

Southwestern Industries, Inc.

TRAK VMC2 Milling Machine with the ProtoTRAK RMX Control



Machine Specifications

Overall Machine Dimensions

Width of machine	30" Folded Pendant 54.47" Open Pendant
Depth of machine	68.15"
Height of mill with head all the way up	101.4"
Minimum height to fit mill through doorway (Z cable carrier collapsed, resistor cover and resistors removed)	90.17"

Table Dimensions

Table size	18" x 15"
Number of tee slots and pitch	4 @ 63 mm
Tee slot width	0.630" or 16 mm
Table maximum load	500 lbs.
Ball Lock [®] hold down force	2250 lbs @ 35 in/lbs of torque
Machine Weight	~2825 lbs
Machine Shipping Weight	~3175 lbs

Travel

X-axis	14"
Y-axis	18" (12" of machining travel)
Z-axis	17"
Maximum distance from spindle nose table surface	20.25"

Minimum distance from spindle nose table surface	2.75"
Maximum swing clearance from spindle center to column	14"
Maximum Rapid speed X, Y & Z-axis, inches per minute	600 Production OPS 400 Toolroom OPS

Spindle

Tool holder type	BT30
Spindle nose diameter	2.2" or 56 mm
Maximum RPM	10000
Horsepower	3 HP
Torque	9 ft-lbs continuous, 13.5 ft-lbs peak

Automatic Tool Carrier

Tool Capacity	8
Maximum tool diameter	2 or ~50 mm
Longest Tool that can be use in ATC – Length measured from bottom of drive dog flange on holder.	6.75"

Air Requirements

Pressure	90 psi
Quality	Air dried/filtered water separator upstream of the machine
CFM	2.5 at 90 psi
SCFM	18

Hardware

- ProtoTRAK RMX CNC
- Three-axis CNC and DRO
- 15.6" Touchscreen LCD
- 2 USB 2.0 ports
- Built in LED status lights
- Uncluttered front panel
- Beacon light
- Spindle speed override
- Coolant pump
- Ethernet port
- 15-gallon coolant tank
- Air blast

ProtoTRAK RMX System Specifications

Some features are optional; please consult with your TRAK Representative for more information.

ProtoTRAK System Hardware

- 2 or 3-axis CNC, 3-axis DRO
- Front panel electronic handwheel for manual operation
- 15.6" Touchscreen LCD
- Intel® 2.0 GHz processor
- 4 GB Ram
- At least 64 GB of mSATA SSD
- 4 USB connectors
- 2 Ethernet Ports (1 for user and 1 for motion control)
- Override of program Feedrate
- Override of spindle speed
- LED status lights built into run panel
- E-stop

- Toggle switch for Production Ops and Tool Room Ops
- Spindle Control (FWD, REV, OFF)
- Feed STOP and GO
- X, Y, Z, and 4th axis selection for Front Panel EHW, as well as 4 levels of resolution control
- POWER RESET button to energize the servos
- 3.5mm Headphone jack for video sound (headphone supplied)

Computer Module Control Hardware

- 4 axis motor control – X, Y, Z, and 4th axis
- 26 inputs
- 16 outputs
- Mill Indexer Interface

Software Features – General Operation

- Enhanced ProtoTRAK Assistance (EPA)
 - Context responsive help with control operations
 - Step-by-step instructions, diagrams and videos
- Watch Me videos for quick introduction to ProtoTRAK RMX operation
- What's New videos for quick review of upgraded features in new releases
- Clear, uncluttered screen display
- Fly out windows for quick access to features and info
- Programming Defaults to simplify part programming
- Individual User profiles for Defaults
- Event Options to modify Defaults or select additional functionality
- QWERTY touchscreen keyboard
- Calculator
- Prompted data inputs
- English language – no codes
- Soft keys – change within context
- Windows® operating system
- Selectable two or three-axis CNC
- Color graphics with adjustable view
- Gestures for pan, zoom, rotate
- Inch/mm conversion
- Convenient modes of operation
- Networking

Info Soft Keys

- Status shows current state of the ProtoTRAK RMX
- Tool Table for instant access to tool set ups
- EPA (Enhanced ProtoTRAK Assistance) help information for ProtoTRAK RMX operation
- Math Help to easily calculate missing print data
- Options appear when available while programming
- Defaults to customize the programming style
- Key board to enter alphanumeric and special symbols
- Calculator for simple calculations
- Warnings appear when you must resolve a condition

Status Features

- IN/MM selection
- 2/3-axis selection
- Check current program name
- Check User Profile Name
- Check software and firmware versions

Tool Table Features

- Tool Library for using tools in multiple programs and DRO

- Program Specific Library to manage tools in the current program
- ATC Library to manage tools residing in the ATC carousel
- All buttons related to ATC such as CALL TOOL and RETURN TOOL available within Tool Table
- Convenient tool length reference to Base tool
- Tool type reference
- Tool material reference
- # Flutes reference
- Tool Diameter set
- Diameter modifier set
- Z modifier set
- Jog and EHW can be enabled for quick tool height reference

EPA (Enhanced ProtoTRAK Assistance) Features

- Context sensitive topics for ProtoTRAK RMX control operations
- Keyword search
- Brief explanations of specific operations
- Screen shots for clarity
- Videos for more advanced explanations
- Updated with software release versions

Math Help Features

- 22 separate intuitive routines
- Calculate missing print data using data provided
- Screen Graphics to guide data inputs
- Feed – IPM / MMPM conversions
- Speed – RPM / SFPM conversions
- Cartesian / Polar conversions
- Right triangle calculations
- Load Beg –
- Loads solution as X and Y Begin
- Load End – Loads solution as X and Y End
- Load Center – Loads solution as X and Y Center

Programming Defaults

- Instant access to all defaults via fly out window
- Feedrate per Minute or per Tooth
- Spindle speed RPM or Surface Speed
- Peck type for drill events
- Number of Passes for Profile, Pocket and Island events
- Finish Cut for Profile, Pocket and Island Events
- Step over percentages
- Face mill tool path
- Z entry: plunge, helical or zig zag (ramp)
- Adaptive Tool Path selections
- Numerous default parameters for pocket and island events
- Speed and feed override for subroutine and copy events
- Forward or Backward Mirror Direction
- Inch or MM
- 2 or 3 axis CNC at start up
- Maximum rapid feedrates – Tool Room & Production Ops
- Cut Tolerances
- Tool Compensation
- Parasolid Set Z Offsets
- Z Rapid
- Part Change Location
- Individual Default User Profiles
- Engrave Event – XY Reference

- Subroutine and Copy Events – Z entry method, Tool Path Pattern, Finish Cut
- Z Retract

Keyboard Features

- QWERTY style
- Touchscreen operation
- Numbers
- Special characters: \$ @ # ? % () < = * + -
- Caps Lock

DRO Mode Features

- Incremental and Absolute dimensions
- Graphical Override of Axis Feed and Spindle RPM
- Jog at rapid with override
- Powerfeed X, Y or Z
- Teach-in of manual moves
- Programmable Go To dimensions
- Servo return to 0 absolute
- Tool offsets from Tool Library
- Line Center calculation
- Circle Center calculation
- Tool #

Program Mode Features

- Circular interpolation
- Linear interpolation
- Advanced Adaptive Tool Path
- Geometry programming
- Toolpath programming
- Auto Geometry Engine – Built-in CAD to fill in missing print data for you while you program
- Alphanumeric program names
- Automatic Scaling of print data
- Nesting
- Multiple Fixtures
- Incremental and absolute dimensions may even be mixed on a single point
- Automatic diameter cutter comp
- Program data editing
- Part graphics update while programming
- Selectable display between size of drawing and number of events
- List Step graphics relate Events to Drawing
- Editing of programmed data
- Swipe to move through programmed Events

Options Within Applicable Events

- Z Safety plane
- Spindle Speed RPM or Surface Speed
- Feed rate per minute or tooth
- Event Comments on/off
- # of Passes or Depth per Pass
- Bottom Finish Cut
- Cutting method One Way or Zig-Zag
- Step-over %
- Machining Angle in XY (0 – 90 deg.)
- Drill Peck: Variable, Fixed, Chip Break
- Dwell Request
- Multiple Holes
- Z Entry Plunge, Zig-Zag or Helical

- Tool path Pattern: Offset, Parallel
- Tool path Pattern: Adaptive
- Order of Passes: Depth or Region
- Cut Tolerances
- Rest Milling options

Canned Cycles (Event Types)

- Position
- Drill / Bore / Tap / Helical Drill
- Bolt Hole Drill / Bore / Tap / Helical Drill
- Mill
- Arc
- Circular profile
- Rectangular profile
- Irregular Profile (with Auto Geometry Engine)
- Face Mill
- Circle pocket
- Rectangular pocket
- Irregular Pocket (with Auto Geometry Engine)
- Islands including Pocket and Island shapes
- Subroutine Repeat / Mirror / Rotate
- Copy – Mirror / Rotate / Convert Drill to Tap
- Helix
- Engrave – Horizontal / Radial / Vertical / Mirror
- Thread Mill
- Program Pause

Edit Mode Features

- Group Delete of Events
- Search Edit to make changes to multiple events
- Erase current program
- G-Code Editor
- Clipboard to copy events for insertion elsewhere
- Update GCD when g code program is loaded

Set Up Mode Features

- Toolpath graphics with selectable views
- Estimated Run Time clock
- Step forward and backward through of Toolpath graphics
- XYZ tool position locations displayed in Step through mode
- Verify Make Part – step by step tool path verification
- Verify View Part – solid model of finished part
- Fixture offsets – convenient table for managing fixtures with DRO and Jog
- Service Codes for infrequent machine and control settings
- Pictures – Add pictures to be saved with your ProtoTRAK or G Code files
- Notes – Add user notes to be saved with your ProtoTRAK or G Code files

Run Mode Features

- 3D CAM file run
- 3D G code file run
- Override of Programmed Axis Feed and Spindle Speed from 0 – 150%
- Virtual handwheels to control Override
- Tap override of Axis Feed and Spindle RPM
- Real time conversion of programmed RPM / SFM
- Real time conversion of programmed IPM / IPT
- Status display:
- Event #

- Fixture#
- Control System Ready
- Current Tool #
- Repeat #
- Countdown clock to next pause or tool change
- Event / G Code Comments
- Start at beginning
- Start at any Event
- Start at tool # for GCD programs
- Start at rough or finish pass
- Start at any finish cut for pockets and islands – XY, Z, XY & Z
- Show Absolute Dimensions during run
- Show Incremental Dimensions
- Show Tool Path – real time graphics with Tool icon
- Show Program
- TRAKing® – you control programmed X, Y and Z feeds with Electronic Handwheel
- Chip Clear

Program In/Out Mode Features

- Program storage to USB device plugged into Control Pendant
- Program storage to Network via RJ45 Port
- Program storage to optional SSD drive
- Browse file locations
- Create New Folders
- CAM program converter
- Convert prior-generation ProtoTRAK programs to current (.PT10)
- Save Temp – saves all current programs, tools and other settings
- Open Temp – opens the data saved at last “Save Temp”
- Rename programs
- Cut, Copy, Delete, Paste of program(s)
- Look - Graphics preview without opening files
- .PTG – saves GCD files with pictures & notes

Auxiliary Functions Option

Enables programming and control of:

- Coolant
- Air
- Pulse Indexer
- Part Change Position
- Programmable Auxiliary Output to control secondary external device

DXF File Converter Option

- Import/convert CAD data into ProtoTRAK programs
- DXF or DWG files
- Chaining
- Add or remove geometry
- Automatic Gap Closing
- Layer control
- Easy, prompted process you can do right at the machine
- Island and Profile Events

Parasolid File Converter Option

- Import and convert 2.5D CAD data into ProtoTRAK programs
- .X_T file support
- X, Y & Z dimensions are transferred into program events
- 2D and 3D views of part
- Chaining

- Add or remove geometry
- Easy, prompted process you can do right at the machine
- Island, Pocket, and Profile Events

Offline Programming Option

- ProtoTRAK RMX user interface for Windows PC
- Program parts and simulate CNC Run
- Modify files from current and former ProtoTRAK models