

Complete CNC Solutions for Mills:

ServoWorks™ S-100M™ /S-120M™ /S-140M™ /S-160M™

Overview

These innovative PC-based industrial CNC controllers are for three-, four-, five- or seven-axis mills and machining centers; laser, plasma and waterjet cutting machines; EDM machines; grinding and shearing machines, etc. This series includes four products that encompass a wide range of multi-axis solutions:

ServoWorks Product	Spindle Axis	Number of coordinated CNC axes	Number of PLC axes or synchronous control axes	TOTAL AXES
S-100M	✓	3	0	4
S-120M	✓	4	3	8
S-140M	✓	5	2	8
S-160M	✓	7	8	16

CNC Milling Functions

- 3 axes (S-100M), 4 axes (S-120M), 5 axes (S-140M) or 7 axes (S-160M) simultaneous control, plus a C axis (spindle) for tapping and positioning capability
- Rigid tapping
- Split (dual) axis for gantry type control (except S-100M)
- 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 milling [VersioBus II interface system: one second look-ahead for 1 ms position feedback rate]
- High-speed / high-precision machining: 60 m/min (2400 in/min)
- Complete drilling and boring canned cycles

Spindle Control Features

- Manual spindle control
- Spindle CW (M03), spindle CCW (M04), spindle stop (M05)
- Spindle speed override (50 - 120%)
- Actual spindle speed measurement and display
- Spindle orientation
- C axis control

Product Features

- Complete dual-axis synchronous control (except S-100M)
- Provides powerful, automatic execution of motion (part programs, processing up to 1000 blocks per second)
- Linear scale feedback control
- 6 workpiece coordinate systems
- Maximum positioning speed: 300 M/min
- Operates with or without a touch panel
- Can be used with a manual pulse generator (handwheel)
- Includes the ServoWorks MotionLite application for servo setup, configuration and tuning
- Can operate on the EtherCAT, VersioBus™ II, Panasonic Realtime Express™, MECHATROLINK™, Mitsubishi SSCNET™ or CANopen communication platforms
- Available for GUI display in English, Japanese, Korean, Simplified Chinese or Traditional Chinese

PLC Features

- PLC axes for independent, individual positioning (except S-100M)
- Integrated soft motion and soft PLC (ideal for high-speed milling)
- Includes LadderWorks PLC, an independent PLC package including a real-time soft PLC Engine and the LadderWorks Console - a Win32 application with a user-friendly ladder editor for editing, monitoring, debugging and compiling PLC sequence programs.
- 800 user configurable alarm messages programmable through PLC



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

Supported G Codes

G00 Rapid traverse
G01 Linear interpolation
G02, G03 CW/CCW circular or helical interpolation
G02.3, G03.3 Positive/negative exponential interpolation
G04 Dwell
G05/G08 Dynamic look-ahead contour control on/off
G10 Program data input
G17, G18, G19 XY/ZX/YZ plane selection
G20, G21 Inch/metric data input
G28, G29 Automatic return to/from the reference point
G30 Automatic return to the 2nd, 3rd, & 4th reference points
G31 Skip cutting
G37 Automatic tool length compensation calibration
G40, G41, G42 Tool radius compensation (TRC) cancel/
left/right
G40.1, G41.1, G42.1 Normal direction control cancel/left/
right
G43, G44 Positive/negative tool length compensation
G43.2 Tool center point (TCP) control
G49 Tool length compensation cancel / TCP cancel
G50, G51 Scaling off/on
G50.1, G51.1 Mirror image off/on
G52 Local coordinate system selection
G53 Machine coordinate system selection
G54-G59 Workpiece coordinate system 1-6 selection
G54.1 Additional workpiece coordinate system selection
G61 Exact stop check mode
G64 Continuous cutting mode
G64.1 Continuous cutting mode with block rollover
G65 Simple macro call
G68, G69 Coordinate system rotation on/cancel
G73 High speed peck drilling cycle
G74 Counter tapping cycle
G76 Fine boring cycle
G80 Canned cycle cancel
G81 Drilling cycle, spot boring
G82 Drilling cycle (dwell)
G83 Peck drilling cycle
G84 Tapping cycle
G85 Boring cycle
G86 Boring cycle (spindle stop)
G87 Back boring cycle
G89 Boring cycle (dwell)
G90, G91 Absolute/incremental command programming
G92 Workpiece coordinate programming
G94 Feed per minute mode
G95 Feed per revolution mode
G98, G99 Return to initial point / R point in canned cycle
G310, G311 Linear interpolation feedrate include/exclude
rotary axes

Macro Functions

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

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:
 - 1) Jog Continuous Mode
 - 2) Jog Incremental Mode
 - 3) Rapid Mode
 - 4) MDI Mode
 - 5) Home 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
- Easy connection of equipment to business-oriented applications running on the network
- Password protection for parameter settings
- HMI can be fully customized by using the ServoWorks Development Kit (SDK)

Display Features

- User-friendly, Windows-based colorful GUI – a full-screen, single window with static display areas, permanently anchored toolbars and easy-to-use soft buttons, for giving commands and accessing information
- Displays real-time position data, plot, I/O status, servo status, NC status and motion monitoring
- Real-time program execution, position display and plotting
- Data display is configurable on-the-fly, in terms of what position types are displayed

Tool Compensation Features

- Tool offset compensation: geometry and wear offsets
- 256 pairs of tool offsets
- Automatic tool length compensation calibration

