1 Software (Servofly) operation instructions

1.1Communication

خواهشمندست، فقط از بخش هایی از نرم افزار که به کاربر پیشنهاد شده است استفاده نمایید , استفاده غیر اصولی از نرم افزار باعث آسیب سخت و نرم افزاری در سیستم سروُ می شود. (لطفاً دقیق مطالعه نمایید.)

⑴Connect servo drive with PC through serial cable.

⑵ Click "Servofly.exe" and select the COM menu, click the defined COM port **(can be modified by PC).**

⑶ The communication succeeds as the following dialog appears.

⑷ The communication fails as the following dialog appears, please check the wiring.

⑸ The communication fails as the following dialog appears, it indicates that the software version does not match, please select Pn-0 to check the version information, and download the right software on our website.

1.2Basic function

⑴Customers can use the basic function of the software in the "File" menu.

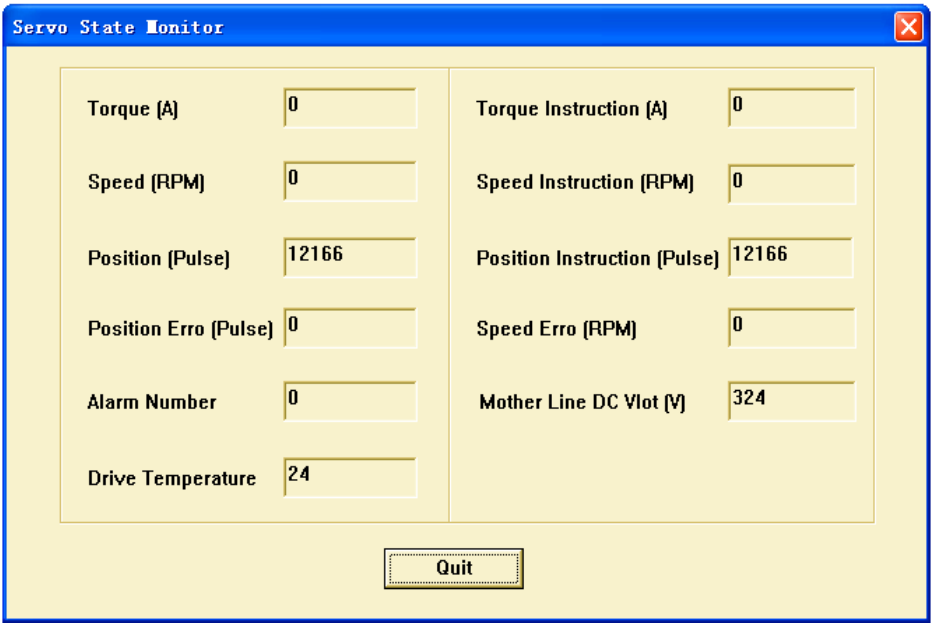
⑵Function

Item	Function
Load Default	Restore default parameters (equal with “EE-Def” in panel operation)
Save to EEPROM	Save the current parameters to EEPROM
Parameters Setting…	Parameter setting
Parameters Upload…	Upload the parameters from servo drive to PC (please name the parameter file as “xx.par”, otherwise the operation would be invalid)
Parameters Download…	Download the parameters from PC to servo drive(only “.par” file is acceptable, and the different firmware edition's parameter cannot mix use)
Exit	Exit the software

1.3Monitoring function

1 .Monitoring the servo state

⑴ “Servo State” choice under the “Monitor” menu is the monitoring choice of the servo state.



⑵ Function

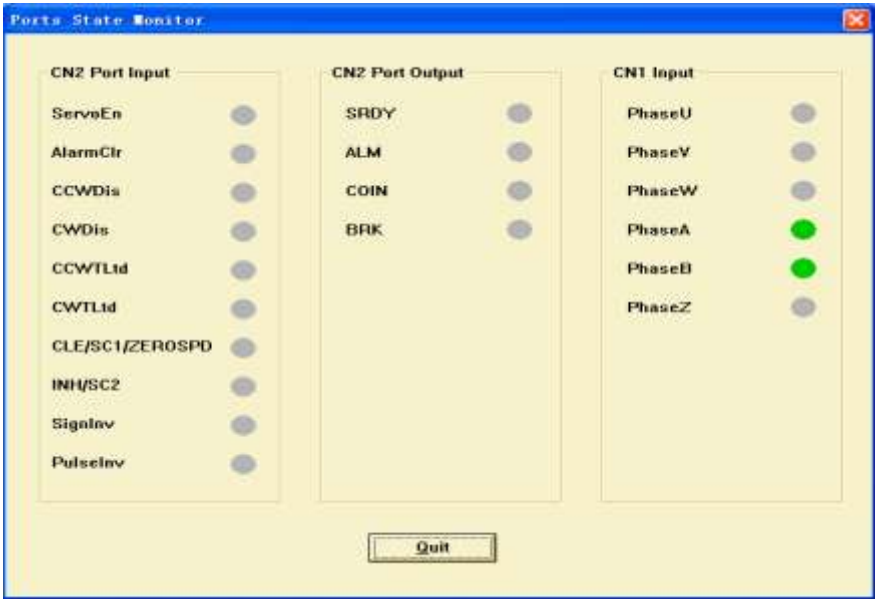
Item	Function
Torque(A)	Motor Q axis current（the value divided by 1.414 is motor current）
Torque Instruction(A)	Motor Q axis current command （the value divided by 1.414 is motor current command）
Speed(RPM)	Motor speed（this is a real time value ）
Speed Instruction(RPM)	Speed command
Position(Pulse)	Feedback pulse
Position Instruction(Pulse)	Pulse command
Position Error(Pulse)	Position deviation (pulse command minus feedback pulse)
Speed Error(Pulse)	Speed deviation（this is a real time value）
Alarm Number	Alarm code(“0” means no alarm）
Mother Line DC Volt (V)	Mother line DC voltage
Drive Temperature	The temperature of the heat sink inside part

2 .Physical port status monitoring function

⑴ The “Physical State” item under the “Monitor” menu is for the physical port status monitoring function.

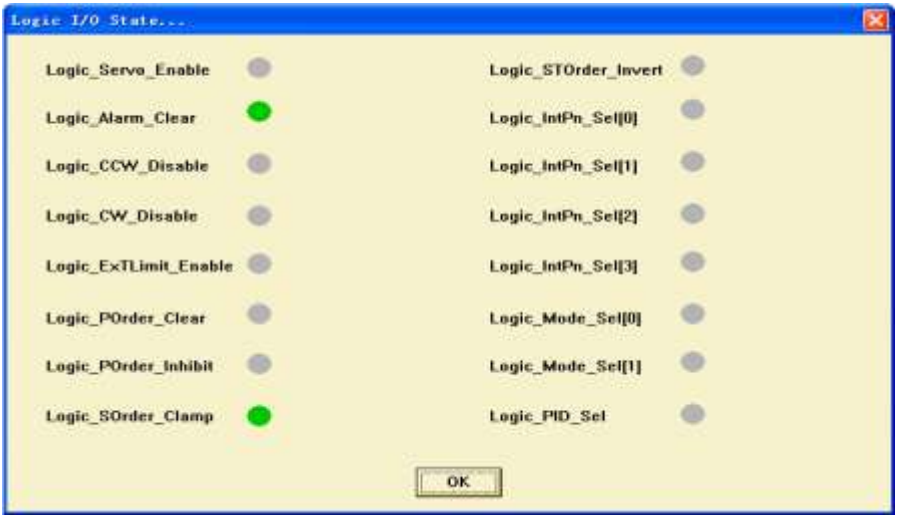
⑵ Function

Item	Function
CN2 Port Input	Monitor the digital input status, green light indicates “ON” and grey light indicates “OFF” , please refer to chapter 3 for details of CN2 connector
CN2 Port Output	Monitor the digital output status, green light indicates “ON” and grey light indicates “OFF” , please refer to chapter 3 for details of CN2 connector
CN1 Port Input	Encoder input signals, green light indicates “ON” and grey light indicates “OFF” , please refer to chapter 4 for details of CN1 connector



3 .Logical port status monitoring function

⑴ The “Logic State” item under the “Monitor” menu is for the logical port status monitoring function.



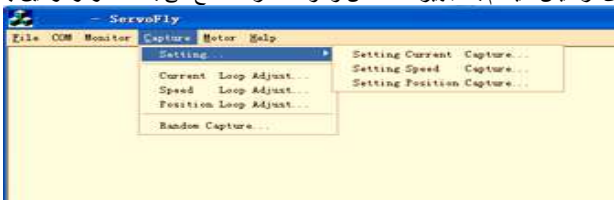
⑵ Function

Monitor the logical input status, green light indicates “ON” and grey light indicates “OFF” , please refer to chapter 3 for details of logical input.

1.4Oscillation control and running curve monitoring function

1 .Oscillation control

توجه: این بخش برای آزمایش سیستم با تجهیزات خاص و توسط افراد مطلع می باشد، **هرگز از این بخش استفاده نکنید.**



In the picture, the items “Setting…”, “Current Loop Adjust…”, “Speed Loop Adjust…” and “Position Loop Adjust…” are for oscillation control, **this function is only for factory testing use, wrong operation may cause damage, please DO NOT use this function.**

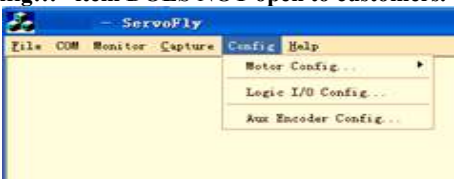
2 .Running curve monitoring function

“Random Capture” menu is for the running curve monitoring function, customers can check the current loop curve, speed loop curve and position loop curve.

1.5Config function

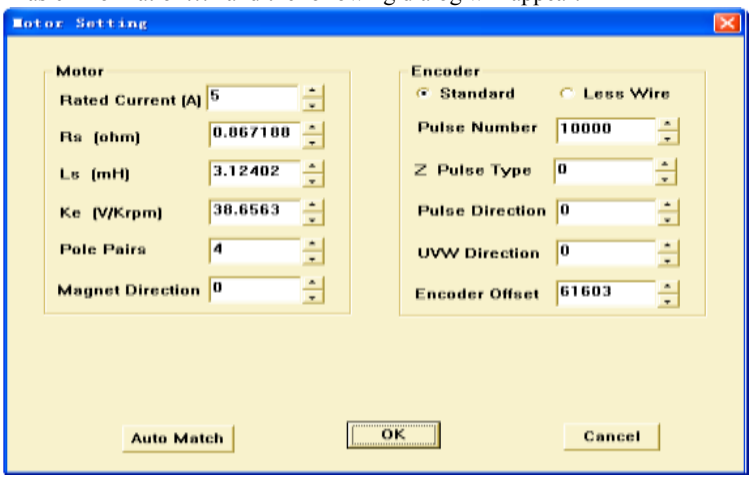
There are two items “Motor Config…” and “Logic I/O Config…” under the “Config” menu.

The “Aux Encoder Config…” item DOES NOT open to customers.



1 .Motor parameters adaptive function

(1) Click “Basic Information…” and the following dialog will appear:



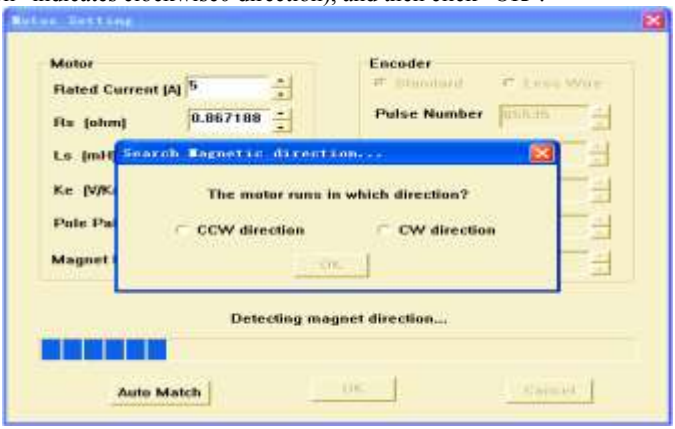
⑵ Fill in the basic data (please don't fill in other parameters)

Item	Function
Rated Current(A)	Motor nominal current
Rs (ohm)	Phase resistance
Ls (mH)	Phase inductance
Ke (V/Krpm)	Back EMF

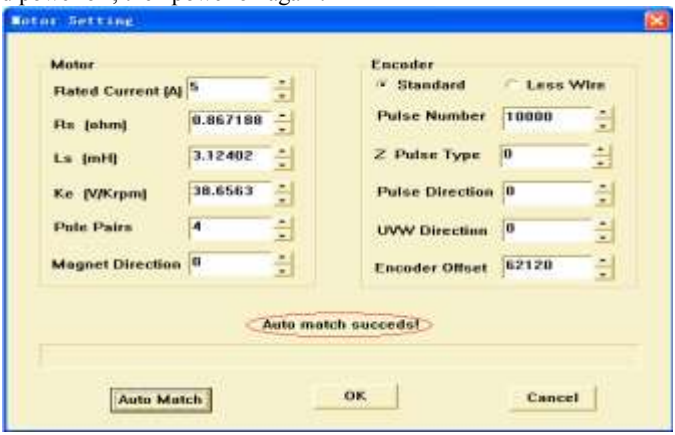
Note：This operation must be carried out by electrical engineer and the above parameters must be effective, otherwise it would cause mistake or damage.

⑶ Adaption

Click "Auto Match" to start the adaption operation, as the following dialog appears, select the right direction (face the motor shaft, "CCW direction" indicates counterclockwise direction and "CW direction" indicates clockwise0 direction), and then click "OK".



The following dialog will appear as if the adaption is successful, please save the parameters to EEPROM and power off, then power on again.



⑷ If adaption is not successful, maybe there is something wrong with the operation, please contact with out technical staff.

2 .Mapping function

⑴ Click “Logic I/O Config...” and the follow dialog will appear:

⑵ The left side part which can not be modified is the logic signal name, the right side part which can be modified by customers is the mapping port. Customers can use UP button and DOWN button to set the mapping method, then click “OK”.

Note: “0” indicates OFF or invalid, “1” indicates ON or valid.

⑶ Please refer to chapter 2 for each logic input signal definition.

⑷ Please confirm that the mapping method is unique, otherwise it would cause abnormal conditions.

2 Logic Mapping Table

Name	Symbol	Default physics mapping port	Fuction
Servo-ON input	Logic_Servo_Enable	Servo En	This signal turns on/off the servo (motor).
Alarm clear input	Logic_Alarm_Clear	Alarm Clr	Clears the alarm condition.
Positive direction over-travel inhibition input	Logic_CCW_Disable	CCW Dis	Positive(CCW) direction over-travel inhibit input.
Negative direction over-travel inhibition input	Logic_CW_Disable	CW Dis	Negative(CW) direction over-travel inhibit input.
External torque limit signal	Logic_ExTLimit_Enable	CCWDT Ltd	The external torque limit function is effective when this logic signal is ON while it is invalid as it is OFF, the limit value is set by Pn-72~Pn-87.
Deviation counter clear input	Logic_POrder_Clear	CLE/SC1/ ZEROSPD	Clears the positional deviation counter.

Command pulse inhibition input	Logic_POrder_Inhibit	INH/SC2	Ignores the positional command pulse.
Speed zero clamp input	Logic_SOrder_Clamp	CLE/SC1 /ZEROSPD	Set the speed command to 0.
Analog command direction switching input	Logic_STOrder_Invert	0	This logic signal can change the direction of the analog quantity instruction (both torque and speed are effective).
Logic control signal input [0]	Logic_IntPn_Sel[0]	INH/SC2	Combine the 4 logic control signal into a binary number, as the trigger signal to switch the internal speed command switching input, external torque limit switching input, point to point control command switching input, etc.
Logic control signal input [1]	Logic_IntPn_Sel[1]	CLE/SC1 /ZEROSPD	
Logic control signal input [2]	Logic_IntPn_Sel[2]	CWT Ltd	
Logic control signal input [3]	Logic_IntPn_Sel[3]	CCWT Ltd	
Mode switching input [0]	Logic_Mode_Sel[0]	0	Selects a control mode (position, torque, speed).
Mode switching input [1]	Logic_Mode_Sel[1]	0	
Gain switching input	Logic_PID_Sel	0	Select 1st or 2nd gain.
Position command PulseInv+	Logic_ PulseInv+	PulseInv+	External position command input. The input mode is set by parameter Pn-52. ①Pn-52=0，step/direction pulse(Default state); ②Pn-52=1，CCW/CW command pulse mode; ③Pn-52=2，A/B pulse.
Position command PulseInv-	Logic_ PulseInv -	PulseInv -	
Position command SignInv+	Logic_ SignInv+	SignInv+	
Position command SignInv-	Logic_ SignInv -	SignInv -	

Note: “0” means normally open or Invalid while “1” is normally closed or effective.

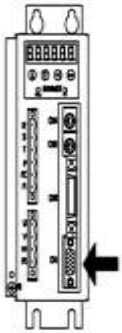
3 I/O connector (CN2)

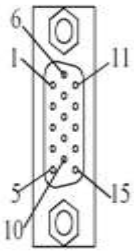
3.1Physic Port Definition of Digital Input

Name		Pin	Function
	Symbol		
Comm and port	VCCCOM	**18**	Anode of power supply（DC12～24V，current≥100mA）for digital input signal.
	ASPEED+	**22**	Motor speed command: -10V to +10V,corresponds to -3000 ~ +3000 r/min speed command (Default setting).
	ASPEED -	**21**	
	AGND	**23**	Ground of the analog speed command input.
	AT0RQUE+	**20**	External analog speed construct input port, differential mode, input impedance10kΩ, input range - 10V～+10V.
	AT0RQUE-	**19**	
	AGND	**24**	Insert 0V of the analog voltage construct input.
	FG	**36**	Terminal of inhibit ground.
Logic map ping port	ServoEn	**10**	Programmable digital input signal, the default setting is Logic_Servo_Enable(Refer to mapping table for the definition).
	AlarmClr	**11**	Programmable digital input signal, the default setting is Logic_Alarm_Clear (Refer to mapping table for the definition).
	CCWDis	**12**	Programmable digital input signal, the default setting is Logic_CCW_Disable (Refer to mapping table for the definition).
	CWDis	**13**	Programmable digital input signal, the default setting is Logic_CW_Disable (Refer to mapping table for the definition).
	CLE/SC1/ZEROSPD	**14**	Programmable digital input signal, the default setting is Logic_POrder_Clear/ Logic_SOrder_Clamp /Logic_IntPn_Sel[1]((Refer to mapping table for the definition).
	INH/SC2	**15**	Programmable digital input signal, the default setting is Logic_POrder_Inhibit/ Logic_IntPn_Sel[0] (Refer to mapping list table the definition).
	CCWTLtd	**16**	Programmable digital input signal, the default setting is Logic_ExTLimit_Enable/ Logic_IntPn_Sel[3] (Refer to mapping list table the definition).
Logic map ping port	CWTLtd	**17**	Programmable digital input signal, the default setting is Logic_IntPn_Sel[2] (Refer to mapping table for the definition).
	PulseInv+	**32**	Programmable digital input signal, the default setting is Logic_ PulseInv+((Refer to mapping table for the definition).
	PulseInv -	**33**	Programmable digital input signal, the default setting is Logic_ PulseInv - (Refer to mapping table for the definition).
	SignInv+	**34**	Programmable digital input signal, the default setting is L Logic_ SignInv+ (Refer to mapping table for the definition).
	SignInv -	**35**	Programmable digital input signal, the default setting is Logic_ SignInv - (Refer to mapping table for the definition).

3.2Definition of Digital Output

Name		Pin	Function
Name	Symbol		
Servo-Ready output	SRDY+	8	This signal shows that the driver is ready to be activated. Output transistor turns ON when both control and main power are ON but not at alarm status.
	SRDY -	27	
Servo-Alarm output	ALM+	25	This signal shows that the driver is in alarm status. Output transistor turns OFF when the driver is at normal status, and turns ON at alarm status.
	ALM -	26	
Positioning complete (position mode)/ Speed arrival output (speed mode)	COIN+	28	Turns ON the output transistor upon completion of positioning; Turns ON the output transistor upon arrive of speed.
	COIN -	29	
Holing brake release signal	BRK+	30	Feeds out the timing signal which activates the holding brake of the motor. Turns the output transistor ON as the motor excitation is on while turns the output transistor OFF as the motor excitation is off.
	BRK -	31	
Phase-A differential output	PhaseA+	1	Feeds out the divided encoder signal (A, B, Z-phase) in differential (equivalent to RS422). Max. output frequency is 4Mpps (after quadrupled)
	PhaseA -	2	
Phase-B differential output	PhaseB+	3	
	PhaseB -	4	
Phase-Z differential output	PhaseZ+	5	
	PhaseZ -	6	
Phase-Z open-collector output	ZOC	7	Open collector output of Z-phase signal. The emitter side of the transistor of the output circuit is connected to the signal ground (GND) and is not insulated.
Encoder grounding	EGND	9	When the Signal receiver is not a optocoupler, you must connect the grounding between servo drive and host controller.





4 Encoder connector (CN1)

Pin definition					
Pin	Definition	Pin	Definition	Pin	Definition
1	A +	6	A -	11	-
2	B +	7	B -	12	5V
3	Z +	8	Z -	13	0V
4	U +	9	U -	14	W +
5	V +	10	V -	15	W -

Encoder connector (CN1)

*** رعایت تمام اصول کاربری برای استفاده اصولی الزامیست.** (تمامی مسائل مربوط به رعایت نکردن اصول استفاده صحیح و استفاده غیر اصولی از سیستم، که باعث بوجود آمدن مشکل و حادثه شود، به عهده کاربر می باشد.)

***به علت بهسازی نرم افزار، اصلاح و تغییر خصوصیات، احتمال تغییراطلاعات مندرج دراین دفترچه راهنما مربوط به این نرم افزار، بدون اطلاع قبلی امکان پذیر می باشد.**

از توجه شما به این نکات سپاس گذاریم.