



# A NEW BREED OF CNC MILLING MACHINE

**ONLY \$3995**  
FOR A LIMITED TIME

Introducing **MR-1**: the first affordable CNC Mill engineered to cut aluminum and steel.

## **AFFORDABLE CNC MILLING IS HERE**

The MR-1 Gantry Mill is a 3-Axis vertical CNC milling machine that was designed specifically for hobbyist, light industrial, and educational uses. MR-1 features the power and rigidity to remove 30 pounds of steel per hour and the accuracy and precision to hold tight tolerances.

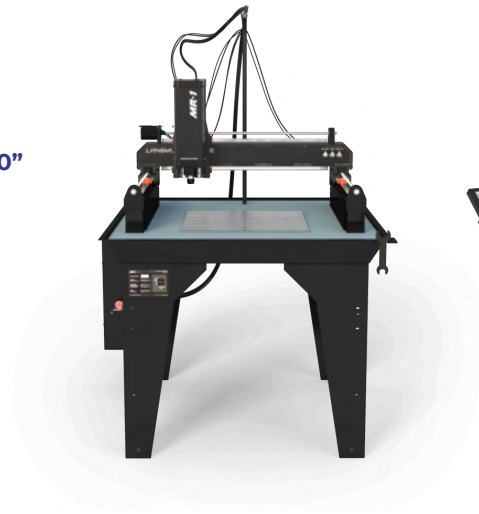
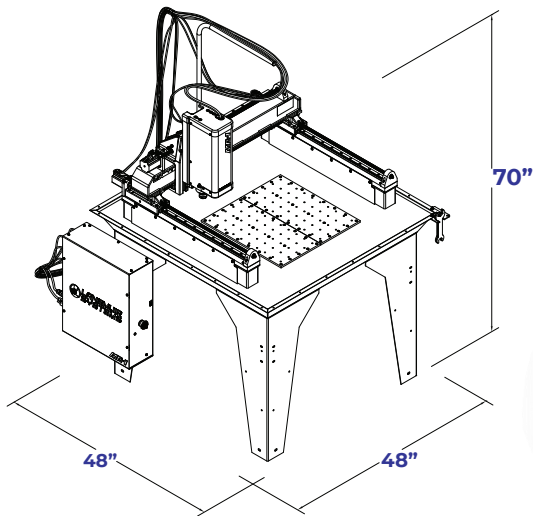
## **MAKE REAL PARTS AT A PRODUCTIVE PACE**

MR-1 stands alone as the only machine in its price class that is capable of productively machining aluminum, steel, titanium, and stainless all while maintaining excellent finishes and accuracy. MR-1 is not a toy; it is a machine tool that you can rely on to make real metal parts. Whether you're prototyping new designs or making a small production run, MR-1 is ready to cut.

## **CUSTOMIZE MR-1 TO MEET YOUR NEEDS AND YOUR BUDGET**

At Langmuir Systems we are solely focused on providing industrial equipment to our customers at affordable prices. MR-1 was designed to perform real milling operations such as facing, drilling, threading, boring, surfacing and slotting. With a full catalog including machine add-ons, tooling, workholding and automatic probing, Langmuir Systems is your one-stop-shop for all your milling needs.

**Build your MR-1 online at:**  
[www.langmuirsystems.com/mr1](http://www.langmuirsystems.com/mr1)



## MACHINE SPECIFICATIONS

Size & Weight	
WIDTH	45.2" (OPTIONAL COMPUTER STAND OR TOUCHSCREEN ADDS ~18")
HEIGHT	72"
WEIGHT	750 - 900 LBS (DEPENDING ON INSTALLED OPTIONS)
Machine Specifications	
MACHINE TABLE SIZE	20" X 20.25" X 0.700"
TOOLING HOLES	1/4"-20 TAPPED HOLES ON A 2 X 2 GRID PATTERN, 100 TOTAL HOLES
SPINDLE NOSE TO TABLE (MAX)	9.0"
SPINDLE NOSE TO TABLE (MIN)	0.9"
X AXIS CARRIAGE TO TABLE CLEARANCE	5.5"
MAXIMUM WEIGHT ON TABLE	300 LBS
MAXIMUM WORKPIECE FOOTPRINT	31" (X) X 37" (Y)
MACHINE BASE STRUCTURE	CONCRETE REINFORCED STEEL STRUCTURE (PATENT PENDING)
Power Requirements	
MACHINE	(1) 120VAC OUTLET, 15A MIN, 1 DEDICATED BREAKER
SPINDLE	(1) 240 VAC OUTLET, 20 AMPS MIN. 1 DEDICATED BREAKER (OR 120VAC, 15 AMPS IF 120V:240V TRANSFORMER IS USED, 1 DEDICATED BREAKER)
TOUCHSCREEN /CONTROLLER (IF PURCHASED)	(3) 120VAC OUTLETS, 15A MIN, 1 DEDICATED BREAKER
FLOOD COOLANT PUMP (IF PURCHASED)	(3) 120VAC OUTLETS, 15A MIN, 1 DEDICATED BREAKER
Machine Travels	
X AXIS	23.0"
Y AXIS	21.8"
Z AXIS	6.1" (+2" OF BONUS TRAVEL)

**MOTION SPECIFICATIONS**

Motion System	
<b>X/Y AXIS</b>	20 mm LINEAR GUIDEWAYS, GREASE LUBRICATED 12 mm C7 BALLSCREW DRIVE, GREASE LUBRICATED
<b>Z AXIS</b>	15 mm LINEAR GUIDEWAYS, GREASE LUBRICATED 12 mm ACME SCREW WITH ANTI-BACKLASH LEAD NUT
<b>X/Y AXIS BACKLASH (MAX)</b>	0.001"
<b>Z AXIS BACKLASH (MAX)</b>	0.002" (WEIGHT OF Z-AXIS/SPINDLE ASSEMBLY CONSUMES BACKLASH)
<b>LINEAR STEP RESOLUTION</b>	0.00015"
<b>LINEAR TRAVEL ERROR (MAX)</b>	0.004" PER 12" OF TRAVEL (BALL SCREW PITCH ERROR COMPENSATION AVAILABLE IN SOFTWARE TO FURTHER REDUCE TRAVEL ERROR)
<b>POSITIONAL REPEATABILITY</b>	0.0005"
Feed Rates & Thrust Force	
<b>X/Y AXIS FEED RATE (MAX)</b>	100 IPM
<b>Z AXIS FEED RATE (MAX)</b>	40 IPM
<b>X AXIS THRUST (MAX)</b>	135 LBS
<b>Y AXIS THRUST (MAX)</b>	135-270 LBS DEPENDING ON LOAD SPLIT BETWEEN Y1 AND Y2 MOTORS
<b>Z AXIS DOWNWARD THRUST (MAX)</b>	160 LBS
Positional & Alignment Accuracy	
<b>X AXIS STRAIGHTNESS ERROR</b>	0.00015" PER INCH
<b>Y AXIS STRAIGHTNESS ERROR</b>	0.00015" PER INCH
<b>Z AXIS STRAIGHTNESS ERROR</b>	0.0001" PER INCH
<b>Y AXIS RAIL COPLANARITY</b>	0.020" MAX ERROR OVER ENTIRE ENVELOPE AS ASSEMBLED. <b>CORRECTABLE TO ZERO WITH SHIMS</b>
<b>Y AXIS RAIL PARALLELISM</b>	0.001" MAX
<b>Z AXIS ALIGNMENT ERROR</b>	0.003" OVER 6" TRAVEL AS ASSEMBLED. <b>CORRECTABLE TO ZERO WITH SHIMS</b>
<b>SPINDLE TRAM ERROR</b>	0.001" PER INCH OF RADIAL SWEEP AS ASSEMBLED. <b>CORRECTABLE TO ZERO WITH SHIMS</b>

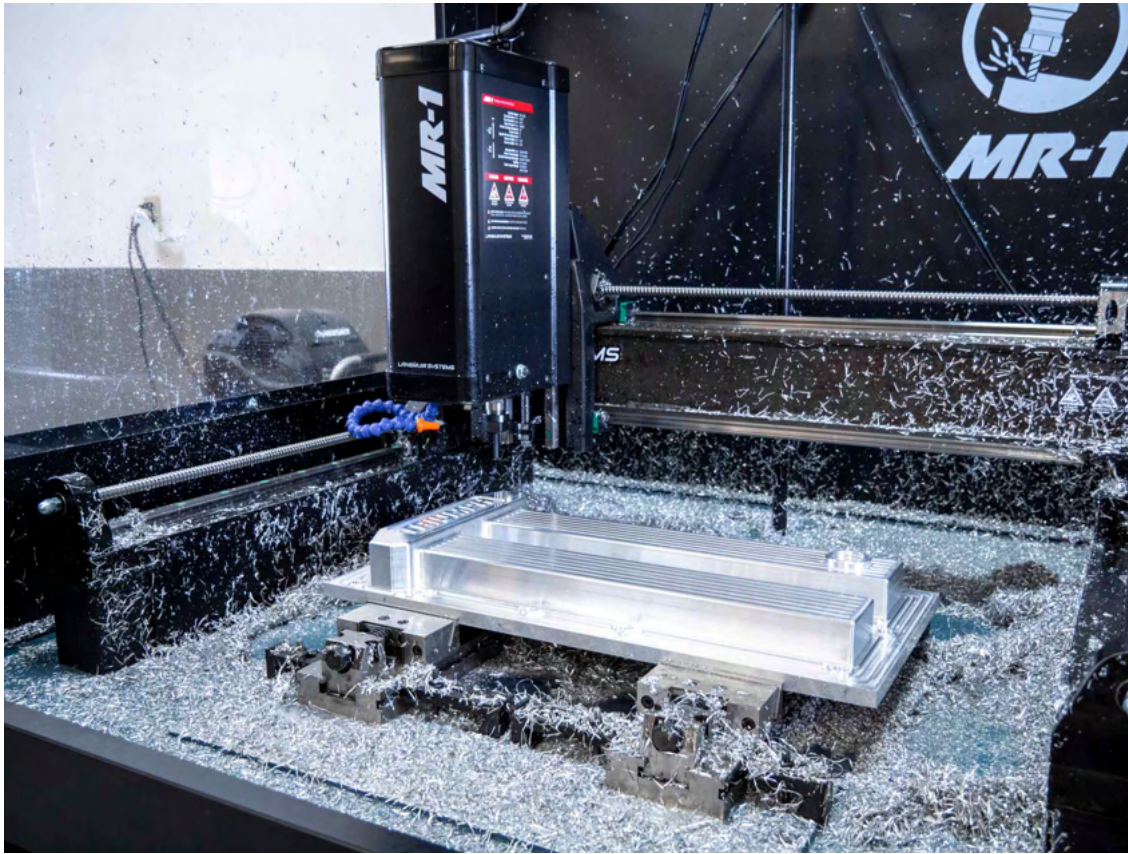
**CONTROLLER SPECIFICATIONS**

Machine Controller
PURPOSE BUILT CNC CONTROLLER ELECTRONICS AND CUTCONTROL SOFTWARE
USER FRIENDLY DESIGN THAT WORKS WITH ANY PC OR APPLE COMPUTER VIA USB CONNECTION
ABILITY TO RUN COMPLEX 3D PROGRAMS MILLIONS OF LINES IN LENGTH
INTEGRATED AUTO-SQUARING GANTRY
3D VISUALIZATION OF G CODE
NUMEROUS CANNED CYCLES FOR CONVERSATIONAL PROGRAMMING
PROBING AND TOOLSETTING COMPATIBILITY. NUMEROUS CANNED PROBING SEQUENCES FOR VARIOUS GEOMETRIES
MDI FUNCTIONALITY FOR SINGLE LINE G-CODE EXECUTION
REMOTE CONTROL OF SPINDLE AND COOLANT (ADD-ON) WITH A CLICK OF A BUTTON
REALTIME SPINDLE LOAD MONITORING
CONTINUOUS DEVELOPMENT OF NEW FEATURES AND FUTURE-PROOFED ADD ONS

## SPINDLE SPECIFICATIONS

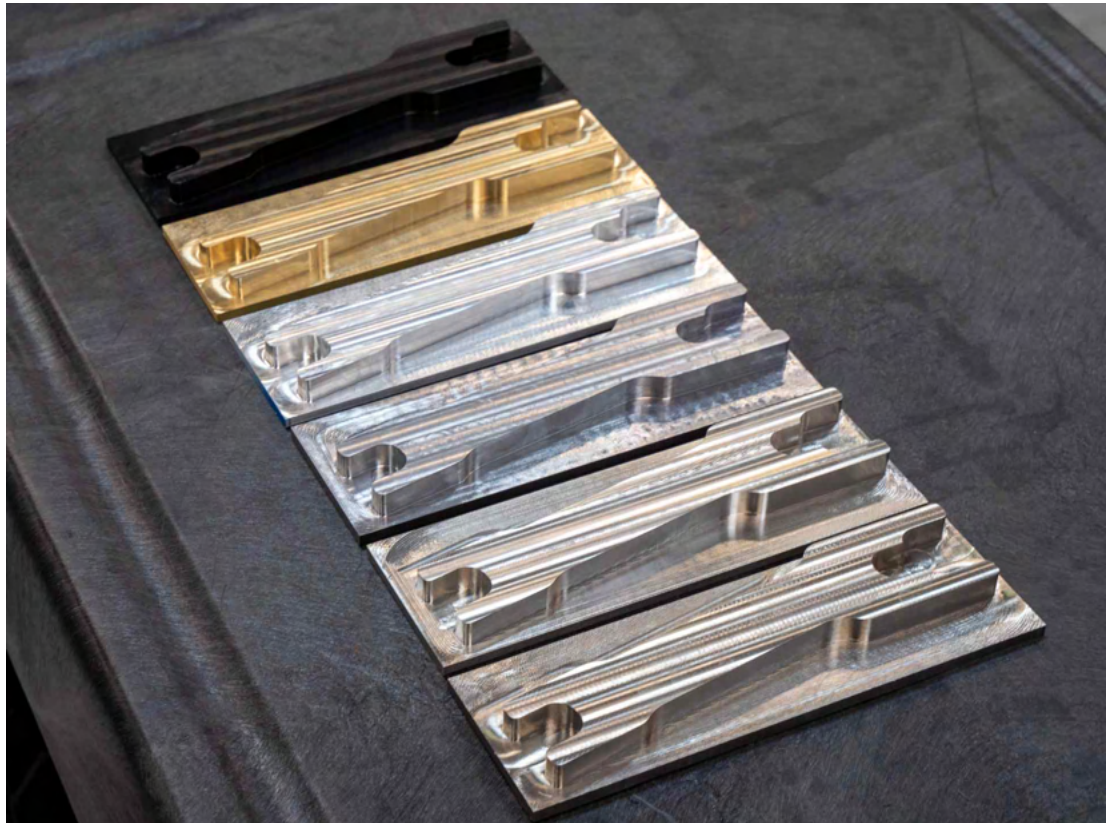
Spindle	
SPINDLE MOTOR TYPE	220V AC SERVO MOTOR WITH INTEGRATED ENCODER FOR PRECISE SPEED CONTROL
SPINDLE MOTOR POWER - 220VAC SUPPLY	3.4 HORSEPOWER (2.5kW)
SPINDLE TORQUE - 220VAC SUPPLY @ 500 RPM	3.5 LB-FT
SPINDLE TORQUE - 220VAC SUPPLY @ 8000 RPM	2.2 LB-FT
SPINDLE MOTOR POWER - 110VAC SUPPLY (WITH OPTIONAL 120V:220V TRANSFORMER ADD-ON)	2.0 HORSEPOWER (1.5 kW)
SPINDLE TORQUE - 110VAC SUPPLY @ 500 RPM	2.1 LB-FT
SPINDLE TORQUE - 110VAC SUPPLY @ 8000 RPM	1.3 LB-FT
TRANSMISSION TYPE	GT2 TIMING BELT (1:2 OVERDRIVE)
SPINDLE SPEED RANGE	0-8000 RPM (SELECTABLE IN CONTROL SOFTWARE, CLOSED LOOP ENCODER FEEDBACK)
SPINDLE TAPER	ISO ER-20
SPINDLE TAPER RUNOUT (MAX)	0.0003"
MINIMUM TOOL SHANK DIAMETER	0.039"
MAXIMUM TOOL SHANK DIAMETER	0.500"
SPINDLE DEFLECTION COEFFICIENT (X DIRECTION)	0.00006" PER LB FORCE (WITH SPINDLE NOSE TO TABLE AT 1.5")
SPINDLE DEFLECTION COEFFICIENT (Y DIRECTION)	0.00004" PER LB FORCE (WITH SPINDLE NOSE TO TABLE AT 1.5")





**MR-1** machining a billet aluminum valve cover.

**MR-1** machines the same part from Delrin, Brass, Aluminum, Steel, Stainless, and Titanium.





**MR-1** machines a massive part from steel.



**MR-1** can make anything you can think of: from automotive parts to golf clubs.