

Features and Specifications



Summary for ServoWorks™ CNC Products

Overview

Soft Servo Systems, Inc. offers a variety of ServoWorks™ CNC products. The features and specifications listed here are common to ServoWorks MC-Quad, S-100M, S-120M, S-140M and S-100T except where noted otherwise. See product specifications for additional features and functions of each CNC solution.

Servo Features

- Complete dual-axis synchronous control (except ServoWorks S-100M and S-100T)
- PID control
- Velocity feedforward
- Servo alarms
- Protective features
- Actual velocity measurement

Macro Features

- 99 local variables
- 400 numbered global variables (their values are lost when the control restarts)
- An unlimited number of symbolic global variables, with meaningful variable naming (such as "#position")
- 500 numbered permanent variables (their values remain even when the control restarts)
- Up to 24,000 system variables (depending upon the number of axes, tool offsets, workpiece coordinate offsets, etc.)
- Extensive math operations:
 - Addition, subtraction, multiplication, division (+, -, *, /)
 - Sin, cos, tan, asin, acos, atan
 - Exponent, square root, absolute value
 - Rounding off, rounding down, rounding up
 - Natural logarithm, exponential function
 - OR, XOR, AND, and NOT
 - Unlimited nesting of parenthesis
- Branching and repetition statements supported: GOTO, IF GOTO, IF THEN, IF ELSE ENDIF, WHILE (with unlimited nesting of branching and repetition statements)
- Macro calls using custom G, M, S and T codes

Integrated Soft PLC

- Ladder logic
- 0.07 μ s/step (Pentium IV 2.4 GHz)
- Max 40,000 steps
- User-friendly ladder editor
- Real-time ladder monitor and time chart
- E-mail and telephone alert

Axis Motion Control Performance

- Up to 16 axes of coordinated motion control (number of axes depends on the ServoWorks CNC application). [VersioBus interface system: 16-axis coordinated motion at 1 ms position feedback rate. Scalable in 4-axis increments.]
- Linear and circular interpolation
- Helical interpolation (except ServoWorks S-100T)
- Exponential interpolation (except ServoWorks S-100T)
- Cylindrical interpolation (ServoWorks S-100T)
- Polar coordinate interpolation (ServoWorks S-100T only)
- Electronic gearing – one gearing ratio per axis
- Least input increment and accuracy: 1E-9 mm/ 1E-10 in. (0.000000001 mm/0.000000001 in.)
- Backlash compensation
- Leadscrew pitch error compensation
- Linear scale feedback control
- Linear scale feedback compensation (ServoWorks MC-Quad)
- Smoothing: acceleration and deceleration can be programmed for linear, bell-shaped and exponential filters
- Velocity feedforward to improve motion performance
- 16-bit analog output per axis (VersioBus interface system)
- Opto-isolated overtravel limit switch inputs and home switch inputs for each axis (VersioBus interface system)
- Corner deceleration control for sharper corners while maintaining high feedrates away from corners
- 1000 cycle three-dimensional dynamic look-ahead contour control (3D-DLACC) with pre-interpolation acceleration for high-speed, high-precision machining for all ServoWorks CNC products except ServoWorks S-100T [VersioBus interface system: one second look-ahead for 1 ms position feedback rate]

Operational Features

- High-speed block processing of up to 1000 blocks/sec.
- Single block
- Optional block skip
- Dry run
- Individual axis machine lock
- Individual axis and individual direction (forward and reverse) interlock (ServoWorks MC-Quad and ServoWorks S-100T)
- Handwheel feed interruption
- Manual intervention and return with manual absolute function
- Cycle start, cycle stop/feed hold
- Emergency stop
- Overtravel limits (hardware limit switches and software stroke limits)
- Machine, workpiece, local and relative coordinates
- Standard STMB functions
- Program stop (M00)
- Optional stop (M01)
- Program rewind (M30)
- Subprogram call from a main program (M98)
- End of subprogram and return to main program (M99)
- Three homing types
- PLC axes (ServoWorks S-120M and S-140M)
- Modes of motion include jogging, manual jogging with an optional handwheel, and rapid positioning

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 and 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

Feed Features

- Maximum positioning speed: 300 M/min
- High-speed cutting function (maximum cutting feedrate): 60 M/min
- Dwell
- Manual feed with an optional pulse generator: x1, x10, x100, x1000 (except ServoWorks S-100T, which has x1, x10 and x100)
- Rapid traverse override (0 – 100%)
- Manual feedrate override (ServoWorks S-100T: 0 – 230%, all other ServoWorks CNC applications: 0 – 254%)
- Per minute feed and per revolution feed (ServoWorks S-100T, S-100M, S-120M and S-140M)

Part Program Storage and Editing

- Windows standard file management
- Storage of part programs is limited only by the size of your PC's hard drive
- Unlimited file size text editor
- Read from and write to your PC's floppy disk, zip disk, compact flash memory drive or PCMCIA card – whatever your PC includes for storage
- Save and load part programs over a LAN through the Ethernet

Interface Features

- Simple and intuitive HMI – easy to learn and easy to use
- Icon- and soft keys-based operation for manual data input
- Manual NC modes, including Jog Mode, Home Mode, Rapid Mode, MDI Mode, HandWheel Mode (manual jog with a pulse generator) and more
- Auto Mode: real-time monitoring of G-code execution, with a part counter and a cycle timer
- 800 user configurable alarm messages programmable through PLC
- Password protection for parameter settings
- Easy connection of equipment to business-oriented applications running on the network
- All ServoWorks CNC Windows HMI applications can be fully customized using the ServoWorks Development Kit (SDK)

Consult the [ServoWorks CNC Product Parts List](#) or your Soft Servo Systems sales representative regarding standard and optional features for these products.



Soft Servo Systems, Inc.
Control the Future

39 Whitcomb Street, Waltham, MA 02453, USA Tel: 1.781.891.9555 Fax: 1.781.891.3853 www.softservo.com

Send inquiries to: info_usa@softservo.com

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