

# INFOMATE

## Introduction

Welcome to the 13th issue of our newsletter. The newsletter is used to send product and information updates to our customers on a regular basis.

## New Power Supplies

**MACHINEMATE**, INC has announced two DC power supplies, to help support an integrator with a total automation solution. The 5V supply (part number M328) is rated at 25 watts (5 amps) while the 24V supply (part number M327) is rated at 150 watts (6.5 amps). Both supplies are DIN-rail mounted, consistent with the other accessories that are available (like the modular IO boxes and the cable breakout terminal strips). The 5V supply would be used for encoder power while the 24V supply would be used for power to discrete inputs (like a switch or button) or discrete outputs (like a light or relay).

The 5V supply accepts an input voltage range from 85 to 264 VAC (auto-sensing, 47 to 63 Hz) while the output voltage can be adjusted from 4.75 to 5.5 VDC. The list price for M328 (shown at right) is \$73.35.



The 24V supply accepts an input voltage range (switch selectable) from 88 to 132 VAC or from 176 to 264 VAC (either range, from 47 to 63 Hz) while the output voltage can be adjusted from 21 to 28 VDC. The list price for M327 is \$146.95.

Specification sheets for both power supplies are available to view or download from our web site (see <http://www.machinemate.com/powersupplies.htm>)

## Trade Shows in 2003

**MACHINEMATE**, INC helped two of our integrators with their exhibitor booth at their local trade shows this spring. We were at:

- ◆ Indiana Machine Tool Show, April 29 to 30, at the Indiana State Fairgrounds Event Center in Indianapolis, with our integrator Highland Automation (based in Madison, Indiana).

We presented both a **MACHINEMATE**® eCNC with the 19" rack-mount front panel holding the 15" TFT color touch screen and an L2 with the two-piece slim line front panel.



- ◆ Northwest Machine Tool Show (part of the Northwest Regional Manufacturing Technology & Industrial Show), June 11 to 12, at the Oregon Convention Center in Portland, Oregon, with our integrator CNC Service and Maintenance (based in Mount Lake Terrace, Washington).

We presented an eCNC with the 19" rack-mount front panel and the 15" TFT color touch screen.

**MACHINEMATE**, INC will exhibit in our own exhibitor booth (#431) at the Milwaukee trade show (2003 Wisconsin Tool Show) in the Fall (September 30 to October 2).

## Retrofit of an ITI Grinder

Ormco/Sybron Corporation in Glendora, California is the manufacturer of a product for the dentistry industry. They have plants in America and in Mexico (Mexicali and Tijuana). Their two ITI grinders, built in 1981, needed to be updated. Both were becoming unreliable due to the aging of the electronics as well as some mechanical problems. The ITI grinder had the Model 300 3-axis CNC control system, manufactured by ITI. Parts were no longer available for this obsolete control.

Carlos Moran of Ormco/Sybron was searching the Internet for a state-of-the-art CNC control and he found MachineMate, Inc of Fond du Lac, Wisconsin. Their PC-based CNC control was just what Carlos was looking for. Carlos asked MACHINEMATE, INC whether they had someone to do the retrofit for them in California. Hydrotronic Machine Tool, Inc was located just a few miles away, in South El Monte, California. Don Emon, President of Hydrotronic, began discussing this retrofit situation with Carlos a short time later.

Carlos wanted a complete package, to retrofit both ITI grinders with PC-based 3-axis CNC controls. Don presented a plan to Ormco that would restore the machines to a 'like new' condition. This plan accounted for the complete lack of documentation for the machines and their controls; it included transporting the grinders to Hydrotronic for the retrofit. The plan was accepted and began soon after its approval.

Due to the lack of documentation, a Hydrotronic technician stripped most of the wiring from the control panel, except for the servo drives, motors, power board and encoders. The Y-axis had a scale that was retained. He also developed the schematic for the installation of the MACHINEMATE CNC.

The electrical aspects were progressing at the same time as the mechanical restoration of the machine. Most of the mechanical problems were minor. The ball screws were still in good condition. The total time to fix the mechanical problems in the grinder and to install the MachineMate CNC was five work weeks (i.e., Monday to Friday).

The grinder's operator loves the new controls as they are easy to operate. The first machine has been in production about two months and the production has increased by 28%, which according to the customer has increased the profit margin. The success of the first retrofit resulted in the retrofit of several other Sybron machines with the MACHINEMATE CNC.



The **MACHINEMATE** was mounted on a pendant arm (see the picture above). The handwheel was mounted in the machine tool builder's panel for ease of positioning each axis. There is a PC keyboard available to the operator; the keyboard is tucked underneath the control on a portable tray. The grinder has a Precise high-speed spindle rated at 4000 RPM. (The Precise Corporation has offices in Racine, Wisconsin and Leichlingen, Germany.) The spindle is controlled by the small panel box to the right of the machine (seen at lower right in the picture). This panel also controls the coolant to the spindle motor to keep it cool. The flood coolant for the grinding wheel is managed by the CNC.

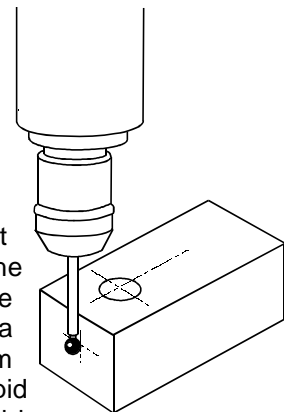
Don Emon founded Hydrotronic in 1976. The primary focus at that time was selling and servicing hydraulic tracers and retrofitting various machines into a 3-dimensional X,Y,Z profiler. The company also did machinery repair and rebuild, including hand-scraping machine ways. Over the past ten years, the company has expanded its services to include retrofitting various machines with 3-axis CNC controls.

Hydrotronic has found the **MACHINEMATE** CNC to be an excellent product that is priced right for its market. They highly recommend the product to anyone seeking to retrofit a machine. They also found the **MACHINEMATE** staff excellent to work with.

## Support for Reverse Engineering

**MACHINEMATE**, INC has two new optional features to support reverse engineering.

First, a 'teach' feature is now available to allow a customer to teach a part easily, creating a part program that will reproduce the physical features on the original part as taught (a form of reverse engineering). The CNC teach feature uses simple functions for the operator, including the points in a profile (like a contour), points in a circle or arc (the circle/arc center will be calculated from the points that are taught) and points off the part (that will be moved at rapid traverse, which are different than those on the part when the movement will be a programmed feedrate). The feature is also extensible so if the operator requires more functions such as spindle on and off or coolant on and off actions during the teaching process, they can be added very easily. This teaching process records the activity in a part program that can reproduce the features of the part, as defined by the operator. The output part program requires minimal editing, usually just the programmed feed rates and the programmed spindle activity (e.g., either clockwise or counterclockwise at which programmed speed and perhaps in which gear range).



Second, a 'digitizing' feature is now available to allow a customer to automatically digitize a part, creating a part program that will reproduce the original part. The feature has a simple set up, including the resolution of the points to be captured on the part and the rough dimensions of the part (XYZ on a mill or XZ on a lathe). Upon activation, the CNC will move the machine enabling the touch probe to record the surface of the part. It will also handle a missing surface, like a hole or an outside surface that is inside the rough dimensions. This digitizing process records the activity in a part program that can reproduce the original contours, enabling the reverse engineering of a part or its features.

## Support for Non-servo Axes (clutch driven)

**MACHINEMATE**, INC has a new optional feature to allow a machine retrofitter or rebuilder to handle the mechanism of a common drive shaft for several axes and the motion for each axis is controlled by several clutches off that common drive shaft. The machine's old control probably had an operator panel of many switches for simple point-to-point commands. The replacement of that old control with a new **MACHINEMATE** CNC enables the machine to be driven by conventional part programs, where the respective axis commands are in the standard RS274D format (i.e., G-codes and M-codes). This feature is enabled for individual axes so if the retrofitter or rebuilder chooses to keep the old mechanical arrangement for some axes but adds new servo drives and motors for other axes, any

combination is allowed. These non-servo machines were of the 1960's vintage and among the manufacturers are Devlieg, Giddings & Lewis and Lucas. Often the machine iron is still good but the control is obsolete making the old electronics difficult and costly to maintain. The control replacement enables the return to useful production for these mature machines but with unlimited part program storage and many new features that the previous control did not have.

## Manuals

The set of control manuals has been improved. There is one new manual, called the Machine Parameter Manual that includes descriptions for all the machine parameters. The Hardware Manual has much new content, with the L2 and eCNC descriptions. The Start Up Manual has more information regarding the configuration of SERCOS parameters while the PLC Interface Manual has material for new interface signals. The set remains at seven bound documents, with the new Machine Parameter Manual replacing the small manual that had described both the Logic Analyzer standard feature and the MM Visualizer optional product for screen development (those two small sections have been improved and merged into other bound documents).

A complete set of manuals is provided on CD with each control at no charge (enabling unlimited print copies by the customer). A bound set of the manuals is also available for purchase for \$195. Each attendee at one of our training classes also receives both a set of printed manuals and the CD.

## Visual Basic and DDE

Several integrators have inquired about writing a Microsoft® Visual Basic™ front-end for the **MACHINEMATE** that would handle special operator screens. The Microsoft VB information has not been so clear regarding its application with DDE for some integrators so we have prepared a simple Visual Basic 6 project that illustrates this easy-to-use software interface in VB. The VB textbox has built-in support for this interface technology and the example project includes the VB code for both read-only (that continually update) and read/write variables. The CNC comes with a built-in DDE server so nothing is required in the CNC for this support of DDE to VB. If you would like a copy of this example VB6 project, just send an email to us at [info@machinemate.com](mailto:info@machinemate.com).

## Conclusion

If you do not want to receive this newsletter, please tell us with a phone call or just respond with an e-mail with 'unsubscribe' in the subject line. If you received a printed issue and you wish to receive it via e-mail, please tell us that by an e-mail to us at [info@machinemate.com](mailto:info@machinemate.com) or call us at 920-907-0001.

Our web site [www.machinemate.com](http://www.machinemate.com) has lots of information about our products and applications; a link can be provided to our customers for the complete manual set. A number of **MACHINEMATE** control retrofit articles are available. Please periodically check the site for news.

Thank you,

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