bus voltage too low
bit7: [MSB]	Driver output short-circuit

Data(MSB)~Data(LSB):Data area.

Check: Checksum, Check=Sum[Byte1~Byte9],then only check the lower byte.

RS485 communication example

Example 1:Read "Actual bus voltage"in driver

The object address of "Actual bus voltage" is 0x5001,and it is 16bits signed(Refer to table F1-3)

Host send: 01 A0 50 01 00 00 00 00 00 F2

If the actual bus voltage is 36V,then the driver will reply:

01 A2 50 01 00 00 00 00 24 18

Example 2: Read "Actual position" in driver

The object address of "Actual position" is 0x7071,and it is 32bits signed(Refer to table F1-3)

Host send: 01 A0 70 71 00 00 00 00 00 82

If the actual position is -8237,convert to HEX 0xFFFFDFD3,

Then the driver will reply:

01 A4 70 71 00 FF FF DF D3 74

If there is "Following error"alarm in driver at the same time,then the driver will reply:

01 A4 70 71 02 FF FF DF D3 76

Example 3: Write "Target velocity_rpm"in driver

The object address of "Target velocity_rpm" is 0x70B1,and it is 16bits signed(Refer to table F1-1).

If we want to write 100 into the object address,convert to HEX 0064

Host send: 01 52 70 B1 00 00 00 00 64 D8

Driver reply: 01 62 70 B1 00 00 00 00 64 E8

Example 4: Write "Target velocity_DEC"in driver

The object address of "Target velocity_DEC" is 0x70B2,and it is 32bits signed(Refer to table F1-1)

If we want to write 3.21rpm,according to conversion formula([DEC]=([rpm]*512*4096)/1875,we can calculate the DEC value:

[DEC]=(3.21*512*4096)/1875=3590,convert to HEX 0E06,

Host send: 01 54 70 B2 00 00 00 0E 06 8B

Driver reply: 01 64 70 B2 00 00 00 0E 06 9B

4.3 CAN Communication

Overview

The driver only support Canopen SDO protocol for CAN port.

SDO protocol format is as following table:

Byte0	Byte1-2	Byte3	Byte4-7
SDO Command specifier	Object Index(LSB…MSB)	Object SubIndex	Maximum 4 bytes of data

Object index is 2 bytes,lowest byte is in the front and highest byte is in the back.For example,if the index is 0x606C,then Byte1 is 6C,Byte2 is 60.

Read

If we want to read data from object address,the sending string and receiving string are as following tables.

Sending string:

Identifier	DLC	Data							
		0	1	2	3	4	5	6	7
0x600+Node_ID	8	Sending CMD	Index		Subindex	00			

Receiving string:

Identifier	DLC	Data							
		0	1	2	3	4	5	6	7
0x580+Node_ID	8	Receiving CMD	Index		Subindex	Data			

Note:The sending command is 0x40.

If receiving 1 byte,the receiving CMD is 0x4F.

If receiving 2 bytes,the receiving CMD is 0x4B.

If receiving 4 bytes,the receiving CMD is 0x43.

If receiving data failed,the receiving CMD is 0x80.

Example: Using Peak-CAN card to send command for reading "Actual position"(Obejcet address is 0x606300),then it needs to send SDO string as follows:

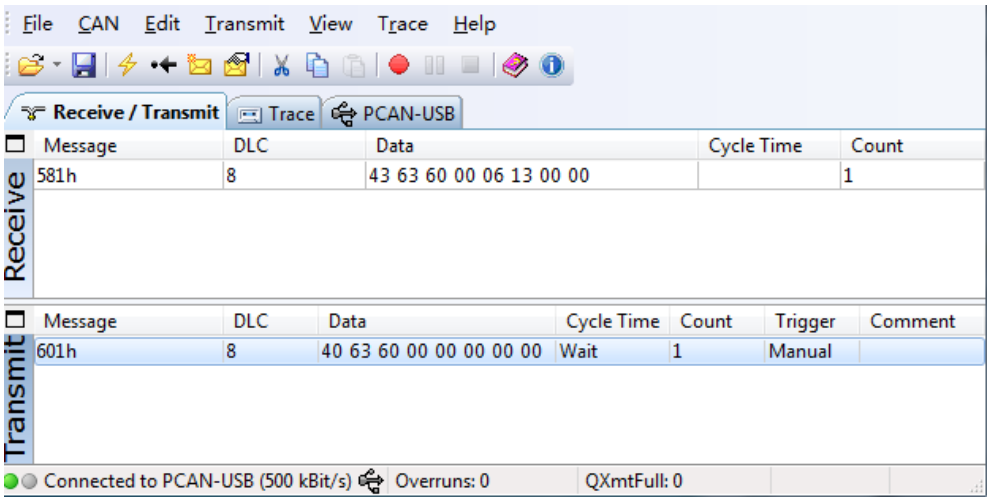
601 40 63 60 00 00 00 00 00

(0x600+Node-ID)(CMD) (Index)（Subindex） （Data）

If the "Actual position" is 4870(HEX is 1306),then it will reply:

581 43 63 60 00 06 13 00 00

(0x580+Node-ID) (CMD) (Index)（Subindex） （Data）



Write

If we want to write data into object address,the sending string and receiving string are as following tables.

Sending string:

Identifier	**DLC**	**Daten**							
		0	**1**	**2**	**3**	**4**	**5**	**6**	**7**
0x600+Node_ID	8	Sending CMD	Index		Subindex	Data			

Receiving string:

Identifier	**DLC**	**Daten**							
		0	**1**	**2**	**3**	**4**	**5**	**6**	**7**
0x580+Node_ID	8	Receiving CMD	Index		Subindex	Data			

Note:The sending command is as follows:

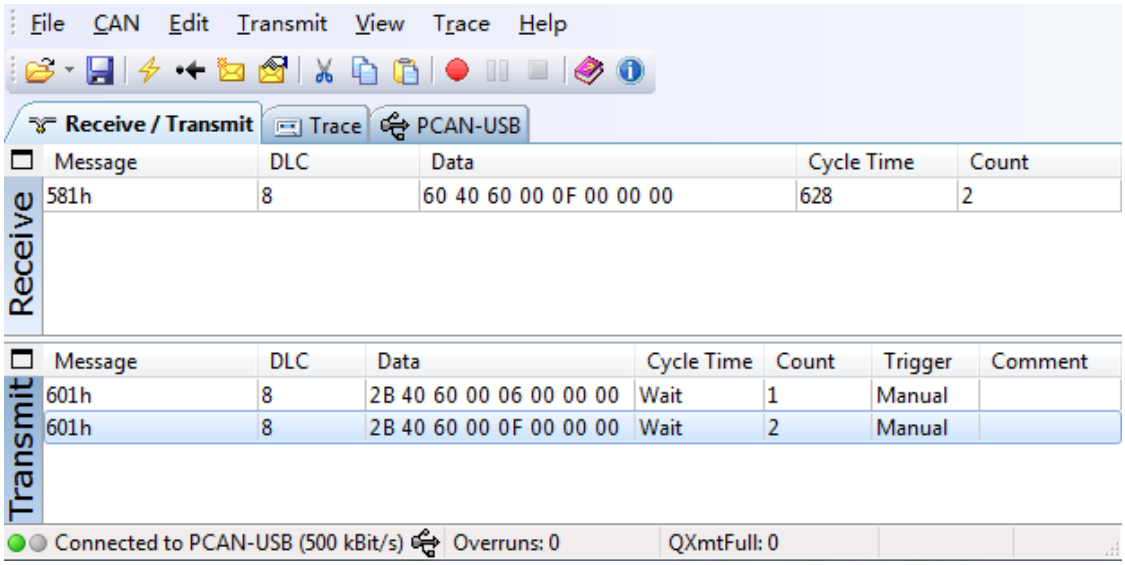
If writing data is 1 byte,the sending CMD is 0x2F.

If writing data is 2 bytes,the sending CMD is 0x2B.

If writing data is 4 bytes,the sending CMD is 0x23.

If writing data is successful,the receiving CMD is 0x60,if writing data failed,the receiving CMD is 0x80.

Example: Write data “6”and “F” to object address “Control word”（0x604000）.The strings are as following picture.



Simple PDO Function

Driver support simple PDO function,it doesn't need to configure in host.

UART /RS485 Object address [16bit]	CAN Object address [16bit][8bit] Index SubIndex	Attribute	Unit	Decription
	0x470001	08U,RW	DEC	Simple PDO function 1. Enable TXPDO1 0. Disable Default：0
	0x180003	16U,RW	mS	TX-PDO1 prohibit time Default 10ms。

PDO format：

Identifier	DLC	Daten							
		0	1	2	3	4	5	6	7
0x180+Node_ID	8	Mapping to object address 0x60F919（Actual Velocity_0.001rpm）				Mapping to object address 0x606300（Actual position）			

CAN SDO Example (Set ID as 1)

Example 1: Read "Actual position".

The object address of "Actual position" is 0x606300,and it is 32bits signed(Refer to table F1-3)

Host send: 601 40 63 60 00 00 00 00 00

If "actual position" is 4870,convert to HEX 1306

Then driver reply: 581 43 63 60 00 06 13 00 00

Example 2: Read "Actual current_Iq"

The object address of "Actual current_Iq" is 0x607800,and it is 16bits signed(Refer to table F1-3)

Host send: 601 40 78 60 00 00 00 00 00

If "Actual current_Iq" is 1 Arms,calculated by conversion formula "[DEC]=[Arms]*1.414*2048/Peak current（L2DB4830's peak current is 30A）,1Arms=97（DEC）=61（HEX）

Driver reply: 581 4B 78 60 00 61 00 00 00

Example 3:Write "Target Velocity_DEC"

The object address of "Target Velocity_DEC" is 0x60FF00,and it is 32bits signed(Refer to table F1-2)

If we want to set speed as 150rpm, calculated by conversion formula

U[y,x]:[DEC]=([rpm]*512*4096)/1875,

[DEC]=(150*512*4096)/1875= 167772,convert to HEX 28F5C,

Host send: 601 23 FF 60 00 5C 8F 02 00

Driver reply: 581 60 FF 60 00 5C 8F 02 00

Example 4: Write "Control word" as 0x0F

The object address of "Control Word" is 0x604000,and it is 16bits signed(Refer to table F1-2)

Host send: 601 2B 40 60 00 0F 00 00 00

Driver reply: 581 60 40 60 00 0F 00 00 00

CAN PDO Example (Set ID as 1)

1.Enable PDO

The object address of "Simple PDO function" is 0x470001,and it is 8bits unsigned(Refer to table F1-5)

Host send: 601 2F 00 47 01 01 00 00 00

Driver reply: 581 60 00 47 01 01 00 00 00

2.Driver upload "Actual Velocity_0.0001rpm" and "Actual Position"

If the actual velocity is 10rpm(0x2710),and actual position is 1000 DEC(0x3E8),then driver will send following data every 10ms：181 10 27 00 00E8 03 00 00

Chapter 5 Control Mode

The driver supports position mode and speed mode.

5.1 Position Mode

Position mode supports absolute positioning and relative positioning.
The control word of absolute positioning and relative positioning is 1F and F.
For example, current position is 1000, we set target position 9000 and -1000 for relative positioning,and same target position for absolute positioning.

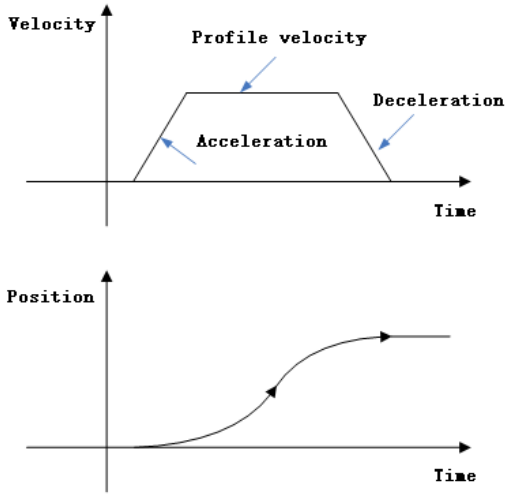


Fig.5.1-1 Velocity and position curce in position mode

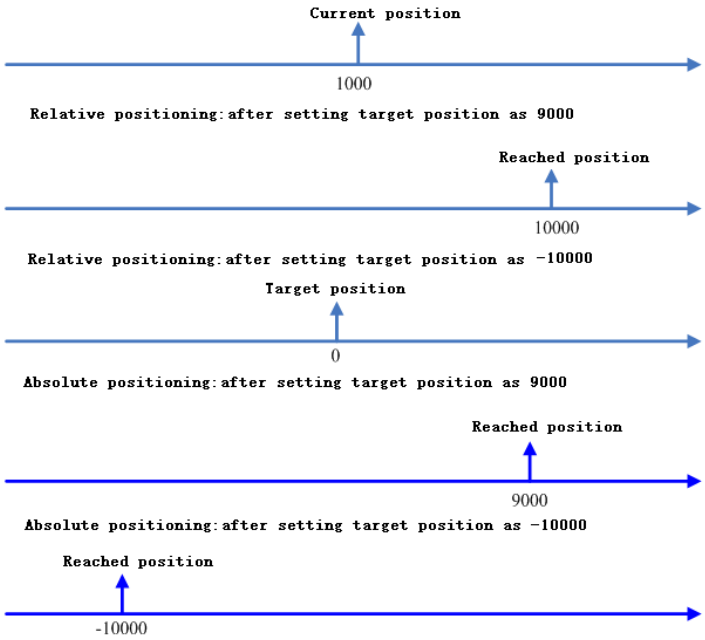


Fig.5.1-2 Position mode example

Common objects for position mode

UART /RS485 Object address [16bit]	CAN Object address [16bit][8bit] Index SubIndex	Attribute	Unit	Description
0x7017	0x606000	08S,RW	DEC	Operation mode 3 Speed mode with Acc/Dec -3 Speed mode without Acc/Dec 4 Torque mode 1 Position mode
0x7019	0x604000	16S,RW	HEX	Control word 0x06 Disable 0x0F Enable 0x86 Clear error
0x7018	0x606100	08S,RO	DEC	Current operation mode
0x7001	0x604100	16U,RO	HEX	Driver status word 0x0000:Driver normal 0x0008:Driver error Details of error information refer to object address[0x7011]
0x701F	0x605A11	08U,RW	DEC	Emergency stop 1:Enable 0:Disable
0x7091	0x607A00	32S,RW	DEC	Target position in absolute positioning （Valid in operation mode 1）
0x709F	0x607B00	32S,RW	DEC	Target position in relative positioning （Valid in operation mode 1）
0x709D	0x608200	16U,RW,S5	rpm	Profile velocity_rpm （Target speed in operation mode 1） Note:This object will affect the value of object[0x7098]
0x7099	0x608300	32U,RW,S5	DEC	Acceleration U[y,x]: [DEC]=[rps/s]*256*[Resolution]/15625; [Resolution]Default:4096
0x709A	0x608400	32U,RW,S5	DEC	Deceleration U[y,x]: [DEC]=[rps/s]*256*[Resolution]/15625; [Resolution]Default:4096
0x709B	0x605A01	32U,RW,S5	DEC	Deceleration in emergency stop Valid in operation mode 3 and 1 U[y,x]: [DEC]=[rps/s]*256*[Resolution]/15625;

				[Resolution]Default:4096
0x7093	0x606500	32U,RW,S5	DEC	Following error window (Only valid in mode 1 when Kpp0 is not 0)
0x709C	0x60FB02	16S,RW,S5	DEC	Position loop speed feedforward (Valid in mode 1) Range:0~256,corresponding to 0~100%
0x7094	0x60FB01	16S,RW,S5	DEC	Kpp0, propotion gain 0 in position loop
0x70B3	0x60F901	16U,RW,S5	DEC	Kvp0,propotion gain 0 in speed loop
0x70B4	0x60F902	16U,RW,S5	DEC	Kvi0,integrator gain 0 in speed loop

Operating procedure in relative position mode:

Step1： Set “Acceleration”,”Deceleration”and “Profile velocity_rpm” if it needs to be change.

Step2： Set “Operation mode” as 1.

Step3： Set “Control word” as F,after this step,the motor will enable.

Step4： Set “Relative target position”,after set this parameter,motor will run the relative position.

Step5： Anytime it can change “Relative target position” and “Profile velocity_rpm”.

Step6： Set “Control word” as 6 to disable motor (Loose the shaft) .

During Step4~Step5,if “Emergency stop”enable,motor will decelerate to stop(Use “Deceleration in emergency stop”) .If “Emergency stop” disable and “Control word” is still F,then motor will continue running to target position.

Example 1: Use UART port to control relative position mode.

Step1： Set “Acceleration” and “Deceleration” if it needs to be change.

Assume we need to set “Acceleration” as 2 rps/s, according to the formular [DEC]=[rps/s]*256*[Resolution]/15625,

Writing value(DEC) = 2*256*4096/15625= 134,convert to HEX 86

Host send:01 54 70 99 00 00 00 00 86 E4

Driver reply: 01 64 70 99 00 00 00 00 86 F4

Step2： Set “Operation mode” as 1

Host send:01 51 70 17 00 00 00 00 01 DA

Driver reply: 01 61 70 17 00 00 00 00 01 EA

Step3： Set “Control word” as F

Host send:01 52 70 19 00 00 00 00 0F EB

Driver reply: 01 52 70 19 00 00 00 00 0F FB

Step4： Set “Relative target position” as -3000 (0xFFFFF448)

Host send:01 54 70 9F 00 FF FF F4 48 9E

Driver reply: 01 64 70 9F 00 FF FF F4 48 AE

Step5： If we want to loose motor,then set “Control word” as 6.

Host send:01 52 70 19 00 00 00 00 06 E2

Driver reply: 01 62 70 19 00 00 00 00 06 F2

Operating procedure in absolute position mode

Step1： Set “Acceleration”,”Deceleration”and “Profile velocity_rpm” if it needs to be change.

Step2：Set “Operation mode” as 1.

Step3：Set “Absolute target position”

Step4：Set “Control word” as 1F,after this step, motor will run the target position.

Step5：Anytime it can change “Absolute target position” and “Profile velocity_rpm”.

Step6：Set “Control word” as 6 to disable motor (Loose the shaft) .

During Step4~Step5,if “Emergency stop”enable,motor will decelerate to stop(Use “Deceleration in emergency stop”) .If “Emergency stop” disable and “Control word” is still 1F,then motor will continue running to target position.

Example1: **Use UART port to control absolute position mode.**

Step1：Set “Acceleration” and “Deceleration” if it needs to be change.
Assume we need to set “Acceleration” as 2 rps/s, according to the formular [DEC]=[rps/s]*256*[Resolution]/15625,
Writing value(DEC) = 2*256*4096/15625= 134,convert to HEX 86
Host send:01 54 70 99 00 00 00 00 86 E4
Driver reply: 01 64 70 99 00 00 00 00 86 F4

Step2：Set “Operation mode” as 1
Host send:01 51 70 17 00 00 00 00 01 DA
Driver reply: 01 61 70 17 00 00 00 00 01 EA

Step3：Set “Absolute target position” as -3000 (0xFFFFF448)
Host send:01 54 70 9F 00 FF FF F4 48 9E
Driver reply: 01 64 70 9F 00 FF FF F4 48 AE

Step4：Set “Control word” as 1F
Host send: 01 52 70 19 00 00 00 00 1F FB
Driver reply: 01 62 70 19 00 00 00 00 1F 0B

Step5：If we want to loose motor,then set “Control word” as 6.
Host send:01 52 70 19 00 00 00 00 06 E2
Driver reply: 01 62 70 19 00 00 00 00 06 F2

5.2 Speed Mode

Speed mode’s schematic diagram is as following figure:

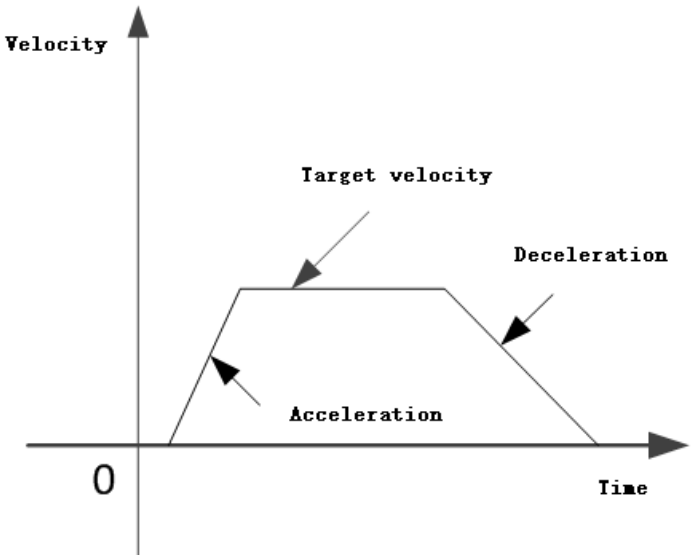


Fig.6.2-1 Speed mode with Acc/Dec

Common object for speed mode

UART /RS485 Object address [16bit]	CAN Object address [16bit][8bit] Index SubIndex	Attribute	Unit	Description
0x7017	0x606000	08S,RW,S5	DEC	Operation mode 3 Speed mode with Acc/Dec -3 Speed mode without Acc/Dec 4 Torque mode 1 Position mode
0x7019	0x604000	16S,RW	HEX	Control word 0x06 Disable 0x0F Enable 0x86 Clear error
0x7018	0x606100	08S,RO	DEC	Current operation mode
0x7001	0x604100	16U,RO	HEX	Driver status word 0x0000:Driver normal 0x0008:Driver error Details of error information refer to object address[0x7011]
0x701F	0x605A11	08U,RW	DEC	Emergency stop 1:Enable 0:Disable
0x7099	0x608300	32U,RW,S5	DEC	Acceleration U[y,x]: [DEC]=[rps/s]*256*[Resolution]/15625; [Resolution]Default:4096
0x709A	0x608400	32U,RW,S5	DEC	Deceleration U[y,x]: [DEC]=[rps/s]*256*[Resolution]/15625; [Resolution]Default:4096
0x709B	0x605A01	32U,RW,S5	DEC	Deceleration in emergency stop Valid in operation mode 3 and 1 U[y,x]: [DEC]=[rps/s]*256*[Resolution]/15625; [Resolution]Default:4096
0x70B1	0x2FF009	16S,RW	rpm	Target Velocity_rpm （Valid in operation mode 3,-3） Note:It will affect the value of object address [0x70B2]
0x70B2	0x60FF00	32S,RW	DEC	Target Velocity_DEC （Valid in operation mode 3,-3） U[y,x]: [DEC]=([rpm]*512*[Resolution])/1875;

				[Resolution]Default:4096
0x7093	0x606500	32U,RW,S5	DEC	Max. following error (Only valid in mode 1 when Kpp0 is not 0)
0x709C	0x60FB02	16S,RW,S5	DEC	Position loop speed feedforward (Valid in mode 1) Range:0~256,corresponding to 0~100%
0x7094	0x60FB01	16S,RW,S5	DEC	Kpp0, propotion gain 0 in position loop
0x70B3	0x60F901	16U,RW,S5	DEC	Kvp0,propotion gain 0 in speed loop
0x70B4	0x60F902	16U,RW,S5	DEC	Kvi0,integrator gain 0 in speed loop

Operating procedure in speed mode:

Step1： Set “Acceleration” and “Deceleration” if it needs to change.

Step2： Set “Control word” as F to enable motor.

Step3： Set “Target velocity_rpm” or “Target velocity_DEC”,then motor will accelerate to this velocity to run.

Step4： Anytime it can change “Target velocity_rpm” or “Target velocity_DEC”.

Step5： Set “Control word” as 6 to disable motor (Loose the shaft) .

During Step3~Step4,if “Emergency stop”enable,motor will decelerate to stop(Use “Deceleration in emergency stop”) .If “Emergency stop” disable and “Control word” is still F,then motor will continue running at setting target velocity.

Example 1:User UART communication to control speed mode

Step1： Set “Acceleration” and “Deceleration” if it needs to be change.
Assume we need to set “Acceleration” as 2 rps/s, according to the formular [DEC]=[rps/s]*256*[Resolution]/15625,
Writing value(DEC) = 2*256*4096/15625= 134,convert to HEX 86
Host send:01 54 70 99 00 00 00 00 86 E4
Driver reply: 01 64 70 99 00 00 00 00 86 F4

Step2： Set “Operation mode” as 3
Host send: 01 51 70 17 00 00 00 00 03 DC
Driver reply: 01 61 70 17 00 00 00 00 03 EC

Step3： Set “Control word” as F
Host send: 01 52 70 19 00 00 00 00 0F EB
Driver reply: 01 52 70 19 00 00 00 00 0F FB

Step4： Set “Target velocity_rpm” as 100 (0x64)
Host send:01 52 70 B1 00 00 00 00 64 D8
Driver reply: 01 62 70 B1 00 00 00 00 64 E8

Step5： If we want to loose motor,then set “Control word” as 6.
Host send:01 52 70 19 00 00 00 00 06 E2
Driver reply: 01 62 70 19 00 00 00 00 06 F2

Chapter 6 Alarm and Troubleshooting

There are two LED in the driver used to indicate the alarm states,one is green(PWR) and the other one is red(ALM).The different blinking times of red LED indicate different alarm information as follows:

LED state 0: “PWR” ON, “ALM” OFF

LED States	PWR	ALM
	ON ●	OFF ○
Descriptions	Driver is normal	
Troubleshooting	None	

LED state 1: “PWR” ON, “ALM” blinking 1 times

LED States	PWR	ALM
	ON ●	Blinking 1 times:●○.....●○.....
Descriptions	Communication failed or Internal error	
Troubleshooting	Check whether the “Communication protection function” is on and host didn’t send command in cycle time， or contact manufacturer.	

LED state 2: “PWR” ON, “ALM” blinking 2 times

LED States	PWR	ALM
	ON ●	Blinking 2 times:●○●○.....●○●○.....
Descriptions	Actual following error exceed the Max_following error	
Troubleshooting	1.Check whether the installation mechanical is stuck. 2.It is overload,the output current of driver or torque of motor is not enough. 2.Setting target velocity is too high. 3.Power supply’s voltage is too low for high speed.	

LED state 3: “PWR” ON, “ALM” blinking 3 times

LED States	PWR	ALM
	ON ●	Blinking 3 times:●○●○●○.....●○●○●○.....
Descriptions	Encoder signal error	
Troubleshooting	1.Check whether encoder cable is disconnect or connection sequence is wrong. 2.Encoder in the motor is broken.	

LED state 4: “PWR” ON, “ALM” blinking 4 times

LED States	PWR	ALM
	ON ●	Blinking 4 times:●○●○●○●○.....●○●○●○●○.....
Descriptions	Overload	
Troubleshooting	1.Load is too big for motor. 2.The mechanical is stuck or not smooth.	

LED state 5: “PWR” ON, “ALM” blinking 5 times

LED States	PWR	ALM
	ON ●	Blinking 5 times:●○●○●○●○●○.....●○●○●○●○●○.....

Descriptions	Driver temperature is too high(Higher than 80℃)
Troubleshooting	1.Overload too many times 2.The mechanical is stuck or not smooth. 3.Environment temperature is too high.

LED state 6: “PWR” ON, “ALM” blinking 6 times

LED States	PWR	ALM
	ON ●	Blinking 6 times:●○●○●○●○●○●○.....●○●○●○●○●○●○.....
Descriptions	Driver voltage is too high.	
Troubleshooting	1. Input voltage of driver is too high. 2. Load is big but deceleration is high.It needs to add braking resistor or reduce deceleration.	

LED state 7: “PWR” ON, “ALM” blinking 7 times

LED States	PWR	ALM
	ON ●	Blinking 7 times:●○●○●○●○●○●○●○.....●○●○●○●○●○●○●○.....
Descriptions	Driver voltage is too low.	
Troubleshooting	1.Input voltage of driver is too low. 2.Power of power supply is not big enough,its voltage is pulled down when motor is running.	

LED state 8: “PWR” ON, “ALM” blinking 8 times

LED States	PWR	ALM
	ON ●	Blinking 8 times:●○●○●○●○●○●○●○●○.....●○●○●○●○●○●○●○●○.....
Descriptions	Driver output shortcircuit.	
Troubleshooting	1.UVW is shortcircuit or motor is burned. 2.MOSFET inside driver is burned.	

LED state 9: “PWR” ON, “ALM” blinking in combination

LED States	PWR	ALM
	ON ●	Blinking in different times combination circularly.
Descriptions	Multiple types of error,refer to state 1-8.	
Troubleshooting	Refer to state 1-8.	

Appendix 1 Common Object List

Attribute descriptions:

RW—Readable and writable,RO—Read only,WO—Writ only.
DEC—Internal unit,it has different convertion formula with different unit.
Data Type：
08U—Unsigned byte,08S—Signed byte
16U—Unsigned 16bits integer,16S—Signed 16bits integer
32U—Unsigned 32bits integer,32S—Signed 32bits integer
S1,S2,… ,S8 : Sign for group of parameters for storage
S1—Communication parameters
S2—IO configuration parameters
S3—Adjusted parameters
S4—Motor parameters
S5—Control loop parameters
U[y,x]—Convertion formula for different unit.

Table F1-1 Motor Parameters

UART /RS485 Object address [16bit]	CAN Object address [16bit][8bit] Index SubIndex	Attribute	Unit	Descriptions
0x7046	0x641016	16U,RO	HEX	Current motor code
0x7031	0x641001	16U,RW,S4	HEX	Motor code setting
0x7032	0x641002	08U,RW,S4	HEX	Feedback type
0x7033	0x641003	32U,RW,S4	DEC	Encoder resolution Default:4096
0x7035	0x641005	08U,RW,S4	DEC	Motor pole pair
0x7036	0x641006	08U,RW,S4	DEC	Exciting mode
0x7037	0x641007	16S,RW,S4	DEC	Exciting current
0x7038	0x641008	16U,RW,S4	ms	Exciting time
0x7039	0x641009	16U,RW,S4	0.1A	Motor IIt current
0x703A	0x64100A	16U,RW,S4	S	Motor IIt time
0x703B	0x64100B	16U,RW,S4	0.1A	Motor max. current
0x7043	0x641013	08U,RW,S4	DEC	Motor rotation direction
0x704A	0x64101A	16U,RW,S4	rpm	Motor rated speed
0x704B	0x64101B	16U,RW,S4	W	Motor rated power
0x704F	0x64101F	16S,RW,S4	Degree	Motor hall angle

Table F1-2 Basic Mode and Control

UART /RS485 Object address [16bit]	CAN Object address [16bit][8bit] Index SubIndex	Attribute	Unit	Descriptions
0x7017	0x606000	08S,RW,S 5	DEC	Operation mode 3 Speed mode with Acc/Dec -3 Speed mode without Acc/Dec 4 Torque mode 1 Position mode
0x7019	0x604000	16S,RW	HEX	Control word 0x06 Disable 0x0F Enable 0x86 Clear error
0x7018	0x606100	08S,RO	DEC	Current operation mode
0x7001	0x604100	16U,RO	HEX	Driver status word 0x0000:Driver normal 0x0008:Driver error Details of error information refer to object address[0x7011]
0x7011	0x260100	16U,RO	HEX	Driver error code 1 *Each bit indicates one error as shown in follows: BIT[0]:Internal error BIT[1]:Encoder ABZ signal error BIT[2]: Encoder UVW signal error BIT[3]:Encoder counting error BIT[4]:Driver temperature too high BIT[5]:Driver bus voltage too high BIT[6]:Driver bus voltage too low BIT[7]:Driver output short-circuit BIT[8]:Braking resistor temperature too high BIT[9]:Following error over-range BIT[10]:Reserved BIT[11]:I²*T error(Overload) BIT[12]:Speed following error over-range BIT[13]:Motor temperature too high BIT[14]:Searching motor failed (Communication encoder) BIT[15]:Communication failed
0x701F	0x605A11	08U,RW	DEC	Emergency stop 1:Enable 0:Disable
0x7091	0x607A00	32S,RW	DEC	Target position in absolute positioning

				（Valid in operation mode 1）
0x709F	0x607B00	32S,RW	DEC	Target position in relative positioning （Valid in operation mode 1）
0x7098	0x608100	32U,RW,S5	DEC	Profile Velocity_DEC （Valid in operation mode 1） U[y,x]: [DEC]=([rpm]*512*[Resolution])/1875; [Resolution]Default:4096
0x709D	0x608200	16U,RW,S5	rpm	Profile velocity_rpm （Target speed in operation mode 1） Note:This object will affect the value of object[0x7098]
0x7099	0x608300	32U,RW,S5	DEC	Acceleration U[y,x]: [DEC]=[rps/s]*256*[Resolution]/15625; [Resolution]Default:4096
0x709A	0x608400	32U,RW,S5	DEC	Deceleration U[y,x]: [DEC]=[rps/s]*256*[Resolution]/15625; [Resolution]Default:4096
0x709B	0x605A01	32U,RW,S5	DEC	Deceleration in emergency stop Valid in operation mode 3 and 1 U[y,x]: [DEC]=[rps/s]*256*[Resolution]/15625; [Resolution]Default:4096
0x70B1	0x2FF009	16S,RW	rpm	Target Velocity_rpm （Valid in operation mode 3,-3） Note:It will affect the value of object address [0x70B2]
0x70B2	0x60FF00	32S,RW	DEC	Target Velocity_DEC （Valid in operation mode 3,-3） U[y,x]: [DEC]=([rpm]*512*[Resolution])/1875; [Resolution]Default:4096
0x70E1	0x60F608	16S,RW	DEC	Output current （Setting output current for operation mode 4） U[y,x]:[DEC]=[Arms]*1.414*2048/Driver max. output current L2DB4830 max. output current is 33Ap
0x70E2	0x607300	16U,RW	DEC	Output current limit （Valid in all operation mode） U[y,x]:[DEC]=[Arms]*1.414*2048/ Driver max. output current L2DB4830 max. output current is 33Ap
0x70B8	0x608000	16U,RW,S5	rpm	Max. speed_rpm Setting maximum speed in all operation mode

0x7093	0x606500	32U,RW,S 5	DEC	Max. position following error (Valid in operation mode 1 when “Kpp” is not 0)
0x8088	0x60FB88	08U,RW,S 5	DEC	Position compensation for operation mode 3: 0:Disable, 1:Enable Default:0
0x709C	0x60FB02	16S,RW,S 5	DEC	Position loop speed feedforward (Valid in mode 1) Range:0~256,corresponding to 0~100%
0x7094	0x60FB01	16S,RW,S 5	DEC	Kpp0, propotion gain 0 in position loop
0x70B3	0x60F901	16U,RW,S 5	DEC	Kvp0,propotion gain 0 in speed loop
0x70B4	0x60F902	16U,RW,S 5	DEC	Kvi0,integrator gain 0 in speed loop
0x70AC	0x607C02	08U,RW	DEC	Clear actual position Set 1 to clear “Actual position” when motor is disable
0x701C	0x500050	08U,RW,S 5	DEC	Noise reduction at zero speed Default：0 0：Disable 1：Enable
0x701D	0x500051	16U,RW,S 5	mS	Noise reduction delay time for enable Default：500
0x7004	0x300015	16U,RW,S 3	℃	Max. temperature for driver over-temperature protection

Table F1-3 Measurement Data

UART /RS485 Object address [16bit]	CAN Object address [16bit][8bit] Index SubIndex	Attribute	Unit	Descriptions
0x7071	0x606300	32S,RO	DEC	Actual position
0x7075	0x60F918	16S,RO	1rpm	Actual speed_rpm Sampling cycle can be changed in object 0x7079 Resolution:1rpm
0x7076	0x60F919	32S,RO	0.001rpm	Actual speed_0.001rpm Sampling cycle can be changed in object 0x7079 Resolution:0.001rpm
0x7079	0x60F91A	16U,RW,S5	ms	Sampling cycle for actual speed Default:30
0x7077	0x606C00	32S,RO	DEC	Actual speed_DEC Sampling cycle is 250uS [DEC]=([rpm]*512*[Resolution])/1875; [Resolution]Default:4096 Note:the value vibration is big because sampling cycle is too short.
0x7072	0x607800	16S,RO	DEC	Actual current_Iq [DEC]=[Arms]*1.414*2048/I_MAX Note:For L2DB4830 series，I_MAX=33；
0x7007	0x60F632	16U,RO	mA	Motor actual IIt current
0x5001	0x60F712	16S,RO	V	Actual DC bus voltage Resolution:1V
0x7002	0x60F70B	16S,RO	℃	Driver actual temperature
0x7092	0x60F400	32S，RO	DEC	Actual position following error

Table F1-4 IO Port Setting

UART /RS485 Object address [16bit]	CAN Object address [16bit][8bit] Index SubIndex	Attribute	Unit	Descriptions
0x5100	0x20100A	16U,RO	BIT	Actual states of digital input(Hardware states) BIT[0]—DIN1_State BIT[1]—DIN2_State … BIT[7]—DIN8_State The corresponding bit will be set 1 when DINx is valid,or it will be set 0
0x5102	0x201001	16U,RO, S2	BIT	Digital input polarity setting BIT[0]—DIN1_Polarity BIT[1]—DIN2_Polarity … BIT[7]—DIN8_Polarity DIN[x+1] polarity is negation when BIT[x] is set as 0 Default：0x00ff
0x5101	0x201002	16U,RW	BIT	Digital input simulate BIT[0]—DIN1_Simulate BIT[1]—DIN2_Simulate … BIT[7]—DIN8_Simulate DIN[x+1] is valid when BIT[x] as 1

Table F1-5 Communication Parameters

UART /RS485 Object address [16bit]	CAN Object address [16bit][8bit] Index SubIndex	Attribute	Unit	Descriptions
0x1005	0x2FE001	08U,RW ,S1	DEC	UART baudrate setting Setting value: 3 → 19200; 4 → 38400; 5 → 56000; 6 → 57600; 7 → 115200 It must save and reboot driver. Default:7
0x100C	0x65100F	08U,RW ,S1	DEC	RS485/CAN ID Activate when DIP switch SW3 set as OFF Default:17

0x3010	0x410010	08U,RW,S1	DEC	Communication loss protection 0:Disable 1:Enable Default:depend on different model
0x3011	0x410011	32U,RW,S1	mS	Communication loss delay time Default:600
	0x470001	08U,RW	DEC	Simple PDO function 0：Disable 1：Enable TXPDO1（Auto-upload “Actual position” and “Actual velocity_0.001rpm”） Default：0
	0x180003	16U,RW	mS	TX-PDO1 prohibit time Default:10ms

Table F1-6 Parameters Storage

UART /RS485 Object address [16bit]	CAN Object address [16bit][8bit] Index SubIndex	Attribute	Unit	Descriptions
0x3061	0x2FE501	08U,RW	DEC	Save group S1 parameters 1:Save
0x3062	0x2FE502	08U,RW	DEC	Save group S2 parameters 1:Save
0x3063	0x2FE503	08U,RW	DEC	Save group S3 parameters 1:Save
0x3064	0x2FE504	08U,RW	DEC	Save group S4 parameters 1:Save
0x3065	0x2FE505	08U,RW	DEC	Save group S5 parameters 1:Save

Table F1-7 Driver Attribute

UART /RS485 Object address [16bit]	CAN Object address [16bit][8bit] Index SubIndex	Attribute	Unit	Descriptions
0x103A	0x30003A	32U,RO	ASCII	Driver mode 1 - series Default:L2DB
0x103B	0x30003B	32U,RO	ASCII	Driver mode 2 – voltage and current Default:4830
0x103C	0x30003C	32U,RO	ASCII	Driver mode 3 - communication Default: RS485:CAFR CAN:CAFC
0x103D	0x30003D	32U,RO	ASCII	Driver mode 4 – software version Default: For 7Nm motor:ASL3 = 0x41534C33 For 10Nm motor:ASM4 = 0x41536D34 For 15Nm motor:ASM5 = 0x41536D35
0x1007	0x2500F1	32U,RO	DEC	Firmware date Format:20190114 Year: 2019 Month: 01 Day: 14
0x1009	0x2500F3	32U,RO	ASCII	Hardware version

Table F1-8 Additional Functions

UART /RS485 Object address [16bit]	CAN Object address [16bit][8bit] Index SubIndex	Attribute	Unit	Descriptions
0x802F	0x500020	08U,RW,S5	DEC	Sstop function 0:Disable 1:Enable Default:0 It is used to limit driver output current when motor is in zero speed.
0x8028	0x500028	32U,RW,S5	DEC	Sstop current limit U[y，x]： [DEC]=[Arms]*1.414*2048*256/I_MAX Note:L2DB4830 series，I_MAX=33； Default： L2DB4830 series：10485 (0.467Arms)
0x8002	0x500002	32U,RW,S5	DEC	S curve start point at decelerating U[y,x]: [DEC]=([rpm]*512*[Resolution])/1875; [Resolution]Default:4096 Default:5rpm
0x8004	0x500004	16U,RW,S5	DEC	Time for S curve Default:64

Appendix 2 Error Code

For UART/RS485 communication,there is one byte(ErrR) in reply string used to indicate error code.Every bit in this byte indicate different error.When the bit is 0,it means no error,when the bit is 1,it means this error activates

ErrR	**Descriptions**	**Behavior of driver and motor**
bit0: [LSB]	Communication loss (Note:this alarm is only valid when enable “Communication loss function”)	Driver cut off output current,motor shaft released
bit1:	Following error over-range	Driver cut off output current,motor shaft released
bit2:	Encoder error	Driver cut off output current,motor shaft released
bit3:	Motor overload	Driver cut off output current,motor shaft released
bit4:	Driver temperature too high	Driver cut off output current,motor shaft released
bit5:	DC bus voltage too high	Driver cut off output current,motor shaft released
bit6:	DC bus voltage too low	Driver cut off output current,motor shaft released
bit7: [MSB]	Driver output shor-circuit	Driver cut off output current,motor shaft released