Laser Interferometer SJ6000

Calibration of Guide Rail

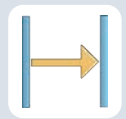
Structure of the case

Portable
case and tripod

Software

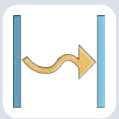
Environmental
compensation device

Prism Modules

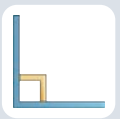


Linearity

Angle



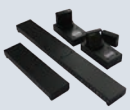
Straightness



Squareness

Flatness

Rotary Axis



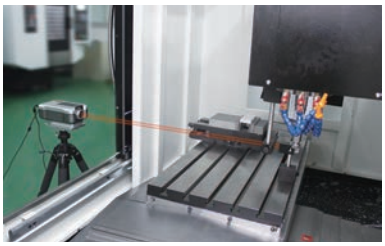
Laser interferometer is recognized as a high precision, high sensitive measuring method by applying light wavelength as criterion, and is widely used in high-end manufacturing industries.

Laser interferometer SJ6000 insists of high-frequency Helium-Neon laser generator from an USA supplier, high-precision environmental compensation modules, high-precision laser interference signal processing system, high-performance computer control system. By applying with thermal frequency stabilization technology of laser dual-longitudinal mode and geometric parameters interference optical path design,SJ6000 can output long-term stable and high-precision(0.05ppm) laser quickly(about 6 minutes) which has powerful anti-interference performance. With different prism modules, it can measure linearity, angle, straightness, flatness and perpendicularity, besides it can also analyze dynamic characteristics.

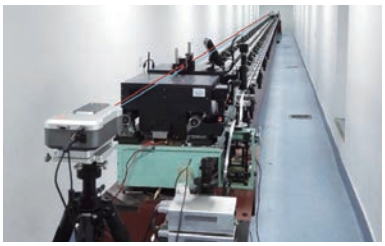
Functions

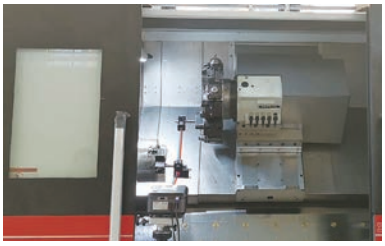
1. Calibrate motion accuracy of guide rail quickly and accurately.
2. Measure and analyze many kinds of dynamic parameters, such as displacement, velocity, acceleration and amplitude frequency.
3. Built-in variety of general standards of machine tools.

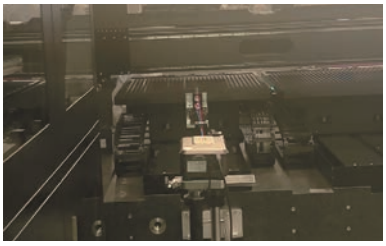
Application

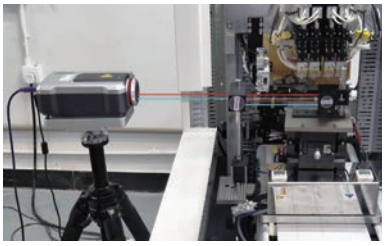

Linear meas. of machine tool


Linear meas. of stage module

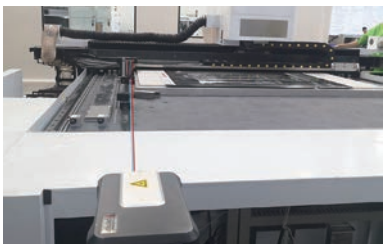

Lab length reference

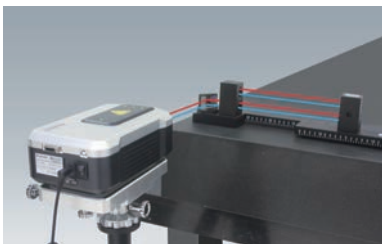

Linear meas. of machine tool


Angle meas. of stage module

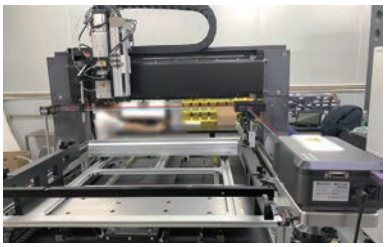

Angle meas. of DC motor

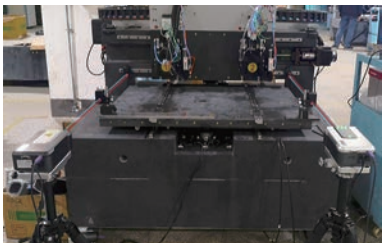

Parallelism meas. of two guide rails


Straightness meas. of equipment


Flatness meas. of Granite table

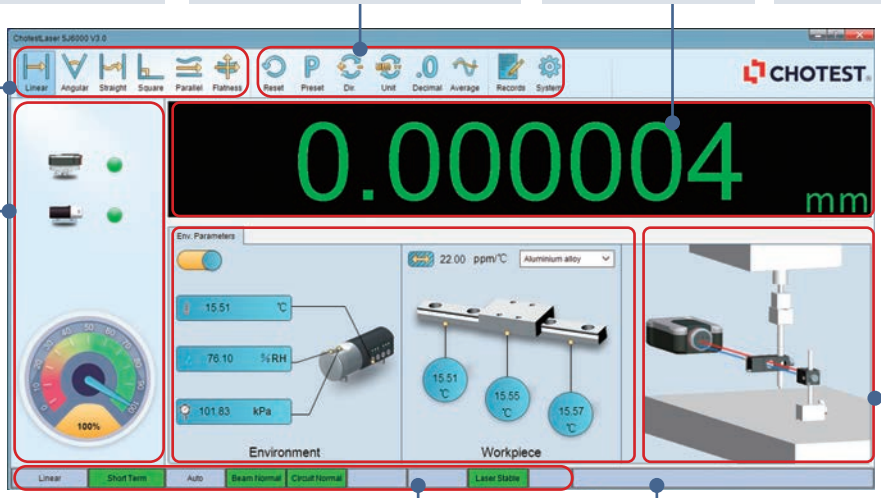

Squareness meas. of CMM


Perpendicularity meas. of equipment


Twin guide rails meas. of equipment

Software

Meas. Module | **Tools** | **Value window** | **Installation guide**



Signal:
Display connection status and signal strength.

Info:
Display the current meas.item, sampling method and device status.

Environment compensation:
Display ambience and object`s temp., manual environment compensation is also available.

Dynamic Measurement Application

Time based

Motion performance evaluation

* Control parameter test and setting of motion controller PID.
* Stability test and evaluation after high-speed motion.
* Small steps test of high-performance motion controller.

Vibration monitoring

* Scanning application:

Applied for the situation when positioning accuracy is not important but constant speed is critical for high quality imaging.

* Machine tool applications:

Applied for the situation when slow and smooth contour movement of cutting tool is critical for high quality machning.

Vibration frequency analysis

* Vibration frequency analysis of the measured object
* FFT fast Fourier transform analysis

Distance based

In distance-based dynamic measurement, laser interferometer SJ6000 "flies" along the axis, that means SJ6000 samples data at designated points without stopping.

Pulse Trigger Mode

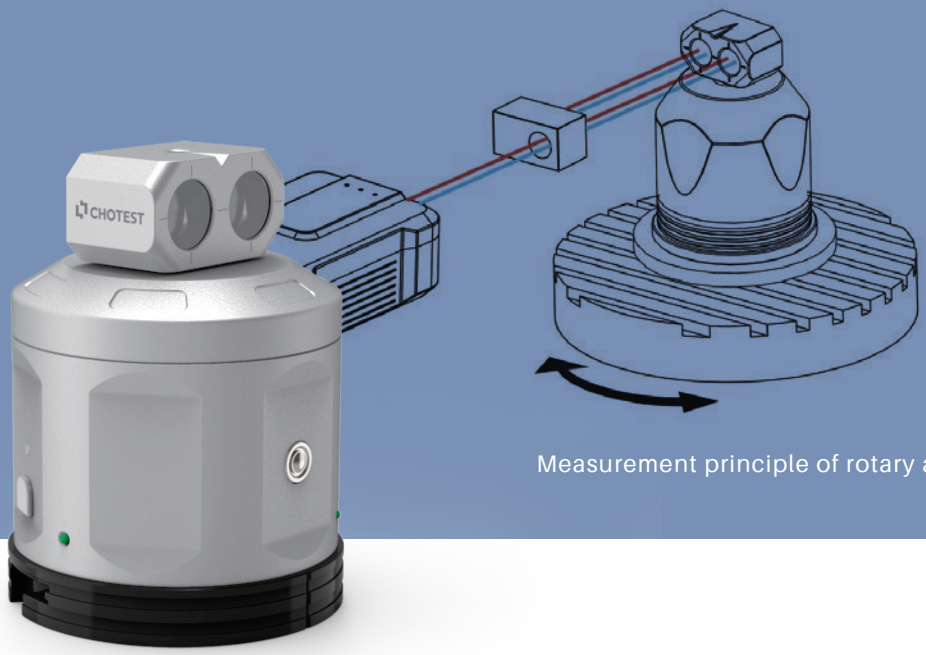
Pulse trigger CT70 is compatible with glass scales, encoders and controllers. Equipped with Pulse trigger CT70, laser interferometer SJ6000 can sample data in pulse trigger mode. Even if the axis does not stop, laser interferometer SJ6000 could sample data at designated points or continuously sample data.

Pulse trigger CT70

Parameters

System parameters:				
1. Measuring method: single frequency				
2. Laser frequency accuracy: 0.05ppm				
3. Dynamic capture rate: 50kHz				
4. Warm-up time: about 6 min				
5. Operating temperature: (0~40)°C				
6. Environment temperature: (0~40)°C, humidity: 0-95%				
7. Storage temperature: -20°C~70°C				
Environmental sensors:				
1. Atmospheric temperature sensor : ±0.1°C(0~40)°C, resolution: 0.01°C				
2. Material temperature sensor: ±0.1°C (0~55)°C, resolution: 0.01°C				
3. Atmospheric humidity sensor: ±6%RH (0~95%)				
4. Atmospheric pressure sensor: ±0.1kPa (65~115)kPa				
Linear measurement:				
1. Measuring range: (0~80)m				
2. Measuring accuracy: 0.5ppm (0~40)°C				
3. Measuring resolution: 1nm				
4. Maximum measuring speed: 4m/s				
Angle measurement:				
1. Axial range: (0~15)m				
2. Measuring range: ±10°				
3. Measuring accuracy: ±(0.02%R+0.1+0.24M)" (R is indicating value, unit: "; M is measured length in meters)				
4. Measuring resolution: 0.01"				
Flatness measurement:				
1. Axial range: (0~15) m				
2. Flatness measuring range: ±1.5 mm				
3. Measuring accuracy: ±(0.2%R+0.02M^2) um (R is indicating value in um; M is measured length in meters)				
4. Substrate size: 180mm adjustable, 360mm adjustable				
5. Measuring resolution: 0.1 um				
Straightness measurement:				
Item	Axis range	Measuring range	Accuracy	Resolution
Short straightness	(0.1~4)m	±3.0mm	±(0.5+0.25%R+0.15M^2)μm	0.01μm
Long straightness	(1~20)m	±3.0mm	±(5.0+2.5%R+0.015M^2)μm	0.1μm
Note: R is indicating value in um; M is measured length in meters				
Squareness measurement:				
Item	Axis range	Measuring range	Accuracy	Resolution
Short straightness	(0.1~3)m	±3/M mm/m	±(2.5+0.25%R+0.8M)μm/m	0.01μm/m
Long straightness	(1~15)m	±3/M mm/m	±(2.5+2.5%R+0.08M)μm/m	0.01μm/m
Note: R is indicating value in um; M is measured length in meters				
Rotary axis measurement:				
1. Measuring range of angle: 0~360°				
2. Max axis rotation speed: No limit(<5°), 10rpm(>5°)				
3. Pitch accuracy of precision turntable: ±1"				
4. Resolution : 0.01"				

Rotary Axis Calibrator WR 50



Measurement principle of rotary axis

Measurement Principle

Equipped with Rotary axis calibrator WR50 and Angle prism, Laser interferometer SJ6000 is capable to calibrate rotary axis 0~360°. Rotary axis calibrator WR50 is intalled to the rotary axis as an angle master.

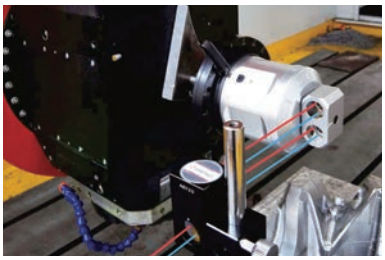
Parameters

Model No.	WR50	Weight	1.9kg
Measuring Range	(0~360)°	Height	148mm
Measuring Accuracy	±1″	Diameter	112mm
Resolution	0.01″	Communication Type	Bluetooth
Max Axis Rotation Speed	10rpm	Power Supply	Li-battery
Max Tracking Speed	2rpm		

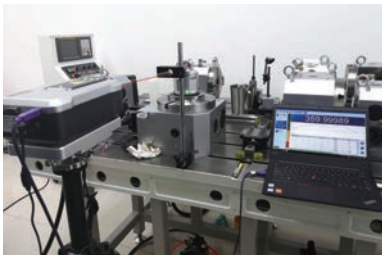
Application

Rotary axis measurement of CNC

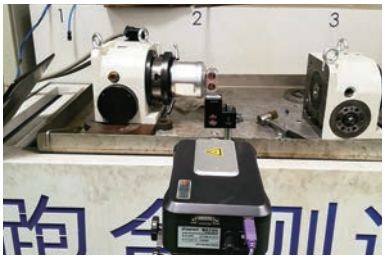
Electric spindle measurement of CNC



Swing axis measurement of CNC



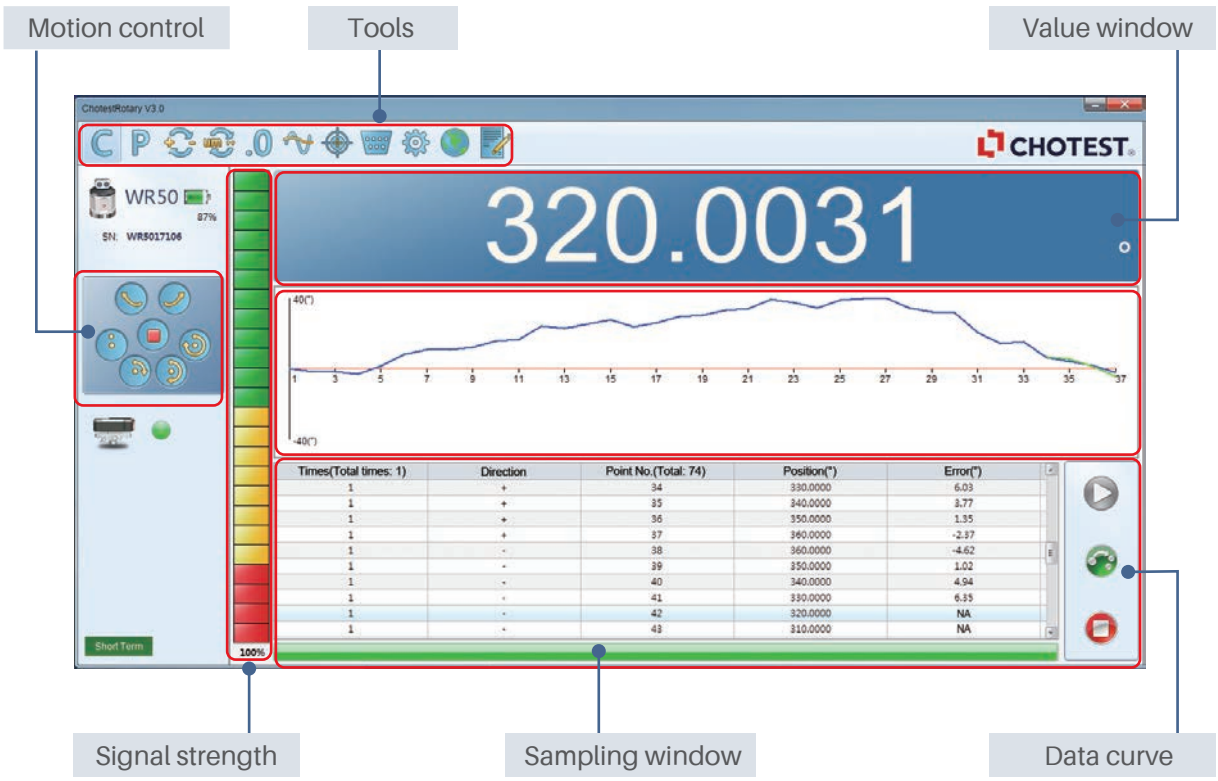
Angle measurement of CNC index plate



Angle measurement of turntable

Angle measurement of CNC turntable

Software



Rotary Axis Calibrator

Eccentric Axis Measurement

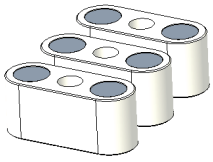
Equipped with angle prism, precision turntable WR50, dedicated jig and dedicated software, SJ6000 is capable to calibrate eccentric axis rotation accuracy.

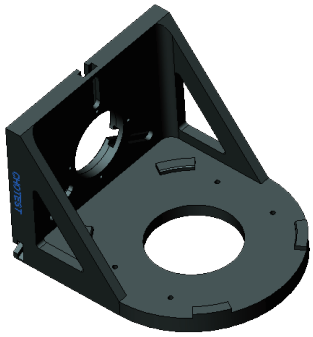
Eccentric axis meas. kit:

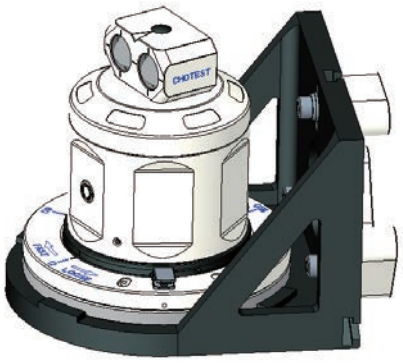
1.Magnet, 3pcs

2.90° Jig

3.Dedicated software

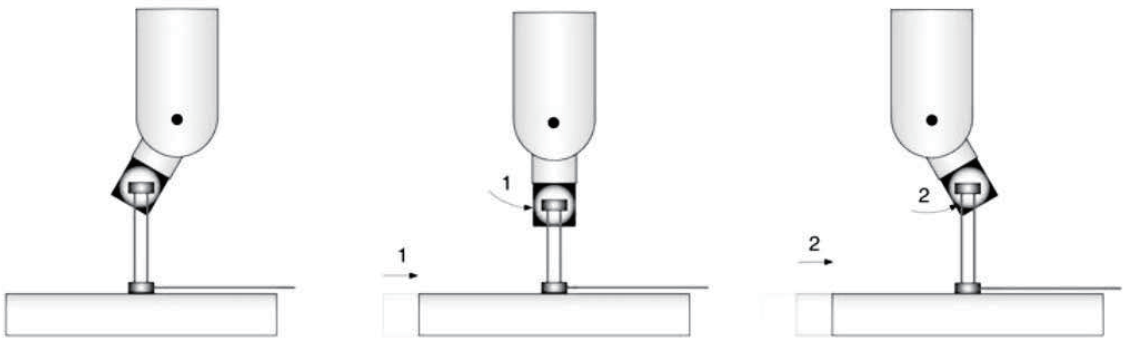




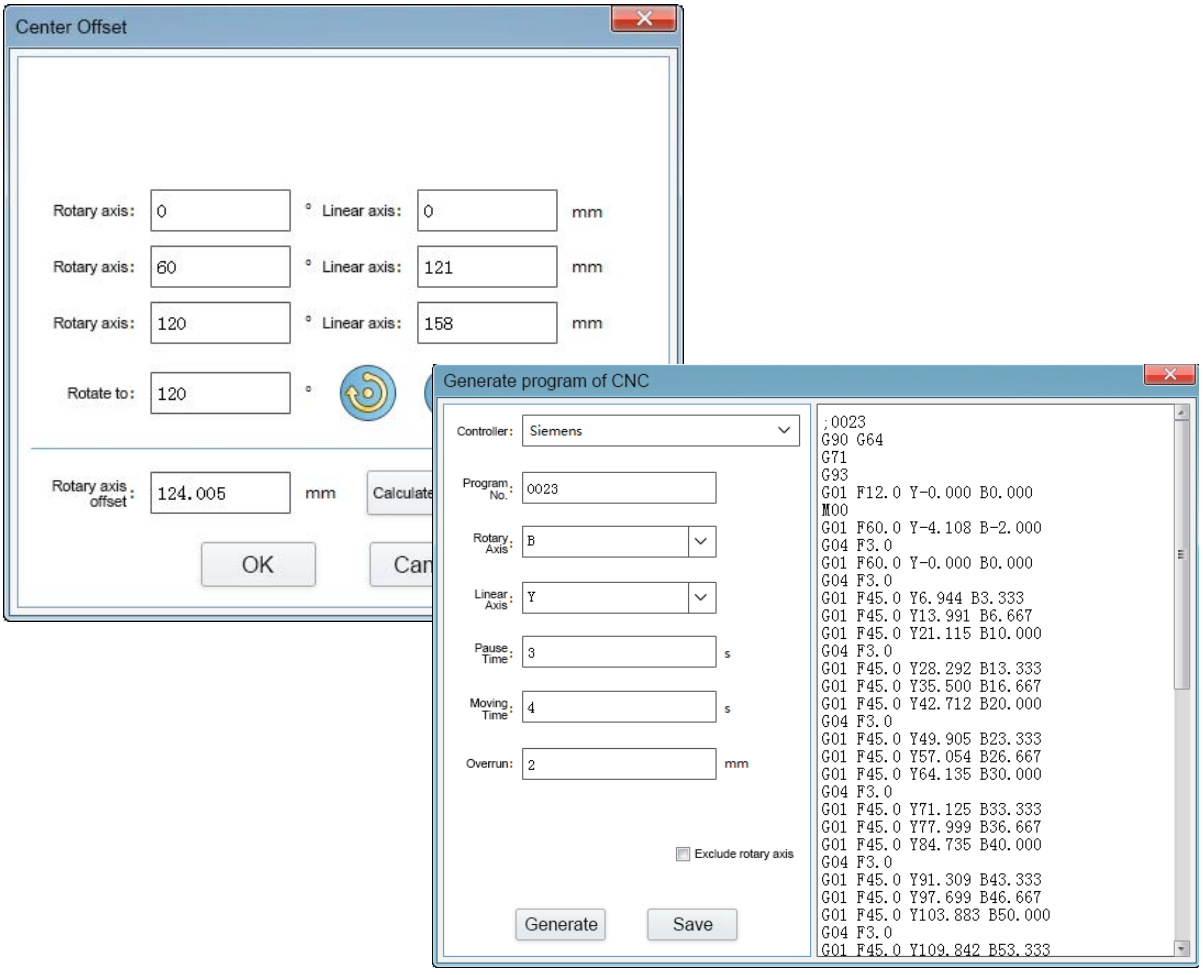


Measurement Principle

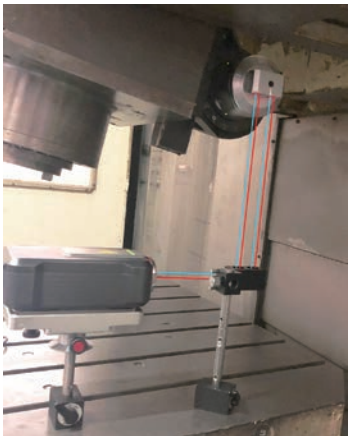
The measurement principle is to use the synchronous movement of the object table and the main spindle, as shown in the figure below. It is important to make sure that angle prism should be always aligned with WR50.

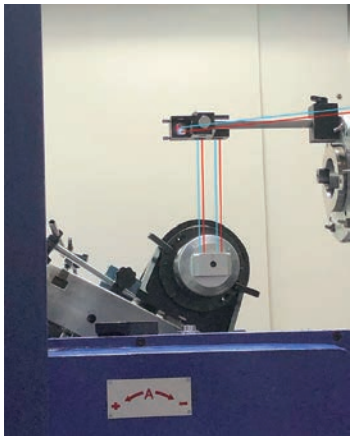


Software Settings



Application



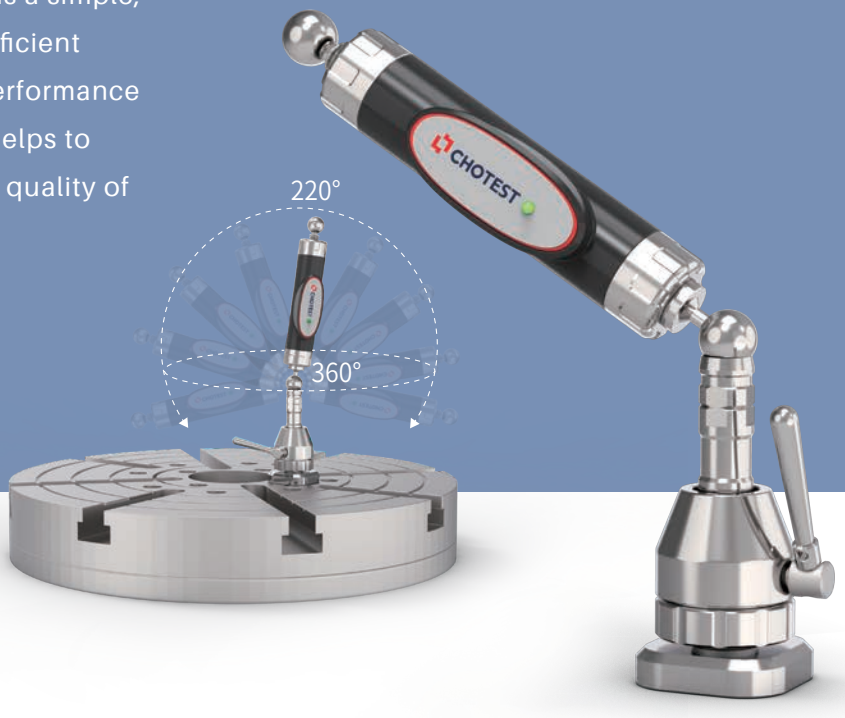


Eccentric axis measurement

Wireless Ballbar MT21

Fast Diagnosis for Machine Tools

MT21 Wireless Ballbar is a simple, fast, economical and efficient solution to diagnose performance of machine tools, and helps to improve the machining quality of machine tools.



Feature

Simple, Fast

The measurement software with guided operation can generate the machine running program automatically. With simple setting, the round track test on three orthogonal planes can be completed in 10~15 minutes.

Powerful Function

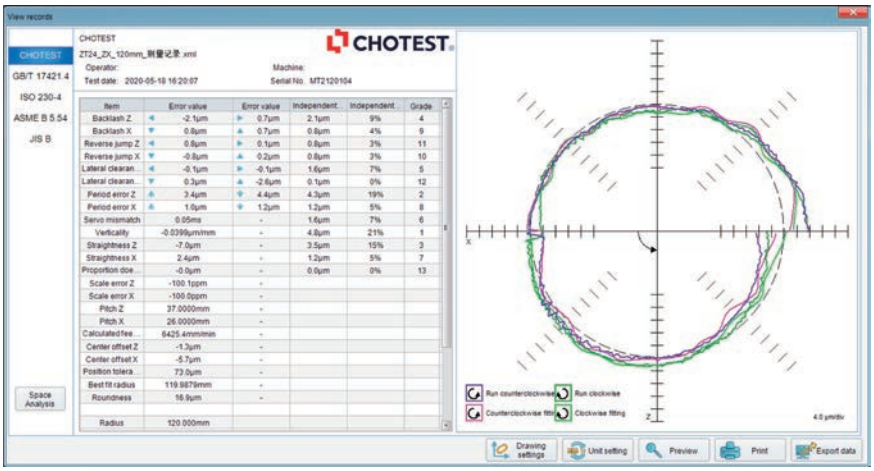
Comprehensive diagnosis report provides a full and professional assessment of machine performance. Taking 360 degree measurement at the XY plane as an example, it can analyze: backlash X, backlash Y, reverse jump X, reverse jump Y, lateral gap X, lateral gap Y, period error X, period error Y, servo Mismatch, perpendicularity, straightness X, straightness Y, proportional mismatch, scale error X, scale error Y, thread pitch X, thread pitch Y, feed rate, center offset X, center offset Y, position tolerance, the best fitting radius, roundness.

Wireless

Data is transmitted to the laptop computer via Bluetooth in real time.

Software

MT21 software with guided operation can implement the round track test on three orthogonal planes quickly and simply. After measurement, software calculates the overall measurement values (roundness, roundness deviation) of the positional accuracy automatically, then generates the analysis report with the graphic format according to GB17421-4, ISO230-4. MT21 achieves the real spatial diagnosis for machine tools.



Error Analysis Report

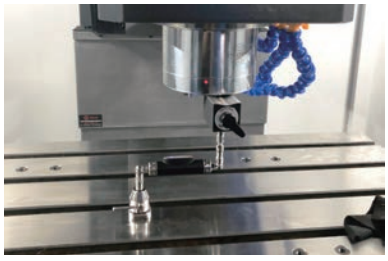
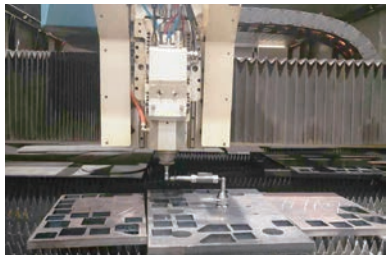
Parameters

Communication: Bluetooth(Typical 10m)
Power Supply: Li-battery
Resolution: 0.1μm
Measuring Accuracy: ±(0.7+0.3%L)μm
Measuring Range: ±1.0mm
Sensor Range: ±2.0mm
Sample Rate: 1000Hz
Working Temperature: (0~40)°C
Size: 120×26×21mm

Configuratioin

1. MT21 Wireless Ballbar	1pc
2. Master gauge	1pc
3. Offset setting ball	1pc
4. Centric holder	1pc
5. Tool cup	1pc
6. Extension bar 50, 100, 150mm	1pc of each
7. Software	
8. Portable suitcase	
9. User Manual	

Application

Roundness inspection of machine tools