

**TRAK<sup>®</sup> MACHINE  
TOOLS**

Featuring  
**ProtoTRAK CNCs**



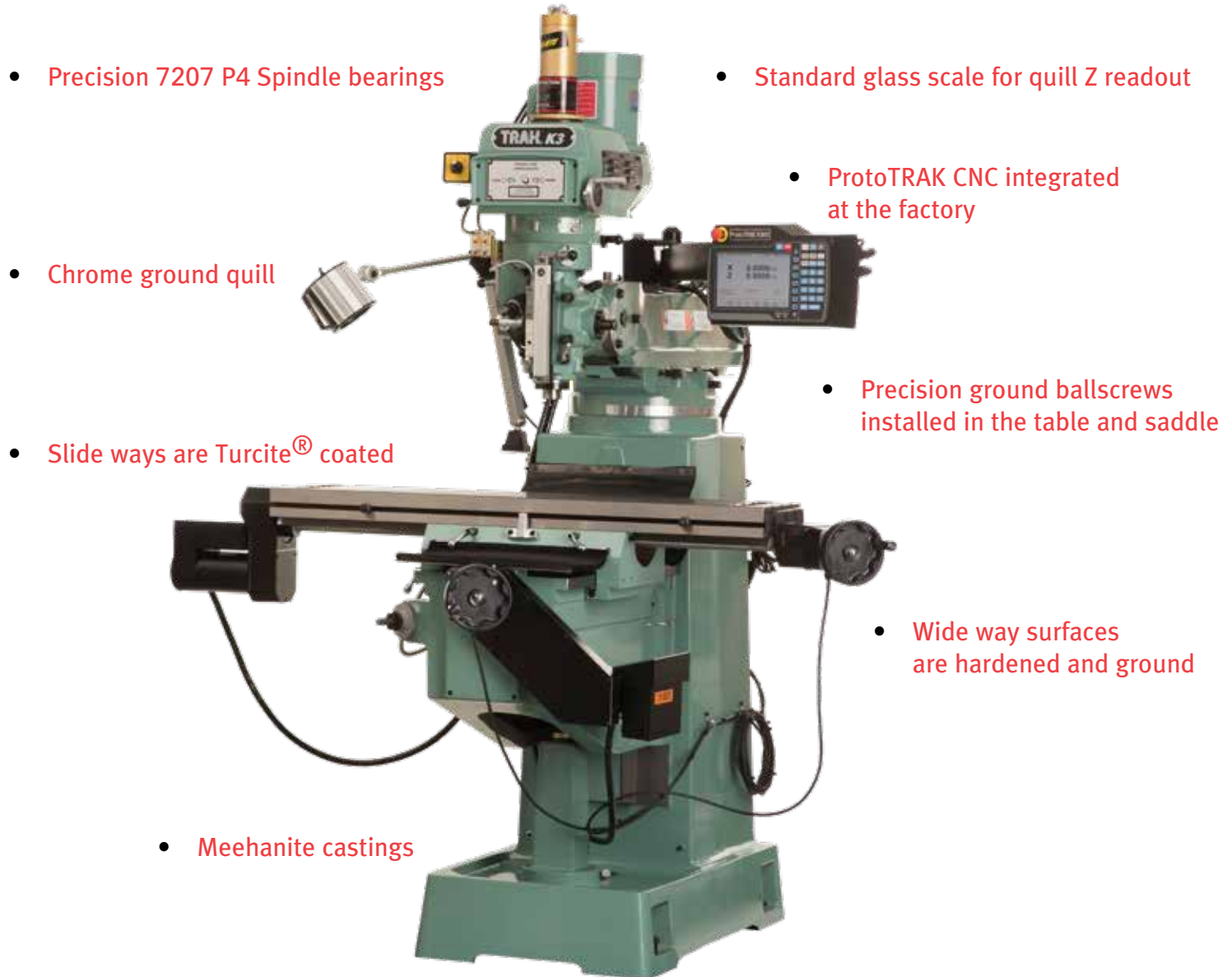
# TRAK Knee Mills

Your Best Choice in Knee Mills Today!

# TRAK Knee Mills

---

The best built, best supported knee-type milling machines you can buy



- Precision 7207 P4 Spindle bearings
- Standard glass scale for quill Z readout
- Chrome ground quill
- ProtoTRAK CNC integrated at the factory
- Slide ways are Turcite® coated
- Precision ground ballscrews installed in the table and saddle
- Wide way surfaces are hardened and ground
- Meehanite castings

## Outstanding Support at no Extra Cost

Only TRAK Knee Mills featuring ProtoTRAK CNCs are factory-integrated by us, the manufacturer of the control. That means an outstanding product and one source of parts and support. You will never be shuffled between machine and CNC supplier – the entire product is our responsibility.

**Our track record proves you can rely on us to live up to our responsibility to you.**

# TRAK Knee Mill Models

---



## ProtoTRAK EMX

Easy to use, yet full CNC functionality

*See page 6 for a complete description*

## TRAK-K3 EMX

- 2-axis CNC
- 3-axis DRO



## ProtoTRAK KMX

The best CNC we've ever made for knee mill applications (and that is saying a lot).

*See page 8 for a complete description*

## TRAK-K3 KMX

- 2-axis CNC
- 3-axis DRO

## TRAK-K3 KMX-3

- 3-axis CNC
- 3-axis DRO



## Three-Axis CNC

TRAK Knee Mills with the SMX and KMX CNC are available as three-axis CNCs, with a quill drive for Z-axis machining. The mill can be run manually, as a two-axis or three-axis CNC. Manual quill control is with our unique Electronic Handwheel.

Note: For most three-axis CNC applications, we highly recommend our TRAK Bed Mills.

# Milling Machine Options



## TRAKing™/Electronic Handwheels

- Converts the mechanical handwheels into electronic handwheels for operating the table and saddle
- Enables the powerful TRAKing® feature
- Useful DRO features
- Not available with the ProtoTRAK EMX CNC



## Power Draw Bar

- A Torque-Rite R8 power draw bar factory installed with push button tool in/out



## Chip Pan



## Remote Stop/Go Switch

- A hand-held switch to stop and continue program run



## Tableguard

- Provides an enclosed work-space mounted on the table
- The sliding door is switched to prevent operation of CNC Run with door open



## Knee Power Feed



## Glass Scales

- A glass scale mounted on the table and saddle
- Not available on ProtoTRAK EMX products



## Spray Coolant

- The non-fogging coolant sprayer directs a fine stream of coolant to the tool and workpiece

## Additional Options

### Coolant Pump

- Mounted inside the bed or machine column
- A manual switch is provided when not used with Auxiliary Functions

### Riser Block

- 4", 6" or 8"

### Limit Switches

- Switches and brackets to set maximum travel limits
- Tripping the switch will cause servo motors to shut down
- Not available with the ProtoTRAK EMX CNC

### Automatic Lubrication Pump

- Provides lubrication to ways and ballscrews
- Programmable
- Alarms in case of problems



## Vise

- Model DX6 6" Kurt vise and mounting hardware.



## Halogen Work Lamp

- Convenient light with bright, long-lasting halogen bulb

# Machine Specifications

---

- Table Size – 50" x 10"
- T-Slots – 5/8" x 3 x 2 1/2"
- Table Travel – 32"
- Saddle Travel – 16"
- Knee Travel – 16"
- Ram Travel – 15"
- Maximum Quill Travel – 5"
- Quill Diameter -- 3 3/8"
- Spindle Taper – R8
- Spindle Speed – 60-4200 RPM
- Head Tilt – 45 deg. forward, 45 deg. back, 90 deg. left, 90 deg. right
- Spindle Motor Power - 3HP continuous
- Power Requirements, machine - 220/ 440V;3P; 8.5/4.25A
- Maximum Weight on Table – 850lbs.
- Machine Weight – 2816 lbs.
- Machine dims l, w, h - 71" x 59" x 84"
- Maximum rapid feed – 100IPM
- Way surface type - Dovetail X, Z Square Y
- Precision 7207 CP4 spindle bearings
- Chrome hardened and ground quill
- Meehanite<sup>®</sup> castings
- Slide ways are Turcite<sup>®</sup> coated
- Wide way surfaces are hardened and ground



# ProtoTRAK EMX



## ProtoTRAK EMX

- Easy to use yet full CNC functionality
- Easy to learn and remember all the features
- We recommend this control when most of the work for the machine is simple
- Great for shops where different people use the machine occasionally
- Vo Techs love this CNC for teaching conventional milling and introduction to CNC on the same machine

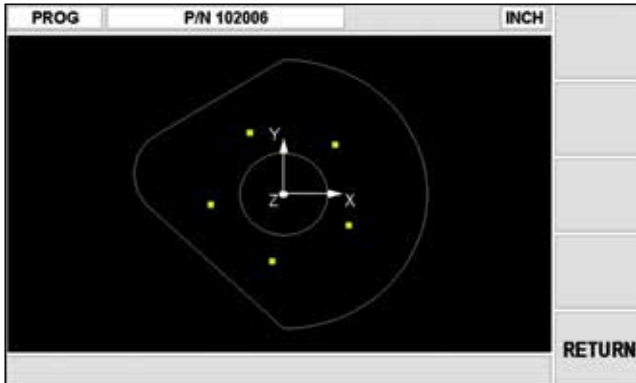
PROG	P/N 102006	INCH	POSN DRILL
EVENT 1	BOLT HOLE	EVENT 2	MILL
# HOLES	5		ARC
X CENTER	0.0000 abs		POCKET FRAME
Y CENTER	0.0000 abs		REPEAT
RADIUS	1.2500		
ANGLE	45.0000		
TOOL #	1		
TOOL DIA	0.2500		
Select an event.			

## Programming

- Program easily with simple selections and prompts in plain English
- The ProtoTRAK EMX defines the tool path for you once you define the part geometry

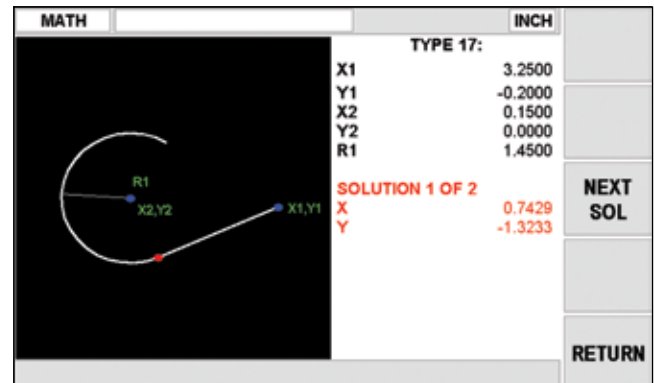
### Canned Cycles

- Posn/ Drill
- Bolt Hole
- Mill
- Arc
- Pocket
- Frame
- Rotate
- Repeat



## Part Graphics

- Press the LOOK key while programming to see programmed events with color graphics



## Math Helps

Quickly calculate intersections, points of tangency, arc centers and more.

## DRO Routines

- View the most useful DRO features in a clear, color display
- Press the Power Feed and Jog Buttons to let the servo motors do most of the work
- Ball screws provide smooth, positive control while hand cranking

## Easy Program Storage and Handling

- Save hundreds of typical programs on the internal flash drive
- Use the USB port to plug in a storage device or move programs between ProtoTRAKs and computers
- Use the optional USB flash drive that is configured to work with ProtoTRAK

## ProtoTRAK EMX Specifications

### Hardware

- Digital Servo Amplifiers – custom designed for ProtoTRAK operation
- D.C. Servo Motors – rated at 280 in-oz. continuous torque
- Precision Ball Screws
- Modular Design – simplifies service and maximizes uptime
- 115V/60Hz
- 10 amps
- Feedrate Override of programmed feedrate and rapid
- Polycarbonate Sealed Membrane Keypad to lock out contamination
- 7.0" Color LCD with adjustable contrast
- On board IDE flash memory storage for part programs
- 2 USB ports for interface with a storage device
- Rugged Industrial PC
- Glass Scale on quill for Z-axis position readout
- Jog button in DRO

### Options

- Remote Stop/Go (RSG) switch
- USB thumb drive for program storage and transfer

### Software

- Diameter Cutter Compensation
- Circular interpolation
- Linear Interpolation
- Conrad – provides automatic corner radius programming
- Incremental and Absolute dimensioning
- Error Messages – to identify programming mistakes
- Fault Messages – for system self-diagnostics
- Parts graphics display
- Look – a single button press to view part graphics
- Machine Tool Error Compensation
- Backlash Compensation
- Selectable Inch/mm measurement readout
- Jog from 1 to 100 inches per minute
- Continue Mill/eliminate repetitive data inputs while programming
- Context help information
- CAM to ProtoTRAK conversational language file conversion
- Teach
- Free offline programming available for download from our website

# ProtoTRAK KMX CNC



## ProtoTRAK KMX

- The best CNC we've ever made for knee mill applications (and that is saying a lot).
- Easy to learn and use with thoughtful features that make work easier
- Improved AGE® capability gives you the power of CAD for finding missing print data while you program!
- Outstanding graphics
- Powerful offline programming for using our Advanced Software Options
- We recommend this ProtoTRAK for most Knee Mill applications due to its amazing combination of price, features and ease of use
- Can handle anything from quick manual jobs to complex profiling

PROG			3 AXIS	INCH
EVENT 1	BOLT HOLE	EVENT 2	MILL	
DRILL OR BORE	DRILL	X BEGIN		INSERT EVENT
# HOLES	5	Y BEGIN		DELETE EVENT
X CENTER	0.0000 abs	Z RAPID		PAGE FWD
Y CENTER	0.0000 abs	Z BEGIN		PAGE BACK
Z RAPID	0.0250 abs	X END		
Z END	-1.1250 abs	Y END		
RADIUS	3.7500	Z END		
ANGLE	45.0000	CONRAD		
# VAR PECKS	2	TOOL OFFSET		
Z FEEDRATE	12.0	Z FEEDRATE		
TOOL #	1	XYZ FEEDRATE		
		TOOL #		
X BEGIN :				

## Powerful Canned Cycles

- |             |                       |                     |
|-------------|-----------------------|---------------------|
| • Position  | • Circle Pocket       | • Subroutine Repeat |
| • Drill     | • Rectangular Pocket  | • Subroutine Rotate |
| • Bolt Hole | • Irregular Pocket    | • Subroutine Mirror |
| • Mill      | • Circular Pocket     | • Copy Repeat       |
| • Arc       | • Rectangular Profile | • Copy Rotate       |
| • Face Mill | • Irregular Profile   | • Copy Mirror       |



PROG			3 AXIS	INCH
EVENT 6	A.G.E. ARC	OK	EVENT 7	A.G.E. ARC Not OK
TANGENT	YES		TANGENT	YES
DIRECTION	CW		DIRECTION	CCW
X BEGIN	3.3055	abs	X END	
Y BEGIN	3.3541	abs	Y END	
X END	1.0985	abs	X CENTER	0.0000 abs
Y END	3.8465	abs	Y CENTER	3.2500 abs
CONRAD			CONRAD	0.0000
RADIUS	1.5000		RADIUS	1.2500
CHORD ANGLE	97.8375		CHORD ANGLE	
Select 1 for YES 2 for NO.				

## AGE™ the Auto Geometry Engine

Program complex profiles easily with the powerful AGE™ feature. Enter the information you have and the AGE™ will calculate missing points for you while you program.

## Advanced File Management

PROG I/O	P/N 1234	3 AXIS	INCH
1.god			
1111.PT4			
123.god			
1234.PT4			
2.god			
3.cam			
4.god			
88.PT4			
888.PT4			
99.PT4			
Program Name : 123			

Run G-code files from your thumbdrive

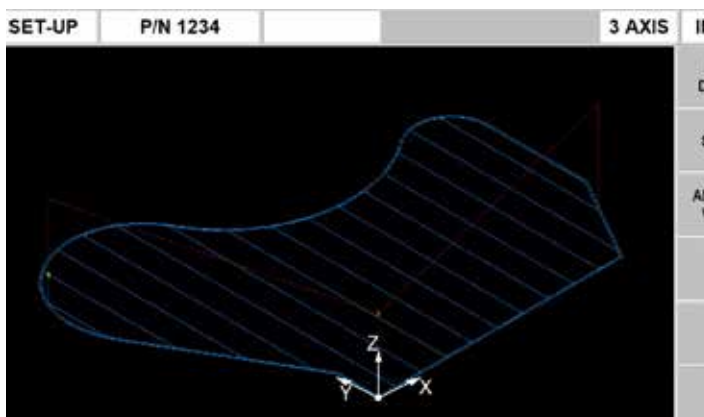
Save programs, tool tables and reference positions for the current program

Save programs for use in older ProtoTRAK CNCs

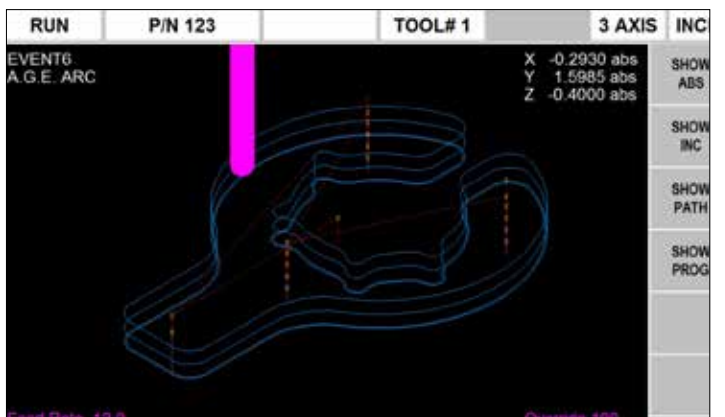
## Convenient Tool Table

SET-UP	P/N 1234	3 AXIS	INCH
TOOL #	DIAMETER	Z OFFSET	Z MODIFIER
1	0.5000	SET BASE	0.0000
Finish End Mill			
Enter tool type number and press SET:			
1.Drill	6.Counterbore	11.Reamer	
2.Center Drill	7.Countersink	12.Thread Mill	
3.Rough End Mill	8.Tap	13.Form	
4.Finish End Mill	9.Boring Bar	14.Other	
5.Face Mill	10.Ball End Mill		
TOOL #1 TOOL TYPE : 4			

## Check your program with convenient graphics

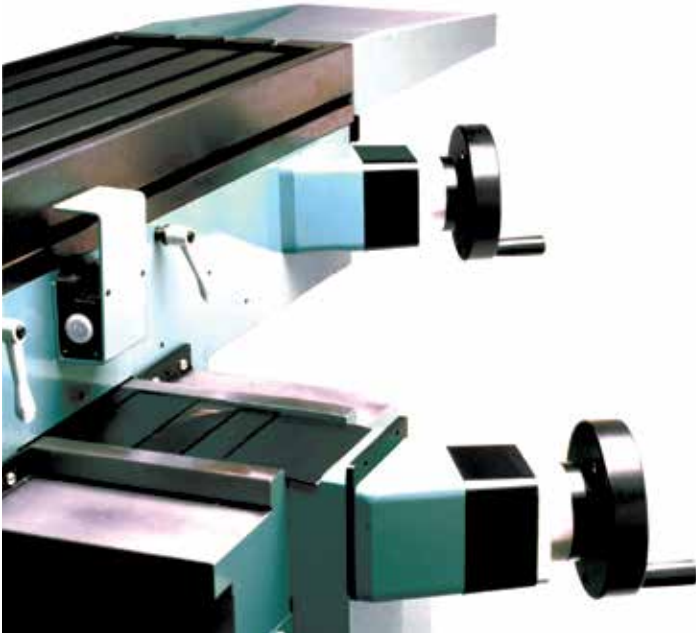


## View your programmed toolpath during program run



# Options for the ProtoTRAK KMX

---



## TRAKing®/ Electronic Handwheel Option

- Electronic handwheels on X and Y  
(replaces the mechanical handwheels)
- TRAKing® of programs during program run
- GoTo Dimensions
- Selectable Fine/Course handwheel resolution

*Once you use TRAKing®, you will never want to crank manual handles again!*



## KMX Offline Programming

- All features of the ProtoTRAK KMX organized to run on your PC
- Program and setup your jobs and then load into the ProtoTRAK KMX
- Windows® operating system

## Converter Package for Offline

(requires purchase of KMX Offline Programming)

### Verify

- Solid model representation of parts and toolpaths

### DXF File Converter

- Import and convert CAD data
- DXF or DWG files
- Automatic Gap Closing with Chaining
- Layer Control
- Easy, prompted process

### Parasolid File Converter

- Generate ProtoTRAK KMX programs from the data in the solid file
- 3D CAD format
- No specialized knowledge required

# ProtoTRAK KMX Specifications

## ProtoTRAK KMX Hardware

- Two- or three-axis CNC, 3-axis DRO
- 9.0" Color LCD
- Rugged industrial PC
- 2 USB ports for interface with a storage device, keyboard and mouse
- RJ45 Port and Ethernet card for Networking
- 110V, 1P, 10A

## Software Features – General Operation

- Clear, uncluttered screen display
- Prompted data inputs
- English language – no codes
- Soft keys - change with context
- Windows® operating system
- Selectable two or three-axis CNC (3-axis models)
- Color graphics with adjustable views
- Inch/mm selectable
- Convenient modes of operation (see below)

## DRO Mode Features

- Incremental and Absolute dimensions
- Jog at rapid with override
- Powerfeed X, Y or Z (3-axis)
- Teach-in of manual moves
- Servo motor return to 0 Absolute
- Tool offsets from library
- Go To Dimensions (Optional with TRAKing®)
- Fine/Course handwheel resolution (Optional with TRAKing®)

## Program Mode Features

- Auto Geometry Engine
- Geometry-based programming
- Tool Path programming
- Scaling of print data
- 3-axis Geometry conversational programming (3-axis models)
- Incremental and Absolute dimensions

- Automatic diameter cutter comp
- Circular interpolation
- Linear interpolation
- Look – graphics with a single button push
- Event editing within the program
- Conrad – automatic corner radius
- Math Helps with graphical interface
- Tool step over adjustable for pocket routines
- Selectable ramp or plunge cutter entry
- Subroutine repeat of programmed events
- Nesting
- Subroutine Rotate about Z-axis for skewing data
- Subroutine Mirror of programmed events
- Copy repeat for editing of repeated events
- Copy rotate for editing of rotated events
- Copy mirror for editing of mirrored events
- Run Island, Helix, Thread Mill and Engrave events when present in an imported ProtoTRAK program

## Canned Cycles

- Position
- Drill
- Bolt Hole
- Mill
- Arc
- Circle pocket
- Rectangular pocket
- Irregular pocket
- Face Mill
- Circular profile
- Rectangular profile
- Irregular profile

## Set Up Mode Features

- Service Codes
  - Software
  - Machine Setup
  - Advanced Diagnostics and Service logs
  - Operator Defaults and options
- Set pocket and Face Mill step-over (in service codes)
- Tool names

- Tool library
- Tool length offset with modifiers
- Tool path graphics with adjustable views
- Verify – solid model representation of finished part (as programmed)

## Run Mode Features

- TRAKing® (optional)
- 3D CAM file program run
- 3D G-code file run with tool comp
- Real time run graphics with tool icon

## Program In/Out Mode Features

- Program Storage to USB Flash Drives
- CAM program converter
- Converter for prior-generation ProtoTRAK programs
- DXF / DWG file Converter (Offline version only)
- Preview Graphics for unopened files
- Networking
- Save Temp to save current program, tool offsets and home positions for running the next day with minimal setup

# Retrofit ProtoTRAK CNCs

Make your manual machines more productive

We have transformed thousands of Bridgeport® and similar knee-type milling machines from outdated manual machines to highly productive ProtoTRAK CNCs. With experience earned over 30 years, we know how to give you the best possible outcome.



The **Retrofit Kit** includes everything: motors, CNC, hardware, ballscrews, fasteners, and even cable ties.

## Custom and General Kits Are Available for the following brands of machines:

\* note, not all models may be retrofitted – contact your Southwestern Industries representative.

Acer	Birmingham	Enco	Kondia	Pasma	Supermax (YCI)
Acra Mill	Bridgeport	Euro-Mill	Lagun	Royal	Vectrax
Alliant	Chevalier	First	Marina	Santec	Victor
Astro	Classic	Hurco	Merlin	Seiki	Webb
Atlas	Clausing Atlas	Kalamazoo	Microcut	Sharp	Wells Index
Atrump	Comet	Kent	Millport	Siber-Hegner/Santec	Willis
Besmer	Do-All	Kingston	MSC	Southbend	Wilton

# An Exciting New Upgrade

For Your ProtoTRAK CNC



## Modern Hardware Platform

- USB Storage replaces the floppy disc drive
- Crisp color LCD replaces monochrome CRT
- Warranty and Express Exchange Protection far into the future

## Improved Navigation

- Edit right in program mode
- Save Temp to retain tool table after shut down

## Exciting New Features

- Enhanced Auto Geometry Engine
- Enhanced Screen Graphics
- Optional TRAKing®

## Easy Transition

- Same look and feel of your current ProtoTRAK
- Quick start guide will have you running parts in minutes



ProtoTRAK MX2 and MX3  
*Manufactured from 1992 to 1996*



ProtoTRAK M2 and M3  
*Manufactured from 1996 to 2001*



TRAK AGE2 and AGE3  
*Manufactured from 1996 to 2001*

## On these Machines:

- Bridgeport®  
and Bridgeport® -style retrofits
- TRAK® Bed Mills
- TRAK® Knee Mills
- Sport Machines



# More TRAK Machines for all your shop needs

---



**RMX DPM Bed Mills**



**RLX CNC Lathes**



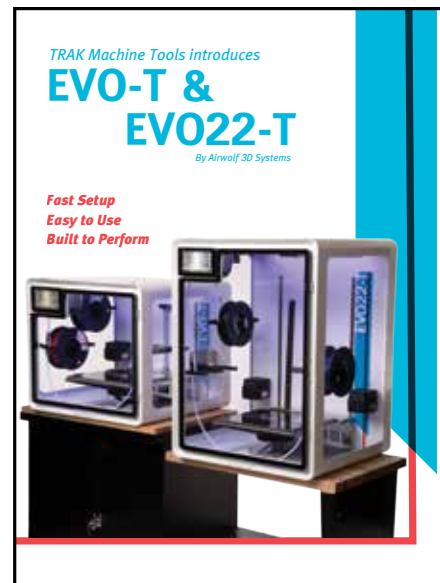
**Toolroom Machining Centers**



**TRAK 1440EX Lathe**



3D Printers by 3ntr



3D Printers by Airwolf



TRAK VMC2

Want to see more? Check out our website or call for demo



2615 Homestead Place  
Rancho Dominguez, CA 90220

T | 310.608.4422  
[www.TRAKmt.com](http://www.TRAKmt.com)