Abstract

Today's CNC controllers
- Boring design
- Minimal function
- Not operator friendly
- Most offer no feedback from machine.

Bk Handheld controller
- Unique, fun design
- Dual axis manual motion control
- Easy to use physical operators
- PC and touchscreen for machine feedback and part setup programming.

Methods and Materials

Mechanical –
- Designed using AutoCAD Inventor.
- Multiple case revisions, to ensure ergonomics and component fitment.
- 3-D printed case using base nylon blend for prototyping.

Electrical –
- Designed using AutoCAD electrical.
- Component selection based on function and ingress rating.
- Components are all sealed IP65 or higher rated.
- Industrial protocol EtherNetIP for communication to the CNC for all inputs and outputs.

Results

The F1 Controller offers multiple features that few if any other CNC controllers offer.
- Dual axis MPG and Jog controls - Zero in from multiplanes for faster setups and a future generation of operators.
- Multi Zone Operation - Operators grouped based on function and use to limit hand movements.
- Part Programming Interface – Full HMI for part setups and running automatic cycles. As well as auxiliary machine function controls.

Discussion

The controllers of today should meet the growing market of younger operators that may be able to creatively operate machine tools given years of experience in multi-plane controls. This could potentially bring about new machining capabilities that weren’t previously available.

Conclusions

This controller is an imaginative offering not as a solution to a problem but a new way of looking at design in a manufacturing environment. One that offers possibilities of new methods and thinking.

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