SYNTEC TECHNOLOGY CO.,LTD.

B01-ITB-16-03

iTB-1616

Basic Installation Instructions V1.2

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.

Please comply with the following guidelines before finish reading the complete manual:

- The installing environment should be indoor and without water vapor, corrosive or flammable gas.
- Please operate the wirings according to the wiring diagram.
- The grounding must be strictly implemented and follow the current national electrician regulations. (References: NFPA 70: National Electrical Code,2005 Ed.)
- Do not modify the wirings while the device is powered up.

1. Safety Precautions:

Please pay extra attention to the following instructions while operating the product.

DANGER

- Install the product by following the manual, or it might cause device damage.
- Do not operate the operate the product in places exposed to water vapor, corrosive or flammable gas. It might cause device damage, electric shock, fire, or explosion.
- Do not install the product at a temperature exceeding the specified range. It might cause device damage or malfunction.
- Do not touch the internal circuits or components while the power is supplied to the controller to prevent electric shock or other damages.
- The internal circuit board of the controller is composed of CMOS ICs, which are vulnerable to static electricity. Do not touch the circuit board before taking precautionary measures.
- The product is for industrial use.
- Do not apply the device to the machines that might lead to casualties, device damage, or system shut down.

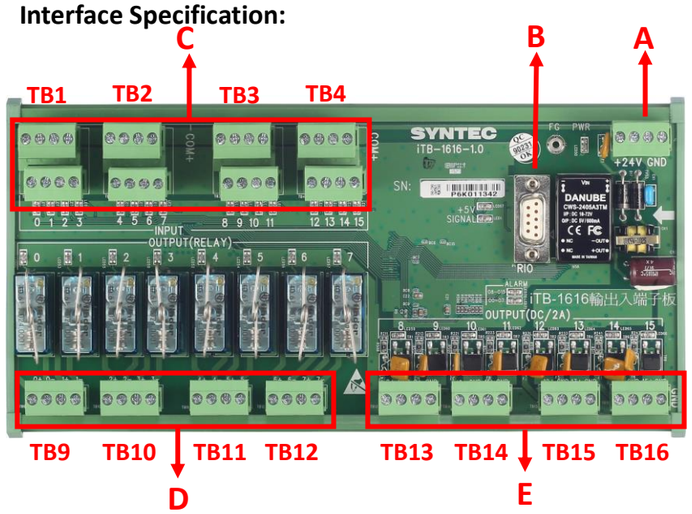
WARNING

- 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 power 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 disassemble the device.
- Please apply the correct grounding loop to prevent signal errors.
- Please separate the signal cable of the controller from all the other motor and power cables by wiring trough to prevent the controller from the malfunctioning caused by large noise interference.

CAUTION

- The CNC controller adopts microcomputer design. Please install the controller in a safe area and keep the area clean. Please keep iron shavings, wires, water, corrosive gases and liquid from the controller to avoid malfunction.
- Storage temperature range: -20℃~60℃
- Storage relative humidity range: 0%~90% and without condensation.
- Operate temperature range: -10℃~55℃
- 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.
- 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.
- Do not touch the terminals within 10 minutes after cutting off the power in case of that the residual voltage might cause electric shocks.

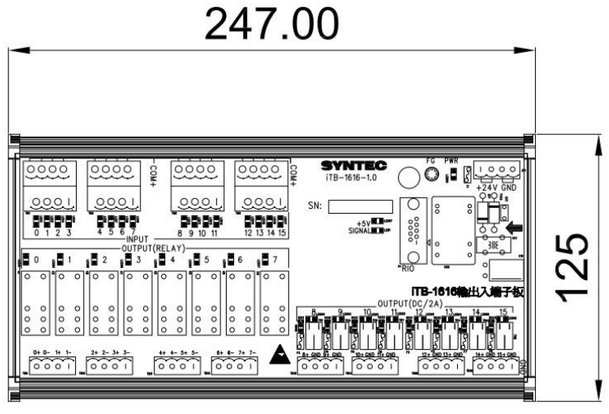
2. Interface Specification:



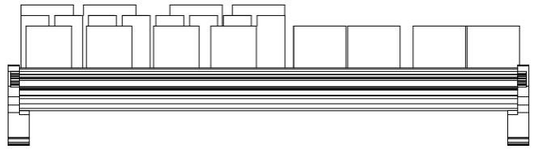
A	Power Input	24V input, best power supply: above 400w
B	RIO Connector	Connect to Syntec Controller RIO interface
C	Input 0-15	16 sets of I 點(I0-I15). Adopt SOURCE Interface. 4 sets of dual-row 8PIN terminals (terminal code: TB1-TB4)
D	OUTPUT 0-7	8 sets of OUTPUT(O0-O7) Rated withstand voltage per set: +24V·16A 4 sets of 4PIN terminals (terminal code: TB9-TB12)
E	OUTPUT 8-15	8 sets of OUTPUT(O8-O15) Rated withstand voltage per set: +24V·2A 4 sets of 4PIN terminal (terminal code: TB13-TB16)

3. Structure Diagram:（Unit：mm）

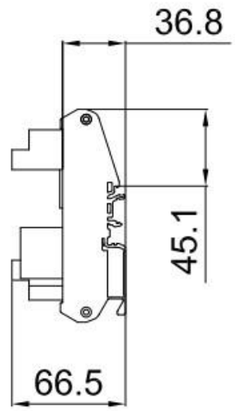
(Top View)



(Front View)

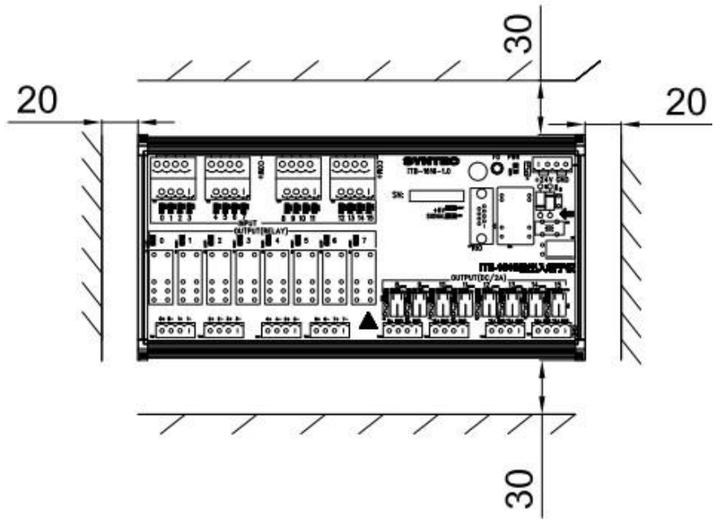


(Side View)

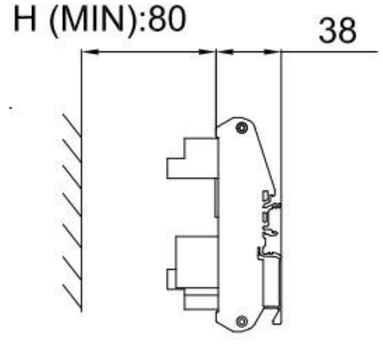


4. Recommended Installation Diagram: (Unit: mm)

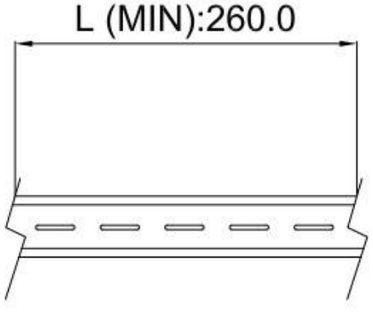
(Top View)



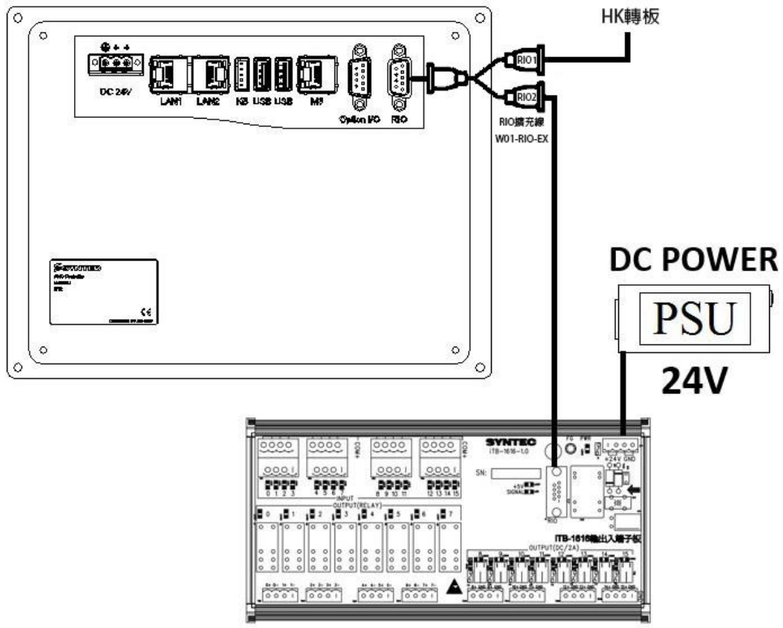
(Side View)



(Din Rail Diagram)



5. Basic Installation Diagram:



6. Interface Specification:

Please notice the value and polarities of voltages.

● 24V INPUT Connector Arrangement

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

● RIO Connector Arrangement

RIO	PIN	SIGNAL	PIN	SIGNAL
1 6 / 5 9	1	RIO-RX+	6	--
	2	RIO-RX-	7	--
	3	RIO-TX+	8	--
	4	RIO-TX-	9	--
	5	--		

● TB1-TB4 Connector Arrangement

接頭編號		TB1	TB2	TB3	TB4
歐規端子	PIN	SIGNAL	SIGNAL	SIGNAL	SIGNAL
8 6 4 2 / 7 5 3 1	1	IN3	IN7	IN11	IN15
	2	+24V	+24V	+24V	+24V
	3	IN2	IN6	IN10	IN14
	4	+24V	+24V	+24V	+24V
	5	IN1	IN5	IN9	IN13
	6	+24V	+24V	+24V	+24V
	7	IN0	IN4	IN8	IN12
	8	+24V	+24V	+24V	+24V

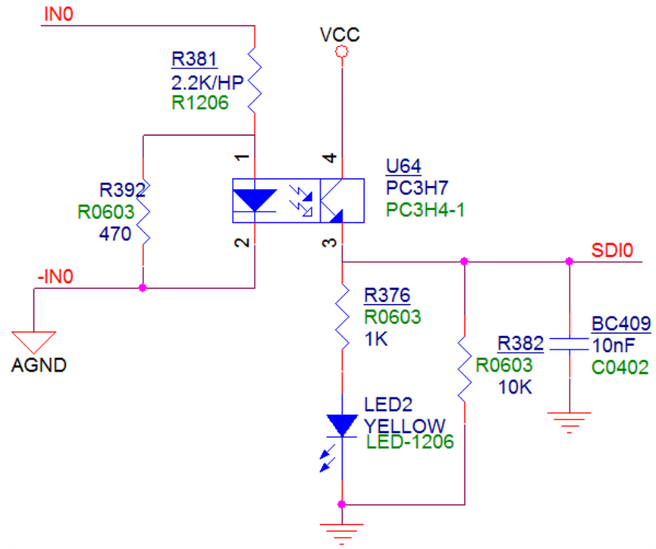
● TB9-12 Connector Arrangement(O0-O7 output, 4 sets of 4PIN terminals)

接頭編號		TB9	TB10	TB11	TB12
歐規端子	PIN	SIGNAL	SIGNAL	SIGNAL	SIGNAL
4 3 2 1	1	OUT1-	OUT3-	OUT5-	OUT7-
	2	OUT1+	OUT3+	OUT5+	OUT7+
	3	OUT0-	OUT2-	OUT4-	OUT6-
	4	OUT0+	OUT2+	OUT4+	OUT6+

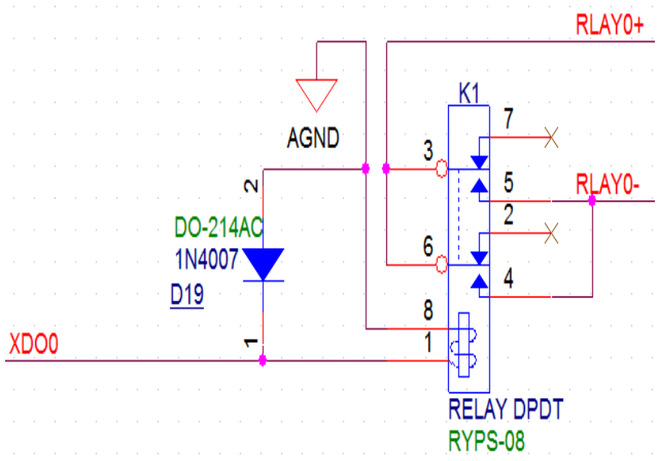
● TB13-16 Connector Arrangement
(O8-O15 output, 4 sets of 4PIN terminals)

接頭編號		TB13	TB14	TB15	TB16
歐規端子	PIN	SIGNAL	SIGNAL	SIGNAL	SIGNAL
4 3 2 1	1	GND	GND	GND	GND
	2	OUT9+	OUT11+	OUT13+	OUT15+
	3	GND	GND	GND	GND
	4	OUT8+	OUT10+	OUT12+	OUT14+

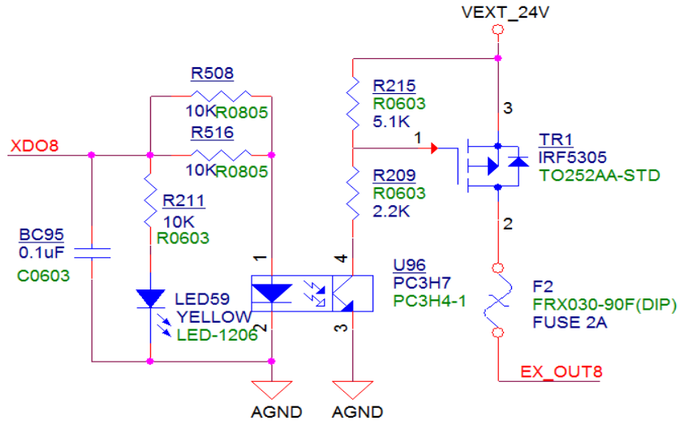
7. Interface Layout:



● OUTPUT0~7 output interface layout



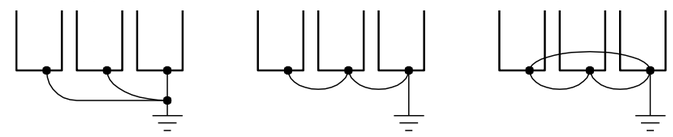
● OUTPUT8~15 output interface layout



8. Wiring Notifications:

- Please connect the ground wire to class-3 (under 100Ω). Poor grounding might cause signal error, electric shock, or fire.
- When using a solenoid valve or other inductive loads, please apply an arc extinguisher or RC voltage dependent resistor RC to ensure the life of the contact points. Advantages of the 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.
- Do not connect with other cables to extend the original length to prevent signal failures or malfunctioning.
- 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. Incorrect wiring may cause output command failures and malfunctioning. ◦
- The external 24V 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 and UL1950)
- Please crimp or weld the wire connections while doing the wirings.
- In case of the use of Ethernet, to prevent the internet congestion and noise, the CAT5e or CAT6 cable are recommended.
- Do not use counterfeit terminal strips. Those terminal strips cannot provide overall protection for the system. The quality is also not guaranteed and prone to cause electrical control problems 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.
  3) Please refer to the pictures below when the controller is grounded with multiple electrical control devices. Do not make it a loop.

(a) O (b) O (c) X



9. 廢棄物處理建議

1) When a product comes to the end of its life, please recycle it in conformity with the local regulations and treat it as industrial waste.
2) To recycle a product, we usually sort the components into steel shavings, electrical parts, etc.; then we sell them to licensed industrial waste management companies.
3) The batteries of the products should be recycled according to the local law.