Hand Held Programmer

The Thermwood Hand Held Programmer is the single most powerful tool available for creating , modifying, editing and refining CNC programs at the machine. The Hand Held Programmer provides a vital link between the CAD/CAM programmer and the CNC machine tool.

With the Hand Held Programmer:

► **Programs can be created at the machine from a sample part.**

► **Existing programs can be modified into new programs.**

► **Programs can be edited or corrected and refined at the machine without the need to re-post.**

► **New programs can be tested, corrected and refined at the machine.**

► **The machine can be used to make cuts without requiring a program.**

The Hand Held Programmer will result in better, more efficient machine operation. Programs are debugged and refined in a fraction of the time normally needed. It is no longer necessary to shuttle between the office and the machine to modify or debug a program. Since refining the program is so easy, even the "little" problems, which are sometimes ignored, can be quickly and easily addressed. Some programs can be created at the machine in less time than it takes to debug a program created off line.

Moving the Axes

The Hand Held Programmer can be used to move any axis of the machine. To move an axis, select the axis, type the distance you want to move and press either + for one direction or - for the other direction. Each time the + or- key is pressed the axis selected will move the distance selected. The axis can also be moved by using a pulse wheel crank on the

Hand Held Programmer. The speed at which the axis moves is controlled using the SPEED key.

Creating a Program

The Hand Held Programmer is used to create program code by moving the machine to the position desired and pressing EN-TER. The control automatically creates the NC code required to move to this new position. Arcs and circles are programmed in a similar manner. Complex programs are created by stringing together these lines and arcs.

The machine moves during program creation so you can see the exact machine position as the program is created. Errors, such as offsets for tools, are caught and corrected immediately. Key sequences are also available to program other functions such as inputs, outputs, pauses, etc..

Modifying a Program

Pressing the JOG key on the Hand Held Programmer executes the next block of code in the program. Pressing - then JOG steps backward one block in the program. With these functions, you can move forward through the program at will. New movements of code can be inserted anywhere within the program. Existing blocks of code can be deleted from the program. Existing programs can be modified and functions can be added or deleted as needed. Throughout this process the machine moves so that you always see the exact result of your changes. Modifications are made quickly, errors are minimized, and both machine and programming time are saved. The resulting program can then be run and discarded or saved under a new name for a later use.

Running New Programs

The Hand Held Programmer is the most effective tool available for verifying and correcting new programs. You can step forward or backward through the program, one block at a time. At each step, the two line display shows you the next block. The Hand Held Programmer is used to correct errors without the need to return to the office, make the correction, re-post the program and reload it into the CNC control. Savings from program verification alone will more than pay for a Hand Held Programmer.

Cutting Without Programs

Once you are familiar with the Hand Held Programmer, the motions resulting from its use can be used to make actual cuts. The speed during programming is controlled using the SPEED key. When a few simple cuts must be accurately made on a single part, sometimes it is quicker to make the cuts using the Hand Held Programmer than it is to create a complete program for just one part.

Hand Held Programmer Features

▶ **Emergency Stop Button**
Stops all machine functions and turns off all tooling.

▶ **Two Line Display**
Displays programming information, block information and messages.

▶ **Keyboard**
25 keys, high response typewriter quality sealed keypad for function and data input.

▶ **Pulse Wheel**
Used to move an axis forward or backward by turning clockwise or counterclockwise. The distance the axis moves per wheel turn is adjustable.

Command	Function
START (SHIFT-JOG)	This is the same as pushing the START button on the operator control panel.
CONTINUE (SHIFT-JOG)	This allows the remainder of the program to be run from a point in the middle.
JOG	Step through a program one step at a time. Pressing (-) before JOG moves one step backwards. Pressing the JOG button when a program is running will cause the program to stop after the block.
DELETE (SHIFT-CLEAR)	The next block in the program (the one shown in the display) will be deleted.
CLEAR	This clears the block which is being developed before it is entered. If the machine has been moved during the development, it will return to the previous position.
LINE (AXIS-#-dist-+/-)	This sequence is used to develop straight line motion. It will program one or more axis to start, accelerate, decelerate and stop at the same time.
ARC	This command is used to develop circular motion on any two axis.
HELIX	This is a modification of the circle routine allowing one additional axis of linear motion to be added to an arc or circle. This motion will start, accelerate, decelerate and stop coordinated with the arc or circle.
ELLIPSE	This is a routine used to program one quadrant of an ELLIPSE in any two axes.
NORMALIZE (AXIS-#-SHIFT-HOME)	This command returns all axis to its reference point or *HOME* position.
HOME	This command returns all axes to their HOME position simultaneously, signals the end of program development and resets to the top of the program.
PAUSE	This command causes the program to pause a specified period of time.
INPUT	This command specifies an external event which must occur before the program execution will continue.
OUTPUT	This command is used to turn on or off a peripheral device (clamp, drill, etc.).
SPEED	This key is used to change the speed that the machine moves during programming and to specify the speed of a programmed movement.
SHIFT+/ SHIFT-	This command changes the amount an axis moves per revolution of the pulse wheel. Available increments are .0001, .0010 and .0100 per pulse with 100 pulses per revolution.