TRM Electronics

Motion Control & Automation Manufacturers

Case Studies

Bowling Ball Machine

Our client is a specialist manufacturer of custom made machines. Having supplied machines for different industries, our client wanted to build a machine to make the grooves and marks for bowling balls

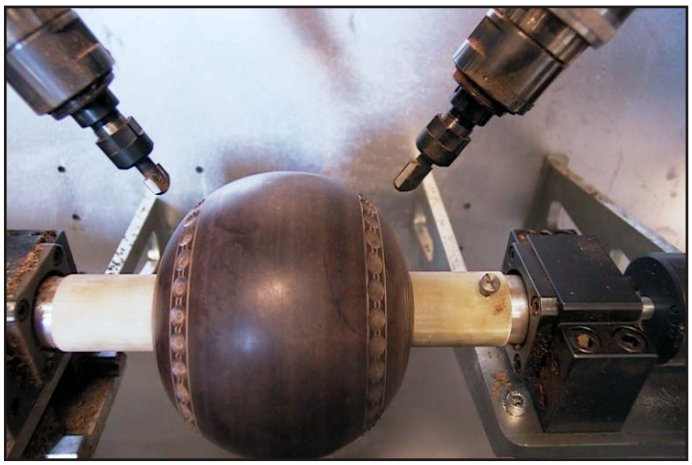
The client wanted to manufacture 50 balls per hour with a variety of marks and patterns.

Bespoke Machines Ltd., used a 1 axis TRM motion controller with MAP software, 1.2 Nm servomotor with 1000 pulses per revolution encoder, TRM electrical cabinet, all wiring between the electrical cabinet and controller pre-made at TRM facilities and a proximity sensor for home position we were able to build a machine to meet and exceed job requirements. The machine is now producing 60 bowling balls per hour and is capable of making many more patterns than before.

We supplied all the electrical controls and motor mentioned above when the machine was 80% built, since all the wiring was pre-made it was quick to install and ready to start the initial tests soon after delivery.

Today the machine is manufacturing bowling balls with more patterns and better quality than ever and still remain competitive with labor costs down and greater production.

Photos courtesy of Bespoke Machines Ltd.
www.bespokemachines.com



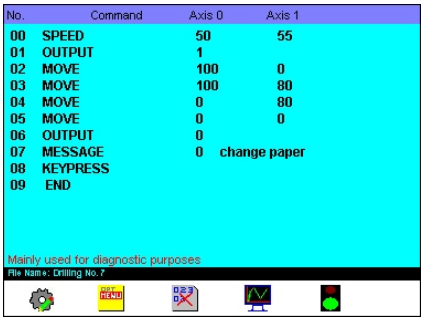
In order to make the grooves, marks and patterns, the servomotor rotates the bowling ball with high accuracy. Using the digital outputs the controller turns the tool motors ON and OFF.

Using the controller's capability for storing up to 100 user programs, different programs are created for making different patterns as shown on the photo above.

The controller was programmed using the **M**otion **A**pplication **P**rogramme 'MAP'. 'MAP' has been used in a vast variety of machines and applications giving the user a greater control of costs, saving money and time on software development.

MAP is an end user friendly language adaptable for the majority of applications with 28 commands to choose from.

One of the great advantages of MAP is that it allows end users to create their own programs with no need for a skilled programmer. MAP has been used in different applications from Sash Windows Machines, Bowling Ball Machines, Tube Bending Machines, XYZ tables, Pallet Manufacturing Robots, rotary axes and milling machines to pharmaceutical mixers among other applications.



Program example using MAP. The controller can store up to 100 end user programs in memory with up to 1000 lines each.

MOTION

Point to Point move:
Moves a single axis from point to point with no acceleration, or velocity parameters. This command is mainly used by the profile generator or for holding position.

Trapezoidal move:
Moves a single axis from point to point, using programmed acceleration and velocity parameters. If the velocity can not be reached the function will generate a triangular profile.

Linear Interpolation:
This function allows up to 4 axis to be linked together to produce a linear profile. Full use is made of the acceleration and velocity parameters.

Circular Interpolation
This function allows two axis to be linked together to produce a circular profile. Full use is made of the acceleration and velocity parameters.

TYPICAL APPLICATIONS

- XY Positioning Tables
- Conveyors
- Dosing
- Mixers
- General Motion Control
- Cutting Machines
- Automatic Drills
- Positioners
- Robotics
- Bending Machines
- Woodworking Machines

Items Provided By TRM for this Application

Professional Motion Controller
1 off 3 Axis stand alone motion controller with keypad and colour screen.

Electrical Cabinet
The TRM Electrical Cabinet is intended to simplify wiring. The Electrical Cabinet provides:

- 24 Volts for the motion controller and the power supply for the DC servo amplifiers to run the motors using an external transformer.
- Screw connectors are used for connecting the Inputs/Outputs for a fast connection
- On-board filtering of power supplies and signals

Servomotor
1 off Servomotor rated at 1.2 Nm and at 60 V

DC Servo-Amplifier
1 off compact current mode amplifier capable of driving brushed DC Servo motors continuously at up to 100 volts and up to 5, 10 or 20 amps depending on the model

Encoder
1 off Digital rotary encoder with 1000 ppr

Sensors
1 off Inductive Proximity sensor for home position and 2 infrared beam sensors for detecting the size of the window

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