SL Series CNC Lathes

New from Milltronics USA

MILLTRONICS USA
LET'S INVENT

Waconia, Minnesota

Headquarters in Waconia, Minnesota

Milltronics USA

Founded in 1973 with over 45 years building machines and controls

- 14,000 machines installed worldwide

A member of the Hurco Companies Machine Tool Group

- Publicly traded company on NASDAQ
- About 800 employees (250 in USA)
- Plants in Indiana, Minnesota, Italy and Taiwan

Minnesota team includes machine design, software, controls, electrical and mechanical engineering

- Also manufacturing, assembly, finance, sales, service, training and applications

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New SL-II Series

CNC Slant-bed Lathes

New SL-II Series

SL means slant lathe, II differentiates from previous generation

- Belted, hydraulic turret – affordable pricing
- Roller ways, direct coupled ballscrews
- Pre-configured machines built to stock (inventory)
- New 9000 Series control

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Chuck size	6” 3-jaw
Spindle nose	A2-5
X/Z travels	7” x 14”
Max turn diameter	12.44”
Max part length	13.38”
Bore/draw tube ID	2.2”/1.77”

SL6-II Spec Summary

Spindle RPM	6,000 rpm
Spindle acc full RPM	4 sec
Spindle de-acc full stop	4.5 sec
Horsepower (peak)	17 hp
Torque	84 ft lbs
Rapid traverse (X/Z)	1181 ipm
Turret stations	12 tools
Tooling size	.75” x .75”
Max boring bar	1.25”
Tool change (adj/frth)	.4/1.4 sec
Repeatability (VDI 3441)	+/- .0001”
Weight	7,000 lbs
MSRP	$51,195

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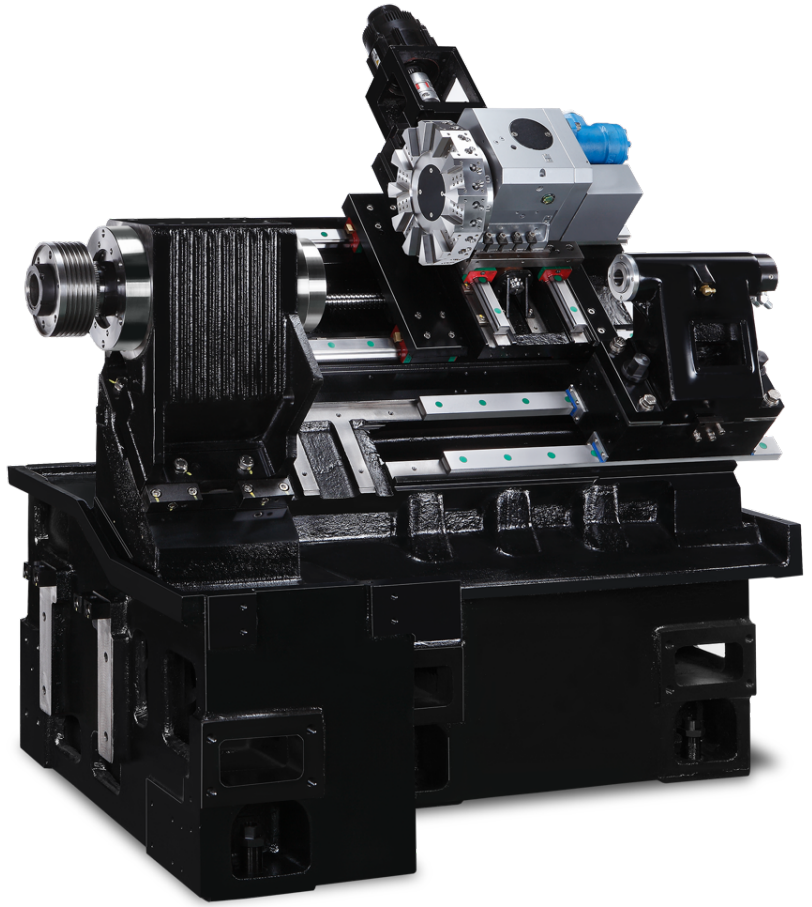
Well Built – SL6-II

Cast iron frame designed with Finite Element Analysis (FEA)
True 45 degree slant bed
Linear motion roller guideways all axes (30 mm X, 35 mm Z)
Distance between X axis ways 6.3”
Distance between Z axis ways 11.2”
Brushless Yaskawa AC servos – Sigma V
Hiwin® doublenut pre-loaded ballscrews – direct coupled
1.26” ground ballscrew X, Z (32 mm)
AC spindle motor with Yaskawa drive
Maintenance free cartridge spindle with permanently greased bearings



Bi-directional hydraulic turret – 2,337 lbs clamping force
Optional hydraulic tailstock mounted on heavy-duty steel rails

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SL8-II Spec Summary

Chuck size	8” 3-jaw
Spindle nose	A2-6
X/Z travels	8” x 21”
Max turn diameter	14”
Max part length	21”
Bore/draw tube ID	3”/2.54”
Spindle RPM	4,000 rpm
Spindle acc full RPM	6.5 sec
Spindle de-acc full stop	6.5 sec
Horsepower (peak)	22 hp
Torque	164 ft lbs
Rapid traverse (X/Z)	1181 ipm
Turret stations	12 tools

Tooling size	1” x 1”
Max boring bar	1.5”
Tool change (adj/frth)	.6/1.4 sec
Repeatability (VDI 3441)	+/- .0001”
Weight	8,885 lbs
MSRP	$64,995

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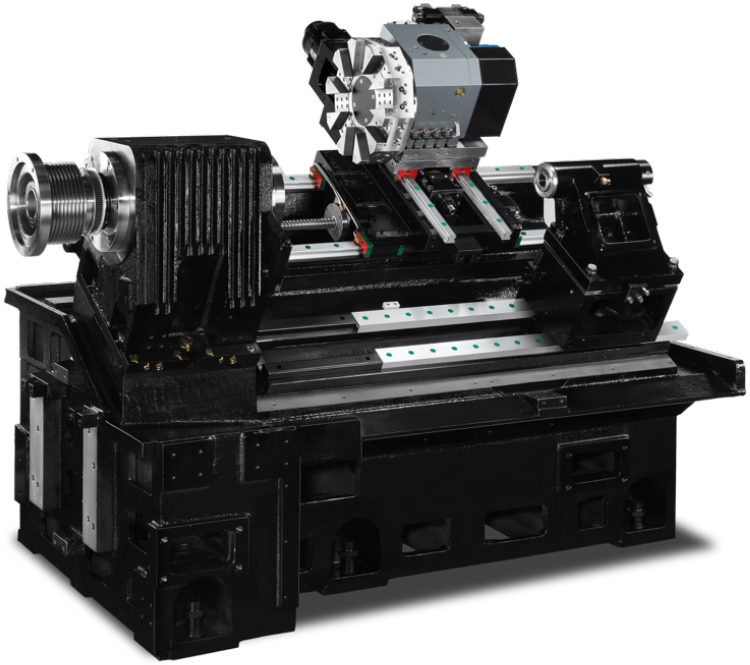

Well Built – SL8-II

Cast iron frame designed with Finite Element Analysis (FEA)
True 30 degree slant bed
Linear motion roller guideways all axes (30 mm X, 35 mm Z)
Distance between X axis ways 6.46”
Distance between Z axis ways 11.95”

Brushless Yaskawa AC servos – Sigma V
Hiwin® doublenut pre-loaded pre-tensioned ballscrews anchored on both ends – direct coupled
1.26” ground ballscrew X, Z (32 mm)
AC spindle motor with Yaskawa drive
Maintenance free cartridge spindle with permanently greased bearings
Bi-directional hydraulic turret – 7,500 lbs clamping force
Optional hydraulic tailstock mounted on heavy-duty steel rails

MILLTRONICS USA
LET'S INVENT

Chuck size	10” 3-jaw
Spindle nose	A2-8
X/Z travels	9.8” x 31.1”
Max turn diameter	17.7”
Max part length	29.92”
Bore/draw tube ID	3.74”/3.18”

SL10-II Spec Summary

Spindle RPM	3,000 rpm
Spindle acc full RPM	6 sec
Spindle de-acc full stop	5 sec
Horsepower (peak)	29.5 hp
Torque	258 ft lbs
Rapid traverse (X/Z)	1181 ipm
Turret stations	12 tools
Tooling size	1” x 1”
Max boring bar	1.5”
Tool change (adj/frth)	.8/1.8 sec
Repeatability (VDI 3441)	+/- .0001”
Weight	10,700 lbs
MSRP	$74,995

MILLTRONICS USA
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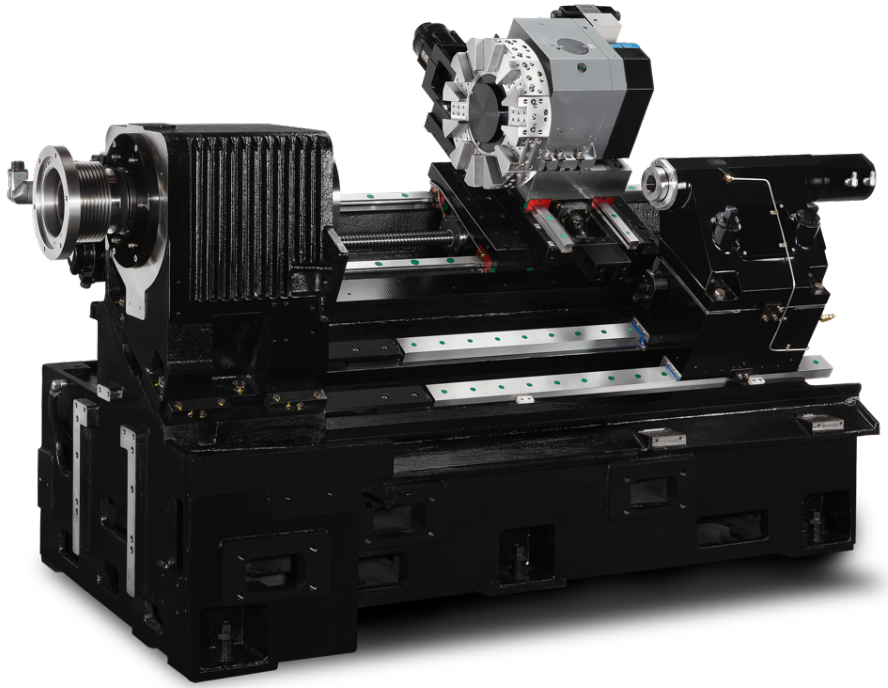
Well Built – SL10-II

Cast iron frame designed with Finite Element Analysis (FEA)
True 30 degree slant bed
Linear motion roller guideways all axes (35 mm X, 45 mm Z)
Distance between X axis ways 7.87”
Distance between Z axis ways 11.98”
Brushless Yaskawa AC servos – Sigma V
Hiwin® doublenut pre-loaded pre-tensioned ballscrews anchored on both ends – direct coupled
1.26” ground ballscrew X (32 mm), 1.57” Z (40 mm)
AC spindle motor with Yaskawa drive



Maintenance free cartridge spindle with permanently greased bearings
Bi-directional hydraulic turret – 7500 lbs clamping force
Optional hydraulic tailstock mounted on heavy-duty steel rails

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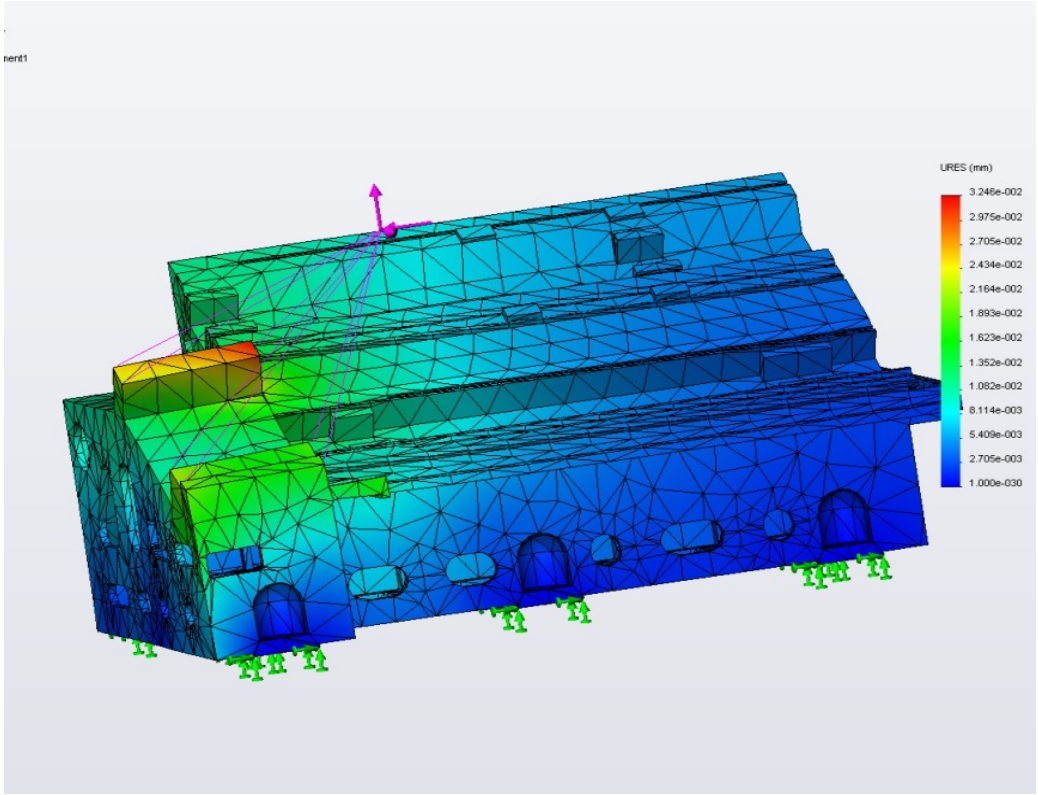
Well Built

True Slant Bed

Finite Element Analysis

Designed with Finite Element Analysis (FEA) – used to evaluate structural rigidity, torsional stiffness, thermal characteristics and natural frequency

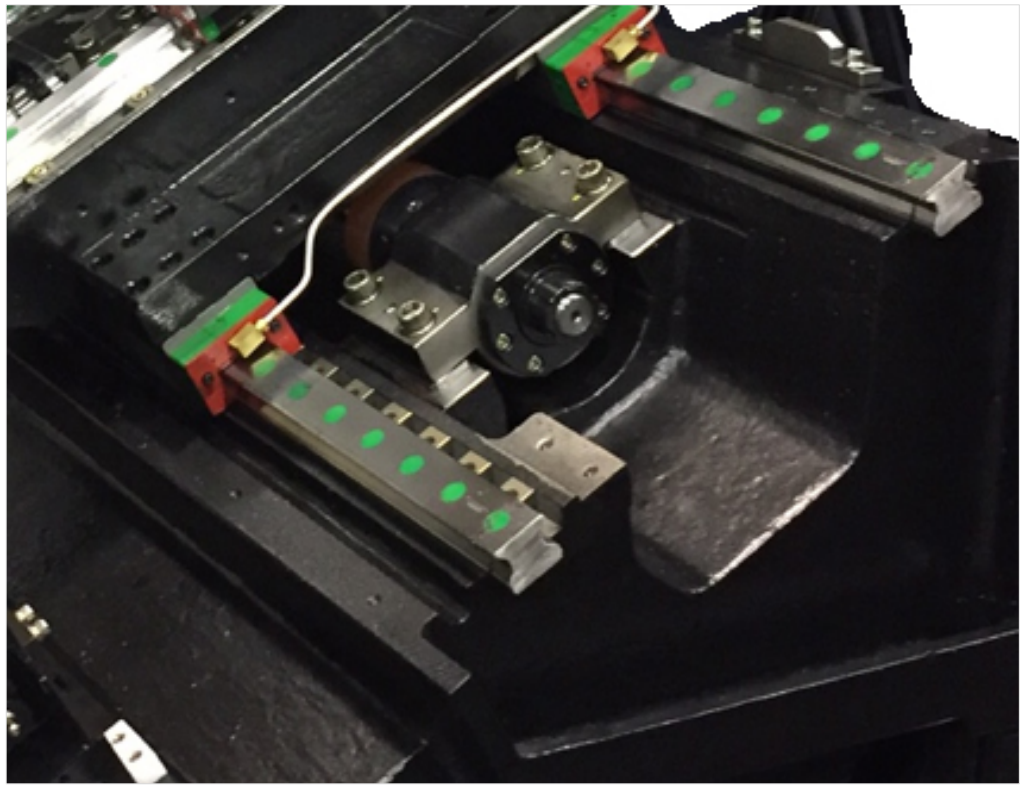
- Rigid one-piece machine base casting yields excellent static and dynamic performance along with outstanding dampening properties



Linear Motion Roller Guides

Milltronics uses Hiwin® linear motion roller guides. These LMG's provide excellent rigidity during heavy cutting with very low friction characteristics that help with higher feed rates:

- Roller ways have more surface contact between the rail and roller than typical ball ways – 40% more rigidity
- Milltronics castings are machined with slot and shoulder for rail - rail is then wedged with fastener to ensure straightness and rigidity

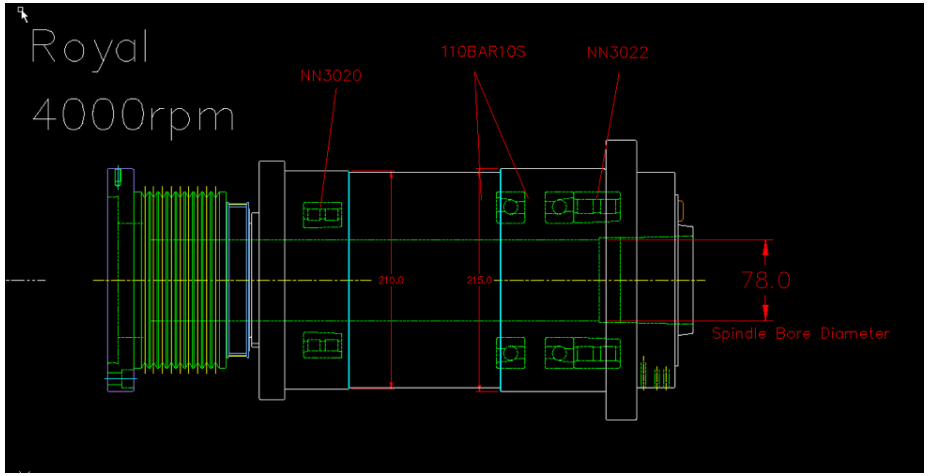


Some competitors just bolt rail to top of casting with no shoulder or wedge locks

SL-II Spindles

SL-II Series spindles are manufactured by Royal and assembled in clean room:

- A2-5/6/8 cartridge-type
- Standard with 3-jaw chuck
- Made of chrome-molly alloy for longer wear and corrosion prevention
- Permanently grease packed and maintenance free
- Precision balanced for long life



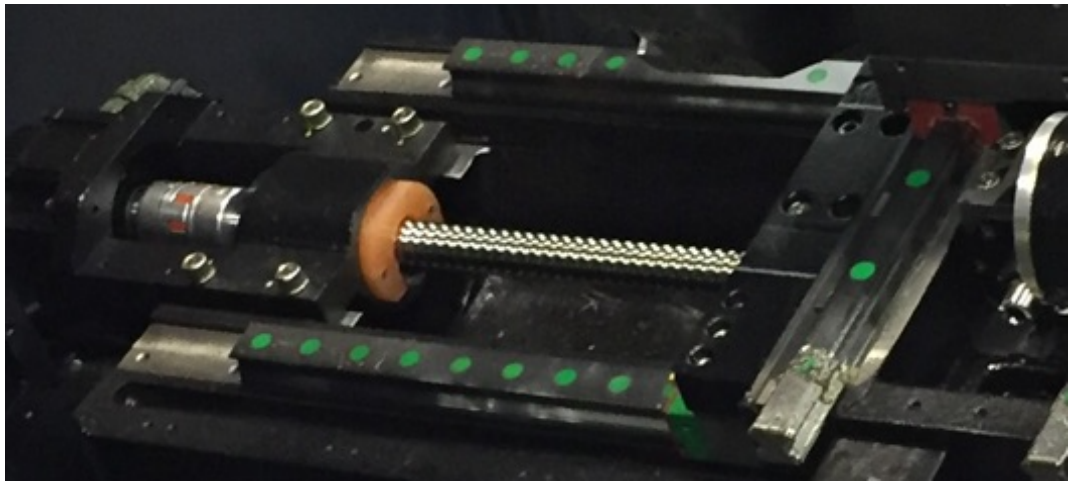
SL8-II Spindle Design

Two (2) rows of roller bearings up front, with two (2) rows of ABEC Class 7 P4 preloaded angular contact bearings mounted right behind. In back, two (2) additional rows of roller bearings provide stiffness and rigidity.

Double-nut Ballscrews

Milltronics uses Hiwin® premium grade double-nut pre-loaded ballscrews that are anchored at both ends (SL8/10-II):

- Double-nut pre-tensioning presents pressure in opposite directions to the ballscrew (SL8/10-II)
- Keeps the nut under tension and prevents backlash
- Produces less heat than a single-nut system such as that used by competition
- Also hardened and ground
- Pre-loaded ABEC 7 precision class angular contact thrust bearings



Ballscrews are direct drive for max performance

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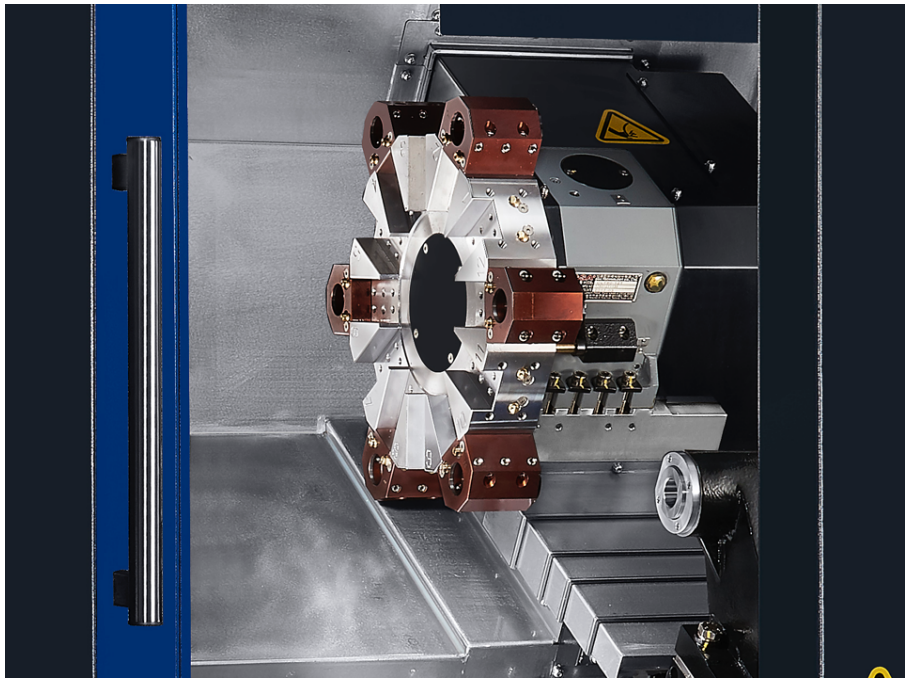
SL-II Turret

Milltronics uses fast, accurate and reliable Sun turrets on the SL Series:

- Standard slotted disk turret takes conventional “stick” tooling with wedge clamps
- 12 stations
- Hydraulically driven and clamped
- Curvic coupling rotation with heavy clamping force
- Bi-directional



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Yaskawa

Milltronics uses state-of-the-art premium servos and drives from Yaskawa, the world's largest manufacturer of motors and drives

- Based in Japan with 8,000 employees worldwide and $2.3 billion revenue
- Strong North American presence - local support
- Yaskawa Sigma V digital drives
  - .625 millisecond velocity loop frequency response time (1.6 kHz)
  - Encoders: 1,048,576 pulses per revolution
  - Enhanced vibration suppression – delivers 5G resistance
  - Higher speed acceleration and deceleration
  - Fast servo adjustments, tuning and troubleshooting with advanced SigmaWin utility

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Chip Management

Milltronics SL Series machines feature internal stainless steel way covers to channel chips into bed of machine

- Optional chip conveyor can dramatically improve housekeeping
- Chip conveyor is easily removable from front
  - No coolant leakage from movement
  - Saves floor space- no tank maintenance

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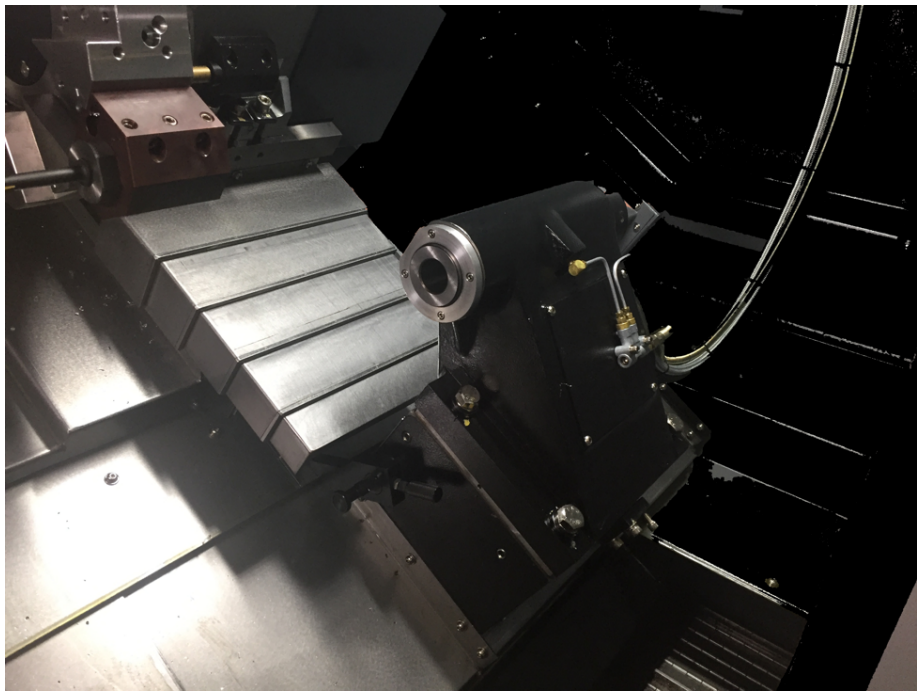
Tailstock - option

- Manual position, programmable hydraulic quill
- Quill can be activated by footswitch or M function from control
- Tailstock comes with live center



Laser Interferometer

After assembly, Milltronics SL-II Series machines are rigorously tested – including the use of a laser interferometer:

- The laser interferometer provides comprehensive accuracy assessment of machine alignment and any roll-pitch-yaw errors in machine
- Machine can be re-lasered after years of use in the field

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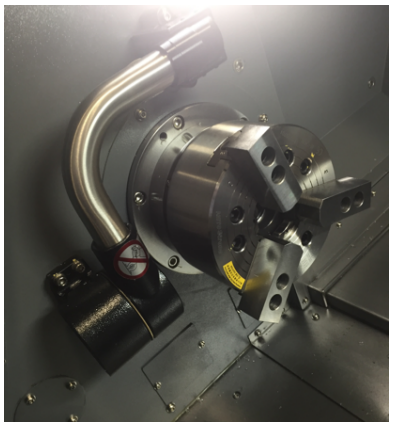
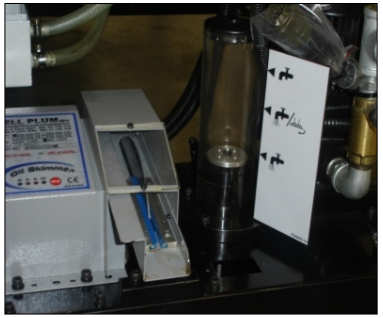
Options

Accessories

Productivity Options

- Tailstock
- Lift-up chip conveyor
- Bar feed interface
- Parts catcher
- Collet chucks
- Renishaw tool pre-setter
- Extended warranty
- Factory installation
- Factory training





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Series 9000 control

Windows® Touch Screen

New 9000 control is Windows®-based and features a 15” color LCD touch screen

New 9000 Series

The 9000 Series CNC is Milltronics latest and upgraded control offered on SL CNC lathes

- Windows®-based platform that offers all the user-friendly features that Milltronics controls are known for
- Intel® Dual Core i5-3610ME processor (64 bit)
- 4GB memory, 120 GB disk storage, 2 USB ports, mid-travel tactile keys and an enlarged 15” LCD touch screen

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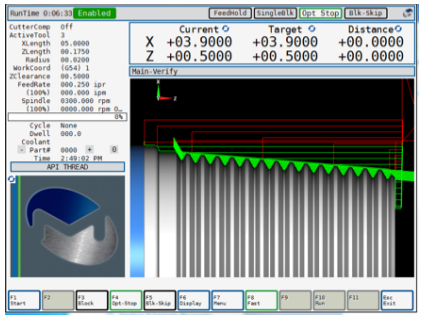
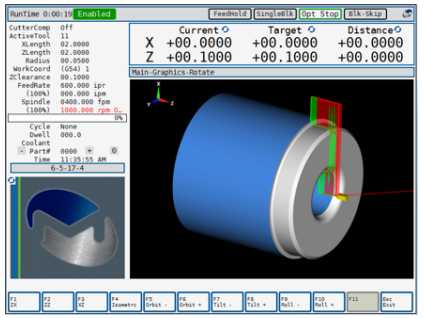
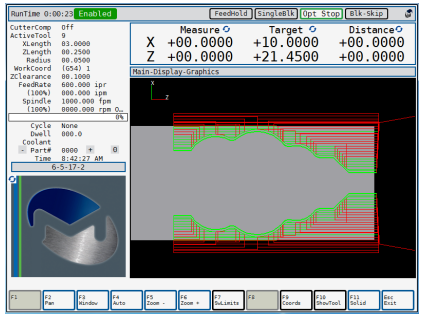
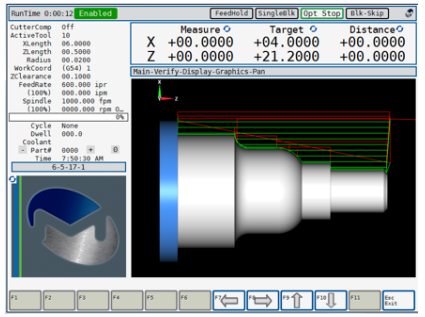
Milltronics Software

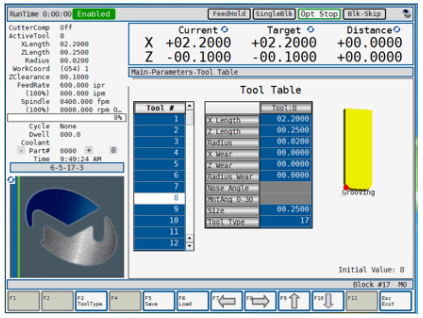
- Touch screen function keys
- Solid model graphics
- Conversational programming
- ISO based G & M code programming
- Auto trig help
- Constant Surface Speed (CSS)
- DXF import
- Tool tables
- Help screens
- On board diagnostics
- Mid-program restart
- Handwheel run
- Scaling, mirror image, rotate
- Canned cycles – drilling, turning, facing boring, tapping, grooving, threading, tangent/circle generate, auto roundcorner/chamfer

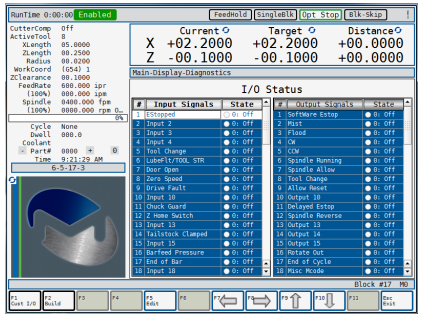












Watch control demo here

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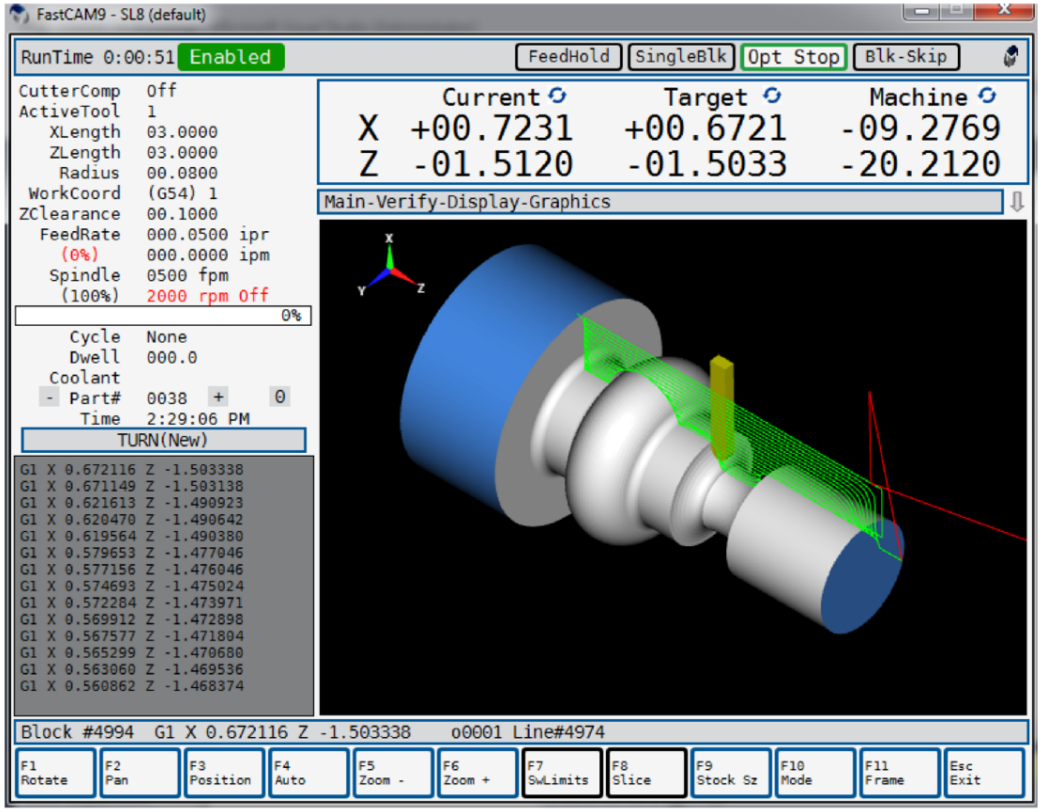
Bi-Directional Cycle (option)



Improves productivity by up to 60%

- Improve turning speed and efficiency while taking advantage of the latest insert technology allowing for cutting forward and reverse, down to and up from
  - Increased tool life
  - Improves surface finish
- Watch video here

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Why Milltronics? 10 Reasons

1. Easy to Use Control

The Milltronics control is straightforward and easy-to-use. Chose between conversational, G-code or use a CAM system – whatever is the most efficient way to program the part.

2. Made Right

Using a machine design process that is ISO 9001 certified, Milltronics starts with FEA analysis and designs accurate, rigid and reliable machines built to last. No shortcuts here.

3. Superior Components

Milltronics partners with top suppliers such as Yaskawa, Royal, Hiwin® and Grundfos. You can judge a machine tool builder by the company it keeps.

4. Upgradeable

Milltronics controls are designed, built and supported by Milltronics – and are designed to be upgradeable. You don't have to miss out on new software or hardware advancements as time marches on.

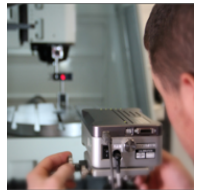
5. Availability

We recognize that sometimes you need a machine *fast.* We work hard to make sure we have our most popular models in stock for quick shipment.

6. Fastest Learning Curve

Because Milltronics machines are so easy to learn and use, you'll be making chips quicker. And don't confuse easy with simple – the 9000 is packed with advanced features and capabilities.

7. Service Network



According to customer surveys, Milltronics and our distributor network offer the best service and support in the industry. We do what it takes!

8. Complete Solution

A complete line – 50 different models of tool room mills and lathes, general purpose and performance VMC, CNC lathes, bridges and boring mills.

9. Global American Company

Milltronics is part of the Hurco Companies Machine Tool Group. Publically traded with solid financials, we're in it for the long haul.

10. More for Your Money

Finally, Milltronics offers better built machines with more standard features for the price. Period.

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Thank you!

Comparisons

Versus Other Milltronics Product

	SL6	New SL6-II
Style	30 degree slant bed	**45 degree slant bed**
Ways	LMG - balls	**LMG - rollers**
Swing Over Bed Diameter	20” (510 mm)	15.95” (405 mm)
Swing Over Cross Slide	9” (230 mm)	**9.5” (240 mm)**
X, Z Axis Travel	7.5” x 21” (190 x 530 mm)	7” x 14” (178 x 356 mm)
Max Turn Diameter	11.75” (300 mm)	**12.44” (316 mm)**
Max Turn Length	18.1” (460 mm)	13.38” (340 mm)
Draw Tube ID	1.65” (42 mm)	**1.77” (45 mm)**
Spindle RPM	6,000 rpm	6,000 rpm
Spindle Horsepower (peak)	17.4 hp (13 kW)	17.4 hp (13 kW)
Spindle Torque (peak)	82 ft lbs (110 Nm)	84 ft lbs @ 1090 rpm (113 Nm)
Spindle Acc/Dec	NA	TBD/TBD sec
Spindle Nose/Chuck Diameter	A2-5/6” (152 mm)	**A2-5/6.65” (169 mm)**
Tool Capacity	12 stations	12 stations
Tool Type	3/4” (20 mm) Slotted Disc	3/4” (19 mm) Slotted Disc
Turret Index (Adjacent)	.7 sec	**.5 sec**
Turret Index (Furthest)	NA	1.5 sec
Rapid Traverse (X/Z)	1000 ipm (25.5 m/min)	**1181/1181 ipm (30/30 m/min)**
Machine Height	63” (1600 mm)	84” (2144 mm)
Required Floorspace	87” x 68” (2200 x 1730 mm)	125” (3173 mm) x 75” (1905 mm)
Machine Weight	7,000 lbs. (3180 kg)	7,000 lbs
Pricing	$ 69,900 (inc cc, part cat & tail)	**$51,195**

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	SL10	New SL10-II
Style	30 degree slant bed	30 degree slant bed
Ways	LMG - balls	**LMG - rollers**
Swing Over Bed Diameter	20” (510 mm)	**23” (582 mm)**
Swing Over Cross Slide	11.8” (300 mm)	**15.8” (402 mm)**
X, Z Axis Travel	7.5” x 21” (190 x 530 mm)	**9.8” x 31” (250 x 790 mm)**
Max Turn Diameter	11.75” (300 mm)	**17.7” (450 mm)**
Max Turn Length	18.1” (460 mm)	**29.9” (760 mm)**
Draw Tube ID	2.55” (65 mm)	**3.18” (81 mm)**
Spindle RPM	4,000 rpm	3,000 rpm
Spindle Horsepower (peak)	24 hp (18 kW)	**29.5 hp (22 kW)**
Spindle Torque (peak)	**380 ft lbs (515 Nm)**	258 ft lbs @ 600 rpm (350 Nm)
Spindle Acc/Dec	NA	5/5 sec
Spindle Nose/Chuck Diameter	A2-6/10” (254 mm)	**A2-8/10” (254 mm)**
Tool Capacity	12 stations	12 stations
Tool Type	3/4” (20 mm) Slotted Disc	**1” (25 mm) Slotted Disc**
Turret Index (Adjacent)	.7 sec	**.5 sec**
Turret Index (Furthest)	NA	1.5 sec
Rapid Traverse (X/Z)	1000 ipm (25.5 m/min)	**1181/1181 ipm (30/30 m/min)**
Machine Height	63” (1600 mm)	72” (1830 mm)
Required Floorspace	87” x 68” (2200 x 1730 mm)	163” (4164 mm) x 112” (2854 mm)
Machine Weight	7,000 lbs. (3180 kg)	**11,054 lbs. (5014 kg)**
Pricing	$ 79,900 (inc cc, part cat & tail)	**$64,995**

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