

Techno CNC Systems **Titan User Manual** (Updated 04/19/17)

Techno CNC Systems Titan Interface Manual



Call: 1-631-648-7481 or Visit: support.technocnc.com



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Introduction

The Techno CNC Systems Titan Interface was developed for use with the Techno CNC Systems Titan Controller Upgrade. The Titan Interface is reminiscent of the original Techno CNC Interface making the transition and learning curve very easy and time efficient.

This new system now moves Techno's older model machines into the new age of CNC with faster processing times, high speed G-code look ahead, and nc code processing. The new CNC interface features the same easy to use commands but modernized for today's PCs.

The purpose of this manual is to teach the basic operation and functionality of the Titan control software.



Any machine tool is potentially dangerous. Computer controlled machines are potentially more dangerous than manual ones. Because we do not know the local conditions of your machine, we can accept no responsibility for any damage or injury caused by its use. It is your responsibility to ensure that you understand the implications of what you design and build and to comply with any legislation and codes of practice applicable to your country or state. If you are in any doubt, be sure to seek guidance from a professionally qualified expert rather than risk injury to yourself or to others.

Do NOT operate a machine if you are unfamiliar with safe operating procedures.



Using the Titan Software with your Machine

General process

1) Part is drawn in a computer aided design (CAD) program.

2) Resulting file transferred into a computer aided manufacturing (CAM) program to create the toolpaths for machining.

3) The CAM program uses a post processor to generate a formatted G code program from the toolpaths created in the software for Mach

4) The G code program is then loaded and executed by the Techno CNC Interface

Typical Machining Process





Software Installation

Needed for installation (All found on provided USB key): TechnoCNC-Installer-#-#.exe (As per 4/2017, the most recent version is 2.11) Ether-Mach-Installer-#-#.exe (As per 4/2017, the most recent version is 1.4) Computer with dedicated Ethernet port Techno CNC Titan Software Registration Key (8 digit alpha-numeric code)

Techno CNC Software Recommended Requirements:

32 or 64-bit Laptop or Desktop

- 1. Windows 10, Windows 8, Windows 7 & Windows XP
- 2. 2Ghz CPU
- 3. 1GB RAM
- 4. Video Card with 256MB RAM *(Large G-code files, especially 3D files will require a video card with 512MB RAM or higher)*
- 5. At least 1 dedicated Ethernet port (2 recommended for machine and internet capability, or 1 dedicated and WiFi)

Techno CNC Titan Software Installation

- a. Make sure you are logged in as an administrator or can receive administrative rights.
- b. Double click on the TechnoCNC-Installer.exe and slowly step your way through the installation process.



TechnoCNC Version 2.11 Setup - Image: Setup Se	TechnoCNC Version 2.11 Setup - Image: Setup Se	Choose "N	lext″	
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I Agree

Cancel

< Back



3. Make sure you choose C:\TechnoCNC as the install directory. We will need to use this same location for the Ether-Mach Plugin.

TechnoCNC Version 2.11 Setup	×
Choose Install Location Choose the folder in which to install TechnoCNC Version 2.11.	
Select the location where you would like to install TechnoCNC	
Destination Folder	
Destination Folder	Browse
Destination Folder C:\TechnoCNC Space required: 122.2MB	Browse
Destination Folder C:\TechnoCNC Space required: 122.2MB Space available: 686.1GB	Browse
Destination Folder C:\TechnoCNC Space required: 122.2MB Space available: 686.1GB ullsoft Install System v2.46	Browse

4. Click "Finish" when complete

🐨 Teo	chnoCNC Version 2.11 Setup – 🗖 🗙
	Completing the TechnoCNC Version 2.11 Setup Wizard TechnoCNC Version 2.11 has been installed on your computer. Click Finish to close this wizard.
	< Back Finish Cancel
(Continued in echno CNC Ether-M	Addendum on Page 40 — ach Plugin Installation & Setup)



Machine Connections Ethernet Connection Tool Changer 0 **Touch Pad** 18 **X-Axis Encoder** E. X-Axis Motor Power 18. **Y-Axis Encoder** 100 Y-Axis Motor Power B. **Z-Axis Encoder Z-Axis Motor** 10 Power (2) **4th-Axis Encoder** 60 642 4th-Axis Motor 100 Power (2) Remote Coolant 100 Solenoid (2) Spindle **ATC Solenoid** VFD



Controller Installation

The Titan controller upgrade is compatible with all Techno CNC Systems early machines. These models include LC Plus, LC standard, RG, Pro Series, Gantry III, Patriot, and Servo Davinci's which all utilize DC Servo motors.

Because of differences in designs of these machines, your Titan upgrade may come with adaptors necessary from seamless integration.

You may also have unused ports on your Titan controller. This is to be expected if you do not have an automatic tool changer, high frequency spindle, coolant system or 4th axis. The 4th axis can only be utilized if the Titan upgrade is ordered with 4-axis control.

Quick Guide

1) Ensure all power is disconnected from the machine.

2) Open your current controller and remove all cables. Take pictures and label all wires in case of installation issues.

3) Remove old controller

4) Install new Titan controller with provided mounting bracket.

5) Using our diagrams in the next section, connect existing wires in to the new controller either directly or via provided adaptors.

6) Power on the controller and ensure feedback from Techno CNC Interface on the host PC.















Techno CN	IC Inte	rface	
TechnoCNC - Industrial	taab.		_ & ×
	Start	Feed Rate Control Feed Rate: FRO%:	
	Pause	10.00 100.0	X: 44 5042
	Stop	- Spindle Control	
Ľ.	Edit	Spindle Spindle Spindle Off On Auto	Z: <u>2.9600</u>
	Run From Here	RPM: 6000.0	A: 0.0000
	Preview	J	File:
	File	Coolant Coolant Coolant Coolant	Enable
	Settings	Off On Auto	Log
Jog Control			Home Zero Goto Tool
Y+	Z+ A+	0.0001 Cycle	Home X
X- X+	Z- A-	Cont. Toggle	Home Y
		Step Jog Mode	Home Z
Y-	Jog Speed %:		Home A
	100.0	J	Home All

Layout:

Jogging Functions - RED

File Execution - YELLOW

I/O and Overrides - BLUE

Operator's Functions - GREEN

Machine Status - ORANGE

Menu Bar - TOP



Menu Bar

The menu bar consists of drop downs that provide access to, among other things, configuration settings, diagnostics, and offset information.

File Menu

The file menu contains commands for opening and closing G code files and exiting the program.



New Gcode File: Selecting this option opens the G code editor with a new blank file. A program can then be manually typed in by the user and saved for later execution.

Recent Files: Display a list of the most recently opened G code files. Select one from the list to load it into Techno CNC Interface for execution.

Open Gcode File: Opens the "Select File" dialog. The user can then navigate to the desired G code file to select and open it in the Techno CNC Interface.

Close Gcode File: Closes the currently loaded G code file.

Exit: Exits the Techno CNC Interface



View Menu

The view menu contains controls for changing the current display.

File	View	Configure	Diagnostic	Wizard	Operator	Help
	Load S	creen		ostics		
	Full Sc	reen	Alt+Enter			
	Fixture	Offsets		-		
	Tool T	able		200000		
	Windo	ws				

Load Screen: Opens a dialog that allows the user to choose a new screen, or display.

Full Screen: Puts the Techno CNC Interface into full screen mode. The interface will be enlarged to cover the entire display.

Fixture Offsets: Displays the fixture offset table.

Tool Table: Displays the tool offset table.

Windows: Provides options for what toolbars are displayed when in the screen editor mode.

Configure Menu

The configure menu provides access to Mach and Plugins configurations. Configuration settings are disabled when the Techno CNC Interface is enabled. To allow access to these settings, first disable the controller.



Select Motion Dev: Use this menu option to select the external motion device that is to be used.

Mach: Opens a window that displays all of the Techno CNC Interface configuration settings. This is where all motor and input and output settings are entered.

Plugins: Opens a window that lists all installed plugins and provides access to each plugin's configuration settings.



Diagnostic Menu

The diagnostic menu provides functions for logging and viewing the status of inputs and outputs.



Logging: Opens the logging facility. This is handy error checking tool that logs events in Mach in real time.

Modbus: Opens a window that shows the current state of Modbus communications.

Regfile: Opens a window that displays the current value of a variety of registers and variables in the Techno CNC Interface. The contents and range of what is displayed here will vary with each machine build.

Wizard Menu

The wizard menu provides access to the pick wizard window. Any installed wizards can be found here. A wizard is a small program that allows a user to easily generate G code for common or moderately complex machining processes.

File	View	Configur	e <u>D</u> iagnostic	Wizard	Operator	Help
Pro	gram Ru	in M	Select Wizard		1	



Operator Menu

The operator menu provides the operator with options for editing the Techno CNC Interface and Lua scripting.



Lock: Locks the screen from being edited, a password is required to unlock.

Unlock: Unlocks the screen for editing, a password is required.

Edit Screen: Switches the Techno CNC Interface into the screen editing mode.

Edit/Debug Scripts: Opens the Lua editor for editing scripts saved as macros, such as custom M codes.

Restore Settings: Restores all settings

Lua Script: Displays the Lua script that controls the screen.

Help Menu

The help menu is where the operator will find the "About" page.

Ş						
File	View	Configu	ire <u>D</u> iagno	ostic Wizard	Operator	Help
Pro	gram Rui	MDI	Tool Path	Diagnostic	About	

About: Opens a window that displays information about the Techno CNC Interface and the computer it is installed on. The about screen indicates what version of the Techno CNC Interface is installed.



Manual Movement Functions

These functions allow the operator to manually jog or step the machine manually. The operator may need to jog the machine in various situations such as moving the machine to a clearance position during loading and unloading of material, setting origins, or loading or changing tools.

The Jog Control area will allow the operator to either continuously jog or incrementally step the machine depending on which mode is selected.



Jog Buttons: Buttons to jog X, Y, Z and A axes.

Cycle Jog Step Distance: In step jog mode, each press of an axis button will move the machine a specified distance; this button cycles through the distances defined in the general configuration. The current step distance in shown in the adjacent box.

Toggle Jog Mode: Toggles between continuous and jog step modes as shown by the mode indicator light in the adjacent area.

Jog Speed: Sets the speed for continuous jog as a percentage of the machine's max speed. Jog speed percentage is shown.



File Execution Functions

These functions allow the operator to affect the current G code file. Here the operator can select which file to load, where to start a program and edit and preview the currently loaded G code file.



White Box: This area shows the actual G code of the currently loaded program. The G code will scroll as the program runs. You may click on a line of code and select "Run From Here" to skip ahead in the program.

Blue Box: This area shows a small preview of the currently loaded program.



Outputs and Overrides

These functions allow the operator to manually turn on and off the spindle and coolant features of the interface. They also allow the operator to override the programmed feedrate of the currently loaded G code program.



Feed Rate Control: This slider bar will allow the operator to manually override the currently loaded G code file's feedrate. The override will be shown as both a percentage of the programmed rate (FRO%) and the actual speed in inches per minute (Feed Rate).

Spindle Control: These buttons allow the operator to manually turn the spindle on and off. When "On", the spindle speed can be adjusted with the slider bar. The spindle's current speed in RPM is shown in the box.

"Auto" is the default mode when running a G code file. This will allow the spindle to turn on and off as designated by the G code file.

Settings: These buttons allow the operator to manually turn the coolant on and off.

"Auto" is the default mode when running a G code file. This will allow the coolant to turn on and off as designated by the G code file.



Axis Information

These functions allow the operator to see the current status of each axis. It shows position and indicates whether or not a limit has been reached.



The axes current position in inches will be shown in green to the right of its label.

The red indicator will show when the machine has reached its limit for that axis.

The position will be displayed as Work Coordinates meaning referencing the last saved origin point.

Program Information and Enable / E-Stop

These functions allow the operator to enable and disable the machine as well as seeing current program information and any known errors.

File:	1	
	Enable	
		Log

File area shows what file is currently loaded and the Line area shows what line number is currently being executed.

The green "Enable" button allows the operator to use the machine. Once enabled, the button will function as an Emergency Stop.

This log area will show any errors or notifications from the software. Log will bring up error history.



Operator's Functions

These area of the Techno CNC Interface will allow the operator to perform necessary functions such as homing, settings origins, movement to specific locations and performing tool changes.

Homing Tab

The homing tab allows the operator to home the machine in order to reference the axes. This must be performed at startup.



Home X: The X axis will be sent to its home position for axis referencing.

Home Y: The Y axis will be sent to its home position for axis referencing.

Home Z: The Z axis will be sent to its home position for axis referencing.

Home A: The 4th axis will be sent to its home position for axis referencing.

Home All: All axes (XYZ and A if applicable) will be sent to their home positions for axis referencing. This is the recommended option for homing the machine.

Homing may result in an error indicating "Home switch stuck", this may indicate a broken homing switch. In this case, the machine cannot be referenced and certain functions will be limited.



Zero Tab

The zero tab allows the operator to set the machine's start position, origin or XYZ zero position.



Zero X: The X axis position will be set to 0. This will set the X axis origin start point.

Zero Y: The Y axis position will be set to 0. This will set the Y axis origin start point.

Zero Z: The Z axis position will be set to 0. This will set the Z axis origin start point.

Zero A: The 4th axis position will be set to 0. This will set the 4th axis origin start point.

Zero All: All axes (XYZ and A if applicable) will set to 0. This will set the program origin.

The zero position or origin, must be set properly in order to successfully run a G code program. Please refer to the "setting an origin" section of the manual for more information.



Goto Tab

The goto tab allows the operator to send the machine to a specific location on the table. The location will be selected and then the operator must choose "Go" to execute the movement.



Origin: This will send the machine to the current origin. It will go to X (0), Y (0), Z (z Offset).

Z Offset: The offset of the Z axis when using the Goto function. This is to ensure the Z axis has proper clearance.

XY Zero: This will raise the Z axis to the home position and then send the machine to the XY origin.

Park: This will send the machine to a clearance or park position.

Goto Position: This allows the operator to go directly to the indicated position. Also known as an absolute movement.

Inc. Move: This allows the operator to go shift the position of the machine relative to its current position. X5 will move the X axis over 5 inches, not go to position X=5

The operator may also double click in the black and green boxes to enter an exact position. After clicking any button or entering any value, the operator must click "Go" in order to execute the command.



Tool Tab

The tool tab allows the operator to change tools, use the touch-off pad, open and close the spindle chuck, learn tool lengths and tool stand positions.



Touch Off A Zero Position: The machine will set A=0 position using the touchpad

Touch Off Z Zero Position: The machine will set the Z=0 position using the touchpad.

Learn Tool Length: The length of the currently loaded tool will be learned and saved using the touchpad.

TN: Shows current tool number. Can be changed.

Learn Tool Stand Location: Will save current position as a tool stand location. See Saving location guide.

Open / Close Chuck: Will open and close the spindle chuck.

Tool Change: Will cause machine to put current tool away and pick up a new tool as indicated by the operator.

These functions will be further discussed in the following sections.

- Using the Touch Pad
- Learning Tool Lengths
- Learning Tool Stand Locations
- Changing Tools



Settings

These screens are accessed by pressing the "Settings" button in the file execution area.

TechnoCNC - Industrial Secondary Configure Disconstant Mission Constants Male	×
Pie view Coningure Dagnosoc wizard Operator Hep	
Diagnostics Settings More Settings	
Spindle Delay (s): 10.00	Goto Moves Z/A with X/Y: Off Hide Menu
Apply Fixture Offset On Home: 0 Off	Spindle Mode: Analog
Default to Continuous On	Use Specific Touchpad Off
Return To Start After Run: Off	Touchpad X: 5.0000
Restore Home and Origin On Startup: Off	Touchpad Y: 2.0000
Use Machine Coordinates: Off	Touchpad Z: 3.0000
Use Soft Limits: Off	Touchpad Thickness: 0.3750
Pause for Manual On	File Run Behavior: Specified Points:
Use Auto Toolchanging: Off	Move To Highest Z Before Run (X=0, Y=0)
Stop Coolant during Pause/TC: Off	Move to Specified Points Before Run 7.0000
Stop Spindle/Coolant on File Complete:	Do Not Move To Origin Before Run
Chuck Open Time (s): 10.00	Empty Tool Touch Point: -5.00 Learn Empty Tool
This area is for settings that are unique to the screen-se CNC configuration. If the parameter you are looking for is	et and not part of the Mach s not here, it is probably in Store Pos As Offset
the menu entry (Configure -> Mach) or (Configure -> Plug	gins -> EtherMach)
1	Store Origin As Offset Tool Editor
Start Stop Pause	E-Stop Back To Screen

Spindle Delay: Time in seconds after spindle on for first movement to execute.

Apply Fixture Offset on Home: If position data is set up for a fixture, HOMING will avoid fixture.

Default to Continuous: If enabled, the machine will choose continuous mode on startup.

Return to Start After Run: If enabled, the machine will return to origin on file completion.

Restore Home and Origin on Startup: If enabled, the machine will remember its last origin after a reboot.



Use Machine Coordinates: If enabled, the machine will always display absolute coordinates.

Use Soft Limits: If enabled, the machine will limit its travel based on operator restrictions.

Pause for Manual: If enabled, the machine will pause when encountering a tool change command in a G code file allowing the operator to manually change tools.

Use Auto Toolchanging: If enabled, the machine equipped with an automatic toolchanger will automatically change tools during program execution.

Stop Coolant during Pause/TC: If enabled, the machine will disable the coolant when paused and when performing a toolchange.

Stop Spindle/Coolant on File Complete: If enabled, the machine will shut off the spindle and coolant after the file has finished (if not told to do so already in the G code).

Chuck Open Time: The delay associated with using the chuck open/close command.

Goto Moves Z/A with X/Y: If enabled, the machine will move all axes at the same time when using the "goto" command. Otherwise Z/A will move first, then followed by X/Y.

Spindle Mode: The method in which the spindle is turned on / off.

Use Specific Touchpad: If enabled, the machine will always go to the indicated position when measuring tool lengths.

Touchpad Thickness: If the machine is equipped with a touchpad for setting Z=0, this is where your thickness of the touchpad is inputted.

File Run Behavior: Choose one:

- Move to Origin Before run
- Move to Highest Z before Run (X=0, Y=0)
- Move to Specified Points Before Run
- Do Not Move Before Run

Empty Tool Touch Point: Lowest distance Z can travel when no tool loaded.

Fixture Editor: Opens a window to enter data for fixture avoidance.

Store Position as Offset: Saves current position as new Origin Offset

Store Origin as Offset: Stores current origin as new Origin Offset

Tool Editor: Opens a window for editing tool length and position data.



R TechnoCNC - Industri File View Configure Dia	al gnostic Wizard Oper	itor Help			_ @ ×
Diagnostics Settings	More Settings				
Use Spindle Sto Auto-Apply Tool Auto Toolchange Clearance Zone Tool Holder Lift A Screenset This area is for s CNC configuration	Version: vettings that are configure -> Mac	0ff off X Axis 4.0 0.2 1.0 unique to the scretter you are looking th) or (Configure -	20 Learn 20 een-set and not part of the Mach g for is not here, it is probably in >> Plugins -> EtherMach)		
	01	5	1		Reset Drives
Use Sp when fau Auto-A length di Auto Ta Cleara Tool ha Reset D	indle Stop Ited. pply Tool fferences. oolchange nce Zone Ider Lift A Drives: Res	pped Sign Length O e Clearand Coordina Amount: R	al: Use signal data fro offset: When changing ce Zone: Which axis tes: Relative clearance elative clearance in Z c o drives after servo faul	om inverter to stop progr tools, automatically app is toolchanger clearance in toolchanger clearance axis after tool change.	ram oly tool needed. ce axis.



Diagnostics

This screen shows the status of inputs, outputs, control signals as well as axis information and overrides.

TechnoCNC - Industrial	_					_ 8
Diagnostics Settings More Settings						
Physical Inputs VFD Fault Chuck Manual VFD Fault Chuck Fully Open Servo Fault Chuck Fully Closed X Home Spindle Stopped Y Home Touchpad Z Home Remote Start A Home Remote Stop Kemote Stop	Axis Diagnostics Current Position * Machine Coortinate +0.896 +7.563 +6.439 -0.661 -0.750 -2.217 +0.000 +0.000 Overrides Brake Release Override Coolant	Work Offset +6.667 -7.100 -1.467 +0.000 Chuck I Override	082 Offset - +0.000 + +0.000 + +0.000 + Release	Head Shift . +0.000 +0.000 +0.000 +0.000 Overrid Ignore D	Wark Switt +0.000 +0.000 +0.000 +0.000 +0.000 e Limits rive Fault	Tool Offset +0.000 +0.000 +0.000
Physical Outputs X Reset Coolant X Reset Chuck Y Reset Spindle On Z Reset Spindle SS1 A Reset Spindle SS2 Spindle SS3	X Brake Y Brake Z Brake A Brake Spd: 5000.00	Ľ				
Internal Control Signals Spindle At Speed Motion Inhibit Coolant Ready Emergency System FRUN Spindle speed capped by cu G1 G17 G90 G91.1 G94 G20 G40 G49 G80 G98 G50 G	urrent range! Log G	1X1 2552-0 503 1X1 2262-0.543 1X1 2172-0.599 1X1.1992-0.733 1X1 1992-0.730 1X1 020 1Y6.464 1X1 208 1X1 2172-0.745 1X1 2262-0.694			_	×
Start Stop Pause				E-Stop	Back	To Scree

Brake Release: This disables the Z axis brake to allow the axis to drop under its own weight.

Chuck Release: This opens/closes the spindle chuck.

Override Limits: This temporarily disables soft limits if they are enabled.

Override Coolant: This allows the user to force on/off the coolant.

Override Spindle: This allows the user to force on/off the spindle.

Ignore Drive Fault: This disables the software looking for VFD faults.



Operating Instructions

These guides will walk the operator through the basic usage of the machine.

Starting the Software

Once the machine is powered on, the operator may start the Techno CNC Interface. Once open, the Techno CNC Interface will be in a disabled state. The system must be enabled before any operation of the machine can take place.



Enable the controller by pressing the flashing green enable button on the right hand side of the controller screen. Once enabled, the machine will unlock and the button will change to "E-Stop".

Homing the Machine

Because all Techno CNC Systems DC servo machines use incremental encoders for position feedback, their positions are often not trusted after a power cycle. In order to determine the position of the machine on the table, the axes must be referenced or homed.





Jogging

Manual jogging allows the operator to move the machine around using on screen controls.



Jogging is enabled whenever the controller is enabled and a program is not being executed. The screen provides controls for jogging 4 axes; X, Y, Z, and A.

There are 2 basic jog modes which are selectable by pressing the "Toggle Jog Mode" button, Continuous and Step. The current selection will be indicated by a green light. The figure above shows continuous mode selected.

Continuous

In continuous mode the machine will move at the specified jog rate as long as a jog button is held down. The jog rate can be changed by moving the slider at the bottom or by directly typing the desired rate into the "Jog speed" box in the bottom right corner. The number shown in the box is a percentage of the max speed of the machine.

Continuous mode is useful for moving the machine relatively large distances and rough positioning.

Step

When finding the edge of a work piece, locating a hole, or other precision position is required, step jog is much more accurate. In step jog, the machine moves only by the specified increment amount, regardless of how long the jog button is held down.

The jog increment can be changed by pressing the "Cycle Jog Step" button. This button will change the "Jog Step" box to the left` of it to show the current increment amount.

The increment values can be changed on the General tab of the main configuration.



Setting an Origin

Once the machine has been homed and before we run a program, we must set the origin or start point.

Origin position is the location point on a drawing in a CAD/CAM package where X,Y and Z all equal zero.

Generally, XY zero is on the bottom left corner and Z zero is the top of the part. In the adjacent figure, the letters are located away from the XY zero, all points representing positive integers.

The machine should be jogged to the corner of the material by using the directional arrows. Use Continuous mode first and then Step mode is precisely find your start location.

Once the machine is in location, go to the "Zero" tab under operator's function and choose the appropriate axis.

Generally you should zero the X and Y axes first and then the Z axis.





Home	Zero Goto	Tool	
	Zero X		
	Zero Y		
	Zero Z		
	Zero A		
	Zero All		



You can Zero the Z axis in one of two ways:

1) Manual Method: Use the Z axis directional arrows to move the machine close to the Z=0 point. Switch to Step Mode to slowly move the tip of the tool to your Z=0 point, either top of the material or bottom of the material as designated by the G code file. Once in position, choose "Zero Z".



2) Touch off Block: Place the touch off block on top of the Z=0 surface and under the cutter. Go to the "Tool" tab under operator's functions and select "Touch off Z Zero position. The spindle will slowly move down until it touches the touchpad. The Z axis will now be zeroed to the surface directly under the touchpad.

Hor	ne	Zero	Goto	Tool	
	Touch Off A Zero Position				
	Touch Off Z Zero Position				
	Lea	rn Tool Len	gth TN	1: 0	
Learn Tool Stand Location					
Open Chuck					
Tool Change					

Once the origin has been set up on the machine, the operator is now ready to run a G code program.

The first step to running a program is to load it into the Techno CNC Interface.



Loading A G Code File

In the File execution area, press "File". A window will open that will allow the operator to navigate to the desired file and open it.

When the file loads, the Techno CNC Interface will quickly run through it to generate a tool path for the tool path window. If there are any major code errors or unknown codes, they will be found on this initial run through. The tool path window will show the actual tool path including cutter comp and any other adjustments made in the program. Check it to make sure it looks as intended before running.

Viewing the G Code File Tool Path

The tool path window shows the programmed path exactly as it will be run by the machine. You can view the toolpath in the file execution window or you can choose "Preview" to bring it up in full screen. It is possible to pan rotate and zoom the tool path window using the mouse. Move the mouse pointer into the tool path window and perform the following:

Rotate - Left Click and Drag

Pan - Left + Right Click and Drag



File

Zoom - Right Click and Drag/Scroll Wheel

Reset View - Double Left Click



Executing a G Code File

When the file loads, the Techno CNC Interface will quickly run through it to generate a tool path for the tool path window. If there are any major code errors or unknown codes they will be found on this initial run through. The tool path window will show the actual tool path including cutter comp and any other adjustments made in the program. Check it to make sure it looks as intended before running.

Start

Pressing the Start button will begin program execution from the beginning of the program, or the line selected if trying to skip ahead. The program will continue to run until a program pause, operator pause or file completion.

Pause

Start

Pause

Pressing the Pause button will immediately pause and put the machine into feed hold mode. This will only pause axis motion. If the spindle is running, it will stay on and any active outputs like coolant will also remain active

Stop

Stop

Pressing the Stop button will immediately end program execution. All motion and outputs will cease and the program will not rewind to the beginning.



Starting from the Middle of a G Code File

There are a couple ways to start execution from a point other than the beginning of a program. If the desired start point is a safe start line or other safe position, not including any motion, the desired start line can be selected and start pressed. Select the desired start line in the G code window and then press the "start" button. When the Start button is pressed, the program will begin execution from this selected line.

Programs can also be started from any position in the program, including in the middle of a cut. To do this, select the point to start by scrolling through the G code program in the G code window and select the desired line. Manually jog the machine close to the start point. Next, press the "Run From Here" button. A window will open to start the process of restarting the program.



In the run from here window, there is a position read out showing distance to go. These distances are how far the machine needs to travel to reach the start point. Before starting execution, the machine must be moved "to profile' at the start point. The axes can be moved using the controls in the "Move Axis to Start Position" section of the window. Enabled axes will be available for selection. Select one or multiple axes to move and press the "Move Selected" button. The selected axes will move to their start positions.

Another button, "Move Unselected" will move the unselected axes. Use this button to move any remaining axes to their start positions. Once the machine is in the start position, press the "OK" button. The Techno CNC Interface will scan the preceding part of the program to get the machine into the proper state. Press "Start" to begin file execution from the given line.



Advanced Tutorials

The following guides will walk the operator through various advanced operations. Many of these guides will be outside the range of some machines. Changing tools and automatic tool length settings are features that may not be supported by all machines.

Using the Automatic Toolchanger

If your machine is equipped with an automatic toolchanger, the new Techno CNC Interface allows the operator to manually change tools similarly to the older software.

Identifying Tools

In order to properly set up tool length and position, the operator will need to associate the tool in the machine with a number in the software. To do this, the operator must choose the "Tool" tab in the operator's pane. In the Tool menu, the operator can input a number in the box marked "TN" and press enter.

Make sure to choose a number appropriate for your machine and setup. Make sure the tool holder for the number you chose is empty so as to avoid crashes and confusion.

Hon	ne	Zero	Goto	Tool	
	Touch Off A Zero Position				
	Touch Off Z Zero Position				
	Learn Tool Length TN: 0				
	Learn Tool Stand Location				
	Open Chuck				
Tool Change					



Learning Tool Stand Locations

Once the tool in the chuck is properly identified, we can now teach its stand location to the software.

1) Jog Tool Holder 1 just outside the opening of Tool Stand 1.

- If you are a one-person operation, you will need to move the keyboard as close to the Tool Stands as possible. A closer position will better enable you to set the right location. If you have a co-worker available to help you, have him stand by the Tool Stand and direct you in jogging.
- At this point, the positioning and margin for error gets pretty tight. We compensate for this by switching from 'Continuous' to 'Step'. Change the Step Jog value to 0.01.

2) Position Tool Holder #1 in Tool Stand #1

- Find the X and Y axis Tool Stand Middle Positions
- Jog Tool Holder 1 to the middle of the Tool Stand along the X axis. At the desired middle position, you should be able to spin the Tool Holder, using your hand, without obstruction.
- To determine a highly accurate X axis middle position, jog the Tool Holder in a positive direction (X+) until Tool Holder 1 cannot spin freely and easily.
- **Warning:** Do not jog beyond the point where the tool cannot spin at all.
- Then, counting the number of jog-clicks, jog the X axis in a negative direction (X-) until Tool Holder 1 cannot spin freely and easily. Take the number of jog-clicks it took to get from one side (X+) of the Tool Stand to the other (X-), divide by 2, and jog back that number of clicks to a very exact middle position. Example: if the total number from one side to the other was 20 (20/2=10), then jogging back 10 jog-clicks (X+) will be an accurate center position for the X axis.
- Repeat process for the Y axis.
- Set the Z axis position
- Jog the Z axis down (Z-) until the Tool Holder 1 initially contacts the Tool Stand Plate
- Then Jog down 2 more jog-clicks (Z-).

3) Learn Tool Stand Position

- We are now ready to set the Tool Stand Location.
- Press "Tool", then "Learn Tool Stand Location" The tool stand location will be learned for the tool that is identified in the "Tool number" box.



Learning Tool Lengths

In order to be able to change tools during a file and continue to cut at the proper depth, the machine must be told how long each tool is.

Measure an Empty Tool Holder

This empty tool holder will be our reference point.

1) Place the touchpad on a stable spot on the table. If possible, choose a spot that can be easily used again in the future, one which will not change.

2) Remove the collet nut, collet and tool from a tool holder, leaving a completely empty tool holder in the chuck.

3) Position this empty tool holder over the touch pad and click on the "Tools" button, then input a Zero (0) in the TN box. This will measure the reference point.

4) Press "Learn Tool Length". The machine will lower down until it touches the touchpad

Measure Your Tools

1) Change tools to the one you will measure first. This can be done through a manual tool change or an automatic one. If it is done manually, be certain to identify the tool in the chuck to the software.

2) Position the tool over the touchpad, in the same spot the empty tool was learned. Leave anywhere from 0.1" to 1" between the tool and the pad.

3) In the main screen, click TOOL, and then click on "Learn tool length". Make sure the number in the Tool Number box (TN) reflects the tool you are trying to learn.

4) The tool will slowly drop until it touches the pad, and then retract. The tool has been learned.

Measure the rest of the tools until the software knows the lengths of all your tools.

When a tool is replaced due to breaking or a need for a different tool, only the replaced tool needs to be taught, but it must be taught with the pad in the same spot. If the spot has moved, or if you cannot remember where the pad was, first re-learn the empty spot. After the empty spot has been re-learned, you can learn that one new tool. There is no need to re-learn all tools after re-learning the empty spot -- this is the benefit of the "new" tool learning system.



Techno CNC Systems Titan User Manual Addendum

Cancel

Next >

(Continued from Page 7 of this Manual)

Techno CNC Ether-Mach Plugin Installation

- a. Make sure you are logged in as an administrator or can receive administrative rights.
- b. Double click on the Ether-Mach-Installer.exe and slowly step your way through the installation process.
 - 1. Choose "Next"



Choose "L Agree" 2.

🕞 Ether-Mach Version 1.4 Setup 🗧 🗖	×		
License Agreement Please review the license terms before installing Ether-Mach Version 1.4.	Nana Nana Nana Nana Nana Nana Nana Nana		
Press Page Down to see the rest of the agreement.			
Ether-Mach Copyright 2016 Stepper311 C	^		
THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT HOLDER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF			
If you accept the terms of the agreement, click I Agree to continue. You must accept the agreement to install Ether-Mach Version 1.4.			
Nullsoft Install System v2.46 	el		

Techno CNC Systems	Techno CNC Systems Titan User Manual
 Make sure you choose C:\TechnoCN the same as the TechnoCNC-Installe 	↓C as the install directory. It MUST be er directory. Click "Install".
C Ether-Mach Versi	on 1.4 Setup – 🗆 🔼
Choose Install Location Choose the folder in which to install Ether-Mach V	ersion 1.4.
Select your Mach4 Installation Directory below, ar	nd then press Install to intall Ether-Mach.
	Browse
	browse
Space required: 5.5MB Space available: 685.9GB	
Nullsoft Install System v2.46	
	< Back Install Cancel

Techno CNC Ether-Mach Plugin Setup

In order to function efficiently and avoid interference from other processes running on your system, you should follow the steps below to configure the Ethernet interface to disable all unnecessary services. If you do not do this, system services such as AutoIP or DHCP can interrupt or interfere with board connectivity, if you can connect at all.







4. Right click on your "Ethernet adaptor" and click properties:





5. Disable every check box except for "Internet Protocol Version 4 (TCP/IPv4)" (You might need to scroll down to get all of them):

#	Ethernet Properties	×		
Networking S	Sharing			
Connect using	Connect using:			
🔮 Broado	com NetLink (TM) Gigabit Ethernet			
	Configure.			
This connecti	ion uses the following items:			
A Hype A Micre	er-V Extensible Virtual Switch osoft Network Adapter Multiplexor Protocol osoft LLDP Protocol Driver -Layer Topology Discovery Mapper I/O Driver -Layer Topology Discovery Responder	^		
□ -▲ Inter ✓ -▲ Inter <	met Protocol Version 6 (TCP/IPv6) met Protocol Version 4 (TCP/IPv4)	~		
 ▲ Inter ✓ ▲ Inter Install. 	met Protocol Version 6 (TCP/IPv6) met Protocol Version 4 (TCP/IPv4) > Uninstall Properties	*		
 ▲ Inter ▲ Inter ▲ Inter Install. Description Transmission wide area in across diverses 	Image: Protocol Version 6 (TCP/IPv6) Image: Protocol Version 4 (TCP/IPv4) Image: Imag	•		

6. Now select and highlight "Internet Protocol Version 4 (TCP/IPv4)" and then click properties:

Install	Uninstall	Properties	
1	11.1.1.1	D	
<		>	
Internet Protocol Version 4 (TCP/IPv4)			
Internet Protocol Version 6 (TCP/IPv6)			
Link-Layer Topology Discovery Responder			



Internet Protocol Version	4 (TCP/IPv4) Properties		
General			
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.			
ODbtain an IP address automatical	ly		
Use the following IP address:			
IP address:	10 . 7 . 7 . 8		
Subnet mask:	255 . 255 . 255 . 0		
Default gateway:			
Obtain DNS server address auton	natically		
 Use the following DNS server add 	resses:		
Preferred DNS server:			
<u>A</u> lternate DNS server:	· · ·		
Ualidate settings upon exit	Ad <u>v</u> anced		
	OK Cancel		

8. Close that dialog by pressing OK, then close the Ethernet Properties dialog by pressing OK.

Your network adapter has now been configured to properly communicate with your new Techno CNC Controller.



Licensing Instructions

Once the Techno CNC software and Ether-Mach programs have been installed, we can now license the software.

HOW TO GET A LICENSE USING THE PROVIDED REGISTRATION CODE:

1) Go to www.machsupport.com

2) Click the large red cart button in the upper right hand corner of the screen.

3) Enter your 8 Digit alpha numeric registration code in the box provided and push the "Apply coupon or registration code" button that is directly beside the entry box.

4) Supply all required registration information by following the directions on the website screens.

Finding your PC ID:

Run the Techno CNC Software and go to the Help>About screen.

Use the PC ID code from the Help/About screen at checkout to license this single computer. Additional licenses can be created after the initial purchase from within your account.

* The email and password you enter during this process are needed to manage your account and licenses. Lost licenses can be resent only if you remember your account details. Licenses and your account are valid as long as you retain the license or the secure login. Licenses will arrive by email typically within 2 hours of your order. Please use an email address/ account that will not block the emails as spam.

<u>IMPORTANT NOTE</u>: The LICENSE will only work for the Computer for which you supplied the PC ID. Each PC has a unique ID code and the license works in coordination with this code.

If you upgrade or exchange your PC, it will be necessary to contact Techno CNC Systems or create a new license yourself by logging into your account and using the website license maintenance feature.



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FIELD SERVICE

Repairs are ordinarily done at Techno CNC Systems, LLC.,'s Ronkonkoma, New York facility, where all necessary instrumentation is available. This instrumentation is difficult to transport, so field service is severely limited, and will only be supplied at Techno CNC Systems, LLC.,'s discretion. If field service is required and is performed at Techno CNC Systems, LLC.,'s sole discretion, all relevant expenses, including transportation, travel time, subsistence costs, and the prevailing cost per hour (eight hour minimum) are the responsibility of the customer.

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