

TB16OUT

Basic Installation Instruction V1.0

Dear users, please go through the instructions in detail before the installation. Also, please preserve the manual properly and hand it to the actual operator of the machine.

CNC controllers are precision electronic devices. For the safety of both operators and the machine, please ensure all the tests, installations and adjustments are operated by professional electrical engineering personnel. For the description with “DANGER”, “WARNING” and “CAUTION” in the manual, please read them in detail. If there are any concerns, please contact our branches in various regions. Our professionals are glad to be at your service.

1. Safety Precautions :

Please pay extra attention to the instructions below while operating the product.	
	<ul style="list-style-type: none"> The controller series are designed to control the motor of the machine tool and manage the IO control. Do not touch the internal circuits or components while the controller is powered up. The internal circuit board of the controller is composed of CMOS ICs, which are vulnerable to static electricity. Do not touch the circuit board with your hand before taking precautionary measures.
	<ul style="list-style-type: none"> Please cut off all the external devices when powering up the controller for the first time. The built-in testing PLC program may start the motor immediately after powered up, which might be dangerous for the staffs around. The controller is a precision instrument. Please prevent non-maintenance staff or non-professional electronic control personnel from disassembling the device.
	<ul style="list-style-type: none"> The CNC controller adopts micro computer design. Please install the controller in a safe area and keep the area clean. Please keep iron shavings, wires, water, corrosive gases and liquids from the controller to avoid malfunction. Storage temperature range: -20°C~60°C Storage relative humidity: 0%~90% and without condensation Operating temperature range: -10°C~55°C Please reserve a space of more than 50mm in width for ventilation and heat dissipation. The grounding of the controller and the machine tool system is necessary for leakage protection and prevention of lightning strikes. Please ensure the controller and the machine tool system are grounded properly before the installation.

Please pay extra attention to the instructions below while operating the product.	
	<ul style="list-style-type: none"> The controller should be installed with a power system operated below 24±20%. If the operating environment provides an unstable voltage source, please apply a voltage stabilizer to ensure proper functioning of the controller. Please turn off the power before plugging/unplugging the cables or modifying the wirings to prevent electric shocks and damage of the controller. Please make sure all the terminals are in the correct position during wiring to prevent damaging the machine caused by incorrect wiring.

2. Description :

The Syntec PIO5 dedicated termination board can directly activate relays and the external I/O function., and there are 16 output points for relays.

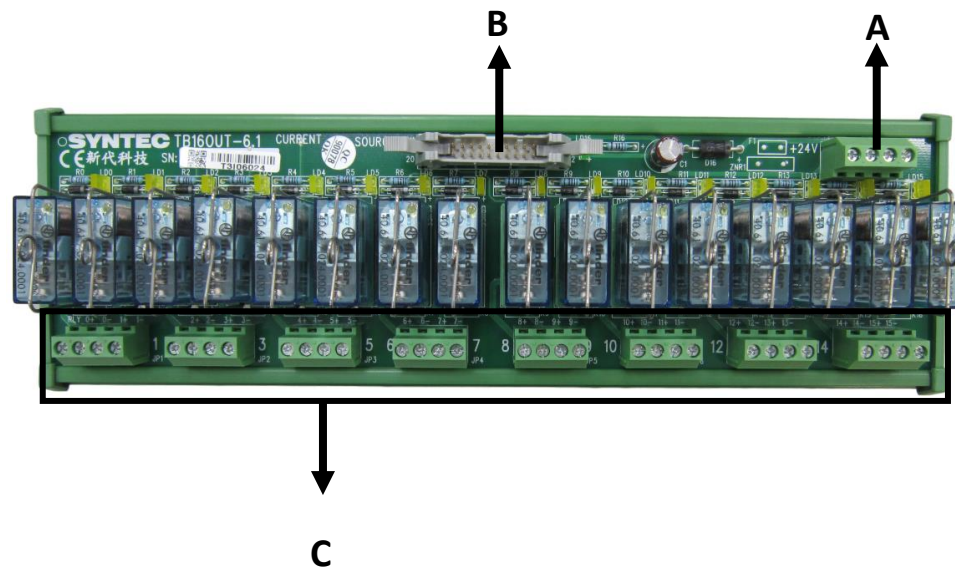
3. Function :

The TB16OUT termination board developed by Syntec is equipped with 16 sets of relay contacts to supply the external interface that requires large current.

4. Features :

- 24V single power input
- 16 sets of RELAY output; per set of relay output is contact A output.

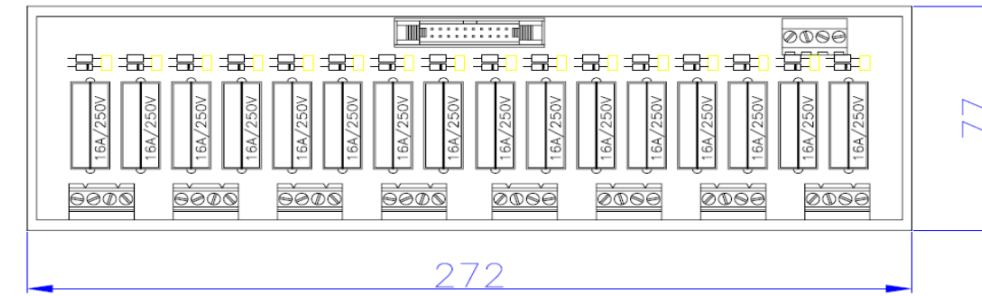
5. Termination board Interface :



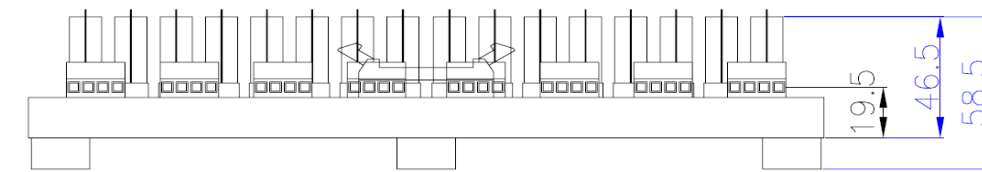
A	Power Source Input	24V · 1A input
B	Y Output Port	O point output
C	Relay Output	16 sets of RELAY output are contact A outputs

6. Structure Specifications : (Unit : mm)

(Front view)



(Side view)



7. Interface Configuration :

Please notice the value and the polarities of voltages.

- CN1 Connector Arrangement

CN1	PIN	SIGNAL	PIN	SIGNAL
	20	OUTPUT8	19	OUTPUT0
	18	OUTPUT9	17	OUTPUT1
	16	OUTPUT10	15	OUTPUT2
	14	OUTPUT11	13	OUTPUT3
	12	OUTPUT12	11	OUTPUT4
	10	OUTPUT13	09	OUTPUT5
	08	OUTPUT14	07	OUTPUT6
	06	OUTPUT15	05	OUTPUT7
	04	GND	03	GND
	02	24V	01	24V

● 24V INPUT Connector Arrangement

24V INPUT	PIN	SIGNAL
	1	+24V
	2	+24V
	3	GND
	4	GND

● JP1 Connector Arrangement

JP1	PIN	SIGNAL
	1	OUT0
	2	
	3	OUT1
	4	

● JP2 Connector Arrangement

JP2	PIN	SIGNAL
	1	OUT2
	2	
	3	OUT3
	4	

● JP3 Port Definition

JP3	PIN	SIGNAL
	1	OUT4
	2	
	3	OUT5
	4	

● JP4 Port Definition

JP4	PIN	SIGNAL
	1	OUT6
	2	
	3	OUT7
	4	

● JP5 Port Definition

JP5	PIN	SIGNAL
	1	OUT8
	2	
	3	OUT9
	4	

● JP6 Port Definition

JP6	PIN	SIGNAL
	1	OUT10
	2	
	3	OUT11
	4	

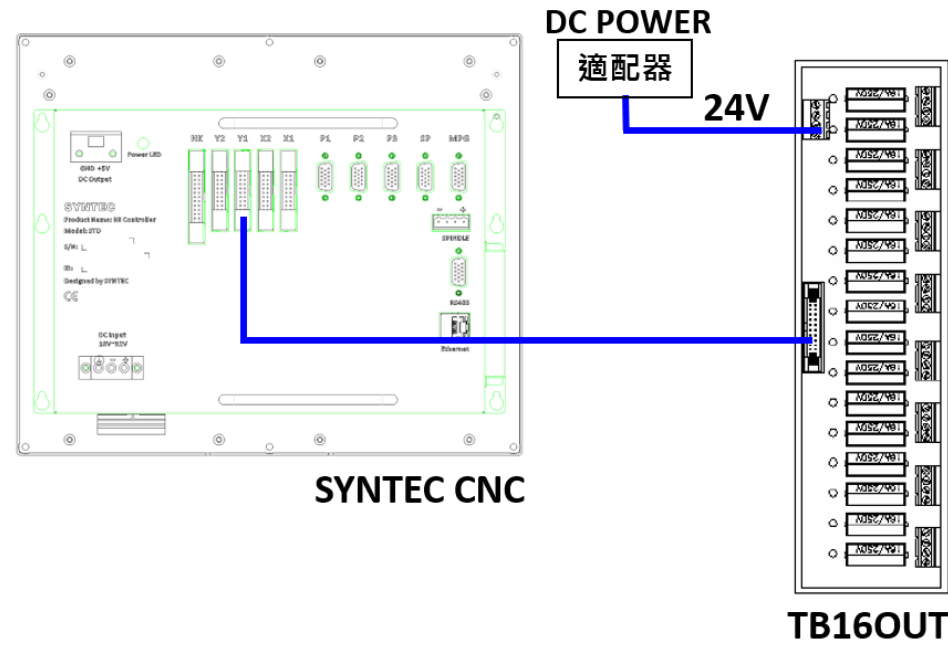
● JP7 Port Definition

JP7	PIN	SIGNAL
	1	OUT12
	2	
	3	OUT13
	4	

● JP8 Port Definition

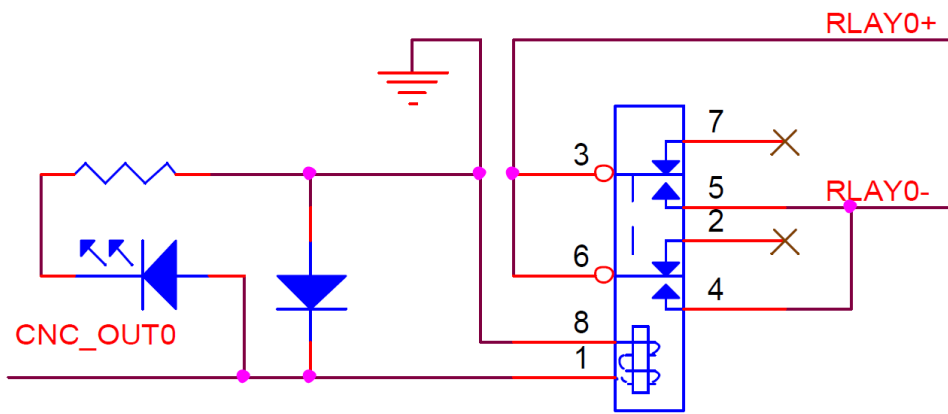
JP8	PIN	SIGNAL
	1	OUT14
	2	
	3	OUT15
	4	

8. Basic Wiring Diagram :



9. Interface Circuit :

- OUTPUT0~15 Input Interface



10. Wiring Notifications :

- When using a solenoid valve or other inductive loads, please apply an arc extinguisher or an RC varistor to ensure the life of the contact points. Advantages of arc extinguisher:
 - 1) Extend the life of electrical contacts
 - 2) Reduce the sparks from the contact points
 - 3) Prevent the inductive loads from interferences caused by back EMF
 - 4) Restrain the impulse voltage
- If the server line you are using is not a standard Syntec cable, please check all the terminals and make sure they are connected properly before running a test. Wrong wirings will lead to controller output command error and malfunctioning.
- MPG terminal's +5V output capacity is 200mA and it is only for a single external hand wheel. Do not connect it with other loads or it might cause malfunction due to the lack of drive capacity.
- The external 24V DC power supply used in wiring should be certificated and protective to avoid the malfunction caused by wiring mistakes. (Recommendation standard : fulfill requirements of both EN60950 & UL1950)
- Please crimp or weld the wire connections while doing the wirings.
- In case of the use of Ethernet, to prevent internet congestion and noise, the CAT5e or CAT6 cable are recommended.
- Do not use counterfeit terminal strips. Those terminal strips cannot provide overall protection of the system. The quality is also not guaranteed and prone to cause electrical control problem of the machine tools.
- Grounding Directions:
 - 1) The length of the grounding wire should follow the electrical equipment regulations. The shorter the better.
 - 2) The grounding wire of the controller should be separated from those with large current loading such as electric welders or high frequency motors.
 Please refer to the pictures below when the controller is grounded with multiple electrical control devices. Do not make it a loop.

