Manual for Simple PLC All-In-One Programmable Time Relay (V6.0)

(The manual is applicable to all the models of flagship products in 2023.)

Contents

We just provide consult and suggestions to users about the programming and we do not provide free programming service.

Chapter 1 Summary

Welcome!

The simple PLC all-in-one programmable time relays produced by us cover the following models.

8 in 8 out model(relay output and transistor output optional)

12 in 12 out model(relay output and transistor output optional)

16 in 16 out model(relay output and transistor output optional)

32 in 32 out model(relay output and transistor output optional)

The products are characterized by simple programming and easy operation. A common engineer can understand the program and make program on site, which reduces the cost to a great degree. At the same time, the products can be used as time relays of multiply paths. Each path of the module can work either independently or dependently, which makes it possible to realize more complex functions than the traditional products.

The products boast of the following characters:

Compatible with two pulse outputs, and adjustable with the frequency scope of 0Hz~150KHz

Capable of free switching between Chinese and English interface.

Support logical AND, OR, Addition, and Subtraction operations.

Capable of working with 64 programs simultaneously.

Afford 25 timers, 99 counters and 99 time meters

Capable of working with 100 external registers, which makes the access to external devices, data exchange and processing possible.

Time delay precision: 0.01 second.

Compatible with NPN and PNP digital signal.

Compatible with 2 high speed pulse inputs

Optional matching with 2 12-bit analog signal inputs(able to detect the signals of 0~20mA ,4~20mA, 0~5V, 0~10V)

Optional matching with 2 high precision analog outputs(able to realize the outputs 0~20mA ,4~20mA, 0~5V, 0~10V)

Optional matching with 2/4 high speed pulse outputs with the frequency of 0Hz~150KHz

Optional matching with RS485-MODBUS-RTU communication.

Compatible with 2 independent 485 ports (32-in-32-0ut, PLC exclusive)

The main 485 port: used to download programs, connect computer and touching screen, read external devices, control external RTU equipments and DTU communication.

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The subordinate 485 port: used to connect touching screen, 2G/4G DTU and 485 RTU equipments.

USB Port (32-in-32-out, PLC exclusive), standard USB2.0 high-speed Port

Connected to the computer, the port is used to realize the functions such as download, upload, simulation, manual control and etc. it replaces the tradition 485 port and boasts of high speed.

Compatible with flickering signal trigger

Compatible with all the expansion output ports of 485 communication module.

Compatible with touching screens.

Compatible with arbitrary combination of perpetual calendar control

Without trapezoid programming

Replaceable with common PLC

Boasting of user-defined key imitation pause /scram functions, several digital inputs accessible with different sensors, logic operation of PLC, user-defined programming of output, and independent or combined timing functions in different time quantums.

Able to replace several time relays.

More powerful programming combination and function than time relays with 0.01 second precision. Arbitrary combination of year, month, date, day and hour makes a serial of specific operation possible.

Able to replace current modules and voltage modules of PLC analog. Internal analog operation makes programming visible.

Program encrypt: encryption of programming can avoid alteration by others.

Offline management: direct editing on the control panel can be done without connecting to the computer. A HD color liquid display is used with options of simplified Chinese, traditional Chinese and English in the interface. It is very user friendly with corresponding displays of menu management, orders and input, which makes operation very easy. Common users can operate it very freely without the trouble of learning trapezoid diagram.

Chapter 2 Hardware Parameters

一、Specification

1：Current supply of Controller

An Internal DC-DC voltage reduction device is used to guarantee working under the constant voltage

Reversal connection proof

Current supply with recommended switch power supply

Voltage : 12~24VDC with transistor output model

24VDC，12VDC with relay output model (customized)

Attention: the current supply of terminal(24V GND) in the simple PLC all-in-one relay can only supply the control itself(see the third table for parameters).

2：Power supply of the load

Another power supply is used for the output terminal. If the output voltage is same as that of the simple PLC relay, they can share a power supply. Otherwise, different power suppliers are used.

二、Input and output Specification

Input port:

The input port, with a built-in 5V up and over current and over voltage protection device, can connect with keys, proximity switches, air cylinder magnetism switches, touching points of relay, photoelectric sensors, Hoare sensors and so on.

If you have purchased the analog version, the model can also support signal access such as transmitters, current and voltage modules, and analog input ranges (0~20mA, 4~20mA, 0~5V, 0~10V)

Output port

The output port can work with all kinds of switch loads, contactors, electromagnetic valves, relays, LEDs and alarming devices. With the devices of analog output, the speed can be adjusted by controlling a 0-10V frequency transformer.

Pulse output port:

Used to control stepper motors/sever motors

Realize high precision location of high speed response.

Several axles working simultaneously.

Supporting the modification of motor speed and distance through touching screen.

A built-in auto-superposed trapezoid diagram makes the motor slow start and stop possible and ensures the maximum torque.

Three units adjustable: millimeter, round and pulse quantity

Zero setting function makes the device look for mechanical zero automatically every time when the equipment is started.

Analog acquisition part:

Input specification: 0~10V or 0~20mA or mixed

Resolution: 12 bit

Accuracy: 0.01V or 0.01mA

Number of channels: 2 channels (multi-channel can be customized)

Refresh rate: 10mS~50mS adjustable

Analog output part:

Output specification: 0~10V or 0~20mA or mixed

Resolution: 16 bit

Accuracy: 0.01V or 0.01mA

Number of output channels: 2 channels (multiple channels can be customized)

Refresh rate: >=30mS

三、Performance Parameters

Item	Parameters	
Product name	Simple PLC All-In-One Programmable Time Relay	
Output type	Relay type	Transistor type
Power supply	10W (<300mA/ DC24V) **Reversal connection proof Input voltage is not greater than 28V**	6W (<200mA/ DC12-24V) **Reversal connection proof Input voltage is not greater than 33V**
Output format	8/12/16/32 relays(constant open)	8/12/16/32 transistors(Open-drain output)
Output load	5A/250VAC、5A/30VDC	2A/12-24VDC
Contactor lifetime	The life span of electric parts and mechanical parts is 100,000 times and 3,000,000 times	Over one hundred million times
Input points	8 / 12 / 16 /32 points	
Input signal	>2mA /DC12-24V compatible with PNP and NPN signals	
Analog input	**0~20mA ,4~20mA, 0~5V, 0~10V Maximum voltage <33V Maximum current <30mA(continuous input)**	
Analog output	**0~20mA (24 V output) 4~20mA (24V output) 0~5V, 0~10V**	
Dimensions	8-in 8-out、12-in 12-out: 145mmX90mmX40mm, 16-in 16-out：160mmX95mmX56mm , 32-in32-out: 300mmX110mmX60mm	

Attention：the module of transistor output is suitable for high frequency and the module of relay output for low frequency.

Chapter 3 Human-Computer Interface and Its Direction for Use

1、Description of functions of keys

Setting: 1, press the setting key for 3 seconds and get access to menu under the working condition.

2, Press the setting key and enter into the programming state.

"←""→": the user can move the cursor right or left with these two keys under the setting or programming state. Under the working condition, the user can switch the following interfaces of time piece display, timing device monitor, counter monitor, timer monitor and analog input monitor and pulse date monitor, temperature collector monitor and pulse collector monitor)

"↑""↓"： with these two keys, the user can move the cursor up/down under the condition of programming or setting.

Under the working condition, the user can check more information with these two keys.

"+""-"：the user can add or minus the data of the selected items. Under working condition, the user can browse the states of 20 programs with these two keys.

"Delete": the user can delete the contents specified by the cursor under the programming state. (successive deletion with pressing the key)

"Insert": under the condition of programming, the user just needs to press the Delete key to insert a new order before the place of cursor.

Remarks: input is saved automatically with "Confirmation" or "Saving .

2、**Menu Explanation**

1, the user gets access to the menu with pressing the setting key for 3 seconds;

2, use the keys of "←" "→**"** to choose desired menu.

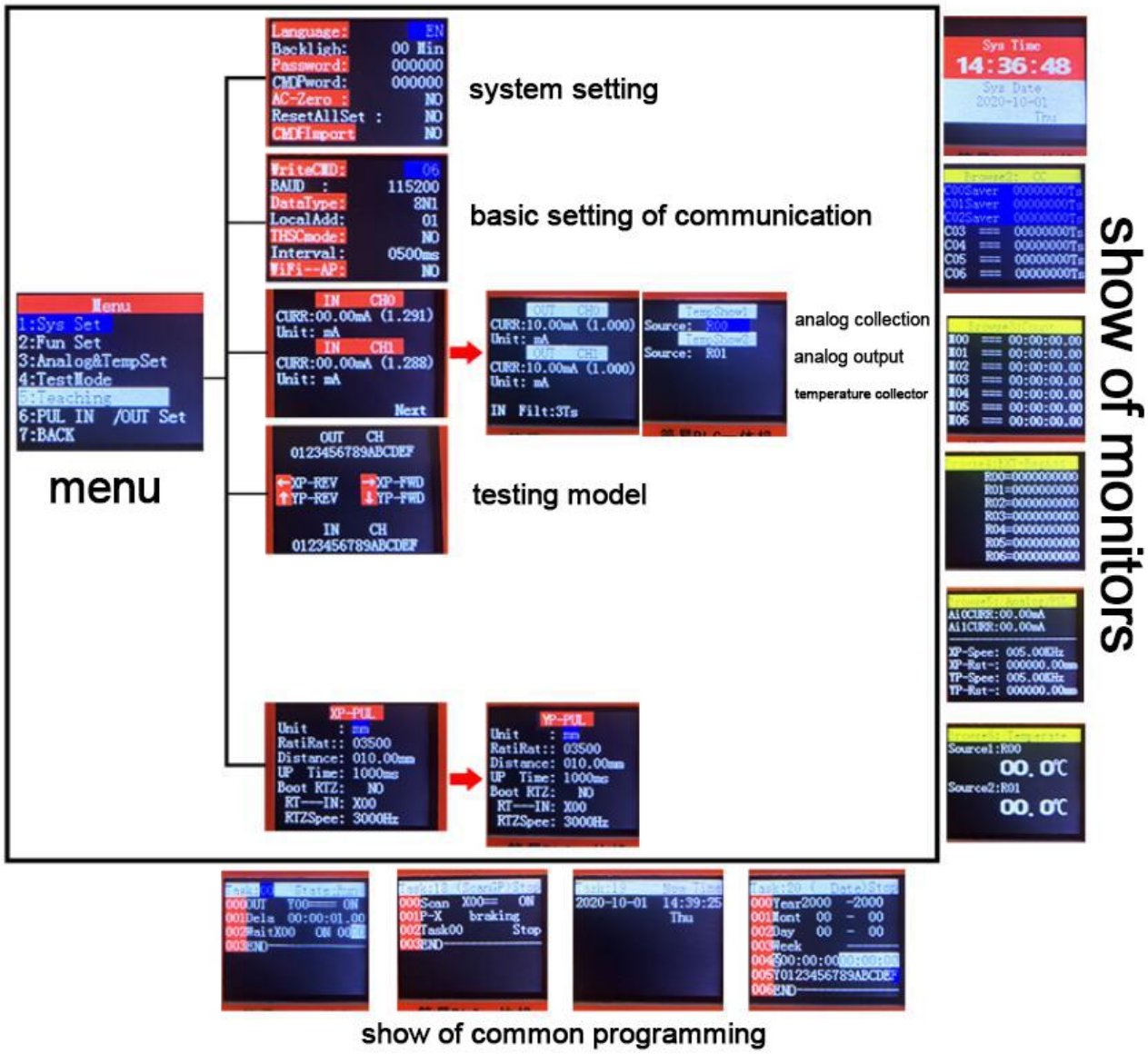
3, press the setting key to enter into sub-menu to modify the corresponding parameters

4, press the key setting after the modification to save the modification and then return to the menu at the next higher level.

5, in the interface of the menu, choose Return key and press Set to exit the menu and return to the working condition of the program.

Please see the diagram below for more details of the menu and sub-menus.

Menu Functions



(1) System settings:

①Language switch: Chinese/English

(2) Backlight time (set plc to press key for N minutes without operating message screen)

(3) Administrator password (default: 000000, this password is used to enter the general menu)

④Program password (default: 000000, this password is used to modify the program and view the program)

After setting, the PLC can only display the program 65 shortcut screen, the rest of the screen is blocked)

⑤ Lock password (default: 000000, this password is used to lock the machine at regular intervals)

⑥Restore factory settings

(7) Program import (for program copy between two PLCs, please refer to the description of program copy function in point 3 below for details)

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(see description of program copy function in point 3 below)

(8) Lockout time: 00-00-00 (timer lockout, year, month, day; set to the time when the plc enters the lockout state.

The plc will enter the lockout state when the lockout password is entered and the lockout password and time will be cleared.

(Lockout time)

(2) Communication settings:

(2) Communication settings: ① Write operation code: 06 code / 16 code (function code sent by switching TX command)

② Baud rate: 115200 (baud rate of PLC communication)

(3) Data format: 8N1

④Local address: 01 (PLC communication station number)

⑤ Touch screen mode: Off (turns on to improve PLC communication speed)

⑥Active interval: 500ms (PLC when master sends command interval)

⑦WIFI Hotspot: Off (optional WiFi or 4G function, this setting needs to be turned on.

Note: 485 and WIFI can only be selected, after WiFi is turned on, 485 will be occupied.

(WiFi must be switched off before the 485 can be used normally.)

(8) Read operation code: 03 code / 04 code (switch to read external hardware command function code)

(3) Analogue and temperature settings:

①Input channel 0, input channel 1 (analog input calibration setting, factory calibrated)

Input channel 0, Input channel 1 (analog input calibration setting, factory calibrated, no need to change)

② Output channel 0, output channel 1 (analog output calibration setting, factory calibrated, no need to change)

output channel 0, output channel 1 (analog output calibration setting, factory calibrated, no need to change)

③ Temperature display 0, temperature display 1 (NTC display temperature setting is factory calibrated, no need to change)

temperature display 0, temperature display 1 (NTC display temperature setting, factory setting, no need to change)

④Analog conversion: CH0:00-00/0000-0000, CH1:00-00/0000-0000 (CH0:00-00/0000-0000)

(CH0:00-00 sets the analog range, 0000-0000 sets the temperature probe temperature measurement range, CH1 is the same.

(CH0:00-00 sets the analog range, 0000-0000 sets the temperature probe temperature measurement range, and CH1 is the same)

(4) Test mode:

①Test input and output: input X00 trigger, Y00 corresponding output

(2) Test pulse output function: Press the corresponding arrow, the X-axis and Y-axis motor will be reversed

(5) Video case and teaching

(6) Pulse input/output setting:

①Unit：turn/mm/pc

② Interpolation factor: 03200 (need to be set the same as the motor driver)

③Distance per revolution: 010.00mm (valid when mm is selected as the unit)

④Acceleration time: 1000ms (motor acceleration and deceleration time)

⑤ Return to zero at power-on: off/positive return to zero/reverse return to zero (set PLC power-on to find mechanical zero)

(set the PLC to find the mechanical zero point)

⑥Probe interface: X00 (mechanical zero point, valid when power-on zero is turned on)

⑦Zero return speed: 3000Hz (valid when power on zero return is on)

Encoder 0:

①Specification: 0400 line (for high speed pulse input, X04X05X06X07 connection)

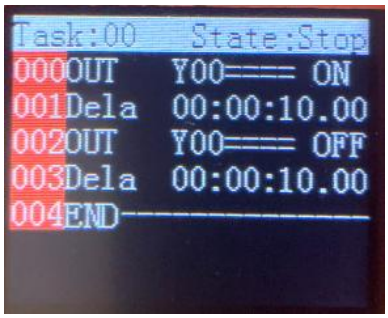
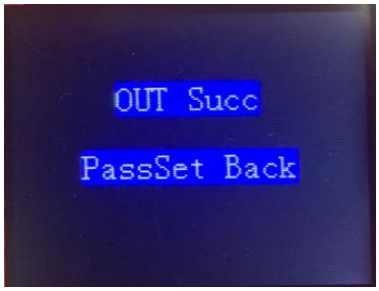
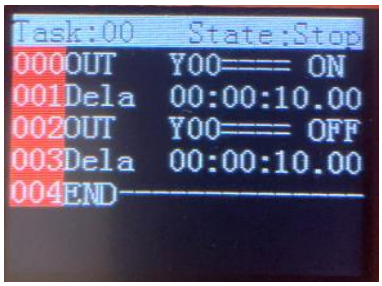
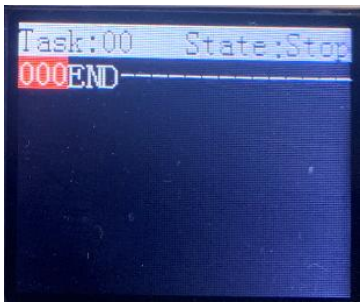
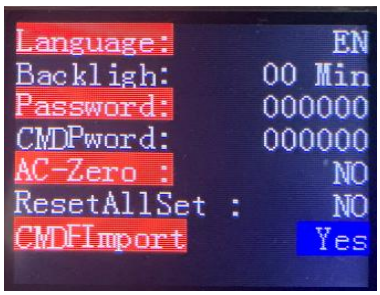
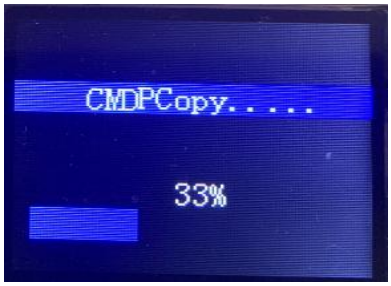
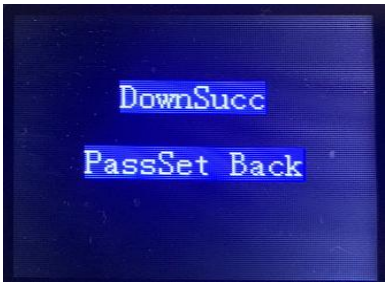
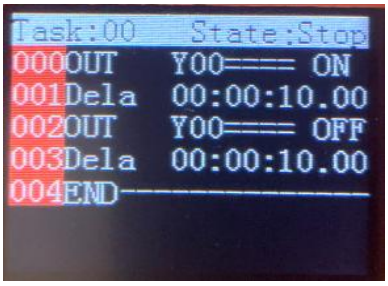
line, see command package for details: encoder command)

② Length per revolution: 0100.00mm

3、Description of program copy functions

First, attention should be paid to the version of PLC hardware, which is displayed when the device is started. Program copy function and programming function are available only with the devices of version 3.0 or higher level. Copy can be made when the two functions' requirements are met. Once the version is confirmed, connect the 485 ports of two devices with cable.

After the programming of the main station is finished and set the passwords of program and management to be 000000. When the main station is working, long press the key Setting to enter into system setting interface. Click Program Import and press the setting key to copy the codes automatically from the main station.

Main PLC	Sub PLC	Wiring and Explanation
   	    	Operation methods: Long press the setting key of sub PLC to enter into the menu. In the system setting interface, move the cursor to the icon of Program Import, press + and change the state to Open and then click the Set key to copy the program from the main station PLC to the substation PLC. When the download is over, click the Setting key to exit. **Attentions:** **1, Both the main station and the sub-station are compatible with RS485 ports.** **2, Copy operation can only be made when the main station is under working condition.** **3, The codes for the administrator in the System setting and the program are 000000.** **4, Ensure the 485 connector is fixed firmly during the copy. Otherwise, the copy will be cancelled automatically and Failure will be displayed on the substation screen. In that case, the program in the sub station is imcomplete and has to be copied again.**

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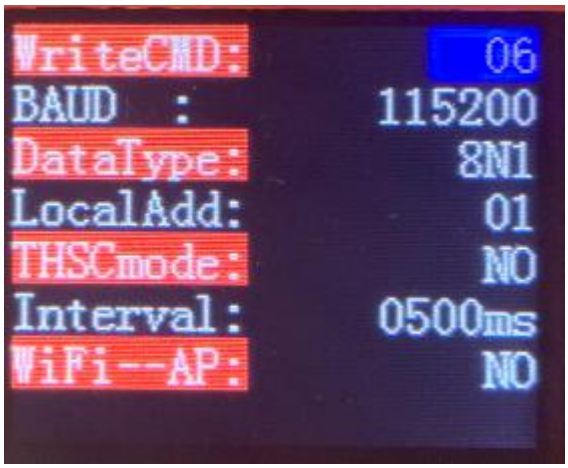
Chapter 4 WIFI Connection

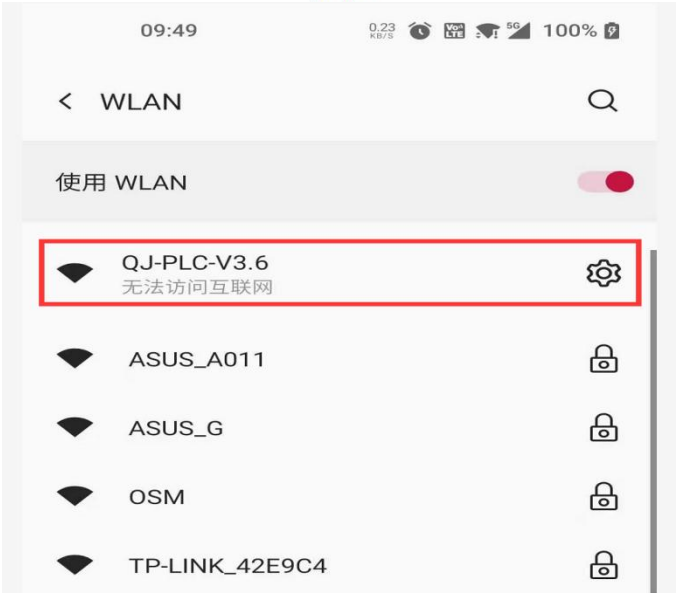
Open WIFI hotspot (the software version for PLC is required to be V3.6 or a higher version)



Long press Setting key to enter the main menu-->485 setting-->WIFI hotspot (as the photo above)

Install “android-build-debug.apk” PLC programming software (only Android version is available at present and the software for Apple IOS is under development)

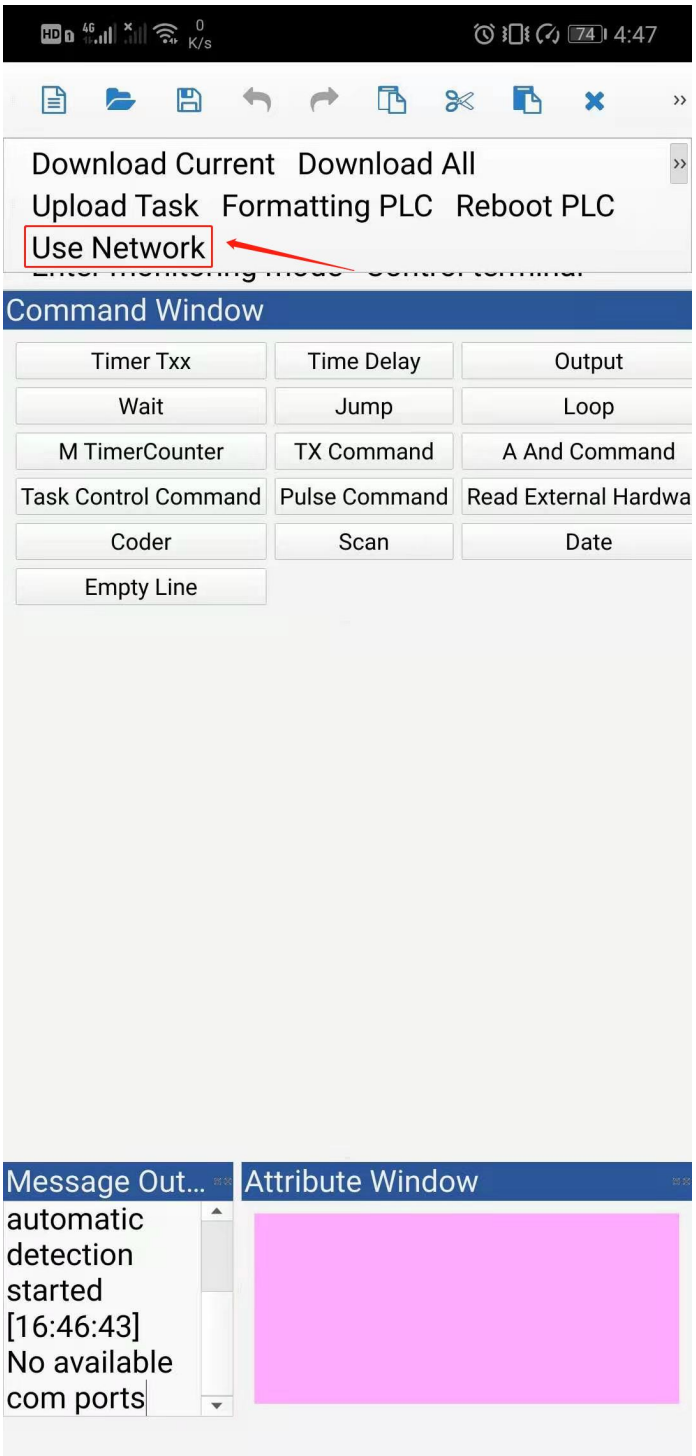
android-build-debug.apk



Password: 88888888

When WIFI is connected, the screen will display” connected, no website found”

Open the“QingJunPLC”APP and click the icon to use the website.

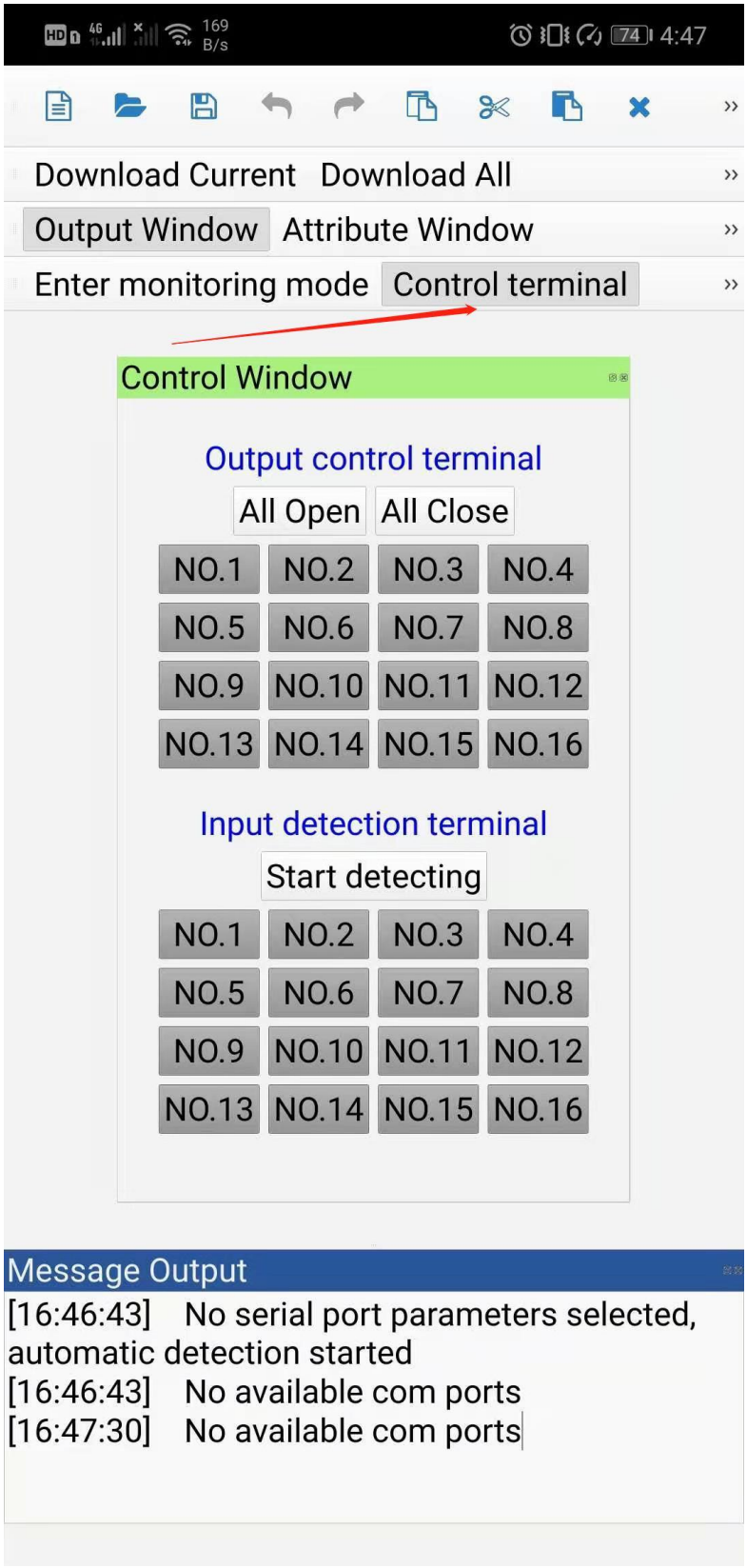


When “Connected to the sever” is shown on the Attribute window, it means that the target PLC is connected.

(attention: one mobile phone can only work with one PLC)

Click the control terminal above and control manually the output of PLC.

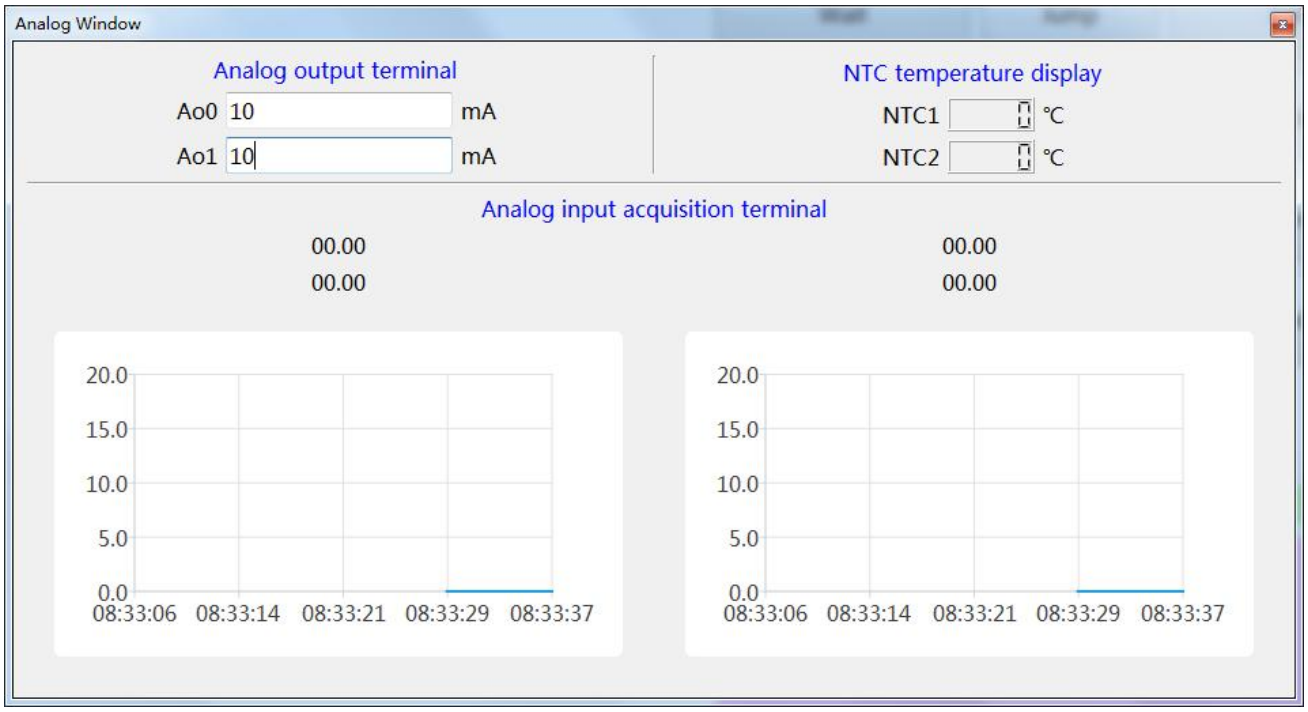
Click Control Checking to update the state of PLC input port automatically



Click"Download" to download the current internal program to mobile phone. User can also click the icon to save the program to the mobile phone for back up. (for the sake of program safety,

PLCs are required to be deciphered before they are downloaded to the mobile phones.

Record display of analog output



The superior computer supports 2 analog outputs online collection record and real time curve depiction, which makes the user know the current and voltage curve easily.

//==========**Programming methods(it is similar with a PC and a mobile phone)**

There are 3 methods to make program as below:

1, Input the order through the 9 keys on the PLC panel,

2, Software in the PC

3, APP in the Android mobile.

The programming on the computer mainly consists of the following procedures:

1, Connect the terminal A and B of PLC with the cable of USB adapter for 485 and its USB port to the computer.

2, Open 

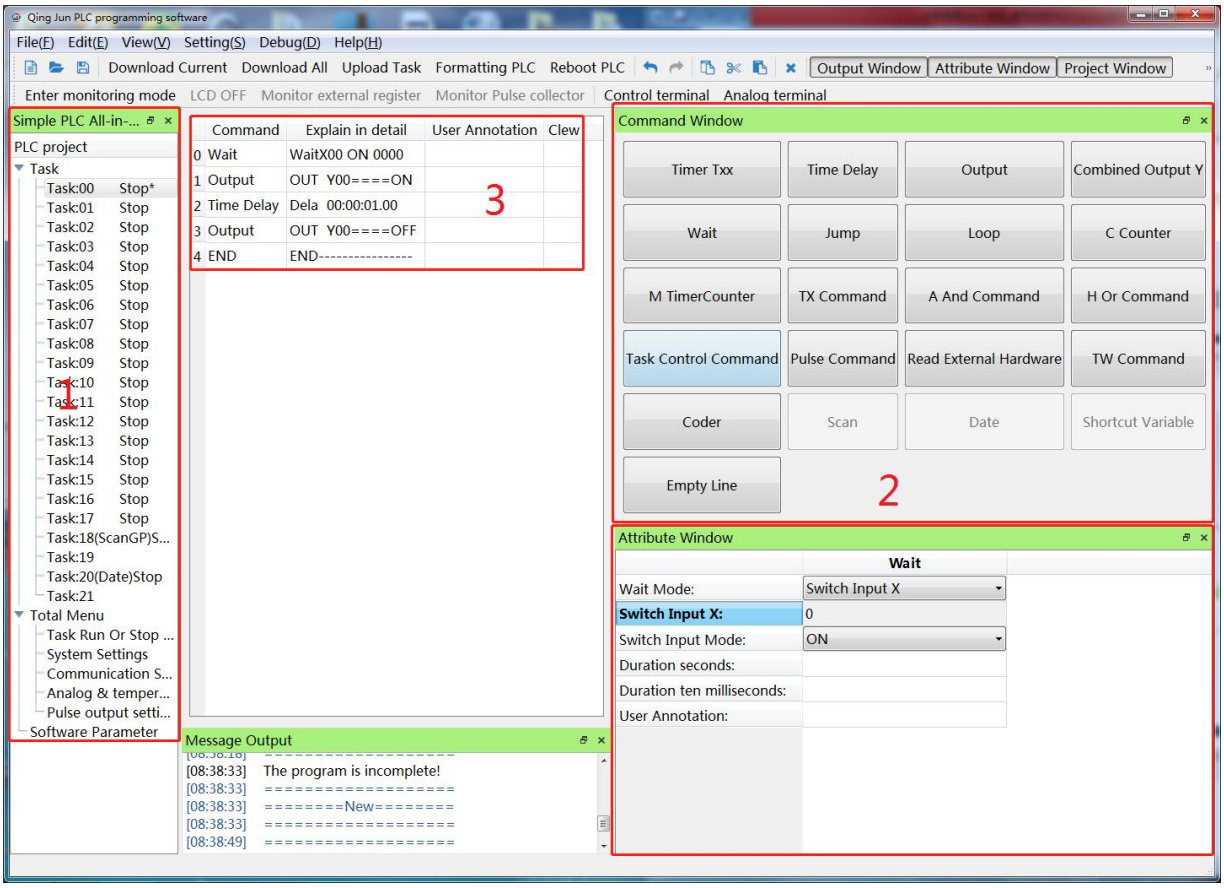
PLC programming software

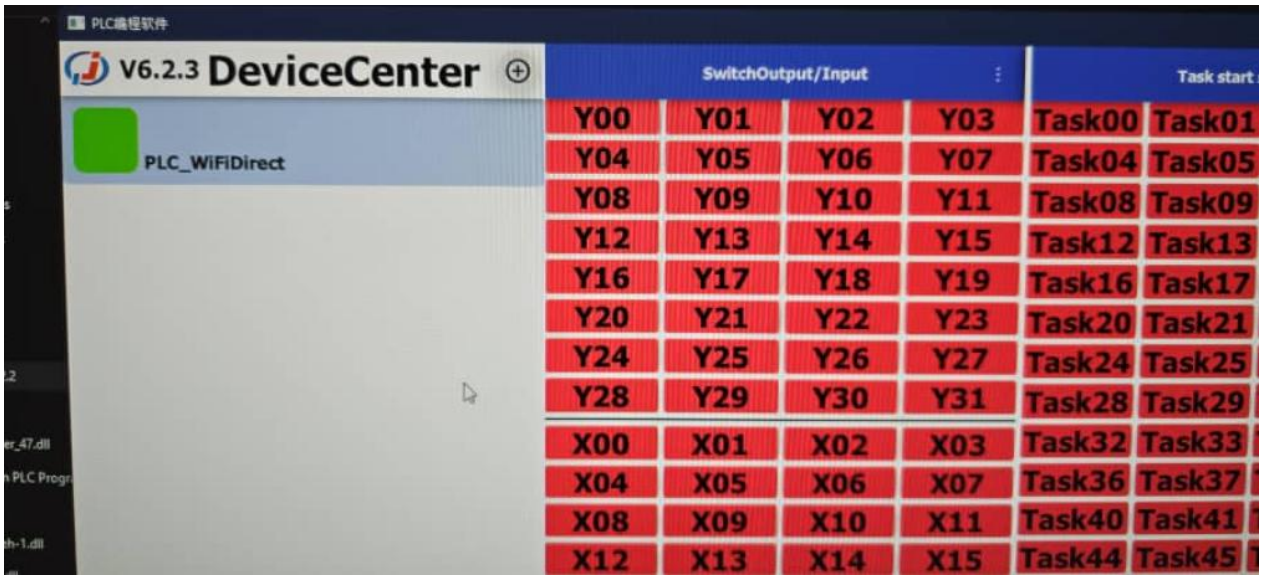
3, the software search automatically PLC and the current program for the user to edit.

The user can edit the program with the 5 steps shown in the picture below,

1) Select the serial No. of the program
2) Select the order to be added

3) Edit the attribute of the order according to the user's requirement(the contents in the 3rd window are to be adjusted in the attribute column)
4) Set the initial state when the program is powered on, Start/Close
5) Click "Copy All" to download the programs to the PLC
6) PLC will stay in the interface of Setting menu after the programs are saved. The programs will run automatically after manual exit from the interface.





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Then reopen the operation again.

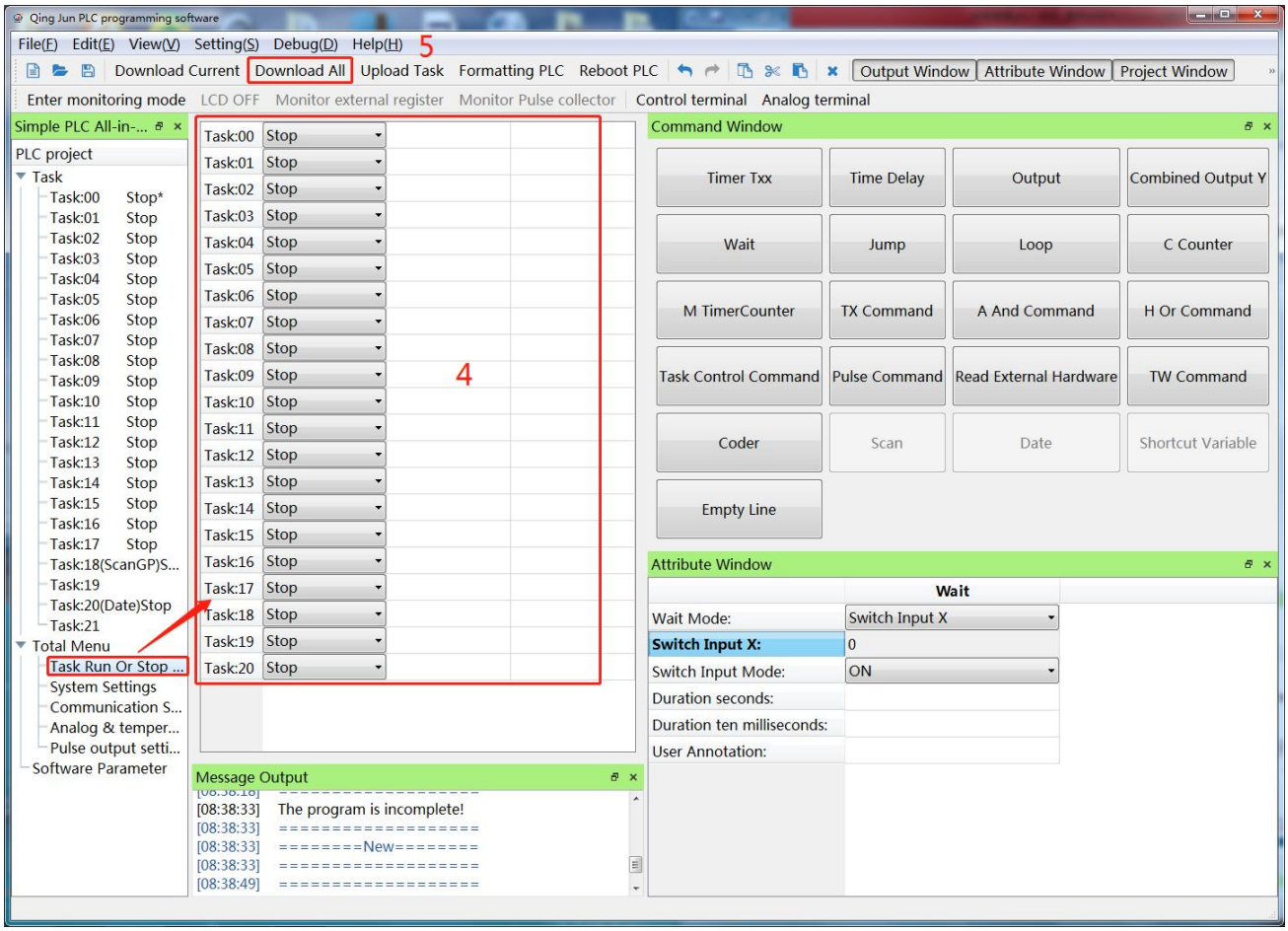
1. Turn off PLC WIFI

2. Plc power off

3. Turn off WIFI on your cell phone and close APP.

4. Plc power on, open the WIFI hotspot.

5. Open the cell phone WIFI connection, open the APP to see if there is any green.



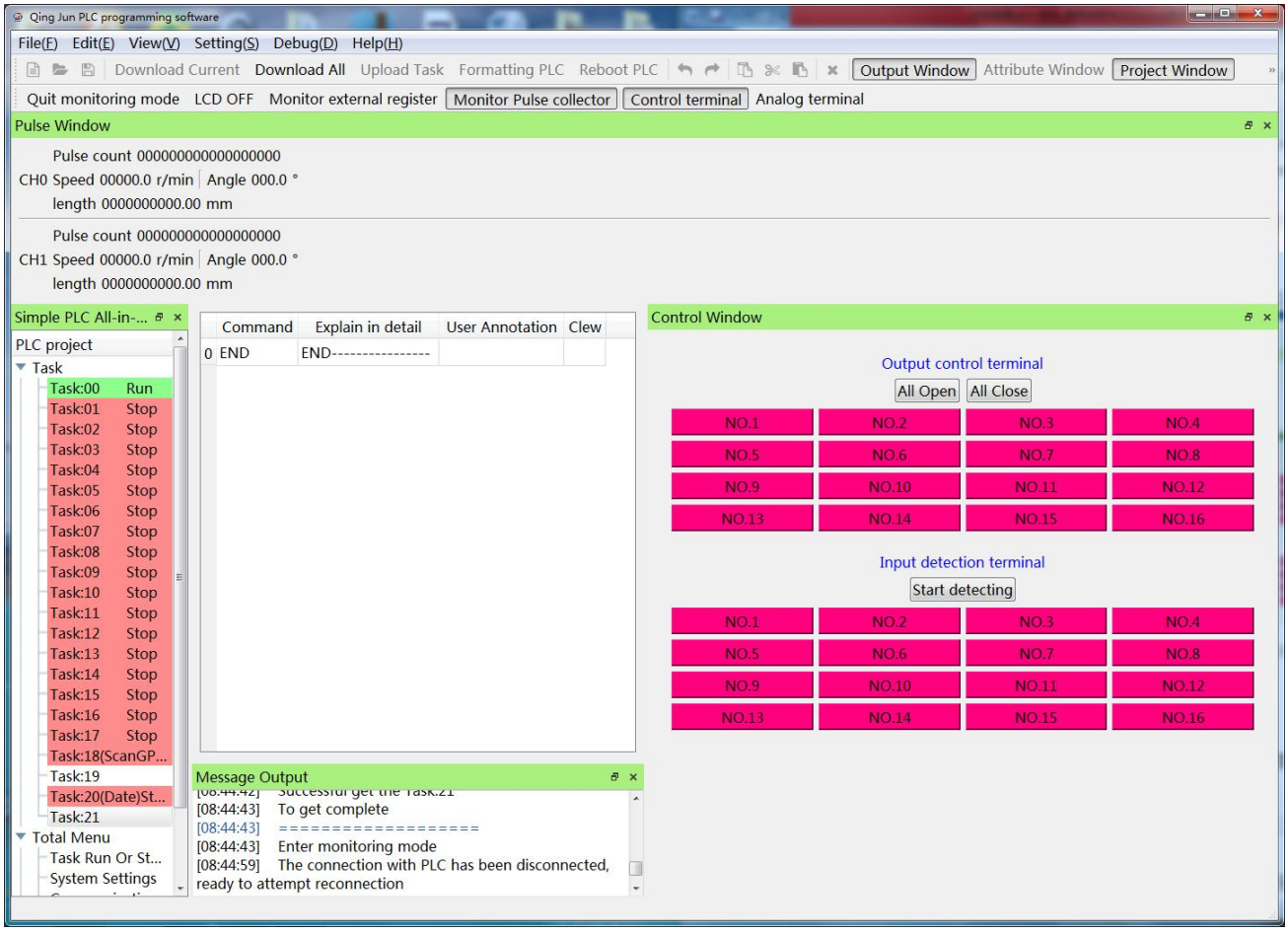
Real time imitation of software==//

1 The program enters into the state of Real time imitation with a click of “Monitoring”

2 The software will give a hint to the user to save the edited program and the user can save it at the selected route.

3 The user can check the collected data and diagrams with Pulse collector and Analog ports in the monitoring mode(see the picture below)

4 Click the Control Unit to control manually the output port of PLC



5 Under monitoring state, the program in the 4th interface will update timely according to the actual state, which is convenient for the user to know the working process.

Supporting 2 high speed input encoders working simultaneously

Compatible with incremental encoders and absolute value encoders

Applicable to single line input and double line input

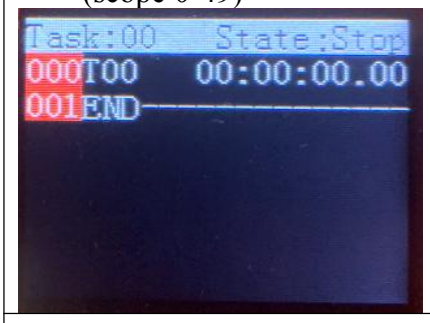
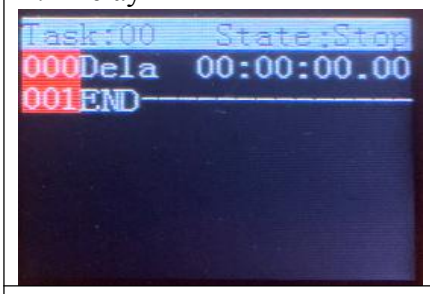
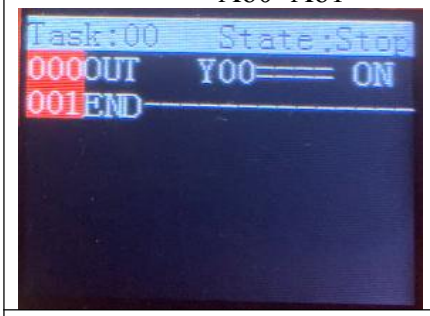
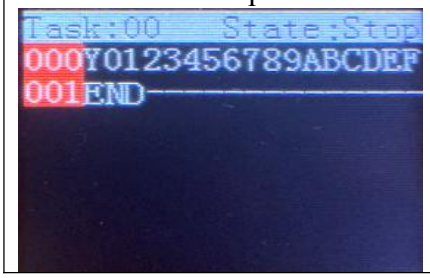
Compatible with NPN and PNP input

Applicable to FW direction and REV direction

Capable of checking angle, speed and distance

Chapter 5 Instructions

(Attentions: the system is designed according to the 16 in and 16 out hardware. Therefore it is compatible with 12 in and 12 out and 8 in and 8 out hardware. If the products you bought belong to 8 in and 8 out, you can operate with the frontal 8 input, i.e. X00-X07 and output Y00-Y07. It does not work with the output Y13.)

<table>
<tr><th>Item</th><th>Instructions</th><th>Function Description</th></tr>
<tr><td rowspan="4">Instructions related to program 00-59</td><td>1：Timer TXX
(scope 0-49)
  </td><td>Timer can be employed quickly to take place of common delay. At the same time, it is more convenient to modify the delay in a batch.
Capable of working independently</td></tr>
<tr><td>2：Delay
  </td><td>Common time delay(hour: minute: second: 10 millisecond)
Special function: the dynamical value of the timer is activated by the hidden symbol behind delay to realize the special effect.</td></tr>
<tr><td>3：Output Y00~Y15
Ao0~Ao1
  </td><td>1: Close, Open and and Turn over
1 Voltage(0-10V), Current(0~20mA),supporting the variable shortcut of Aval00~49
(Follow descriptions of program 64)
2 Output following input
3 Output analog increment 0.10</td></tr>
<tr><td>4：Combined output Y
  </td><td>All output Y0123456789ABCDEF
All Open Yxxxxxxxxxxxxxx
Y08~Y15 output Y- - - - - - - - 89ABCDEF
Y00~Y07 turn over Y↕↕↕↕↕↕↕↕ - - - - - - - -</td></tr>
</table>

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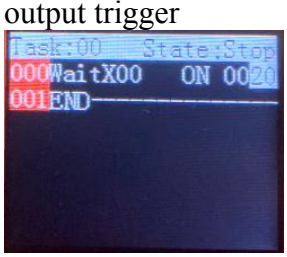
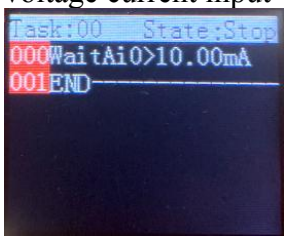
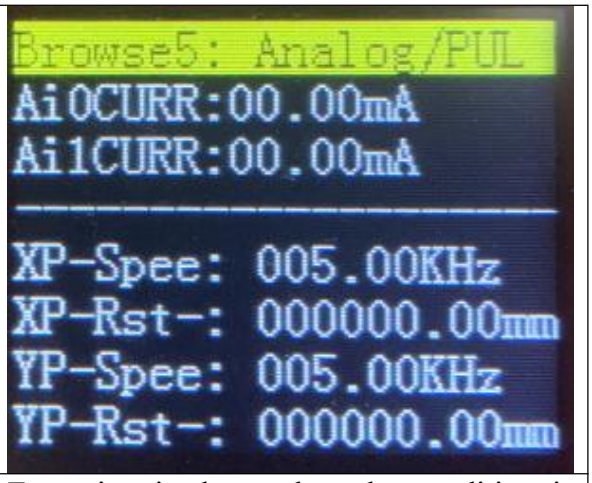
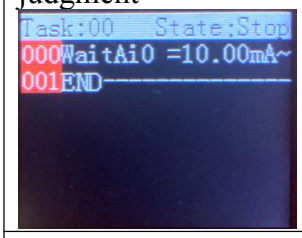
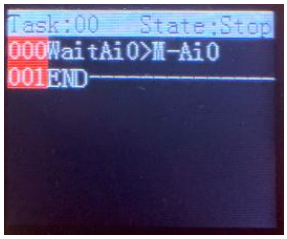
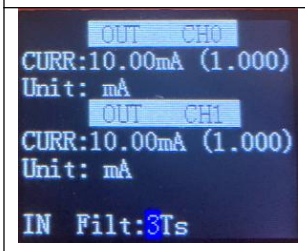
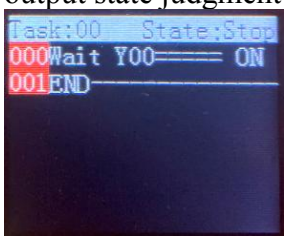
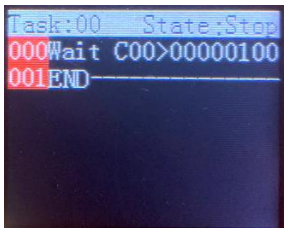
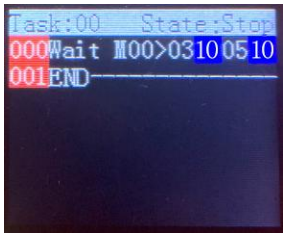
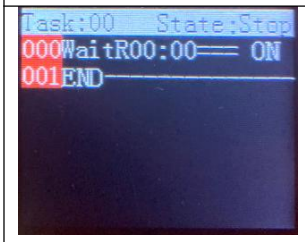
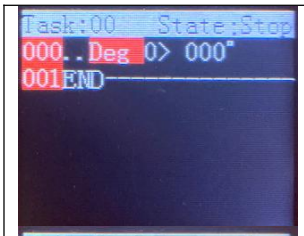
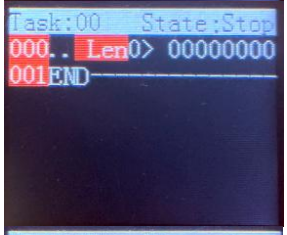
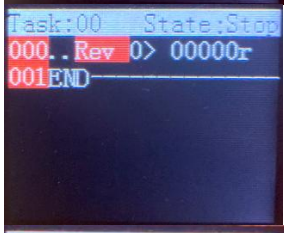
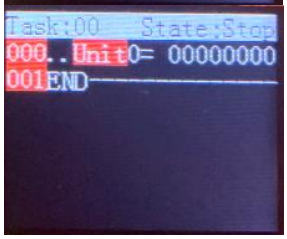
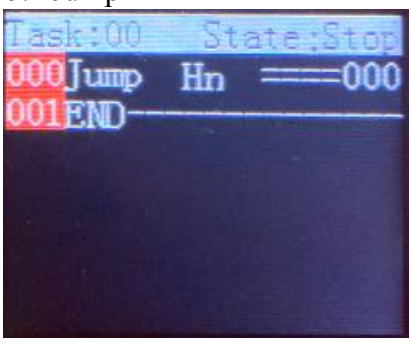
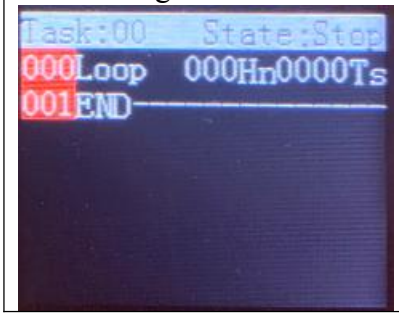
	5：**Wait until all the conditions meet the requirement to execute the next order**	X00~X15 output trigger 	When X00 keeps close, it takes 20ms to execute the next operation (the frontal oo in 0000 means second and the rear 00 10 millisecond) Example 1 Close 0020 means that the next order is executed after the device is closed for 200mS. Example 2 Close 0030 means that the next order is executed after the device is closed for 300mS. Example: Rising edge (execution is done from up to down after triggering) Example: Falling edge(execution is done from down to up after triggering) For example, if a skipping order is added after a waiting order, these 3 orders become an instant judgment. That is say, if the conditions are met, it will skip to the target line to execute the order. If the conditions are not met, the program will execute the order from the line after the Skipping order.
		Ai0~Ai1 voltage current input 	Execution is done when the condition is > (10.00mA or Aval) Execution is done when the condition is < (10.00mA or Aval) Execution is done when the condition is = (10.00mA or Aval) Execution is done when the condition is ≥ (10.00mA or Aval) Execution is done when the condition is ≤ (10.00mA or Aval) Attention: The checked analog data can be viewed in the screen of monitor 5.

	
Ai0~Ai1 current voltage internal judgment 	Execution is done when the condition is 10.00mA ~ 13.00mA Execution is done when the condition is 5.00 V ~ 8.00 V. Supporting the variable shortcut Aval00-49 (Follow descriptions of program 64)
M-Ai0~M-Ai1 	The data are used to remember the collected analog data for the comparison later.
	The filtration of the channel of analog collection(default value is 3) This function is applicable to different sample collection speed or filtration smoothness(0-5) with the actual corresponding updating time 0f 10ms~200ms.
Y00~Y15 output state judgment 	The next order is executed when it is closed. The next order is executed when it is open.

		C judgment of counter value 	Example 1 C00 > 00000100 When C00 of the counter is greater than 100, the next order is executed. Example 2 C00 < Cval03 When Coo is less than the variable shortcut, the next order is executed. (with reference to the description in program 21)
		M judgment of timer value 	Wait for the value of counter M00 When the result is greater than 03:10: 05, the next order is executed.
			Wait R00:00=close It is used to judge the product state of input port of RS485 R00 refers to the mapping result from reading the external hardware and 00 refers to the data at the input port of the extended panel.

   	equal angle 0>000° equal length 0>00000000 equal distance 0=00000000 These concepts are used to judge the input of high speed pulse. Wiring: X04 is connected to the phase A of encoder 0 and X05 is connected to phase B of encoder 0 in order to differentiate the clockwise turning from anticlockwise turning. If it is not necessary to make this differentiation, it goes without connecting phase B. X06 is connected to the phase A of encoder 1 and X07 is connected to phase B of encoder 1 in order to differentiate the clockwise turning from anticlockwise turning. If it is not necessary to make this differentiation, it goes without connecting phase B.
6：Jump 	Jumping to line 099 to execute the order If the line No. is out the range of the specification, it will jump to the first line to execute the order. If a jump order is added after an order such as “wait”, “A” or “H”, these 3 orders become an instant judgment. That is say, if the conditions are met, it will jump to the target line to execute the order. If the conditions are not met, the program will execute the order from the line after the jumping order.
7：Circling 	Circle 000 line 0000 times Circle the program between 000 line and this order 0000 times are the circling times.

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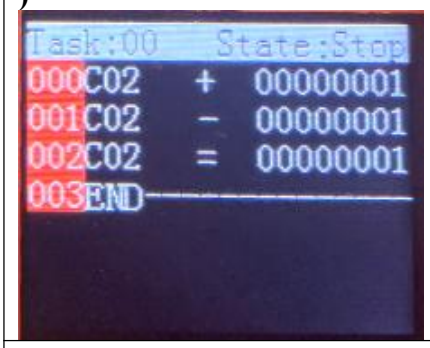
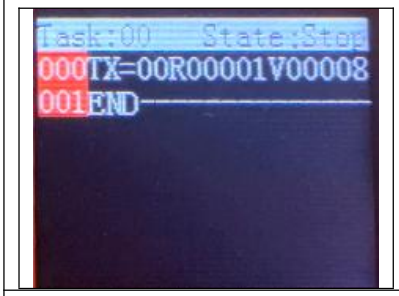
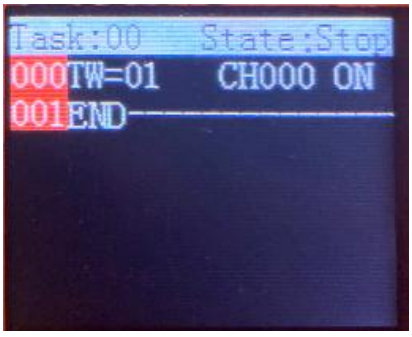
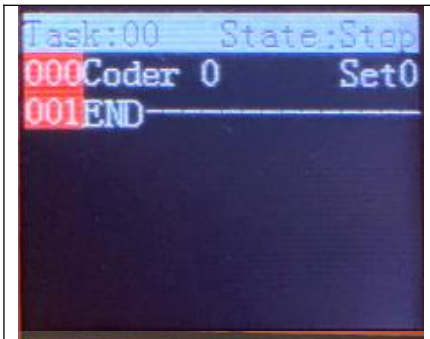
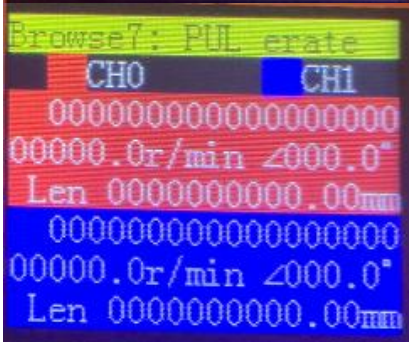
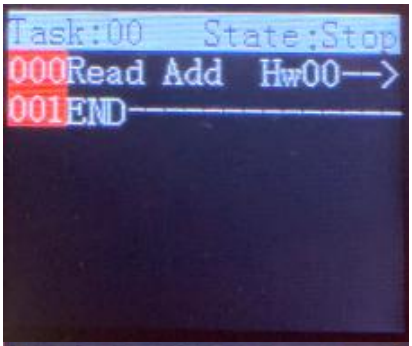
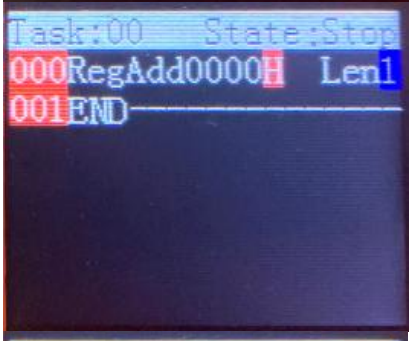
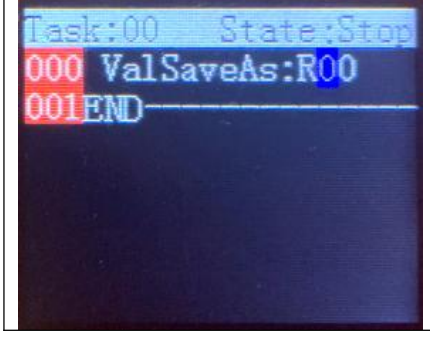
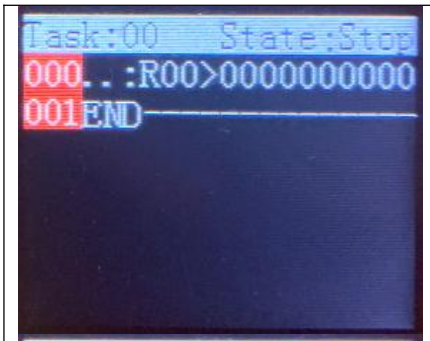
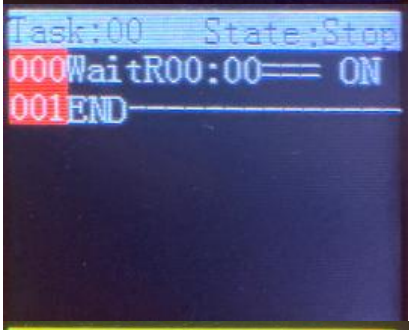
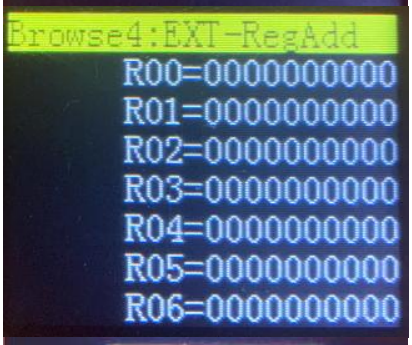
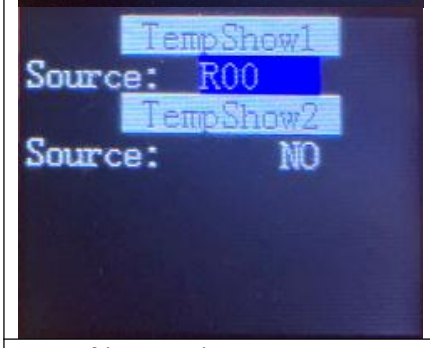
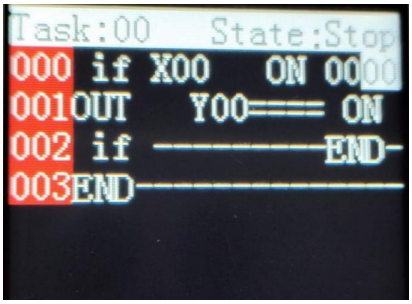
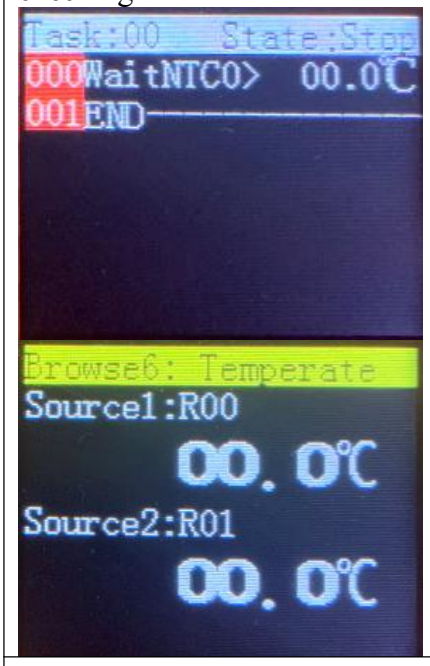
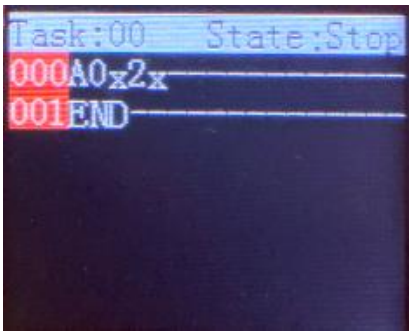
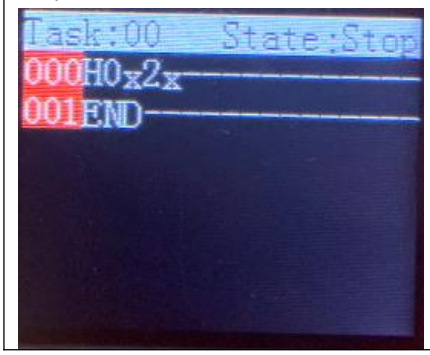
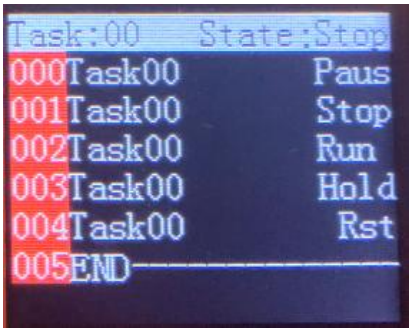
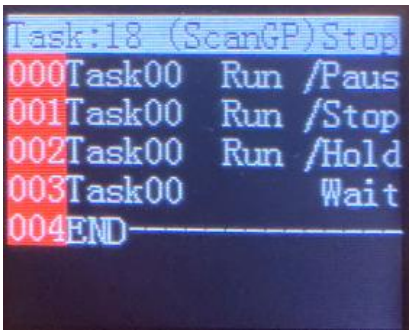
8：Counter **(Only C00, C01 and Co2 have the function of blackout holding.** **)** 	C02 + 00000001 the counter 2 plus 1 C02 + 00000001 the counter 2 minus 1 C02 = 00000001 the value of counter 2 is 1, Supporting the variable shortcut(with reference to the description in program 21)
9：M timer 	M01 clearing counter 01 returning to 0 M01 start counter 01 starts timing M01 pause counter 01 stops timing
10：TX instructions 	TX=00R00001V00008 An instruction of 8 is sent from the register of 00001 to the equipment of 00 through 485. The maximum address of equipment, register and register value is 99, 65535 and 65535 respectively.
11：TW instructions 	TW=01 Channel 000 Close A signal from equipment 01 is sent to the first path of an external register through 485. Applicable to the bit operation of an external relay module(code 05)
12：Encoders	Encoder 0 clear Applicable to the data clearance of high speed pulse input X04 is connected to the phase A of encoder 0 and X05 is connected to phase B of encoder 0 in order to differentiate the clockwise turning from anticlockwise

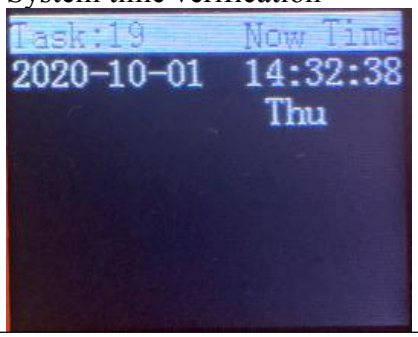
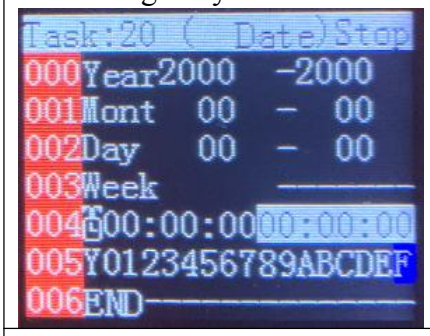
	 	turning. If it is not necessary to make this differentiation, it goes without connecting phase B. X06 is connected to the phase A of encoder 1 and X07 is connected to phase B of encoder 1 in order to differentiate the clockwise turning from anticlockwise turning. If it is not necessary to make this differentiation, it goes without connecting phase B. It can realize the following functions of two encoders, Measuring angle(compatible with APP monitor display) Measuring revolution(compatible with APP monitor display) Measuring distance (compatible with APP monitor display) The obtained data are displayed in the small screen of PLC Also applicable to length counter, revolution monitor, and angle gauge.
	13：Reading external hardware   	When it is ordered to read an external hardware, No. R must be specified because the display allocation and handling are made according to No. R. PLC can be used as a temporary buffering saver when it is used as main station to inquire the external data. User can execute or trigger a instruction or program based on the result. Generally, PLC can read the external temperature, moisture, revolution and the value of voltage and current if the subordinate equipment is compatible with MODBUS-RTU protocol. The data regarding R can be found in monitor 4. If it is about temperature, the user just needs to change the temperature into the corresponding No.R in setting of analog and temperature to get the data conveniently. Used to read the data of temperature and moisture sensor. Work with all the external registers that are compatible with MODBUS Code 03. It can work with 18 external registers at most. PLC will read automatically without interference the instructions, which must be added to the program. The user just needs

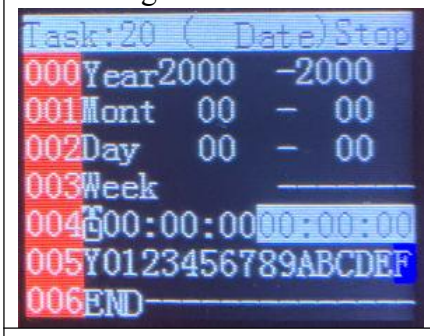
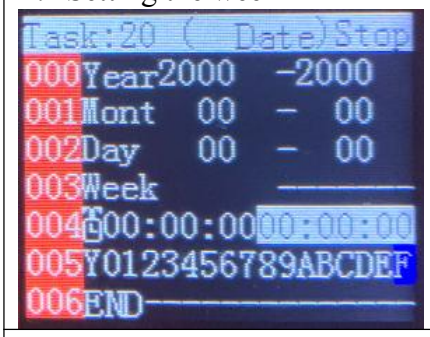
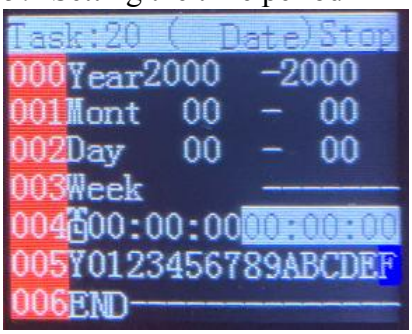
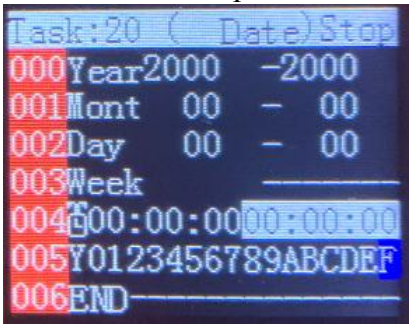
   	to judge the value of Rxx.
14. If instruction 	Momentarily determine the condition of if, if it meets, then execute down the statement between if and if - end, if not, then execute if - end after the statement Illustration on the right. Execute line 000, determine the state of x00, if X00 is closed, execute line 001; if x00 is broken, execute line 003. (Note: "if statement" should be used in combination with "if - end", otherwise there will be logical confusion)

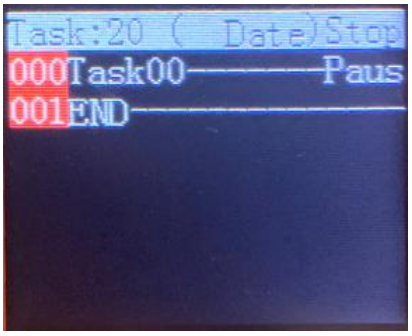
15：NTC temperature checking 	Supporting NTC temperature checking of 2 channels. Checking scope: 0~100 ℃ (resolution rate of 0.1℃) Temperature data can be used directly to program. There is an interface for temperature monitoring, which makes condition judgment more conveniently. Support for shortcut variables Aval00
16：A AND instruction 	Example: A 0 x 2 x - - - - - - - - - - - - The next order is executed when all the following conditions are met, i.e. X0 close, X1 open, X2 close and X3 open. If a skipping order is added after an order such as “A” or “H”, these 3 order s become an instant judgment. That is say, if the conditions are met, it will skip to the target line to execute the order. If the conditions are not met, the program will execute the order from the line after the Skipping order.
17：H OR instruction 	Example: H 0 x 2 x - - - - - - - - - - - - The next order is executed when one of the following conditions is met, such as, X0 close, X1 open, X2 close or X3 open.

18：Program control instructions   	Program 00-- --Pause(when program 00 pauses temporarily, all the related outputs automatically open and all the related timer and time delay pause) Program 00----Stop(when program 00 stops and the related outputs open automatically, the related timers and time delay return to their original states) Program 00----Start(starting executing program 00) Program 00---- Holding(program 00 stop running promptly but all the related outputs are not effected) Program 00----Restart(when program 00 is restarted immediately, all the related output is open and program 00 starts to run from the beginning) Program 00----Start/pause(switching between pause and start) Program 00----Start/stop(switching between start and stop) Program 00---Start/holding(switching between start and holding) Program 00—Wait to stop(waiting until the target program to finish its operation and then stop)
19：Pulse instructions **Axle X, Axle Y or Axle Z** Axis X speed000.00KHz Axis X speed = Sval00	Speed 000.00KHz~150.00KHz (Set its speed value before calling forward/reverse rotation) Support shortcut variable Sval00
Axis X forward = 0000.00 revolutions Axis X forward = Lval00 revolutions Axis X forward = unlimited revolutions Axis X forward = C00 revolutions	Forward 0000.00 revolutions (or mm or pieces) (Units can be selected in the pulse output setting menu) Support shortcut variable Lval00 Supports variable C00 Unlimited pulses can be sent
Axis X Reverse 0000.00 turns Axis X reverse = Lval00 turns Axis X Reverse Unlimited Turns Axis X Reverse C00 turns	Reverse 0000.00 revolutions (or mm or pieces) (Units can be selected in the pulse output setting menu) Support shortcut variable Lval00 Supports variable C00 Unlimited pulses can be sent
Axis X Stop immediately	Immediate stop (Pulse output can be stopped immediately at any time. (Pulse output can be stopped immediately

		at any time, and the remaining pulses are not memorized)
	Axis X Wait to stop	Waiting for stop (Wait for the pulse to be sent and the motor to stop before execute next) Note: This statement cannot be used to execute an infinite number of revolutions.
	Axis X Set to program zero	Set to program zero (The current position is marked as program zero)
	Axis X Return to program zero	Return to program zero (Commanding the motor to return to program zero)
	Axis X Duty Cycle 00%	Duty Cycle 00% (Set Duty Cycle) (Note: selectable 00, 10, 20, 30. 40, 50, 60, 70, 80, 90)
	Axis X Slow stop	Slow stop (Pulse output can be stopped immediately at any time. (pulse output can be stopped immediately at any time and the remaining pulses are not memorized) buffer time, the buffer time is calculated by speed and Acceleration and deceleration time, need to be measured.
	Axis X acceleration time 0000ms	Acceleration time 0000ms (Set acceleration and deceleration time)
	Axis X position memory	Position Memory (Memorizes the number of pulses remaining in the current transmission)
	Axis X Break point resumption	Break Point Repeat (sends the number of pulses remaining from the last memory pulse)
	Axis X positioning 0000.00 revolutions Axis X positioning -0000.00 turns Axis X positioning =Lval00 turns Axis X positioning C00 turns	Positioning 0000.00 turns (or mm or pieces) (Unit can be selected in pulse output setting menu) Position in absolute coordinates, supports negative coordinates. Support shortcut variable Lval00 Support variable C00

<table>
<tr><td rowspan="13">Program 60-62 Scanning Program Group</td><td>1：Scan
(Simultaneous checking without order)</td><td>Programming same as that of program 00-59
Program state judgment is added.
For example, scan program 00 stop
It is judged based on the state of program 00(start/ stop)</td></tr>
<tr><td>2：Output</td><td rowspan="12">Programming same as that of program 00-59</td></tr>
<tr><td>3：Combined output Y</td></tr>
<tr><td>4：C counter</td></tr>
<tr><td>5：M timer</td></tr>
<tr><td>6：TX Instructions</td></tr>
<tr><td>7：A And Instructions</td></tr>
<tr><td>8：H OR instructions</td></tr>
<tr><td>9：Program control instructions</td></tr>
<tr><td>10：Speed of Axle X 000.00KHz</td></tr>
<tr><td>11：TW=00 channel 000 close</td></tr>
<tr><td>12：Encoder 0 clear</td></tr>
<tr><td>Program 63</td><td>System time verification
 
</td><td>Used to set system time
It necessitates to correct the system time in advance if it is used as a timer.</td></tr>
<tr><td rowspan="2"></td><td>1：Setting the year
 
</td><td>The restrictive conditions of adding year
Year 2019-2019 means the year 2019 is specified
Example 2:
Year 2019-2023 means the period from 2019-2023 is specified.</td></tr>
<tr><td>2：Setting the month</td><td>The restrictive conditions of adding month
Example 1:
Month 03-03 means March is specified
Example 2
Month 07-08 means the period from July to August is specified.</td></tr>
</table>

Program 64(setting the calendar)		
	3：Setting the date 	The restrictive conditions of adding a day Example 1 Day 03-03 means the 3rd day of a month is specified. Example 2 Day 03-08 means the period from the 3rd day to the 8th day is specified.
	4：Setting the week 	The restrictive conditions of adding a week, Example, - - 2 3 4 5 – means Tuesday, Wednesday, Thursday , Friday…
	5：Setting the time period 	Restrictive conditions of adding time Example 08:30:00 12:00:00 means the period from 8:30 to 12 o'clock proper is specified
	6：Combined output Y 	Refer to program 00--17

	7： Program control instructions 	Refer to program 00--17 **Set calendar support shortcut variables (A0~E9)**
Program 65 (quick interface)	1：Txx timer Scope 0-24	T08: 02:02:00:00 Set the value of timer 2 to be 2 hours and 2 minutes
	2：Aval variable shortcut special for analog (scope 0-49)	Aval01 10.00 V/mA Set the value of variable shortcut Aval 01 to be 10.00
	3：Cval variable shortcut special for counter (scope 0-49)	20000000 Set the variable shortcut Cval01 to be 20000000
	4：Sval variable shortcut special for pulse output （scope 0~24）	Sval01 010.00KHz Set the variable shortcut Sval to be 10Khz
	5：Lval variable shortcut special for pulse output (scope 0-24)	Lval01 0010.00mm/round Set the variable shortcut Sval to be 10mm/round
	6：System clock	Display the present system time

Chapter 6 RS485 Communication and Its Touching Screen Links

1: The working principle of touching screen links

On the condition that the screens are compatible with 485 port and Modbus RTU protocol, the links are applicable to the screens of any brand.

Principle: touching screen visits the internal registers in the all- in –one relay in order to exchange the data.

The compatible registers are listed as below:

Register Address（**Hexadecimal H/Decimal D**）	Description	Read / Write	Data length	Range of values	Function code
0000H/0000D	Y00-Y15 internal output coil	R/W	16 bits	0~65535	01、03、10
0001H/0001D	X00-X15 input port	R	16 bits	0~65535	02、03
0002H/0002D	Ai0 collected current	R	16 bits	0~20000	03
0003H/0003D	Ai1 collected current	R	16 bits	0~20000	03
0004H/0004D	Ao0 analog output value	R/W	16 bits	0~20000	03、06、10
0005H/0005D	Ao1 analog output value	R/W	16 bits	0~20000	03、06、10
0006H/0006D	Ai0 collected voltage	R	16 bits	0~10000	03
0007H/0007D	Ai1 collected voltage	R	16 bits	0~10000	03
0008H/0008D	NTC0 collected value	R	16 bits	0~1000	03
0009H/0009D	NTC1 collected value	R	16 bits	0~1000	03
0010H/0016D	Y16-Y31 internal output coil	R	16 bits	0~65535	03、06、10
0011H/0017D	X16-X31 input port	R	16 bits	0~65535	03
0064H~0078H/ 0100D~0120D	Program 00-19 start/ stop	R/W	16 bits	0~3 **（0 stop, 1 start, 2 pause, 3 restart）**	03、06、10
00C8H~012BH /0200D~0299D	Shortcut interface Quick Timer T00~T24	R/W	16 bits	hours：0~23 minutes：0~59 seconds：0~59 10 milliseconds ~0~99	03、06、10（10 code single write, does not support continuous write）
012CH~015DH /0300D~0349D	Shortcut interface Qiuck Analog Aval00~Aval49	R/W	16 bits	0~1000	03、06、10
015EH~018FH /0350D~0399D（Reserved）	Shortcut interface Counter Cval00~Cval49	R/W	16 bits	0~65535	03、06、10
0258H~02BBH /0600D~0699D（Add）			32 bits	0~99999999	
0190H~01A8H /0400D~0424D	Shortcut interface Fast speed value Sval00~Sval24	R/W	16 bits	0~10000	03、06、10
01A9H~01DAH /0425D~0474D	Shortcut interface Quick length value Lval00~Lval24	R/W	32 bits	0~99999	03、06、10
01E0H~0212H /0480D~0530D	Auxiliary coil A0~E9 (50 in total) (For fixed calendar)	R/W	16 bits	0~65535	03、06、10
0096H~00BEH /0150D~0190D	Mapping register R00~R19	R	32 bits	0~0xFFFFFFFF	03
2710H~2773H /10000D~10099D	Counter C00~C49	R/W	32 bits	0~0xFFFFFFFF	03

We just provide consult and suggestions to users about the programming and we do not provide free programming service.

2774H~27D7H /10100D~10199D	Timer M00~M49	R	32 bits	0~0xFFFFFFFF	03
27D8H/10200D	Encoder 1 angle	R	16 bits	0~3600	03
27D9H~27DAH /10201D~10202D	Encoder 1 rotation speed	R	32 bits	0~99999	03
27DBH~27DEH /10203D~10206D	Encoder 1 length	R	64 bits	0~0xFFFFFFFFFFFFFFFF	03
27DFH~27E2H /10207D~10210D	Encoder 1 number of pulses	R	64 bits	0~0xFFFFFFFFFFFFFFFF	03
283CH/10300D	Encoder 2 angle	R	16 bits	0~3600	03
283DH~283EH /10301D~10302D	Encoder 2 rotation speed	R	32 bits	0~99999	03
283FH~2842H /10303D~10306D	Encoder 2 length	R	64 bits	0~0xFFFFFFFFFFFFFFFF	03
2843H~2846H /10307D~10310D	Encoder 2 number of pulses	R	64 bits	0~0xFFFFFFFFFFFFFFFF	03
2847H~2848H /10311D~10312D	X axis speed	R	32 bits	0~15000	03
2849H~284CH /10313D~10316D	X axis coordinates	R	64 bits	0~0xFFFFFFFFFFFFFFFF	03
284DH~2850H /10317D~10320D	X axis current number of pulses	R	64 bits	0~0xFFFFFFFFFFFFFFFF	03
2851H~2852H /10321D~10322D	Y axis speed	R	32 bits	0~15000	03
2853H~2856H /10323D~10326D	Y axis coordinates	R	64 bits	0~0xFFFFFFFFFFFFFFFF	03
2857H~285AH /10327D~10330D	Y axis current number of pulses	R	64 bits	0~0xFFFFFFFFFFFFFFFF	03
285BH~285CH /10331D~10332D	Z axis speed	R	32 bits	0~15000	03
285DH~2860H /10333D~10336D	Z axis coordinates	R	64 bits	0~0xFFFFFFFFFFFFFFFF	03
2861H~2864H /10337D~10340D	Z axis current number of pulses	R	64 bits	0~0xFFFFFFFFFFFFFFFF	03
2865H~2866H /10341D~10342D	W axis speed	R	32 bits	0~15000	03
2867H~286AH /10343D~10346D	W axis coordinates	R	64 bits	0~0xFFFFFFFFFFFFFFFF	03
286BH~286EH /10347D~10350D	W axis current number of pulses	R	64 bits	0~0xFFFFFFFFFFFFFFFF	03

(0x2849、0x284D、0x2853、0x2857、0x285D、0x2861、0x2867、0x286B The highest bits of data contain symbol information)

Attention: start or stop the register through program: 00 stop，01 start，02 pause，03 re-start . Lval data are of 32 bytes and occupy two registers of 16 bytes, i.e. 425 and 426. Attention should be paid to the internal update of waiting instructions and scanning instructions, adding distance instructions within 00-18 program and the data update of setting of pulse input/output

in the general menu.

2. Superior PC Communication and Extended Communication Examples

Communication explanation of RS485 Modbus-RTU

What follows are the common addresses of internal registers:

Read or edit with the codes 03, 06 and 10 in the Modbus-RTU

Baud rate and verification can be modified in the communication setting in the general menu of simple PLC. Open 485 communication before using 485 communication. The address of the PLC refers to the physical address of the MODBUS(the address is exclusive and can not be repeated by other equipment.

Communication adjustment of serial ports of superior PC

Example 1

Read the coil state of address 00000 through code 03 and send the message 00 03 00 00 00 01 85 DB

Analysis:

00=PLC hardware address

03= operation code

00 00= initial address of register

00 01 register quantity that can be read successively

85 DB=CRC Verification

Returning code: 00 03 02 00 01 44 44

Analysis:

00=PLC hardware address

03=operation code

02= valid byte quantity

00 01=16 inputs state(Y00 close, y01-15 open)

44 44=CRC verification

Example 2:

Read the coil state of address 00001 through code 03 and send the message 00 03 00 01 00 01 D4 1B

Analysis:

00=PLC hardware address

03= Operation code

00 01= Initial address

00 01 register quantity that can be read successively

D4 1B=CRC verification

Returning code: 00 03 02 00 02 04 45

Analysis:

00=PLC hardware address

03= operation code

02= valid bytes

00 02=16 inputs state(X01 triggered and others untriggered)

04 45=CRC verification

Example 3

Operate output coil by editing the address 00000 through the code 06 and send the message 00 06 00 00 00 03 C8 1A

Analysis:

00=PLC hardware address

06=operation code

00 00= initial address of registers

00 03=edit the value of register

C8 1A=CRC verification

Returning code: 00 06 00 00 00 03 C8 1A

Analysis:

00=PLC hardware address

06=operation code

00 00=initial address of register

00 03=current value of register

C8 1A=CRC verification

Final state: Y00 Close, Y01 Close Y02-Y15 Open

Example 4

Start simultaneously the program 00 and 01 by editing the addresses 00100 and 00101 by operation code 01 and send 00 10 00 64 00 02 04 00 01 00 01 60 88

Analysis:

00=PLC hardware address

10=operation code

00 64=initial address of register

00 02=register quantity that can be operated successively

04= quantity of the related bytes(quantity of register *2)

00 01= the value of the first register(representing the starting program 00)

00 01=the value of the 2nd register(representing the starting program 01)

60 88=CRC verification

Returning code: 00 10 00 64 00 02 01 C6

Analysis:

00=PLC hardware address

10=operation code

00 64=initial address of register

00 02=quantity of registers

01 C6=CRC verification

Final state: start program 00 and 01 at the same time.

Example 5:

Read the counter C00 through code 03 and send the message 00 03 27 10 00 02 CE AB

Hint: two bytes are to be read successively since each counter occupies the saving space of 2 bytes.

Analysis:

00=PLC hardware address

03=operation code

27 10=initial address(decimal 10000)

00 02 the quantity of registers that are read successively

CE AB=CRC verification

Returning codes: 00 03 04 00 00 00 C5 2A A0

Analysis:

00=PLC hardware address

03=operation code

04=valid bytes

00 00=high 16 bits data

00 C5=low 16 bits data

2A A0=CRC verification

Final state: =197（decimal）

Example 6: assign the counter C00 through code 10(used to clear or change arbitrary value) and send the code 00 10 27 10 00 02 04 00 01 86 A0 B1 F0 to change the value of counter C00 into 100000. 100000(decimal)= 00 01 86 A0(hexadecimal)

Hint: two bytes are to be read successively since each counter occupies the saving space of 2 bytes.

Analysis:

00=PLC hardware address

10=operation code

27 10=the initial address of register

00 02=the quantity of registers that needs to be operated successively

04= the related byte quantity(quantity of register*2)

00 01=the value of the 1st register (pay attention to the high-low byte format and sequential position)

86 A0=the value of the 2nd register(pay attention to the high-low byte format and sequential position)

B1 F0=CRC verification

Returning code: 00 10 27 10 00 02 4B 68

Analysis:

00=PLC hardware address

10=operation code

27 10=the initial address of register

00 02=the quantity of register

4B 68=CRC verification

Final result: change the value of counter C00 into 100000

Example 7:

Change the value of timer T00 through code 10 in the aim of modifying the value of time delay online.

Hint: each timer consists of four types of data, i.e. hour, minute, second and millisecond and occupies four registers accordingly. For example, the addresses in the case of T00 are 200 201 202 203 respectively.

Send the message 00 10 00 CA 00 01 02 00 0A 3A 6D to change the internal value of second of the timer T00 into 10 seconds.

Analysis:

00=PLC hardware address

10=operation code

00 CA=the initial address of register

00 01=the quantity of registers that needs to be operated successively

02= the related byte quantity (the quantity of register *2)

00 0A=target value

3A 6D=CRC verification

Returning code: 00 10 00 CA 00 01 20 26

Analysis:

00=PLC hardware address

10=operation code

00 CA=the initial address of register

00 01=the quantity of registers

20 26=CRC verification

3: Operation manual for computer software

Software environment

The software can only work with Windows 7 system or other superior windows systems at present

Installation of software

The software is free of installation. The software can run with double click “QingJunPLC.exe” after it is decompressed.

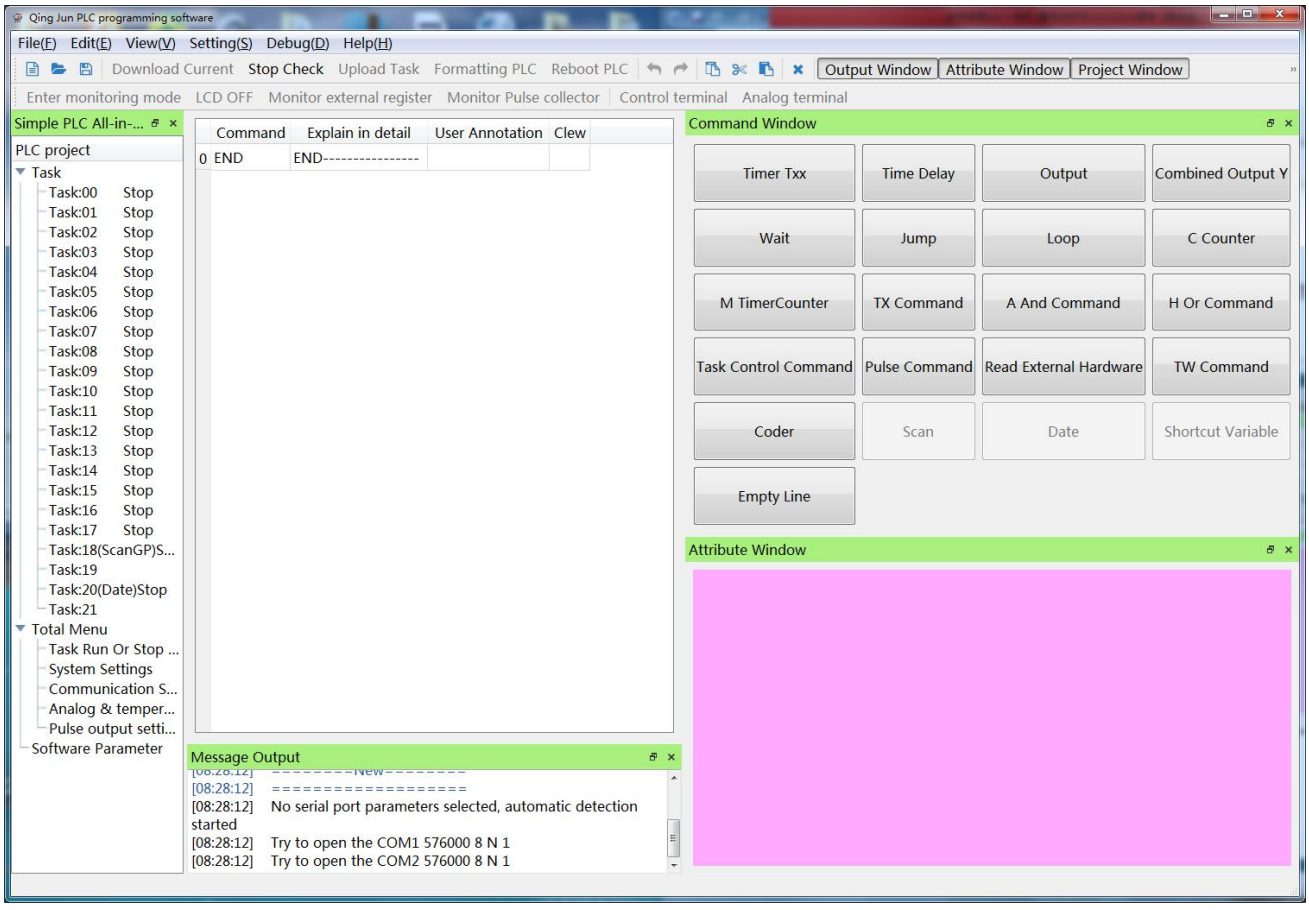
Software functions

Support the upload and download between the software and PLC

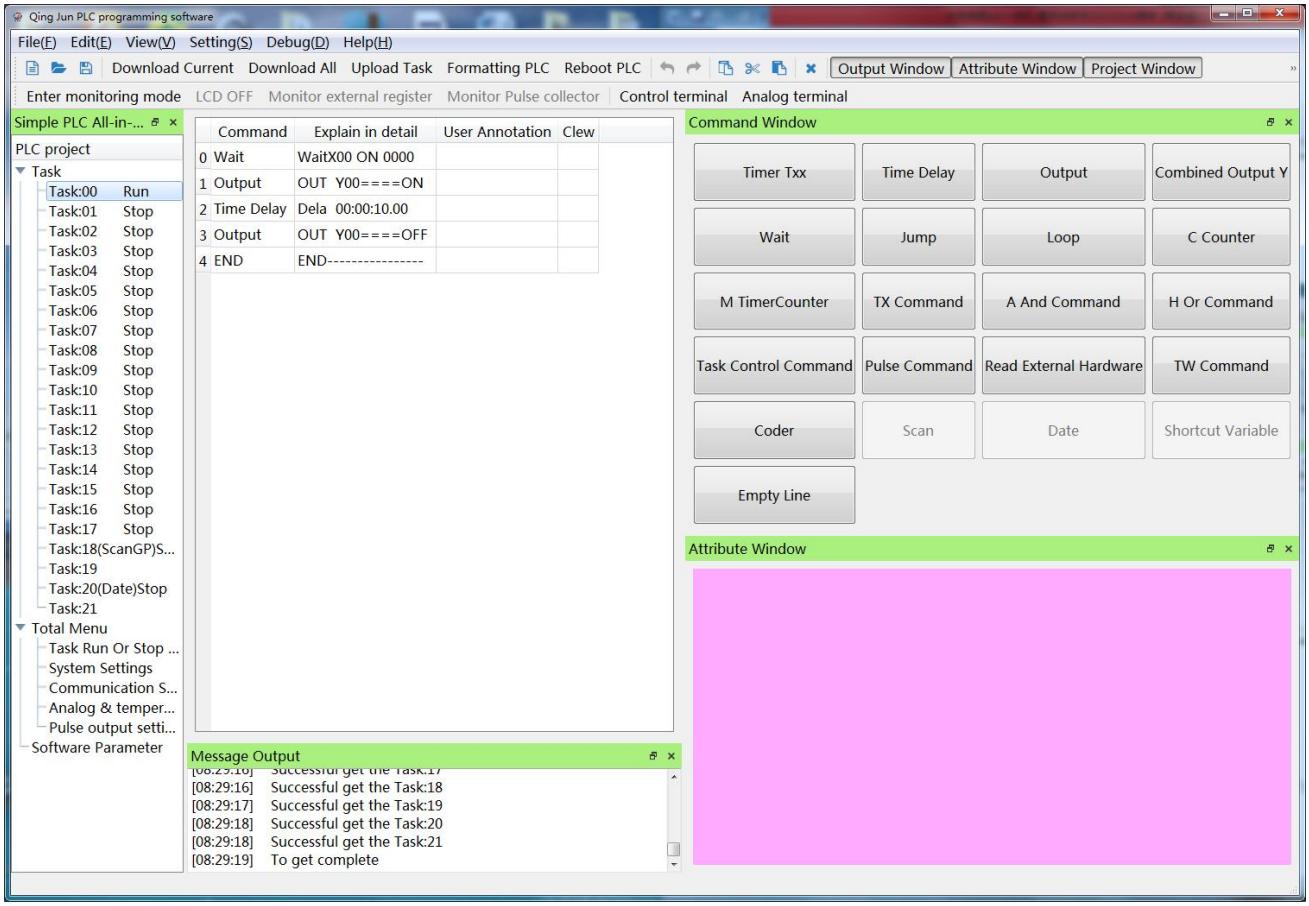
Support the real time monitor of PLC working state

Support the opening and saving of software

Software application

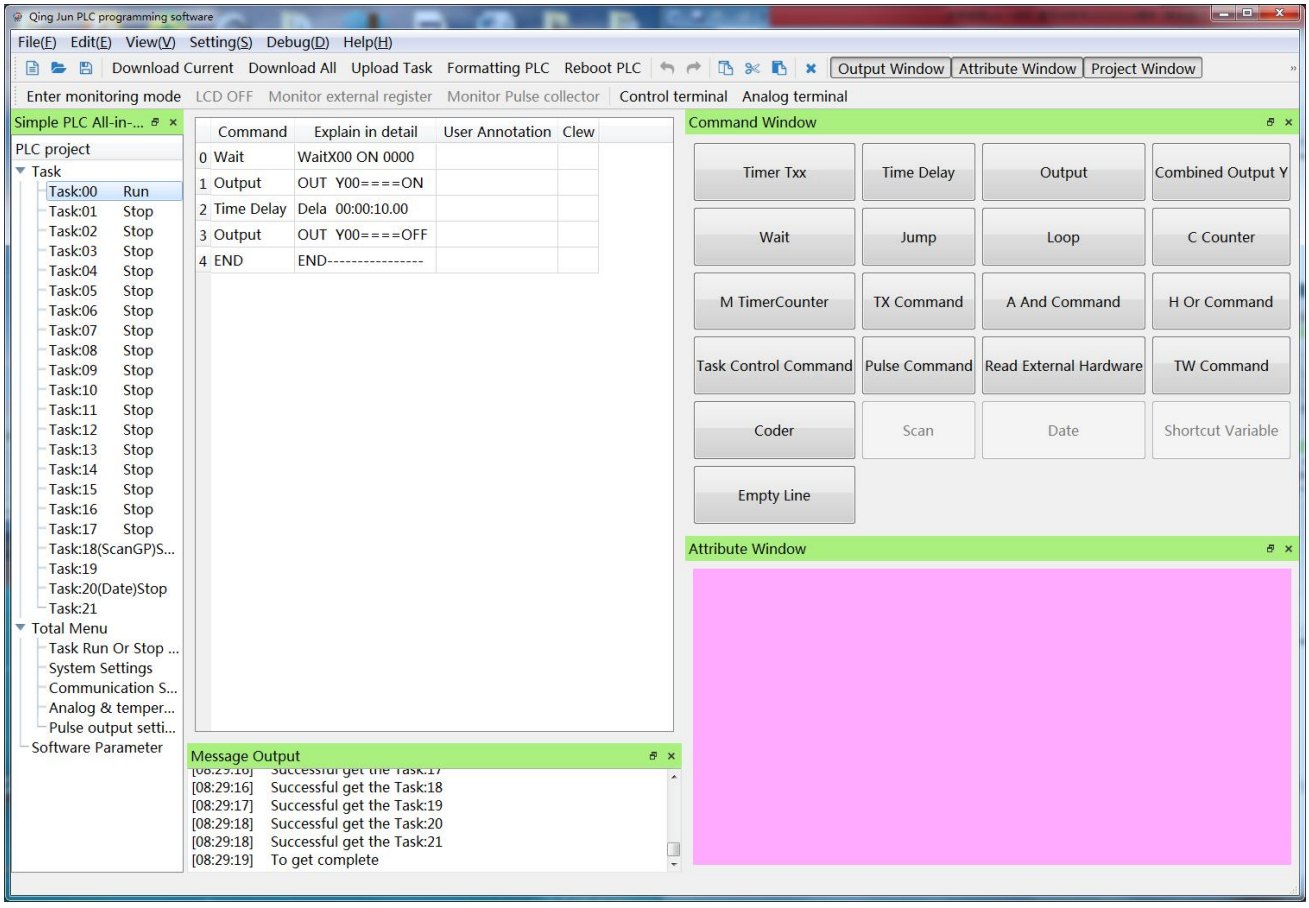


Click the software to obtain the PLC program automatically



Software obtaining over

We just provide consult and suggestions to users about the programming and we do not provide free programming service.



Program copy

（Click copy all and successful verification time will be displayed）

Programming method: what the user needs to do is just key in the order to be executed in the instruction window and modify the parameters in the attribute window.

We just provide consult and suggestions to users about the programming and we do not provide free programming service.

Chapter 7: Programming Exemplification

1. Cases of common programming, examples are given to explain how to use the following instructions

(delay, output, circling, waiting, scanning, counting, keying, analog input and output, calendar)

1）、Cases of delay instruction control

Program：00 Running		Explanation:
000 outputY00== close 001 delay 00:00:00.50 002 outputY01== close 003 delay 00:00:00.50	004 output Y00== open 005 delay 00:00:00.50 006 output Y01== open 007 delay 00:00:00.50 **008 program 00-------stop**	the registers Y00-Y01 500mS close one by one and then open one by one **Default: infinite circling** **Program 00 just works once if line 012 is inserted**

2）、Cases of timer T in lieu of time delay control

Program：00 Running		Explanation
000 output Y00== close 001 T00 00:00:00.50 002 output Y01==close 003 T00 00:00:00.50	004 output Y00==open 005 T00 00:00:00.50 006 output Y01==open 007 T00 00:00:00.50	the registers Y00-Y01 500mS close one by one and then open one by one the value of T00 can be modified in the shortcut interface

3）、Cases of judgment based on Counter C

Program：00 Running		Program：60(with Scanner) running
000 C00=00000000 001 output Y00==close 002 time –delay 00:00:00.50 003 output Y01==close 004 time--delay 00:00:00.50 005 output Y00==open	006 delay 00:00:00.50 007 output Y01== close 008 delay 00:00:00.50 009 C00 + 00000001 010 circling 001 line 0000 times	000 scan C00>**00000030** 001 program 00 --------- stop
Explanation: the counter re-sets automatically when it is powered on. Y00 and Y01 close one after another and then open one by one. When the circle is over, counter C00 plus 1 automatically. **Program 18 keeps checking the value of Counter C00 and the program 00 stops when the value is greater than 30.**		

4）、Cases of Timer M

Program：00 stop	Program：60(with scanner) Run	
000 output Y00===close 001 outputY01===open 002 M00 clear 003 M00 start 004 wait X01close 0.00 005 M00 pause 006 M00 clear 007 output Y00=== open 008 outputY01=== open 009 delay 00:00:01:00 010 output Y00=== open 011 output Y01=== close 012 M01 clear 013 M01 start 014 wait X02 close 0.00 015 M01 pause 016 M01 clear 017 output Y00=== open 018 output Y01=== open 019 program 00 ------stop	000 scan X00===close 001 program 00--------start 002 output Y03==== open 003 scan M00>**00:00:01:30** 004 M00 clear 005 program 00 -------stop 006 output Y03==== close 007 scan M01>**00:00:01:00** 008 M01 clear 009 program 00 --------- stop 010 outputY03==== close	Explanation: X00 starting switch X01, X02 limit switch Y00 ,Y01 positive and negative control ports of motor The program can realize the following function: press X00 and the motor turns to X01 limit and then turns anti-clockwisely to X02 limit 1 second later. If the operation is overtime and the motor does not receive the limit signal, the motor stops automatically and gives out an alarming signal to close Y03. Press the starting switch of X00 again to remove the alarm and re-start the motor.

5）、Program 00 cases of key testing(sequential testing of input ports)

Program：00 running	
000 wait X00==close 001 output Y00== close 002 output Y01== close	Explanation: The next order is executed only when X00 is Close.

6）、Program 18 cases with scanner(parallel testing of input ports)

Program: 60(with scanner) running	
000 scan X00== close 001 output Y00== close 002 output Y01== close 003 scan X01== close 004 scan X02== close 005 output Y02== close	Explanation: Test the states of input ports X00, X01 and X02 simultaneously If X00 closes, Y00 and Y01 Close If X01 and X02 close, Y02 close(realization and function) If X00, X01 and X02 close simultaneously, Y00, Y01 and Y02 close at the same time.

7）、Scan 3 keys to control 3 corresponding programs in lieu of 3 time relays

Program ： 00 stop 000 output Y00==close 001 delay 00:00:01.00 002 output Y00==open 003 delay 00:00:01.00 004 program 00----stop	Program ： 01 stop 000 output Y01== close 001 delay 00:00:01.00 002 output Y01== open 003 delay 00:00:01.00 004 program 01---- stop	Program ： 02 stop 000 output Y02== close 001 delay 00:00:01.00 002 output Y02== open 003 delay 00:00:01.00 004 program 02---- stop	Program 60:(with scanner) run 000 scan X00== close 001 program 00---- run 002 scan X01== close 003 program 01----- run 004 scan X02== close 005 program 02----- run
Explanation: scan three keys X00 X01 X02 simultaneously, program 00 works if X00 closes Program 01 works if X01 closes Program 02 works if X02 closes			

8）、Cases of sensors with cylinder and limits of "start, pause and stop"

Program：00 stop 000 output Y00== close 001 wait X03 close **0.02** 002 output Y01== close 003 wait X04 close **0.02** 004 output Y02== close 005 wait X05 close **0.02**	006 output Y00== open 007 output Y01== open 008 output Y02== open 009 C00 +00000001 010 program 00--- stop	Program 60 : (with scanner) start 000 scan X00==close 001 program 00---- run 002 scan X01== close 003 program 00----- pause 004 scan X02== close 005 program 00-----stop
Explanation : Press X00 to start program 00. When cylinder Y00 moves to the limit X3, cylinder Y01 starts to work. When cylinder moves to the limit X4, cylinder Y02 starts to work. When cylinder Y03 moves to the limit X5, all the three cylinders close at the same time and the value of counter 00 added 1 automatically. The program suspends if press the key pause midway. It will continue to work if press the key again. The program stops if press the key stop midway. If it is restarted, program 00 will reset and Y00 Y01 Y02 open automatically and start to work until the program is restarted next time. 0.02 refers to the time to remove vibration, i.e. 20mS		

9）、Cooperation of several paths

Program 00 Run	
000 output Y00==close 001 delay 00:00:05.00 002 output Y02==close 003 delay 00:00:03.00 004 output Y02==open	005 output Y04==close 006 delay 00:00:02.00 007 output Y00==open 008 output Y04==open 009 delay 00:00:01.00
Explanation: several paths work together within a circle. Y00 opens after it closes for 10 seconds. Y02 opens after it closes for 3 seconds and Y04 closes when Y00 closes for 5 seconds. 2 seconds later, Y00 and Y04 open at the same time and repeat the above movements infinitely .	

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10）、Cases of inset circles.

Program：00 run		
000 output Y00== close 001 delay 00:00:01.00 002 output Y00==open 003 delay 00:00:01.00 004 circle 000 line 0005 times	005 output Y01== close 006 delay 00:00:01.00 007 output Y01==open 008 delay 00:00:01.00 009 circle 000 line 0005 times 010 program 00------ stop	Explanations: Y01 closes and opens once when Y00 closes and opens 5 times. It stops when the above circle repeats 5 times.

11）、Cases of imitating key clicking(realize the function of opening and closing with clicking the key once)

Program：00 stop	Program ：01 start	Explanations:
000 output Y00== close 001 delay 00:00:01:00 002 outputY00== close 003 delay 00:00:01:00	000 wait X00 close 0.02 001 program 00--- start 002 wait X00 open 0.02 003 wait X00 close 0.02 004 program 00---stop 005 wait X00 open 0.02	Press X00 and wait for 20mS to remove the vibration. Program 00 starts to work if vibration removal is successful. Otherwise a testing must be done again. After the key is released, the program continues to check the pressing of X00 next time, which triggers program00 stop. The circle repeats this way.

12）、Cases of Input signal triggering of edge

The motor reverses when it turns to the preceding limit and it stops when it reaches the back limit.

Starting key X00 frontal limit X01 back limit X02

Program：00 stop		Program 60：(with scanner) start
000 output Y00==close 001 output Y01== open 002 wait X01 rising edge 0.00 003 output Y00== open 004 output Y01=== open 005 delay 00:00:01:00	006 output Y00==open 007 output Y01== close 008 wait X02 rising edge 0.00 009 output Y00== open 010 output Y01==open 011 program 00------ stop	000 scan X00 rising edge 001 program 00--------- start
Explanations: Press X00, and the program starts to work. The motor keeps turning until it reaches the limit X01 and it stops. The motor reverses 1 second later and it keeps turning until it reaches the limit X02 and then it stops. Program 00 stops at that time and wait the triggering start next time.		

13）、It starts to work when there is an input signal and it stops when there is no input signal.

Program 00：stop	Program 60：(with scanner) start	Explanations:
000 output Y00== close 001 delay 00:00:01.0 002 output Y00==open 003 output Y01== close 004 delay 00:00:01.0 005 output Y01== open 006 program 00------ stop	000 scan X00=== close 001 program 00------ start 002 scan X00=== open 003 program 00------stop	Program 00 starts when X00 closes Program 00 stops when X00 opens. Output is related to the program start and open states intelligently.

14）、Testing of analog input common testing

The units of the input and output must be set in the general menu in advance

Program ： 00 stop	Program 60:(with scanner) start	Explanations:
000 output Y00== close 001 delay 00:00:01.0 002 outputY00== open 003 delay 00:00:01.0	000 scan Ai0 > 10.00mA 001 program 00-------- start 002 scan Ai0 < 10.00mA 003 program 00-------- stop	Continuous testing If the input current value is greater than 10.00mA, program 00 starts. Otherwise program 00 stops.

15）、Testing of analog input judgment of scope

The units of the input and output must be set in the general menu in advance

Program：00 stop	Program 60:(with scanner) start
000 output Y00== close 001 delay 00:00:01.0 002 output Y00== open 003 delay 00:00:01.0	000 scan Ai0 = 05.00mA ~ 10.00mA 001 program 00===== start 002 scan Ai0 > 10.00mA 003 program 00=====stop 004 scan Ai0 < 05.00mA 005 program 00=====stop
Explanations： Continuously scan the current value of input channel Ai0 Program 00 starts if the conditions conforms to 5.00mA~10.00mA	

16）、Cases of analog output

The units of the input and output must be set in the general menu in advance

Program 60：(with scanner) start	
000 scan X00==== close 001 output Ao0= 04.00mA 002 scan X01==== close 003 output Ao0= 08.50mA 004 scan X02==== close 005 output Ao1= =05.00V 006 scan X03==== close 007 output Ao0= 00.00mA 008 output Ao1= =00.00V	Explanations: Press X00, the Ao0 output current is 4.00mA Press X01, the Ao0 output current is 8.50mA Press X02, the Ao1 voltage is 5V Press X03, Ao0 and Ao1 are close

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17）、Cases of external relay modules controlled by 485

485 parameters are to be set in the general menu in advance

Program 60： (with scanner) start	Explanations:
000 scan X00=====rising edge 001 TX=08 R 00000 V 00001 002 scan X01=====rising edge 003 TX=08 R 00000 V 00002 004 scan X02=====rising edge 005 TX=08 R 00000 V 00004	Press X00 and send an order in the format of MODBUS RTU code 06 to operate the external register 00000 and change it to 00001(coil 1 close) In the same way, press X01 to change the external register 00000 to 00002(coil 2 close) Press X02 to change the external register 00000 to 00004(coil 3 close)

18）、Setting the calendar

(hint: just add what you want)

Case 1

Program 64：(setting calendar) start	Explanation:
000 setting the week： 0 - - - - - 6 001 Y**0 - - - - - - - - - - - - - - -**	In the cases of Sunday or Saturday, Y00 is close.

Case 2

Program 64：(setting calendar) start	Explanations:
000 setting the week： 0 - - - - - 6 001 setting the month：**February --March** 002 Y**0 - - - - - - - - - - - - - - -**	Y00 is close in the cases of Sundays or Saturdays in February or March.

Case 3

Program 64：(setting the calendar) start	Explanations:
000 setting the week： 0 - - - - - 6 001 setting the month： **February --March** 002 setting the year： **Year 2019- year 2020** 003 Y**0 - - - - - - - - - - - - - - -**	Y00 is close on the Sundays or Saturdays in February or March from 2019 to 2020.

Case 4

Program 64：(setting the calendar) start	Explanations:
000 setting the week： 0 - - - - - 6 001 setting the month： **February --March** 002 setting the year： **Year 2019-year 2020** 003 setting the hour：00:23:00 00:06:30 004 Y**0 - - - - - - - - - - - - - - -** 005 program -------start	Y00 is close and program 00 works when it is from 23:30 to 6:30 am on Sundays or Saturdays in February or March of year 2019 and 2020.

19）、Setting the calendar in order to realize different actions under different conditions.

Program 64：(setting the calendar) start	Explanations: Y00 closes and program 00 starts when it comes to the period from 23:00 to 6:30 am on the day from 2nd to 6th every month.
000 setting the date：2nd to 6th 001 setting the hour：00:23:00 00:06:30 002 Y**0 - - - - - - - - - - - - - - -** 003 program 00 ---------- start 004 setting the date：2nd to 6th 005 setting the hour：00:08:00 00:09:30 006 Y**- - 2** - - - - - - - - - - - - 007 program 01 ---------- start	

2: Cases of accessing to external registers through RS485

20）、The case is based on the realization of 485 Modbus-RTU protocol

Attentions: simple PLC all-in-one with 485 modules are the prerequisite condition.

The following parameters are to be set in advance in Setting of 485 communication in the general menu if 485 port is used for the first time.

485 communication (open)

Baud rate(select the proper baud rate according to the external equipment)

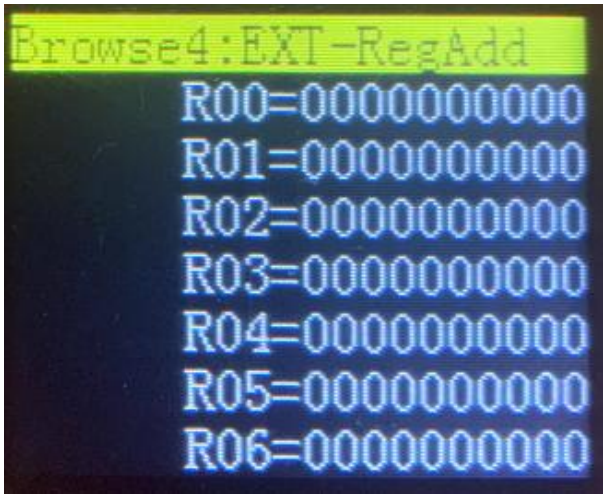
Data format(select the proper format of data according to the external equipment)

Address (the modbus address of the module can not be the same as others)

Touching screen: if you want to connect the device to the touching screen or you want to enhance the speed of communication, set the mode to the open state.

Driving interval: the time interval of reading the external communication and it is commonly set to be 500mS

Program 00： start	Analysis Powered on, PLC starts to run program 00 automatically. It executes the order of line 000 and checks the equipment of external address 03H and reads the register at the address of 2710H and read 2 successive bytes and feedback the result to R00 through 485 port. If R00 is greater than 1, output 002 is executed and Y0 is close.
000 read external hardware 3H--->register 2710H---> length of 2 bytes is mapped: R00 001 wait：R00>000000000001 002 output Y00 ---------- close	



Hints: the collected data from an external register can be monitored in the monitor 4.
The result is displayed on the register 00 if program 00 reads the external register. It is true of other cases.

3: Cases of pulse output of high speed

21）、Inching control of the positive and negative rotation of stepper motors

Program 00: start	Program 01: start
000 wait X02 close 0.02 001 axle X speed 010.00KHz 002 axle X rotation infinite round 003 wait X02 open 0.02 004 axle X stop promptly 005 end----------	000 wait X03 close 0.02 001 axle X speed 010.00KHz 002 axle X reversal infinite round 003 wait X03 open 0.02 004 X axle stop promptly 005 end----------

Explanations:
Program 00 takes responsibility to make axle X turn clockwise and program 01 its reversal.
Just take program 00 for example to explain. When X02 closes for more than 20mS, set the speed of X axle motor to be 10KHz(the higher the frequency, the faster the speed)
The motor starts to turn clockwisely (turn length is infinite until X02 is released. The motor stops immediately X02 is released.
It is true of the case when X axle reverses.

22）、Control the guide screw of X motor to complete the following tasks.

1, Press Start key to make the axle X to rotate 100mm at the speed of 10KHz and reverses 50mm with an interval of 0.5 second delay respectively. It returns to zero point automatically with 3 circles.

2, Press the emergency key to stop the motor and returns to the zero point at the speed of 5KHz and wait for restart next time.

Attentions: since mm is used as the unit of length, before the program is made, it would be better to

set the following parameters once for all in setting of pulse output of the general menu, such as common unit, subdivision coefficient of driver, round distance, and etc.

Program 00: start	Program 01: start
000 wait X01 close0.00 001 axle X speed 010.00KHz 002 axle X rotate 0100.00mm 003 axle X waiting for stop 004 delay 00:00:00. 50 005 axle X reverse 0050.00mm 006 axle X waiting for stop 007 delay 00:00:00. 50 008 circle 002 line 0003 times 009 axle X reverse infinite mm 010 wait X00 close 0.00 011 axle X prompt stop 012 end ----------	000 wait X02 close 0.00 001 program 00---------- stop 002 axle X prompt stop 003 axle X speed 005.00KHz 004 axle X reverse infinite mm 005 wait X00 close 0.00 006 X axle prompt stop 007 program 00---------- start 008 end----------

Explanations:

Mechanical zero point sensor connected to X00

Start key X01

Emergent stop key X02

Program 00 takes responsibilities of normal processing.

Program 01 takes responsibilities of emergent cases.

Analysis of program 00

Start program 00 and keep it run until it detects X01 is close and assign the motor speed to be 10KHz. Order the motor to rotate 100 mm until it stops. Order it to reverse 50mm after 0.5 second delay. Skip to 002 line with 0.5 second delay to recircle the above process 3 times. The motor finally stops when the motor reverse to the limit switch.

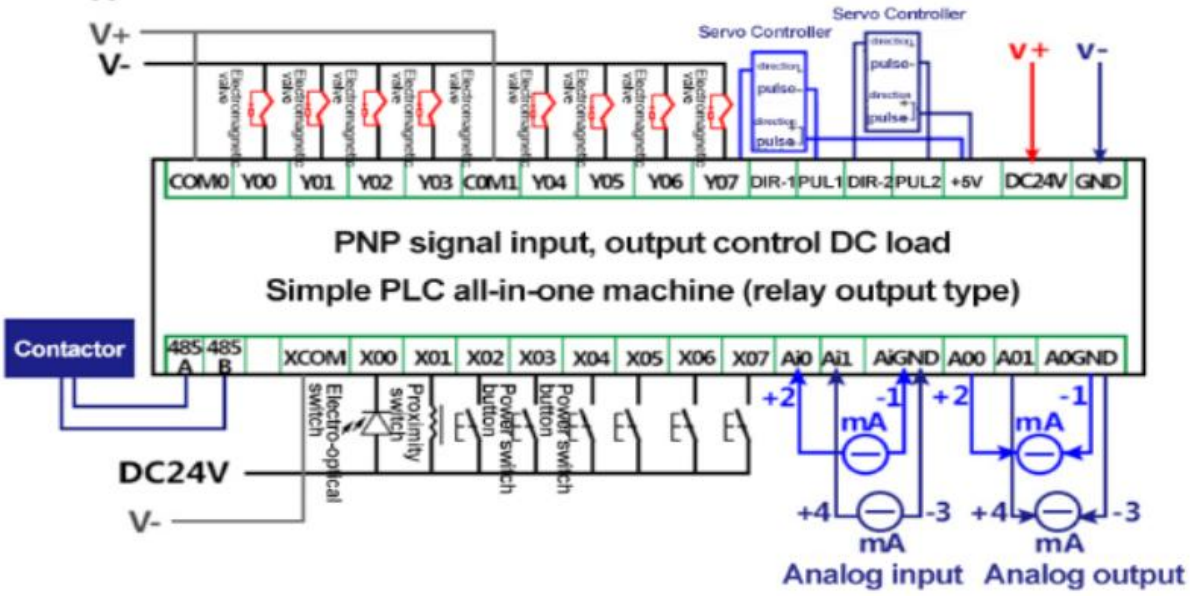
Analysis of program 01

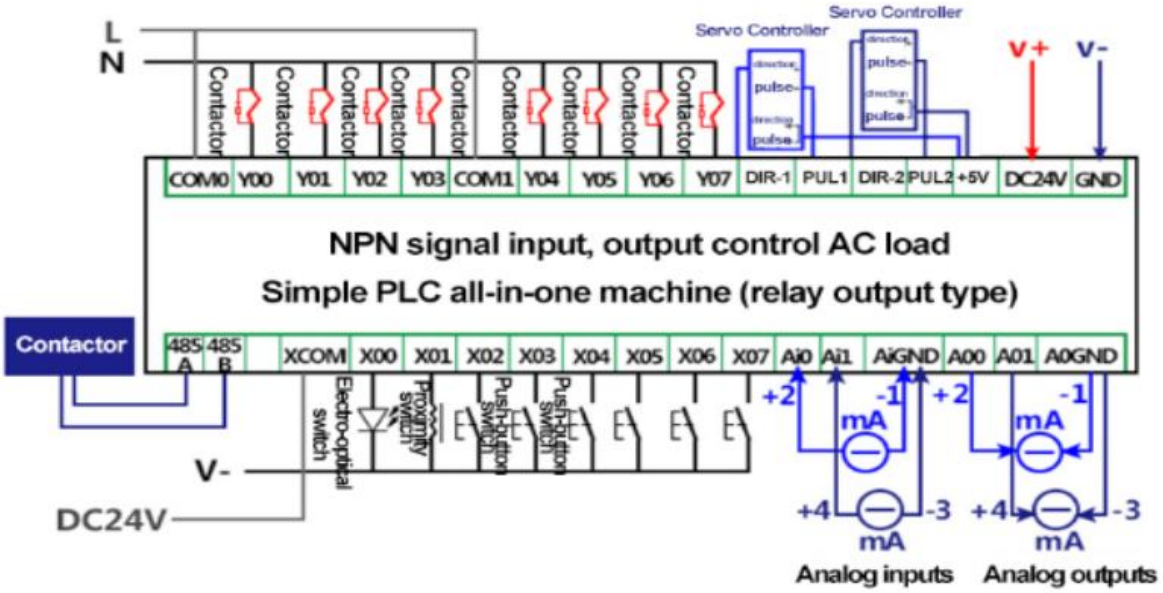
Start the machine to run program 01, looking for X02. Stop program 00 if X02 is close. Stop the motor and set its speed to be 5 KHz and order the motor to reverse for infinite length. The motor stops when limit switch X00 closes. Restart program 00 for next task.

Please get access to website for more video explanations or contact the custom service for video links.

Chapter 8 Wiring Diagram

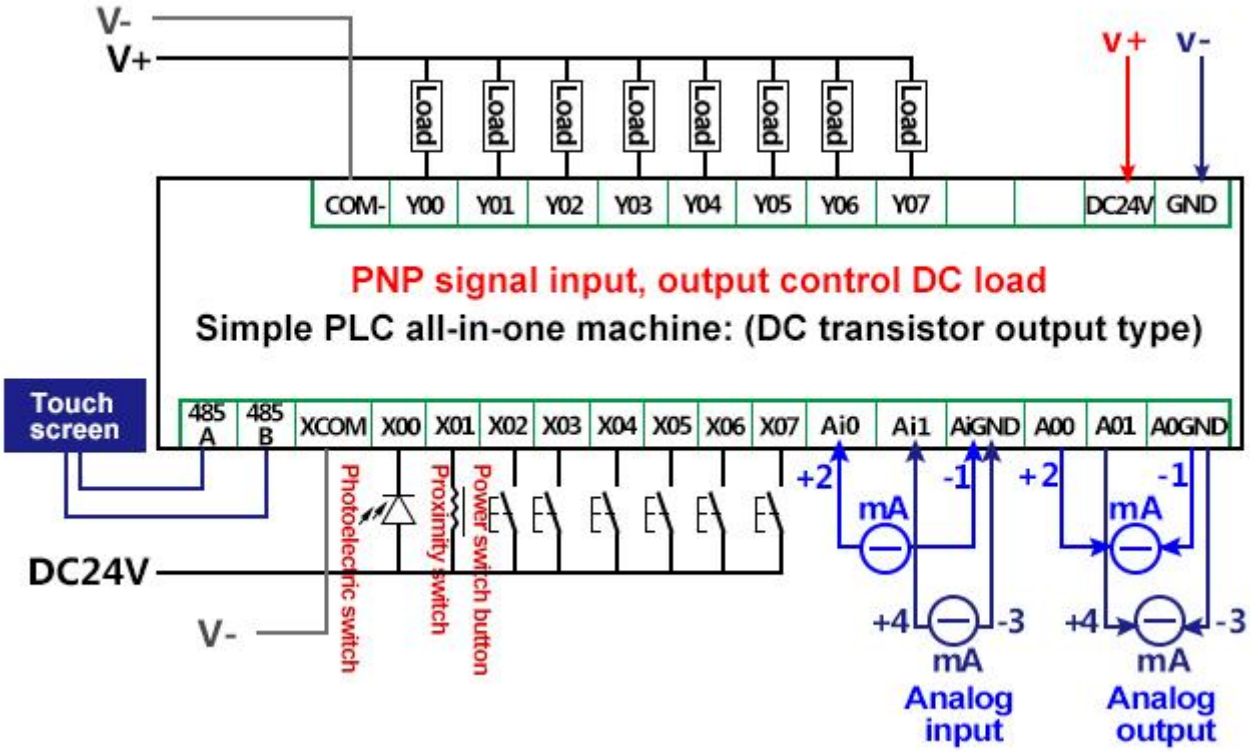
Wiring diagram of simple PLC all- in-one modules (relay output) 8-in and 8-out.

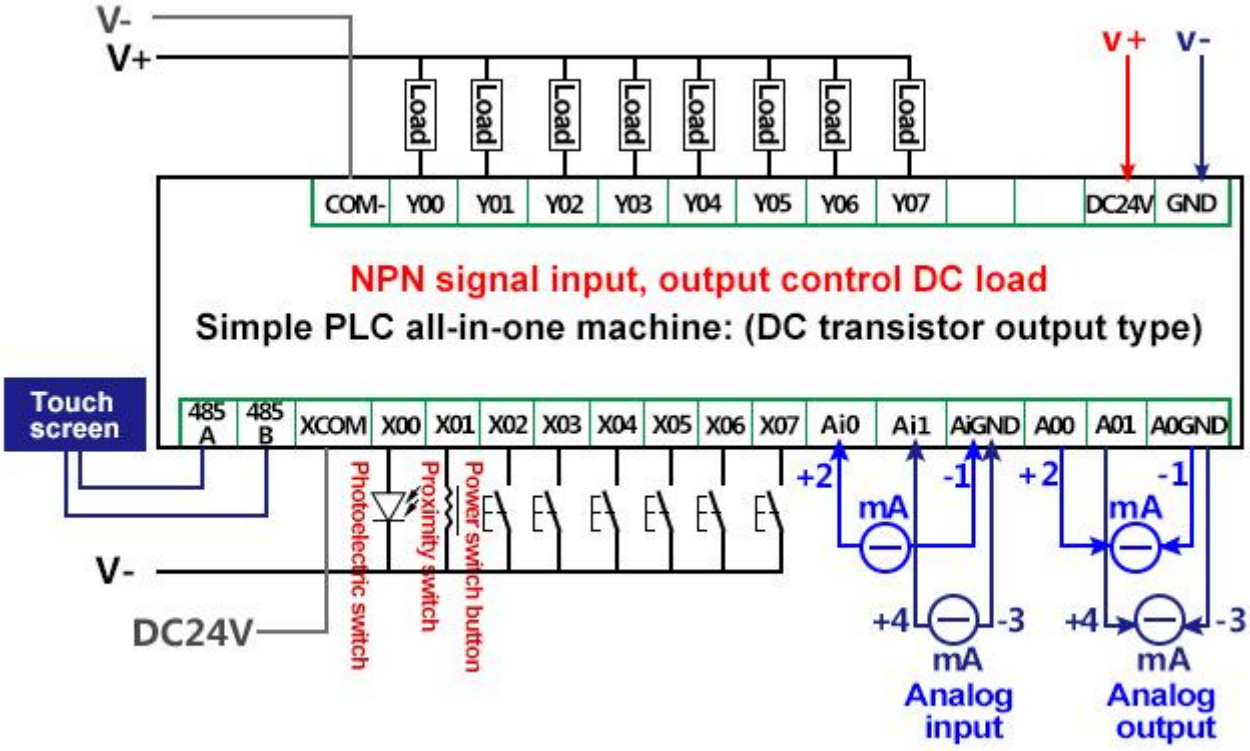




We just provide consult and suggestions to users about the programming and we do not provide free programming service.

Wiring diagram of simple PLC all-in-one modules(DC transistor output)
8-in and 8-out





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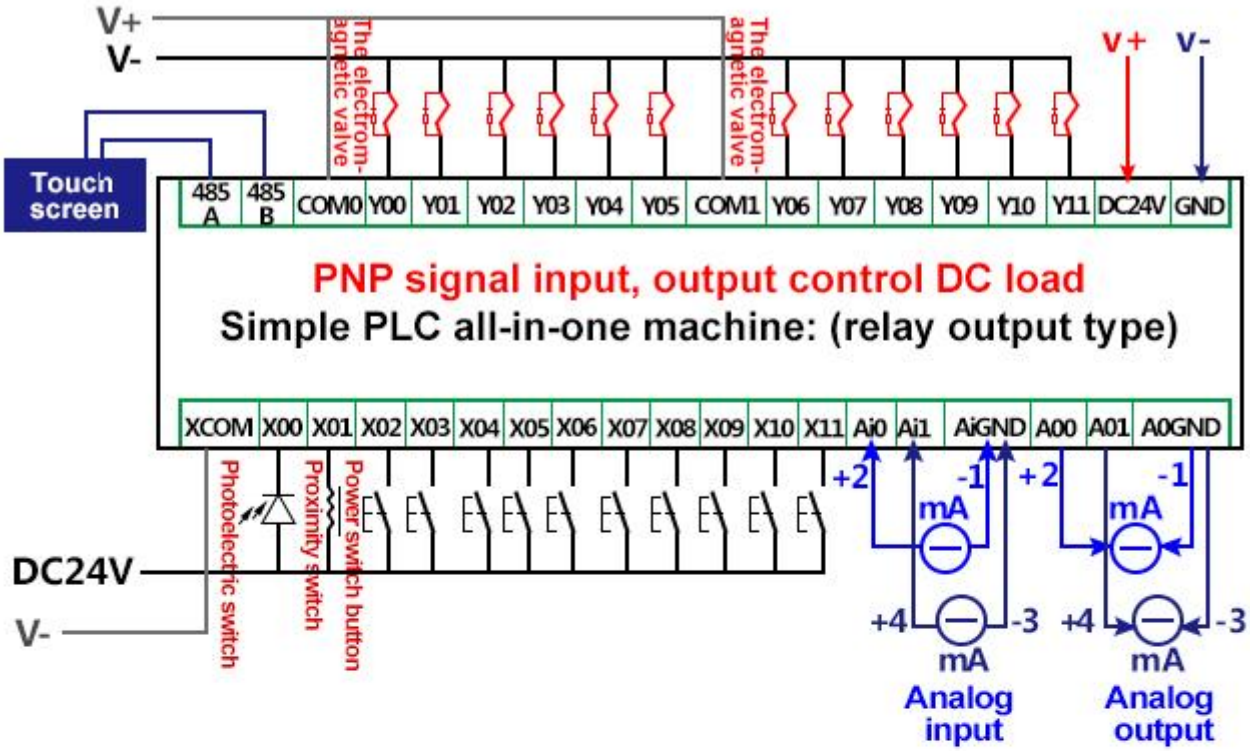
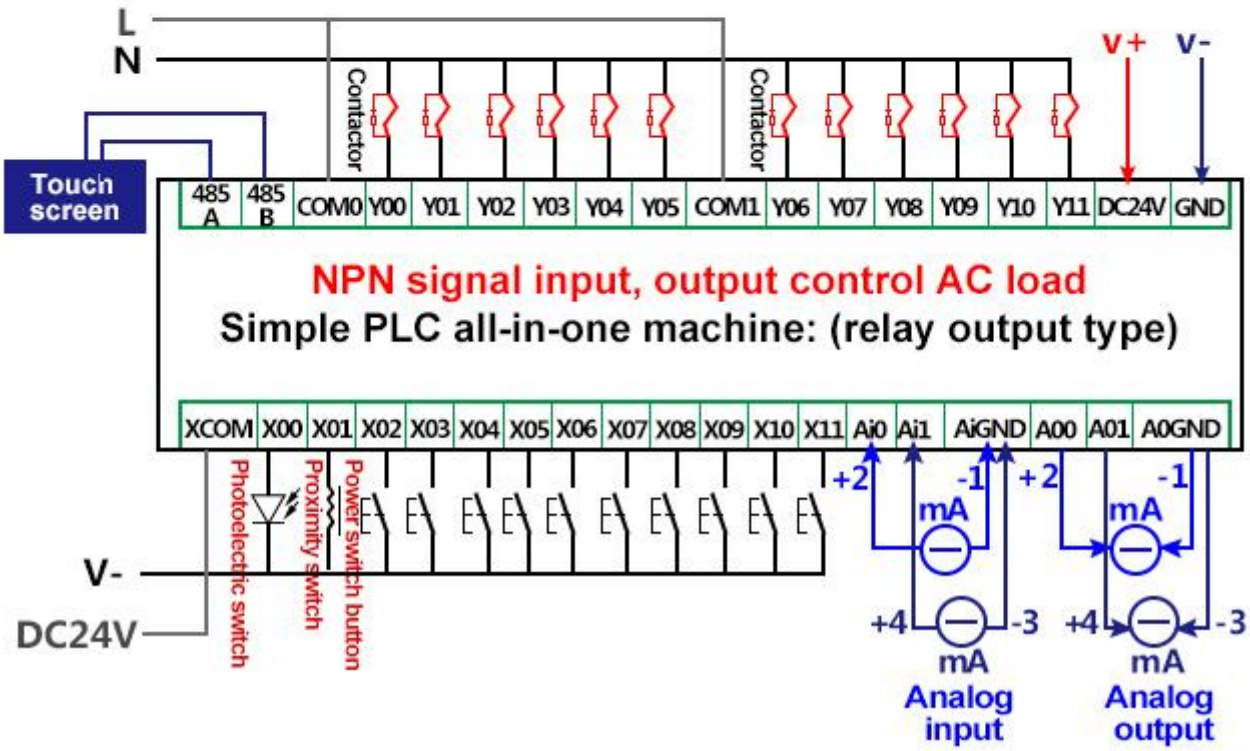
Wiring diagram of simple PLC all- in-one modules (relay output) 12-in and 12-out





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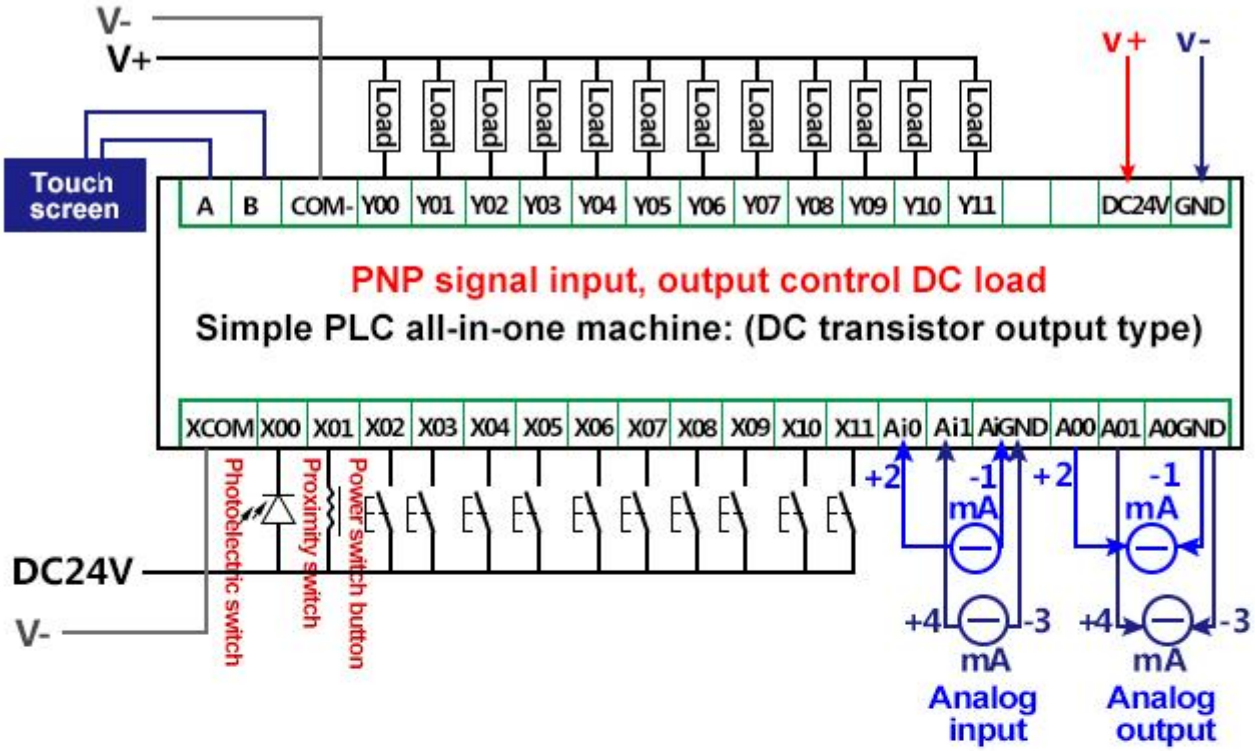
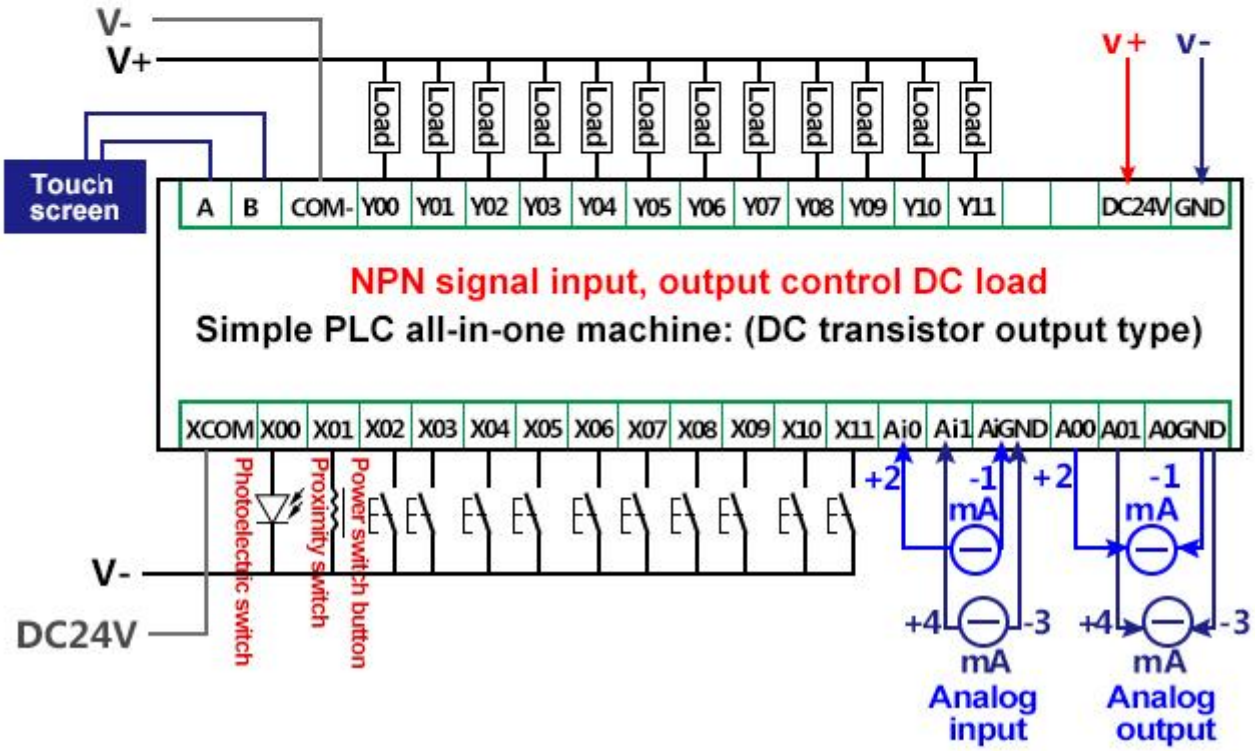
Wiring diagram of simple PLC all-in-one modules(DC transistor output)

12-in and 12-out





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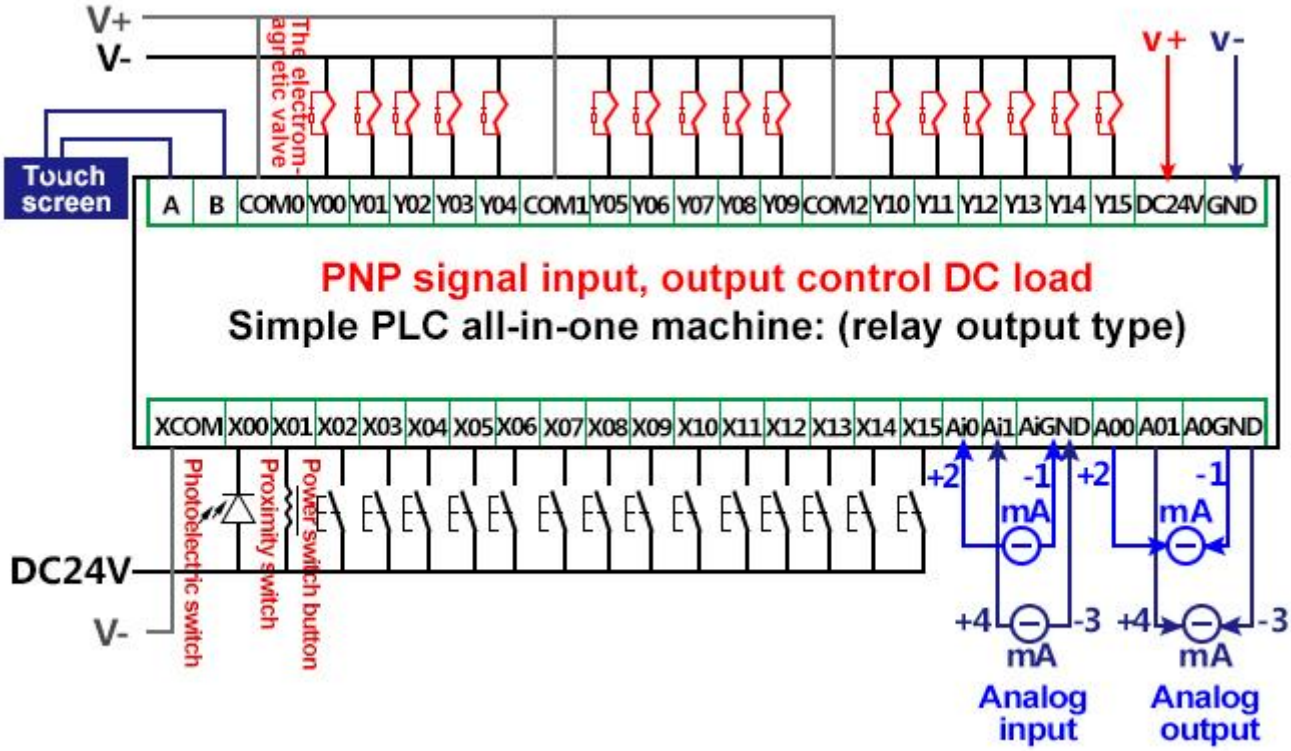
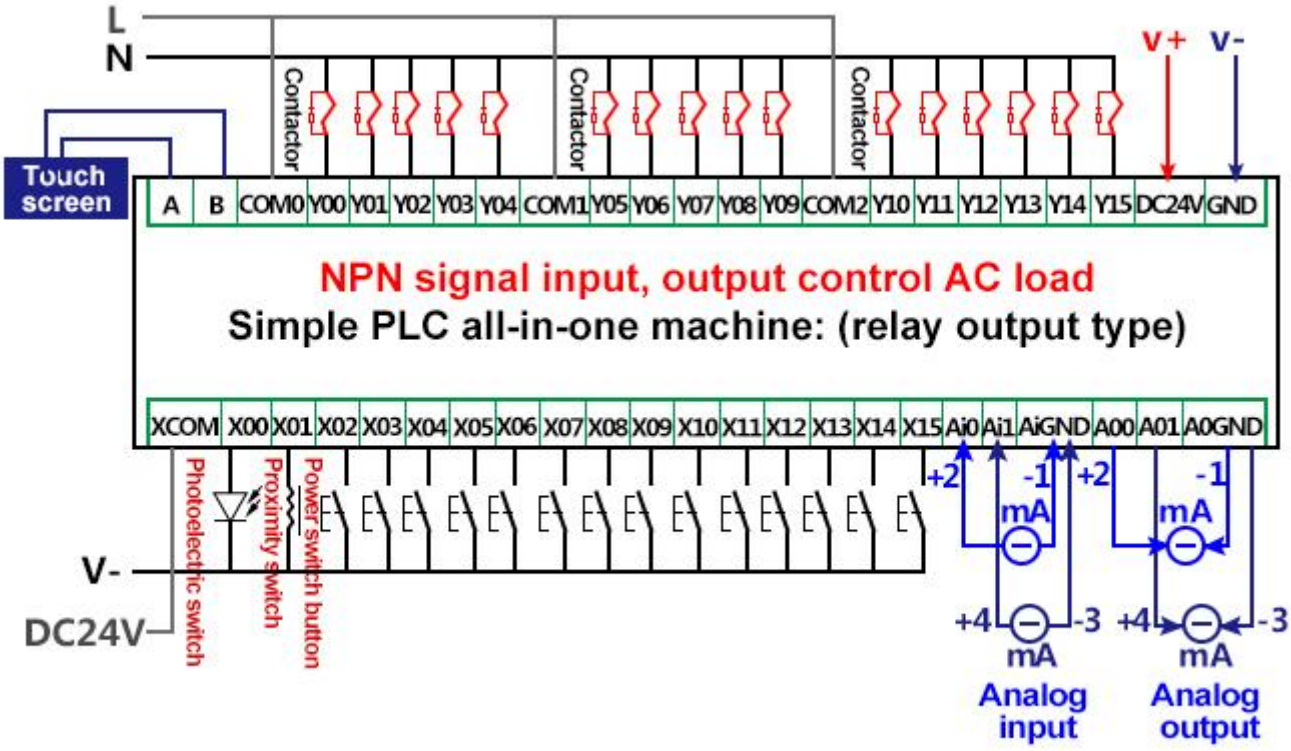
Wiring diagram of simple PLC all- in-one modules (relay output) 16-in and 16-out





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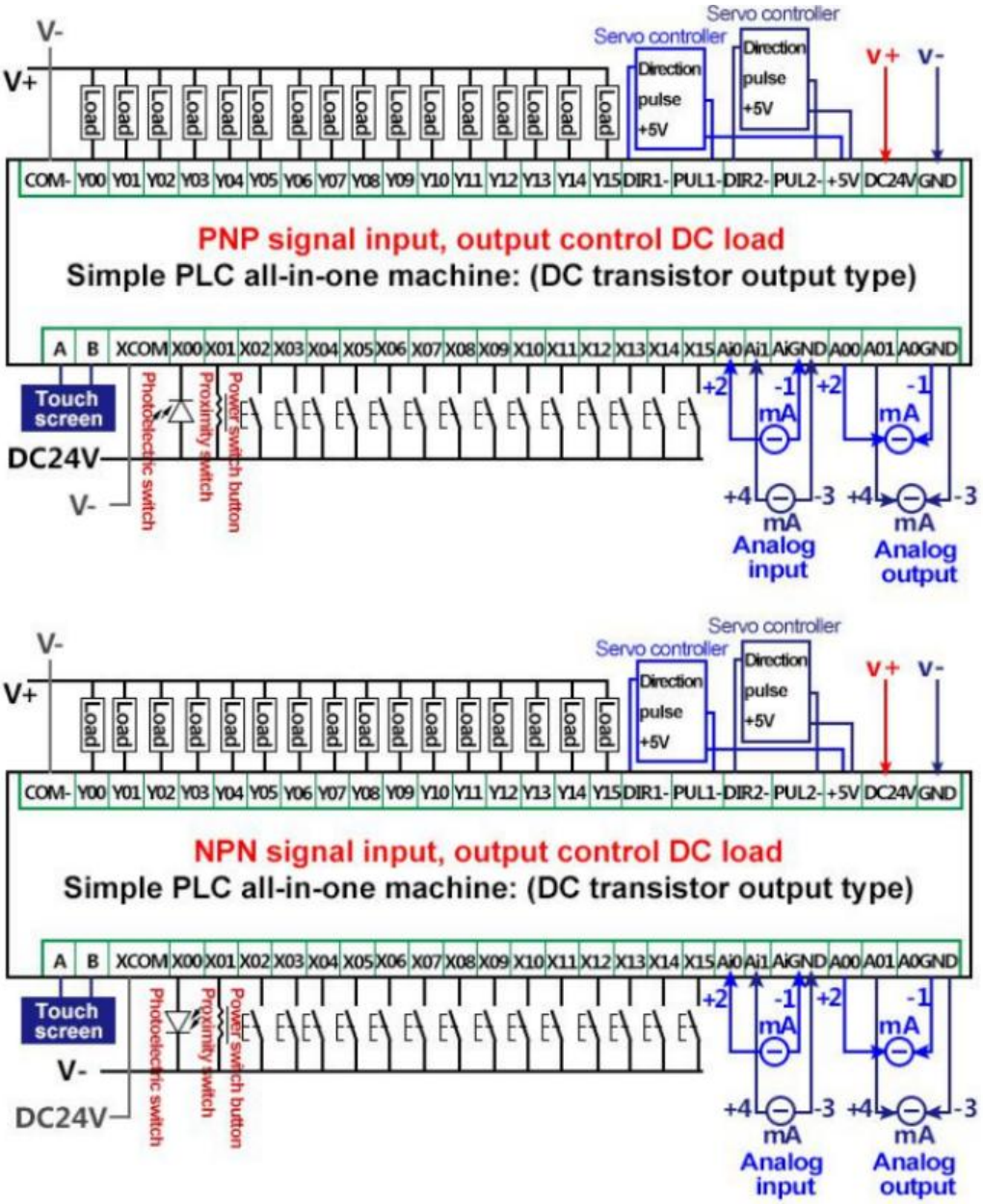
Wiring diagram of simple PLC all-in-one modules(DC transistor output)
16-in and 16-out



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