

# XYZ Machine Tools

## ProtoTRAK® KMX CNC

### Safety and Quick Start Guide

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Part Number:	17640
Version:	180619

**Covers all XYZ KMX Turret Mills**



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# Introduction

This guide provides important safety Information and a very brief description of the operation of the CNC control.

Full safety and operating information is provided in the ProtoTRAK KMX Safety, Programming, Operating, and Care Manual. Please take time to read and understand this manual before using the machine. This manual can be downloaded from the support pages of our website <https://www.xyzmachinetools.com/customer-support/downloads-manuals/>

## Safety

This machine is designed for the machining of cold metal within the stated capacity of the machine with axes movement occurring by manual use of handwheels or CNC control.

This machine must not be used for machining flammable materials (e.g. magnesium) without undertaking a risk assessment and incorporating any additional safety measures identified.

It is designed to be used in a standard workshop environment only.

It is the responsibility of the employer, machine owner or controller to ensure that this machine is installed, operated and maintained in accordance with the Provision and Use of Work Equipment Regulations (1998) or equivalent local regulations.

In particular, the responsible person must:

1. Undertake a Risk Assessment on the use of this machine, paying particular attention to the unique characteristics of the Prototrak control system (for example, operating mode selection and access to the work zone)
2. Generate and apply Safe Operating Procedures for the use of the Prototrak machine
3. Provide any additional training, safeguarding and PPE identified by the risk assessment.

This machine must only be operated by trained and experienced operators.

The following Safety Features must be checked on a regular basis (e.g. at the start of every shift):

1. E-stop
  - a. In DRO mode, press the E-stop button and ensure that the control flags up critical error 0055 (machine disabled) and that the axes and spindle cannot be started.
2. Table Guard Interlock
  - a. Start the spindle and then open each door guard in turn. Check that the spindle stops quickly (less than 3 seconds) and that the spindle brake is on. Check that the spindle (and powered knee on SLV) cannot be started.
  - b. With the table guard open, check that the feedrate is limited to 2m/min (78 ipm). The DRO display will not change and will still show 2540mm/min, so check that the feedrate drops/increases as you jog the axes and open/close the guard (X axis is the best).
  - c. Go into DRO mode, open the table guards and then turn off or remove the air supply. Close the table guards and check the Door open message stays on the screen and that the spindle cannot be started.
3. Safety Speed Monitoring – If you have manual handwheels, move the table in any mode other than DRO, RUN or TOOL TABLE. Check for a fault 232 or 233, depending on which axes was jogging (unintended motion).
4. Guards: Inspect the guards for signs of damage (especially the transparent panels). Replace if any part of the guard is damaged. Replace the transparent panels in accordance with the stated schedule, regardless of their apparent condition (see the FAQ on our website for why this is important).

Notes on the E-stop and Table Guard critical safety functions:

- E-stop:
  - This is provided by a safety rated, hard-wired E-stop system controlled by the E-stop

button on the pendant. When the machine is E-stopped (button pressed in), the axes, spindle and other potentially hazardous machine functions are disabled by removal of power.

- Air pressure (for the spindle brake and optional air powered drawbar) is NOT released in E-stop. To remove air pressure; disconnect the air supply at the quick release coupling.
- To reset the E-stop, twist to release the E-stop button and then press the blue POWER ON button (for about 1 second). When the button is released, the machine will come out of E-stop.
- Releasing the E-stop button and pressing the POWER ON button, will always take the machine out of the hardware E-stop condition (unless there is a fault with the safety circuits). However, the machine may still be disabled because of the current machine mode, or on the results of software safety checks undertaken by the control (e.g. fault 232). This an "NC Not ready" state; and should not be confused with the hardware E-stop condition.
- The hardware E-stop also disables the auto lube pump, so always leave the machine in this condition if not being used for a while, to avoid emptying the oil tank unnecessarily.
- Table Guards:
  - With either (or both) of the table guards open, it is not possible to run the spindle or operate the powered knee (SLV model).
  - If the air pressure to the machine is less than about 50psi, it will not be possible to start the spindle, even with the table guards closed.. This interlock has been provided to ensure there is sufficient air pressure to stop the spindle quickly when the table guards are opened.
  - If pressure is lost whilst the table guards are closed. It will be possible to continue to run the spindle until the guards are opened. Once opened, you will not be able to re-start the spindle again, even if the guards are closed.

When operating this machine, always observe the following safety precautions

- Do not operate this machine without knowing the function of every control key, button, knob, or handle.
- Always wear the appropriate personal protective equipment, including safety glasses and safety shoes.
- Do not wear loose fitting gloves whilst operating this machine as they could easily get caught in moving parts.
- Never wear rings, watches, long sleeves, neckties, jewelry, or other loose items when operating the machine.
- Keep your hair away from moving parts. Wear adequate safety head gear.
- Never operate any machine tool after consuming alcoholic beverages, or taking strong medications, or while using non-prescription drugs.
- Carry out a COSHH risk assessment and use the correct protection equipment, e.g. barrier cream/latex gloves, to prevent harm from items such as cutting fluid, lubrication oil and other substances used on the machine.
- Do not use compressed air to remove swarf or clean the machine. This can damage the slideway seals and create coolant mist which can be harmful. XYZ recommend the use of BioConcept cutting fluids which do not present a risk to the respiratory tract.
- Always ensure the appropriate guarding is in place for the machinery operation being undertaken. Never reach around a guard to gain access to the part, tool, or fixture.
- Observe and understand the warning and safety information labels affixed to this machine.
- Do not attempt to tamper with or override any guarding/safety device fitted to the machine.
- Stop the machine spindle, open the table guards and take the CNC control out of an active mode (DRO, RUN, TOOL TABLE):
  - Before changing tools.
  - Before changing parts.
  - Before you clear away the Swarf, oil or coolant. Always use a chip scraper or brush.
  - Before you make an adjustment to the part, vice, coolant nozzle or take measurements.



## Keyboard Hard Keys

**GO:** initiates motion in Run

**STOP:** halts motion during Run

**LOOK:** part graphics in Program and Program I/O modes

**INC/ABS:** switches all or one axis between incremental and absolute

**INC SET:** loads incremental dimensions and general data

**ABS SET:** loads absolute dimensions and general data

**X, Y, Z:** selects axis for subsequent commands

**0-9, +/-, . :** inputs numeric data with floating point format. Data is automatically + unless +/- key is pressed. All input data is automatically rounded to the system's resolution.

**MODE:** to change from one mode of operation to another

**RESTORE:** clears an entry

**IN/MM:** causes inch to metric or metric to inch conversion of displayed data

**ACC:** turns coolant on and off

**F/C:** selects between fine and coarse resolution on Electronic Handwheels (if fitted)

## Arrow Keys

Between the LCD Screen and the hard keys is a column of arrow keys.

**Up key, down key:** these are located at the top and bottom of the column, respectively. They have several uses:

- feedrate override in RUN and DRO modes
- page forward, page back to move through events in a program
- data forward, data back to move through the data in an event

**Select Keys (7 off):** These keys are called soft keys. A description of the current function or use of each of these keys will be shown on the LCD screen next to each key. If there is no description beside a key, that key has no function in the current mode.

## Emergency Stop Switch

See safety section for more information on the E-stop button.

## The Liquid Crystal Display (LCD)

The information displayed on the LCD screen is usually divided into 4 sections.

The top, status line, shows the system's current status. This includes the mode, inch or mm measurement and part numbers.

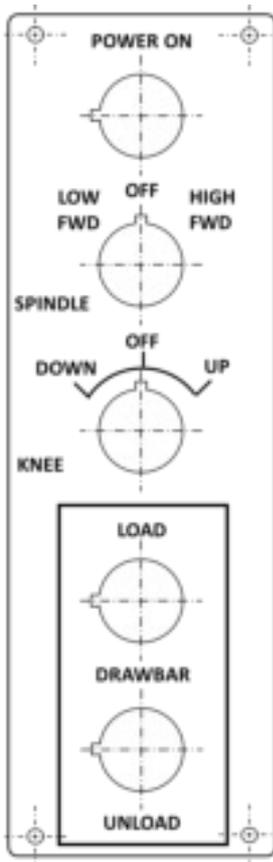
Beneath this, and filling most of the screen, is the information area. Position data, program data and graphics are shown here. In addition, message windows will be displayed here.

Beneath the information area is a single "conversation" line. When numeric data is required, the conversation line will appear for you to see the values you enter, before they are set into the system.

On the right side of the LCD are boxes describing the current function of the adjacent soft key.

There is an LCD screensaver built into the control. If the system is inactive (e.g. no user input or axes movement) for 20, continuous minutes, the LCD will turn itself off (black screen). Press any key to bring the screen back to its previous display. The key you press will be ignored, except to turn the screen on.

## Switch Box Controls



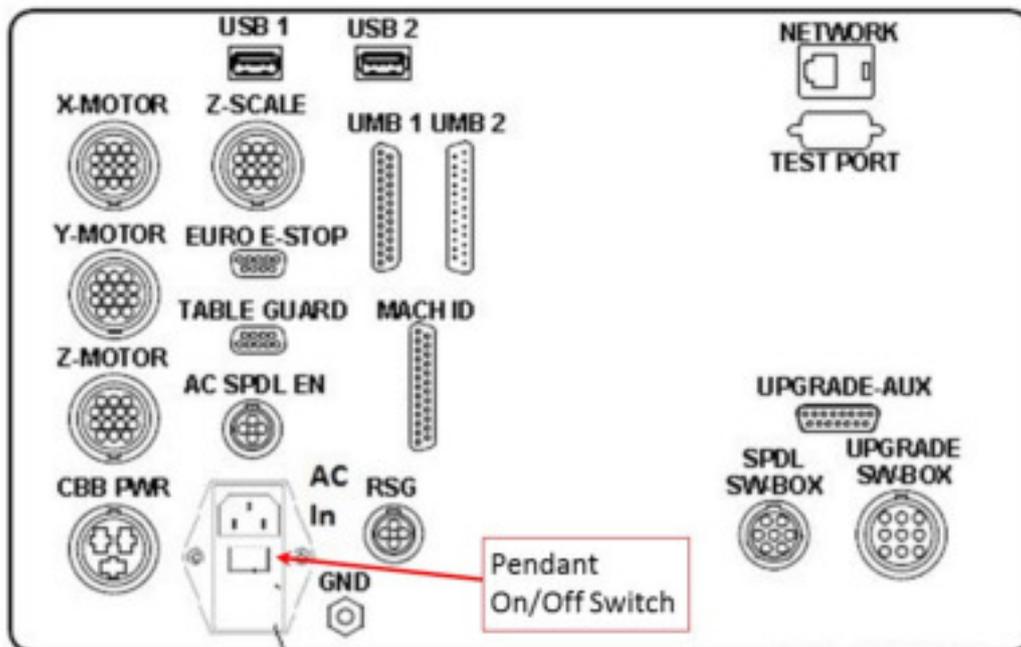
**POWER ON:** Press and hold in for about 1 second to reset the machine from a hardware E-stop (including at first power on). The switch will light up blue to indicate the machine is out of hardware E-stop.

**SPINDLE:** Use to turn the spindle on and off (in the forward or reverse direction, depending on the gear selected). The spindle can only be run if the table guards are closed. For KMX 2000 and SLV, the control must be in a spindle enabled mode (DRO, RUN etc.) and the spindle will turn off automatically, at the end of a programme run.

**KNEE:** Use to raise or lower the knee using the power knee feed (SLV only). The table guards must be closed to operate the power knee

**DRAWBAR:** Use to clamp and unclamp tools using the optional, air powered drawbar.

## Rear of Pendant



**On/Off switch:** This switch turns the pendant on and off. It does not affect the electrical cabinet except that it controls the 24VDC power used by the E-stop and table guard safety modules.

**USB1/USB2:** These are USB ports used for external keyboards or memory sticks for programme I/O (and software updates). DO NOT plug anything else into these ports (e.g mobile 'phones).

**Test Port:** DO NOT plug anything into this connector.

**AC SPDL EN:** This connector is only used on some KMX, PT3 upgrades. It is internally connected to 110VAC in certain modes. DO NOT plug anything else into this connector.

**CBB PWR:** This connector is not used on Euro KMX models. It is internally connected to 110VAC. DO NOT plug anything (else) into this connector.

**UPGRADE-AUX:** This connector is only used on some KMX, PT3 upgrades. DO NOT plug anything else into this connector.

**SPDL SW BOX:** This connector is not used on Euro KMX models. It is internally connected to 110VAC. DO NOT plug anything into this connector.

**UPGRADE SW BOX:** This connector is not used on Euro KMX models. It is internally connected to 110VAC. DO NOT plug anything into this connector.

**Warning: never plug/unplug any cables with the power on (other than USB) as this may damage the pendant!**

## Powering Up the System

To turn on the machine, rotate the power switch on the Electrical Cabinet to the On position. Then turn on the pendant using the On/Off switch on the back.

The control will go through its boot up sequence. When it is finished, the following screen will appear.



Press the CHECK SYSTEM select key.

The machine will always power up in an E-stop condition, Press the POWER ON button when you are ready to start moving the machine. Many control functions, like programming can be done with the machine in the E-stop condition (which saves you lube oil).

Please refer to the Operating Manual for full operating instructions.

## Turning off the System

Press Mode, Restore, Shut Down and finally answer Yes.

Turn the power off at the back of the pendant. Turn the power off at the machine electrical cabinet.

The ProtoTRAK control should be shut off, at a minimum, every week. Failure to reboot may cause the control to run slowly.

## Maintenance

Please refer to the schedule on the machine and in the service manual for important maintenance activity.

## XYZ Machine Tools Ltd.

### ProtoTRAK UK Warranty Policy

ProtoTRAK products are warranted to the original purchaser to be free from defects in workmanship and materials for the following periods:

Product	Warranty Period
New ProtoTRAK Controlled Machine	12 Months
Any Exchange Unit or Spare Part	6 Months

The warranty period starts on the date of the invoice to the original purchaser from XYZ Machine Tools Ltd (XYZ) or their authorised distributor. If a unit under warranty fails, it will be repaired or exchanged at our option for a properly functioning unit in similar or better condition. Such repairs or exchanges will be made carriage paid within the UK mainland.

**Disclaimers of Warranties** This warranty is expressly in lieu of any other warranties, express or implied, including any implied warranty of merchantability or fitness for a particular purpose, and of any other obligations or liability on the part of XYZ (or any producing entity, if different). Warranty repairs/exchanges do not cover incidental costs such as installation, labour, etc.

- XYZ is not responsible for consequential damages from use or misuse of any of its products.
- ProtoTRAK products are precision mechanical/electromechanical measurement systems and must be given the reasonable care that these types of instruments require.
- Replacement of slideway wipers and covers is the responsibility of the customer. Consequently, the warranty does not apply if swarf or coolant have been allowed to enter the mechanism.
- This machine is designed to cut common, metallic engineering materials (such as steel and aluminium). DO NOT use to cut special materials (such as composites or abrasives) without agreement from XYZ Machine Tools. Any damage caused to the machine by processing such materials will not be covered by the warranty.
- Accidental damage, beyond the control of XYZ, is not covered by the warranty. Thus, the warranty does not apply if an instrument has been abused, dropped, hit, disassembled or opened.
- Improper installation by or at the direction of the customer in such a way that the product consequently fails, is considered to be beyond the control of the manufacturer and outside the scope of the warranty.