TekMOV Motion Control Software

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TekMOV overview

TekMOV Motion Control software consists of **TekmovUI**, a Microsoft Windows based program for machine configuration and data spooling, and **tekmovppc**, a program that runs inside the G3-01 motion control board to operate the machine hardware. The G3-01 board also hosts a http server that allows an on board User Interface program to communicate with the controller via web browsers or Flash Media players.

TekMOV Software Features

- Easy to use Operator interface reduces demands on operator's skills and attention.
- **Modular Firmware** features are password protected, allowing machines to be shipped in basic form, and upgraded later. Modules include:
  - Large Table size
  - Homing
  - Tool length sensor
  - Z axis
  - 3D
  - C Axis tangential knife control
  - Auto Tool Change
  - Auto Tool Rack Pop Up
  - Plasma
  - Plasma Torch Height Control
  - Digitizer
  - Bar Code Reader
  - Opticam Registration mark system
  - Inkjet Label print head
  - Enhanced Motion Control

- **Open Architecture** system, using Industry Standard HPGL 2 or G Code instruction sets. Files generated by Cadlink Signlab, Artcam, Type 3, Autocad, Sign Wizard, Casmate, Enroute, plus many others can be used.
- 2D, 21/2D, and 3D plot files fully supported. 3D Profiling Software allows both AutoCarve and sweep-pass style 3D profiling.

- **Comprehensive Woodworking machinery support:** Nested Based Manufacturing support including Auto Tool change, Multibore spindle, bar code reader, sheet loading, sheet unloading, inkjet labeling.

- **Comprehensive Sign and Graphics machinery support:** Cut-To-Mask support, camera registration system, tangential knife support.

- **S curved acceleration** on tool up moves allows fast smooth motion. Up to 4 times the acceleration compared to tangential acceleration, with smoother motion.

- **Auto Tuning of Servo PID Settings** with user selectable Crossover Frequency takes the guesswork out of servo tuning, and gives correct settings for the specific machine.
- **Plot Spooler (DNC Link)** allows you to store as many cutting jobs as you like on office computers, and sends them to the controller when needed, with 100% error free communications link. Host Computer can be anywhere on the office network. The Job Folder used by the controller can have user defined sub directories, allowing you to better organize your jobs. No Limit Job Storage Space. Number of jobs and data limited only by hard disk space on office system.
- **Search Function** allows re-cutting of shapes if toolbit breaks. Simply push Search button, and move from shape to shape with the joystick.
- **Versatile Jogging Control** with user definable High, Low and Fixed Low Speed ranges, with 1/10 speed scaling function for accurate positioning
- **Independent Origin Setting** Set X and Y origin independently, allowing accurate origins on odd shaped pieces.
- **Material thickness, Job Origin can be embedded in Plot File,** reducing setup and possible errors in production environment.
- **Local Jobs** include Go To Home, Go To Origin, Go To Park Location, Grip / Release tool, Spindle On / Off, Tool Rack Up / Down, Sense Tool Length.
- **Multiple Home Positions** Save as many Home Positions (Job Origins) as needed, and call them up by name. This makes setup for repeat work much easier.
- **Multiple Origins , Origin Lock** Up to 8 Origins can be stored on the system, allowing quick changeover to different jigs for production work. Origin Lock prevents Operators inadvertently changing origin during operation.
- **Material Thickness Lock** In production environment, this prevents the operator changing the material thickness by mistake
- **Spindle Position Readout** on Operator Console allows you to know where the spindle is during jogging. This is useful when offsetting origin of a job by a set amount, measuring material, etc.
- **Automatic Tool Length Sensing** Permits the operator to easily instruct the controller to measure the length of the tool bit, and permit precise depth control.
- **Automatic Tool Change support** permits the fitting of ATC spindles. Up to 99 different tools are supported.
- **Carousel and Tool Rack support** permits the ATC spindle to pick up tools from either type of tool storage system.
- **Automatic Power Failure Recovery**. If the power goes out during profile cutting, the origin of the job, and the material thickness are saved, so when power is re applied, the job can be resumed without the loss or damage to the workpiece on the table.
- **Flash Eprom** for downloading firmware updates allows controllers to be kept current via remote internet support.
- **Batttery Backed up RAM** in controller stores recent job data for quick resume after start up.
- **Web Based Operator Interface** allows remote support technician to see what is displayed on the local machine interface. This makes remote support almost as if the technician is in the room.
- **On Board Diagnostics** allows the encoders, amplifiers, overtravel switches and relays,

SERIAL COMMUNICATION, TO BE TESTED ONE AT A TIME FOR EASY MACHINE COMMISSIONING AND MAINTENANCE.

- **MOTION ERROR DETECTION** STOPS MOTION WHEN FOLLOWING ERROR OF SERVOS EXCEEDS USER SPECIFIED SET POINT. THIS SAFEGUARDS AGAINST TROUBLES CAUSED BY DULL TOOLBITS, STALLED SPINDLES, CRASHING INTO CLAMPS, CUTTING TOO FAST ETC.
- **EXCESSIVE DRIVE ERROR** SHUTDOWN PREVENTS DRIVE RUN-AWAY IN THE EVENT OF LOST ENCODER SIGNAL OR OTHER CONTROLLER ERROR.
- **HOMING SEQUENCE** ON POWER UP ALLOWS SOFTWARE SQUARING OF DUAL DRIVE GANTRY.
- **METRIC AND IMPERIAL** SPEED AND DISTANCE UNITS SUPPORTED.

INDUSTRY SPECIFIC FEATURES

PLASMA CUTTING FEATURES

- **INITIAL HEIGHT SENSOR SUPPORT** WHICH PERMITS TORCH TO BE LOWERED TO THE EXACT HEIGHT ABOVE THE WORK PIECE, TO MAKE SURE TORCH IGNITES CORRECTLY.
- **OPERATOR CONTROLLED DWELL** ADJUSTED AT THE OPERATOR INTERFACE, PERMITS SETTING OF TIME DELAY TO ALLOW PENETRATION OF MATERIAL BEFORE STARTING THE CUT.
- **OPERATOR CONTROLLED PREHEAT PAUSE** THIS FEATURE ALLOWS THE OPERATOR TO PAUSE THE MACHINE TO PREHEAT THE METAL WHEN CUTTING WITH AN OXY / ACETYLENE TORCH.
- **AUTOMATIC TORCH HEIGHT CONTROL** ALLOWS FOR ACCURATE CUTTING OVER WARPED SHEETS.
- **HEIGHT CONTROL ENABLE / DISABLE** SWITCHING AS A % OF TOP SPEED, SOFTWARE ADJUSTABLE. THIS PREVENTS THE TORCH LOWERING INTO PENETRATION HOLES, AND LEAD-IN CUTS.
- **PENETRATION DELAY** ADJUSTABLE FROM OPERATOR CONSOLE.

ROUTERING FEATURES

- **AUTOMATIC TOOL LENGTH SENSOR**, PREVENTS TOOLBIT FROM CUTTING INTO TABLE TOP.
- **MATERIAL THICKNESS SENSOR** ALLOWS FOR QUICK SETTING OF MATERIAL TOP PRIOR TO CUTTING
- **AUTOMATIC TOOL CHANGER** SUPPORT, SUPPORTING AUTOMATIC SPINDLE SPEED SETTING, TOOL LENGTH MEMORY, POP UP TOOL RACK, SPINDLE STOP SENSOR, TOOL CLAMP / RELEASE SENSORS ETC.
- **SUPPORT FOR SEMI AUTOMATIC TOOL CHANGE (QUICK CHANGE)** WHERE TOOL HOLDERS ARE MANUALLY FITTED INTO AN AUTOMATIC TOOL CHANGE SPINDLE.
- **MULTIBORE SPINDLE SUPPORT**
- **SHEET LOADING** AND **UNLOADING** SUPPORT, FOR FLOW THRU OPERATION
- **INKJET LABELLER** SUPPORT, FOR IDENTIFICATION OF COMPONENTS.

RECIPROCATING STEERED BLADE CUTTING FEATURES

- **STEERED KNIFE SUPPORT** WHICH STEERS THE BLADE ALONG THE CONTOUR.

- **Programmable Move-Ahead** to compensate for width of blade trailing behind the center of rotation
- **Programmable Lift-and-Turn angle** to define when the knife has to be retracted to make a sharp turn.
- **Automatic Tool Change** of tangential blades and crease wheels.

Engraving features

- **Top Left Origin** or Bottom Left Origin.
- **Solenoid Z** axis and motorized Z axis supported.
- **Interpolation** of vectors for high speed cutting of small vector paths.
- **Auto Nosecone Depth sensor**, eliminates need to set material thickness.
- **Auto Load Function** allows the plot file to be sent from the computer, and machine can automatically start cutting the job.
- Support for **twin spindles**.
- **Quick Set Z** function moves spindle to first tool down location, permitting Z depth setting without marking material.

Waterjet cutting features

- **Ultra Slow Speed Settings** as low as .0001mm/sec. possible, allowing cutting of thick slow cutting materials.
- **Penetration Delay** adjustable from Operator console.

Plasma cutting features

- **Initial Height Sensor Support** which permits torch to be lowered to the exact height above the work piece, to make sure torch ignites correctly.
- **Operator controlled Dwell** adjusted at the operator interface, permits setting of time delay to allow penetration of material before starting the cut.
- **Operator Controlled Preheat Pause** This feature allows the operator to pause the machine to preheat the metal when cutting with an oxy / Acetylene torch.
- **Automatic Torch Height Control** allows for accurate cutting over warped sheets.
- **Height Control Enable / Disable** switching as a % of top speed, software adjustable. This prevents the torch lowering into penetration holes, and lead-in cuts.
- **Penetration Delay** adjustable from Operator console.