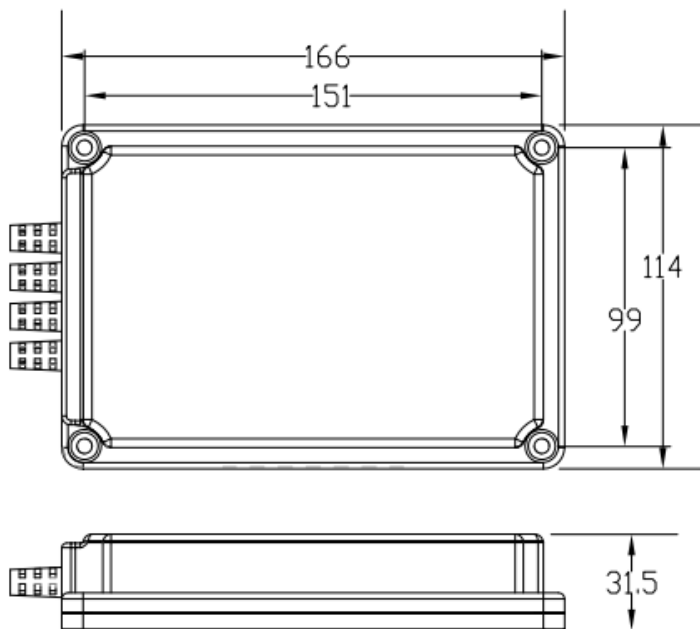


MXES-500W Specifications

1.1 Controller Dimensions

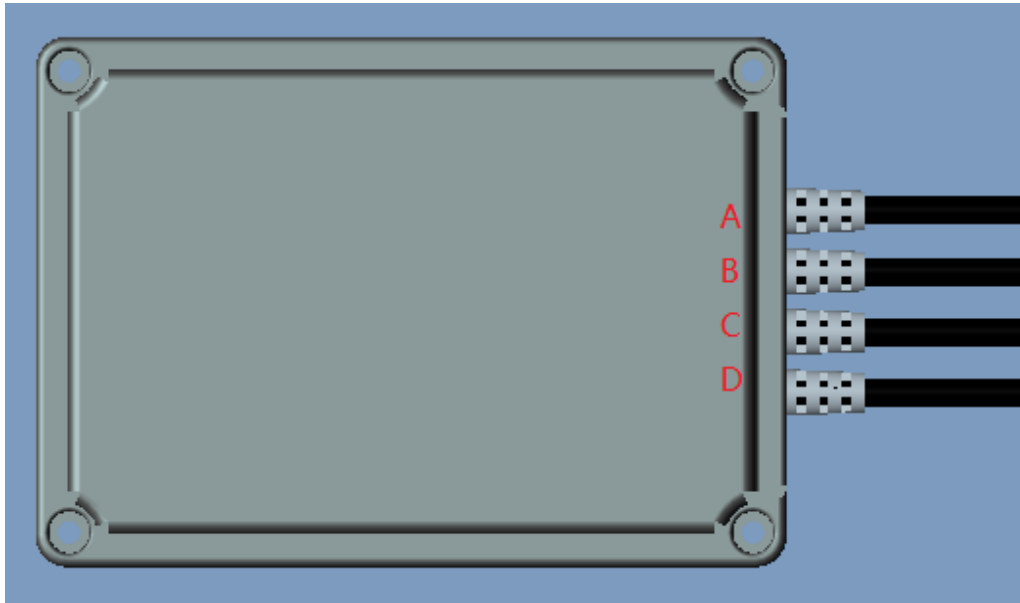


1.2 Controller Specifications

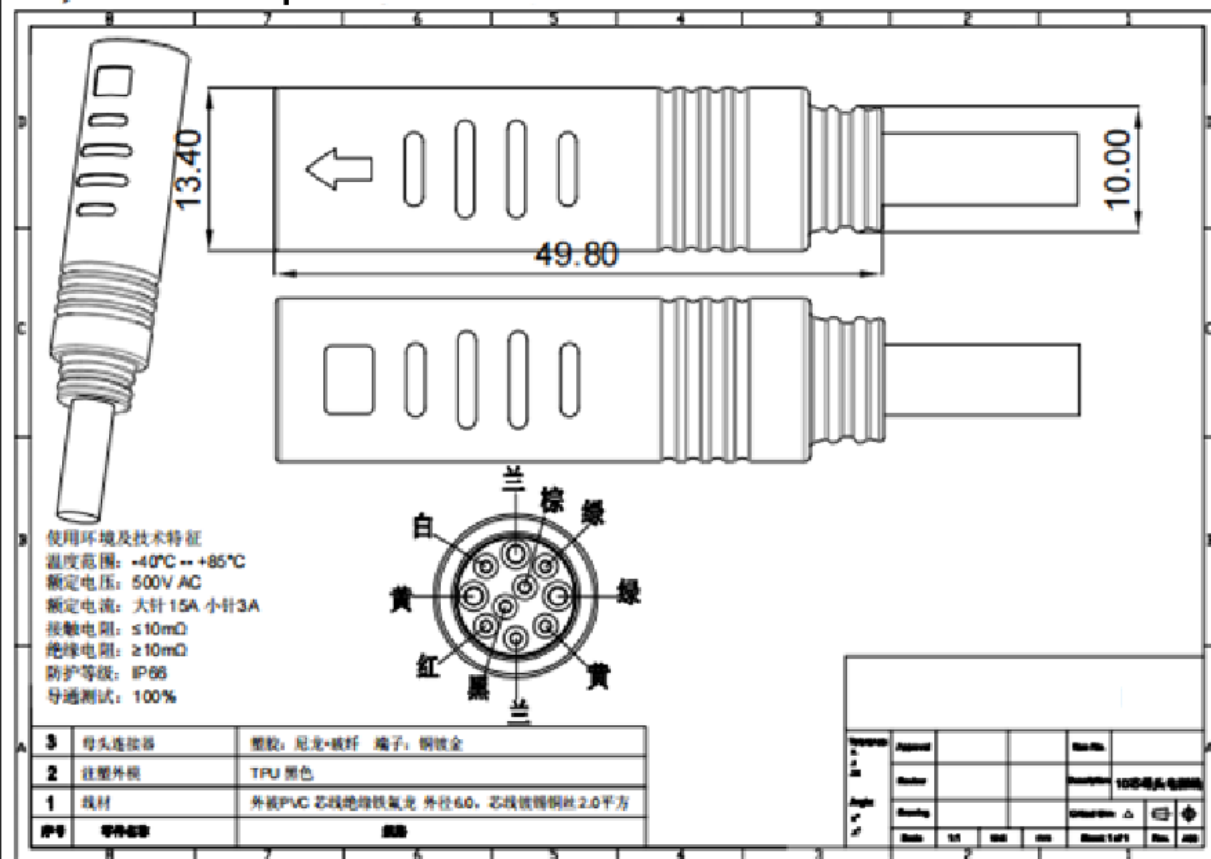
Model Number			MXES-W100100D120HN-V1
Rated Values	Continuous Output Current		M1:40A
			M2:40A
	Main Circuit	Input Voltage Range (V)	20~60V
		Maximum Output Current (A)	40A
Specification	Control Method		SVPWM sinusoidal current control
	Feedback		Hall sensor, Incremental Encoder
	Operating Conditions	Controller Protection Temperature	-25~+90℃
		Storage Temperature	-25~+55℃
		Operating/Storage Humidity	<90% RH (non-condensing)
		Vibration / Shock Resistance	4.9m/s ² / 19.6m/s ²
		Protection Level	IP67
	Protection Functions		Over-current, Over-load, Under-voltage, Over-voltage, Over-temperature
	Throttle Input	Voltage Range:	0~5 V

2. Signals and Wiring

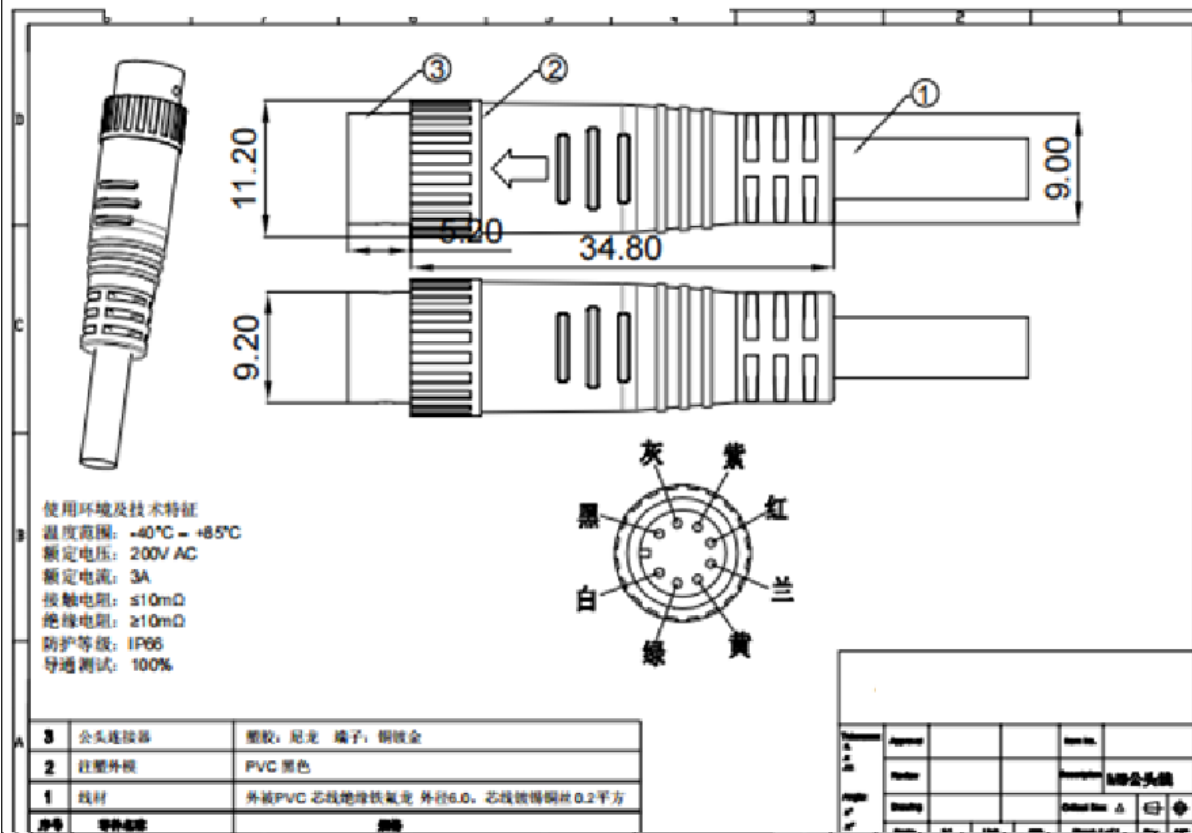
2.1 Wiring Instructions



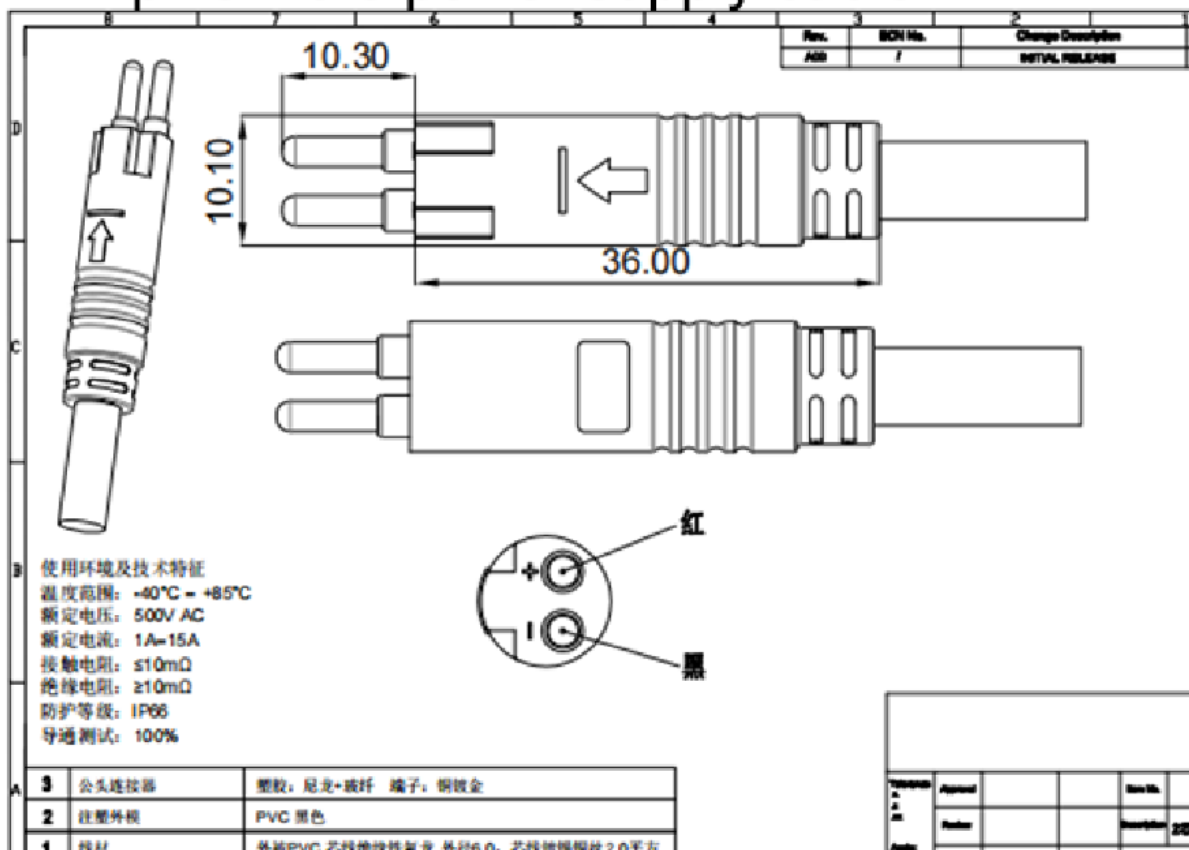
A, D: 10 pins motor cable



B: 8 pins male signal cable



C:2 pins male power supply cable



2.2 wire Signal Definitions: Different control way, the wires definition and function may be different.

2 pins male power supply cable (C) Length: 650mm		
Color	Definition	Mark
Red	B+ (battery)	
Black	B- (battery)	

8 pins signal cable (B) Length:1550mm		
Control Method: throttle		
Color	Definition	Mark
White	TX (PC program)	
Green	RX (PC program)	
Yellow	Power lock (connect to GND)	
Blue	Speed signal	
Red	5V	
Purple	Reverse signal (connect to GND)	
Gray	Brake signal (connect to GND)	
Black	GND	

8 pins signal cable (B) Length: 1550mm		
Controller Method: RS485		
Colo	Definition	mark
Whit	TX (PC PROGRAM)	
Gree	RX (PC PROGRAM)	
Blue	Power lock (connect to GND)	
Yell	Spare	
Red	RS485-A	
Purp	RS485-B	
Gray	Spare	
Blac	GND	

8 pins signal cable (B) Length: 1550mm		
Controller Method: CAN		
Colo	Definition	Mark
Whit	TX (PC PROGRAM)	
Gree	RX (PC PROGRAM)	
Blue	Power lock (connect to GND)	
Red	Spare	
Yell	CAN-H	
Gray	CAN-L	
Purp	Spare	
Blac	GND	

10 pins signal wire(A、D) Length: 400mm		
Regular signal wire		
Color	Definition	Mark
Yello	Motor phase cable	
Green	Motor phase cable	
Blue	Motor phase cable	
Red	Motor hall sensor 5V	
Black	Motor hall sensor GND	
Yello	Motor hall sensor signal wire	
Green	Motor hall sensor signal wire	
Blue	Motor hall sensor signal wire	
Brown	EMB (optional)	
White	EMB (optional)	

10 pins signal wire(A、D)Length: 400mm		
Encoder		
Color	Definition	Mark
Yellow	Motor phase cable	
Green	Motor phase cable	
Blue	Motor phase cable	
Red	Motor hall sensor 5V	
Black	Motor hall sensor GND	
Yellow	Motor hall sensor signal wire	
Green	Motor hall sensor signal wire	
Blue	Motor hall sensor signal wire	
Brown	Encoder A	
White	Encoder B	

10 pins signal wire(A、D) Length: 400mm		
EMB and Encoder		
Color	Definition	Mark
Yellow	Motor phase cable	
Green	Motor phase cable	
Blue	Motor phase cable	
Red	Motor hall sensor 5V	
Black	Motor hall sensor GND	
Yellow	Motor hall sensor signal wire	
Green	Motor hall sensor signal wire	
Blue	Motor hall sensor signal wire	
Orange	Encoder A	
White	Encoder B	
Brown	EMB (optional)	
Purple	EMB (optional)	

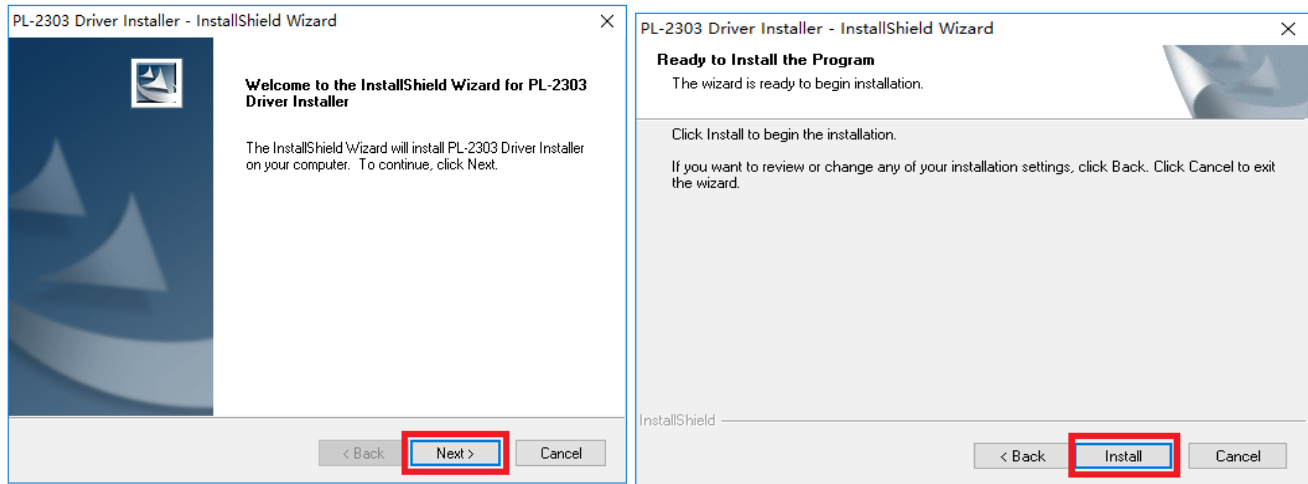
10 pins signal wire(A、D) Length: 400mm		
EMB and Encoder		
Color	Definition	Mark
Yellow	Motor phase cable	
Green	Motor phase cable	
Blue	Motor phase cable	
Red	Motor hall sensor 5V	
Black	Motor hall sensor GND	
Yellow	Motor hall sensor signal wire	
Green	Motor hall sensor signal wire	
Blue	Motor hall sensor signal wire	
Orange	Encoder A	
White	Encoder B	
Brown	EMB (optional)	
Purple	EMB (optional)	

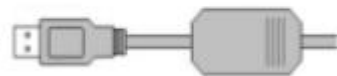
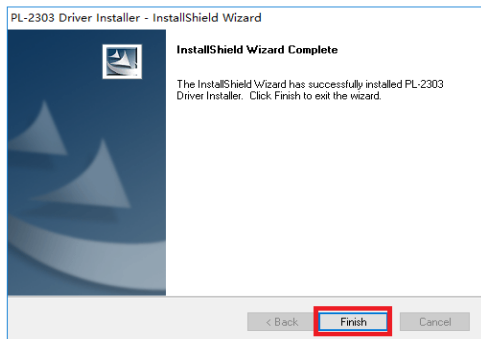
3. PC Programming & Testing

3.1 Programmer Driver Installation

Open the “Driver Files” folder and select the appropriate driver version (example: Windows 10).

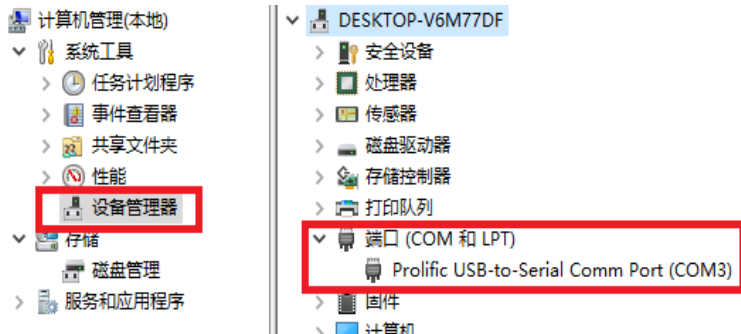
Double-click  **USB-to-Serial Comm Port.exe** the installer to complete driver installation.





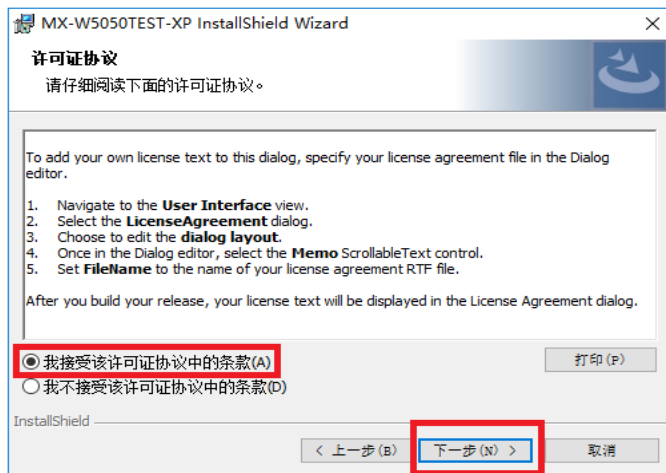
Programming USB cable

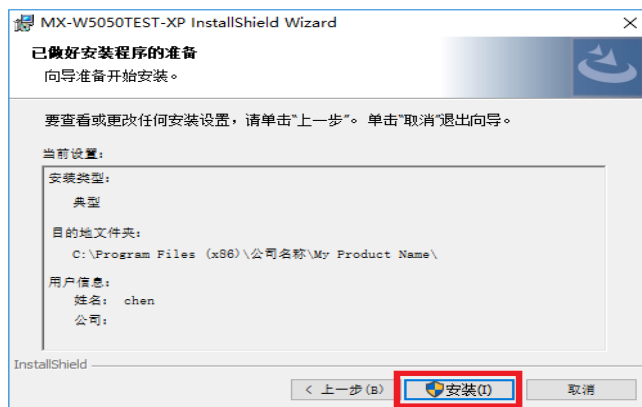
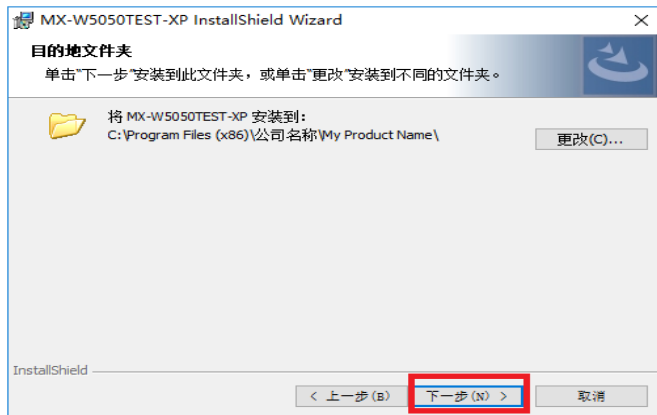
After installation, connect the programmer to the PC via USB and check in Device Manager to confirm the COM port is recognized. (Note: COM port number varies depending on PC.)



3.2 Programming Software Installation

Open the “Programming Files” folder and double-click “setup.exe” to install the software.





3.3 Software Description

Operation Steps

1. Connect the PC, programmer, controller, motor, and power supply, then power on the controller.
2. On the desktop,  double-click the shortcut to open the programming interface.

Display Parameter

VdcBus: 48.96413 V CurrentBus: 0 A Throttle: 0.01981235 V Controller: 21 °C

Brake status: disable Fault: Can

Motor1

Speed: 0 kr/min MotorCurrent: 0.6900134 A

Temperature: 0 °C

Set Parameters

MaxCur_P: 100 MaxCur_P: 100 OverCur_1: 80 Type: ☐ Analog ☒ RS485 ☐ CAN RS485 Address: 1 Baud: 115200

MaxVol: 60 MinVol: 21 OverCur_Tim: 60 ☐ Remote ☒ Rocker

Kp_Ida: 0 Ki_Ida: 0 Tim_max1: 10 Can Driver_Send ID(hsa): 18018001 Baud: 500 X

Kp_Spd: 1000 Ki_Spd: 2000 SF_Tim_max1: 0.5 Driver_Receive ID(hsa): 18018000 ☐ Standard ☒ Expand

ListMaxCov: 1 ListMaxCov: 1 Send interval time: 100 ms

volHkres: 55 RateSpeed: 1500

Communication disconnected

Drive downtime: 1.5 s

Motor Brake

☐ Enable Keep_val: 12 V ☐ AUTOWELD

Delay: 2 s Pick-up_val: 20 V

Motor2

Speed: 0 kr/min MotorCurrent: 0.7324219 A

Temperature: 0 °C

Set Parameters

MaxCur_P: 100 MaxCur_P: 100 OverCur_1: 80 Type: ☐ Analog ☒ RS485 ☐ CAN RS485 Address: 1 Baud: 115200

MaxVol: 60 MinVol: 21 OverCur_Tim: 60 ☐ Remote ☒ Rocker

Kp_Ida: 0 Ki_Ida: 0 Tim_max1: 10 Can Driver_Send ID(hsa): 18018001 Baud: 500 X

Kp_Spd: 1000 Ki_Spd: 2000 SF_Tim_max1: 0.5 Driver_Receive ID(hsa): 18018000 ☐ Standard ☒ Expand

ListMaxCov: 1 ListMaxCov: 1 Send interval time: 100 ms

Communication disconnected

Drive downtime: 1.5 s

Motor Brake

☐ Enable Keep_val: 12 V ☐ AUTOWELD

Delay: 2 s Pick-up_val: 20 V

Motor Parameter

Pair: 10 Plus_Volts: 0.1944241

Loq_M: 0.0003699936 Rs_Ohm: 0.10232

Led_M: 0.0003699936

Control Parameter

Motor1

Ref_A: 0 A

SpeedRef_type: 0.0 Start

Motor2

Ref_A: 0 A

SpeedRef_type: 0.0 Start

Serial Port: COM10

Baud Rate: 38400

Parity: None

Data Bits: 8

Stop Bits: 1

Close serial port

Parameter setting

Set

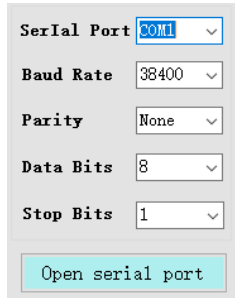
Save

Firmware upgrade

Start upgrade

Exit

3. Serial Port Settings (notes: the COM number may be different)



A screenshot of a serial port configuration window. It contains five dropdown menus for 'Serial Port' (COM1), 'Baud Rate' (38400), 'Parity' (None), 'Data Bits' (8), and 'Stop Bits' (1). At the bottom is a light blue button labeled 'Open serial port'.

Serial Port	COM1
Baud Rate	38400
Parity	None
Data Bits	8
Stop Bits	1

Open serial port

4. Click **“Open serial port”** to establish communication.

● Display Parameter

Display Parameter											
VdcBus:	0	V	CurrentBus:	0	A	Throttle:	0	V	Controller:	0	℃
Brake status:	0		Fault:	0							
Motor1						Motor2					
Speed:	0	kr/min	MotorCurrent:	0	A	Speed:	0	kr/min	MotorCurrent:	0	A
Temperature:	0	℃				Temperature:	0	℃			

Parameter	Description
VdcBus	Power Supply Voltage
CurrentBus	Bus Current
Throttle	Throttle Voltage
Controller	Controller Temperature
Brake status	Brake Status
Fault	Refer to “Controller Fault Information Table 1-1”
Speed	Motor 1 Speed (rpm)
MotorCurrent	Motor 1 Phase Current
Temperature	Motor 1 Temperature (Reserved)
Speed	Motor 2 Speed (rpm)
MotorCurrent	Motor 2 Phase Current
Temperature	Motor 2 Temperature (Reserved)

● Set Parameter

Type

☒ Analog
 ☐ RS485
 ☐ CAN
 ☐ Remote
 ☐ Rocker

RS485

Address:

Baud:

Can

Driver_Send ID(hex): Baud: K

Driver_Receive ID(hex):

Send interval time: ms

Standrad ☐ Expand ☒

Communication disconnected

Drive downtime: S

Type	
Analog	Analog Control
RS485	RS485 Control
CAN	CAN Control
Remote	Remote Controller
Rocker	Joystick Control

RS485	
Address:485 address	Baud: 485 Baud rate

CAN	
Baud	CAN Baud Rate
DriverSend ID	Driver Send ID
DriverSend ID	DriverSend ID
Send interval time	Data Sending Interval (ms)
Standrad	Standard Frame
Expand	Extended Frame
Communication disconnected	
Drive downtime	Motor Delay Shutdown Time on Communication Error (s)

Set Parameter

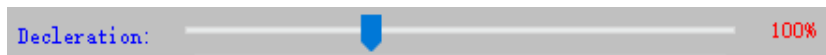
Maxcur_bus:	100	Maxcur_P:	100	OverCur_I:	80
Maxvol:	60	Minvol:	21	OverCur_Tim:	60
Kp_Idq:	0	Ki_Idq:	0	Tim_maxI:	10
Kp_Spd:	1000	Ki_Spd:	2000	SF_Tim_maxI:	0.5
LimtMaxSCw:	1	LimtMaxSCw:	1		
volBRres:	55	RateSpeed:	1500		

Maxcur_bus	Maximum Bus Current
Maxcur_P	Maximum Phase Current
Maxvol	Maximum Input Voltage
Minvol	Minimum Input Voltage
Kp_Idq	Kp of Id/Iq Loop (Reserved)
Ki_Idq	Ki of Id/Iq Loop (Reserved)
Kp_Spd	Speed Loop Kp
Ki_Spd	Speed Loop Ki

LimtMaxSCw	Forward Speed Limit
LimtMaxSCcw	Reverse Speed Limit
volBRres	Brake Voltage
RateSpeed	Maximum Speed
OverCur_I	Overcurrent Threshold
OverCur_Tim	Overcurrent Duration
Tim_maxI	Maximum Current Duration
SF_Tim_maxI	Current Reduction Ratio After Maximum Current Duration



Accel : adjust acceleration



Decleration: adjust deceleration

 A configuration panel for "Motor1" with a grey background. It contains two main sections: "Mode" and "Direction". The "Mode" section has three radio buttons: "Torque", "Speed" (which is selected), and "Position". The "Direction" section has two radio buttons: "Forward" (which is selected) and "Reversal". Below these is a "SensorType" section with three radio buttons: "hallLess", "hall" (which is selected), and "Encoder".

Motor1			
Parameter	Description	Parameter	Description
Mode	Working Mode	Reversal	Reverse Rotation
Torque	Torque Mode	SensorType	Sensor Type
Speed	Speed Mode	hallLess	Sensorless (No Hall)
Position	Position Mode (Reserved)	hall	Hall Sensor
Direction	Motor Rotation Direction	Encoder	Encoder
Forward	Forward Rotation		

Motor2

Mode

☐ Torque ☒ Speed ☐ Position

Direction

☒ Forward ☐ Reversal

SensorType

☐ hallLess ☒ hall ☐ Encoder

Motor2			
Parameter	Description	Parameter	Description
Mode	Working Mode	Reversal	Reverse Rotation
Torque	Torque Mode	SensorType	Sensor Type
Speed	Speed Mode	hallLess	Sensorless (No Hall)
Position	Position Mode (Reserved)	hall	Hall Sensor
Direction	Motor Rotation Direction	Encoder	Encoder
Forward	Forward Rotation		

Encoder
 Pair: ☐ AB_swap

Encoder	
Pair	Encoder Pole Pairs
AB_swap	Encoder A/B Phase Swap

Motor Brake
☐ Enable Keep_vol: V ☐ AUTOHOLD
 Delay: s Pick-up_vol: V

Motor Brake: EMB brake setting	
Enable	Brake Enable
Delay	Brake Release Delay Time
Keep_vol	Brake Holding Voltage
Pick-up_vol	Brake Pickup Voltage
AUTOHOLD	Auto Hold Function (Enable for Hill Hold Assist)

Motor Parameter

Pair: Flux_VpHz:

Lsq_H: Rs_Ohm:

Lsd_H:

Motor Parameter	
Pair	Motor Pole Pairs
Flux_VpHz	Back EMF Constant (V/Hz)
Lsq_H	Motor Inductance Lsq (H)
Lsd_H	Motor Inductance Lsd (H)
Rs_Ohm	Motor Phase Resistance (Ω)

Motor ID

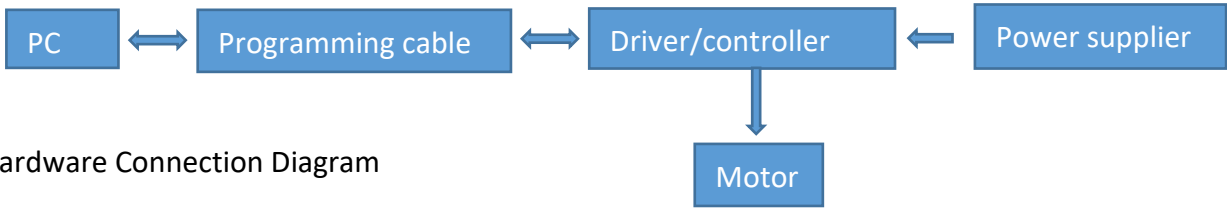
Rs_Current: Ls_Current:

R/L(Hz):

Motor ID	Data Upate	Hall ID
Data Updata	click to save motor data	click to get hall sensor data

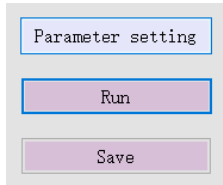
3.4 Example Operation of PC programming software

1.Hareware connection



Hardware Connection Diagram

3.4.1 Parameter Settings



Operating Steps:

- ◆ Connect PC, programmer, controller, motor, and power; power on controller.

◆ Locate the shortcut icon on the desktop  and double-click it to open the programming interface as shown above.

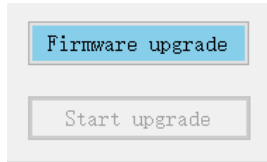
- ◆ Select the COM port (the COM number may differ on different computers).
- ◆ Click “Open serial port” to open the communication port.
- ◆ under “Parameter setting,click “Set” to modify parameters.
- ◆ click “Save”to save parameters.
- ◆ Click “Run”to exit parameter mode.

3.4.2 Motor & Controller Matching

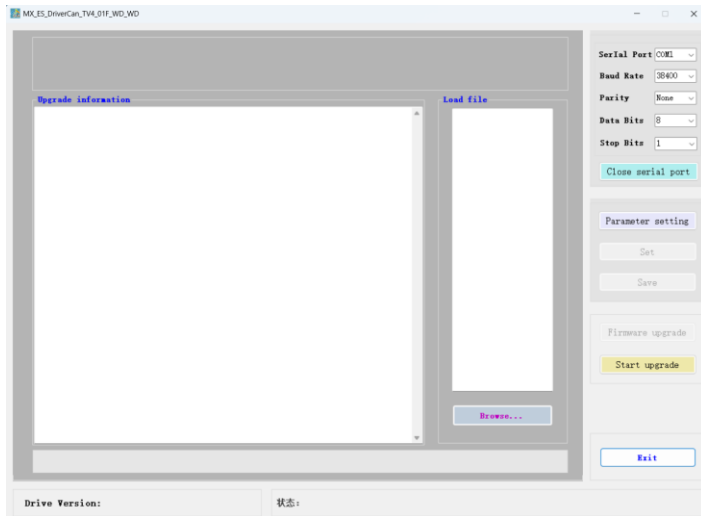


- ◆ When the controller and the PC are communicating correctly (both motors must be connected to the controller) , Click “Motor ID” to perform motor identification. After a short moment, the M2 motor will rotate (only one motor will rotate.If severe vibration or abnormal rotation occurs, switch off the power immediately). Wait for the motor to stop automatically.
- ◆ Then click “Data Update” to write the identified motor parameters into the controller.
- ◆ Click “Hall ID” to perform Hall angle identification

3.4.3 Firmware upgrade/changing



- ◆ Click “Parameter setting”,it will show firmware upgrade window.



- ◆ Click “browse “and select the firmware xxx.bin file.

- ◆ Click “Start upgrade” to upload the new firmware。

image 4-4-4

Appendix — Fault Code Table 1-1

Code	Description	Code	Description
0	Normal	16	Motor 1 Phase Loss
1	Controller Fault	17	Motor 2 Brake Fault
2		18	Motor 1 Brake Fault
3		19	Motor 2 Encoder Fault
4		20	Motor 1 Encoder Fault
5	Over-current	21	Motor 2 Over-temperature
6	Over-voltage	22	Motor 1 Over-temperature
7	Under-voltage	23	Motor 2 Hall Sensor Fault
8	Over-temperature	24	Motor 1 Hall Sensor Fault
9	—	25	Motor 2 Stall
10	—	26	Motor 1 Stall
11	Motor 2 Overspeed	27	UART Communication Fault
12	Motor 1 Overspeed	28	RS485 Communication Fault
13	Motor 2 Overload	29	CAN Communication Fault
14	Motor 1 Overload	30	Joystick Fault
15	Motor 2 Phase Loss	31	Throttle Fault