

Ver1.0 Terminal Table

(Mother Board Ver1.0.00.000)

Terminal No.	Function	Terminal No.	Function
1	5V power+	2	Security earth wire
3	I: Z axis top limit, electric diagram①	4	GND
5	I: U axis top limit, electric diagram①	6	I: Z axis bottom limit, electric diagram①
7	O: electric diagram②	8	I: U axis bottom limit, electric diagram①
9	O: electric diagram②	10	O: electric diagram②
11	5V power+	12	O: electric diagram②
13	O: U axis (difference) DIR+	14	GND
15	O: U axis(difference) Step+	16	O: U axis (difference) DIR-
17	O: Z axis(difference) Step+	18	O: U axis(difference)Step-
19	O: Z axis(difference) DIR+	20	O: Z axis(difference) Step-
21	5V power+	22	O: Z axis(difference) DIR-
23	O: Z axis (TTL) DIR	24	GND
25	O: U axis (TTL) DIR	26	O: Z axis (TTL) Step
27	5V power+	28	O: U axis (TTL) Step
29	5V power+	30	GND
31	I: X axis original sensor Electric diagram①	32	GND
33	I: Y axis original sensor Electric diagram①	34	I: X axis bottom limit, electric diagram①
35	O: Electric diagram②	36	I: Y axis bottom limit, Electric diagram①
37	O: Electric diagram②	38	O: Electric diagram②
39	5V power+	40	O: Electric diagram②
41	O: Y axis(difference) DIR+	42	GND
43	O: Y axis(difference) Step+	44	O: Y axis(difference) DIR-
45	O: X axis(difference)Step+	46	O: Y axis(difference) Step-
47	O: X axis(difference) DIR+	48	O: X axis(difference) Step-
49	5V power+	50	O: X axis(difference)DIR-
51	O: X axis (TTL) DIR	52	GND
53	O: Y axis (TTL) DIR	54	O: X axis (TTL) Step
55	5V power+	56	O: Y axis (TTL) Step
57	5V power+	58	GND
59	Security earth wire	60	GND

	Laser generator terminal (isolated from other parts)			
61	Connect with power output of the laser power supply		62	LGND
63	5V power from transformation		64	LGND
65	L5V		66	LGND
67	5V 1K pull upward		68	State input 1
69	5V 1K pull upward		70	State input 2
71	5V 1K pull upward		72	State input 3
73	5V 1K pull upward		74	State input 4, connect laser generator state output
75	L5V		76	LGND
77	Pre-startup control		78	
79	PWM output		80	Laser switch control
81	L5V		82	LGND, connect with laser generator G N D
83	Pre-startup control -		84	Pre-startup control +
85			86	
87	PWM output -, add 1 K upward pull, connect control input port of laser generator		88	PWM output +
89	Laser switch control -		90	Laser switch control +
91	L5V, connect 5 V		92	Laser power control signal
			94	LGND, connect G N D
93	I: water protector test input			
95	I: test input (reserved)		96	I: test input (reserved)
97	5V power +		98	I: test input (reserved)
99	O: general output 11		100	GND
101	O: general output 10		102	GND
103	O: general output 9		104	O: general output 8
105	5V power+		106	GND
107	O: general output 4		108	O: general output 5
109	O: general output 6		110	O: general output 7
111	5V power+		112	GND
113	O: general output 3		114	O: general output 2
115	O: general output 1		116	O: general output 0
117	5V power+		118	GND
119	5V power+		120	GND
204	Cover safeguard		205	Foot switch

220	Mode numbered sensor 1		221	Mode numbered sensor 0
222	Mode numbered sensor 3		223	Mode numbered sensor 2

Ver1.3 Terminal Table

(Mother Board Ver1.0.0x.0xx)

Terminal No.	Function	Terminal No.	Function
1	VCC2 (not 5V , Power supply for Sensor)	2	GND
3	O: feeding axis (difference) DIR+	4	O: feeding axis (difference) DIR-
5	O: feeding motor1 (roller) Step+	6	O: feeding motor 1 (roller) Step-
7	O: feeding motor2 (platform) Step+	8	O: feeding motor 2 (platform) Step-
9	O: feeding instruction +	10	O: feeding instruction -
11	5V power supply +	12	GND
13	VCC2	14	GND
15	5V 1K pull upward	16	I: U axis top limit , electronic diagram①
17	5V 1K pull upward	18	I: U axis bottom limit, electronic diagram①
19	5V 1K pull upward	20	I: Z axis bottom limit, electronic diagram①
21	5V 1K pull upward	22	I: Z axis top limit , electronic diagram①
23	VCC2	24	GND
25	5V	26	GND
27	O: U axis (difference) DIR+	28	O: U axis (difference) DIR-
29	O: U axis (difference) Step+	30	O: U axis (difference) Step-
31	O: Z axis (difference) Step+	32	O: Z axis (difference) Step-
33	O: Z axis (difference) DIR+	34	O: Z axis (difference) DIR-
35	5V	36	GND
37	VCC2	38	GND
39	5V 1K pull upward	40	I:Y axis top limit , electronic diagram①
41	5V 1K pull upward	42	I: Y axis bottom limit, electronic diagram①
43	5V 1K pull upward	44	I: X axis top limit , electronic diagram①
45	5V 1K pull upward	46	I: X axis bottom limit, electronic diagram①
47	VCC2	48	GND

49	5V		50	GND
51	O: Y axis(difference) DIR+		52	O: Y axis (difference) DIR-
53	O: Y axis (difference) Step+		54	O: Y axis (difference) Step-
55	O: X axis (difference) Step+		56	O: X axis (difference) Step-
57	O: X axis (difference) DIR+		58	O: X axis (difference) DIR-
59	5V		60	GND
	Laser generator port (isolated from other parts)			
61	Connect with power output of the laser power supply		62	LGND
63	5V power from transformation		64	LGND
65	L5V		66	LGND
67	5V 1K pull upward		68	State input 1
69	5V 1K pull upward		70	State input 2
71	5V 1K pull upward		72	State input 3
73	5V 1K pull upward		74	State input 4
75	L5V		76	LGND
77	O: pre-startup control+ RF generator enable signal +		78	O: preactivation control - RF generator release power -
79	O: laser switch control 2 +		80	O: laser switch control 2 -
81	O: PWM output +		83	O: PWM output -
83	O: laser switch control 1 +		84	O: laser switch control 1 -
85	L5V		86	LGND
87	Laser power control signal 2 (1-4 the same , able to connect 4 laser power supply)		88	Laser power control signal 1
89	Laser power control signal 4		90	Laser power control signal 3
91	L5V		92	LGND
93	5V		94	GND
95	I: water protector(sensor) test input 1		96	GND
97	I: water protector(sensor) test input 2		98	GND
99	I: test input (reserved)		100	GND
101	I: test input (reserved)		102	GND
103	5V		104	GND
105	O: general output12		106	O: general output 11

	(manufacturer parameter : gang control 4)			(manufacturer parameter : gang control 3)
107	O: general output 10 (manufacturer: gang control 2)		108	O: general output 9 (manufacturer parameter : gang control 1)
109	O: general output 8 (user parameter : gang control 8)		110	O: general output 7 (user parameter: gang control 7)
111	O: general output 6 (user parameter : gang control 6)		112	O: general output 5 (user parameter: gang control 5)
113	O: general output 4 (user parameter : gang control 4)		114	O: general output 3 (user parameter: gang control 3)
115	O: general output 2 (user parameter : gang control 2)		116	O: general output 1 (user parameter: gang control 1)
117	5V power +		118	GND
145	5V power+			GND
147	VCC2			GND
149	Feeding port test		150	5V 1K pull upward
151	Unloading port test		152	5V 1K pull upward
153			154	5V 1K pull upward
155			156	5V 1K pull upward
157	VCC2		158	GND
159	5V power+		160	GND
167	5V		168	GND
169	VCC2		170	GND
191	Foot switch			
193	Cover safeguard			

NOTES:

When double laser heads are used:

1. Add one more 5V power supply for L5V and LGND
2. leave 61、63 unconnected
3. choose 1 in laser generator type
4. two water protector, connect to water protector1,2 respectively
5. connect two laser power supplies to “laser switch control 1+” and “laser switch control 2+” respectively

When single laser head is used:

1. connect 61 with 12V output terminal of power supply
2. short circuit 63 with 65
3. choose 0 in laser generator type
4. connect a water switch to “water protector 1”
5. connect laser power supply control to “laser switch control 1+”

when feeding axis is used:

1. Add U63-U66, U67,U69 in CM motherboard
2. Feeding axis are controlled by two motors, they are feeding roller and platform. The relevant resolution factors are testing resolution factor and movement resolution factor correspondingly.
3. First set the resolution factors of two motors correctly.
4. If you want to set movement speed a little quicker than that of the feeding roller, decrease the movement resolution factors properly and vice versa.
5. The resolution factors of the feeding roller depends on the accuracy of the feeding size, therefore do not change the control resolution factors randomly.

VR0、VR1、VR2、VR3、VR4:

VR0: For adjusting the output voltage

Adjustment procedures:

1. Finished in the welding workshop
2. Make a port to connect with P8: connect 10,19,20,21,22 with GND
Connect terminal 1 with 5V, that is a 5 V power supply is needed. Connect terminal 8 with G N D
3. Connect the terminal to P8
4. Adjust VR0 to make the voltage of terminal 1,2,6,7 of U8 is 3V3
5. On single laser head occasion, short circuit terminal 2,3 of VR1,VR2, that means no rheostat is needed.
6. On multi laser tubes occasion, set the VR1~VR4
7. Adjust VR1~VR4 to the limit that means the output voltage of terminal 87~90 is 3V3

V 1 ~ V R 4 :

To adjust the output voltage of terminal 87 ~ 90 on the wiring board to synchronize the laser output of multi laser tubes.

Different laser generators have different power and comprehensive performance and the lowest laser generator can not match with the highest one. Therefore, the highest one should be adjusted to match with the lowest one. And the adjusting method is as followings:

Set the rheostat of the lowest laser generator to its limit to put it into full play. Then adjust the rheostats of other laser generators to keep the efficiency consistent. On single laser tube occasion, it is not necessary to set V R 1 ~ V R 4 ,but the terminal 2 , 3 of the

rheostat should be short circuited.

First to test(or adjusting $V R 0$) to make sure that the voltage of terminal 1,2,6,7 on U8 is around 3V3 before any kind of adjustment

U 7 , U 8 :

U 7 , U 8 output four same laser power voltage control signals

When different voltages are needed to keep the same efficiency of multi laser generators, we can only adjust $V R 1 \sim V R 4$.

U 7 , V R 3 , V R 4 are reserved for the four laser heads and are not useful at present.

At present use laser power control signal 1,2 that is the terminal 87,88on the wired board.

43	Laser generator State input 1		44	Laser generator state input 2
45	O: Pre-startup control— RF generator release power —		46	O: PWM output—
47	LGND		48	O: laser switch control 2 +
49	O: laser switch control 1 +		50	LGND
51	laser power control signal 0 when the laser power is 100%, adjust VR0, the voltage is 3.2V On single domestic laser tube occasion, use this terminal		52	laser power control signal 2 relevant rheostat is VR2, it is for adjusting multi laser generators to reach balance. On multi laser generators occasion, use the terminal
53	laser power control signal 3 relevant rheostat is VR3, it is for adjusting multi laser generators to reach balance. On multi laser generators occasion, use the terminal		54	laser power control signal 4 it is for adjusting multi laser generators to reach balance. On multi laser generators occasion, use the terminal
55	LGND			
			56	GND
57	I: water protector test input 1		58	I: water protector test input 2
59	GND		60	I: test input (reserved)
61	I: test input (reserved)		62	GND
63	GND		64	O: general output 12 (manufacturer parameter: gang control 4)
65	O: general output 11 (manufacturer parameter: gang control 3)		66	O: general output 10 (manufacturer parameter: gang control 2)
67	O: general output 9 (manufacturer parameter: gang control 1)		68	GND
69	O: general output 8 (user parameter: gang control 8)		70	O: general output 7 (user parameter: gang control 7)
71	O: general output 6 (user parameter: gang control 6)		72	O: general output 5 (user parameter: gang control 5)
73	O: general output 4 (user parameter: gang control 4)		74	O: general output 3 (user parameter: gang control 3)
75	O: general output 2 (user parameter: gang control 2)		76	O: general output 1 (user parameter: gang control 1)

77	GND		78	5V power+
79			80	
81	GND		82	5V 1K pull upward
83	I: U axis bottom limit, electric diagram①		84	GND
85	5V 1K pull upward		86	I: U axis top limit, electric diagram①
87	GND		88	5V 1K pull upward
89	I: Z axis bottom limit, electric diagram①		90	Vp (not 5V , for sensor power supply)
91	5V power+		92	GND
93	O: feeding axis (difference) DIR+		94	O: feeding motor 1 (roller) Step+
95	O: feeding motor 2 (platform) Step+		96	O: feeding instruction+
97	5V power+		98	Vp (not 5V , for sensor power supply)
99	GND		100	5V 1K pull upward
101	Feeding port test		102	GND
103	5V 1K pull upward		104	Unloading port test
105	GND		106	5V 1K pull upward
107			108	GND
109	5V 1K pull upward		110	
111	5V power+		112	Vp (not 5V , for sensor power supply)
113	GND		114	General input 12 (foot switch)
115	General input 11 (cover safeguard)		116	General input10
117	General input 9 (laser beam emit control)		118	GND
119	General input 8		120	General input 7
121	GND		122	General input 6
123	General input 5		124	GND
125	General input 4 (mode choice 0)		126	General input 3 (mode choice1)
127	General input 2 (mode choice 2)		128	General input 1

Notes:

When double laser heads are used:

6. Add one more 5V power supply for L5V (terminal 36) and LGND (terminal 33)
7. Do not short circuit terminal 35,36
8. choose 1 in laser generator type 1

9. connect two water protectors, connect water protector to 1,2 respectively
10. connect two laser power supplies to “laser switch control 1+” and “laser switch control 2+” respectively

When single laser generator is used:

6. connect 34 with 12V output terminal of power supply
7. short circuit terminal 35 and 36
8. choose 0 in laser generator type
9. connect a water protector to water protector 1
10. connect laser power supply control to laser switch control 1+

When feeding axis is used:

6. Add U63-U66, U67,U69 in CM motherboard
7. Feeding axis are controlled by two motors, they are feeding roller and platform. The relevant resolution factors are testing resolution factor and movement resolution factor correspondingly.
8. First set the resolution factors of two motors correctly.
9. If you want to set movement speed a little quicker than that of the feeding roller, decrease the movement resolution factors properly and vice versa.
10. The resolution factors of the feeding roller depends on the accuracy of the feeding size, therefore do not change the control resolution factors randomly.

Rheostat VR0、VR2、VR3、VR4:

VR0: For adjusting the output voltage

Adjustment procedures:

1. In the welding workshop
2. Make a terminal to connect with P8: connect terminal 10,19,20,21,22 with GND
Connect terminal 1 with 5V, that is a 5 V power supply is needed. Connect terminal 8 with G N D
3. Connect the terminal to P8
4. Adjust VR0 to make the voltage of terminal 6,7 on U8 and terminal 51 on wiring board is 3.2~3.3V
5. On single laser generator occasion, rheostat VR2, VR3, VR4 are not needed.
6. On multi laser tubes occasion, set the VR2, VR3 and VR4.
7. Adjust VR2, VR3,VR4 to the limit that means the output of terminal voltage 52,53,54 is 3V3

VR2, VR3, VR4:

To adjust the output voltage of terminal 52, 53, 54 on the wiring board to synchronize the laser output of multi laser tubes.

Different laser generators have different power and comprehensive performance and the lowest laser generator can not match with the highest one. Therefore, the highest one

should be adjusted to match with the lowest one. And the adjusting method is as followings:

Set the rheostat of the lowest laser generator to its limit to put it into full play. Then adjust the rheostats of other laser generators to keep the efficiency consistent.

First to test(or adjusting V R 0) to make sure that the voltage of terminal 6,7 on U8 (terminal 51 on the wired board)is around 3V3 before any kind of adjustment

43	Laser generator State input 1		44	Laser generator state input 2
45	O: Pre-startup control— RF generator release power —		46	O: PWM output—
47	LGND		48	O: laser switch control 2 +
49	O: laser switch control 1 +		50	LGND
51	laser power control signal 0 when the laser power is 100%, adjust VR0, the voltage is 3.2V On single domestic laser tube occasion, use this terminal		52	laser power control signal 2 relevant rheostat is VR2, it is for adjusting multi laser generators to reach balance. On multi laser generators occasion, use the terminal
53	laser power control signal 3 relevant rheostat is VR3, it is for adjusting multi laser generators to reach balance. On multi laser generators occasion, use the terminal		54	laser power control signal 4 it is for adjusting multi laser generators to reach balance. On multi laser generators occasion, use the terminal
55	LGND			
			56	GND
57	I: water protector test input 1		58	I: water protector test input 2
59	GND		60	I: test input (reserved)
61	I: test input (reserved)		62	GND
63	GND		64	O: general output 12 (manufacturer parameter: gang control 4)
65	O: general output 11 (manufacturer parameter: gang control 3)		66	O: general output 10 (manufacturer parameter: gang control 2)
67	O: general output 9 (manufacturer parameter: gang control 1)		68	GND
69	O: general output 8 (user parameter: gang control 8)		70	O: general output 7 (user parameter: gang control 7)
71	O: general output 6 (user parameter: gang control 6)		72	O: general output 5 (user parameter: gang control 5)
73	O: general output 4 (user parameter: gang control 4)		74	O: general output 3 (user parameter: gang control 3)
75	O: general output 2 (user parameter: gang control 2)		76	O: general output 1 (user parameter: gang control 1)

77	GND		78	5V power+
79			80	
81	GND		82	5V 1K pull upward
83	I: U axis bottom limit, electric diagram①		84	GND
85	5V 1K pull upward		86	I: U axis top limit, electric diagram①
87	GND		88	5V 1K pull upward
89	I: Z axis bottom limit, electric diagram①		90	Vp (not 5V , for sensor power supply)
91	5V power+		92	GND
93	O: feeding axis (difference) DIR+		94	O: feeding motor 1 (roller) Step+
95	O: feeding motor 2 (platform) Step+		96	O: feeding instruction+
97	5V power+		98	Vp (not 5V , for sensor power supply)
99	GND		100	5V 1K pull upward
101	Feeding port test		102	GND
103	5V 1K pull upward		104	Unloading port test
105	GND		106	5V 1K pull upward
107			108	GND
109	5V 1K pull upward		110	
111	5V power+		112	Vp (not 5V , for sensor power supply)
113	GND		114	General input 12 (foot switch)
115	General input 11 (cover safeguard)		116	General input 10
117	General input 9 (laser beam emit control)		118	GND
119	General input 8		120	General input 7
121	GND		122	General input 6
123	General input 5		124	GND
125	General input 4 (mode choice 0)		126	General input 3 (mode choice 1)
127	General input 2 (mode choice 2)		128	General input 1

Notes:

When double laser heads are used:

11. Add one more 5V power supply for L5V (terminal 36) and LGND (terminal 33)
12. Do not short circuit terminal 35, 36
13. choose 1 in laser generator type 1

14. connect two water protectors, connect water protector to 1,2 respectively
15. connect two laser power supplies to “laser switch control 1+” and “laser switch control 2+” respectively

When single laser generator is used:

11. connect 34 with 12V output terminal of power supply
12. short circuit terminal 35 and 36
13. choose 0 in laser generator type
14. connect a water protector to water protector 1
15. connect laser power supply control to laser switch control 1+

When feeding axis is used:

11. Add U63-U66, U67,U69 in CM motherboard
12. Feeding axis are controlled by two motors, they are feeding roller and platform. The relevant resolution factors are testing resolution factor and movement resolution factor correspondingly.
13. First set the resolution factors of two motors correctly.
14. If you want to set movement speed a little quicker than that of the feeding roller, decrease the movement resolution factors properly and vice versa.
15. The resolution factors of the feeding roller depends on the accuracy of the feeding size, therefore do not change the control resolution factors randomly.

Rheostat VR0、VR2、VR3、VR4:

VR0: For adjusting the output voltage

Adjustment procedures:

1. In the welding workshop
2. Make a terminal to connect with P8: connect terminal 10,19,20,21,22 with GND
Connect terminal 1 with 5V, that is a 5 V power supply is needed. Connect terminal 8 with G N D
3. Connect the terminal to P8
4. Adjust VR0 to make the voltage of terminal 6,7 on U8 and terminal 51 on wiring board is 3.2~3.3V
5. On single laser generator occasion, rheostat VR2, VR3, VR4 are not needed.
6. On multi laser tubes occasion, set the VR2, VR3 and VR4.
7. Adjust VR2, VR3,VR4 to the limit that means the output of terminal voltage 52,53,54 is 3V3

VR2, VR3, VR4:

To adjust the output voltage of terminal 52, 53, 54 on the wiring board to synchronize the laser output of multi laser tubes.

Different laser generators have different power and comprehensive performance and the lowest laser generator can not match with the highest one. Therefore, the highest one

should be adjusted to match with the lowest one. And the adjusting method is as followings:

Set the rheostat of the lowest laser generator to its limit to put it into full play. Then adjust the rheostats of other laser generators to keep the efficiency consistent.

First to test(or adjusting V R 0) to make sure that the voltage of terminal 6,7 on U8 (terminal 51 on the wired board)is around 3V3 before any kind of adjustment