Control-Systems

Basic Information's

Select from the beginning the best fitting technology

Controller comparison

Technology	Advantages	Disadvantages
Direct control	• Cheap • Simple cabling	• Not reliable. • High failure rate. • Dedicated hardware. One function • Gets complicated if even simple logical controls are required. • Needs bulky cables to the handset
Relay control	• Simple but robust control. (Reliable) • Thin wires possible btw. Handset and control • Simple logic combinations in Handset possible.	• Needs an additional control box for the relay's • Still needs the same among of wires between Handset and Control box like in case of direct control

Controller comparison

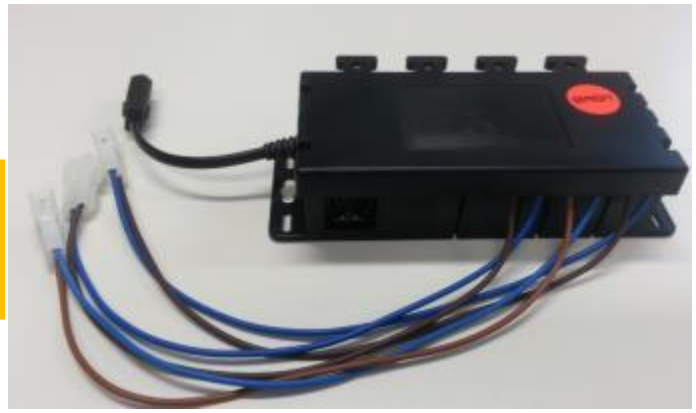
Technology	Advantages	Disadvantages
ISP; Programmable Logic	• Very robust control • No Memory loss possible • No Power on Delay time • Complex logic algorithm possible • Timer and counter function • Reprogrammable • Low stand by current. 0µA solutions possible. • Per motor only one control wire necessary.	• More components • No Hall sensor feedback possible • If analog signals needs to be measured, it get's expensive
µ-Processor	• Most flexible • High memory capability • Complicated control algorithm possible • More intelligent motor controls possible. Like torque or current limit. • Serial communication (Bus Structure) possible / recommended	• Higher cost, more components • Start up time during Power on • Some more failure sources like memory loss or bug related mistakes. Debugging and testing time needs to be heeded. • EMC issue pop's up because of Mosfet control and µC own Oscillator

Some Example's

On the next page we would like to show you some example's of control units and some typical application according to the different technologies

Simple Relay control

Pictures:



- Multiple Purpose housing
- With or without cable OUT/INPUT possible
- Protection degree IPx2
- Up to 3 motors independant selectable
- Accu Charging possible through relay PCBA
- Accu and SMPS operation possible
- Different cable connectors possible

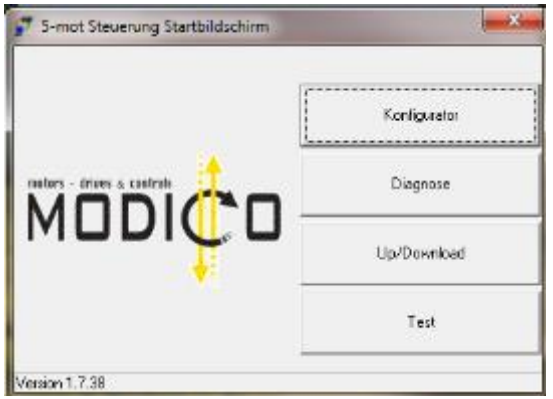
ISP-control box; Programmable Logic

Pictures:

- Multiple Purpose housing
- Protection degree IPx2
- With or without cable out/input possible
- Up to 4 motors independant selectable
- Different cable connectors possible
- Accu and SMPS operation possible,
- Heating and Massage Control possible
- Free programmable through ISP-Logic

µ-Processor controler

Pictures:



- Multiple Purpose housing
- Accu and SMPS operation possible,
- Heating, Massage, light, Multimedia operation possible
- Up to 6 motors independant selectable
- Free programmable, Diagnose toll, up/download, accessories, test etc. through Windows based Software
- Up to IPx6 depend on the housing
- UL and TÜV approved
- Etc.

Thank you for your attention

Additional  needed

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