GSK980MDa Milling Machine CNC System

GSK980MDa can control five feeding axes (including C axis), two analog spindles, 2ms interpolation in high speed, 0.1μm precision, which obviously improve the efficiency, precision and surface quality of processing parts. New USB interface, it supports the file operation and program running in flash disk. It provides 26 cycle commands of rigid tapping, drilling, boring, milling, etc. It supports the macro command in sentence type and calls the macro program with parameter. The command function is powerful, convenient and flexible programming.

Characteristics:

■   The five axes of X, Z, Y, 4th and 5th control, any three axes linkage movement, the axial name and the axial type of 4th and 5th can be defined.

■   2ms interpolation cycle, the precision of 1μm or 0.1μm can be selected.

■   Maximum speed: 60m/min （When it is 0.1μm, the maximum speed is 24m/min）

■   Multiple functions, it can realize the drilling/boring, roughing of round groove/rectangle groove, finishing of full circle/rectangle, continuous drilling of straight line/rectangle/arc, etc.

■   Adapted servo spindle can realize spindle continuous position, rigid tapping function

■   Built-in many PLC programs, running PLC programs can be selected.

- Memory capacity: 40M, total 10,000 part programs.

- Support macro command programming in sentence type and the calling of macro program with the parameter.

- Support metric system/inch system, with the function of auto beveling and tool life management

- Display in Chinese, English, Spanish, and Russian, which is selected by the parameter.

- With USB interface, support USB file processing, system configuration and software upgrade

- DNC in high speed, realize part program real-time transmission processing

- Analog voltage output of 0V～10V in two channels, support two-spindle control.

- Electronic MPG output in one channel, support hand MPG.

- Common input in 40 points/output in 32 points

- Overall installation dimension and command system are completely compatible with GSK980MD.

● Technical specification

■ Control axes
- Control axes: 5 axes　（X, Z, Y, 4th and 5th）
- Interpolation axes: X, Y, Z, 4th and 5th　linear interpolation; X,Y and Z three axes linear and spiral interpolation, any two axes arc interpolation;
- PLC control axes: 5 axes

■ Feeding axis function
- Minimum command unit: 0.001mm or 0.0001mm can be selected
- Position command range: ±99999999 × minimum command unit
- Rapid traverse speed: When the command unit is 0.001mm, the maximum speed is 60m/min; 0.0001mm, the maximum speed is 24m/min.
- Rapid override: F0, 25%, 50% and 100%, total four levels, real-time adjustment;
- Feeding override: total 16 levels: 0～150%, real-time adjustment;
- Interpolation mode: linear, arc and spiral interpolation and rigid tapping

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- ◆ Auto chamfering

- ■ **Acceleration and deceleration function**
  - ◆ Cutting feeding: Acceleration or deceleration in linear type/index type or front/rear is selectable.
  - ◆ Rapid traverse: Acceleration or deceleration in linear type/index type or front/rear is selectable.
  - ◆ Tapping: Acceleration or deceleration in linear type/index type or front/rear is selectable.
  - ◆ The starting speed, finishing speed and time of acceleration and deceleration are set by the parameter.

- ■ **Spindle function**
  - ◆ Analog voltage 0V～10V output in two channels, support two-spindle control
  - ◆ Spindle encoder feed back in one channel, the resolution of spindle encoder can be set (0 or 100p/r～5000p/r)
  - ◆ Transmission ratio between encoder and spindle is:（1～255）:（1～255）
  - ◆ Spindle speed: It is specified by S code or PLC signal, the speed range is 0rpm～9999rpm.
  - ◆ Spindle override: total 8 levels: 50%～120%, real-time adjustment
  - ◆ Spindle constant surface speed control
  - ◆ Tapping cycle/rigid tapping

- ■ **Tool function**
  - ◆ Tool length compensation
  - ◆ Tool radius compensation (C type)
  - ◆ Tool wearing compensation
  - ◆ Tool life management

- ■ **Precision compensation**
  - ◆ Backlash compensation
  - ◆ Pitch error compensation in memory type

- ■ **PLC function**
  - ◆ PLC program in two levels, maximum 5,000 steps, the refresh cycle of the 1st level program: 8ms.
  - ◆ PLC program communication download
  - ◆ Support PLC warning and PLC alarm
  - ◆ Support many PLC programs (maximum 16), the current running PLC program can be selected
  - ◆ Basic I/O: input in 40 points/output in 32 points

- ■ **Man-machine interface**
  - ◆ 7.4″large screen LCD, the resolution is 234×480
  - ◆ Display in Chinese, English, Spanish or Russian, etc
  - ◆ Display in processing path and it can real-time zoom in and out, translation and scroll lock.
  - ◆ Real-time clock

- **Operation management**
  - ◆ Operation mode: Edit, auto, MDI, machine zero-return, MPG/single step, manual and DNC.
  - ◆ Operation authority of multiple levels management
  - ◆ Alarm record

- **Editing program**
  - ◆ Program capacity: 40M, 10,000 programs (including subprograms, macro programs)
  - ◆ Editing function: program/block/characters research, rewrite and delete
  - ◆ Program format: ISO code, support macro command programming in sentence type
  - ◆ Calling program: It supports macro program with parameter, subprogram nesting of 4 layers

- **Communication function**
  - ◆ RS232: Files of part program and parameter, etc can be transmitted in two-way, DNC real-time processing, support PLC program, serial ports of system software upgrade.
  - ◆ USB: File operation, directly processing files, support PLC program, system software upgrade in flash disc.

- **Safety function**
  - ◆ Emergency stop
  - ◆ Hardware travel limit
  - ◆ Software travel limit
  - ◆ Data restoring and recovering

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List of G codes

CODE	FUNCTION	CODE	FUNCTION	CODE	FUNCTION
G00	Positioning (rapid traverse)	G54	Work piece coordinate system 1	G94	Feeding/min
G01	Linear interpolation (cutting feeding)	G55	Work piece coordinate system 2	G95	Feeding/rev
G02	CW arc/spiral interpolation	G56	Work piece coordinate system 3	G98	Return to initialization plane during fixed cycle
G03	CCW arc/spiral interpolation	G57	Work piece coordinate system 4	G99	Return to point R plane during fixed cycle
G04	Dwell, exact stop	G58	Work piece coordinate system 5	G110	CCW round groove roughing
G10	Set the compensation value	G59	Work piece coordinate system 6	G111	CW round groove roughing
G17	Select XY plane	G65	Macro command	G112	Finishing in CCW full circle
G18	Select ZY plane	G73	Deep hole processing cycle in high speed	G113	Finishing in CW full circle
G19	Select YZ plane	G74	Laevorotatory tapping cycle	G114	CCW outer circle finishing
G20	Input system inch	G80	Cancel fixed cycle	G115	CW outer circle finishing
G21	Input system metric	G81	Drilling hole in cycle (dot drilling cycle)	G134	CCW rectangle groove roughing
G28	Reference point return	G82	Drilling in cycle (boring stage hole cycle)	G135	CW rectangle groove roughing
G29	Return from reference point	G83	Deep hole drilling in cycle	G136	CCW rectangle groove finishing
G30	Reference points 2nd, 3rd and 4th return	G84	Tapping in cycle	G137	CW rectangle groove finishing
G31	Jumping function	G85	Boring hole in cycle	G138	CCW rectangle outer finishing
G40	Cancel tool radius compensation	G86	Drilling hole in cycle	G139	CW rectangle outer finishing
G41	Tool radius left compensation	G88	Boring hole in cycle	G140	CW rectangle continuous drilling
G42	Tool radius right compensation	G89	Boring hole in cycle	G141	CCW rectangle continuous drilling
G43	Tool length positive compensation	G90	Absolute value programming	G142	CW arc continuous drilling
G44	Tool length negative compensation	G91	Increment value programming	G143	CCW arc continuous drilling
G49	Cancel tool length compensation	G92	Set coordinate system		

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GSK980MDa adopts the same configuration software GSKComm, and ladder diagram editing software GSKLadder，GSKComm and GSKLadder, which are run in WIN98/2000/XP, with GSK980MD. The users can edit part program, transmit the part programs, parameter, tool compensation and pitch between PC and CNC in two-way in GSKComm of PC, and DNC real-time processing. The machine manufacturer can edit the ladder diagram in GSKLadder， and upload and download PLC programs between PC and CNC
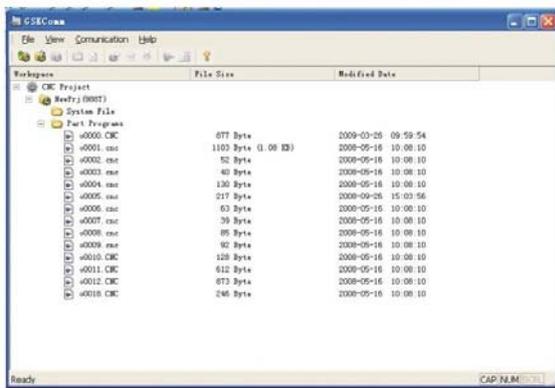
Communication software GSKComm interface
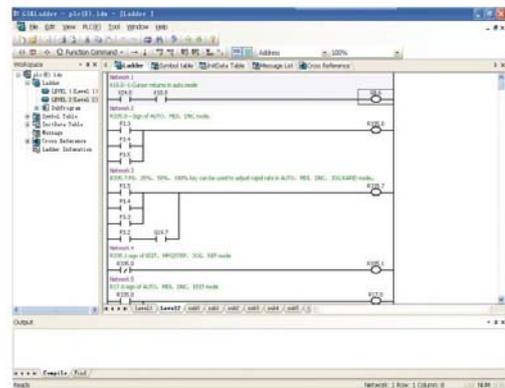
PLC Ladder diagram editing software GSKLadder interface

User installation processing diagram