

num

N° 41 - November 2004

information

Rotary Transfer Machines

PRODUCTS

Axiom Power :
always more!

SOLUTIONS

Morealli : 100.000 gears
per month



Philippe Toinet,
Sales and
Marketing Director
of Num

Num : Major Strategic Choices!

2004 results confirm the appropriateness of Num's strategic choices in terms of sales and product policies.

To date, the consolidated results for 2004 show that we have made the right choices". This is how Philippe Toinet, Business and Marketing Director at Num comments on the company's current situation. It is true that in a rather flat market, where investments are still low, notably in France and Germany, Num has succeeded in avoiding pitfalls by concentrating on its strong points: "First, without ever neglecting volume markets like turning and milling, we have always paid special attention to increasingly specific requests to the point that in certain sectors we have become recognized specialists (precision machining, transfer machines, 5-axis

machines etc.)," explains Philippe Toinet. "This approach has resulted in the enrichment of our know-how. But this diversification also enables us to better withstand unplanned market events", he continues. High added value projects, with a strong technical bent, are not postponed as often as more ordinary projects because they often correspond to a vital need for efficiency.

"Then", continues Philippe Toinet, "we have enthusiastically integrated our clients' need for productivity in the definition of our new products. Often, this involves improving equipment flexibility. That is why since its release in 2003, we have continued to develop our Axium Power

and Num Power ranges with the integration of Visual Tool, for example, that avoids breaks in the digital chain between design and production thus reducing certain adjusting steps and securing data transfer".

Poles of Expertise

Num can also congratulate itself on having been able to adapt its organization to make the most of its flexibility and responsiveness. "By setting up our MTCs (Machines Technical Centers), we have found the way to consolidate our presence in countries by improving the adequacy between our offer and the specific needs of each country," recounts Philippe Toinet. "Now, each MTC is sufficiently independent

to develop its own service offering, or even supplement its product offering. This has led to the development of poles of expertise for particular trades: tool sharpening in Switzerland, gear cutting in the U.S., grinding and the wood working industry in Italy, the stone industry in Spain etc. This enables us to multiply our targets. As soon as a solution has proven itself, it becomes easy to duplicate it in another country and use the skills acquired." It is certainly true that this ease of adaptation is greatly facilitated by the openness of the Num range.



Num Shows Off at ITMS 2004!

Last September, Num participated in the ITMS trade show held in Chicago. This provided Num Corp with the opportunity to introduce, among others, new cylindrical and surface grinding, gear cutting and tool sharpening solutions to American users.

A demonstration showing a Num CNC equipped with Visual Tool was also exhibited on the DP Technology stand. Remember that Visual Tool is the result of a partnership between Num and DP Technology. This concept aims to integrate graphic programming and simulation functions into Num CNC systems and showed DP Technology's Esprit CAM system in the CNC. This can result in considerable improvement in the efficiency and speed of actions performed down on the machine.

Axium Power : Striving to Always Bring you More!

Since its launch in 2003, Num's Axium Power CNC system has continued to evolve, enriched with new functions and breaking through its previous boundaries. A quick look at these new possibilities is a must.

Axium Power is now capable of handling up to 32 axes in eight groups (sets of synchronized axes). This new performance, combined if necessary with the multi-CNC configuration features, yields a particularly attractive solution for transfer machine type applications (up to more than 100 axes – see articles following pages). In addition, with this new 32-axis configuration, Num is able to cover the full range of applications previously covered by its analog bus CNCs.

Open and User-friendly

At the same time, Axium Power now includes an Ethernet TCP-IP link greatly simplifying wiring of the system. This will make

it much easier to support multi-panel and multi-CNC processes as well as remote maintenance and diagnostics by allowing the use of off-the-shelf software.

The HMI has continued to expand towards ever greater user-friendliness, in particular through a Visual Tool function that offers an especially accommodating 2.5D editor and a highly realistic 3D simulation. It should also be remembered that access to Esprit's (DP Technology) CAM milling or turning functions allow the use of all Num's specific integrated cycles, as well as a different approach to machining strategies. Finally, the range of panels available has been expanded to include two industrial



Axium Power offers now a wide choice of PC panels

screens, FS151 and FS151-KBD, and an iPC Compact PC panel.

Changes in MTC Management

Since the M T C s (Machine Technical Centers) were set up, certain management changes have taken place: Num Germany was entrusted to Jean-Marie Amman, Num Italy to Roberto Brignolo and, after 22

very successful years at the head of Num Switzerland, Hans Bachmann is succeeded by his associate Peter von Rüti, previously Sales Director. Before retiring however Hans Bachmann will devote his remaining time to Num's

marketing strategy. As for the new managers, there is no doubt that you'll find in these men the qualities you've come to value from Num.



Rotary Transfer Machine

When Axium Power Controls more than 60 Axes!

Transfer machines, rotary or otherwise, are a world apart in machine-tools. Specializing for many years in this area, Precitrame Machines is an excellent example.

One often thinks that end-users best know the particular features of their business. But taking the step of becoming a manufacturer because you can't find the machine that meets your needs is a risky decision indeed. Precitrame's decision to do so proved successful. First born as a division of the company of the same name, the Machines business became independent in 2001 when it became Precitrame Machines. Better

machining stations (milling, turning, grinding, engraving etc.) that it assembles according to need. "Our clients come in with a plan of a part" continues Olivier Voumard, "and information concerning the speed they need, the quantities they want to produce, etc. and we propose a turnkey solution that takes into account their manufacturing process requirements".

The new Precitrame range pushes the concept of modularity to the limit, thus satisfying sectors as varied as automotive, medical, audiovisual and naturally the sector in which Precitrame began, watch making ... all businesses that require both high volume and precision.

60-axis plus!

The nature of transfer machines is such that each module performs a very simple action. However, the simultaneous management of all the modules is essential. It is essential that each station perform operations of equivalent duration and the positioning systems and those that transfer the part from one station to the next must be perfectly coordinated. This requires an accurate CNC system that features advanced

axis group control. "Each module is considered an independent entity" specifies Olivier Voumard, "so the CNC has to be able to control several channels simultaneously and separately. Our machines feature between 12 and 60 axes, from axes dedicated to machining, to those used for loading and unloading, and the different measuring systems. The CNC system must be able to support a great many axes and, as there are no 60-axis CNCs, several CNC systems must be combined entirely transparently for the end-user".

"With its Axium Power system" he adds, "Num has succeeded perfectly in meeting our requirements. Furthermore, the system's flexibility and the involvement of the Num teams have enabled us to set it up easily. But the alliance of our machines and Num's CNCs yields a rare idiosyncrasy: according to our clients, thanks to the Axium Power interpolation algorithms, the systems achieve a surface finish presenting unique aesthetic qualities, and in certain sectors this is an essential asset!".



The Precitrame transfer machines feature 4 to 16 machining modules.

yet, since 2004, the company has a new plant entirely dedicated to building its machines and today this manufacturer has carved out its reputation in the rotary transfer machine sector (see also article page 10).

The Art of Optimization!

"We specialized in production machines for small size parts (about 50 mm³) and very large series" confides Olivier Voumard, the company's General Manager. "All our added value stems from our aptitude to offer a machine that helps improve our clients' productivity, at the best cost", he continues. The transfer machine is the ultimate production tool since it allows the production of parts based on elementary machining operations occurring in parallel, as the passage from one station to the next is automatic. "It's all a matter of optimization" adds Olivier Voumard, "If you set up one station less you are too slow; if you incorporate one more, you're too expensive!"

In response to its client's needs, Precitrame has developed a certain number of different



Today, even a production machine should be beautiful, as shown by the futuristic design of the Precitrame machines.

Machining Synthetic Materials

Bicycle Helmets – Made in Germany

Thanks to its clever ideas and modern equipment, D-H-G Knauer GmbH has risen to a top position among helmet system manufacturers. The eight most recent machines are controlled by Num CNCs.

In Freiberg, Germany, a medium size company called D-H-G Knauer GmbH, produces bicycle helmets under the KED marque with a production rate of nearly 100%. In addition to its success in its own domestic market, D-H-G Knauer exports 80% of its production worldwide. For example, it is the market leader in South Korea. D-H-G Knauer GmbH was founded in 1985. Originally, it was a service provider in the machining and transformation of synthetic materials.

Several thousand helmets in 48 hours!

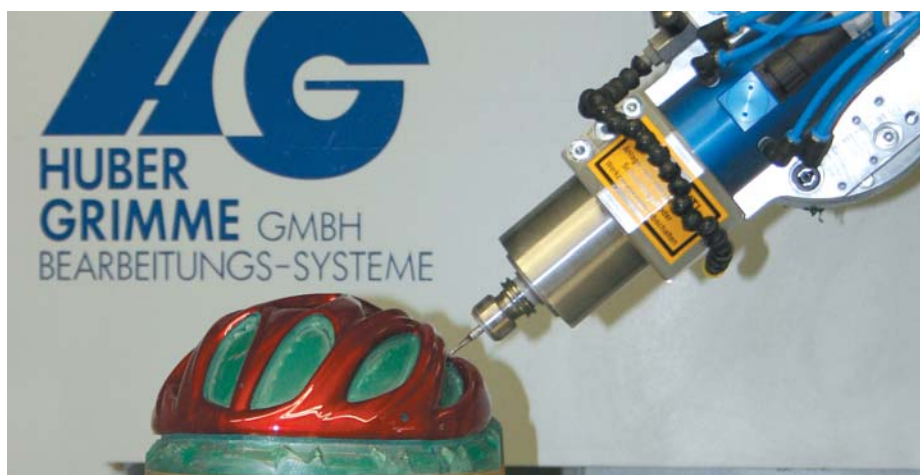
Hans-Georg Knauer, the founder-manager of the company explains his success this way: "We imagined a rapid, flexible chain of processes, which we succeeded in achieving in practice, with the emphasis on the best possible quality". Here are the results. When a sports store orders bicycle helmets for its current collection, those helmets leave the company no more than 48 hours after the order was received – even if the order is for several thousand units. They are produced according to the just-in-time principal since Knauer has no inventory. To be able to produce to order, the company has set up highly flexible manufacturing operation with one or two shifts according to the need.

The key phase of manufacturing at D-H-G Knauer is the mechanical machining of the thin thermoplastic outer shell. It is first held on a jig adapted to the shape of the helmet, in the machining center. The flashing is removed by a clamping device, the ventilation openings are milled and holes are drilled for the helmet fastenings. When it leaves the machine, the helmet shell is ready for assembly.

To control this process which combines speed with reliability, Hans-Georg Knauer uses Huber & Grimme machining centers, 14 of which are in the plant. He has remained loyal to the brand since the foundation of the company.

Cooperation for more than 10 years

Since its creation, HG Bearbeitungs-Systeme GmbH Huber & Grimme, established in Wiedergeltingen, has specialized in CNC systems for machining synthetic materials and producing models. Since the mid-90s, Huber & Grimme has equipped all its machines with Num numerical controls. And this is not by chance, explains Peter Fendt, the sales manager: "We are very satisfied with this co-operation, which would not have lasted 10 years otherwise. The numerical controls meet our requirements in terms of calculation power, with short processing times



The helmet slots are milled into the shell using a high speed spindle. The other tools necessary are housed in the magazine.

and easy programming. We also appreciate the highly flexible personnel at Num, as well as their immense know-how of special applications." Using Num CNCs is very easy: all the programs are taught directly on the machine. "There is no question of using any another programming method due to the thinness of the synthetic material shells we machine", explains Hans-Georg Knauer. "We have already tried to use conventional programming on the machine; we have also tested a CAD/CAM system. Unfortunately the final results were not good enough. "To facilitate teaching, Num has developed its own mobile teach-in-box for Huber & Grimme that gives the programmer greater flexibility. If success continues, the installed base of machines at Knauer should soon grow. The list of candidates certainly includes the manufacturer Huber & Grimme and the numerical control specialist, Num.



Hans-Georg Knauer: "With the new Num numerical control, we can make corrections to the current program while still machining."



Eight in line: The new HG 1400 machining centers enabled productivity at Knauer to be increased. Machining times were reduced by at least one third.

Gear cutting



The design and production of gears is a specialist's activity

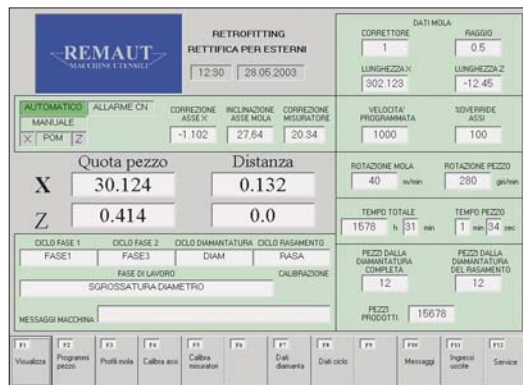
The development of a professional HMI facilitates automatic production and flexibility

Moreali produces 100,000 gears per month with Num CNCs!

A professional attitude provides the Italian manufacturer with a flexible, high performance production tool.

Since the early fifties, the Italian company Moreali, established in the Italian "Technology Valley" (Emilia Romagna), has specialized in the manufacture of high quality gears. Two thirds of its production are intended for the domestic market and one third for export to France, Germany and Canada. Production is composed of gears for oil-hydraulic pumps, straight bevel gearing, spiral bevel gearing, of the "Gleason" Hipoid system, amongst others. "High quality, high productivity, high value added services (design, dimensioning, packaging etc.) are the keys to the success of our activities" declares Gianfranco Macca, owner of the company. "Designing a gear is a specialist's task" he continues "as there are a multitude of possible solutions depending on the characteristics desired for the transmission. One must be able to cleverly combine tooth geometry, the material, the transmission torque, etc."

"Our latest gear hobbing machine, a Gleason 106 is now controlled by a Num Power 1040 CNC" says the manager of bevel gearing, "We have a high speed spindle that reaches cutting speeds of 100 to 130 m per minute, hence a significant reduction in machining time, above all, an improvement of the final crowning cut". Easy programming, simple setup and the availability of special cycles make this machine extremely flexible and simple to use. "This flexibility was obtained" explains Silvano Nutini, technical manager for Remaut, "by personalizing the human machine interface with Num development tools: MMITool and Procam". MMITool can change the HMI via an object-oriented language, by displaying only the information the operator needs. Procam is an interactive automatic program creation package, where data is entered into fields proposed by the graphical interface. "Furthermore", adds Silvano Nutini, "we were able to develop gear machining cycles (cutting etc.) in the form of a parameter file, thanks to structured programming and sophisticated macros resident in the Num CNC."



Combining quality, variable batches and automatic production

"Producing 100,000 gears per month, with consistent quality, the least possible rejects, batches that vary from a few dozen to two thousand items, working non-stop, all automatically, that's the challenge we must meet" explains the Design Department Manager. "Today, this is possible thanks to the know-how of Remaut, responsible for the maintenance and overhaul of our machines, and to the know-how of Num."



A HMI dedicated to grinding

In the Grinding Department, the Tacchella grinding machine, recently renovated and equipped with the Axiom Power CNC system, is particularly important. "The choice of a PC-based CNC system (Axiom Power)" explains Silvano Nutini, "enabled the development of a dedicated grinding HMI by using standard software tools (Visual Basic, Visual C++). Moreover, the presence of an applications server in the CNC (PCToolkit) gives free access to the information of the CNC, the digital drives and the programmable controller. These were integrated in the display pages in order to facilitate surveillance and machine maintenance". The Num HP Drive servodrives proved indispensable in obtaining high accuracy levels (in the order of a micrometre) and the reliability required by grinding operations.

Industrial machining of Timber Frames

Almo uses its **metal cutting know-how** for an **innovative** woodworking machine!



Almo Technologie has launched a machine capable of performing all the machining and jointing operations on wooden frames, entirely automatically, with a 5-axis machining center controlled by an Axiom Power CNC.

When Michel Loyet took over at Almo two years ago, he knew how to make use of the company's knowledge and skills with flexible and industrial machines to diversify into the construction joinery sector. This is how the Vega 5-axis machining center was born. Intended for carpenters and joiners, this machine is notable for the judicious transfer of technology ...

Machining an entire construction frame

"With the Vega, we meet every need in terms of cutting timber joints and wooden frameworks" explains Miguel Gomez, Technical Director at Almo Technologie. "The m/c's originality lies in the fact that it is based on true metalworking philosophy. Thus, the perfectly rigid portal frame structure, usually reserved for machining metal parts, is ideally suited to intensive, high speed operations. Likewise, the multi-directional 18,000 rpm tool head allows machining at any angle, even on the ends of the beams. Combined with a feed rate of 60m/min, we are entering the realms of high speed machining. This is why we have also worked in co-operation with tool makers to take account of all the aspects of high speed machining. Taking all these imperatives into account is quite natural when machining metal, but less so in the case of wood".

The position of the tool head, above the part to be machined, facilitates the evacuation of waste, in particular during sawing operations. The Sytec brand tool head is controlled, like the entire machine, by a Num Axiom Power CNC, associated with HP Drive digital servodrives. It automatically selects the tool according to the machining to be performed and optimizes cutting speed.

"Several applications were developed specifically for this machine", adds Franck Strugareck, Sales Engineer at Num. "Thus, the head positions itself automatically according to the degree of incline required by the tool and the arrangement of the part. We have also developed, with the help of dynamic operators, algorithms that either allow accurately synchronizing the loading and unloading

clamps, or on the contrary, managing them independently during the machining phases, to eliminate any possibility of collision. Finally, thanks to a measuring system located at the loading system, the blank (section and length) is identified and the CNC can then launch the appropriate program".



Automating the construction carpenter's trade

The Vega machining center has a completely enclosed machining area. This is another legacy of Almo Technologie's experience in the metal working sector. "In the automotive industry" states Miguel Gomez, "we had to follow very strict safety rules. We thought it would be useful to replicate them on the Vega, especially since this favors compliance with noise and dust standards".

With Vega, the objective of the Almo Technologie teams was to industrialize the construction carpenter's profession. Objective attained, since 3 machines have been sold already. "We plan to market 50 machines per year," concludes Michel Loyet, "twenty of them for export, for a price ranging from 300,000 to 350,000 euros". Especially since other functions are yet to be implemented, like remote maintenance via Axiom Power's TCP/IP link. Other business sectors are interested by this type of machine. Its flexibility and characteristics allow it to be easily configured for machining composite materials, light alloy profiles and models.

Totally enclosed, the Vega machine offers excellent safety. Furthermore, its HMI allows the operator to find familiar terms and representations on the dialogue screens and 3D displays

The Vega machining center meets all the needs for joinery and timber frames (maximum section: 300 x 450 mm - width: 650 mm and optionally 1200 mm).



The position of the tool head, above the part to be machined, facilitates the evacuation of waste, in particular during sawing operations. This Sytec brand tool head is controlled by a Num Axiom Power CNC, coupled with HP Drive digital servodrives.

Boring/Milling Machine



Num contributes to the development of High-tech Bottling Lines

Alfatek has improved the quality and flexibility of its production thanks to a Maut boring/milling machine equipped with an Axiom Power system!

Designing and building a bottling line requires perfect synergy between mechanical engineers, product specialists and micro-biologists. Their close collaboration yields systems that are increasingly compliant with the stringent organic, chemical, physical and microbiological characteristics required today. Having based its production on its capacity to unite these trades, Alfatek whose headquarters are in Albano Laziale, near Rome, succeeded in imposing its systems on the national and international markets in the last ten years. Its core business is the installation of wine bottling lines but it has increasingly diversified into all food liquids, oil, liqueurs, milk etc.



"Before having this machine" explains Francesco Scarano, "certain mechanical parts could not be machined in a single operation. This reduced the precision of the finished part and considerably increased lead times".

"It was precisely to meet the needs of these new applications that we made new investments," says Francesco Scarano, plant manager. "We had to improve flexibility, productivity and delivery lead times".

This policy led notably to the acquisition of a Maut MME3 boring/milling machine, as well as five vertical machining centers and ten numerical control lathes.

The boring/milling machine is equipped with an Axiom Power CNC system and Num HP Drives, enabling it to reach traverse rates of 40 m/min and machining speeds of 20 m/min. Thanks to its 18 kW "built in" Num Motorspindle®, the tool can rotate at 7,600 rpm, while the X axis travels up to 6 m (1 m for the Y-axis and 1.8

m for the Z-axis). Furthermore, the machine features a bi-rotational head (A inclined at 45°, driven by B) and uses the "inclined plane" function of the CNC system to execute cycles common to a three axis machine with any inclination of the toolhead. The CNC calculates all the translations to perform for the rotation of the toolhead, simply on the basis of the angles formed by the new plane with the axes of the machine, taking into account the tool length and radius corrections. Finally, the automatic tool change system, with forty available stations and random management, completes the equipment. "Before having this machine" explains Francesco Scarano, "certain mechanical parts such as the bases or more generally large size parts, could not be machined in a single operation. This reduced the precision of the finished part and considerably increased lead times. The manufacture of large size parts had to be outsourced which limited the autonomy of the company".

Goal Reached!

Since its implementation in May, the Maut machine was especially used to produce steel bases for batches that varied from one to ten items. "Availability, in CNC, of macro-commands for drilling, rigid tapping, boring and slotting, greatly facilitates the production of part programs" says Francesco Scarano. "Furthermore, rigid tapping integrated in the CNC enabled us to use spindles with no axial compensation system, guaranteeing better machining quality and reducing tool costs". "Another important asset", he concludes, "is that this machine can manufacture a wide range of different parts, notably those normally machined on our CNC machining centers. This provides our production with significant flexibility and enables us to adapt more easily to the current and future requirements of our mechanical designers. Finally, the selection of the Axiom Power PC-based system facilitated the connection of the CNC to the company network with obvious benefits in terms of production management".

Tool Grinding

A Service "Pro" Chooses Num !

When choosing a machine, technical performance is certainly one criteria. TTB Engineering also decided to include quality of service and Num has followed it in this approach.

For several years, TTB Engineering has been producing 5 or 6-axis tool sharpening centers for the production of small size tools (12 to 0.02 mm Ø). Called TGC (Tool Grinding Centres), these machining centers are designed for production, and feature up to 5 wheel spindles, each able to hold 3 grinding wheels. This innovative system permits cylindrical and shape grinding from A to Z without unclamping the workpiece. In addition to time savings, this process is also highly precise. The Swiss manufacturer has announced results of roughly 0.5 µm!

But TTB's strategy is not limited to the supply of recognized, high performance grinding centers. This company, located near Lugano, has decided to differentiate itself through a very service-oriented approach to customer needs.

Downtimes less than a day long!

Like many machine manufacturers, TTB is confronted with diverse and varied requests; the imperatives of the automotive industry are not the same as those of the medical, watch making or electronic industry. Thus the TGC feature a modular design enabling them to adapt to the different specifications of users. It is here that TTB wants to make a difference. "We have broken the machine down into several functional blocks that are tested before and during machine assembly" explains Roberto Vassalli, company Director. "But above all, we have decided to keep some of them in stock in order to respond nearly instantaneously to any failure notified by our clients. Thanks to this anticipation, we are able to repair a machine in less than one day, and saving a day of production can be vital for a manufacturer. This is what led us to monitor our inventory of spare parts with such precision", he continues, "and in our warehouse we store parts that are no longer manufactured by our supplier but that we know are still used by our clients".

This method enables TTB to optimize its assembly times. "We are capable of setting up a machine, complying with client specifications, in about 15 days!" announces Roberto Vassalli.

Num, A Partner up to Standard

"It was initially the renown and success of the NUMROTO software that attracted us to Num." confessed Roberto Vassalli. "In the



TTB Engineering produces 5 or 6-axis sharpening centers for the production of small size tools (12 to 0.02 mm Ø).

sharpening sector, NUMROTO has a very extensive installed base, in many countries. Furthermore, its scalability, like for example its compatibility with the most varied measuring systems, make it a truly universal system. Moreover, Num quickly demonstrated its capacity to meet our particular needs" he added.

To meet TTB's requirements, Num developed a specific fluid-cooled synchronous servomotor. This servomotor, reaches speeds of over 10,000 rpm, and is available in several versions (self-contained and housed for axis applications, and as separate parts for spindle applications). In addition, to its major asset (compactness) its multiple applications capability facilitate its placement in the inventory. "Today, Num mounts complete systems for us, CNC/Drives/Motors" affirms Roberto Vassalli. And having the same philosophy regarding customer satisfaction is certainly a excellent way for us to get along!



Mounted on a turntable, the wheel spindles can be equipped with 3 grinding wheels each. Associated with the 4-axis work-holding device, this multi-wheel spindle can perform a cylindrical grinding operation with no tool change.

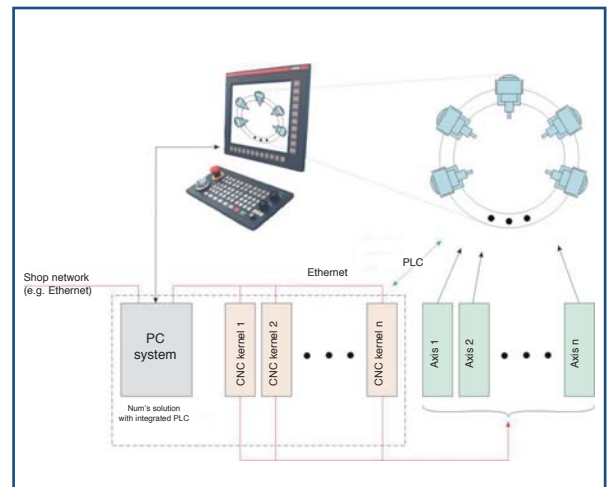
Transfer Machines

How to allow the intuitive use of a machine with more than 100 axes?

As transfer machines evolve, they reveal new control needs. Num offers a solution to improve yield.

In the machine-tool environment, machining centers have customarily competed with rotary or linear transfer machines. The former were generally used for small and medium size batches, while the latter, built for speed and precision, were reserved for large scale production. Transfer machines are composed of several stations. A part is machined by undergoing partial treatment at each station, which always executes the same operation. While the borderline between machining centers and transfer machines was fairly well defined for a long time, it has now become much less clear. There is a trend toward greater operating flexibility to allow the launch of smaller batches with a greater number of part variants.

In these conditions, changeover times becomes paramount. Likewise, flexibility and user-friendliness are decisive characteristics in the selection of this type of machine. That is why CNC systems are an excellent solution for replacing the fixed, rigid solutions that have long driven the basic design of transfer machines.

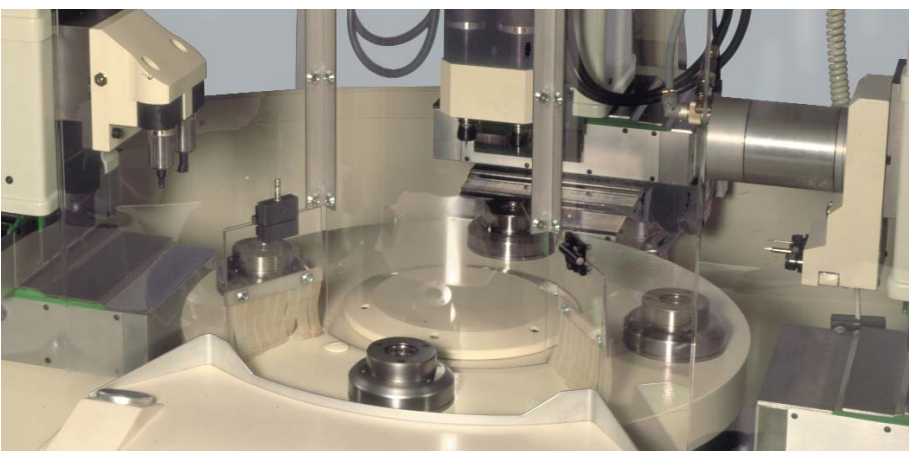


Flow chart of Num system. Operator-side, use is particularly simple and intuitive.

totally transparent for the user. Users must be freed of any concern specific to a particular CNC such as the name of fixed axes, the designations of the channels, etc. They must be able to focus on the proper terms of their machine, like the name of the station and the operations performed there.

Based on its Axiom Power CNC system, Num has developed an application that drives a simple or complex machine and illustrates it on the CNC panel as it appears in reality.

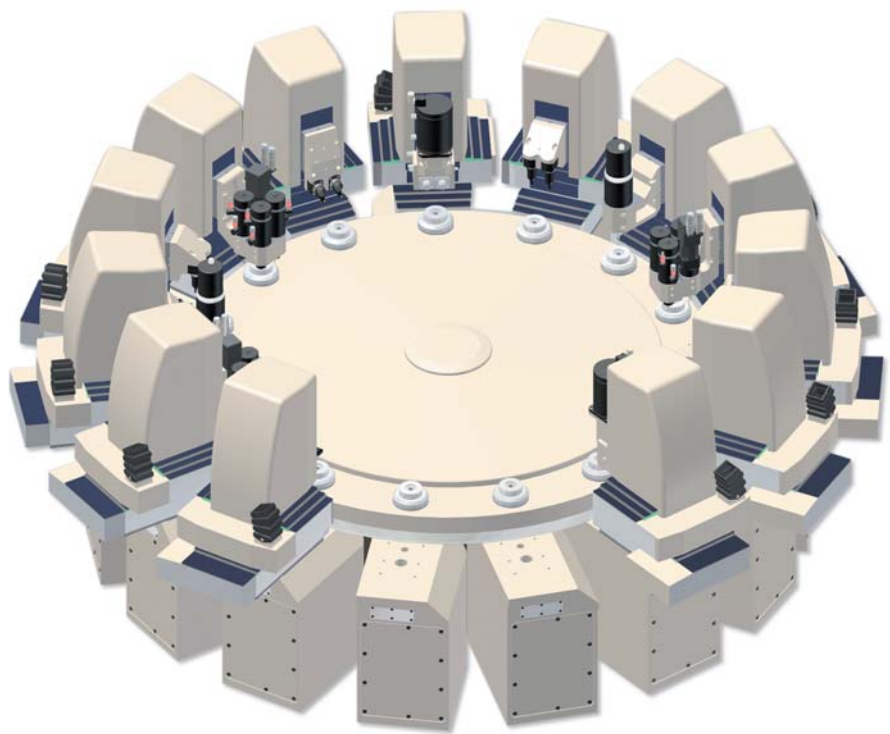
This application can be adapted to the machine's configuration. An Axiom Power kernel can drive a maximum of 8 stations for a total of 32 axes, with at most 9 axes per station. For the largest transfer systems, several CNC kernels can be connected in parallel (see figure 1). This yields machines with over 40 stations and more than 100 CNC axes. The turning, milling, grinding, measuring stations, etc. are combined at will according to need. The many stations of larger systems can be combined into "modules". The Num solution takes into account this type of configuration and allows the user to focus on the stations of a particular module. Station and module names can be freely defined. Each station can thus be easily identified by the user. Likewise, whatever the operating mode of the



A New Concept for Transfer Machines

A transfer machine supports the most diverse machining processes: turning, drilling, milling, grinding, measuring, etc. The CNC system must be able to manage a great number of axes, and when that number is very high it must be possible to link several CNCs in a way that is

CNC system, each station or module can be selected. The assignment of part programs and other CNC machining data to the different stations is automatic, releasing the operator from this distribution. This is also the case for the backups. When part programs are created, their assigned station is clearly indicated. Particularly transfer machines with a lot of stations can have a considerable number of tool offsets. These offsets can be assigned to a particular station to facilitate their management and use. Users can simply choose to show all the tool offsets or just those corresponding to the station selected. With these complex machines, an operating problem like de-synchronization can have disastrous effects. In the event of a failure, it is essential that error messages are as clear and accurate as possible. The Num application informs users of possible errors, while the unaffected stations continue to run normally. These error messages indicate the physical CNC kernel and the CNC channel concerned. This information facilitates trouble-shooting on the physical components. Furthermore, the error messages are recorded in a fault log.



A nearly limitless system...

To make best use of the features of all transfer machines, the Num solution is not limited to the previously mentioned possibilities. It also allows specific developments either by the machine manufacturer or the system supplier. These adaptations are

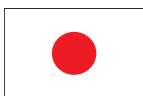
possible both for the HMI (Human Machine Interface) and the real time CNC kernels. In conclusion, the new Num application simplifies transfer machine use and reduces the risk of operating errors, yielding improved productivity and reduced setting times, and as a result, a reduction in part price.

A part is machined by undergoing partial treatment at each station, which always executes the same operation (Precitrame's doc.)

Num goes to the Show...

November 2004

JIMTOF



Tokyo / Japan

March 2005

Industrie



Lyon / France

September 2005

EMO



Hanover / Germany

November 2005

FIMA



Valence / Spain

Educatec



Paris / France

April 2005

CIMT



Peking / Rep. of China

October 2005

Scanautomatic



Göteborg / Sweden

Educatec



Paris / France

SPS/IPC/Drives



Nuremberg / Germany

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LIGNA +



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Automation



Paris / France

num information

Published by Num SA
Immeuble "Les Courlis"
46 avenue Kléber
92700 Colombes
Tel.: +33 (0)1 34 23 66 66
Fax: +33 (0)1 34 23 65 49
www.schneider-num.com
United States
Num Corporation (USA)
603 East Diehl Road,
Suite 115,
Naperville, IL 60563
Tel.: +1 630/505-7722
Fax: +1 630/505-7754
sales@num-usa.com
www.num-usa.com
United Kingdom
Num (UK) Ltd
Unit 43 & 44, Centenary
Business Centre,
Hammond Close
Nuneaton CV11 6RY
Tel.: +44 (0)2476 387306
Fax: +44 (0)2476 387316
sales@schneider-num.co.uk
www.schneider-num.co.uk
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Axiom Power CNC System

Boost Your Machines
And Your **Productivity !**

Num : CNC Systems and Applications

From the combination of a powerful industrial PC, a compact universal CNC, digital bus drives and a wide range of axis and spindle motors, Axiom Power systems are capable of meeting all needs, from the simplest to the most complex.

Quick Implementation, Computational Power, Accuracy and Quality of Machining are among so many reasons to choose Axiom Power!

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