Designed to grind supermaterials such as polycrystalline diamonds, the GT-610 SD is a platform that can be adapted to work with other hard materials where the process is unknown and challenging. This machine was configured to gather all of the parameters affecting the grinding process for the sake of analysis and optimization. The result is the ability to fine tune the grinding process and modify it to improve throughput, increase wheel life, and get the most optimum setup.

The GT-610 SD weighs more than 7,000 pounds and is built on a mineral cast base for thermal and vibration stability. It is powered by a 15HP spindle motor driving a high precision spindle assembly on the work wheel side. The machine has the ability to automatically compensate for wheel wear by increasing the speed of the spindle while maintaining constant surface speed, insuring efficient grinding wheel performance. Using software and intelligent motion control, it is also able to adapt the process to measured grinding pressures.

A built-in automatic wheel balancing system dynamically adjusts and eliminates wheel vibration, producing smooth part finishes. This system constantly monitors and compensates for changes in the grinding system behavior, further optimizing the cycle. The super high rigidity roller guides carry the work rest blade on one axis, and the regulating wheel on an independent second axis. Both are precision ground surfaces and maintain a resolution of 0.1μm. The high speed, high performance multi-axis controller insures that diameter control is maintained, even when grinding such hard materials. The regulating wheel includes tilt sensors and is driven by a servo drive. Mounted on the regulating wheel is a 2-axis automatic dressing system. The machine control decides when to dress the regulating wheel and simultaneously adjusts the rotation to insure efficient grinding action.

The system’s intelligence can detect loading on the grinding wheel and immediately initiates a wheel stick dressing cycle. The 2-axis stick dressing system mounted behind the work wheel insures that cutting action remains efficient by sharpening the wheel. Not only does the dresser know when and how fast to move across the grinding wheel during the dressing cycle, it also calculates the optimum pressure applied on the dressing stick to maximize effectiveness while minimizing usage. The results are better set-ups, constantly sharpened grinding wheels, and perfect parts.

In order to provide a completely hands-off system, this machine incorporates a 6-axis robot. During a typical cycle, the robot picks a part from a pallet, places it in a high accuracy optical gauge, measures the component in three places, and then the machine determines what to do next to reach its target diameter. The robot places the part between the grinding wheels and retrieves it at the end of the thrufeed cycle. It then places it in a washer, dries it, and measures the part again, compensating for diameter or taper error. In challenging components such as PCD drill bits mounted on a tungsten carbide substrate, taper is a critical tolerance that needs to be controlled due to the hardness profiles of these dissimilar materials. The GT-610SD software algorithms insure parallelism by controlling wheel speeds, dressing cycle frequency and timing, thrufeed rate, number of grind passes, and many other control variables. The data logging features of this machine allow engineers to fully understand the process of grinding these challenging parts and can duplicate the setup simply after crucial variables have been fine-tuned and retained. An OPC interface to SCADA management systems allows the machine to interface to a supervisory control network, allowing data capture and process management to take place remotely.

THE GLEBAR ADVANTAGE
The GT-610 SD achieves a level of autonomous intelligent operation and efficiency never before achieved on a centerless grinder.
GT-610 SD
Centerless Grinding System

KEY FEATURES
• Part diameter feedback, allowing the machine to correct the wheel dress profile for size variation by station and slide positioning
• Custom automation with gauging integration
• In- and post-process gauging system available for 100% inspection of parts
• High-precision, angular contact ABEC 7 bearings on the regulating wheel spindle
• 8-5/8" wide grinding wheel
• 10" and 12" diameter grinding wheel models available
• Independent upper and lower slides
• Super high rigidity roller guides with 0.1 micron scale feedback
• Stepper motor-driven upper and lower slides
• A built-in blade height ramp system for finite blade adjustment
• Automatic wheel balancing
• Acoustic emissions sensing for superior wheel dress quality and automatic blade touch-off
• Fully enclosed platform with mist collector
• Simple touch screen controls
• CE certification and approved safety interlocks available

SPECIFICATIONS
• Work wheel diameter: 10" (254 mm)
• Work wheel length: 8-5/8" (219mm)
• Work wheel RPM: 200 - 3600
• Regulating wheel diameter: 6" (152 mm)
• Upper slide resolution: 0.1µm (0.000004")
• Lower slide resolution: 0.1µm (0.000004")

ACCESSORIES
• Hydraulic template-tracing work wheel dresser
• Wheel balancing system
• Three stage recirculating cooling system

GRINDS
• Carbide
• Metal
• PCD