

# CNCmakers Limited

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## 1 Introduction

With GSK-Link Ethernet bus, MPG trial-cut, Cs axis control, GSK980TC3 Series Bus Turning CNC System is a new CNC system developed by **CNCmakers** which greatly improves machining speed, precision, surface roughness. Its band-new designed human-machine interface characterizes friendly beauty and easily use; its connection is convenient, which can meet the applied requirements of popularized CNC turning.



Programming

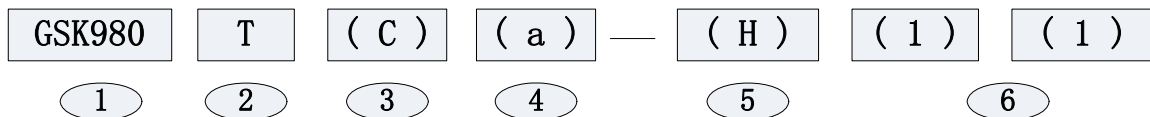
- Standard equipped GE servo unit, optional to bus I/O
- Using 8.4 inch TrueColor LCD, supporting Chinese and English
- The least control precision 0.1um, maximum traverse speed 60m/min
- The adaptive servo spindle realizing the spindle orientation, CS axis control
- Single-head/multi-head metric/inch straight thread, taper thread and end thread
- MPG trial-cut, MPG interrupt function
- Supporting RS232 communication
- Providing 12-stage time limit stop setting
- Supporting the servo tool turret, 4-cutter spacing electric tool post, hydraulic tool post

## 1.2 Technical Specifications

Motion control	Controlled axes: X, Z, Y, C; C axis is taken as Cs axis; optional to 5 axes and 3 link;
	Interpolation: positioning (G00), linear (G01), circular (G02, G03)
	Maximum programmable dimensions: metric: -99999.999mm~99999.999mm, least code increment: 0.001mm Inch: -9999.9999inch~9999.9999inch, least code increment: 0.0001inch
	Maximum feedrate: linear 15000mm/min Feedrate override: 0~200% divided into 12 to realize real-time adjustment
	Maximum rapid traverse speed: 60000 mm/min. Rapid override: F0, 25%, 50%, 100% to real-time adjustment
	Feed per rev: 0.01 mm/r~500mm/r (need to install a spindle encoder 1024P/r or 1200P/r)
	Acceleration/deceleration mode: front acceleration/deceleration (linear, S type), post acceleration/deceleration (linear, exponential type)
	Electronic gear: frequency multiplying 1~65536, frequency division 1~65536
	MPG feed: 0.001, 0.01, 0.1mm; single step feed: 0.001, 0.01, 0.1, 1mm
Display interface	<ul style="list-style-type: none"> <li>* Using a color 8.4 inch LCD with resolution ratio 800×600</li> <li>* Displaying all machining path</li> </ul>
G Function	<ul style="list-style-type: none"> <li>* Using G code system A including 39 G codes with a fixed cycle code and compound cycle code</li> <li>* Supporting a statement macro program (macro B)</li> <li>* Supporting 5-level subprogram call, and using a user macro program to call</li> </ul>
Thread function	<ul style="list-style-type: none"> <li>* Common thread (following the spindle)</li> <li>* Single-head/multi/head metric/inch straight thread, taper thread, end thread, constant pitch thread and variable pitch thread</li> <li>* Thread run-out length, angle and speed characteristics can be set by parameters</li> <li>* Thread pitch: 0.001mm~500mm(metric) 0.06 tooth/inch~25400 tooth/inch (inch)</li> </ul>
Compensation function	<ul style="list-style-type: none"> <li>* Pitch error compensation: compensation interval, compensation origin can be set. Select a one-way thread compensation or bidirection thread compensation</li> <li>* Backlash compensation: can set a fixed frequency or speed-up/down method, support G0 and G1 to use different backlash compensation</li> <li>* Tool compensation: 99 groups tool length compensation and tool nose radius compensation</li> </ul>
T Tool function	<ul style="list-style-type: none"> <li>* Adaptive tool post: set up to 16-cutter spacing electric tool post, LIO SHING company's tool post (12-cutter spacing), DIAMOND company's tool post (encoder or count type)</li> <li>* Toolsetting mode: MDI/automatic absolute tool change or manually relative tool change, cutter spacing CW, locking CCW</li> <li>* Toolsetting mode: fixed point toolsetting, trial-cut toolsetting, machine zero return toolsetting</li> <li>* Cutter spacing signal input mode: direct input</li> </ul>
S Spindle function	<ul style="list-style-type: none"> <li>* S2 digit (I/O gears control) / S5 digit (analog output)</li> <li>* Spindle encoder: encoder lines can be set (100 p/r~5000p/r)</li> <li>* Drive ratio between encoder and spindle: (1~255): (1~255)</li> <li>* Spindle override: 50%~120% divided into 8 levels to real-time tuning</li> <li>* 2-channel 0V~10V analog voltage output, supporting double-spindle control</li> </ul>
M Miscellaneous function	<ul style="list-style-type: none"> <li>* Specify with M and 2-digit. M function can be customized</li> <li>* System's interior M codes( they cannot be defined again): end of program M02, M30; program stop M00; optional stop M01; subprogram call M98; end of subprogram M99</li> <li>*Cooling ON/OFF * lubricating ON/OFF * chuck clamping/releasing in MDI/Auto mode, tailstock forward/backward</li> </ul>
Program edit	<ul style="list-style-type: none"> <li>* Program capacity: 57MB, 400 subprograms</li> <li>* Format: relative/absolute compound programming</li> <li>* Subprogram: can be edited, supporting 5-layer subprogram nesting</li> <li>* Program preview *background edit</li> </ul>

Operation function	*Mode selection: Edit, Auto, MDI, Zero return, JOG, Single step, MPG *Motion control: Single block, skip, dry run, miscellaneous lock, program restart, MPG interrupt, single step interrupt, MPG interference, machine lock, interlock, feed hold, cycle start, emergency stop, external reset signal, external power supply ON/OFF
PLC function	* PLC processing speed: 1us/step; up to 8000 steps; 10 basic code, 35 functional codes; * I/O input/output:32/32, extensible IO *Select 1~4 PMC axis
Safety function	<ul style="list-style-type: none"> <li>● Emergency stop</li> <li>● Hardware stroke limit</li> <li>● Data backup and recover</li> </ul>
Communication function	<ul style="list-style-type: none"> <li>● RS232: two-way transmission of part programs and parameters, supporting PLC programs</li> <li>● USB: U-disk file operation, U-disk file's direct machining, supporting PLC programs, system software U-disk upgrade</li> </ul>
Adaptive component	* Switching power supply: RS-PB2 (provided with a whole set, and installed) * Drive unit: GSK GE series (including incremental and absolute) * Tool post controller: GSK TB tool post controller

### 1.3 Product Module Definition



No	Code explanation	
①	Main part property of product model: GSK980TC3 series	
②	Function (machining object) allocation: represented with the capital English letters T-turning machine	
③	Its series' extension: represented with the capital English letters. None: initial version	
④	Its subfamily extension( or improved model): represented with the lower case letters a,b,c.....or digital. None: initial version	
⑤	Structural style or special machine style	Structural style: separately represented with the capital English letters U, H, V and B. U-combined, H-horizontal, V-vertical, B-box model special machine style: represented with the capital English P
⑥	LCD dimension (structure) or special machine code	LCD dimension: represented with one Arabic digit 1~9. 1 means 8.4 inch, 2 means 10.4 inch, 3~9 means..., special machine code: represented with 2-digit Arabic digit 01~99

#### Example:

- ◆ **GSK980TC3-U1**: show 980TC3 series, a combined structure, 8.4-inch LCD
- ◆ **GSK980TC3-P01**: show 980TC3 series, No. 01 special machine