CNCmakers Limited

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C1000T introduction

Product introduction

C1000T can control 5 feed axes(including C axis), 2 analog spindles, 1ms high-speed interpolation, 0.1μm control precision, which can obviously improve the machining efficiency, precision and surface quality.

Volume Ⅰ Programming

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X, Z, Y, 4th, 5th ; axis name and axis type of Y, 4th, 5th can be defined

1ms interpolation period, control precision 1μm, 0.1μm

Max. speed 60m/min (up to 24m/min in 0.1μm)

Adapting to the servo spindle to realize the spindle continuously positioning, rigid tapping, and the rigid thread machining

Built-in multi PLC programs, and the PLC program currently running can be selected

Statement macro command programming, macro program call with parameter

Metric/inch programming, automatic toolsetting, automatic chamfer, tool life management function

Chinese, English display can be selected by parameters.

USB interface, U disc file operation, system configuration and software

2-channel 0V ~ 10V analog voltage output, two-spindle control

1-channel MPG input, MPG function

36 input signals and 36 output signals

Appearance installation dimension, and command system are compatible with C1000T

Volume Ⅰ Programming

Technical specification

Controllable axes

Controllable axes: 5 (X, Z, Y , 4th,5th)

Link axes：4

Feed axis function

Least input unit: 0.001mm（0.0001inch）and 0.0001mm（0.00001inch）

Least command unit：0.001mm（0.0001inch）and 0.0001mm（0.00001inch）

Position command range: ±99999999× least command unit

Rapid traverse speed : max. speed 60m/min in 0.001mm command unit

Rapid override: F0, 25%, 50%, 100%

Feedrate override: 0～150% 16 grades to tune

Interpolation mode: linear interpolation, arc interpolation(three-point arc interpolation), thread interpolation and rigid tapping

Automatic chamfer function

Thread function

General thread(following spindle)/rigid thread

Single/multi metric, inch straight thread, taper thread, end face thread, constant pitch thread and variable pitch thread

Thread run-out length, angle, speed characteristics can be set

Thread pitch: 0.01mm～500mm or 0.06 tooth/inch～2540 tooth/inch

Acceleration/deceleration function

Cutting feed: front acceleration/deceleration linear, front acceleration/deceleration S back acceleration/deceleration linear,back acceleration/deceleration exponent

Rapid traverse: linear,S type

Thread cutting: linear, exponential

Initial speed, termination speed, time of acceleration/deceleration can be set by parameters.

Spindle function

2-channel 0V～10V analog voltage output, two-spindle control

1-channel spindle encoder feedback, spindle encoder line can be set（100p/r～5000p/r）

Transmission ratio between encoder and spindle:（1～255）:（1～255）

Spindle speed: it is set by S or PLC, and speed range: 0r/min～9999r/min

Spindle override: 50%～120% 8 grades tune

Spindle constant surface speed control

Rigid tapping

Tool function

Tool length compensation

Tool nose radius compensation（C）

Tool wear compensation

Tool life management

Tool setting mode: fixed-point tool setting, trial-cut tool setting, reference point return tool setting, automatic tool setting

Tool offset execution mode: modifying coordinate mode, tool traverse mode

Precision compensation

Backlash compensation

Memory pitch error compensation

PLC function

Two-level PLC program，up to 5000 steps，the 1st program refresh period 8ms

PLC program communication download

PLC warning and PLC alarm

Many PLC programs（up to 20PCS），the PLC program currently running can be selected

Basic I/O：18 input signals /18 output signals

Man-machine interface

8.0″ wide screen LCD，resolution: 800X600

Chinese, English display

Planar tool path display

Real-time clock

Operation management

Operation mode: edit, auto, MDI, machine zero return, MPG/single, manual, program zero return

Multi-level operation privilege management

Alarm record

Program edit

Program capacity: 56MB，400 programs（including subprograms and macro programs）

Edit function: program/block word search, modification, deletion,copying,pasting

Program format: ISO command, statement macro command programming, relative coordinate, absolute coordinate and compound coordinate programming

Program call: macro program call with parameter, 4-level program built-in ,,

Communication function

RS232：two-way transmitting part programs and parameters, PLC program, system software serial upgrade

USB：U file operation, U file directly machining, PLC program, system software U upgrade

Safety function

Emergency stop

Hardware travel limit

Software travel check

Data backup and recovery

Volume Ⅰ Programming

G command table

Command	Function	Command	Function	Command	Function
G00	Rapid traverse (positioning)	G40	Tool nose radius compensation cancle	G96	Constant surface speed control
G01	Linear interpolation	G41	Tool nose radius compensation left	G97	Constant surface speed control cancel
G02	CW arc interpolation	G42	Tool nose radius compensation right	G98	Feed per minute
G03	CCW arc interpolation	G50	Floate workpiece coordinate system	G99	Feed per revolution
G04	Dwell, exact stop	G54~G59	Workpiece coordinate system setting		
G17	Plane selection command	G65	Macro command non-modal call		
G18	Plane selection command)	G71	Axial roughing cycle		
G19	Plane selection command	G72	Radial roughing cycle		
G10	Data input mode ON	G73	Closed cutting cycle		
G11	Cancle data input mode	G74	Axial grooving cycle		
G20	Input in inch	G75	Radial grooving cycle		
G21	Input in metric	G76	Multiple thread cutting cycle		
G28	Automatic return machinel zero point	G80	Rigid tapping state cancel		
G30	2nd, 3rd, 4th reference point	G84	Axial rigid tapping		
G31	Skip function	G88	Radial rigid tapping		
G32	Constant pitch thread cutting	G90	Axial cutting cycle		
G33	Z tapping cycle	G92	Thread cutting cycle		
G34	Thread cutting with variable lead	G94	Radial cutting cycle		

Environment and conditions

C1000T storage delivery, working environment as follows:

Item	Working conditions	Storage delivery conditions
Ambient temperature	0℃~45℃	-40℃~+70℃
Ambient humidity	≤90%(no freezing)	≤95%(40℃)
Atmosphere pressure	86 kPa~106 kPa	86 kPa~106 kPa
Altitude	≤1000m	≤1000m

Power supply

C1000T can normally run in the following AC input power supply.
Voltage: within(0.85 ~ 1.1)×rated AC input voltage (AC 220V); Frequency: 49Hz ~ 51Hz continuously changing

1.1.5 Guard

C1000T guard level is not less than IP20.

CNC system of machine tools and CNC machine tools

CNC machine tool is an electro-mechanical integrated product, composed of Numerical Control Systems of Machine Tools, machines, electric control components, hydraulic components, pneumatic components, lubricant, cooling and other subsystems (components), and CNC systems of machine tools are control cores of CNC machine tools. CNC systems of machine tools are made up of computerized numerical control(CNC), servo (stepper) motor drive devices, servo (or stepper) motor etc.
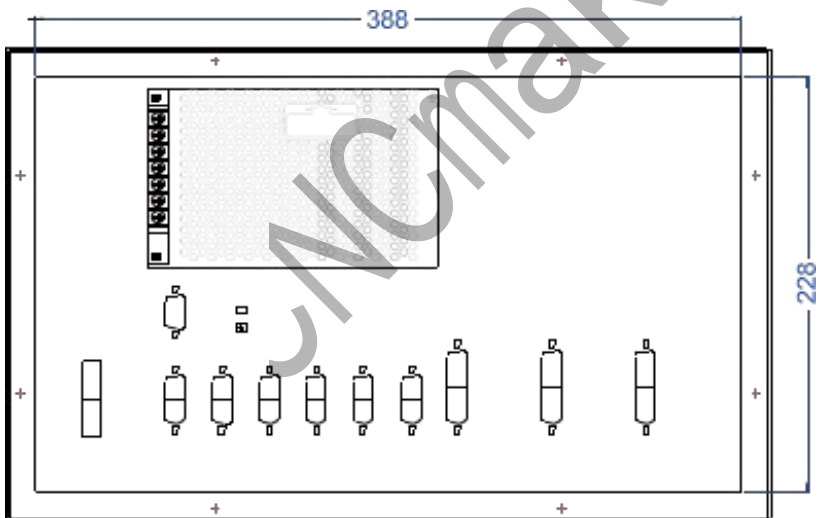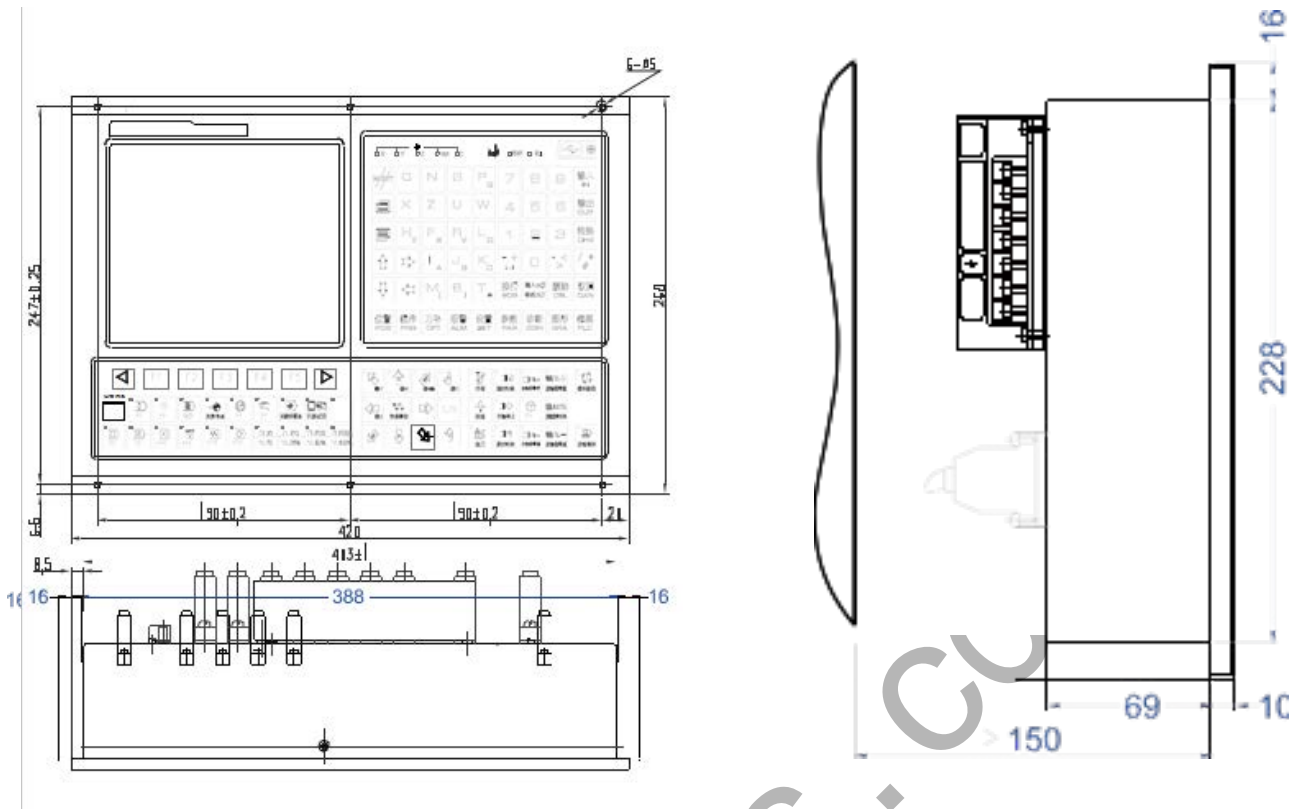
Operational principles of CNC machine tools: according to requirements of machining technology, edit user programs and input them to CNC, then CNC outputs motion control commands to the servo (stepper) motor drive devices, and last the servo (or stepper) motor completes the cutting feed of machine tool by mechanical driving device; logic control commands in user programs to control spindle start/stop, tool selections, cooling ON/OFF, lubricant ON/OFF are output to electric control systems of machine tools from CNC, and then the electric control systems control output components including buttons, switches, indicators, relays, contactors and so on. Presently, the electric control systems are employed with Programmable Logic Controller (PLC) with characteristics of compact, convenience and high reliance. Thereof, the motion control systems and logic control systems are the main of CNC machine tools.

C1000T Turning Machine CNC system has simultaneously motion control and logic control function to control two axes of CNC machine tool to move, and has nested PLC function. Edit PLC programs (ladder diagram) according to requirements of input and output control of machine tool and then download them to C1000T Turning Machine CNC system, which realizes the required electric control requirements of machine tool, is convenient to electric design of machine tool and reduces cost of CNC machine tool.
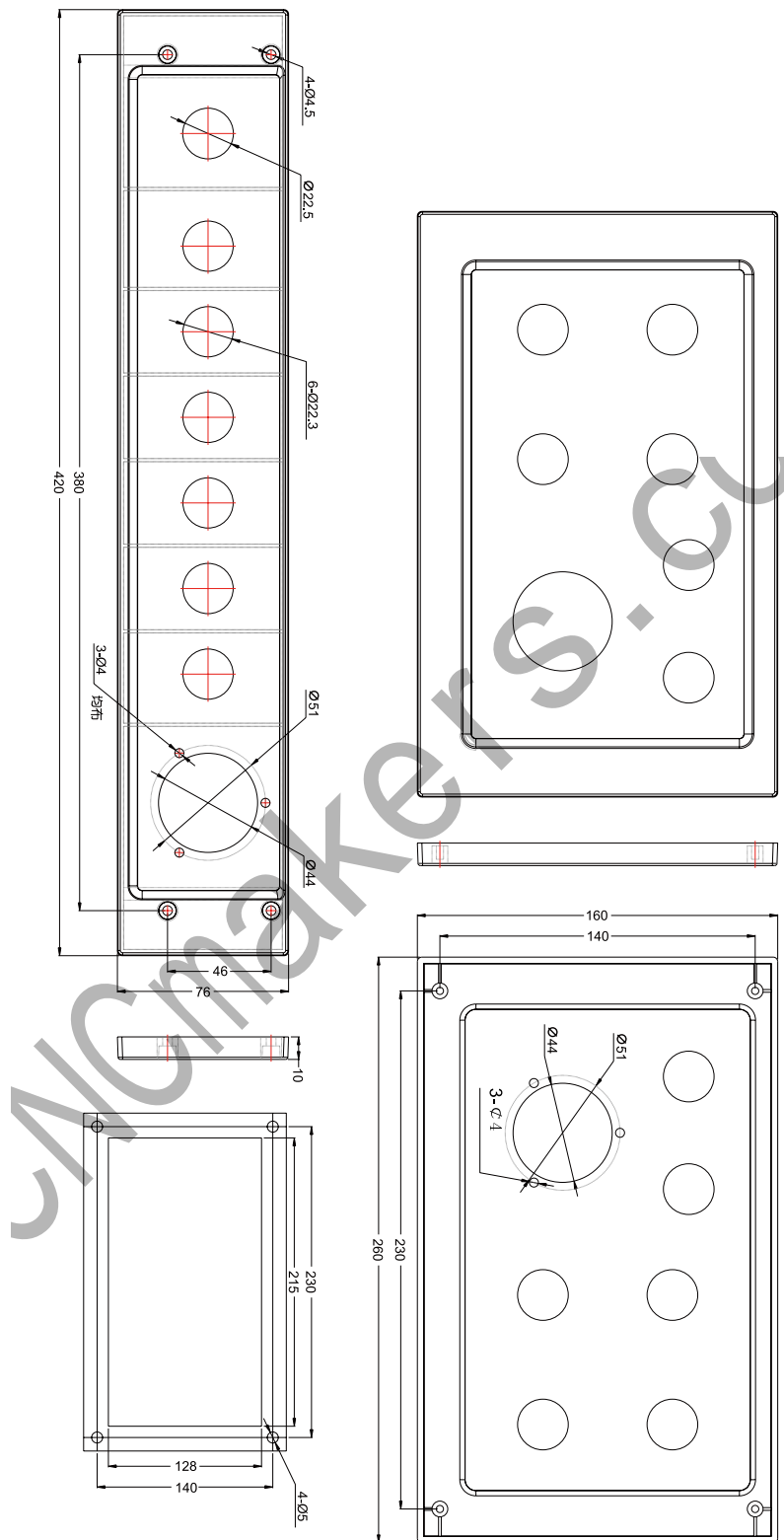
Software used to control C1000T Turning Machine CNC system are divided into system software (NC for short) and PLC software (PLC for short). NC system is used to control the display, communication, edit, decoding, interpolation and acceleration/deceleration, and PLC system for controlling explanations, executions, inputs and outputs of ladder diagrams.

Standard PLC programs are loaded (except for the special order) when C1000T Turning Machine CNC System is delivered, concerned PLC control functions in following functions and operations are described according to control logics of standard PLC programs, marking with "Standard PLC functions" in C1000T Turning CNC System User Manual. Refer to Operation Manual of machine manufacturer about functions and operations of PLC control because the machine manufacturer may modify or edit PLC programs again.

C1000T contour dimension

Additional panel dimensions