Overview
ServoWorks™ S-100T™ is a unique PC-based CNC controller for lathes, providing 2-axis motion control with a spindle, or 3-axis motion control including a C axis.

ServoWorks™ S-120T™ adds one additional axis, providing 3-axis motion control with a spindle, or 4-axis motion control including a C axis.

This industrial CNC solution supports all standard lathe operational functions and features, including indexing, plus live tools and all-axes simultaneous interpolation with a spindle (C axis). High performance CNC functionality and productivity allow customers to produce complex and precise parts quickly and easily.

Standard CNC Lathe Functions
- Drilling
- Profiling
- Grooving
- Cutting
- Chamfering
- Indexing
- Boring
- Multi-pass threading

Spindle Control Features
- Manual spindle control
- Spindle speed override (50 – 120%)
- Constant surface speed control (CSS)
- Actual spindle speed measurement and display
- Spindle gear change – supports up to 4 gear stages
- Spindle speed check

C-Axis Control and Live Tool Features
- Full interpolation of X, Z and C axes
- Cylindrical interpolation
- Polar coordinate interpolation
- Face drilling
- Face tapping
- Face boring
- Side drilling
- Side tapping
- Side boring
- End face cutting cycle

Tool Compensation Features
- Tool offset compensation: geometry and wear offsets
- 99 pairs of tool offsets
- Easy tool offset measurement: no calculations needed
- Tool nose radius compensations

Macro Functions
- Supports local, global, permanent, and system variables (including symbolic global variables)
- Unlimited nesting of branching and repetition conditional statements
- Extensive math operations

Product Features
- Provides powerful, automatic execution of part programs, processing up to 1000 blocks per second
- Least input increment and accuracy: 1E−9 mm/ 1E−10 in. (0.000000001 mm/0.0000000001 in.)
- Workpiece coordinates (one external zero offset and 6 workpiece coordinate systems)
- Maximum positioning speed: 300 M/min
- Maximum cutting feedrate: 60 M/min
- Operates with or without a touch panel
- Can be used with a manual pulse generator (handwheel)
- Quick and easy system setup
- Can operate on the EtherCAT and MECHATROLINK™ II and III platforms
- Available for GUI display in English and Simplified Chinese

PLC Features
- Integrated soft motion and soft PLC
- Includes LadderWorks PLC, an independent PLC package including a real-time soft PLC Engine.

Consult the ServoWorks CNC Product Parts List or your Soft Servo Systems sales representative regarding standard and optional features for this product.
**Display Features**
- Simple, user-friendly colorful GUI — will seem familiar because it is Windows-based
- Full-screen single window with static display areas, permanently anchored toolbars and easy-to-use soft buttons for giving commands, accessing information
- Displays position data, plot, I/O status, servo status, NC status and motion monitoring
- Real-time program execution, position display and plotting
- Real-time I/O, servo, NC status and motion monitoring
- Data display is configurable on-the-fly, in terms of what position types are displayed

**Interface Features**
- Simple and intuitive HMI — easy to learn and easy to use
- Icon- and soft keys-based operation for manual data input
- 800 user configurable alarm messages programmable through PLC
- Manual NC modes:
  1. Jog Continuous Mode
  2. Jog Incremental Mode
  3. Home Mode
  4. Rapid Mode
  5. MDI Mode
  6. HandWheel Mode (manual jog with a pulse generator)
  7. Spindle Mode
- Auto Mode: real-time monitoring of G-code execution, with a part counter and a cycle timer
- On-line, interactive part program editing
- Graphical G-code input and editing facilitates part program creation
- Easy connection of equipment to business-oriented applications running on the network
- Password protection for parameter settings
- The ServoWorks S-100T Windows HMI application can be fully customized by using the ServoWorks Development Kit (SDK)

**Supported G Codes**
- G00 Positioning (rapid traverse)
- G01 Linear interpolation
- G02, G03 CW/CCW circular interpolation
- G04 Dwell
- G09 Exact stop check
- G10 Programmable data input
- G20, G21 Inch/metric data input
- G22, G23 Barrier check on/off
- G24, G26 Spindle speed fluctuation detection off/on
- G28, G29 Automatic zero return to/from the reference point
- G30 Automatic zero return to 2nd, 3rd & 4th reference points
- G32 Thread cutting with a constant lead
- G40, G41 Tool nose radius compensation cancel/left/right
- G50 Coordinate system preset and maximum spindle RPM
- G52 Local coordinate preset
- G53 Machine coordinate selection
- G54–G59 Workpiece coordinate selection
- G61 Exact stop check mode
- G64 Continuous cutting mode
- G65 Simple macro call
- G70 Finishing cycle
- G71, G72 Stock removal in turning/facing
- G73 Pattern repeat cycle
- G74 End face peck drilling/grooving
- G75 Outer diameter/inner diameter grooving
- G76 Multiple-pass threading cycle
- G80 Hole machining canned cycle cancel
- G83 Face drilling cycle
- G84 Face tapping cycle
- G85 Face boring cycle
- G87 Side drilling cycle
- G88 Side tapping cycle
- G89 Side boring cycle
- G90 Outer diameter/inner diameter cutting cycle
- G92 Thread cutting cycle
- G94 End face cutting cycle
- G96, G97 Constant surface speed control set/cancel
- G98, G99 Per minute/per revolution feed
- G107 Cylindrical interpolation
- G112, G113 Polar coordinate interpolation mode set/cancel
- G164 Continuous cutting mode with block rollover

**Supported M Codes**
- Program stop (M00)
- Optional stop (M01)
- Program end/program end and rewind (M02/M30)
- Spindle CW (M03) and spindle CCW (M04)
- Spindle stop (M05)
- Coolant on/off (M08, M09)
- Chuck unclamp/clamp, collet open/close (M10, M11)
- Indexing — spindle orientation, spindle rotation mode (M19, M20)
- Live tools control (M50–M55)
- Subprogram calls (M98/M99)
- Up to 82 customizable M codes through PLC