

**Technical Document** 

## 4th Axis Homing Kit Setup

Product Identification: 4th Axis Homing Kit (PN 31921)

**Purpose:** This document details setup of the 4th Axis Homing Kit with PathPilot<sup>™</sup> to reference a 4th axis to a repeatable home position on PCNC 1100 and PCNC 770 mills. A homing kit eliminates the need to re-indicate work after a power cycle, eliminates rewinding of the axis after operations that jog the axis in one direction only, and reduces setup time for 4th axis work.

Qty. 4	4th Axis	Homing	Kit (Pl	N 31921)	PN
--------	----------	--------	---------	----------	----

I	Proximity Sensor	31922
I	6' Lead	—
I	DIN Connector	30624

**NOTE:** If any of these items are missing, contact Tormach Customer Service for a replacement at (608) 849-8381.

## Using Proximity Sensor



1. Power on mill according to Power On/Power Off Procedure detailed below.

**WARNING! Electrical Shock Hazard:** Be sure to power off machine before making any electrical modifications. Failure to do so may result in serious injury or death.

## **Power Off/On Procedure**

	I. Push red E-stop button in	TIT
Power Off	2. Click Exit on screen; when prompted click OK to power off	
	3.Turn Main Disconnect Off (see image at right)	
Deven On	I.Turn Main Disconnect On (see image at right)	
	2. After software loads, turn red E-stop clockwise to release	
Power On	3. Press green Start button	
	4. Click Reset on screen	



**Technical Document** 

- 2. Identify DIN Connector on one end of 4th Axis Homing Kit (see **Figure 1 inset**); plug in to accessory port on operator panel.
- Mount Proximity Sensor on a temporary fixture like a Magnetic Base or similar (see Figure 1).

**NOTE:** Dedicated setups may be devised for particular jobs depending on part geometry.



Figure I

4. Identify a Trigger point for Proximity Sensor. In the setup shown in **Figure 2**, one jaw of 3-jaw Chuck on the 4th axis serves as a Trigger as it rotates in a perpendicular path toward the Proximity Sensor.

**NOTE:** Any metallic object of reasonable size may be used to trigger the Proximity Sensor; however, steel and iron are best. Nonferrous metals have a reduced sensing distance.

- 5. Ensure Trigger approaches Proximity Sensor face from a 90° angle (see **Figure 2**).
- Position Proximity Sensor no more than .060" (1.5 mm) from Trigger point for accurate detection.

**NOTE:** Repeatability is dependent on both the size of the Trigger and the airgap between the Trigger and the Proximity Sensor face. In the setup shown in **Figure 1** and **Figure 2**, repeatability was better than 15 arc seconds of rotation.



Figure 2



## **Technical Document**

- 7. On PathPilot interface's *Settings* screen, click *4th Axis Homing* (PN 31921) checkbox (see **Figure 3**).
- 8. Using *REFA* button (see **Figure 3**), reference A-axis to a home position.
- 9. After 4th axis homing is complete, remove DIN Connector from operator panel's accessory port.

no cobro b	ositioning		10000				
G1 Linear in	Linear Interpolation		ATC A MANUAL TOOLCHANGE				
G2 Clockwit	2 Clockwise circular interpolation		- 110		INC TOUCONDUNC		
53 Counter clockwise circular interpolation		NETWORK N	AME rogge	SPINDLE TYPE:	Standard 0		
G20 Inch unit	t					and the second	
G21 Millimet	ter unit						
G40 Cancel r	radius compensation						
G41 Start rad	dius compensation left						
G42 Start rad	dius compensitation right		and the second second	DISABLE HOME SWITCH	ES 🛛 03	0/M998 MOVE IN Z ONLY	
G54 Work of	fset coordinate system		and the second s	ENABLE SOFT KEYBOA	RD 🗖 EN	ABLE INJECTION MOLDER	
G55 Work of	fset coordinate system		•	ENARIE DODE SWITCH		ARIE ONE SCANNER	
C56 Work of	fset coordinate system			LINNEL DOWN ON THIS			
G57 Work of	fset coordinate system				EN EN	IABLE USB IO BOARD	
G58 Work of	iset coordinate system			THE SETTER (PM	0 PA	SSIVE PROBE (PN 32309)	)
059 Work of	fset coordinate system		5	ATH AXIS HOMING (PN)	1920		
GB0 Cancel o	canned cycle mode		Statement of the local division of the local			SWITCH	10
GR1 Cannad	Carlies delling		-			DAULA	_
Main	File S	ettings Offset	S Conversal	tional Probe	Status	and the second second	
				and the second se	_		
	CYCLE START	•	WORK	DTG	STEP: DOOT	0000 ° 0000 °	.1000 *
SINGLE BLO	CK 🎱 🚺 MOT BREA	💙 IX*	-6.7065	0.0000 REFX		100% J	16 EM 2
FEEDHOLD	STOP		-3 3920	0.0000 000			
			0.0020	0.0000 8211	HEV STOP	2000	1 221
COOLANT	RESET		1.8402	0.0000 8572	STORE 4	FEEDRATE: 0.0	/MIN
COOLANT	RESET		1.8402	0.0000	STORE TO	FEEDRATE: 0.0	/MP
COOLANT	RESET 100% 100%		1.8402	0.0000 RF7* 0.0000 RF7*		FEEDRATE: 0.0	/MI /MI 0 630
COOLANT	RESET		1.8402 0.0000	0.0000 2572 0.00 0572 0.00 0572	PathPilot*	FEEDRATE: 0.0 FEEDRATE: 0.0 15 543 THE LEMITE CO TI 0.00000 CO TI MILLEN V172-62-6276072 E7	лин Лин 0 630

Figure 3