



Model Number

ZSB - LS - 0.9 - 1 - 5 - 1 - Q

Model No.

0.9° stepper motor

lead screw 1mm

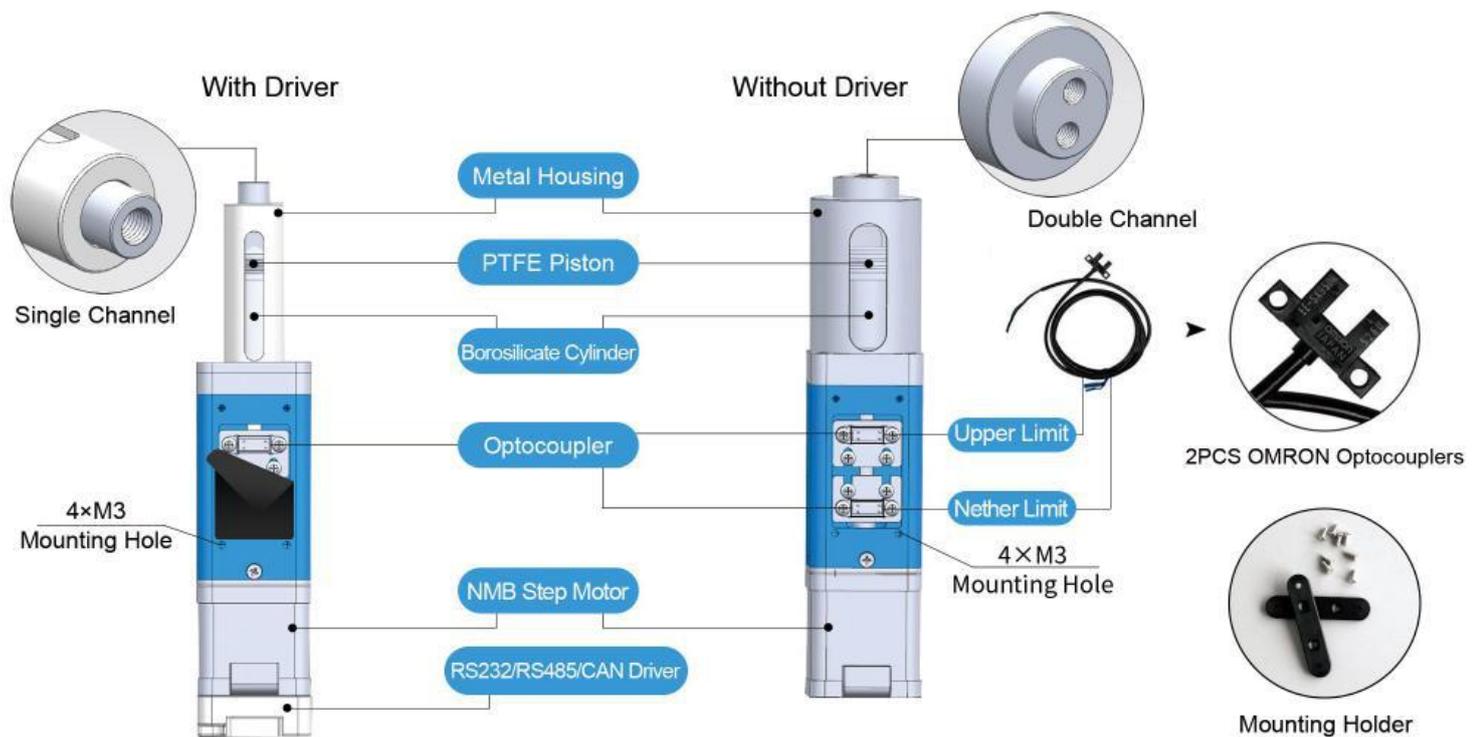
5	5ml
10	10ml
20	20ml

1	single channel
2	double channel

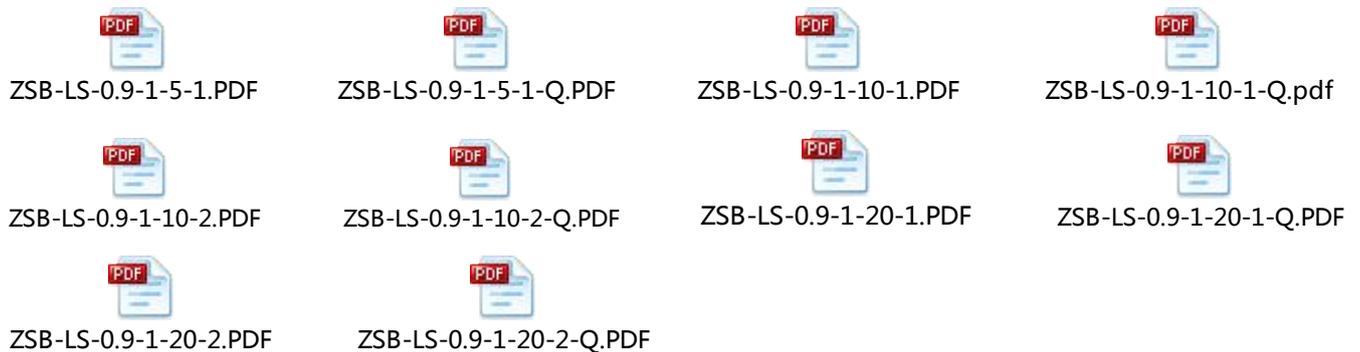
Q	with driver
	without driver

5ml – single channel 10ml – single/double channel 20ml – single/double channel

Pump Structure



Dimension (unit: mm)



Technical Parameters

Model No.	MiNi SY-04		
Accuracy	≤1%@100% stroke		
Repeatability	3‰ - 7‰ (0.3% - 0.7%)		
Pressure rating	0-1.0Mpa (air)	0-1.2Mpa (water)	
Service life	3 million times no leakage (media: water)		
Initial position detection	Optocoupler detect the original piston position for accurate location		
Syringe Volume	5ml	10ml	20ml
Cylinder ID	14.55mm	23mm	32mm
Rated stroke (control steps)	30mm (12000 steps)	24.08mm (9632 steps)	24.88 (9952 steps)
Linear speed	0.017 – 5mm/s	0.017 – 5mm/s	0.017 – 5mm/s

Time range (rated stroke)	6s – 1765s	4.8s – 1416s	5s – 1464s
Accuracy resolution	0.0025mm/0.4154μL	0.0025mm/1.0381μL	0.0025mm/2.0096μL
Actuator	Ball screw (lead 1mm)		
Max. piston drive	≥ 100N		
Sub. piston drive	≥ 45 N		
Fluid path	Borosilicate cylinder, PTFE piston		
Max. pressure (Fluid path)	Positive air pressure 0-1.0Mpa / Negative air pressure 0-0.05Mpa		
Connection	1/4-28UNF Female		
Communication	RS232/RS485/CAN		
Baud rate	RS232/RS485: 9600dps, 19200dps, 38400dps, 57600dps, 115200dps CAN: 100Kbps, 200Kbps, 500Kbps, 1Mbps		
Device address & Parameter setting	Communication interface		
Dimension (L*W*H)	42*42*206mm (with driver) 47.5*42*191mm (without driver)		
Power supply	DC24V/1.5A		
Working environment	5°C– 55°C < 80% relative humidity, non-condensing		
Net Weight	0.72kg		

Dispensing Volume

Dispensing Volume = $\pi \times (\text{cylinder ID} \div 2)^2 \times H$

$$\text{Height (H)} = \frac{\text{Lead screw}}{\text{motor steps under 1 circle}}$$

Technical Function

Address setting	Address settable from 0 to 255
Baud rate setting	RS232/RS485/CAN baud rate settable
Priority setting	When communicate through CAN, address 0 will be of the highest priority
Speed setting	Serial settable from 1rpm to 250rpm
Subdivision setting	Subdivision settable to be 1, 2, 4, 8, 16, 32, 128, 256
Reset internal data	Factory reset
Parameter query	Query device address, speed, subdivision, baud rate etc.
Version query	Query current firmware version
Motor direction control	CW, CCW
Reset	Return piston to origin
Strong stop	Strong stop the running motor
Motor status query	Query current motor status
Power memory	When motor suddenly stops, current position can be queried by display the distance between current position with origin

Collision protection

Upper and nether optocoupler to limit the piston position

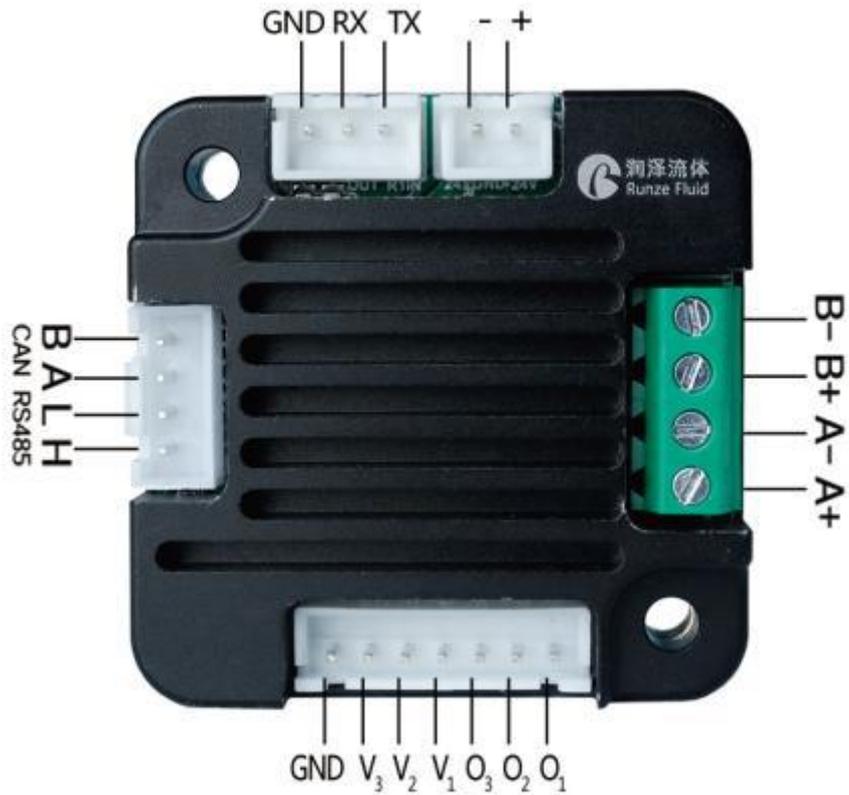


0.9° 42 Stepper Motor.pdf

Motor Wire	0.9° step motor
A+	Orange
A-	Blue
B+	Red
B-	Yellow

Motor Parameter	0.9°step motor
Max. power	9.2W
Step angle	0.9°
Phase	2
Phase voltage	4.6V
Phase current	1.0A
Resistance	4.6Ω±0.48
Inductance	18.6mH REF
Insulation	100m Ω MIN
Max. Temperature	80°C MAX
Explosion-Proof level	B

Driver Port



Port Name	Description	Port Name	Description
+	DC24V positive	A+/A-	Phase A wiring
-	DC24V negative	B+/B-	Phase B wiring
TX	RS232 TX	O1	Optocoupler wiring
RX	RS232 RX	O2	
GND	GND	O3	
H	CAN H	V1	
L	CAN L	V2	
A	RS485 A	V3	
B	RS485 B	GND	

Accessories (with driver)



RS232/RS485 Converter



Power Supply



U disk with debug software

Driver Control Instruction

The data between syringe pump and upper monitor (PC, PLC, Raspberry Pi, micro-controller) was transmitted by serial communication RS232/RS485/CAN

Communication Form: Asynchronous serial communication; Command and data frames are sum check 2 Byte; Commands and data are hexadecimal numbers; Command parameters saved by little-endian mode.

Communication Interface: RS232 or RS485 or CAN

Communication Mode: Bidirectional asynchronous; master-slave mode

Baud rate: 9600bps,19200bps,38400bps,57600bps,115200bps (RS232/RS485) / 100K, 200K, 500K, 1M (CAN)

Data bit: 8

Even-odd Check: None

Response Time: <1 second

1. Command Code

Setting Command

Command code	Function	Command Type	Number of Bytes
0x00	Address setting	Factory command	4
0x01	RS232 baud rate setting	Factory command	4
0x02	RS485 baud rate setting	Factory command	4
0x03	CAN baud rate setting	Factory command	4
0x07	Max speed setting	Factory command	4
0x0b	Reset speed setting	Factory command	4
0x0e	Setting self-reset when power on	Factory command	4
0x10	CAN destination address setting	Factory command	4
0xff	Reset internal data of driver	Factory command	4

Query Command

Command code	Function	Command Type	Number of Bytes
0x20	Query address	Common command	2
0x21	Query RS232 baud rate	Common command	2
0x22	Query RS485 baud rate	Common command	2
0x23	Query CAN baud rate	Common command	2
0x27	Query maximum speed	Common command	2
0x2b	Query reset speed	Common command	2
0x2e	Query auto reset when power on	Common command	2
0x30	Query CAN destination address	Common command	2
0x3f	Query Version	Common command	2

Control Command

Command code	Function	Command Type	Number of Bytes
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0x42	Motor moves as CW (Injection), motor stops when touch reset Optocoupler	Common command	2
0x4d	Motor moves as CCW (Suction), motor stops when touch nether limit Optocoupler	Common command	2
0x45	Reset	Common command	2
0x49	Strong stop	Common command	2
0x4a	Query motor status	Common command	2
0x4b	Dynamical speed setting (current speed will be invalid after used once, if speed not been set next time, device default works at maximum speed)	Common command	2
0x65	Query motor stop events	Common command	2
0x66	Query current motor position	Common command	2
0x67	Clear internal position data record	Common command	2
0x68	Query current motor direction	Common command	2

Response Command

Code B2	Parameter Instruction
0x00	Normal status
0x01	Frame error
0x02	Parameter error
0x03	Optocoupler error
0x04	Motor busy
0x05	Motor stalling
0x06	Unknown position
0xfe	Task suspension
0xff	Unknown error

Response Command When Query Motor Stop Events

Code B3 B4	Parameter Instruction
0x00 0x00	unknown
0x01 0x00	Motor normally run the steps as command told
0x02 0x00	motor stops when touch Optocoupler
0x03 0x00	Coded disc detected motor stalling
0x04 0x00	Internal chip detected motor stalling
0x05 0x00	External event request motor stop

2. Control Command Format

“Common command” message frame is 8 bytes, full format as following:

Send Command (Common Command)

Send command	Start code	Address bit	Control command	Command parameter	End code	Sum check
Byte code	B0	B1	B2	B3, B4	B5	B6, B7
Number of Bytes	1	1	1	2	1	2

“Factory Command” message frame is 14 bytes, full format as following:

Send Command (Factory Command)

Send command	Start code	Address bit	Control command	Password	Command parameter	End code	Sum check
Byte code	B0	B1	B2	B3/B4/ B5/B6	B7/B8/ B9/B10	B11	B12/B13
Number of Bytes	1	1	1	4	4	1	2

Response Command (Common Command)

Response command	Start code	Address bit	Response state	Response parameter	End code	Sum check
Byte code	B0	B1	B2	B3, B4	B5	B6, B7
Number of Bytes	1	1	1	2	1	2

Definition	Code
Start code B0	0xCC
End code B5 (B11)	0xDD

Note: start code of common command and factory command are B0; end code of common command is B5 while end code of factory command is B11.

Name	Abbreviation	Code B1	Remark
Address bit	address	0xXX	

Note: 1. Send command and response command share the same address bit
2. XX in the “0xXX” means settable, factory defaults as 0x00, parameter range as 0x00 ~ 0xFF.

Control Command (Factory Command) (B2~B10)

Code B2	Abbreviation	Password B3 B4 B5 B6	Parameter B7 B8 B9 B10 Instruction
0x00	Address setting	B3=0xFF B4=0xEE B5=0xBB B6=0xAA	B7=0xXX (B8=0x00 B9=0x00 B10=0x00) XX value range is 00 ~ FF, defaults as 00

0x01	RS232 baud rate setting	B3=0xFF B4=0xEE B5=0xBB B6=0xAA	Total 5 baud rates: factory defaults as 9600bps (B8=0x00 B9=0x00 B10=0x00)
0x02	RS485 baud rate setting	B3=0xFF B4=0xEE B5=0xBB B6=0xAA	B7=0x00 baud rate as 9600bps B7=0x01 baud rate as 19200bps B7=0x02 baud rate as 38400bps B7=0x03 baud rate as 57600bps B7=0x04 baud rate as 115200bps
0x03	CAN baud rate setting	B3=0xFF B4=0xEE B5=0xBB B6=0xAA	Total 4 baud rates: factory defaults as 100K (B8=0x00 B9=0x00 B10=0x00) B7=0x00 baud rate as 100K B7=0x01 baud rate as 200K B7=0x02 baud rate as 500K B7=0x03 baud rate as 1M
0x07	Maximum speed setting	B3=0xFF B4=0xEE B5=0xBB B6=0xAA	B7=0xFF B8=0xFF B9=0x00 B10=0x00 B8B7 value range is 0x0005 ~ 0x015E, Speed set as 5~350rpm (factory default speed 200rpm, that is B7=C8) Note: speed range 5~350rpm is best working speed recommended, pump may works wrongly when lower than 5rpm or higher than 350rpm.
0x0e	Setting automatic reset when power on	B3=0xFF B4=0xEE B5=0xBB B6=0xAA	(B8=0x00 B9=0x00 B10=0x00) B7=0x00 non-automatic reset B7=0x01 automatic reset
0x10	Setting CAN destination address	B3=0xFF B4=0xEE B5=0xBB B6=0xAA	B7=0xFF (B8=0x00 B9=0x00 B10=0x00) XX value range is 00 ~ FF, default as 00
0xff	Reset internal data of driver	B3=0xFF B4=0xEE B5=0xBB B6=0xAA	B7=0x00 B8=0x00 B9=0x00 B10=0x00

Query Command (B2~B4)

Code B2	Abbreviation	Parameter Instruction B3 B4
0x20	Query address	B3=0x00 B4=0x00
0x21	Query RS232 baud rate	B3=0x00 B4=0x00
0x22	Query RS485 baud rate	B3=0x00 B4=0x00
0x23	Query CAN baud rate	B3=0x00 B4=0x00
0x27	Query maximum speed	B3=0x00 B4=0x00
0x2b	Query reset speed	B3=0x00 B4=0x00
0x2e	Query automatic reset when power on	B3=0x00 B4=0x00
0x30	Query CAN destination address	B3=0x00 B4=0x00
0x3f	Query current version	B3=0x00 B4=0x00

Control Command (B2~B4)

Code B2	Abbreviation	Parameter Instruction B3 B4
0x4d	Motor runs as CCW (Suction) and stop when touch nether limit Optocoupler	Maximum value range of B4B3 decided by cylinder volume. E.g. 5ml syringe pump resolution 0.4154μL, so maximum steps are $\frac{5ml}{0.4154\mu l} = 12036$, hexadecimal number of 12036 is 0x2F04, so value range of B4B3 will be 0x0001 ~ 0x2F04.
0x42	Motor runs as CW (Injection) and stops when touch reset optocoupler	Value of B4B3 will be bigger than zero. When steps of B3B4 was set to be more than steps from motor to reset optocoupler, motor will stop when touch the optocoupler; when steps of B3B4 was set to be less than steps from motor to reset optocoupler, motor will run as preset steps.
0x45	reset	B3=0x00 B4=0x00 Motor stops until touch the Optocoupler
0x49	Strong stop	B3=0x00 B4=0x00
0x4a	Query motor status	B3=0x00 B4=0x00
0x4b	Dynamical speed setting (current speed will be invalid after used once, if users don't set speed next time, pump default work at maximum speed)	B4B3 value range is 0x0001 ~ 0x015E, motor speed is 1~350rpm, speed setting must be less than maximum speed. Note: when speed set as 1rpm, subdivision must be 256
0x65	Query motor stop events	Motor stop reasons can be confirmed by received command parameters: B3=0x00 B4=0x00 unknown reason B3=0x01 B4=0x00 Motor run the steps as command told B3=0x02 B4=0x00 Motor stops when touch optocoupler B3=0x03 B4=0x00 Coded disc detected motor stalling B3=0x04 B4=0x00 Internal chips detected motor stalling B3=0x05 B4=0x00 External event request motor stop
0x66	Query current motor position	B3=0x00 B4=0x00 This command can inquiry current motor position when syringe pump stops because of sudden power-off or extraneous factors. It will show how many motor steps between current position and original position. E.g. Inquiry command is 0x66, received command B3=0x3E B4=0x0A, hexadecimal number is 2622, so the distance between current motor and original position is 2622steps, then the suctioned or discharged volume can be worked out.
0x67	Clear internal position data record	B3=0x00 B4=0x00 When suddenly power off, pump still keeps working a small period of time at the moment of power off which cause wrong motor steps, when repowered on and send command 45 to reset position, motor position data is not zero, so users need to send 0x67 to help zero the motor position then send 0x66 to query the current position, received command B3=0x00 B4=0x00 means current position data is zero, it helps eliminating the error.
		In received command, B3=0x00 B4=0x00 means motor runs as

0x68	Query current motor direction	CCW, piston goes downwards, syringe pump suction liquid; B3=0x01 B4=0x00 means motor runs as CW, piston goes upwards, syringe pump dispense liquid.
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Sum Check (B6, B7)

Name	Abbreviation	Code B6, B7	Remark
Sum check	Sum check	0xXX 0xXX	XX means sum from start code to end code

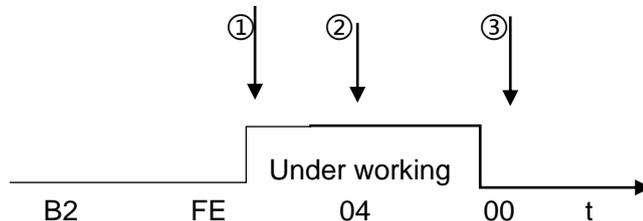
Note: Sum check bit of factory command is B12, B13; Sum check of common command is B6, B7.

Response Command

Code B2	Instruction	Other Parameter = B3 B4
0x00	Normal status	B3=0x00 B4=0x00
0x01	Frame error	Parameter=0x00 0x00,
0x02	Parameter error	Parameter=0x00 0x00
0x03	Optocoupler error	Parameter=0x00 0x00
0x04	Motor busy	Parameter=0x00 0x00
0xfe	Task suspend	Parameter=0x00 0x00
0xff	Unknown error	Parameter=0x00 0x00

- (1) Code B2 in response command means current motor status. Only when B2=0x00 motor works normally. Other codes means different motor breakdown.

When pump controlled by RS485 and send command B2=0x4d, 0x42 or 0x45, status parameter in response command is FE (task suspension), it means motor is now under working as command required, if send other commands now (except for query command), the status parameter in response command will be 04 which means motor busy, if resend polling command 0x4a, the status parameter in response command will be 00 which means motor is normally running). See below chart for ref.:



- ① send control command (B2=0x4d or 0x42, 0x45)
- ② send other control commands
- ③ send polling command 0x4a

- (2) Other parameters B3,B4 in response command make sense only when send inquiry command; when send

setting or control command, response parameters make no sense with default 00 00. When send inquiry command and parameter B2 in response command is 00, then response B3, B4 make sense, returned value is the inquiry result. E.g. when sent inquiry command 0x21 (Inquiry RS232 baud rate), B3, B4 in response command is 04 00, it means baud rate of RS232 is 115200bps.

Kind Reminder:

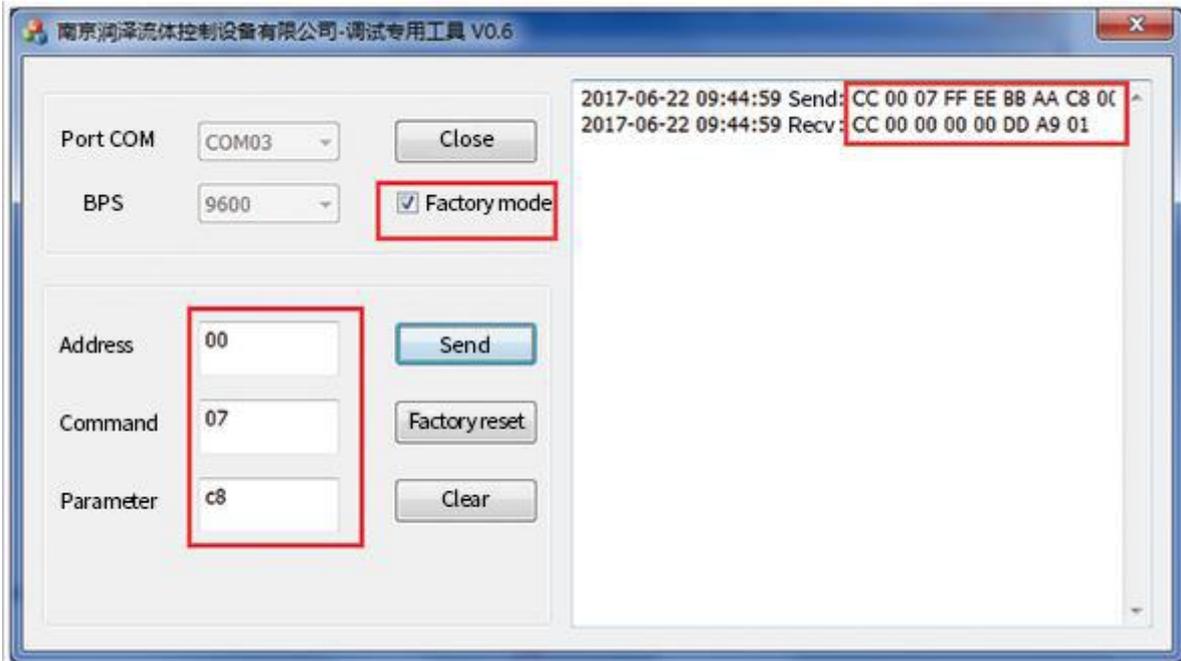
1. All code parameters saved by little-endian mode. Little-endian mode means low data position saved in the low address, high data position saved in the high address.
2. When suddenly being powered off, motor will keep run further 1 step, motor steps will be some deviation with reset command 45 to make it reset after powered on, thus we send command 67 (clear out position) to make it right.
3. Deviation 0-15 steps when 24V powered off while deviation 0-55 steps when 110-240V powered off.
(Deviation steps was worked out by average test value)
4. Pump start working after send control command (B2=0x4d, 0X42 or 0x45), after finish proceeding the command, users need to send 4A to query, only when response command B3 = 00 pump can receive the next control command.
(From software version V13, this limitation has been relieved, after pump finish proceeding the command, pump can receive new control command, users **DO NOT** need to send 4A to query.)

3. Operation Examples (RS232)

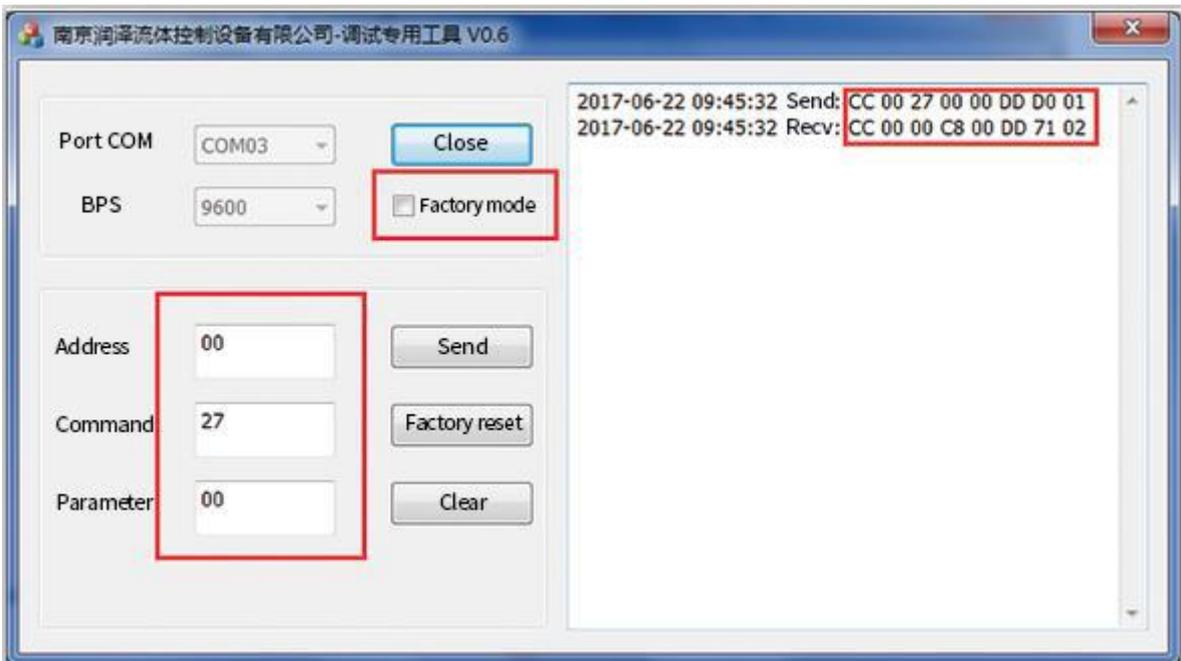
1. Power on the device
2. Click "Factory mode" if necessary, or directly set the commands if unnecessary.
3. Restart the device after finish settings (24v power supply **MUST** be cut off before restart) to make it into effect.

E.g.1 Set maximum speed (200rpm)

1. Tick "factory mode" as picture 1
2. Input "00" into "Address" (default as 00, if address has been changed, then input new address), input speed code 07 into "Command", input speed C8 into "Parameter" (hexadecimal number), click "Send", it means correct settings if received code B3=C8.
3. After confirmed correct settings, cancel the ticked "Factory mode" as picture 2



Picture 1



Picture 2

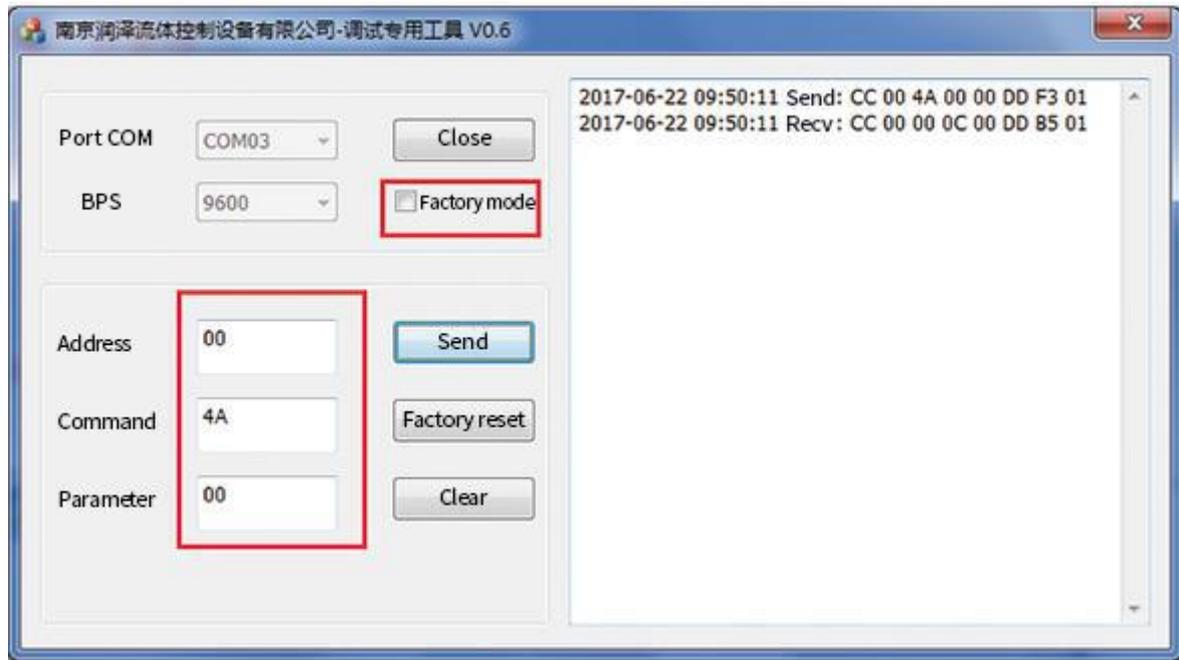
4. Query preset speed, input speed code 27 into “Command”, input “00” into “Parameter” (if you input other command, received parameter will be 02 which means parameter error), click “Send”, it means correct settings if received code as picture 2.
5. Restart the device after finish correct settings (24v power supply **MUST** be cut off before restart) to make the settings into effect.

Note: There are two ways of speed setting: Dynamically setting and Factory setting.

Dynamically setting no need to tick “Factory mode” and set speed will be invalid after used once, it is current working speed, if dynamically speed is not set, device default work at maximum speed. Speed set under “Factory Command” can be kept using.

E.g.2 Query Motor Status (Picture 3)

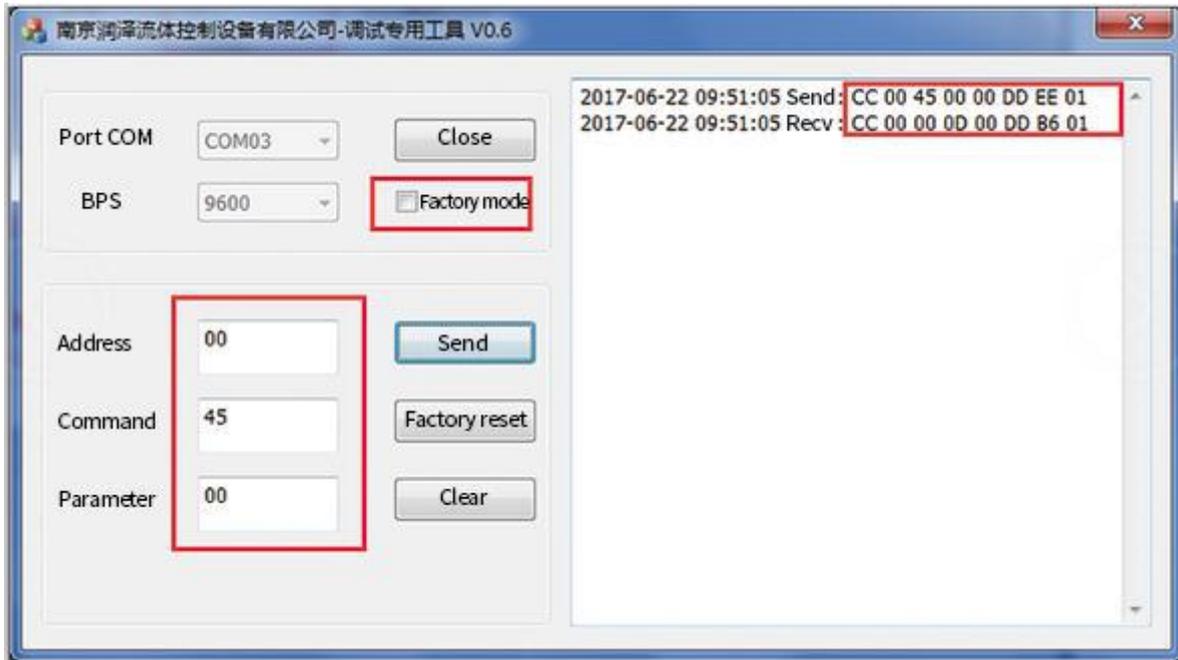
1. Input "00" into "Address" (If address has been changed, then input new address)
2. Input "4A" into "Command" (Query motor status)
3. Input "00" into "Parameter" (if you input other parameters, returned message will be 02 which means parameter error)
4. Click "Send" after finish inputs, motor status data will be returned, it means correct settings if received code B3=00 as picture 3.



Picture 3

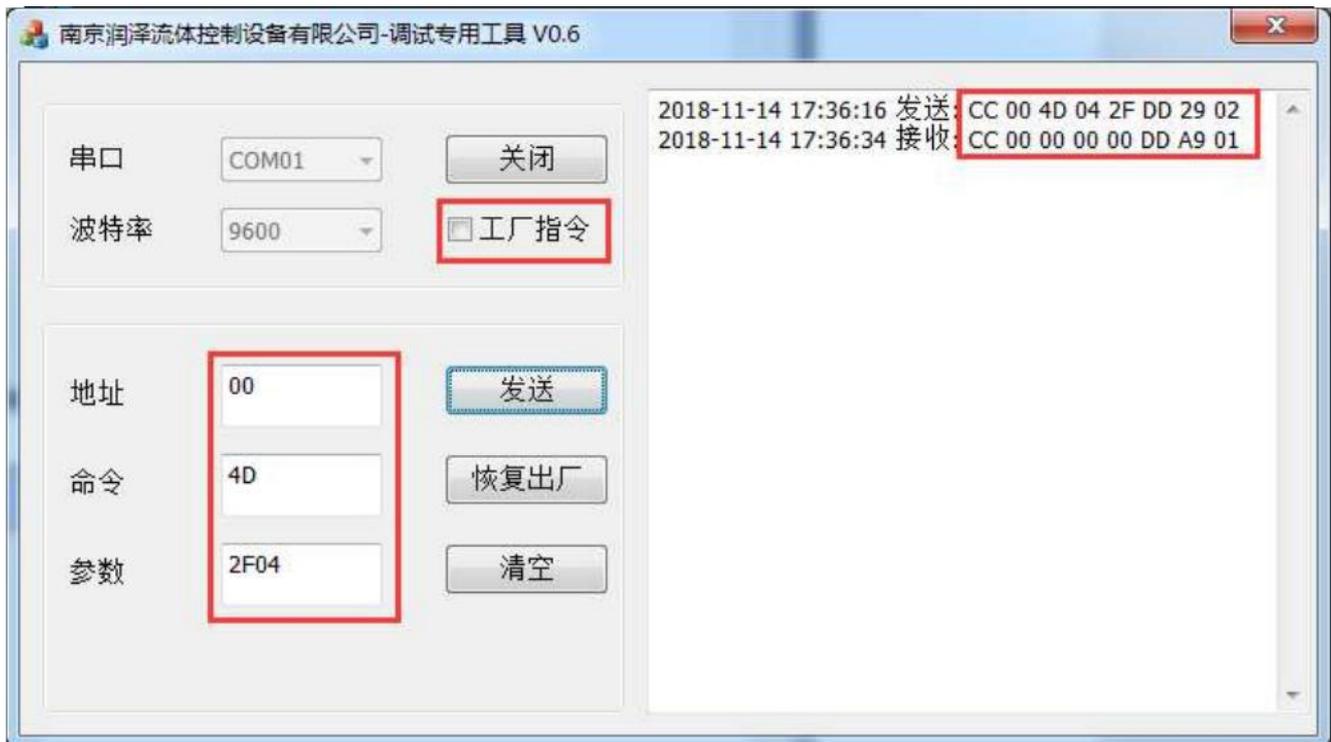
E.g.3 Control Syringe Pump Suction and Dispense Liquid

1. Input reset command 45 into "Command" and input "00" into "Address" (if address has been changed, then input new address; if you input other parameters, received parameter will be 02 which means parameter error), click "Send", it means correct settings if received code as picture 4.



Picture 4

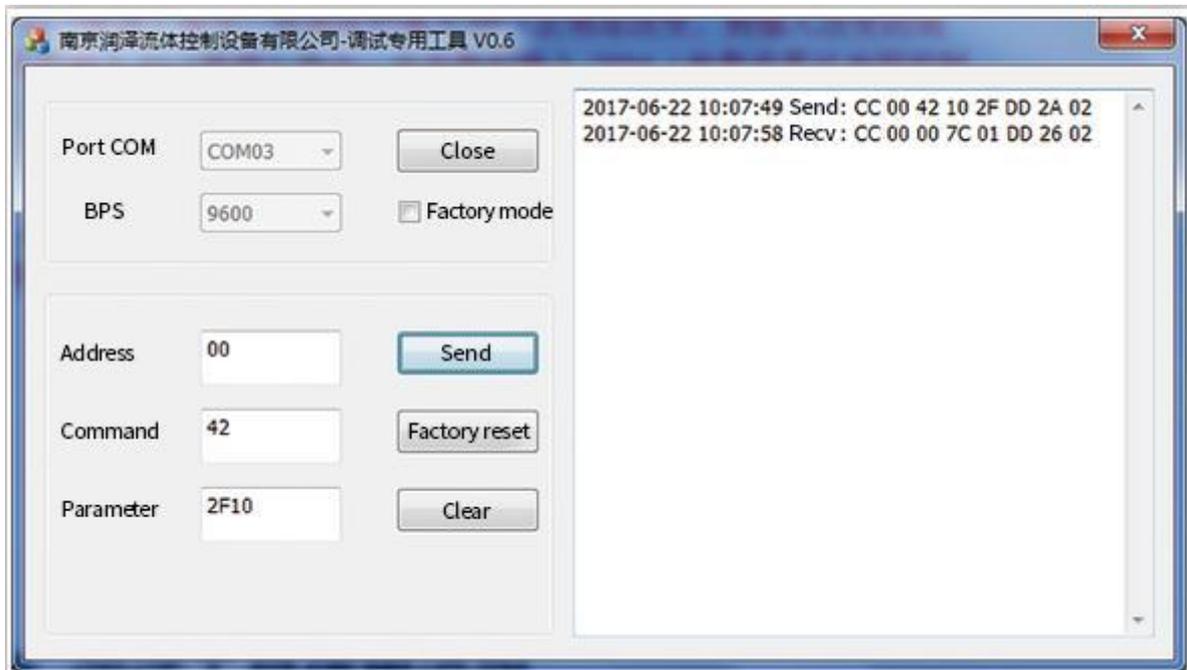
- Input "00" into "Address" (if address has been changed, then input new address), input suction command 4D into "Command" and input "2F04" into "Parameter" (please take control commands for reference), click "Send", it means correct settings if received code as Picture 5.



Picture 5

- Input "00" into "Address" (if address has been changed, then input new address), input dispense command 42 into "Command" and input "2F04" into "Parameter" (please take control commands for reference), click "Send", it means correct settings if received code as picture 6.

Note: To avoid lost steps, input parameter of command 42 can be more than that of command 41.



Picture 6

4. RS232 Debug Instructions

(1) RS232 Debug Tool: MotorTester V0.6.exe

Since no RS232 communication interface on computer, we need to realize the communication by USB. Select the correct COM port from Device Manager on Computer, you need to verify which COM port is the correct one if there are few COM ports.



Picture 7

In picture 8, baud rate is device factory default 9600bps, after select correct COM port and baud rate, input correct command code B2 of Address, Command and Parameter, received parameter will be B3 B4. If you need to input factory command, then click "factory mode" while common command no need to click this blank. Click "Send", the sent and received code will be shown in the right display box.



Picture 8

The button "clear" in debug tool means clear the contents in right display box; "factory reset" means to return all the settings to factory default settings. Address, command, parameter must be input hexadecimal numbers.

(2) RS232 communication example

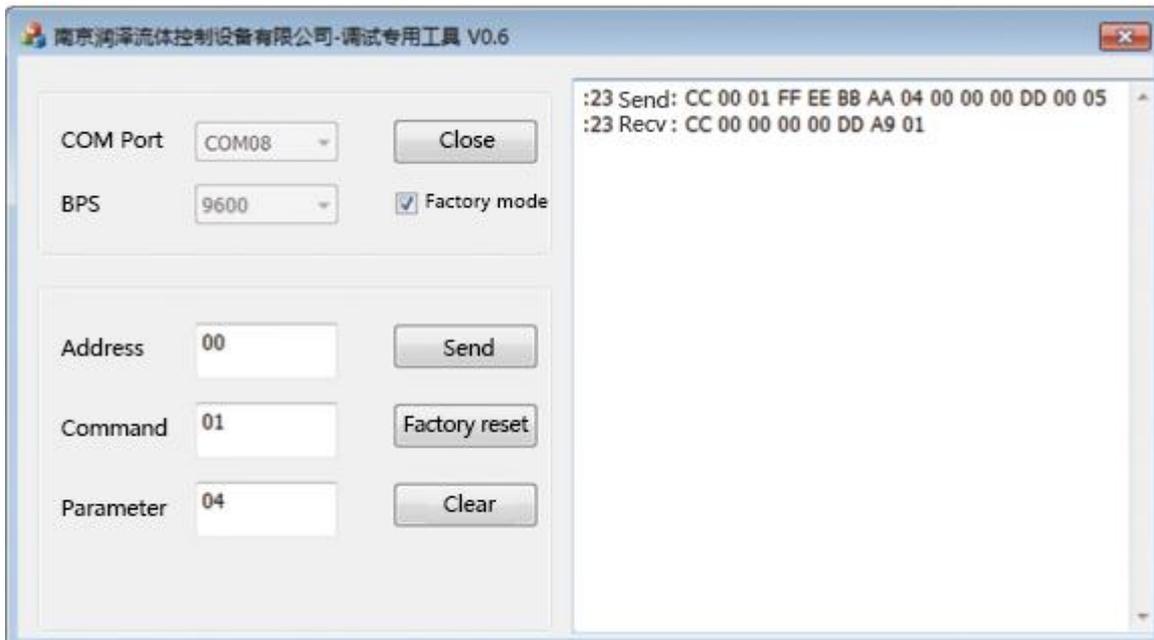
① Send Command: Set RS232 baud rate

B0	B1	B2	B3/B4/B5/B6	B7/B8/B9/B10	B11	B12	B13
0xCC	0x00	0x00	B3=0xFF B4=0xEE B5=0xBB B6=0xAA	B7=0x04 B8=0x00 B9=0x00 B10=0x00	0xDD	0x00	0x05

Response Command

B0	B1	B2	B3	B4	B5	B6	B7
0xCC	0x00	0x00	0x00	0x00	0xDD	0xA9	0x01

RS232 baud rate setting is factory command, "factory mode" need to be ticked, operation result as picture 9:



Picture 9

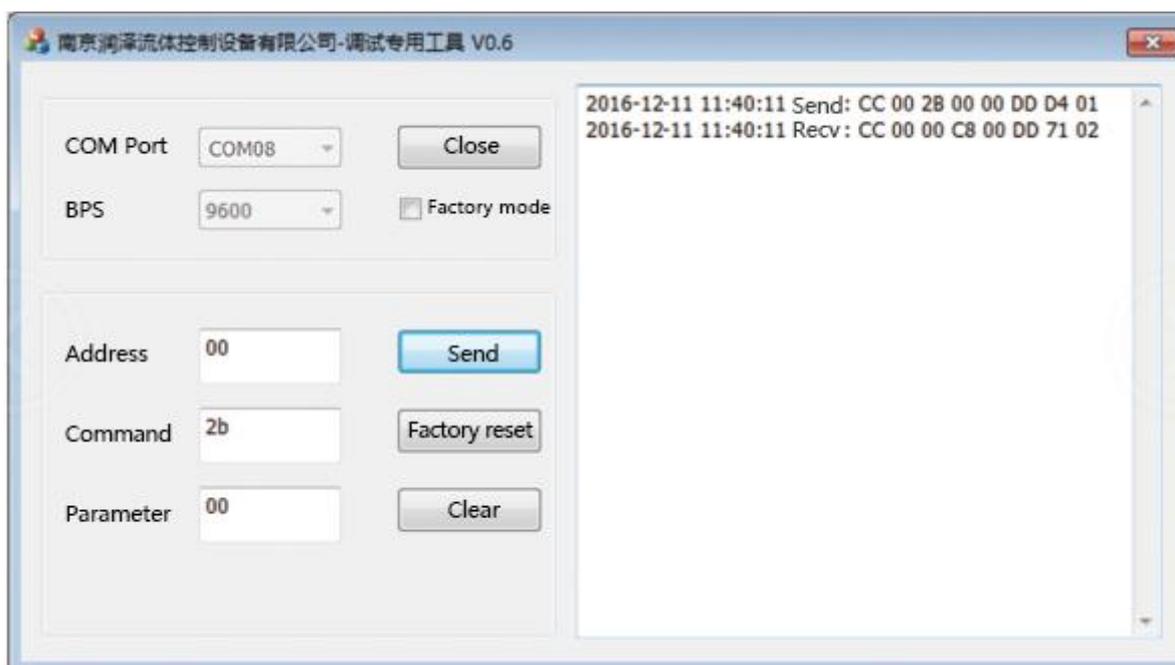
② Send Commands: Query reset speed

B0	B1	B2	B3	B4	B5	B6	B7
0xCC	0x00	0x2B	0x00	0x00	0xDD	0xD4	0x01

Response command

B0	B1	B2	B3	B4	B5	B6	B7
0xCC	0x00	0x00	0xC8	0x00	0xDD	0x71	0x02

Query command is common command, operation result as picture 10:



Picture 10

Parameter bit in response command is C8 00. Little-Endian storage with low data bit saved in low address bit, hexadecimal 0x00C8 converted to decimal is 200, so reset speed is 200rpm.

5. RS485 Debug Instructions

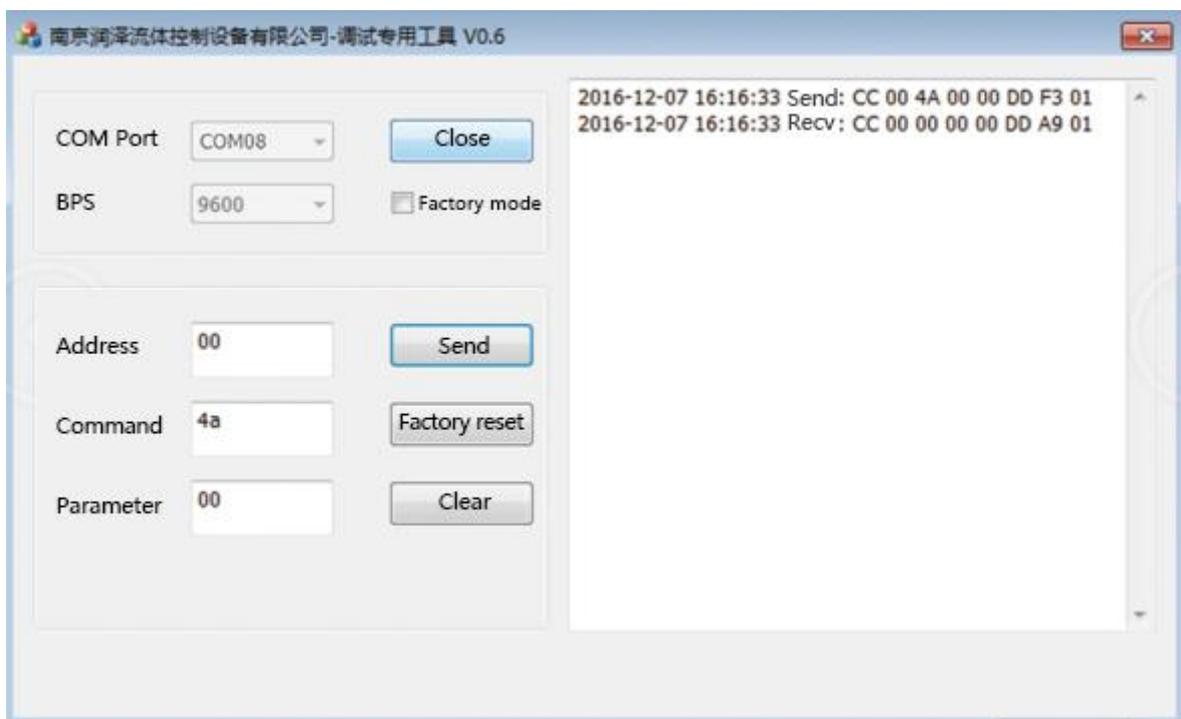
(1) RS485 Debug Tool: MotorTester V0.6.exe

① Send command: Query current motor status

B0	B1	B2	B3	B4	B5	B6	B7
0xCC	0x00	0x4a	0x00	0x00	0xDD	0xF3	0x01

Response command

B0	B1	B2	B3	B4	B5	B6	B7
0xCC	0x00	0x00	0x00	0x00	0xDD	0xA9	0x01



Picture 11

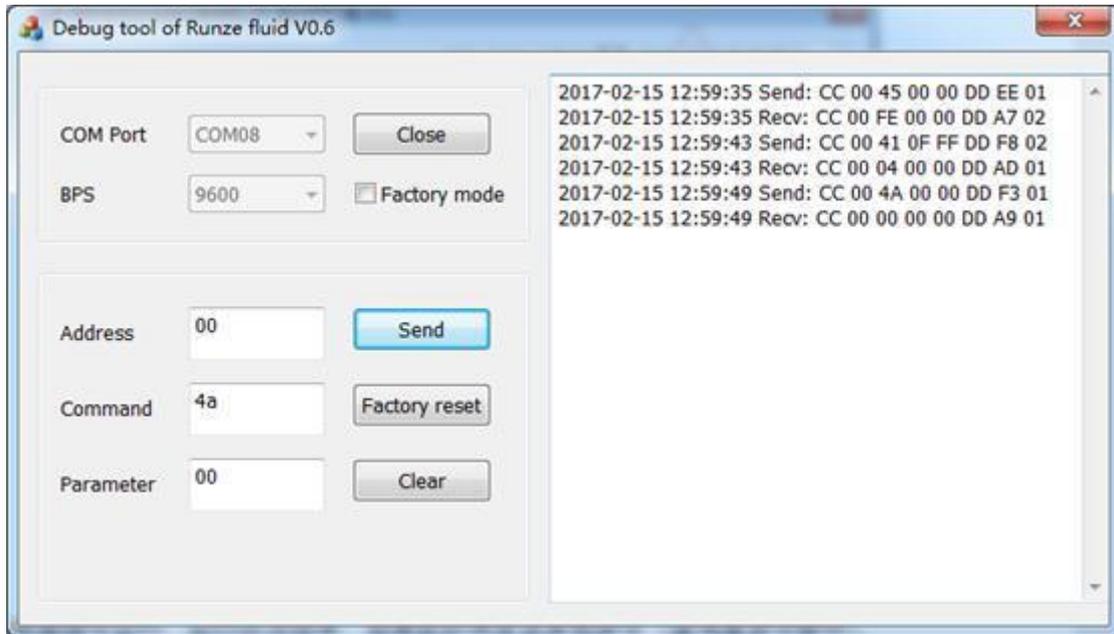
Note: When RS485 control several devices, 0x4a is polling command, each time control command B2=0X4d, 0x42 or 0X45 was sent out, you need to send polling command to inquiry current motor status, or when you send other commands (except for query command) it will show motor busy.

② Send Command: Reset

B0	B1	B2	B3	B4	B5	B6	B7
0xCC	0x00	0x45	0x00	0x00	0xDD	0xEE	0x01

Response command

B0	B1	B2	B3	B4	B5	B6	B7
0xCC	0x00	0xFE	0x00	0x00	0xDD	0xA7	0x02



Picture 12

Status parameter B2=0XFE in response command means motor is working as sent commands, if send other commands (except for inquiry command) now, the status parameter in response command should be 04 (motor busy), if resend polling order 0x4a, the status parameter in response command should be 00 (motor works in normal state as picture12).

Note: When RS485 control several devices, 0x4a is polling command, each time control command B2=0X4d, 0x42 or 0X45 was sent out, you need to send polling command to query current motor status, or when you send other commands (except for inquiry command) it will show motor busy.

③ Send Command: Motor runs as counterclockwise (CCW) – Suction

B0	B1	B2	B3	B4	B5	B6	B7
0xCC	0x00	0x4d	0xAA	0x00	0xDD	0x94	0x02

Response Command

B0	B1	B2	B3	B4	B5	B6	B7
0xCC	0x00	0xFE	0x00	0x00	0xDD	0xA7	0x02

CCW = liquid suction, B3B4 = motor steps, operation result as picture 13:



Picture 13

Status parameter B2=0xFE in response command means motor works normally. Parameter of B3 B4 is AA 00, 0x00AA = decimal number 170, it means motor steps is 170 when suction liquid.

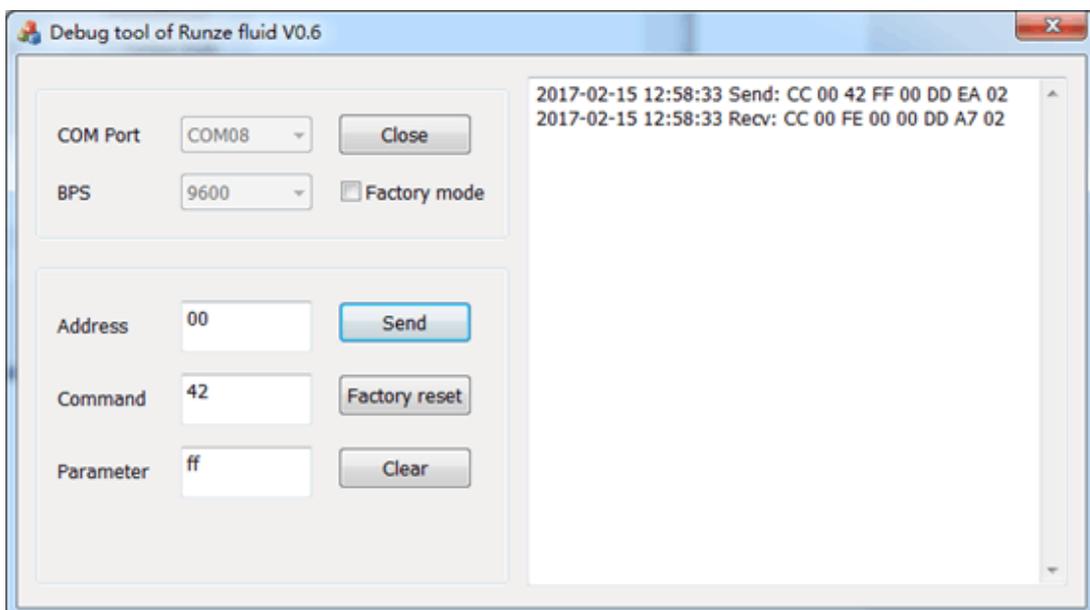
- ④ Send command: Motor runs as clockwise (CW) and stops when touched Optocoupler - Dispense

B0	B1	B2	B3	B4	B5	B6	B7
0xCC	0x00	0x42	0xFF	0x00	0xDD	0xEA	0x02

Response command

B0	B1	B2	B3	B4	B5	B6	B7
0xCC	0x00	0xFE	0x00	0x00	0xDD	0xA7	0x02

CW = liquid dispensing, operation result as picture14:



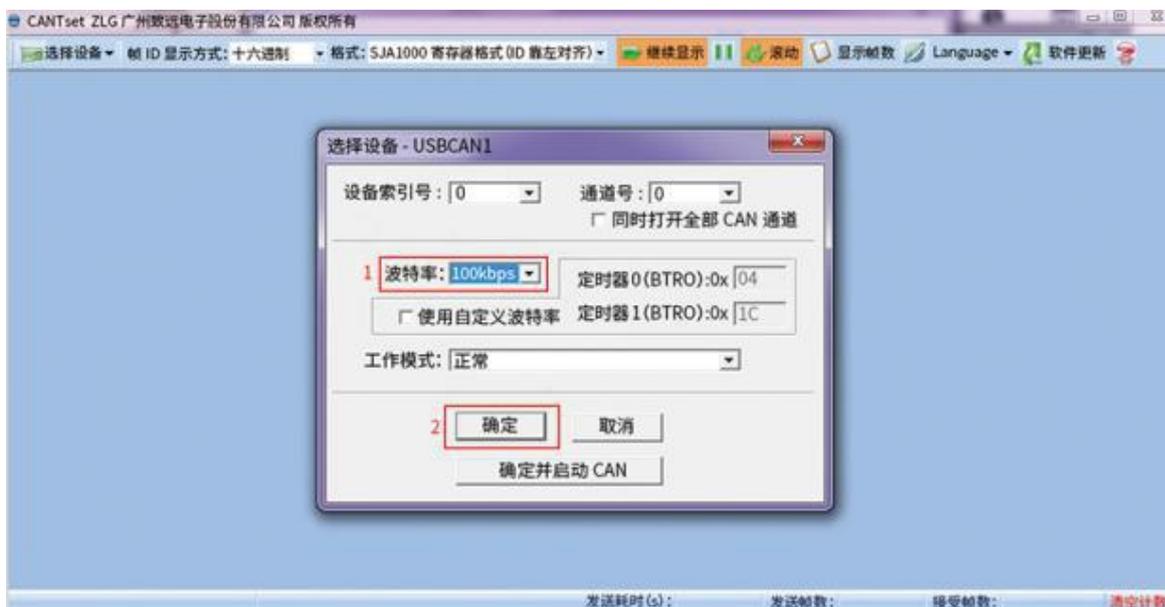
Picture 14

Satus parameter B2=0xFE in response command means motor works normally. Send command “0x42”, if steps parameter of B3B4 is more than steps between motor and reset Optocoupler, motor will stop at reset Optocoupler; if steps parameter of B3B4 is less than steps between motor and reset Optocoupler, motor will work reset steps.

6- CAN Debug Instructions

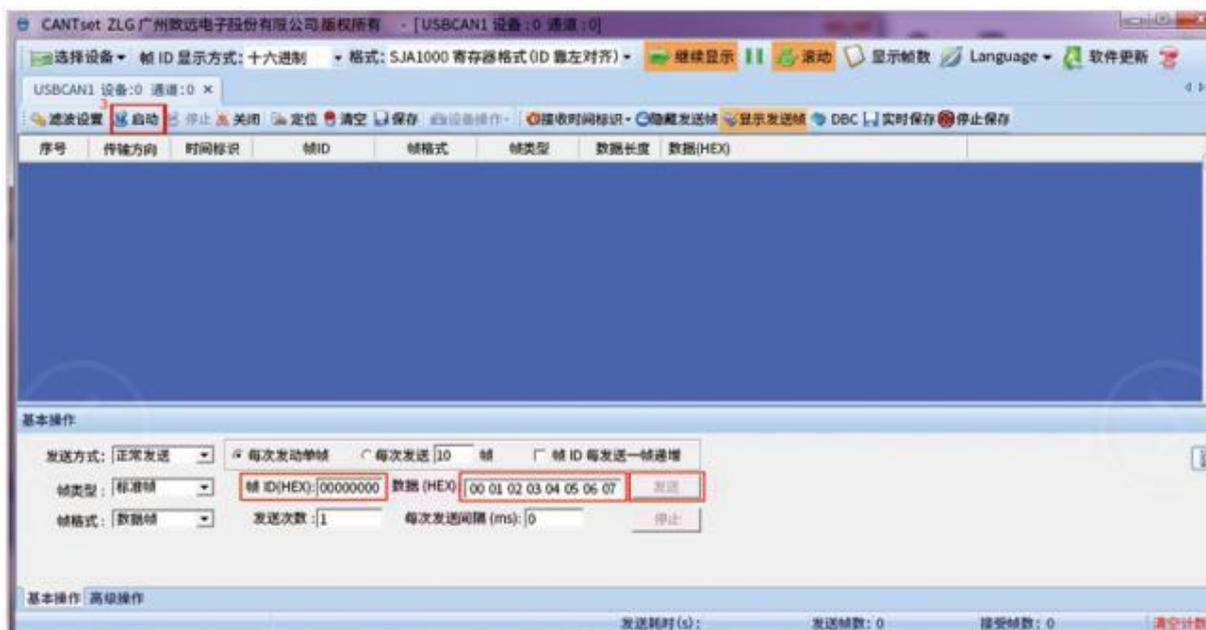
(1) CAN Debug Tool: CAN Test as picture 15 (CANTest_Setup_V2.23.exe)

① Send command: Query current motor status



Picture 15

Open CAN debug, interface as picture 15, Click “send” after select the correct baud rate, click “confirm” to below interface, click “Start” then input command to proceed.



Picture 16

Or, click “confirm and start” then input commands to proceed. Input “Frame ID” (address) and “Data”, click “send” to get received code. For example, input command 0x4a to inquiry motor status, other options no need to change, sent and received command will displayed as picture 17:



Picture 17

(2) CAN communication example

① Send command: Reset

B0	B1	B2	B3	B4	B5	B6	B7
0xCC	0x00	0x45	0x00	0x00	0xDD	0xEE	0x01

Response command

B0	B1	B2	B3	B4	B5	B6	B7
0xCC	0x00	0x00	0x00	0x00	0xDD	0xA9	0x01

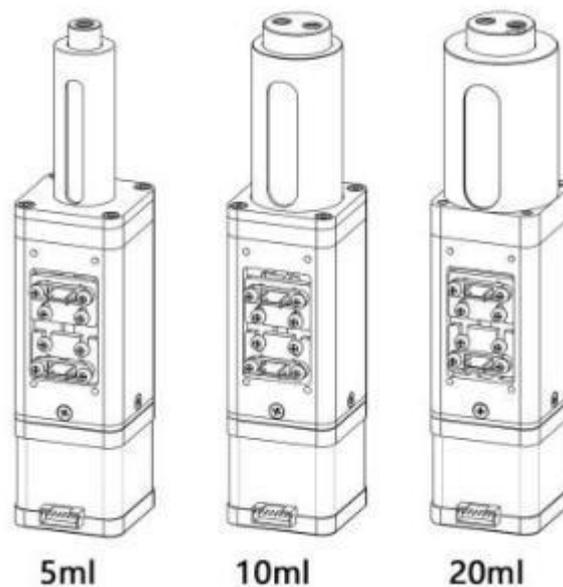
Operation result as picture 18:



Picture 18

Received commands B2=00 means device works normally and successfully reset.

MiNi SY-04 without driver



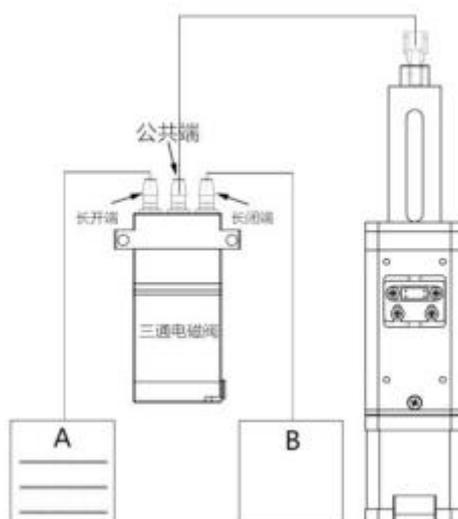
MiNi SY-04 syringe pump without driver was equipped two pieces OMRON Optocouplers (Model No. EE-SX95-R) for control upper and nether limit to protect the pump from been damaged.

OMRON Optocoupler adjustment method:

Start the motor until piston reach the upper limit position, move upper optocoupler upward until it detected the signal then fix the mounting screws; Start the motor until piston reach the nether limit position, move nether optocoupler downward until it detected the signal then fix the mounting screws;

Note: Position of Optocouplers must be adjusted under low speed to avoid any damage to pump.

Solenoid Valve + MiNi SY-04 Syringe pump



- Connect 3 way solenoid valve with single channel MiNi SY-04 syringe pump as above picture
- When NO (normally open) port of solenoid valve was connected with pump, liquid was suctioned in from container A to syringe; when NC (normally close) port of solenoid valve was connected with pump, liquid was dispensed out from syringe to container B.
- Double channel MiNi SY-04 works with check valves to realize a successful suction and dispensing.

Control Driver (without driver)

- 1) PWM control driver – MC-20T
- 2) RS232/RS485/CAN control driver – MC-20C



Packing Info.

Carton Size: 26*15.5*18.5CM

G.W.: 2.0KG



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