Roland

3D Modeling Machine

# MDX-500

DAC-FFP
Digital AC Servo / Feed Forward Processing

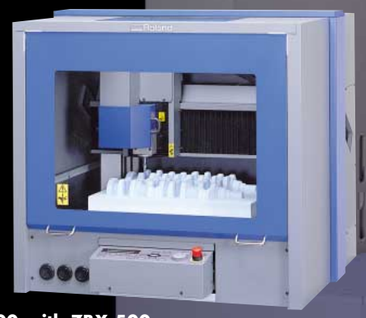

*Beauty and the Beast*

With Digital AC Servo Motors and Feed Forward Processing

MODELA Pro

# Introducing the MDX-500

Roland's MDX-500 is a heavy-duty CNC milling machine with the power to easily cut through metals but with the precision and speed to perform the finest 3D engraving.



MDX-500 with ZBX-500

## DAC-FFP -- Roland's Advanced Control Technology

### High Power and High Speed

**The MDX-500 is the only machine in its class with AC Servo motors and Feed Forward Processing.**

DAC : Digital AC Servo motors on the X-, Y- and Z-axes contain no brushes while delivering the high speed and high torque necessary for smooth and steady milling. The result is a motor life cycle of 8,000 hours and greatly reduced heat. The MDX-500's spindle motor is a high power, DC brushless motor which further eliminates motor maintenance concerns.

FFP : Feed Forward Processing is a predictive technology that anticipates tool path. The result is higher torque, greater accuracy, faster speed and increased energy efficiency.

### A Total Solution

**The MDX-500 includes a rich array of powerful, easy-to-use software as standard.**

MODELA Player is a CAM software application that allows uniform 3D scaling, selection of milling direction and automatic generation and display of the tool path. It accepts DXF and STL files exported from commercially available CAD/CAM software.

Virtual MODELA enables simulation of finished shapes and estimates production time. To reduce time and materials, it also simulates a suitable modeling/engraving depth before the actual process has begun.

MODELA 3D TEXT turns any Windows True Type font into a 3D relief.

MODELA 3D DESIGN makes it possible to intuitively create 3D shapes, called "objects." An object is created by taking a predefined shape, such as a cylinder or sphere and using control rods, called "reference lines," to modify the basic shape into the final design. The software also allows adding color to the created shapes.

3D Engrave adds thickness to a flat (2D) graphic to create a 3D form which you can then engrave on, even a curved surface. You can also import from a PIX file from a Roland 3D scanner for creating 3D designs.

Dr. Engrave features an automatic layout function that allows you to import your CSV formatted database for faster engraving output. Dr. Engrave quickly and easily imports your data and lays out your job optimally to fit the material.

### Enhanced Connectivity

The MDX-500 supports industry standard NC codes. NC codes provide connectivity with a wide variety of commercial 3D, CAD/CAM software.

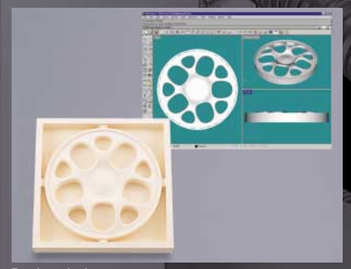
### Safety Features

The MDX-500 incorporates a number of safety features to ensure carefree operation whether in a machine shop or office location.
- A large, conveniently located emergency stop switch enables you to shut down the machine instantly at the push of a button.
- The spindle cover door includes a safety switch that prevents the machine's operation when open.
- An optional safety cover is available which makes the cutting mechanism inaccessible during operation.
- The cover also cuts down noise and simultaneously prevents swarf and dust produced during machining from entering the surrounding environment.

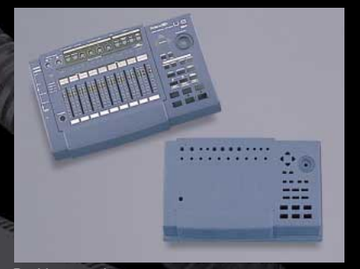
*The Beast*

## Modeling

Choose the high-torque spindle and the MDX-500 is ideal for rapid prototyping, small lot production, or producing dies and molds. With its 400W spindle motor and a torque twice that of conventional machines, the MDX-500 is capable of milling aluminum, brass and copper.



Product design



Rapid prototyping

Small lot production

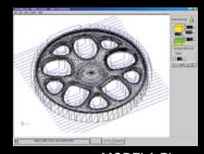
### Spindle

With the high-torque spindle installed, the MDX-500 is perfect for milling metals such as aluminum, brass and copper at a rate of 3,000 to 12,000 rpm.

### Software

**MODELA Player** Windows®

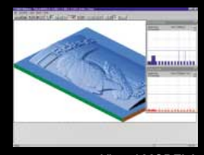
With the included MODELA Player software, the MDX-500 accepts DXF or STL files created by commercial CAD/CAM packages.



MODELA Player

**Virtual MODELA** Windows®

Virtual MODELA simulates designs and machining time.

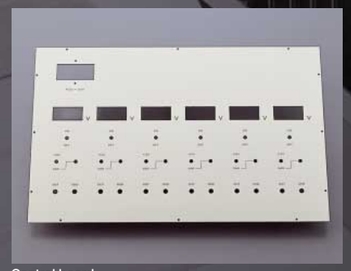


Virtual MODELA

*Beauty*

## Engraving

Choose the high-speed spindle and the MDX-500 is perfect for 2D and 3D engraving, 3D signs and reliefs, even on a curved surface. You can capture the finest detail in ABS, chemical wood, modeling wax, and acrylic or other resins.



Control board

Jewelry


3D signs

### Spindle

With the high-speed spindle installed, the MDX-500 can engrave finely finished letters and lines. With a rotation speed between 5,000 and 20,000 rpm, the MDX-500 engraves acrylic, brass, plastic and wood.

### Software

**3D Engrave** Windows®

Included with the MDX-500 is a full-suite of software. 3D Engrave allows you to design 3D letters and engrave them onto 3D curves.

3D Engrave

**Dr. Engrave** Windows®

Dr. Engrave is a 2D engraving software for creating nametags and nameplates.

Dr.Engrave

**Whatever your job, the MDX-500 is designed to make quick work of it.**

# 3D Modeling machine MODELA Pro Model MDX-500 SPECIFICATIONS

| Model | MDX-500 |
|---|---|
| T-slot (XY) table size | 550 mm x 360 mm (21-5/8" x 14-1/8") |
| Max.cutting area | 500 mm (X) x 330 mm (Y) x 105 mm (Z) (19-5/8" (X) x 12-15/16" (Y) x 4-1/8" (Z)) |
| XYZ motor | AC servo motor |
| Feed rate | X,Y,Z-axis:Max.85 mm/sec. (3-3/8" /sec.) |
| Acceleration | 0.3G, 0.1G, 0.05G |
| Software resolution* | [When RML-1 has been selected] 0.01 mm/step (0.00039") [When NC codes has been selected] 0.001 mm/step (0.000039") |
| Mechanical resolution | 0.001 mm/step |
| Spindle motor | DC brushless motor Max.400 W (when with high-torque spindle) |
| Revolution speed | [High torque spindle] 3000－12000 rpm [High speed spindle] 5000 - 20000 rpm<br>(Variable manually or by the command set) |
| Tool chuck | Collet and Cutter holder system |
| Acceptable shank diameter | ∅10 Max. |
| Positioning accuracy | ±0.1 mm (0.00394") / 300mm (11-13/16") (Under no-load conditions) |
| Repeat accuracy | ±0.05 mm (0.00197") (Under no-load conditions) |
| Origin-point reproducibility (when the power is switched on/off) | ±0.08 mm (0.00315") |
| Possible table load weight | [0.3G] 12 kg (26.5 lb.) or less [0.05G] 15 kg (33.1lb.) or less |
| Interface | Parallel (in compliance with the specification of Centronics) Serial (under RS-232C standard) |
| Buffer size | 2 MB<br>(Replot buffer : [RML-1] 2 Mbyte [NCcodes] Max.2 Mbyte (end-user setting) |
| Instruction system | RML-1 (mode1,mode2) or NCcodes supported by the MDX-500 (Selectable through display operation) |
| Power consumption | 6.5 A / 117 V 3.5 A / 220 - 230 V 3.5 A / 240 V |
| Dimensions | 740 mm (W) x 840 mm (D) x 670 mm (H) (29-1/8"(W) x 33-1/16"(D) x 26-3/8"(H)) |
| Weight | 92 kg (202.8 lb.) |
| Operation temperature | 5－40℃ (41－104˚F) |
| Operation humidity | 35 － 80 % (no condensation) |
| Accessories | T-slot clamps : 4, Spanner : 1, Z0 position sensor : 1, Power cord : 1, Key connector : 1, Belt for high torque spindle: 1,<br>USER'S MANUAL : 3 (1 Setup & Maintenance, 2 Cutting Using the Included Software, 3 Cutting Using NC codes),<br>NCcode PROGRAMMER'S MANUAL : 1, Roland Software Package CD-ROM : 1 |

*The measurement unit for positioning coordinates is 0.01 mm/step(0.00039").

## ■ OPTIONS

**For Modeling (Options for ZS-500T)**

| Name | Model No. | Description |
|---|---|---|
| High Torque Spindle Unit | ZS-500T | Dia. 6 mm collet included. (Life cycle : every 5,000 hours) |
| Collet | ZC-5030 | Dia. 3 mm, 1 pce. |
| | ZC-5032 | Dia. 3.175 mm (1/8"), 1 pce. |
| | ZC-5040 | Dia. 4 mm, 1 pce. |
| | ZC-5050 | Dia. 5 mm, 1 pce. |
| | ZC-5060 | Dia. 6 mm, 1 pce. |
| | ZC-5063 | Dia. 6.35 mm (1/4"), 1 pce. |
| | ZC-5080 | Dia. 8 mm, 1 pce. |
| | ZC-5100 | Dia. 10 mm, 1 pce. |
| Collet Set | ZC-500T | Dia. 3, 3.175 (1/8"), 4, 5, 6, 6.35 (1/4"), 8, 10 mm,1 pce. each |
| Collet & Cutter Holder Set | ZC-500TE | Dia. 6.35 mm (1/4"), 4.36 mm (11/64"), 1 pce. each |
| Vacuum Adapter | ZAD-500T | For ZS-500T |

**For Engraving (Options for ZS-500SH)**

| Name | Model No. | Description |
|---|---|---|
| High Speed Spindle Unit | ZS-500SH | Dia. 4.36 mm collet and cutter holder included. (Life cycle : every 1,500 hours) |
| High Speed Spindle Unit (for replacement) | ZS-500S | For replacement of ZS-500SH (Life cycle : every 1,500 hours) |
| Collet | ZC-23-6.35 | Dia. 6.35 mm (1/4"), 1 pce. |
| Collet Set | ZC-23 | Dia. 3,4,5,6 mm (1/8"), 1 pce.each |
| Vacuum Adapter | ZAD-500S | For ZS-500SH |

**For Modeling and Engraving**

| Name | Model No. | Description |
|---|---|---|
| Vacuum Table | ZV-500A | Mountable area : 500 mm (X) x 330 mm (Y)<br>(19-5/8" (X) x 12-15/16" (Y)) |
| Center Vise | ZV-500C | Chuck for Engraving plates : 152 mm (X) x 135 mm (Y) (5-15/16" (X) x 5-5/16" (Y))<br>Chuck for Cylinders : 90 mm (X) x 130 mm (Y) (3-1/2" (X) x 5-1/16" (Y)) |
| Table Spacer | ZA-500 | Materials that need the Table Spacer : less than 50 mm (1-15/16")<br>The height of the Table Spacer : 80 mm (3-1/8") |
| Safety Cover | ZBX-500 | 900 mm (W) x 790 mm (D) x 810 mm (D) / 52 kg<br>(35-7/16" (W) x 31-1/8" (D) x 31-15/16" (H) / 114.6 lb.) |

## ■ TOOL

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

| Description | Model No. | Specifications (unit = mm) | Collet chuck | |
|---|---|---|---|---|
| | | | For ZS-500T | For ZS-500SH |
| Square end mill (High speed steel) | ZHS-100 | dia. = 1, 3 ℓ x 6d x 50L x 2NT | ZC-5060 | ZC-23 |
| | ZHS-200 | dia. = 2, 6 ℓ x 6d x 50L x 2NT | ZC-5060 | ZC-23 |
| | ZHS-300 | dia. = 3, 10 ℓ x 6d x 50L x 2NT | ZC-5060 | ZC-23 |
| | ZHS-400 | dia. = 4, 8 ℓ x 6d x 60L x 2NT | ZC-5060 | ZC-23 |
| | ZHS-500 | dia. = 5, 10 ℓ x 6d x 60L x 2NT | ZC-5060 | ZC-23 |
| | ZHS-600 | dia. = 6, 15 ℓ x 6d x 55L x 2NT | ZC-5060 | ZC-23 |
| | ZHS-800 | dia. = 8, 15 ℓ x 8d x 60L x 2NT | ZC-5080 | not available |
| | ZHS-1000 | dia. = 10, 25 ℓ x 10d x 70L x 2NT | ZC-5100 | not available |
| Square end mill (Cemented carbide) | ZUS-300 | dia. = 3, 15 ℓ x 3d x 60L x 2NT | ZC-5030 | ZC-23 |
| | ZUS-400 | dia. = 4, 20 ℓ x 4d x 60L x 2NT | ZC-5040 | ZC-23 |
| | ZUS-500 | dia. = 5, 25 ℓ x 5d x 60L x 2NT | ZC-5050 | ZC-23 |
| | ZUS-600 | dia. = 6, 25 ℓ x 6d x 60L x 2NT | ZC-5060 | ZC-23 |
| Ball end mill (Cemented carbide) | ZUB-150 | R1.5, 10 ℓ x 3d x 65L x 2NT | ZC-5030 | ZC-23 |
| | ZUB-200 | R2.0, 12 ℓ x 4d x 65L x 2NT | ZC-5040 | ZC-23 |
| | ZUB-250 | R2.5, 20 ℓ x 5d x 65L x 2NT | ZC-5050 | ZC-23 |
| | ZUB-300 | R3.0, 30 ℓ x 6d x 65L x 2NT | ZC-5060 | ZC-23 |
| Ball end mill (High speed steel) | ZHB-400 | R4.0, 14 ℓ x 8d x 100L x 2NT | ZC-5080 | not available |
| | ZHB-500 | R5.0, 18 ℓ x 10d x 100L x 2NT | ZC-5100 | not available |

*ZC-5060 (1 pce. of 6d collet chuck) is also included in ZS-500T.
*ZC-23 is a collet set of 1 pce. each of 3d, 4d, 5d, and 6d.

dia = shank diameter, L = overall length, W = blade width,
D = drill diameter, ℓ = blade (drill) length

| Description | Model No. | Specifications (unit = mm) | Collet chuck | |
|---|---|---|---|---|
| | | | For ZS-500T | For ZS-500SH |
| Engraving tool (High speed steel) | ZEC-H4010 | dia. = 4.36, 155L x 0.10W | ZC-500TE | Standard |
| | ZEC-H4032 | dia. = 4.36, 155L x 0.32W | ZC-500TE | Standard |
| | ZEC-H4050 | dia. = 4.36, 155L x 0.50W | ZC-500TE | Standard |
| | ZEC-H4075 | dia. = 4.36, 155L x 0.75W | ZC-500TE | Standard |
| Engraving tool (Cemented carbide) | ZEC-U4032 | dia. = 4.36, 155L x 0.32W | ZC-500TE | Standard |
| | ZEC-U4050 | dia. = 4.36, 155L x 0.50W | ZC-500TE | Standard |
| Flat tool (High speed steel) | ZHS-H4100 | dia. = 4.36, 155L x 1.0W | ZC-500TE | Standard |
| | ZHS-H4150 | dia. = 4.36, 155L x 1.5W | ZC-500TE | Standard |
| | ZHS-H4200 | dia. = 4.36, 155L x 2.0W x 3.0 ℓ | ZC-500TE | Standard |
| | ZHS-H4250 | dia. = 4.36, 155L x 2.5W x 3.5 ℓ | ZC-500TE | Standard |
| | ZHS-H4300 | dia. = 4.36, 155L x 3.0W x 4.5 ℓ | ZC-500TE | Standard |
| | ZHS-H4350 | dia. = 4.36, 155L x 3.5W x 5.5 ℓ | ZC-500TE | Standard |
| | ZHS-H4400 | dia. = 4.36, 155L x 4.0W x 6.0 ℓ | ZC-500TE | Standard |
| Diamond Scraper | ZDC-D4000 | dia. = 4.36, 155L | ZC-500TE | Standard |

*ZC-500TE collet set contains 1 pce. each of dia.4.36 and 6.35 mm collet chuck and cutter holder.
*ZS-500SH spindle unit contains 1 pce. of dia.4.36 mm collet chuck.



Roland

**AUTHORIZED DEALER:**

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