

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, S-160M 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 II 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 II interface system)
- Opto-isolated overtravel limit switch inputs and home switch inputs for each axis (VersioBus II 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 II 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, S-140M and S-160M)
- 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, S-140M and S-160M)

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)
- GUIs available in multiple languages

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

Send inquiries to: info_usa@softservo.com

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Tel: 1.781.891.9555

Fax: 1.781.891.3853

www.softservo.com