7i96 Reference Build Pinout for Plasma machines

TB1 - Step and direction

Pin - TB1	Signal	Connection	Remarks
1	GND	No connection	Joint 0 - X axis Do not connect anything to stepper drive enable
2	STEP0-		
3	STEP0+		
4	DIR0-		
5	DIR0+		
6	+5VP	No connection	
7	GND	No connection	Joint 1 - Y Do not connect anything to stepper drive enable
8	STEP1-		
9	STEP1+		
10	DIR1-		
11	DIR1+		
12	+5VP	No connection	
13	GND	No connection	Joint 3 - Z axis Do not connect anything to stepper drive enable
14	STEP2-		
15	STEP2+		
16	DIR2-		
17	DIR2+		
18	+5VP	No connection	
19	GND	No connection	Joint 4 - Reserved for rotary axis Do not connect anything to stepper drive enable
20	STEP3-		
21	STEP0+		
22	DIR3-		
23	DIR3+		
24	+5VP	No connection	

TB2 - Step and direction/Encoder/RS422

Pin - TB2	Signal	Connection	Remarks
1	GND	No connection	PWM Signal
2	STEP4-		
3	STEP4+		
4	DIR4-		
5	DIR4+		
6	+5VP	THCAD-10 Power	THCAD-10+ 5V
7	ENCA+	ENC.0 Arc Voltage Frequency	THCAD-10 FOUT+
8	ENCA-		THCAD-10 FOUT-
9	GND		THCAD-10 GND
10	ENCB+	ENC.1 Hyper/Ohmic Sensing	THCAD-5 FOUT+
11	ENCB-		THCAD-5 FOUT-
12	+5VP		THCAD-5+ 5V
13	IDX+	ENC.2 Not used	
14	IDX-		
15	GND		THCAD-5 GND
16	RS422/RS485 RX+	Smart Serial Interface - normally not used	
17	RS422/RS485 RX-		
18	RS422/RS485 TX+		
19	RS422/RS485 TX-		
20	+5VP		
21	5V IN		
22	5V IN		
23	GND		
24	GND		

TB3 -Isolated IO

Pin - TB3	Signal	Connection	Remarks
1	INPUT0	External Estop	
2	INPUT1	ArcOK	To CNC Port Pin 14
3	INPUT2	Float Switch	
4	INPUT3	Breakaway	
5	INPUT4	Home/Min Limit Joint 0 (X)	
6	INPUT5	Home/Min Limit Joint 1 (Y1)	
7	INPUT6	Home/Min Limit Joint 2 (Y2)	If 3 Joints: X axis min limit
8	INPUT7	Home/Max Limit Joint 3 (Z)	
9	INPUT8	Max Limit Joint 0 (X)	
10	INPUT9	Max Limit Joint 1 (Y1)	
11	INPUT10	Max Limit Joint 2 (Y2)	If 3 Joints: Y axis min limit
12	INPUT COMMON	Field Power Ground	Set to Sourcing inputs +24V enables inputs
13	OUT0-	Ohmic Probe Enable -	Ohmic AC Relay in-
14	OUT0+	Ohmic Probe Enable +	Ohmic AC Relay in+
15	OUT1-	Torch On- (Spindle 0)	CNC Port 4
16	OUT1+	Torch On+	CNC Port 3
17	OUT2-	Air Scribe Enable-	Air solenoid enable scribe (send to bottom)
18	OUT2+	Air Scribe Enable+	
19	OUT3-	Scribe On- (Spindle 1)	Air Solenoid start scribing
20	OUT3+	Scribe On+	
21	OUT4-	Drill Enable-	Air solenoid enable drill (send to bottom)
22	OUT4+	Drill Enable+	
23	OUT5-	Drill On- (Spindle 2)	Air Solenoid start drilling
24	OUT5+	Drill On+	

Hypertherm CNC Port

Set Divider board to 30:1
Do not connect cable shield at this end

Pin	Signal		
1	NC		
2	NC		
3	Torch on	Green	TB3-16
4	Torch On	Black	TB3-15
5	Divided Voltage -	Black	THCAD-10 IN -
6	Divided Voltage +	White	THCAD-10 IN +
7	NC		
8	NC		
9	NC		
10	NC		
11	NC		
12	Arc OK	Red	FIeld Power +24
13	Ground	Green/Yellow	
14	Arc Ok	Black	TB3-2

THCAD-10 Torch Voltage

THCAD Calibration data:
THCAD Divider setting: 32
Frequency at 0 volts: 118900 (1/32: 3715.625)
Frequency at full scale: 962600 (1/32: 30081.25)

Connector	Signal
+5V	TB2-6
FOUT+	TB2-7
FOUT-	TB2-8
GND	TB2-9
SHIELD	THC Shield Connect to Frame Ground Earth point Connect second pin to Cable shield
IN+	30:1 divided voltage + (CNC Port 6) Add Optional scaling resistor between 22 & 25)
IN-	30:1 divided voltage - (CNC Port 5)

THCAD-5 Ohmic Sensing

THCAD Calibration data:
THCAD Divider setting: 32
Frequency at 0 volts: 138000 (1/32: 4312.5)
Frequency at full scale: 987600 (1/32: 30862.5)

REQUIRES 390K SCALING RESISTOR

Signal	Signal
+5 V	TB2-12
FOUT+	TB2-10
FOUT-	TB2-11
GND	TB2-15
SHIELD	THC Shield Connect to Frame Ground Earth point
IN+	390k Resistor => +24V (23)
IN-	To Torch Ohmic Clip

Power Supply -24V to Table Star Ground

DIN Rail terminals

Pin	Signal
1,2,3	Mains Neutral out (to power supplies)
4,5	Ground out (to power Supplies)
6,7,8	Mains Live out (to power Supplies)
9,10	Mains live spare
11	Mains Live in (from IEC filtered input)
12	Mains Ground in
13	Mains Ground spare
14	Mains Neutral 14
15,16	Mains Neutral Spare
21	Ground for THCAD-5
22	
23	390k resistor inside - To TCAD-5 IN+
24	390k scaling resistor inside - To Isolated +24 volt
25	
26	Ground For THCAD-10

Field Power - Mesa Comm X2

Pins 1-12 are field power ground
Pins 13-24 are field power +24 volts

Pin	Field Power	Remarks
1	Field Power GROUND	
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12	-24 volts	From Field Power Power supply (-24v)
13	Field Power +24 volts	
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		
24	+24V	From Field Power Power supply (+24v)