# XYZ Machine Tools
# ProtoTRAK® RX CNC
## Safety and Quick Start Guide

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| Part Number: | 17639 |
| Version: | 230519 |

**Covers all XYZ RMX and RLX Models**

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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 RMX or RLX CNC Safety, Programming, Operating, and Care Manual. Please take time to read and understand these manuals before using the machine. These manuals 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 machine 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. Press the E-stop button and ensure that the control flags up faults 261 (E-stop active) and 0055 (machine disabled) and that the axes and spindle cannot be started. For lathes, check that the spindle is held on the emergency stop brake.
    b. For lathes with sliding front guards: press each of the safety edge strips and check the machine goes into the E-stop condition each time.
2. Guard Interlocks
    a. Table Guards (RMX Mills): Start the spindle at maximum speed and then open each door guard in turn. Check that the spindle stops quickly (around 1 second) and cannot be re-started and that the maximum feedrate is limited to 2m/min (78 ipm)
    b. Chuck Guard (RLX lathes): Start the spindle at maximum speed and then open the chuck guard. Check that the spindle stops quickly (around 3 to 8 secs depending on model) and cannot be re-started.
    c. Belt door guard (RLX lathes): Repeat the above for the belt door guard. WARNING: Only open the door enough to trigger the interlock – stay well clear of the drive belts!
    d. Main Door (RLX lathes): open the main door guard in DRO mode. Check that the door open message appears on the screen and that maximum feedrate is limited to 2m/min (78 ipm).
3. Safety Speed Monitoring – Close the table guards(mills) or main door guard (lathes) and whilst jogging at max feedrate, open the guards. Check for a fault 247, 248 or 249, depending on which axes was jogging (max permissible feedrate exceeded).
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). For mills, do not forget to use the retractable guard at the back of the table. For lathes, always close the front door when cutting, regardless of mode.

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

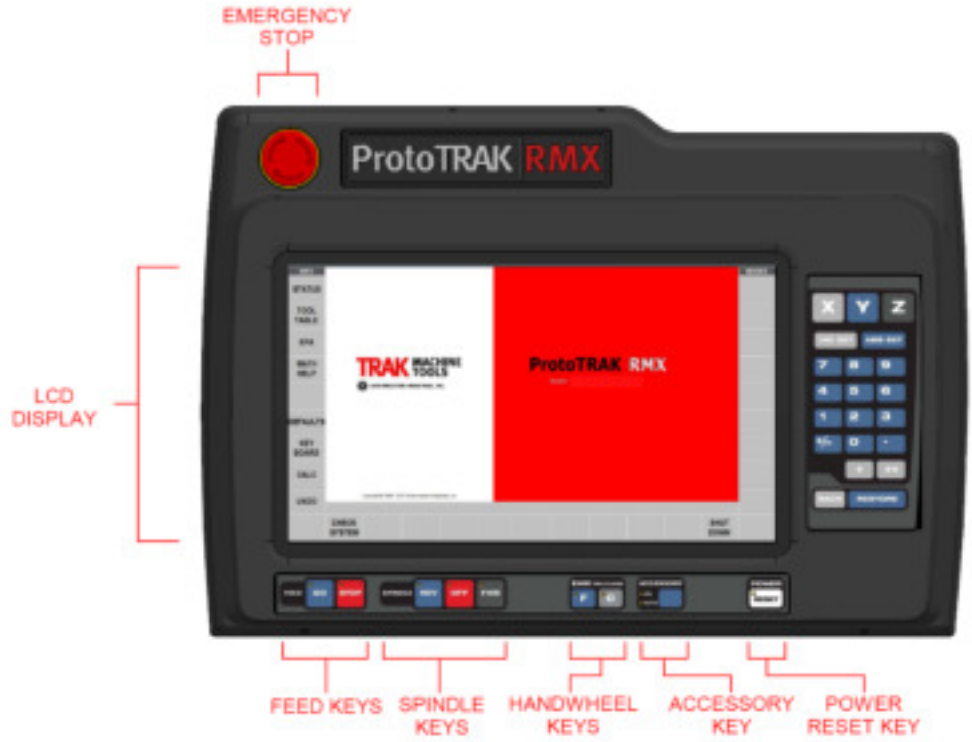
- E-stop:
  - This is provided by a safety rated, hard-wired E-stop system controlled by the E-stop button on the pendant or table guard/apron panel. When the machine is E-stopped, the axes are disabled and the spindle is put into a Safe Torque Off mode.
  - Releasing the E-stop button and pressing the Reset 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 (fault 0055). This an "NC Not ready" state; and should not be confused with the hardware E-stop condition.
  - If you wish to leave the machine in a hardware E-stop condition, for example, when leaving the machine unattended, always press in, and leave pressed in, one of the E-stop buttons. Do not twist to release the E-stop button until you are ready to make the machine live again.
- Spindle Guards (table guards for mills or chuck/belt door guards for lathes):
  - When the spindle guards are opened, the spindle control system actively drives the spindle to a stop very quickly, but the spindle remains powered. After a short delay, the spindle is put into a Safe Torque Off mode, where the spindle is now completely safe. On mills, this time delay coincides with the spindle air brake being applied.
  - Therefore, DO NOT touch the spindle until the spindle is in the Safe Torque Off Mode, i.e. the mill air brake has engaged (which occurs approximately 3 seconds after the door guards are opened) or a few seconds after the lathe chuck has come to a stop.
  - Note, if the spindle guards are closed again at about the same time as the delay expires, due to small differences in each of the dual channel safety circuits, it is possible for the safety circuit to lock out and then the spindle cannot be run. In this case, simply open the guards again and wait about 10 seconds before closing.

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/ or chuck guards and take the CNC control out of an active mode (DRO, RUN, TOOL SETUP):
  - 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.
- Do not rotate the spindle by hand unless the table guard or chuck guard is open.
- Keep the working area clear and remove all tools (spanners, chuck keys etc.) from the machine before you start the machine running. Loose items can become dangerous flying projectiles.
- Keep work area well lit. Ask for additional light if needed.
- Be aware that the machine can move unexpectedly so do not lean on the machine while it is running.
- To prevent slippage and personal injury, keep the working area around the machine dry and clean. Ensure there is no swarf, oil, coolant and obstacles of any kind around the machine.
- Avoid getting pinched in places where the spindle, table or guards create "pinch points" whilst the machine is in motion.
- Securely clamp and properly locate the workpiece in the vice, fixture or chuck. Use proper tool holding equipment.
- For Mills:
    - Do not raise the cutting tool above the table guards without additional guarding measures such as a cutter guard.
    - Manual handwheels: to prevent injury during powered axes movement, keep the handle folded inside the hand wheel at all times except when required to hand crank the table.
- For Lathes
    - The safe RPM for the chuck, faceplate or job set up must never be exceeded. The maximum safe RPM value must always be entered into the control before the spindle is started.
    - Long workpieces must not be machined without suitable supports from the tailstock and/or steadies. The maximum, unsupported workpiece length MUST NOT EXCEED 300mm.
    - Material extending out the back of the headstock can present a whipping hazard. Ensure the workpiece is supported with the correct equipment prior to starting the spindle.
- Use the correct tooling for the process being undertaken. Never use damaged or worn tools and ensure the correct cutting parameters (speed, feed, and depth of cut) are used in order to prevent tool breakage.
- Prevent damage to the workpiece or the cutting tool. Never start the machine (including the rotation of the spindle) if the tool is in contact with the part.
- Avoid large overhangs on cutting tools when not necessary.
- To prevent fires, keep flammable materials and fluids away from the machine, hot swarf and workpieces.
- Never change gears when the spindle is rotating
- Stop and disconnect the power to the machine before undertaking any cleaning or maintenance

# Operating Controls




**Keyboard Hard Keys**

**X, Y, Z:** selects axis for subsequent commands
**INC SET:** loads incremental dimensions and general data
**ABS SET:** loads absolute dimensions and general data
**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
**RESTORE**: clears an entry, aborts a keying procedure
**BACK:** Moves back within the screen or the DIL when there isn't a better way to do it.
*** KEY –** Not used at this time.
**** KEY** – Not used at this time.

**Feed Keys:**
**GO:** initiates motion in Run. The green LED on the GO key will be lit when the servomotors are moving the machine or when the program run has been initiated by the GO key.
**STOP:** halts motion during Run. The red LED on the STOP key will be lit when the servos motors are not moving the machine.

**Spindle Keys:**
**REV:** runs the spindle in reverse at programmed speed with any override.
**OFF:** Turns spindle off.
**FWD:** runs spindle in the forward direction at programmed spindle speed with any override.

**EHW FINE/COURSE:**
Selects the resolution for the Electronic Handwheels (if fitted).

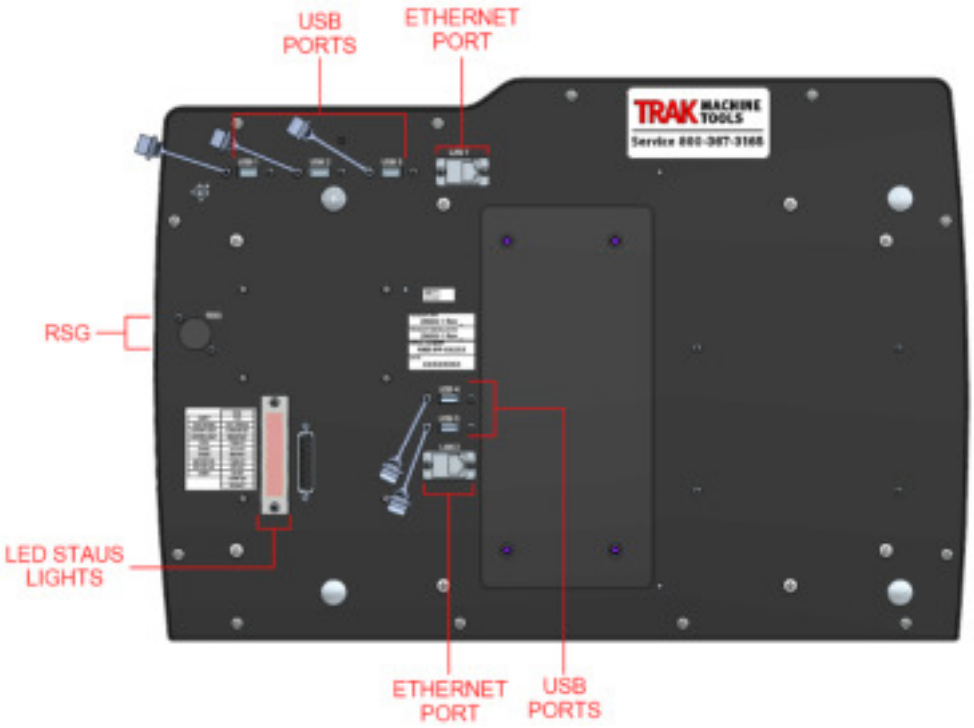
**ACCESSORY**: When the switch is in the On position, the flood coolant pump will come on and stay on during machining operations. It will not turn off during tool changes.

**POWER / RESET:** the LED on indicates the servo system (axes and spindle) is ready. This button will need to be pressed at first power up and any time the control gets into a critical fault condition. For example, if the user presses the Emergency Stop button.

**Keyboard Soft Keys**
The soft keys are enabled and operated by the touchscreen.

**Fly Out Windows**
Touching one of the INFO Soft Keys initiates another window to open (or "fly out"). When one of these windows is active, the associated INFO Soft Key will be yellow. In order to put the window away, or switch to another Fly Out Window, press the INFO Soft Key again.

Warnings are also presented in a Fly Out Window. When a Warning appears, you must press the Clear soft key to dismiss the warning.




The lower ethernet port is used for communication with the computer module in the electrical cabinet – do not remove this cable.

A USB Option Key is plugged into the USB port above the lower Ethernet port. This key must be plugged in to allow certain standard software features to work and also to allow optional software features to work.

Please note a number of control features designed to maximise the productivity of the machine:

The **Touch Screen** Interface enables you to interact with your programs and set ups with more certainty and control than ever before.

**Defaults** allow you to customize the ProtoTRAK RX for how *you* make parts; they are easy to set and easy to change.

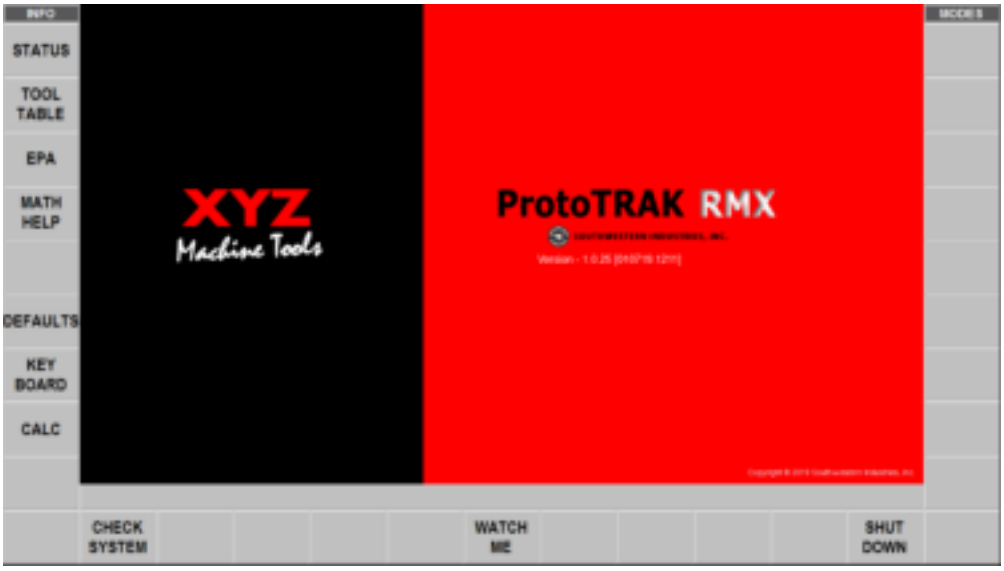
The **large LCD screen** and **fly out windows** allow you work with everything you need at the same time without flipping between screens.

**Enhanced ProtoTRAK Assistance (EPA)** is always available for you to quickly look up the information you need for what you are doing at the time.

# Powering Up the System

To turn on the machine, rotate the power switch on the Electrical Cabinet to the On position.

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




Tap the CHECK SYSTEM soft key and, for lathes, enter the maximum (safe) spindle speed based on chuck rating and/or job setup and press ABS SET

The machine will always power up in an Estop condition, Press the POWER Reset hard key and hold it for a few seconds, until the white LED comes on, when you are ready to start moving the machine.

# Shutting down the ProtoTRAK RX CNC

**Important:** The system must be turned off properly or you may lose unsaved data such as programs or certain machine configurations. The SHUT DOWN soft key will initiate the process of shutting down safely. When the screen goes blank, turn the power switch at the back of the electrical cabinet to the Off position.

First close any Fly Out Windows that are open. We also recommend that you complete any prompted activity, such as programming an Event. Press the BACK hard key repeatedly until you get to the screen shown above.

The ProtoTRAK control should be shut off at a minimum every few days. Failure to reboot may cause the control to run slowly. Use the SAVE TEMP feature prior to shut down to save your current positions, tool information and program.

If the screen does not go blank after the RX software closes, use the on-screen keyboard or an external keyboard to shut down Windows in the normal way (do not switch off power if Windows is still running).

Please refer to the Operating Manual for full operating instructions.

# Maintenance

Please refer to the maintenance schedule on the machine or 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.