Roland

Desktop 3D Scanning and Milling

MODELA
Model:

MDX-15/20

Transforming Ideas into Reality: Roland Revolutionizes 3D CAD

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The Power of 3D Modeling on Your Desktop

Seeing your ideas take shape has always been the dream of the 3D designer. Today's powerful, lower-cost CAD workstations and software help make this dream a reality as never before. The reality is, however, it can still take days or weeks to go from a CAD drawing to having a part, mold, or prototype. But not any longer. Roland's MDX-15 and MDX-20 puts you in control with the power of 3D scanning and milling on your desktop.

Easy-to-use and compatible with many popular 3D CAD software programs, the MDX-15/20 is an affordable, all-in-one scanning and milling device perfect for a variety of product design tasks from model and jewelry making to molds, rapid prototyping, small lot production and package design. Use it to test and modify your designs, reducing errors, time and cost.

Model: MDX-15
Max operation area : 6" (X) x 4" (Y) x 2.375" (Z)

Model: MDX-20
Max operation area : 8" (X) x 6" (Y) x 2.375" (Z)

1 Easy-to-Use, Compact Design

The MDX-15/20's stylish good looks and compact size make it an attractive addition to your desktop. Yet it is also a very powerful performer, one that is surprisingly easy to use, even for first time users. Just plug it in to your computer as you would a desktop printer with an RS-232C cable. By following the simple instructions included in PDF format, even a beginner can be scanning and milling in minutes.

2 Choose from Two Models

MDX-15   Maximum work area:
6 in. (X) x 4 in. (Y) x 2-3/8 in. (Z)
152.4 mm (X) x 101.6 mm (Y) x 60.5 mm (Z)

MDX-20   Maximum work area:
8 in. (X) x 6 in. (Y) x 2-3/8 in. (Z)
203.2 mm (X) x 152.4 mm (Y) x 60.5 mm (Z)

3 Compatible with Popular Software

Adding to its functionality, the MDX-15/20 works with a variety of popular 3D CAD and computer graphics software programs, including SolidWorks®, Rhinoceros®, VectorWorks®, LightWave®, VisualMill and 3d studio max,® allowing you to design in the program you're most comfortable with.
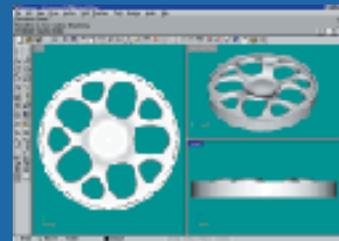
4 3D Scanning and Milling in One

The MDX-15/20 is the culmination of over ten years of innovative product development in scanning and milling by Roland engineers. Utilizing innovative Roland Active Piezo Sensor (R.A.P.S.) technology, the MDX-15/20 is a precision 3D scanner, capable of scanning objects at 4 to 15 mm per second with a resolution of up to 0.002" (0.05 mm). Replacing the sensor unit with the spindle turns the MDX-15/20 into a powerful CNC mill capable of cutting light metals, including aluminum and brass.
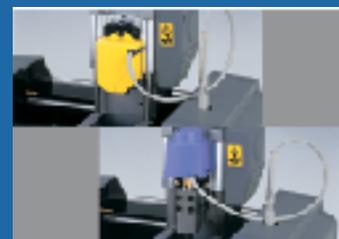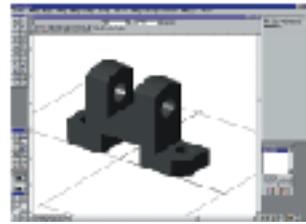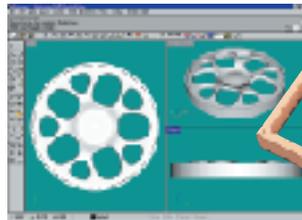
Streamline the Entire Design Process

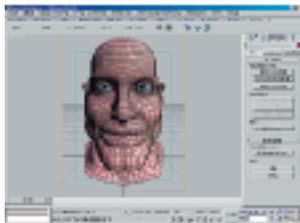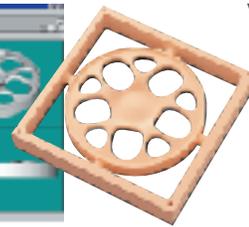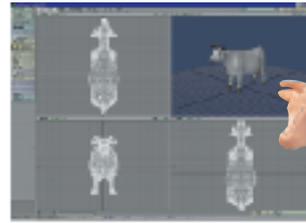## ● Compatible with Popular 3D Software
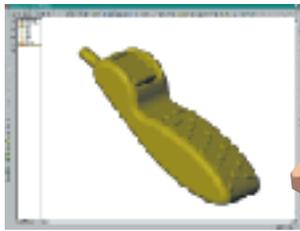
SolidWorks®

VisualMill

Rhinoceros®

3d studio max®

LightWave®

● Applications Software Included

The MDX-15/20 comes standard with powerful application software compatible with Windows® 95/98/Me, Windows NT® 4.0 and Windows® 2000, making it easy to use right out of the box.

MODELA Player is a numeric control software application that allows importing of 3D files from most popular computer graphics and CAD applications. Included with MODELA Player are libraries of various tool diameters and shapes with their pre-determined cutting speeds and depths. MODELA Player facilitates uniform 3D scaling, selection of milling direction and automatic generation and display of the tool path.

Virtual MODELA provides a quick preview of the entire milling operation. This powerful feature eliminates milling errors, enables simulation of finished shapes and estimates production time.

Dr. PICZA Scanning Software features a dynamic graphic display and diverse editing functions. Dr. PICZA features control functions such as scan pitch and area settings, plus numerous editing functions including a handy convex/concave inversion function for making molds, a mirror function for creating symmetric data, a tilt adjustment function, curve smoothing, and a function for adjusting the height of surfaces. A preview function lets you check the image from any angle using a wide frame. You can even display color and texture renderings. PICZA scanning data can be stored in its original format, or exported in DXF, IGES, VRML, or as Point Cloud data (ASCII).

MODELA Player
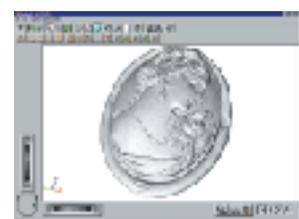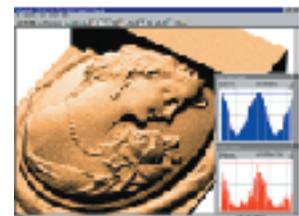
Dr.PICZA

Streamline the Entire Design Process

Milling

The advantages of physical models are many, including the ability to check fit, weight, center of gravity, etc., and then make changes as necessary. With the MDX-15/20's spindle unit installed, you're ready to transform your ideas into reality. A variety of tools can be used, including straight-end mills or cutters for rough cuts and square edges, or ball-end mills for finishing. The MDX-15/20 mills ABS, acrylic, woods, plaster, styrene foam, chemical wood, modeling wax, and light metals such as aluminum and brass.

MODELA Player quickly imports your design and prepares for milling. To begin, set the model's scale and milling direction from the tool and material libraries in the software. Next, select the size and type of materials to be milled. MODELA Player automatically sets the best milling parameters based on the materials you choose. Then click start. That's all there is to it. Your ideas are quickly transformed into reality, whether mockups, prototypes, molds, or small lot production of finished parts.

Spindle unit
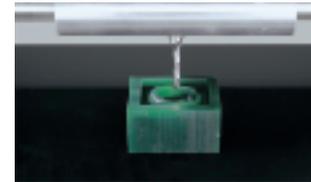
Scanning

The MDX-15/20 is ideal for reverse engineering. Before beginning your designs, you can use the MDX-15/20 to scan and digitize data from an existing part or mold for your CAD drawings. Due to the precision of Roland Active Piezo Sensor (R.A.P.S.) technology, the MDX scans a wide range of objects, including soft objects like clay and fruit, etc., that conventional contact scanners can't. It can even scan glass or acrylic - an impossibility with optical scanners because their light beams pass through the material.

To begin scanning, simply install the sensor unit on the device, open the Dr. PICZA software which controls processing, define the scan area and select the level of resolution you would like - from 0.20" up to 0.002". Click "Scan" and the MDX-15/20 goes to work. For fine detail areas, you can rescan at a higher resolution. The MDX-15/20 automatically combines two or more scans.

Sensor unit

Major Features of MDX-15/20

- Use the MDX-15/20 to quickly check your designs or for trial production of parts and molds.
- Scan at up to 0.002" (0.05 mm) resolution; mill at 0.00024" (0.00625 mm) / step.
- Simple controls allow anyone to begin working without training.
- Compatible with a wide variety of popular 3D CAD software programs.
- Supports industry standard file formats, including STL, IGES, and DXF.
- Fits on your desktop.

■ SPECIFICATIONS

	MDX-15	MDX-20
XY table size	6-11/16 in. (X) x 4-5/16 in. (Y) (170 mm x 110 mm)	8-5/8 in. (X) x 6-1/4 in. (Y) (220 mm x 160 mm)
Max. operation area	6 in. (X) x 4 in. (Y) x 2-3/8 in. (Z) (152.4 mm (X) x 101.6 mm (Y) x 60.5 mm (Z))	8 in. (X) x 6 in. (Y) x 2-3/8 in. (Z) (203.2 mm (X) x 152.4 mm (Y) x 60.5 mm (Z))
Max. table load weight	1.1 lb. (500 g)	2.2 lb. (1000 g)
Interface	Serial (RS-232C)	
Control keys	STANDBY key, VIEW key, TOOL-UP key, TOOL-DOWN key	
LED	SCANNING MODE LED, MODELING MODE LED, VIEW LED	
Power Pack	Exclusive AC adapter (DC+19V 2.1 A)	
Acoustic noise level	Standby mode : under 35 dB (A) Operation mode (not cutting) : under 70 dB (A) (According to ISO 7779)	
External dimensions	16-13/16 in. (W) x 11-1/16 in. (D) x 12-1/16 in. (H) (426 mm (W) x 280 mm (D) x 305 mm (H))	18-13-16 in. (W) x 15-1/16 in. (D) x 12-1/16 in. (H) (476.8 mm (W) x 381.6 mm (D) x 305 mm (H))
Weight (unit only)	21.2 lb. (9.6 kg)	30.2 lb. (13.7 kg)
Operation temperature	41 to 104°F (5 to 40°C)	
Operation humidity	35 to 80 % (no condensation)	
Accessories	AC adapter: 1, power cord: 1, Roland Software Package CD-ROM: 1, spindle unit: 1, sensor unit: 1, cap screw M4x15 : 4, tool:1, set screw M3x3 : 2, double-sided tape: 1, front cover: 1, hexagonal wrench (size : 3 mm) :1, hexagonal wrench (size : 1.5 mm): 1, positioning pins: 3, clay: 1, MDX-15/20 user's manual: 1	

*The MDX-15/20 includes PS-1/8 as standard accessory.

Modeling Functions

Tool chuck	1/8 in. or 6 mm tool chuck included
Spindle motor	10W (DC motor)
Software resolution	0.000984 in./step (0.025 mm/step)
Mechanical resolution	0.000246 in./step (0.00625 mm/step)
Revolution speed	6500 rpm
Feed rate	0.00393 to 9/16 in./sec. (0.1 to 15 mm/sec.)
Acceptable material	Wood, Plaster, Resin (modeling wax, styrenform), Chemical wood, Aluminum (A5052 according to JIS), Brass
Acceptable tool	Endmil, Drill

Scanning Functions

Sensor	Roland Active Piezo Sensor (R.A.P.S.) Probe length 2-5/16 in. (60 mm), tip bulb diameter 0.00315 in. (0.08 mm)
Scanning method	Contacting, mesh-point height-sensing
Scanning pitch (Dr. PICZA)	X/Y-axis directions -- 0.002 to 0.20 in. (0.05 to 5.00 mm) (settable in steps of 0.002 in. (0.05 mm)) Z-axis direction -- 0.000984 in. (0.025 mm)
Scanning speed	1/8—9/16 in./sec. (4—15mm/sec.)
Exportable file formats	DXF, VRML, STL, 3DMF, IGES, Grayscale, Point Group and BMP

■ OPTIONS

■ Spindle unit with tool chuck

Product number	Applicable tool shank diameter	Quantity per package
PS-3	3 mm	1 pce.
PS-4	4 mm	1 pce.
PS-5	5 mm	1 pce.
PS-6	6 mm	1 pce.
PS-1/8	3.175 mm (1/8")	1 pce.
PS-1/4	6.35 mm (1/4")	1 pce.

*The MDX-15/20 includes PS-1/8 as standard accessory.

■ Engraving tool

dia = shank diameter
W = blade width

Material	Product number	Specifications (unit = mm)	Quantity per package	Required Spindle unit
Cemented carbide	ZEC-100	dia = 6, 50L	1 pce.	PS-6
High Speed Steel	ZEC-H2010	dia = 3.175, 110L x 0.10W	1 pce.	PS-1/8
	ZEC-H2032	dia = 3.175, 110L x 0.32W	1 pce.	PS-1/8
	ZEC-H2050	dia = 3.175, 110L x 0.50W	1 pce.	PS-1/8
	ZEC-H2075	dia = 3.175, 110L x 0.75W	1 pce.	PS-1/8

■ Replacement spindle motor

Product number	Specifications	Quantity per package
MM-40	Motor unit, 10 W / DC motor	1 pce.

■ End mill

dia = flute diameter, R = flute radius, ℓ = flute length, L = overall length, d = shank diameter, NT = number of flute

Description	Product number	Specifications (unit = mm)	Quantity per package	Required Spindle unit
Square end mill made of high speed steel	ZHS-100	dia = 1, 3 ℓ x 6d x 50L x 2NT	1 pce.	PS-6
	ZHS-200	dia = 2, 6 ℓ x 6d x 50L x 2NT	1 pce.	PS-6
	ZHS-300	dia = 3, 10 ℓ x 6d x 50L x 2NT	1 pce.	PS-6
	ZHS-400	dia = 4, 8 ℓ x 6d x 60L x 2NT	1 pce.	PS-6
	ZHS-500	dia = 5, 10 ℓ x 6d x 60L x 2NT	1 pce.	PS-6
	ZHS-600	dia = 6, 15 ℓ x 6d x 55L x 2NT	1 pce.	PS-6
Square end mill made of cemented carbide	ZUS-400	dia = 4, 20 ℓ x 4d x 60L x 2NT	1 pce.	PS-4
	ZUS-500	dia = 5, 25 ℓ x 5d x 60L x 2NT	1 pce.	PS-5
	ZUS-600	dia = 6, 25 ℓ x 6d x 60L x 2NT	1 pce.	PS-6
Ball end mill made of cemented carbide	ZUB-150	R1.5, 10 ℓ x 3d x 65L x 2NT	1 pce.	PS-3
	ZUB-200	R2.0, 12 ℓ x 4d x 65L x 2NT	1 pce.	PS-4
	ZUB-250	R2.5, 20 ℓ x 5d x 65L x 2NT	1 pce.	PS-5
	ZUB-300	R3.0, 30 ℓ x 6d x 65L x 2NT	1 pce.	PS-6

*Please use a spindle unit for the desired shank diameter.

■ Modeling wax

Product number	Specifications
US-WAX 46BL-7	4" (W) x 4" (D) x 1.5" (H), 7 pcs.
ZW-200	175 mm(W) x 75 mm(D) x 38 mm(H),10 pcs.

■ Safety cover for MDX-15 only

Product number	Specifications
ZBX-15	550 mm(W) x 450 mm(D) x 462 mm(H) (21-11/16"(W) x 17-3/4"(D) x 18-1/4"(H))

Roland

RDGA-MDX-01