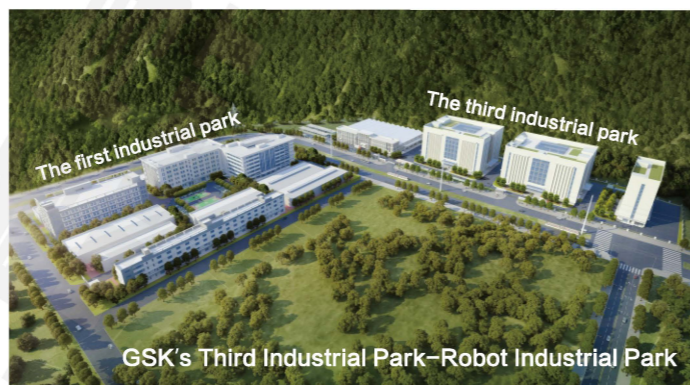


GSK CNC Equipment Co.,Ltd.-China Southern CNC Industrial Base



GSK's Second Industrial Park - Precision Part Machining Park



GSK's Third Industrial Park - Robot Industrial Park

CNCMAKERS LIMITED (hereinafter referred as CNCMAKERS) is specially devoted to conducting research and practice of basic equipment industrial development, providing "trinity" packaged solutions of machine tool CNC system, servo drive and servo motor, taking initiative in the expansion of industrial robot and all-electric injection molding machine field, developing the new marketing mode of machine tool exhibition hall, providing the customers with all-round professional machine tool remanufacturing solutions and services, promoting the integration of production and education, setting up the vocational education and training institute, as well as conducting highly skilled CNC personnel training. It has developed into a high-tech enterprise integrating science, education, industry and trade, thus being known as "China Southern CNC Industrial Base".

Adhering to the corporate philosophy of "making itself a century-old enterprise and building gold quality" and the service spirit of "keeping improvement and making users satisfied", CNCMAKERS enhances the user product value & benefits through continuous technological progress and innovation, and makes unremitting efforts to promote the localization process of basic equipment industry, improve the technological level of the industry, and promote the development of China's national equipment manufacturing industry.



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# GSK 980TDi

## Turning Machine CNC System

### COMMAND THE FUTURE

## The product overview

### GSK 980TDi TURNING MACHINE CNC PRODUCT BRIEF

GSK 980TDi is a new member of the GSK 980TD series product, which is developed by the original engineers who have studied the GSK 980TD, GSK 980TDa, GSK 980TDb and GSK 980TDC, etc. products, as well it is the newest product followed with the GSK 980TDC, which GSK aims at the common CNC Turning machine and Turning center market.

GSK 980TDi is based upon the GSK-Link industry spot BUS, which is adapted with the BUS servo drive unit and absolute encoder servo motor, carries out the 0.1 μm level position accuracy, servo parameter on-line configuration and non-block mechanical zero return. Simultaneously, invite the known professionals in the industry field to design the newest appearance. Additionally, the project team has been carried out a large number of studies in the efficiency improve, intelligence application, humanization operation and user secondary development, etc.

The launch of the GSK980TDi will lead another significant revolution in the common CNC system!



## Technical features

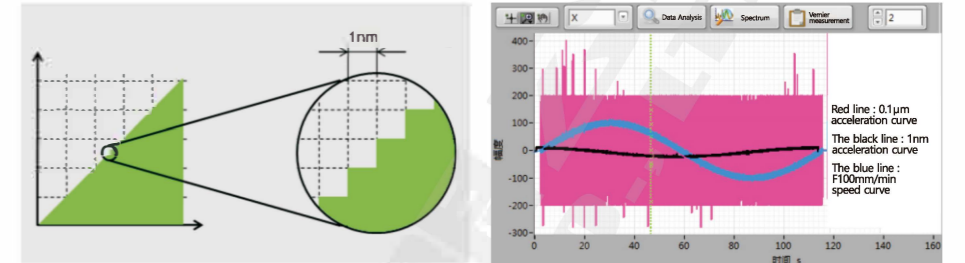
- Based on GSK-Link industrial field bus
- Least command increment: 0.1 μm, maximum traverse rate: 100m/min
- Support turning and milling
- Support torque control
- Support servo parameter online configuration, servo status real-time monitoring
- Support display interface secondary development (User-defined)
- Support non-stop mechanical zero return
- Standard bus servo drive unit and multi-turn 17-bit absolute encoder



## Technical features

### High speed & high precision control

Based on GSK-Link industrial fieldbus, servo motors equipped with GR-L series servo devices and 25-bit or higher high-resolution absolute encoders can achieve nano-level interpolation, so that the output accuracy of the system matches the feedback accuracy of the servo motor encoder, giving full play to the performance of high-resolution encoder servo motors, thus achieving high-speed, high-precision processing results

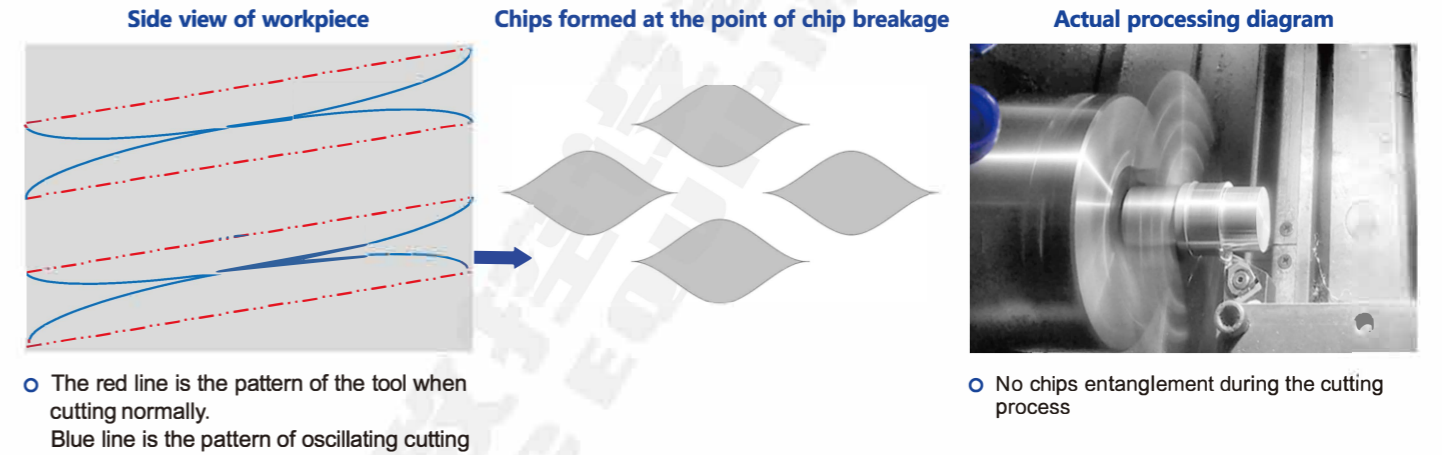


○ Nano output accuracy

○ Nano-level acceleration variation control is significantly better than 0.1μm/s. Facilitates servo control and improves processing performance

### Oscillating chip break

During the roughing process, a certain frequency of sine/cosine wave interference is applied to the feed axis to cause the tool to oscillate in the direction of the cutting track, breaking the continuous chips into pieces and avoiding the chips from winding around the tool or the workpiece, thus causing the tool to break or the workpiece to deviate from the center of rotation during the machining process.



### Support turning, milling and drilling complex machining

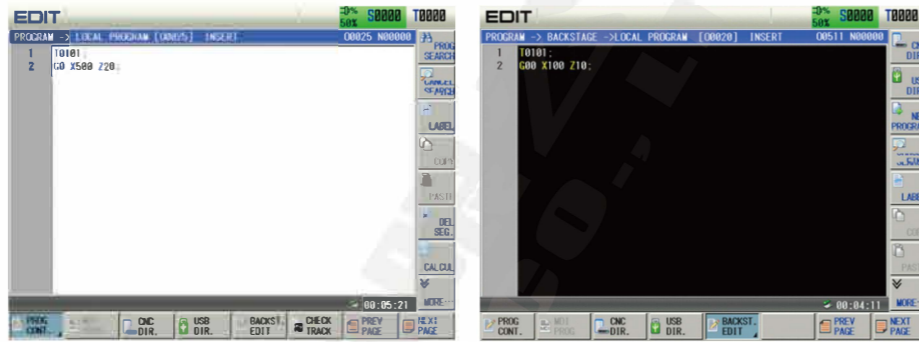
The system has 5 feed axes and 2 analog spindles. When the servo spindle is adapted, spindle orientation, rigid tapping, cylindrical interpolation, and polar coordinate interpolation can be realized to meet the requirements of turning and milling.



## Technical features

### Backstage editing

During the program processing, other different programs can be edited, fully using of system resources, rational planning of time, and improving the efficiency of operation of the machine

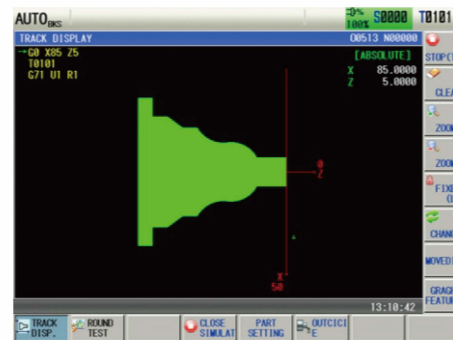


○ front desk editing

○ backstage editing

### Graphical simulation

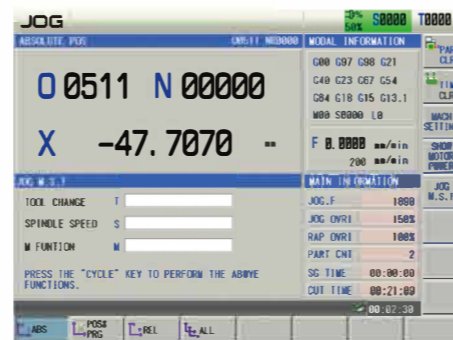
During the program processing, the workpiece entity is used as a model to simulate the real processing scene of the workpiece, and the tool path is more intuitive and easier to check the programming errors



○ solid simulation

### Manual MST function

Users can start MST commands in the position screen in manual/MPG mode, which reduces page switching and makes the operation more centralized and easy for users to quickly operate the machine

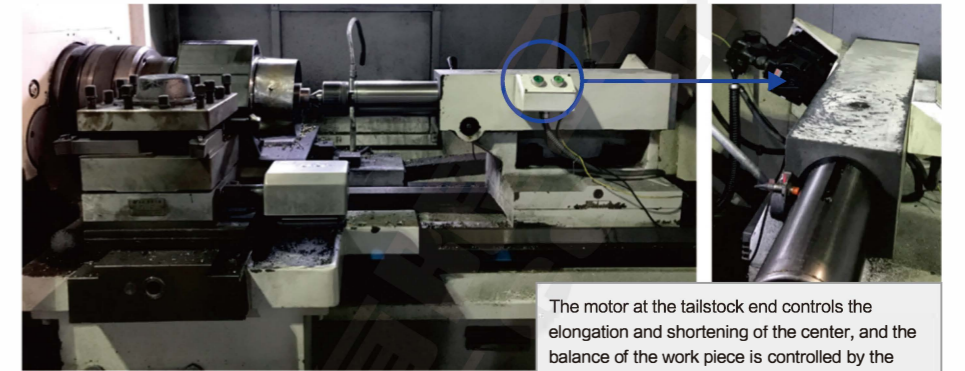


○ MST can execute directly

## Technical features

### Torque control

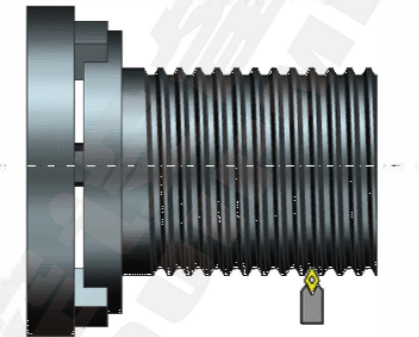
The torque control function controls the motor to rotate at a certain rate, with a certain moment as the termination condition of the rotary motion. When the motor reaches the required torque, the current torque is maintained, so that the motor achieves dynamic balance with the external force in the rotation direction, which can be used for work piece docking and tailstock control between spindles.



The motor at the tailstock end controls the elongation and shortening of the center, and the balance of the work piece is controlled by the specified torque and the chuck.

### Thread repair function

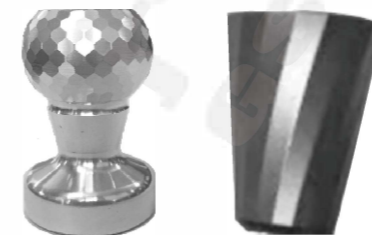
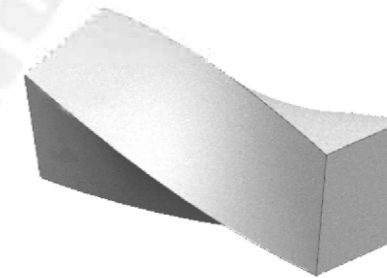
The thread repair function allows the machine to repair damaged threads (large oil pipelines or screw) regardless of whether the machine tool is equipped with a servo spindle or an analog spindle.



○ Record the current repair position of the thread

### Polygon turning

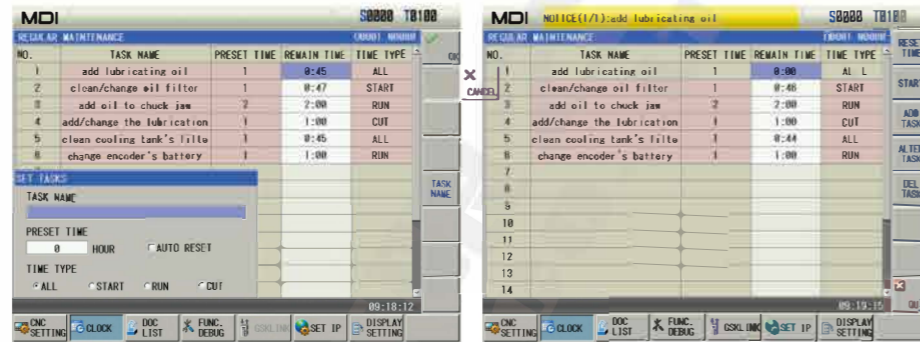
For traditional polygon processing, power milling tools are usually used for processing. For occasions where high precision is not required, the polygon turning function can be used to accelerate the processing of various polygons by the offset angle before synchronizing the workpiece axis with the main control axis and changing the speed ratio of the workpiece axis and the tool axis



## Technical features

### Regular maintenance tasks

The machine tool manufacturers can customize the maintenance plan for each machine tool, import the plan into the system, and the system as your work assistant will remind you to maintain the machine tool regularly, so that the machine tool can maximize its performance.

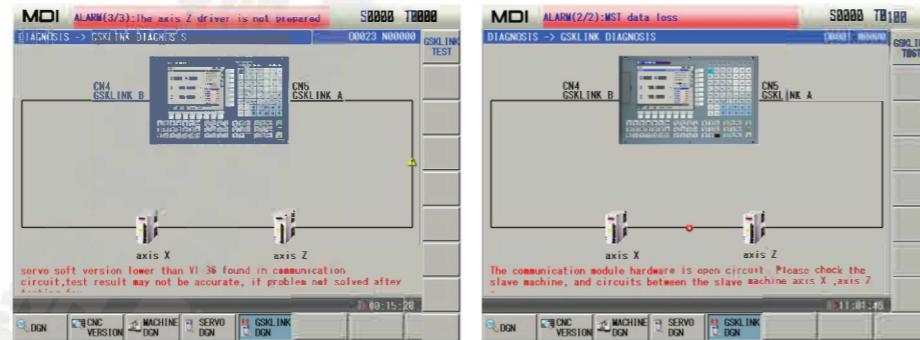


○ Add or modify tasks online

○ Maintenance task reminder

### Broken loop diagnostic function

The broken loop diagnostic function provides an online diagnosis of the fault that the bus is not connected by the driver or the line fault, and informs the fault point where the image is located, so that the maintenance personnel can solve the problem quickly and accurately.

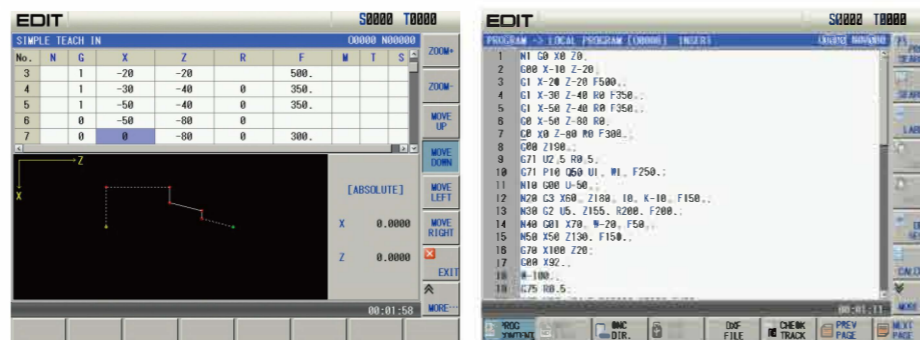


○ Poor contact failure

○ Hardware breakage

### Graphic teaching programming

Enter the coordinates and rate directly in the corresponding address bar, eliminating the trouble of entering the address each time. According to the input coordinates, the program track is drawn in real time, allowing you to adjust the program in time to avoid errors.



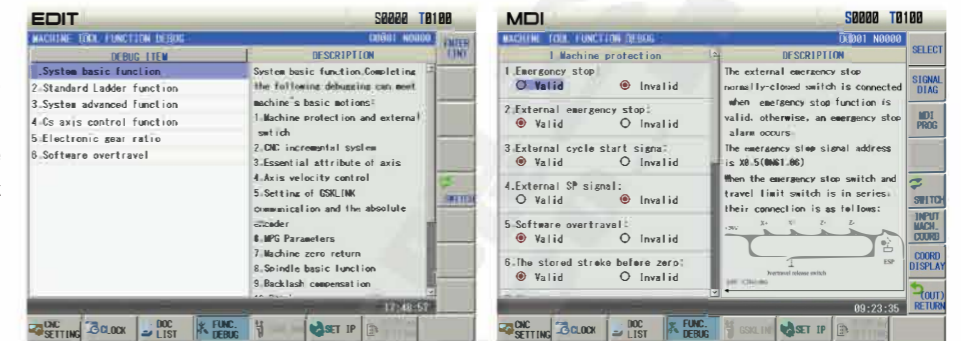
○ Tabular programming

○ Insert the program into the current segment when exiting

## Technical features

### Online machine commissioning wizard

In the past, CNC machine tools usually required experienced engineers to debug, while the machine tool debugging guides are classified the debugging steps of CNC machine tools according to functions, making the debugging work simple and fast, so that the machine tool debugging work is no longer a "patent" of a few people.

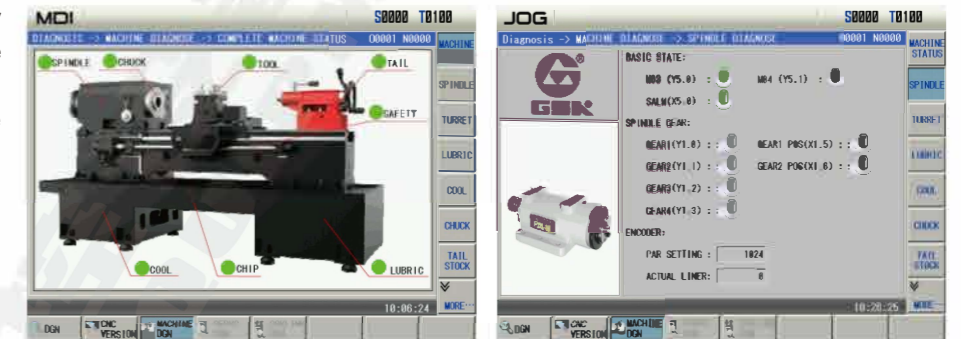


○ Fine debugging classification

○ Intuitive debugging options

### Machine tool fault diagnosis

The machine tool diagnostic function visually visualizes the input and output signals of the machine tool on the machine structure drawing, making the fault display of the machine tool more intuitive and convenient for troubleshooting machine problems.

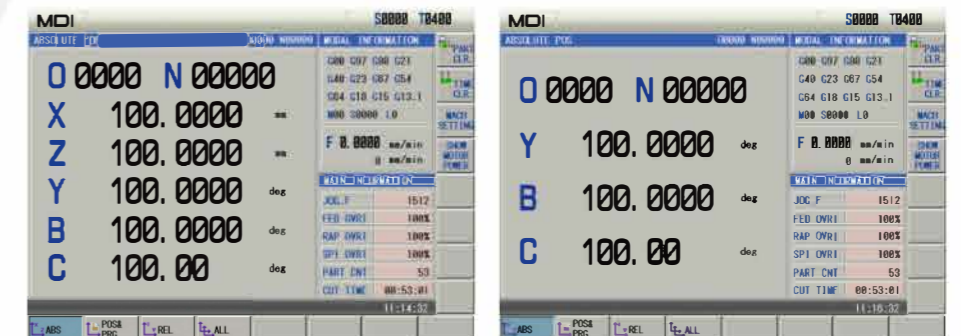


○ machine status

○ Spindle-related signals

### Axis hiding

Hide unused or unattended axes to make the interface more concise.



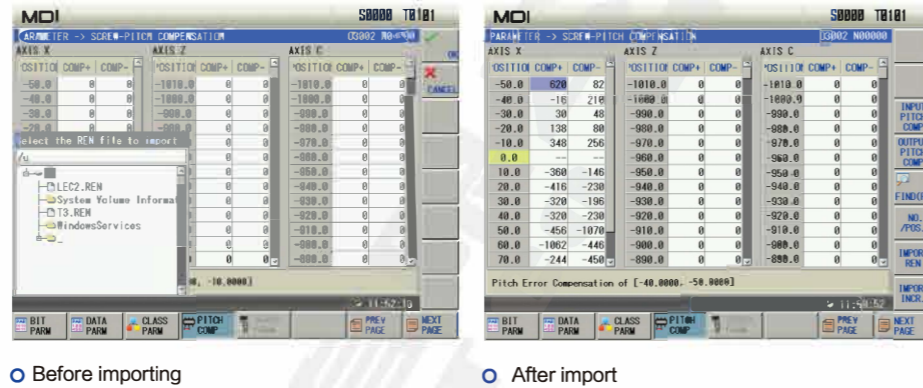
○ Before axis hiding

○ after hiding X-axis Z-axis

## Technical features

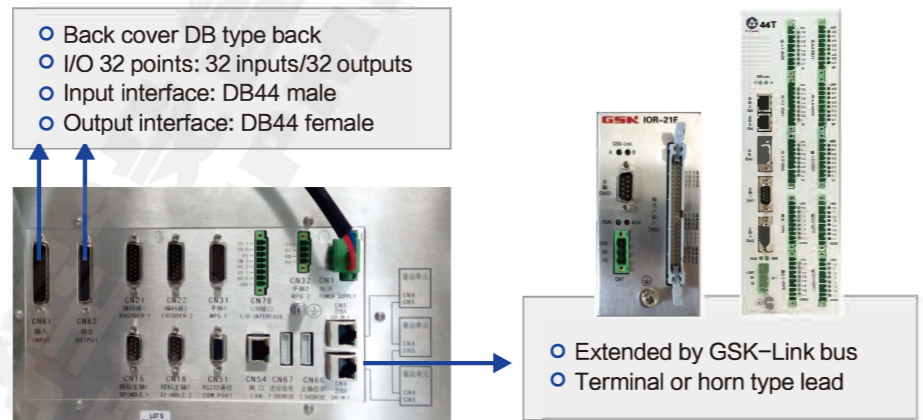
### Pitch error compensation function

Pitch error compensation function supports one-way pitch error compensation and two-way pitch error compensation function, also can identify the file output from the laser instrument(\*.REN file), no need for customers to manually input, improve input efficiency and reduce the chance of input errors



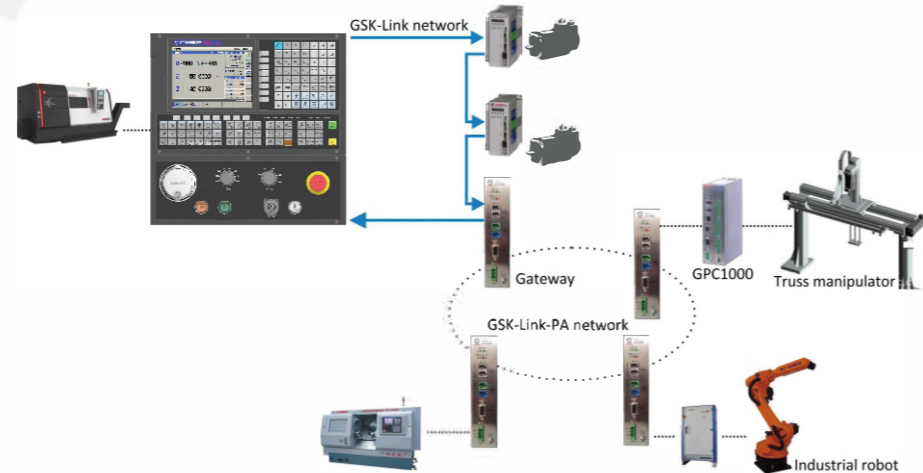
### I/O point extension

GSK980TDi back interface has a number of I/O 32 inputs/ 32 outputs, through the DB44 pin interface (completely compatible with the GSK980TDc interface and definition). At the same time, the GSK980TDi supports the adaptation of the IO-R series IO units (IOR-21F, IOR-21T, IOR-44T, etc.), and the number of I/O can be extended by the GSK-Link bus.



### Full bus connection in production line

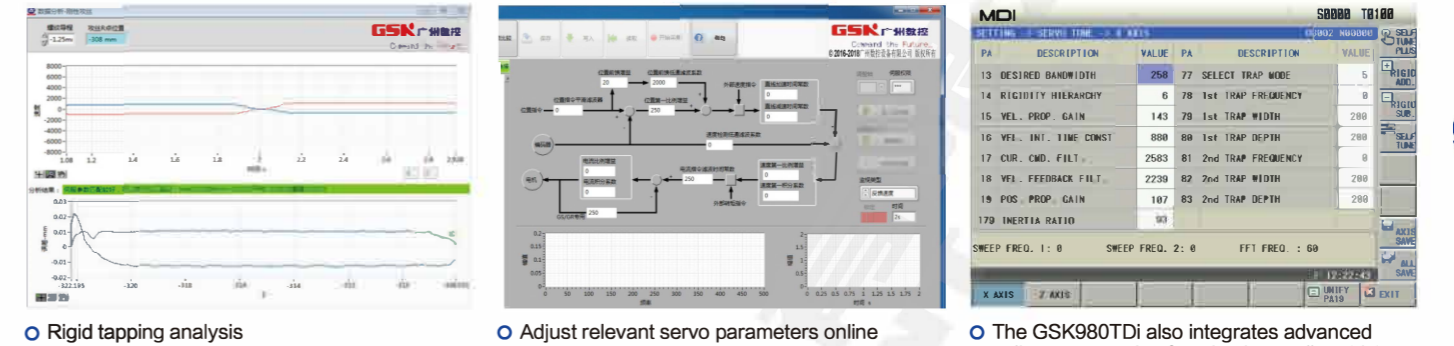
GSK980TDi system can realize the seamless connection between CNC machine tools and industrial robots, truss robots and other automation equipment through gateways and GPCs, thus building an automated production line, which significant saves in labor costs and increases production efficiency.



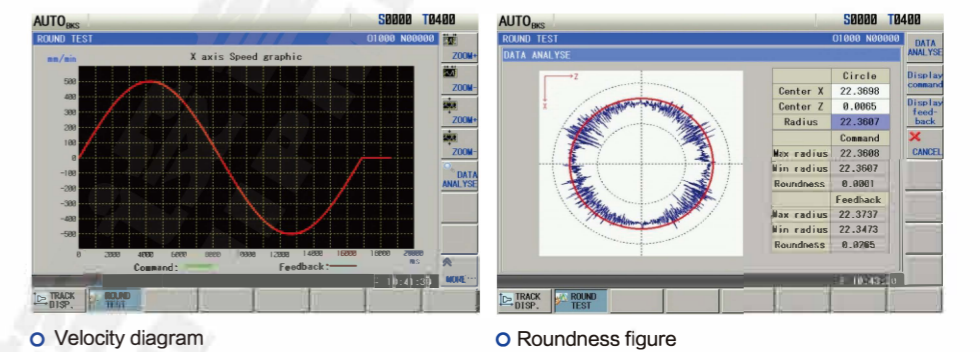
## Technical features

### On-line debugging

The PC debugging software can remotely collect the theoretical data and machine data of the GSK980TDi and through systematic analysis of these data, the acceleration and deceleration characteristics of the servo drives of each axis can be intuitively adjusted. Through the intuitive curve diagram, online adjustment of the servo parameters can quickly realize the analysis and debugging of the servo characteristics, greatly improving the overall performance of the machine tool and simplifying the time spent on machine tool debugging.



After the GSK980TDi online servo tuning, it also can analyze the speed, position and roundness of the processed data in real time, which facilitates better adjustment of the servo and system-related parameters to get the best processing results.



## Application case

### GSK980TDi applied in Brake Pad Machining

Special type: Brake pad processing machine

Technical parameters:

Relevant parameters of each axis	Traverse distance	Torque of the movement axis	Positioning precision	Motor modal	Drive	Rapid traverse rate
X axis	300mm	15N.m	0.001mm	130SJT-M150D	GR2050	8000mm/min
Y axis	360°	15N.m	0.001°	130SJT-M150D	GR2050	18000° /min

Application picture:



Application effect

- 0 Driving linear and rotary axes with a general servo drive;
- 0 The grinding wheel is machined with end faces instead of the side of the common grinding wheel;
- 0 Complete tasks with dedicated instructions.

## Technical specification

Item	Specification
Controlled axis number	Max. controlled axis number: 5 axes
	Max. linkage axis number: 5 axes (linear interpolation), 2 axes (circular interpolation)
	PLC controlled axis number: 5 axes
Coordinate value(system) and dimensions	Work piece coordinate system (G50), local coordinate system, work piece coordinate (G54~G59)
	Coordinate plane selection
	Position command range: $\pm 99999999 \times$ least input increment
	Absolute/incremental programming, diameter/radius programming, inch/metric conversion, linear axis/rotation axis
preparatory function	9 G commands, including quick positioning, linear interpolation, circular interpolation, cylindrical interpolation, thread cutting, polar coordinate interpolation, polygon turning, rigid tapping, dwell, drilling, tool compensation, macro call, jump, cycle, tilt axis and thread repair, etc.
Feed function	Rapid traverse rate: 0 mm/min ~100000 mm/min
	Rapid override: F0, 25%, 50%, 100%, a total of 4 levels of real-time adjustment
	Cutting feedrate: 0 mm/min ~15000 mm/min
	Feedrate override: 0~150%, a total of 16 levels of real-time adjustment
Bus function	Rapid traverse/cutting feedrate acceleration/deceleration: linear type, S type, the starting and termination rate of acceleration/deceleration and acceleration/deceleration time set by the parameters
	Servo motor with multi-turn absolute position encoder
	The absolute coordinate system is automatically restored after the machine is powered off
	Machine tool mechanical return without block
	Servo parameters online modification
	Servo status online diagnosis
Thread cutting	Operation log, running log, processing log
	Remote monitor, GSKLINK function
	Thread type: equal pitch straight thread / taper thread / end thread / arc thread, variable pitch straight thread / taper thread / end thread / equal tip width variable lead thread
	Number of threads:1~99
	Thread pitch: 0.01mm~500mm (metric thread) or 0.06 teeth/inch~2540 teeth/inch (Inch thread)
Spindle function	Thread cutting acceleration and deceleration: Linear type, index type, S type optional
	Thread run-out: The run-out length, angle and rate characteristic can be set.
	Spindle revolution speed: Set by S code or PLC signal, the range: 0 rpm~9999 rpm
	Spindle override: 50% ~ 120%, a total of 8 levels of real-time adjustment
Tool function	2 route 0V ~ 10V analog voltage output, support flexible tapping/rigid tapping
	2 route spindle encoder feedback, the spindle encoder resolution can be set.
	Tool length compensation (tool offset): 32 groups
	Tool wearing compensation: 32 groups
	Tool lifetime management:32 groups (8 pieces/group)
	Tool nose radius compensation (C type)
M.S.T function	Tool setting mode: Fixed point tool setting, trial cutting tool setting, reference point matching tool setting, automatic tool setting, coordinate recording function
	Tool offset execution mode: modify coordinate mode, tool movement mode
	Special M code (M00, M01, M02, M30, M98 and M99), other M codes are defined by PLC

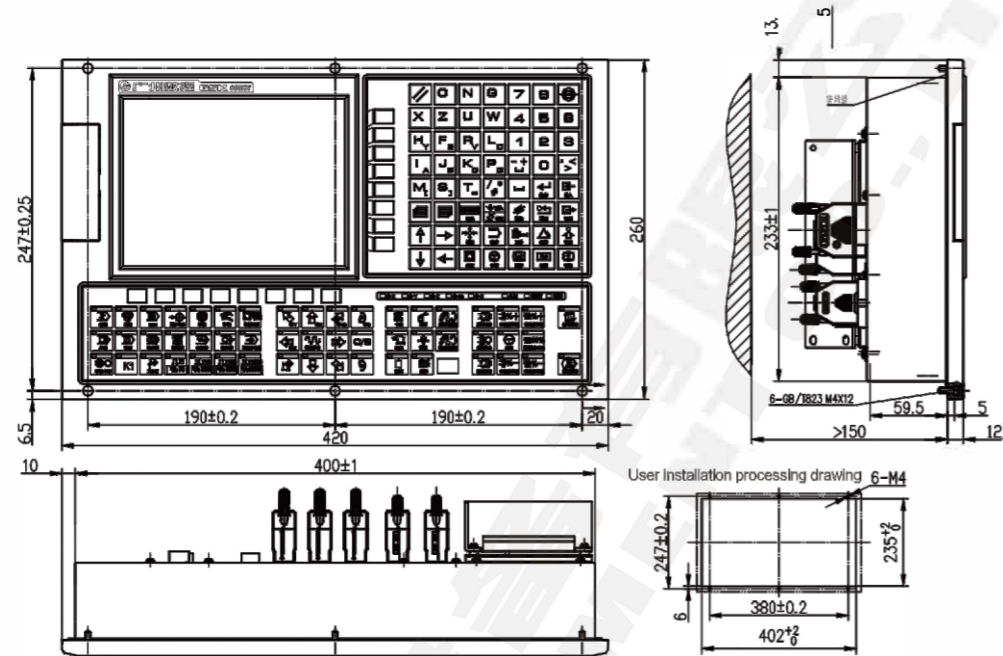
## Technical specification

Item	Specification	
PLC function	Two levels of PLC program, maximum5000 steps, the 1st level refresh period 8ms	
	13 basic commands, 44 function commands	
	PLC program on-line display, real-time monitor; support PLC warning and PLC alarm	
	Support many PLC programs, the current running PLC program optional	
	Basic I/O: 48 inputs/38 outputs	
	Extendable serial I/O unit (optional): IOR-21F: 24 inputs, 16 outputs, 2 analog voltage output	
	IOR-21T: 24 inputs, 16 outputs, 2 analog voltage output	
Program memory and edit	IOR-04T: 48 inputs, 32 outputs	
	IOR-44T: 48inputs, 32 outputs, 4 analog voltage output, 1 RS485/232 serial interface	
	Program memory: 64M, 10000 programs (include subprogram and macro)	
	Edit mode: full-screen edit	
	Edit function: program/block/character search, rewrite, delete, copy, paste	
	MDI input, 10 blocks operation	
Program check function	Support macro/subprogram call, allow 4-layer subprogram nesting	
	The calculator	
	Miscellaneous programming	
Simplified programming function	Path preview, graphic simulation, dry run, machine tool lock, M.S.T lock, single block operation, stored stroke check	
Compensation function	Canned cycle, multiple canned cycle, rigid tapping, direct input of drawing size, automatic chamfering, statement macro programming	
	Backlash compensation : 0 mm~2 mm (or 0 inch~0.2 inch), backlash compensation mode and the frequency set by the parameters	
HMI	Memory pitch error compensation: Total 1024 compensation points, each axis compensation point number set by the parameters	
	8.4" LCD true color	
	Support Chinese, English and other languages display	
	The process path shows that the process path can be zoomed in and out; the font of the program content can also be zoomed in and out.	
Operation management	Position, Program, Tool Compensation, Alarm, Parameter, Set, Graph, Diagnosis, Ladder diagram, Help	
	Operation mode: Edit, Auto, MDI, Mechanical zero return, MPG/Single step, Manual, Program zero return, MPG trial cutting/Retraction	
	6 level operation authority management	
	32 times for power off in the limited time	
	Program switch, Parameter switch	
	MPG interruption, Teach	
Communication function	The machine function debugging, the machine default diagnosis	
	Regular maintenance function	
	USB flash disk: USB flash disk file operation, USB flash disk file direct processing, support PLC program, system software upgrade with USB flash disk upgrade	
Safety function	RS232: Bidirectional transmission of parts programs, parameters, etc., screw-in parameter import and export, support PLC program update	
	LAN: Remote file transfer	
Electrical interface	Emergency stop, hardware travel limit, software travel check, data backup and recovery	
	48/38 digital input and output interface, 2-way encoder interface, 2-way hand wheel interface, 2-way spindle analog interface, Rj45 network port, GSK-LINK network port	
Overall dimension	GSK980TDi ( W*H*D )	420 × 260 × 150mm
	GSK980TDi-V ( W*H*D )	292 × 422 × 150mm
	GSK980TDi-H ( W*H*D )	400x400x150mm

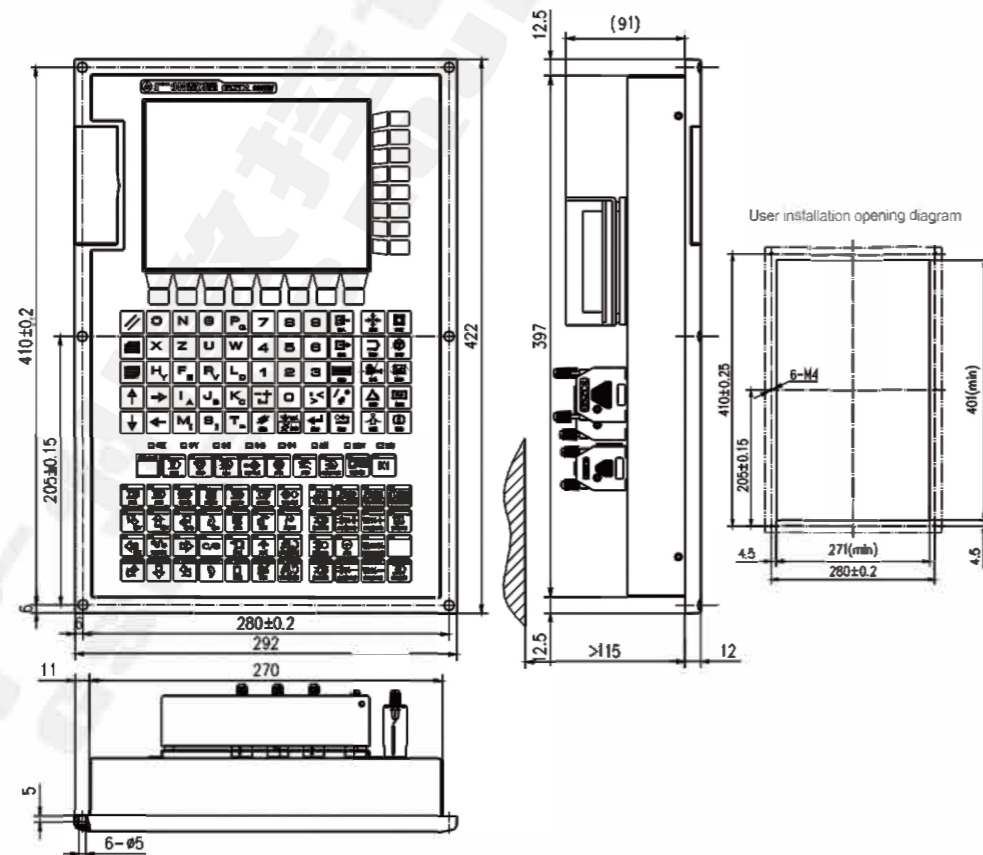
## Installation dimension

### CNC Installation dimension

GSK 980TDi Overall Dimension(8.4 inches)

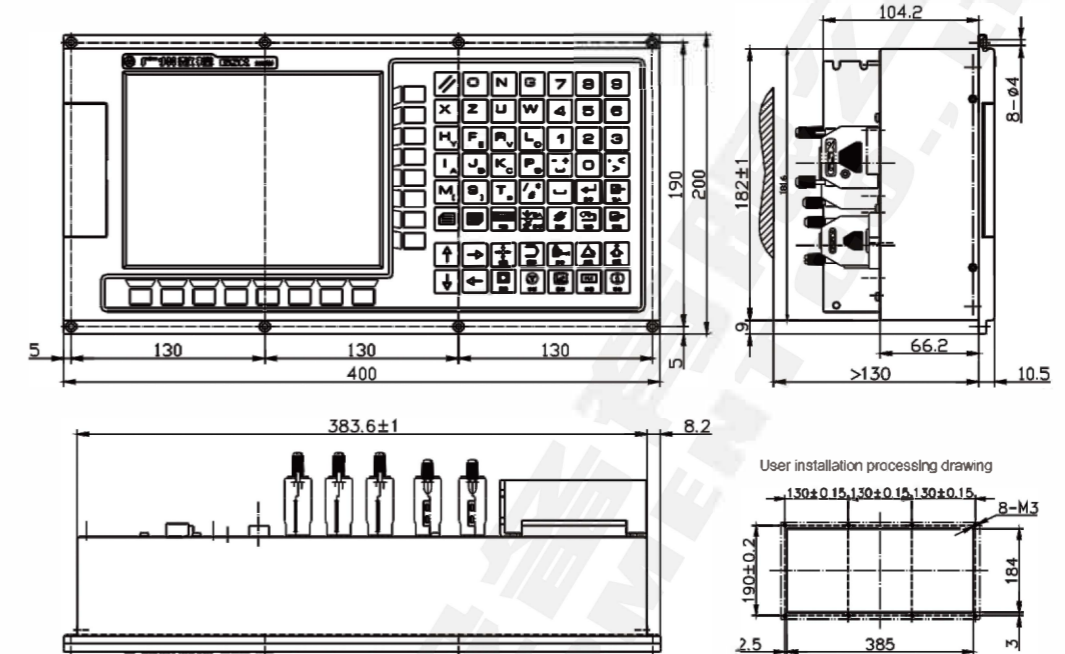


GSK 980TDi-V Overall Dimension(8.4 inches)



## Installation dimension

GSK 980TDi-H Host installation size(8.4 inches)



GSK 980TDi-H Installation dimension of the operation panel

